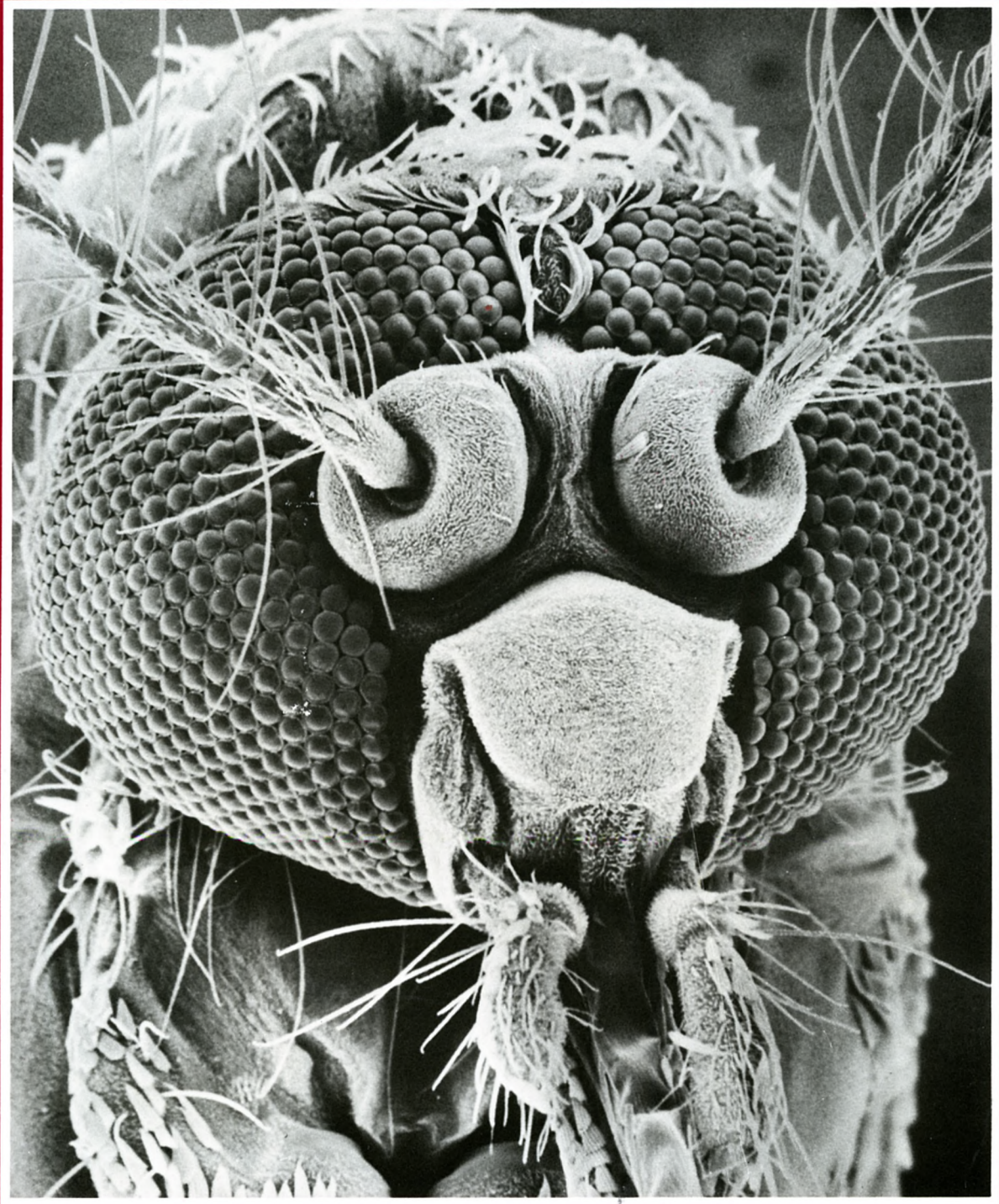


Taxonomists' Glossary of Mosquito Anatomy



Ralph E. Harbach
Kenneth L. Knight



TAXONOMISTS' GLOSSARY OF MOSQUITO ANATOMY

By **Ralph E. Harbach** and
Kenneth L. Knight

This book is the first comprehensive treatment of the nomenclature applied to the sclerotized anatomy of mosquitoes (Diptera: Culicidae). Authorative for the advanced worker as well as the newcomer to mosquito identification, this glossary presents the most complete descriptive terminology ever available. Compiled from a comprehensive study of the mosquito literature, *Taxonomists' Glossary of Mosquito Anatomy* is indispensable for students, researchers, teachers, and libraries. It is an essential tool for mosquito abatement and public health personnel, as well as an important literature source for all research entomologists.

The broad coverage of this book includes, insofar as possible, definitions of structures which are comparative in scope, both phylogenetically and ontogenetically. For the majority of structures the term is defined as it applies throughout all insect groups. The specific application of each term to mosquitoes embraces the three subfamilies (Anophelinae, Culicinae, and Toxorhynchitinae) and many of the genera and subgenera. This is intended to promote stability of the anatomical terminology of the Culicidae and related insects.

The terminology is treated under five headings: adult, egg, larva, pupa, and vestiture. All terms known to the authors are included, with the recommended or accepted term appearing before its definition and a list of its synonyms. Synonymous terms can be located within the text by use of the index. The first published use for each term is cited. An abbreviation and a reference to one or more figures are given for each recommended or accepted term.

Each section concludes with a series of illustrations. The 83 plates, with a total of 365 line drawings and scanning electron micrographs, each with detailed captions, make this work one of the most useful and complete glossaries ever published.

ABOUT THE AUTHORS:

Ralph E. Harbach is currently serving as a commissioned entomologist in the U.S. Army Medical Service Corps. He is stationed at the Department of Entomology, Walter Reed Army Institute of Research and is assigned to the Medical Entomology Project, Smithsonian Institution. He received his B.S. and M.S. in zoology at Western Illinois University and his Ph.D. in entomology at the University of Illinois. Dr. Harbach joined Kenneth Knight in 1976 as a Research Associate at North Carolina State University where this work was completed before he entered the Army in early 1980. He is the author of a number of publications on insect and mosquito anatomy.

Kenneth L. Knight is an Emeritus Professor and recent Head of the Department of Entomology at North Carolina State University. He received his B.Ed. in biological science education at Illinois State University and his M.S. and Ph.D. in entomology at the University of Illinois. After 21 years of service as a commissioned medical entomologist in the U.S. Navy, he joined the entomology faculty at Iowa State University in 1962. In 1966, he moved to the Department of Entomology at the University of Georgia and then in 1968 to his present position. He is past president of the American Mosquito Control Association and the Entomological Society of America and the author of numerous works on the taxonomy and biology of mosquitoes.

**TAXONOMISTS' GLOSSARY
OF
MOSQUITO ANATOMY**

RALPH E. HARBACH

and

KENNETH L. KNIGHT

Department of Entomology
North Carolina State University
Raleigh, N.C. 27650

1980

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*This book is dedicated to the memory of the late
Dr. Jean L. Laffoon
(1922 — 1973)
whose early assistance in the production of this work set a pattern for
excellence which has guided us throughout.*

In Memoriam

While this book was in press, the death of Dr. John N. Belkin on April 24, 1980 was announced. The devastating loss to mosquito systematics resulting from his death is enough reason alone to honor his memory here. However, Dr. Belkin's long-term commitment to advancing our knowledge of mosquito anatomy and improving mosquito anatomical terminology mark him as one who deserves especially meritorious recognition. We are additionally pleased to honor his memory because of his unselfish assistance to us throughout the long period of preparation that this book has undergone.

FOREWORD

When one considers knowledge of life history, biology, morphology, distribution, taxonomy, and relationship to other living creatures including man, mosquitoes must be among the best known of all insects and probably all arthropods. This book provides further evidence of the progress that culicidologists are continually making in the study of their subject. There surely can be no greater need in taxonomy for the purpose of reporting, communicating, and understanding than a common use of terms.

Anyone who has had to deal with a covey of taxonomists working in one project knows how difficult or even impossible it can be to get them to use the same morphological terms. There are the Cornellians, Snodgrassians, Christophersians, Edwardians, Belkinians to mention a few plus those who use a mixed pickle of terms combining all known and some unknown sources.

During the early years of my leadership of the Army Mosquito Project, later the Southeast Asia Mosquito Project, one of my principal duties was the examination and approval for publication of manuscripts submitted by staff taxonomists. The lack of uniformity in the use of morphological terms made a great impression, and it became obvious that some standardization was called for and that something should be done about it. It was realized that this was not a simple matter of laying down hard and fast rules without deep and thoughtful study of the subject and its history. Fortunately for me and for the science of culicidology, there appeared on the scene ("The Laundry," Georgia Avenue, Washington, D.C.) that "verray parfit gentel knight"¹ who is co-author of this scholarly volume. It did not take long for me to convince him of the necessity of such a work and he forthwith began a series of articles, often in collaboration with Jean L. Laffoon, in *Mosquito Systematics*, which by the way also had its origin in "The Laundry." Truly "it's not the cage that makes the canary sing."² From this humble beginning the work progressed, acquired the expert help of R. E. Harbach as well as the superb line drawings of S. Jung, Y. C. Lee, and C. Chang, and emerged as this splendid book with which I am sure no study on any other family of insects can compare either for scholarship or practical application.

This work will definitely be welcomed by all students of mosquitoes and will serve as an example of excellence for those who wish to do the same for other families of insects.

¹ Chaucer. *The Canterbury Tales*.

² From the Chinese.

Botha de Meillon
Philadelphia
November 1979

ACKNOWLEDGMENTS

The discovery at the turn of the nineteenth century that two of the most devastating diseases of man, malaria and yellow fever, were transmitted by mosquitoes immediately raised the prospect that these diseases could be eliminated through mosquito destruction. Physicians, sanitarians, and entomologists quickly rose to the challenge, and the study of mosquito species and their biology began in earnest.

Mosquito identification then, as now, relied principally on differences in features of the sclerotized portions of the body. Because of this, mosquito anatomy has for decades been dealt with principally by taxonomists, not anatomists and morphologists. Little or no comparative work was done, either within the Culicidae or between the family and related dipterous taxa, and a proliferation of anatomical terminology and interpretations resulted. Mosquito identification and description have been hampered through the years by this multiplicity of anatomical terms, often synonyms or homonyms, and by the impreciseness of their applications.

Through the exhortations in 1969 of Dr. Botha de Meillon, then Principal Investigator of the Southeast Asia Mosquito Project at the U. S. National Museum (funded by the U. S. Army Medical Research and Development Command), one of us (KLK) undertook the task of developing an illustrated glossary in which each feature of mosquito sclerotized anatomy was to be defined and named with a term recommended for use. All other terms referring to these features were to be treated as synonyms. It was a naive beginning, and there was little understanding of the immensity and complexity of the task which lay ahead. Through the provision of hundreds of hours of expert assistance by Dr. Jean L. Laffoon, three full-time years from the life of the senior author, years of part-time efforts by the junior author, intermittent assistance by many entomologists about the world, and the financial support of several agencies, this task culminated 10 years later in the present volume.

It is a rare and pleasurable honor to acknowledge our indebtedness to Dr. Botha de Meillon, now in a working retirement, for the impetus which initiated this project and for the interested support provided by him in all the years since.

We recognize with gratitude the following individuals who took time from busy schedules to review one or more parts of this work when published separately in *Mosquito Systematics* and/or to submit information from their areas of special expertise either spontaneously or in response to requests for help: John N. Belkin, Peter Belton, Richard M. Bohart, Anthony B. Bosworth, George W. Byers, D. A. Craig, George B. Craig, Jr., Richard F. Darsie, Roy A. Ellis, Michael E. Faran, Clark F. Gardner, Bruce A. Harrison, William R. Horsfall, J. Ackland Jones, John Lane, Elizabeth N. Marks, Peter F. Mattingly, Herbert H. Neunzig, Lewis T. Nielsen, E. L. Peyton, John A. Reid, John F. Reinert, Sunthorn Sirivanakarn, Andrew Spielman, Alan Stone, Kazuo Tanaka, Ronald A. Ward, P. Wenk, and David A. Young.

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Special recognition is due Major Bruce A. Harrison, U. S. Army, stationed at North Carolina State University during a portion of the project, who served as a consultant on many interpretational matters relating to mosquito anatomy.

We are especially grateful for the meticulous typing, organizational skills, and untiring support of Mrs. Rita H. Reynolds, who prepared the 16 manuscripts published in *Mosquito Systematics*, and to Mrs. Ruth B. Pugh, who prepared the entire manuscript for this book and in the process solved many troublesome format problems.

Special recognition is due the following superb artists who with incredible patience and skill produced our drawings: Mrs. Chien C. Chang, Mrs. Yvonne Lee, Mr. Vichai Malikul, and Mrs. Shuling Tung.

The problem of keeping up with the scientific literature was simplified through the dedicated efforts of Mrs. Helen Sollers-Riedel, who for many years has published quarterly a section in *Mosquito News* entitled "Literature References to Mosquitoes and Mosquito-Borne Diseases." Special thanks are due the American Mosquito Control Association and the National Institutes of Health for supporting the preparation and publication of this indispensable literature survey. Acknowledgment is also due Dr. Richard H. Foote who made it possible for us to use, over a period of time, the extremely valuable USDA-SEA Current Awareness Literature Service computer printouts. These assisted greatly in maintaining an early awareness of the new literature available for reference.

Ms. Margaret A. Sugg and Ms. Ann S. Smith of the Interlibrary Loan Department, D. H. Hill Library, North Carolina State University, with endless patience and consummate skill secured countless references from distant libraries.

The early years of this project received artist support through funding from the U. S. Army Medical Research and Development Command (USAMRDC) Contract No. DA-49-193-MD-2672 and later from USAMRDC Research Contract No. DAMD-17-74-C-4086 by way of the Southeast Asia Mosquito Project (SEAMP), now the Medical Entomology Project (MEP), at the U. S. National Museum, Smithsonian Institution. The senior author, manuscript preparation, and some artist time were funded from September 1976 until the present by Grant No. LM 02787 from the National Library of Medicine, NIH, HEW. Facilities for the project and the junior author's salary were provided by the School of Agriculture and Life Sciences, North Carolina State University, Raleigh, N.C. 27650.

Last of all, we acknowledge with warm pleasure the patience and support of our wives, Roberta Harbach and Ruth Knight, during the many hours of family time that went into this work.

Ralph E. Harbach

Kenneth L. Knight

December 20, 1979

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INTRODUCTION

Throughout the 80 years since serious mosquito study began, individuals attempting to identify or describe mosquitoes have frequently found themselves handicapped by encountering in the literature two or more names for the same anatomical feature; or even more troublesome, finding the same name applied to two or more different structures or combinations of structures. Although some standardization of terminology has occurred, principally because of the mosquito anatomical glossary published by Belkin (1962), considerable confusion still exists. This is true in part because Belkin's glossary was not, nor was it meant to be, inclusive of all mosquito anatomical terms, and in part because an inadequate number of detailed comparative anatomical studies have been published.

It goes without saying that some structural relationships will probably never be worked out for the family as a whole since many annectant and ancestral forms undoubtedly no longer exist. Because of this, the goal of a totally standardized nomenclature is probably not attainable. Nonetheless, the discovery of new techniques occasionally permits an advance toward the accomplishment of this goal. The development of the scanning electron microscope (SEM) is one such technique, permitting as it does a greatly enlarged and three-dimensional view of many previously hard-to-understand structures. Another is the discovery by Belkin (1960), and the subsequent elaboration by Barr and Myers (1962), that ontogenetic homologies between the larval and pupal setae can be determined because the setae are linked by a common neuron while the pupa is developing within the larval cuticle.

The only previous serious effort to produce a glossary of mosquito anatomical terms was by Belkin (1962). However, hundreds of papers have been published dealing in one fashion or another with mosquito anatomy. A very large number of these are referenced in this book. General entomological glossaries preceding this work include Kirby and Spence (1826), Smith (1906), Jardine (1913), Snodgrass (1935), de la Torre-Bueno (1937), Tuxen (1970), and Borror *et al.* (1976).

With the belief in mind that a glossary naming, defining, and illustrating each sclerotized structure of all life stages of the mosquito, as well as listing all synonyms of these names, would be of value to everyone working with mosquitoes, one of us (KLK) began work on the project in 1969. From the beginning, the concept was to develop the glossary in parts (with Part I treating the adult head, Part II the adult thorax, and so on), each part being published as completed. All terms known to have been applied to mosquito structures were to be included with, in the case of each structure, one term being selected for recommended use and fully defined. Early issuance of the parts was planned to give knowledgeable individuals the opportunity to comment fully on the choice of recommended terms and their definitions. Following their completion, all the parts (16 were developed) were to be completely revised and issued in book form.

Although begun alone, the magnitude of the task led KLK to recruit the help of Dr. Jean L. Laffoon, who assisted in the preparation of Parts II through IX before his untimely death in 1973. Dr. Laffoon was uniquely qualified for this because of his continuing effort to collect all anatomical terms for the class Insecta, a task which unfortunately he did not live to complete.

As the work progressed, a not-so-subtle change began to be apparent in the completed parts. First, an increasing effort was made to apply a "law of priority" to the selection of recommended terms, meaning that an effort was made to accept the oldest appropriate name for each structure. This in turn caused an increase in efforts to trace structural homologies wherever possible, and in several cases it became necessary to conduct some comparative studies within the family Culicidae, e.g. on the larval mouthparts. Eventually, the practice was also adopted of listing the reference for the first application of each term to mosquitoes.

During the course of the work, it became increasingly apparent that SEM studies would be necessary if various problems of structural interpretation were to be resolved. To make the necessary expertise available, the National Institutes of Health was approached for funding. Through their affiliate, the National Library of Medicine, support beginning in the fall of 1976 brought the services of REH, a trained morphologist and electron microscopist, who remained full-time on the project until its completion.

Publication of the original 16 parts was completed in December 1978. The contents of the present volume are the result of a total revision, updating, and amalgamation of these.

EXPLANATION

The contents of this book consist of a glossary text, a literature cited section, and an index.

GLOSSARY TEXT.

The anatomical and descriptive terminology of mosquitoes is treated under five headings, i.e., adult, egg, larva, pupa, and vestiture. Illustrations follow the text in each of these sections.

Two types of terms occur throughout the glossary text, those recommended for general use and those which commonly appear in mosquito descriptive literature but are anatomically incorrect, too imprecise for acceptance as *bona fide* synonyms, and/or are unnecessary and in need of explanation. The first are shown in bold face capital letters; the second in bold face lower case letters.

Each recommended term in most cases is followed, in this order, by: (1) a recommended abbreviation, in parenthesis; (2) a reference to one or more figures which illustrate the structure, in parenthesis; (3) the literature reference known to us to first use the term within the Culicidae, in brackets; (4) a definition, often with the first part broadly applicable within Insecta and with the remainder specific for Culicidae; (5) synonymic terms each followed, where known, by the literature citation known to us to first use the term within the Culicidae, in parenthesis; and (6) ending in some cases with supplementary information, in a separate paragraph.

Abbreviations - A recommended abbreviation, comprised either of all capitals or of a combination of upper and lower case letters, has been developed for each recommended term and is used both in the text and in labeling the figures. Abbreviations are not duplicated within a given section of the glossary but in a few cases are duplicated between sections. Individual elements of the larval and pupal chaetotaxy are named with a number and a hyphenated capital letter(s) when referred to in the text but are designated only with the appropriate number when indicated on an illustration.

Synonyms - To insure that a reader of mosquito descriptive literature can determine the meaning of any terminology encountered, we have been quite broad in our interpretation of what constitutes a synonymic term, i.e., in some cases treating what might be considered to be descriptive phrases as terms. Neither time nor space permitted us to be as liberal in the case of terms in languages other than English. For example, terms originating in English but later translated into other languages; in such cases the non-English translations are excluded. However, if terms treated as synonyms first appeared in a foreign language, they are included as well as the later literal English translations. Unique foreign terms, those not literally translatable and those used only in a foreign language, are listed in their original form.

Throughout preparation of the glossary text, more or less arbitrary decisions frequently had to be made, e.g., how to handle synonymic terms occurring in the literature in both hyphenated and unhyphenated forms. In such a case, if the first known use was as a solid word, it is listed that way, and the later hyphenated uses are omitted; if first use was as a hyphenated word, it is listed that way, and the later solid uses are omitted.

REFERENCES CITED.

It has not been possible to search all of the taxonomic descriptive literature for the earliest use of terms, nor for all terms used in such literature. However, we feel the coverage here of purely morphological and anatomical works is exhaustive and that a large percentage of those descriptive articles having a prefatory description of mosquito structure has also been seen. The preponderance of useful morphological works are in English, German, or French with valuable but lesser numbers of articles being in Russian, Danish, Portuguese, or Japanese.

INDEX.

Each term, both those recommended and those treated as synonyms, are followed in the index by one of the letters A, E, L, P, or V, indicating either adult, egg, larva, pupa, or vestiture, and by the page number on which it occurs. Terms beginning with either Arabic or Roman numerals are shown in a separate listing following the alphabetical portion of the index.

ADULT

A

ABDOMEN (Figs. 1,20) — The third, posterior division (tagma) of the insect body. In adult mosquitoes, consisting of ten apparent segments.

ABDOMINAL SEGMENT (I,II,etc.) (Fig.1) [Theobald 1901b,7] — One of the annular subdivisions of the insect abdomen. Ten are apparent in adult mosquitoes. (Syn.: segment, Theobald 1901b,17; uromere, Hodapp and Jones 1961,832)

ABDOMINAL SPIRACLE (Abs) (Figs.1,20) [Christophers 1901,4] — One of the pair of spiracles of an abdominal segment. In adult mosquitoes, borne anterolaterally in the pleural membrane of abdominal segments I-VII. (Syn. probably excluding the spiracular chamber: stigma, Nuttall and Shipley 1901c,470; abdominal stigma, Nuttall and Shipley 1901c,478; air-hole, Theobald 1901b,7; spiracle, Natvig 1948,17; spiracular opening, Christophers 1960,456)

ACCESSORY GLAND DUCT (AGD) (Fig.27) [Jones and Wheeler 1965,402] — A duct of an accessory gland of the insect reproductive system. In female mosquitoes, opening into the vagina near the orifice of the spermathecal ducts. (Syn.: caecal duct, Mattingly 1957,18)

ACCESSORY GLAND DUCT BASE (AGDB) (Fig.27) — In female mosquitoes, the usually pigmented part of the accessory gland duct near its opening into the vagina. (Syn.: basal area, Reinert 1974b,50; base of accessory gland duct, Reinert 1974b,56)

ACCESSORY SETA (AsS) (Fig.21) [Gater 1935,38] — In male *Anopheles*, one of usually a pair of prominent setae located near the mesal margin of the dorsal (prerotation sense) surface of the gonocoxite; dorsal to the internal seta and distal to the parabasal setae. (Syn.: accessory hair, Christophers 1915b,373; accessory spine, Ross and Roberts 1943,2)

ACROSTICHAL AREA (AA) (Fig.11) [Belkin 1962,548] — The median longitudinal area of the scutum from the anterior promontory to the prescutellar space; bearing the acrostichal setae. (Syn.: median area, Christophers 1933, in part, 14)

ACROSTICHAL SCALE (AcSc) (Figs.16,19) — One of the scales usually occurring in one or two lines on the acrostichal area of the scutum; when two rows are present they are borne on either side of the acrostichal setae (unless absent); sometimes merging posteriorly with the prescutellar scales. (Syn.: acrostichal scale line, Belkin 1962,548; acrostichal line, Berlin 1969,5; median band, Wood *et al.* 1979,31; median stripe, Wood *et al.* 1979,32; middorsal stripe, Wood *et al.* 1979, including the inner dorsocentral scales, 32; midlongitudinal stripe, Wood *et al.* 1979,32)

ACROSTICHAL SETA (AcS) (Figs.11,16) [acrostichal bristle, Edwards 1941,8] — One of the setae occurring in a median longitudinal row on the acrostichal area of the scutum; absent in some genera and/or species. (Syn.: central mesonotal chaeta, Christophers 1915a, legend to Pl. XIX; central mesonotal seta, Gater 1935,27; central bristle, Lee and Woodhill 1944,20)

ACROTERGITE (Ac) (Fig.12) [Owen 1977,430] — The part of a tergum cephalad of the antecostal suture. In the thorax of winged insects, the acrotergite of the metanotum has become the mesopostnotum while that of the mesonotum has remained as a narrow flange bearing the first phragma. (Syn.: acrotergite 2, Owen 1977,427)

ADULT — A fully-developed, sexually-mature animal; the final stage in the arthropod life cycle.

AEDEAGAL POUCH (AeP) [Spielman 1964,327] — In male mosquitoes, the membranous depression or pocket into which the aedeagus is retracted at rest. (Syn.: penis cavity, Christophers 1922,569; phallosome sac, Christophers 1960,460)

AEDEAGAL SCLERITE (AeS) (Figs.21,23-25) [Belkin 1968,9] — In males of the Dixidae and certain Culicidae, e.g., *Aedes* subgenus *Verrallina*, a supporting sclerite on either side of the phallus; in most male mosquitoes, one of a pair of lateral sclerotizations of the aedeagus. (Syn.: Basalhaken, Eckstein 1920,226; lateral plate, Christophers 1922,552; lateral phallosomic plate, Christophers 1922,552; penis valve, Freeborn 1924a,205; ventral lobe, Colless 1965,263; aedeagal plate, Jones and Wheeler 1965,408; lateral aedeagal plate, Knight and Laffoon 1971a,12)

AEDEAGAL SPICULE (AeSp) (Fig.22) — In some male mosquitoes, one of the usually flattened spicules borne at the apex of the aedeagus. (Syn.: spine, Dyar 1918b,86; flattened appendage, Dyar 1918b,86; aedeagal spine, Rossignol and McIver 1977,419)

AEDEAGUS (Ae) (Figs.21,22,25) [Dyar 1918b,86] — In most male mosquitoes, the central body of the phallosome serving as the intromittent organ; in certain male mosquitoes, e.g., *Aedes* subgenus *Verrallina*, the distal part of the phallus. (Syn.: penis, Giles 1900,20; theca, Wesch  1906,340; sheath, Wesch  1906,340; penis-sheath, Wesch  1906,345; unci, Howard *et al.* 1912,69; cylindre p rianal, Brolemann 1919b,73; mesosome, Edwards 1920,35; apical plate, Evans 1921,450; phallosome, Barraud 1923a,776; penaeal sheath, Roth 1943,120; intromittent organ, Snodgrass 1959,69; penis filament, Belkin 1968,10; copulatory organ, Jones 1968,110; aedeagal dome, Spielman *et al.* 1974,194)

ALULA (Al) (Figs.17,19) [Giles 1900,16] — In many Diptera, a lobe of the posterior margin of the wing bounded proximally by the upper calypter, distally by the axillary incision and anteriorly by the base of the anal vein; weakly differentiated in mosquitoes. (Syn.: squama, Nuttall and Shipley 1901c,474; axillary lobe, Owen 1977,436)

ANAL VEIN (A) (Figs.17,19) [anal nervure, Nuttall and Shipley 1901c,475] — Any principal longitudinal vein between the cubitus and the jugum. In mosquitoes, only one anal vein (1A) is developed. (Syn.: 6th longitudinal vein, Skuse 1889,1764; sixth longitudinal vein, Giles 1900,10; analis, Gater 1935,28; vein 6, Barraud 1934,57) For other interpretations of homology see Table 1.

ANEPISTERNAL CLEFT (AEC) (Figs.12,13) [Crampton 1925,61] — In many Diptera, the membranous space separating the anterior and posterior mesanepisterna and extending anteroventrally between the anterior mesanepisternum and the mesokatepisternum. (Syn.: basalar cleft, Crampton 1925,61)

ANTEALAR AREA (AnA) (Figs.12,13) [Belkin 1962,548] — The lateral area of the scutum at the level of the paratergite; bearing the antealar scales and setae.

ANTEALAR SCALE (AnSc) (Figs.13,16) — One of the scales occurring on the antealar area of the scutum; a distinct line of antealar scales may be continuous anteriorly with the lateral scutal fossal scales and posteriorly with a lateral line of supraalar scales. (Syn.: antealar scale patch, Belkin 1962,548; lateral marginal line, Berlin 1969, including the lateral scutal fossal scales, 5; supraalar macula, Schick 1970, including the supraalar scales, 9; lateral band, Wood *et al.* 1979, including the lateral scutal fossal scales, 31)

ANTEALAR SETA (AnS) (Figs.12,13,16) — One of the setae occurring in a longitudinal row on the antealar area of the scutum immediately above the paratergite; sometimes more or less continuous with the supraalar setae posteriorly. (Syn.: lateral mesonotal chaeta, Christophers 1915a, legend to Pl. XIX; supra-paratergal seta, Knight 1978,106)

ANTECOSTAL SUTURE (AIS) (Figs.12,19) [Owen 1977,432] — The external groove of the first and second phragmata. That of the first phragma is not readily visible in mosquitoes.

ANTENNA (Ant) (Fig. 1) — One of the paired anterior appendicular organs of the insect head. In adult mosquitoes, consisting of a narrow ringlike basal segment (scape), a second globular and cup-shaped segment (pedicel) and a third segment (flagellum) comprised of a series of 13-14 flagellomeres. (Syn.: feeler, Nuttall and Shipley 1901c,459; F hler, Eckstein 1920,225)

ANTENNAL LENGTH [Belkin 1962,547] — The length of the antenna measured in the extended position and expressed as a fraction of the proboscis length.

ANTENNAL SOCKET (AS) (Figs.2,4,7,8) [Knight 1970,24] — The membranous area of the head into which the base of the antenna is set. (Syn.: antennal fossa, Peterson 1916,15; Stirn, Martini 1923b, in part, 19; Antennengrube, Schiemenz 1957,274)

antennal suture [Antennalnaht, Schiemenz 1957,274] — In insects, a line of inflection surrounding the antennal socket. Applied by Schiemenz (1957,273) to the margin of the scape adjacent to the antennal socket of *Culiseta annulata* (Schrank).

antennifer — Applied by Patton and Evans (1929,54) and Schiemenz (1957,274) to a process of the scape which articulates with the pedicel. See **ANTENNIFER** in the larval section.

ANTEPROCOXAL MEMBRANE (AM) (Fig.11) [Knight and Laffoon 1970b,133] — The membrane anterior to the forecoxa, between it and the proepisternum; sometimes with anteprocoxal scales. (Syn.: precoxal membrane, Snodgrass 1912,57; antecoxal membrane, Belkin 1962,548)

ANTEPROCOXAL SCALE (ASc) — One of the scales occurring in a small group on the anteprocoxal membrane. (Syn.: antecoxal membrane scale, Belkin 1962,548)

ANTEPRONOTAL SCALE (ApSc) (Fig.16) — One of the scales occurring in a group on the

antepronotum; sometimes forming a tuft. (Syn.: prothoracic tuft, Christophers 1913,47; pronotal tuft, Christophers 1933,16; anterior pronotal scale, Belkin 1962,548; pronotal scale tuft, Gillies and De Meillon 1968,7)

ANTEPRONOTAL SETA (Aps) (Figs.11-13,16) [Knight and Laffoon 1970b,133] — Any seta occurring on the antepronotum. (Syn.: prothoracic chaeta, Christophers 1915a, legend to Pl. XIX; pronotal bristle, Edwards 1921,265; soies prothoracales, Séguy, 1924,13; prothoracic group, Matheson 1929,6; anterior pronotal bristle, Patton and Evans 1929,275; anterior pronotal seta, Komp 1937,250; seta of prothoracic lobe, Komp 1937,250; anterior pronotal chaeta, Christophers 1960,432)

➤ **ANTEPRONOTUM (Ap)** (Figs.11-13) [Crampton 1925, Fig.40] — In mosquitoes and some other Diptera, the anterior division of the pronotum; visible as a lateral setose lobe just above the proepisternum. (Syn.: shoulder callosity, Giles 1900,9; patagium, Christophers 1901,4; prosternum, Nuttall and Shipley 1901c, in part, 471; prothoracic lobe, Theobald 1901a,230; protergum, Snodgrass 1912,55; oval lobe, Snodgrass 1912,55; protergal lobe, Snodgrass 1912,55; anterior pronotum, Freeborn 1924b,37; pronotum, Kirkpatrick 1925,13; anterior notum, Freeborn 1926,339; Lobus des Pronotum, Martini 1931,2; anterior pronotal lobe, Christophers 1933,14; pronotal lobe, Edwards 1941,7; notum, Snodgrass 1959, in part, 65)

ANTERIOR DORSOCENTRAL AREA (ADA) [Belkin 1962,548] — The part of the dorsocentral area cephalad of about the level of the antealar area; with setae and scales.

ANTERIOR DORSOCENTRAL SCALE (ADSc) (Fig.16) — One of the scales occurring in a more or less distinct line located cephalad of the posterior scutal fossal scales on the anterior dorsocentral area of the scutum. (Syn.: anterior dorsocentral scale line, Belkin 1962,548; middorsocentral spot, Wood *et al.* 1979, in part, 31)

ANTERIOR DORSOCENTRAL SETA (ADS) (Figs.16,19) [anterior dorsocentral bristle, Belkin 1962,548] — A dorsocentral seta occurring on the anterior dorsocentral area; occurring in one or more rows.

ANTERIOR HARD PALATE (AHP) (Figs. 8,9) [Thompson 1905,156] — The irregular platelike anterior area of the clypeopalatum; bearing one or more palatal setae. (Syn.: Epipharynx, Vogel 1921,270; Pharynxdecke, Vogel 1921,272; dorsal hard palate, Lee 1974,189; dorsal palate, Lee 1974,213)

ANTERIOR MESANEPISTERNUM (AMes) — In some Diptera, the somewhat triangular anterior part of the mesanepisternum bearing the mesothoracic spiracle; separated from the posterior mesanepisternum and the meskatepisternum by the anepisternal cleft. In mosquitoes, divided into four areas, the prespiracular area anterior to the spiracle, the hypostigmal area immediately below the spiracle, the subspiracular area ventral to the hypostigmal area and the postspiracular area posterior to the hypostigmal and subspiracular areas. (Syn. at least for the combined sub- and postspiracular areas: episternum of mesothorax, Nuttall and Shipley 1901c,470; anterior episternum, Christophers 1915a, legend to Pl. XIX; meso-episternum, Prashad 1918,615; Mesepisternum, Martini 1923b,19; anepisternum, Freeborn 1924b,38; anterior anepisternum, Crampton 1925, Fig.40; preanepisternum, Crampton 1925, Fig.40; mes-episternum, Kirkpatrick 1925,14; mesanepisternum, Patton and Evans 1929,86; mesopleuron, Shannon 1931,127; postspiracular area, Christophers 1933,14; mesothoracic anepisternum, Christophers 1933,14; preepisternum, Snodgrass 1959,64; dorsales Mesepisternum, Mohrig 1969,21)

ANTERIOR MESEPIMERAL SCALE (AMSc) (Fig.16) — One of the mesepimeral scales occurring in a group on the cephalodorsal quarter of the mesanepimeron. (Syn.: anterior mesepimeral scale patch, Belkin 1962,548)

ANTERIOR NOTAL WING PROCESS (ANWP) (Fig.17) [Owen 1977,432] — The projection of the lateral scutal margin which articulates with the anterior part of the first axillary sclerite. (Syn.: flange, Christophers 1960,449; suralare, Owen 1977, in part, 436)

ANTERIOR PROMONTORY (AnP) (Figs.11,12) [Christophers 1915a, legend to Pl. XIX] — The broad median area of the mesonotum at the anterior end of the acrostichal area which more or less projects cephalad over the cervix. (Syn.: humeral area, Belkin 1962, in part, 548)

ANTERIOR SCUTAL FOSSAL SETA (ASFS) (Fig.16) — One of the setae occurring in a group on the anterolateral margin of the scutal fossa above the posterior margin of the antepronotum. (Syn.: humeral bristle, Belkin 1962,548)

ANTERIOR SCUTELLAR RIDGE (ASR) (Figs.17,19) [Owen 1977,429] — The external ridge

extending from the anterolateral angle of the scutellum to the base of the posterior notal wing process. (Syn.: post-alar ridge, Christophers 1915a,366; alar ridge, Prashad 1918,615)

ANTERIOR TENTORIAL ARM (ATA) (Figs.5-9) [Robinson 1939,219] — The apodeme extending posteriad from the anterior tentorial pit; its apex meeting the posterior tentorial arm at a visible fusion point; sometimes bearing a small dorsal tentorial arm; also sometimes bearing a small ventral tentorial arm. (Syn.: anterior arm of the tentorium, Peterson 1916, Fig.159; pretentorium, Patton and Evans 1929,56; anterior arm, Robinson 1939,219; anterior arm of tentorium, Robinson 1939,222)

ANTERIOR TENTORIAL PIT (ATP) (Figs.2,4,6-8) [Robinson 1939,215] — An external depression in the cranium at the base of each anterior tentorial arm. In adult mosquitoes, occurring where the epistomal suture meets the antennal socket. (Syn.: anterior opening, Nuttall and Shipley 1901c,481; Antennengrübchen, Kulagin 1905,298; invagination of the anterior arm of the tentorium, Peterson 1916, Fig.10; frontal pit, Patton and Evans 1929,54; anterior pit, Snodgrass 1959,52)

anterior tentorium [Robinson 1939,219] — The pair of anterior tentorial arms.

anterior wing-root [Prashad 1918,624] — The proximal area of the wing including the basal parts of the costa, radius and remigium.

antero-medial bare space [Christophers 1915a, legend to Pl. XIX] — The area between the acrostichal and dorsocentral setae on roughly the anterior half of the scutum.

A / P [Gutsevich 1974b,251] — Ratio of the total length of the second and third flagellomeres to the proboscis length (note that Gutsevich (1974a,245) measured the length of the proboscis from the anterior margin of the clypeus rather than from the labial basal setae). (Syn.: A / Pr, Gutsevich 1975a,154); index of A / Pr, Gutsevich 1975a,162)

apical intersegmental fold [Reinert 1974b,50] — In female mosquitoes, the usually cephalad-directed fold of the intersegmental membrane between the posterior margin of sternum VIII and the lower vaginal lip; the membrane carries the insula on its posterior median area. (Syn.: pre-atrial fold, Christophers 1923,704)

This unnecessary term is a poor one in that the fold is not apical to any structure and the intersegmental membrane in which it occurs does not have an apex. A more appropriate term might be pregonotremal fold.

APICODORSAL LOBE (ADL) (Figs.20-22) — In male mosquitoes, the most distal area of the dorsal (prerotation sense) surface of the gonocoxite; an apical dorsomesal lobe. (Syn.: subapical lobe, Dyar 1905a,43; lobe of the side piece, Howard *et al.* 1912,69; apical lobe, Dyar 1918a,74; saille apicale, Brolemann 1919b,75; apical angle, Dyar 1919,116; apikaler Lappen, Martini 1922,134; Apicallappen, Martini 1922,137; verrue apicale, Séguy 1924,15; apicotergal lobe, Belkin 1962,553; apicotergal angle, Belkin 1962,553; apicotergal area, Belkin 1962,553)

APICOVENTRAL LOBE (AVL) [Christophers and Barraud 1923,831] — In male mosquitoes, the most distal area of the ventral (prerotation sense) surface of the gonocoxite; an apical ventromesal lobe. (Syn.: apicosternal lobe, Belkin 1962,553; apicosternal angle, Belkin 1962,553; apicosternal area, Belkin 1962,553)

APODEME — Any ridge or ingrowth of the cuticle forming the endoskeleton; usually marked externally by a suture or pit.

APODEME OF GONOCOXITE (AG) (Fig.22) [Knight and Laffoon 1971a,9] — In male mosquitoes, an apodematous continuation of the proximal mesal dorsal (prerotation sense) corner of the gonocoxite; fused or articulated with the basal piece. (Syn.: apodeme, Edwards 1920,30; apodeme of the clasper, Christophers 1922, 563; grosse Muskelfortsatz, Martini 1922,135; grosse Myapophyse, Martini 1922,139; apodeme of the side-piece, Christophers and Barraud 1923,832; apodeme of side-piece, Christophers and Barraud 1923,835; Gelenkfortsatz, Martini 1928,155; apodeme of coxite, Christophers 1933,31; apodeme of the coxite, Gater 1935,38; process of the side piece, Rees and Onishi 1951,237; process of side piece, Rees and Onishi 1951,246; apodeme of clasper, Spielman 1964,326; ventral apodeme, Jones and Wheeler 1965,408)

APOPHYSEAL CUP (AC) (Figs.12,14,15) [Owen 1977,433] — A cuplike process borne on the free end of a sternal apophysis; receiving the attachment of certain thoracic muscles.

ARCULUS (Ar) (Fig.17) [Christophers and Barraud 1924,1105] — A crossvein between the radius and cubitus near the wing base in certain insects, including mosquitoes. (Syn.: articular, Prashad 1918,625; articular sclerite, Christophers 1960,444)

AXILLARY CORD (AxC) (Fig.17) [Snodgrass 1912,56] — The thickened posterior edge of the upper and lower calypters; continuous basally with the posterior scutellar ridge.

AXILLARY INCISION (AI) (Fig.17) [Giles 1900,16] — In Diptera, a notch on the posterior margin of the wing between the alula and distal part.

AXILLARY SCLERITE (AxS) [Owen 1977,441] — One of the small articulatory plates located between the lateral margin of the notum and the bases of the wing veins in wing-flexing insects. As is typical of most insects, first, second and third axillary sclerites are present in mosquitoes. (Syn.: axillary, Gater 1935,28; basal sclerite, Christophers 1960,442; articulatory sclerite, Owen 1977,442)

B

BASALAR APODEME (BaA) (Fig.12) [Owen 1977,432] — An apodeme of the mesothorax arising from the posterior mesanepisternum slightly below the basalare.

BASALARE (Ba) (Figs.12,13) [Owen 1977,429] — The episternal epipleurite giving insertion to the anterior pleural wing muscles. In the mesothorax of mosquitoes, the lobe borne at the apex of the posterior mesanepisternum anterior to the pleural wing process; in the metathorax of mosquitoes, the small lobe at the apex of the metepisternum before the pleural wing process. (Syn. for the basalare of the mesothorax: unguoid, Prashad 1918,616; unguoid process, Christophers 1960,449)

BASAL DORSOMESAL LOBE (BDL) (Fig.22) — In male mosquitoes, a basal lobe on the mesal margin of the dorsal (prerotation sense) surface of the gonocoxite. (Syn.: basal lobe, Dyar 1905a,43; claspette, Dyar 1905a,43; lobe of the side piece, Howard *et al.* 1912,69; outer lobe, Dyar 1918a,71; verrue basale, Brolemann 1919b,75; Basallappen, Martini 1921,253; basaler Lappen, Martini 1922,134; basal tergomesal lobe, Belkin 1962,553; basal tergomesal area, Belkin 1962,553)

BASAL LATERAL ARM (BLA) (Figs.23,25) [Barraud 1934,4] — In male *Culex* mosquitoes, a laterally directed basal process of the paraproct; may bend in caudal and/or ventral directions. (Syn.: minor limb, Felt 1905,483; basal process, Dyar and Knab 1909,33; basal projection, Dyar and Knab 1909,35; saille transversale, Brolemann 1919a,435; basal arm, Edwards 1920,32; basal arm of tenth sternite, Edwards 1921,330; ventral arm of the paraproct, Freeborn 1924a,191; ventral arm, Freeborn 1924a,198; ventral arm of paraproct, Natvig 1948,37; basal arm of the tenth sternite, Rees and Onishi 1951,237; basal sternal process, Belkin 1962,553; Paraproctfortsatz, Iglisch 1977,266)

This structure arises from the lateral margin at the base of the paraproct and on this basis “basal lateral arm” is more appropriate than either “basal arm,” “ventral arm” (previously recommended for use by Knight and Laffoon 1971a,14) or “basal sternal process.”

BASAL MEDIAN APODEME (BMA) [Reinert 1976b,28] — In female mosquitoes, an apodeme arising on the midline at the base of the ventral surface of the postgenital lobe. (Syn.: stigmata, Jones and Wheeler 1965,403; basal median longitudinal apodeme, Zavortink 1972,12)

BASAL MESAL LOBE (BML) (Figs.21,22) [Belkin 1962,553] — In male mosquitoes, a small lobe or sclerite located basomesally on the gonocoxite; usually connected ventrally with its mate; possibly homologous with the claspette. (Syn.: basal lobe, Dyar 1918a, in part, 71; gonapophyse, Brolemann 1919b,86; basal lobe, Christophers 1922,560; basal plaque, Christophers 1922,560; Sinneslappen der Valve, Martini 1928,149; Sinnesfeld, Martini 1928,156; basal lobe of paramere, Hodapp and Jones 1961,833; basal lobe of the paramere, Hodapp and Jones 1961,834; basal lobe of the basimere, Jones and Wheeler 1965,409) See **GENITALIA**.

basal palpal hair [Christophers 1915a,364] — One of several conspicuous setae arising from the basal palpomere of the maxillary palpi in certain female *Anopheles*. (Syn.: basal palpal chaeta, Christophers 1915a, legend to Pl. XIX)

BASAL PIECE (BP) (Figs.20-23) [Belkin 1962,553] — In male mosquitoes, one of the pair of basal supporting sclerotizations of the phallosome; lying within abdominal segment IX and often extending anteriorly into VIII; articulated with the paramere, sometimes articulated with the base of the proctiger and often connected with the apodeme of gonocoxite; probably primitively an apodeme of the mesal margin of the gonocoxite. (Syn.: apodeme, Wesché 1906,352; ligament, Dyar 1918b,89; apodème aliforme, Brolemann 1919a,431; apodème aliforme de la trigonapophyse, Brolemann 1919b,101; basal plate, Edwards 1920,33; basal apodeme, Christophers 1922,554; plate of paramere, Roth 1943,119; basal plate of paraproct, LaCasse and Yamaguti 1950,7; ventral root of basimere, Hodapp and Jones 1961, in part, 833; dorsal root of basimere, Hodapp and Jones 1961, in part, 833; ventral root, Jones and Wheeler 1965, in part, 408; dorsal root, Jones and Wheeler 1965, in part 408; ventral root of the clasper, Jones and Wheeler 1965, in part 408; dorsal root of the clasper,

Jones and Wheeler 1965, in part 408; parameral apodeme, Knight and Laffoon 1971a,13; gonocoxal apodeme, Wood *et al.* 1979,37)

BASAL SPUR (BS) [Belkin 1962,551] — A longitudinal proximal extension of the radial sector or radius-four-plus-five when these are sharply bent in the form of a crossvein near their points of origin. (Syn.: spur, Belkin 1962,552)

BASAL VENTROMESAL LOBE (BVL) — In male mosquitoes, a basal lobe on the mesal margin of the ventral (prerotation sense) surface of the gonocoxite. (Syn.: baso-ventral lobe, Christophers and Barraud 1923,831)

BASISTERNUM (Bat) — The area of a thoracic sternum anterior to the sternacostal suture and/or the sternal apophyseal pits. See **FURCASTERNUM**.

BASOLATERAL SETA (BLS) (Fig.27) [Reinert 1974b,50] — In female mosquitoes, a small seta which may be present on either anterolateral corner of tergum VIII or sternum VIII; occasionally replaced by a small bulla (campaniform sense organ?); may function in monitoring the degree of retraction of abdominal segment VIII.

C

CALYPTER (Ct) [Knight and Laffoon 1970c,166] — In most winged Diptera, either of two posterior lobes of the posterior margin of the wing proximad of the alula. (Syn.: alula, Nuttall and Shipley 1901c,474; tegula, Blanchard 1905,59; squama, Christophers 1933,18) See **LOWER** and **UPPER CALYPTER**.

CAPITELLUM (Ca) (Fig.17) [Prashad 1916,504] — The expanded, knoblike distal part of the halter. (Syn.: knob, Nuttall and Shipley 1901c,477; globule, Natvig 1948,17)

CARDO (Cd) (Figs.5,6) [Wesché 1909,4] — The basal subdivision of the maxilla. In mosquitoes, imbedded in the membrane near the posterior tentorial pit; fused anteriorly with the rodlike stipes to form the supitocardinal rod; distinguishable from the stipes by muscle insertions.


CELL — An area of wing membrane delimited by veins or by veins and the wing margin; named after the vein immediately anterior to it or after the posterior element if the vein is formed by the "fusion" of two vein branches; the names of the cells present in mosquitoes are listed below. (Syn.: area, Nuttall and Shipley 1901c,475)

CELL 1A (1A) (Figs.17,19) — The cell occurring between the posterior wing margin and the anal vein. (Syn.: spurious cell, Skuse 1889,1764; anal area, Nuttall and Shipley 1901c,475; axillary cell, Howard *et al.* 1912,61; auxiliary cell, Matheson 1929,11)

CELL C (C) (Figs.17,19) — The cell posterior to the costa; subdivided by the humeral crossvein into the proximal first cell C and the large distal second cell C. (Syn.: costal cell, Skuse 1889,1764)

CELL CuA (CuA) (Figs.17,19) — The extremely narrow cell posterior to the cubitus anterior; usually indistinctly separated from cell CuP by the weak and often incomplete cubitus posterior.

CELL CuP (CuP) (Figs.17,19) — The cell posterior to the weakly developed cubitus posterior. (Syn. probably including cell CuA (see): axillary cell, Skuse 1889,1764; cubitus area, Nuttall and Shipley 1901c,475; auxiliary cell, Theobald 1901b,18; anal cell, Matheson 1929,11; cell cu₂, Matheson 1929,11)

 **CELL M (M)** (Figs.17,19) — The cell posterior to the stem of the media. (Syn.: 2nd basal cell, Skuse 1889,1764; second basal cell, Giles 1900,10; media area, Nuttall and Shipley 1901c,475)

CELL M₁ (M₁) (Figs.17,19) — The cell posterior to media-one; its length is measured (according to Belkin 1962,551) along the longitudinal axis of the stem and media-one-plus-two from the point of separation of media-one and media-two; this length is usually compared to the length of media-one-plus-two measured along the same axis. (Syn.: 2nd posterior cell, Skuse 1889,1764; second posterior cell, Giles 1900,10; cell M₂, Nuttall and Shipley 1901c,475; lower fork cell, Kirkpatrick 1925,17; second fork cell, Patton and Evans 1929,183; posterior forked cell, Christophers 1933,18; lower forked cell, Barraud 1934,xxvii)

CELL M₂ (M₂) (Figs.17,19) — The cell posterior to media-one-plus-two and media-two. (Syn.: 3rd posterior cell, Skuse 1889,1764; third posterior cell, Giles 1900,10; cell M₃, Nuttall and Shipley 1901c,475)

CELL M₄ (M₄) (Figs.17,19) — The cell posterior to media-three-plus-four. (Syn.: anal cell, Skuse

1889,1764; cell Cu₁, Nuttall and Shipley 1901c,475; 4th posterior cell, Howard *et al.* 1912,61)

➤ **CELL R (R)** (Figs.17,19) — The cell posterior to the stem of the radius and the radial sector. (Syn.: 1st basal cell, Skuse 1889,1764; first basal cell, Giles 1900,10; radius area, Nuttall and Shipley 1901c,475; basal cell, Theobald 1901b,19)

CELL R₁ (R₁) (Figs.17,19) — The cell posterior to radius-one. (Syn.: marginal cell, Skuse 1889,1764; 1st marginal cell, Howard *et al.* 1912,61)

CELL R₂ (R₂) (Figs.17,19) — The cell enclosed between radius-two and radius-three; its length is measured (according to Belkin 1962,551) along the projection of the longitudinal axis of radius-two-plus-three from the point of separation of radius-two and radius-three; this length compared to the length of radius-two-plus-three measured along the same axis. (Syn.: 1st sub-marginal cell, Skuse 1889,1764; first sub-marginal cell, Giles 1900,10; second marginal cell, Howard *et al.* 1912,61; 2nd marginal cell, Howard *et al.* 1912,61; upper fork cell, Kirkpatrick 1925,17; first fork cell, Patton and Evans 1929,183; anterior forked cell, Christophers 1933,18; upper forked cell, Barraud 1934,xxvii)

CELL R₃ (R₃) (Figs.17,19) — The cell posterior to radius-two-plus-three and radius-three. (Syn.: 2nd sub-marginal cell, Skuse 1889,1764; second sub-marginal cell, Giles 1900,10; sub-marginal cell, Howard *et al.* 1912,61)

CELL R₄ (R₄) (Figs.17,19) — The cell posterior to radius-four-plus-five. (Syn.: 1st posterior cell, Skuse 1889,1764; first posterior cell, Giles 1900,10)

CELL Sc (Sc) (Figs.17,19) — The cell posterior to the stem of the subcosta proximad of the crossveinlike subcosta-two; usually applied to the combined cells Sc and Sc₁. (Syn.: sub-costal cell, Skuse 1889,1764)

CELL Sc₁ (Sc₁) — The cell posterior to subcosta-one; usually regarded as part of cell Sc.

CEPHALIGER (Cg) (Figs.2,11,12) [Crampton 1942,147]—The anterior process of the cervical sclerite which articulates with the occipital condyle of the cranium. (Syn.: head-bearing process, Crampton 1942,147)

➤ **CERCAL SCLERITE (CSc)** (Figs.23,25) [Belkin 1962,553] — Any sclerite forming a part of the cercus. In male mosquitoes, the more or less distinctly sclerotized area between the paraprocts on the dorsal (prerotation sense) surface of the proctiger or one of a pair of sclerites in the same area. (Syn.: plaques chitinisées du pénis, Brolemann 1919a,439; tenth tergite, Edwards 1920,31; dorsal plate, Barraud 1923a,776; dorsal plate of the anal segment, Christophers and Barraud 1923,835; epiproct, Freeborn 1924a,191; X. Tergit, Martini 1928,152; dorsale Analkegelsklerite, Martini 1928,153; dorsal plate of proctiger, Edwards 1941,15; dorsal plate of the proctiger, Christophers 1960,457; lateral segment of paraproct, Spielman 1964,326; basotergal lobe of proctiger, Peyton and Hockman 1968,377)

CERCAL SETA (CSe) (Figs.22,23,25) [Belkin 1962,553] — Any seta on a cercus. All setae on the proctiger of male mosquitoes are considered to be from the cercus and are thus cercal setae; usually one to a few pairs are present distally.

CERCUS (Ce) (Figs.♂ 22,23,25; ♀ 1,20,25-27) [in ♂ Knight and Laffoon 1971a,10; in ♀, Edwards 1912,5] — One of the pair of appendages of abdominal segment XI; often articulating with a more anterior segment, particularly when the posterior segments are reduced. In male mosquitoes, largely membranous, not sharply delimited from adjacent parts of the proctiger and with the paraproct representing the main area of sclerotization. In female mosquitoes, a pair of more or less conspicuous lobes posterior to tergum IX; appendages of the proctiger. (Syn. for ♂: anal membrane, Carpenter *et al.* 1946,33. Syn. for ♀: palette, de Réaumur 1738,627; tentacule vulvaire, Dufour 1851,210; lobe of ovipositor, Giles 1900,20; basal lobe, Theobald 1901a,230; genital lobe, Nuttall and Shipley 1901c,470; petit lobe, Blanchard 1905,62; terminal lobe, Felt 1905,450; lobe, Felt 1905,468; upper valve, Weschél 1906,360; appendice, Brolemann 1919b,96; tenth abdominal segment, Curtin and Jones 1961,302; gonopod, Giglioli 1963, in part, 151; telocercus, Giglioli 1963,153)

CERCUS/DORSAL POSTGENITAL LOBE INDEX (cercus/dorsal PGL Index) [Reinert 1973,3] — In female mosquitoes, the cercus length divided by the dorsal postgenital lobe length.

CERCUS INDEX [Reinert 1973,3] — In female mosquitoes, the cercus length divided by the cercus width.

- CERCUS LENGTH** [Reinert 1973, Fig. 70] — In female mosquitoes, the dorsal measurement of the distance from the apex to the most anterior point of the cercus. (Syn.: dorsal cercus length, Reinert 1973, 3)
- CERCUS WIDTH** [Reinert 1973, 3] — In female mosquitoes, the width of the cercus measured at one-half the cercus length.
- CERVICAL CONDYLE (CC)** (Fig. 2) [Owen 1977, 420] — The posterior process of the cervical sclerite which articulates with the proepisternum.
- CERVICAL SCLERITE (CS)** (Figs. 1, 2, 5, 6, 11, 12, 14) [Christophers 1901, 4] — A sclerite situated laterally on the cervix; anteriorly bearing the cephaliger which articulates with the occipital condyle of the cranium; posteriorly bearing a cervical condyle which articulates with the proepisternum. (Syn.: lateral chitinous plate, Nuttall and Shipley 1901c, 468; sclerite of neck, Nuttall and Shipley 1901c, 470; cervicum, Snodgrass 1912, 57; neck sclerite, Peterson 1916, 24; Halsplatte, Martini 1923b, 19; lateral cervicale, Crampton 1925, Fig. 40, Pl. VII; lateral jugular sclerite, Patton and Evans 1929, 85; lateral cervical sclerite, Patton and Evans 1929, 86; jugular sclerite, Patton and Evans 1929, 87; Laterocervicalia, Schiemenz 1957, 274; cervical plate, Snodgrass 1959, 65; anterior lateral cervicale, Owen 1977, in part, 428; posterior lateral cervicale, Owen 1977, in part, 429)
- CERVIX (Cv)** (Figs. 1-6, 11, 12, 14) [Swellingrebel and Rodenwaldt 1932, 11] — The membranous tube connecting the thorax to the head at the margins of the occipital foramen; laterally supported by the cervical sclerites. (Syn.: neck, MacLoskie 1887, 107; Gula, Schiemenz 1957, in part, 274; Kehle, Schiemenz 1957, in part, 274)
- **CIBARIAL ARMATURE (CA)** (Fig. 8) [Knight and Laffoon 1970a, 70] — In some female mosquitoes, a series of specialized spicules, cibarial teeth, borne on a transverse ridge, cibarial crest, and a group of spiculate ridges, cibarial ridges, lying ventrally at the posterior margin of the cibarium. (Syn.: bucco-pharyngeal armature, Sinton and Covell 1927, 302; pharyngeal armature, Christophers 1933, 24; bucco-pharyngeal apparatus, Lee and Woodhill 1944, 15)
- CIBARIAL CREST (CC)** (Fig. 9) — The transverse ridge located ventrally at the posterior margin of the cibarium which supports the cibarial teeth. (Syn.: crest, Thompson 1905, 158; pharyngeal bar, Christophers 1933, 24; cibarial bar, Reid 1968, 16)
- **CIBARIAL DOME (CD)** (Fig. 9) [Valencia 1973, 5] — A hemispherical, spiculate structure projecting from the clypeopalatum; at the posterior margin of the cibarium, presumably the posterior part of the posterior hard palate. (Syn.: cobblestone area, Barraud and Covell 1928, 676; shagreened area, Barraud and Covell 1928, 676)
- **CIBARIAL RIDGE (CIR)** (Fig. 10) [Knight and Laffoon 1970a, 70] — In female mosquitoes of some genera, one of a series of short spiculate ridges lying just posterior to the cibarial crest and forming part of the cibarial armature. (Syn.: bucco-pharyngeal ridge, Sinton and Covell 1928, 303; post-armature ridge, Christophers 1933, 26; pharyngeal ridge, Christophers 1933, 28)
- CIBARIAL SETA (CIS)** — One of the various types of setae borne within the cibarium; in groups designated by location as dorsal, palatal and ventral setae. (Syn.: epipharyngeal sense organ, Snodgrass 1959, 63; cibarial sense organ, von Gernet and Buerger 1966, 259; cibarial pump sense organ, von Gernet and Buerger 1966, 261; cibarial receptor, von Gernet and Buerger 1966, 264; cibarial sensillum, Lee and Davies 1978, 189)
- In keeping with the terminology applied to the vestiture of mosquitoes by Harbach and Knight (1978c), "seta" is substituted here for "papilla," hence, "dorsal seta," "palatal seta" and "ventral seta" replace "dorsal papilla," "palatal papilla" and "ventral papilla," respectively, which were recommended for use by Knight and Laffoon (1970a). It should be noted that some of the dorsal setae are not papilliform structures.
- CIBARIAL TEETH (CT)** (Figs. 9, 10) [Reid 1968, 15] — In some female mosquitoes, a series of specialized spicules borne on the cibarial crest located ventrally at the posterior margin of the cibarium; commonly of two kinds called cones and rods; when a single type is present they have more or less the character of cones. (Syn.: hairs, Nuttall and Shipley 1903, 170; spurs, Thompson 1905, 157; teeth, Sinton and Covell 1927, 303; pharyngeal teeth, Christophers 1933, 24; ventral teeth, Snodgrass 1959, 63; denticles, Gutsevich 1974a, 243)
- CIBARIUM (Cib)** (Figs. 5-10) [Schiemenz 1957, 275] — The preoral food cavity between the base of the hypopharynx and the under surface of the clypeus, clypeopalatum. Serving as the primary sucking organ in mosquitoes and many other insects. (Syn.: pharynx, Dimmock 1881, 238; buccal cavity,

Nuttall and Shipley 1903,166; subclypeal tube, Thompson 1905,155; basipharynx, Peterson 1916, Figs.504-505; Pharynxpumpe, Martini 1923b,29; mid-pharynx, Evans 1938,12; pharyngeal pump, Natvig 1948,5; antlia cibarialis, Snodgrass 1943,13; cibarial pump, Snodgrass 1943,13; bucco-pharynx, Christophers 1960,418; bucco-pharyngeal cavity, Christophers 1960,423; oral cavity, Gutsevich 1974a,243) Compare **CIBARIUM** in the larva section.

CLASPETTE (Ci) (Figs.20-22,24) [Edwards 1920,29] — In male mosquitoes, a descriptive term applied to a variably-shaped lobe arising mesally at the base of the gonocoxite; possibly homologous with the prosophallus or the basal mesal lobe. (Syn.: volselle, Dufour 1851,209; harpe, Dyar 1905a,43; harpago, Dyar and Knab 1909,33; accessory lobe, Christophers 1915b,371; gonapophyse, Brolemann 1919b,73; Spreizhaken, Eckstein 1920,226; Basalanhänge, Martini 1921,252; claspette process, Christophers 1922,569; Anhänge, Martini 1922,135; Zängchen, Martini 1922,137; claspette lobe, Freeborn 1926,342; basal membranous lobe, King and Bradley 1941,63; claspetoid, Natvig 1948,29; prosophallus, Schick 1970,12) See **GENITALIA**.

In anophelines, the claspette is often divided into a *dorsal lobe* [Gater 1935,40] (Syn.: ventral lobe, Root 1923,267; external lobe, Gater 1935,40; outer lobe, Roth 1944,106; dorsal claspette, Faran 1979,28) and a *ventral lobe* [Ross and Roberts 1943,2] (Syn.: dorsal lobe, Christophers 1915b,375; inner lobe, Christophers 1915b,375; ventral claspette, Faran 1979,28). The dorsal lobe in some species is more or less divided so that in addition to the ventral lobe there is a *middle lobe* Christophers 1915b,376] (Syn.: median lobe, Root 1923,267) and a *dorsal lobe* (Syn.: ventral lobe, Christophers 1915b,376). In species of the subgenus *Nyssorhynchus*, the ventral lobes are fused, *median lobe* [Evans 1921,449]. The latter usually bears a small *basal lobule* [Faran 1979,28] (Syn.: lobule, Ross and Roberts 1943,33) on either side which may be homologous with the middle lobe.

CLASPETTE FILAMENT (CF) (Figs.20-22,24) [Carpenter and LaCasse 1955,13] — In male mosquitoes, a specialized apical seta of the claspette; usually simple or foliform. (Syn.: terminal segment, Dyar 1905a,43; apical filament, Dyar 1905c,185; filament of harpago, Dyar 1918a,77; apical appendage of harpago, Dyar 1918a,86; article apical, Brolemann 1919b,76; second article, Brolemann 1919b,81; 2^e article des gonapophyses, Brolemann 1919b,101; appendage of claspette, Edwards 1921,298; filament of the claspette, Matheson 1929,15; filament of claspette, Matheson 1929,15; spatulate process, Gater 1935,38; clubbed process, Gater 1935,40; apical process, Ross 1947,64; filament, Belkin 1962,553; Klaspettenhang, Mohrig 1969,23)

CLASPETTE STEM (CSI) (Figs.20,22,24) [Carpenter and LaCasse 1955,13] — In male mosquitoes, the basal part of the claspette; bearing the claspette filament apically. (Syn.: basal segment, Dyar 1905a,43; stem of harpago, Dyar 1918a,76; premier article, Brolemann 1919b,80; article basal, Brolemann 1919b,83; 1^{er} article des gonapophyse, Brolemann 1919b,101; stem, Natvig 1934,328)

CLYPEAL PHRAGMA (CPh) (Figs.5,7,8) [Knight and Laffoon 1970a,70] — A flat, sheetlike apodeme extending from the exposed part of the clypeus to the lateral margin of the cibarium. (Syn.: Stirnfortsätze, Kulagin 1905,287; Seitenfortsätze der Stirn, Kulagin 1905,335; fulcral plate, Robinson 1939,219; apodeme of the clypeus, Snodgrass 1943,9; Fulcrum, Schiemenz 1957,275; paraclypeal phragma, Waldbauer 1962,203)

This term was proposed by Knight and Laffoon (1970a,70) because "fulcral plate," commonly used in Diptera, is too inclusive and "paraclypeal phragma" implies that the structure somehow lies outside the clypeus.

CLYPEOLABRAL SUTURE (CIS) (Figs.2,4-6) [clypeo-labral suture, Waldbauer 1962,202] — The transverse suture separating the clypeus and labrum.

CLYPEOPALATUM (Cp) [Laffoon and Knight 1973,79] — The part of the palatum formed by the under surface of the clypeus, the roof of the cibarium. (Syn.: palate, Nuttall and Shipley 1903,168; dorsal plate, Thompson 1905,157; Palatum, Schiemenz 1957,283; epipharyngeal surface, Snodgrass 1959,62)

Wenk (1962,91), in a study on the adult simuliid head, coined the germanized Latin term "Clypeo-Palatum" for the roof of the cibarium. Laffoon and Knight (1973,79) endorsed the anglicized Latin form "clypeopalatum" for use in culicid larvae and adults.

CLYPEUS (Cip) (Figs.2,4,6-9) [Dimmock 1881,234] — The facial area delimited above by the epistomal suture and below by the clypeolabral suture; giving origin to the dorsal cibarial muscles; conspicuous and projecting in adult mosquitoes. (Syn.: epistom, Dimmock 1881,238; face, Annett *et al.* 1901,74; Stirn, Kulagin 1905,285; fronto-clypeus, Peterson 1916,16; postclypeus, Crampton 1942,141) Compare **CLYPEUS** in the larva and pupa sections.

COMMON SALIVARY DUCT (CSD) (Figs.5,6,9) [Christophers 1901,5] — The common median part

of the salivary ducts opening into the salivary pump. (Syn.: poison duct, MacLoskie 1887,106; common duct, MacLoskie 1887,107; ductule, MacLoskie 1888,886; venemo-salivary duct, MacLoskie 1888, including the salivary ducts, 886; duct, Theobald 1901b,4; Speichelgang, Leon 1904,731; salivary duct, Peterson 1916, Fig.504)

COMPOUND EYE (CE) (Figs.1-8) [Christophers 1901,3; Theobald 1901a,229] — A light-perceptive organ consisting of an aggregation of optic elements (ommatidia) generally located on each side of the head; the cuticular part (cornea) consists of several hundred circular corneal facets (lenses); bounded by the ocular sclerite. In mosquitoes, convex, kidney-shaped and occupying much of the anterolateral surface of the head. (Syn.: eye, Muir 1883,466; Facettenaue, Martini 1923b,19; Komplexauge, Constantineanu 1930,325; zusammengesetztes Auge, Constantineanu 1930,325)

CONE (Cn) (Fig.10) [Annett *et al.* 1901,85] — One of the specialized spicules comprising the cibarial teeth; when both cones and rods are present, they are set alternately, the cones anterior to the rods, but sending posteriorly a basal extension, crest, between the bases of the rods; consisting of a basal part, pediment, and a terminal tapered part, filament; supported in some cases by extra buttresslike ridges, roots, arising from the flat ventral surface of the cibarium.

conoid [Prashad 1918,627] — A poorly defined term interpreted by Christophers (1960,444) to be a line of thickening which occurs from a point anterior to the calypter and proximal to the alula at the axillary incision when the wing is extended, and by Owen (1977,442) to be a conical area located in the wing membrane posterior to the radius.

coracoid [Prashad 1918,625] — A prolongation of the proximal margin of the second axillary sclerite which articulates with the third axillary sclerite.

CORNEAL FACET (CoF) (Figs.2-4) [Marshall 1938,57] — One of the lenslike divisions of the cuticular part (cornea) of the compound eye. (Syn.: cuticular lens, Nuttall and Shipley 1901c,458; eye-facet, Nuttall and Shipley 1903,198; facette, Blanchard 1905,44; facet, Peterson 1916,22)

Knight (1970,29) defined "ommatidium" for use in the Culicidae, but this term has been omitted herein because it includes internal soft tissue as well as an outer cuticular part, corneal facet.

CORONAL RIDGE (CR) (Fig.5) [Coronalleiste, Schiemenz 1957,285] — The cuticular ingrowth marked externally by the coronal suture.

CORONAL SUTURE (cs) (Figs.2,4,7) [Robinson 1939,215] — The median longitudinal suture on the dorsal surface of the head (vertex). In mosquitoes, partly apodematous but becoming shallower anteriorly; passing forward from the upper margin of the occipital foramen to the frons where the postfrontal sutures diverge from it. (Syn.: median suture of the occiput, Howard *et al.* 1912,25; stem of the epicranial suture, Peterson 1916,15; coronal sulcus, Snodgrass 1943,8; median coronal sulcus, Snodgrass 1959,51; median cranial sulcus, Snodgrass 1959,53; longitudinal suture, Gutsevich 1974a,244)

CORPOTENTORIUM (Co) [Schiemenz 1957,275] — A slender process extending from the dorsal surface near the posterior end of each posterior tentorial arm to the postoccipital ridge. (Syn.: body of the tentorium, Robinson 1939,219; body of tentorium, Robinson 1939,219)

COSTA (C) (Figs.17,19) [Skuse 1889,1763] — The usual first principal longitudinal vein of the wing; typically extending around the wing apex from its articulation with the humeral plate; sometimes absent posteriorly and apically; sometimes somewhat removed from the margin. (Syn.: costal vein, Theobald 1901a,235; vein C, Belkin 1962,551)

COXA (C) — The basal segment of the leg articulating with the sternum and/or pleuron; referred to as fore-, mid- or hindcoxa as appropriate. (Syn.: hip, Giles 1900,16)

COXAL CAVITY (CC) [Knight and Laffoon 1970b,133] — The opening or space by which the coxa articulates with the thorax, acetabulum; referred to as pro-, meso- or metacoxal cavity as appropriate.

COXAL SETA (CxS) (Figs.12,16) [coxal chaeta, Christophers 1915a, legend to Pl. XIX] — Any seta occurring on a coxa; may be described as inner, outer, anterior, posterior, upper and lower fore-, mid- and hindcoxal setae as appropriate. (Syn.: coxale Borste, Martini 1931,66)

CRANIUM [Snodgrass 1943,8] — The sclerotized skull-like part of the head. (Syn.: Kopfkapsel, Vogel 1921,277; head capsule, Patton and Evans 1929,55)

CREST (Cr) (Fig.10) [Christophers 1933,18] — The posterior part of the pediment of a cone extending between the bases of adjacent rods; bearing spiculate processes, the "crest spines" of Christophers (1933,28).

CROSSVEIN— A short, usually transverse vein between two longitudinal veins. In mosquitoes, the usual crossveins are the humeral crossvein between the costa and subcosta, the radiomedial crossvein between the costa and subcosta, the radiomedial crossvein between the radius and media and the mediocubital crossvein between the media and cubitus. (Syn.: transverse-vein, Theobald 1901a,231; cross-nervure, Nuttall and Shipley 1901c,475)

CUBITOMARGINAL RIDGE (cm) [cubito-marginal ridge, Colless 1979,127] — A faint ridge or convex fold of the wing membrane running parallel to the wing margin across the apex of the cubitus anterior; extending anteriorly at least halfway to the apex of media-three-plus-four; posteriorly fading away near the anal vein.

CUBITUS (Cu) [Knight and Laffoon 1970c,167] — The usual fifth longitudinal vein of the wing; usually with two main branches, cubitus anterior and cubitus posterior.

The interpretation accepted here for the media-cubitus-anal area of the wing will be difficult for culicidologists to accept. However, the traditional interpretation applied to this area (Comstock 1918) and customarily used by culicidologists breaks down when an effort is made to apply it throughout the Insecta. Accordingly, Tillyard's (1926) modifications, as designated by Colless and McAlpine (1970) are accepted here. For other interpretations of homology see Table 1.

CUBITUS ANTERIOR (CuA) (Figs.17,19) [Knight and Laffoon 1970c,167] — The anterior branch of the cubitus. Unbranched in mosquitoes. (Syn. including the mediocubital crossvein and media-three-plus-four unless otherwise noted: 5th longitudinal vein, Skuse 1889,1764; fifth longitudinal vein, Giles 1900,10; cubitus-two, Nuttall and Shipley 1901c, the part of CuA distal to the mediocubital crossvein, 475; fifth long vein, Theobald 1901b,17; fifth vein, Howard *et al.* 1912,61; main fifth longitudinal vein, Christophers 1933, CuA only, 18; vein 5, Barraud 1934, in part, 57; vein 5.2, Barraud 1934, in part, 57) For other interpretations of homology see Table 1.

CUBITUS POSTERIOR (CuP) (Figs.17,19) [Knight and Laffoon 1970c,167] — The posterior branch of the cubitus. In mosquitoes it is unbranched, weakly developed and closely parallels the cubitus anterior. (Syn.: incassation, Skuse 1889,1764; cubito-anal fold, Marshall 1938,68; cubital fold, Christophers 1960,446; plical vein, Belkin 1962,551; plical fold, Harrison and Scanlon 1975,12) For other interpretations of homology see Table 1.

CUBITUS POSTERIOR SCALE (CPS) — One of the scales occurring in a group on the ventral surface of the wing at the base of the cubitus posterior and extending to the base of the anal vein. (Syn.: plical scale, Belkin 1962,551)

D

DORSAL AEDEAGAL BRIDGE (DAB) (Figs.22,23) [Knight and Laffoon 1971a,10] — In male mosquitoes, the transverse sclerotization connecting the aedeagal sclerites nearest the anus. (Syn.: bridge, Edwards 1920,35; lower bridge, Edwards 1920,35; dorsal bridge Christophers and Barraud 1923,832; dorsal bridge of phallosome, Christophers and Barraud 1923,835)

DORSAL APODEME (DAd) [Barraud and Covell 1928,677] — A small prominence borne on the dorsal (internal) surface of the posterior hard palate.

DORSAL ARM (DOA) (Fig.23) [Sundararaman 1949,307] — In *Culex* males, the dorsal process (in the normal resting position) of the outer division of the lateral plate. (Syn.: interior hook, Wesché 1906,350; second piece, Dyar and Knab 1909,33; second plate of the harpago, Dyar and Knab 1909,35; second division of the harpago, Edwards 1914,64; third plate, Dyar 1918b,90; uncal plate 3, Dyar 1918b, in Explanation of Plates; plate 3 of uncus, Dyar 1918b,92; bras péniens, Brolemann 1919a,433; median process, Christophers 1922,553; median process of lateral plate of phallosome, Christophers and Barraud 1923,835; appendage c, Freeborn 1924a,206; process c, Freeborn 1924a,207; rod of inner mesosomal plate, Ross 1947,46; inner mesosomal plate, Ross 1947, in *Culex pipiens* Linnaeus and *Cx. pipiens quinquefasciatus* Say only, 48; tergal arm, Belkin 1962,554; ventral arm of the aedeagus, Spielman 1966, in everted position, 309; ventral arm of aedeagus, Spielman 1966, in everted position, 312; paraproct, Spielman *et al.* 1974,194; dorsale Sklerit, Iglisch 1977,266; dorsaler Sklerit des Aedoeagus, Iglisch 1977,279)

DORSAL POSTGENITAL LOBE INDEX (dorsal PGL index) [Reinert 1973,4] — In female mosquitoes, the dorsal postgenital lobe length divided by one-half the postgenital lobe width.

DORSAL POSTGENITAL LOBE LENGTH (dorsal PGL length) [Reinert 1973,3] — In female mosquitoes, the length of the postgenital lobe measured along the dorsal midline.

DORSAL POSTGENITAL LOBE WIDTH (dorsal PGL width) [Reinert 1973,4] — In female mosquitoes, the dorsal width of the postgenital lobe measured at one-half the dorsal postgenital lobe length.

DORSAL SETA (DSe) (Figs.8,9) — One of the cibarial setae borne lateral and/or posterior to the anterior hard palate of the clypeopalatum; the dorsal setae usually consist of two peglike setae located immediately adjacent to the posterolateral margin of the anterior hard palate, the more anterior of these is borne within a pit, and a linear series of one to six small simple setae borne lateral to the former. (Syn.: dorsal papilla, Sinton and Covell 1927,302; smaller dorsal papilla, Barraud and Covell 1928, in part, in Explanation of Pl. LXII; larger dorsal papilla, Barraud and Covell 1928, in part, in Explanation of Pl. LXII; dorsal papillar sense organ, Day 1954, in part, 520; campaniform papilla, Day 1954, in part, 520; hair-like sensillum, Day 1954,521; Sinnshaare, Schiemenz 1957, in part, 286; Geschmackshaare, Schiemenz 1957, in part, 330; trichoid sensillum, Lee 1974, in part, 187; dorsal papilla, Lee 1974, in part, 196)

DORSAL TENTORIAL ARM (DTA) [Robinson 1939,219] — A short process, when present, extending anterodorsad from the main part of the anterior tentorial arm. (Syn.: dorsal spine, Robinson 1939,219; dorsal arm of the tentorium, Christophers 1960,421)

DORSOCENTRAL AREA (DA) (Figs.11,12) [Belkin 1962,548] — A longitudinal area of the scutum on each side of the acrostichal area extending from the anterior promontory to the prescutellar area; indefinitely divided into anterior and posterior dorsocentral areas at the level of the antearlar area; bearing the dorsocentral scales and setae.

DORSOCENTRAL SCALE (DSc) — Any scale borne on the dorsocentral area of the scutum; may occur in more or less distinct anterior, posterior, inner and/or outer longitudinal rows. (Syn.: dorsocentral scale line, Belkin 1962,548)

DORSOCENTRAL SETA (DS) (Figs.11,12,19) [dorso-central bristle, Edwards 1941,8] — Any seta occurring on the dorsocentral area; divided into anterior and posterior rows near the median posterior corner of the scutal fossa at about the level of the antearlar area. (Syn.: dorso-central mesonotal chaeta, Christophers 1915a, legend to Pl. XIX; dorso-central chaeta, Christophers 1960,438)

DV / D (Fig.23) [Sundaraman 1949,310] — In male *Culex*, the ratio of the distance between the apices of the ventral arm of the inner division of the lateral plate and the dorsal arm of the outer division on one side (DV) to the distance between the apices of the dorsal arms of the outer divisions (D), measured from the dorsal aspect (prerotation sense) in undissected specimens with the genitalia in the normal resting position.

E

EMPODIUM (Em) (Figs.18,19) [Nuttall and Shipley 1901c,473] — The distal median prolongation of the unguitractor plate. Padlike or spiculose in mosquitoes. (Syn.: epipodium, Giles 1900,17; pièce penniforme, Blanchard 1905,60)

epicranium [Thompson 1905,152] — A term variously applied to the areas of the cranium exclusive of the facial areas (pre-ocular region, Thompson 1905,148). (Syn.: epicranial region, Thompson 1905,148; postocular region, Thompson 1905,148; epicranial plate, Gater 1935,14). See **EPICRANIUM** in the larva section.

EPISTOMAL RIDGE (ER) (Figs.5,6) [Epistomalleiste, Schiemenz 1957,281] — The cranial inflection marked externally by the epistomal suture.

EPISTOMAL SUTURE (Eps) (Figs.2,4,7,8) [Epistomalnaht, Schiemenz 1957,273] — The suture marking the anteroventral limit of the frons and terminating laterally in the anterior tentorial pits.

ESOPHAGUS (Es) (Fig.5) [oesophagus, Nuttall and Shipley 1903,166] — The part of the stomodeum following the pharynx. In mosquitoes, beginning in the cervix and extending into the thorax.

EXTERNAL APODEME (EA) [Barraud 1923a, in Explanation of Plate LI] — In male mosquitoes, an apodematous basal continuation of the external or lateral sclerotization of the gonocoxite. (Syn.: kleiner Muskelfortsatz, Martini 1922,135; kleine Myapophyse, Martini 1922,139; Gelenkfortsatz, Martini 1928,155)

EXTERNAL PROCESS (EP) [Sirivanakarn 1977,4] — In some *Culex* males, applied to the main part of the lateral plate where an internal process (see) is distinguishable; the lateral plate is otherwise

simple and undivided. (Syn.: dorsal process, Colless 1965,83)

F

FASCICLE (f) [Robinson 1939,224] — The closely appressed bundle of six needlelike mouthparts (stylets), including the labrum, two mandibles, two laciniae and the hypopharynx, which form the piercing-siphoning apparatus. (Syn.: Stiletbündel, Vogel 1921,262; Bündel, Vogel 1921,267; stylet bundle, Robinson 1939,233; Stechborstenbündel, Schiemenz 1957,283; stylet fascicle, Snodgrass 1959,57)

FEMUR (Fe) — In arthropods, the usual third segment (fourth if two trochanters are present) of the leg; generally the largest leg segment; referred to as fore-, mid- or hindfemur as appropriate. (Syn.: thigh, Giles 1900,16)

FILAMENT (Fi) (Fig.10) [Christophers 1933,26] — The tapered terminal part of a cone borne upon the pediment; bearing short lateral processes, the "lateral spicules" of Christophers (1933,28).

FIRST AXILLARY SCLERITE (FAXS) (Fig.17) [Owen 1977,441] — The axillary sclerite at the base of the wing articulating with the anterior and postmedian notal wing processes and the second and third axillary sclerites; with a muscle attached to it. (Syn.: middle sclerite, Shipley and Wilson 1902,368; intermediate sclerite, Shipley and Wilson 1902,372; dens, Prashad 1918,616; first axillary, Christophers 1960,451)

FIRST PHRAGMA (FP) (Figs.11,12) [Christophers 1960,432] — A transverse apodeme just under the overhanging anterior promontory and internally connecting the antepre-nota; extending posteriorly from each antepre-notum as a thin rod-shaped apodeme (phragmal thread, Owen 1977,431) and attaching to the posterior border of the postpronotum. (Syn.: pronotal apodeme, Christophers 1960,432)

FLAGELLAR WHORL (FW) (Figs.2,5) [Belkin 1962,547] — A ring of long curved setae borne by each flagellomere of the antenna; may be situated basally, medially or apically. (Syn.: bouquet, de Réaumur 1738,579; whorl, Muir 1883,466; verticel, Giles 1900,22; fan, Nuttall and Shipley 1901c,460; basal whorl, Felt 1905,458; hairwhorl, Bonne and Bonne-Wepster 1925,11; antennal whorl, Gutsevich 1975a,154)

FLAGELLOMERE (Fim) (Figs.2,5-8) [Knight 1970,25] — An individual unit of the antennal flagellum. (Syn.: segment, Nuttall and Shipley 1901c,459; antennal joint, Theobald 1901b,2; joint, Theobald 1901b,2; Geisselglied, Martini 1921,254; flagellar segment, Patton and Evans 1929,54; Antennenglied, Swellengrebel and Rodenwaldt 1932,11; flagellar unit, Snodgrass 1959,52; section, Anderson and Horsfall 1963,73)

FLAGELLUM (Fi) (Fig.1) [Peterson 1916, Figs.210-211] — The third segment of the antenna. In mosquitoes, comprised of 13-14 flagellomeres. (Syn.: shaft, Howard *et al.* 1912,26; antennal shaft, Howard *et al.* 1912,33; Fühlergeißel, Martini 1921,254; Geißel, Martini 1931,1; third segment of antenna, Crampton 1942,141; postpedicel, Crampton 1942,141)

FOOD MEATUS (FM) [Knight and Laffoon 1970a,71] — The channel formed by the juxtaposition of the mouthparts anterior to the cibarium. (Syn.: epipharynx tube, Dimmock 1881,235; labral canal, Thompson 1905,155; proboscis canal, Thompson 1905,155; food channel, Patton and Cragg 1913,22; food canal, Gater 1935,16; labral tube, Robinson 1939,223; blood channel, Christophers 1960,418; food tube, Waldbauer 1962,204)

FORECOXA (C-I) (Figs.11,12) [fore coxa, Theobald 1901b,5] — The coxa of the foreleg. In mosquitoes, articulating with the pleural coxal process of the proepisternum. (Syn.: front coxa, Snodgrass 1912,57; anterior coxa, Snodgrass 1912,57; 1st coxa, Patton and Evans 1929,86; first coxa, Christophers 1960,436; coxa 1, Owen 1977,429)

FOREFEMUR (Fe-I) (Fig.18) — The femur of the foreleg. (Syn.: front femur, Howard *et al.* 1912,62)

FOREFEMUR LENGTH [Belkin 1962,550] — The length of the forefemur measured from its point of articulation with the foretrochanter to its apex along the ventral margin (the anteroventral margin when in the resting position).

FOREFEMUR / PROBOSCIS RATIO (f/p) [fore femur/proboscis ratio, Reid 1968,5] — Ratio of the forefemur length to the proboscis length.

FORELEG (Fig.18) [fore leg, Theobald 1901b,7] — One of the pair of legs of the prothorax. (Syn.:

front leg, Giles 1900,25; first leg, Nuttall and Shipley 1901c,470; prothoracic leg, Nuttall and Shipley 1901c,473; anterior leg, Smith 1904,17)

FORETARSUS (Ta-I) (Fig.18) [fore tarsus, Natvig 1948,13] — The tarsus of one of the forelegs. (Syn.: front tarsus, Howard *et al.* 1912,63; first tarsus, LaCasse and Yamaguti 1948,3)

FORETIBIA (Ti-I) (Fig.18) [fore-tibia, Christophers 1960,441] — The tibia of one of the forelegs. (Syn.: front tibia, Howard *et al.* 1912,63)

FORETROCHANTER (Tr-I) — The trochanter of one of the forelegs.

FOREUNGUIS (U-I) (Fig.18) [fore unguis, Theobald 1901b,19] — The anterior or posterior unguis of one of the forelegs. (Syn.: foreclaw, Belkin 1962,550)

forked cell index [Christophers 1933,21] — The length of cell R_2 (see) or cell M_1 (see) measured along radius-three or media-two, respectively.

FRINGE SCALE (FS) (Figs.17,19) [Theobald 1901a, also secondary fringe scale,230] — In many winged insects, any scale in the wing fringe. In mosquitoes, one of the long fusiform scales occurring in a row along the dorsal surface of the wing edge. (Syn.: marginal wing scale, Giles 1900,20; posterior fringe scale, LaCasse and Yamaguti 1948,3)

FRONS (Fr) (Figs.2,4,7,8,) [Giles 1900,6] — The facial area of the cranium lying between the postfrontal sutures dorsally and the epistomal suture ventrally; largely obscured by the convergent antennal sockets. (Syn.: front, Giles 1900,6; vertex, Peterson 1916, in part, 13; Stirn, Martini 1923b,19; Postfrons, Schiemenz 1957, in part, 274; Praefrons, Schiemenz 1957, in part, 174; frontal area, Christophers 1960,421) Compare **frons** in the larva section.

The “frons” is delimited in various ways by different authors and in different insects and stages and thus is not morphologically equivalent except in limited cases.

FRONTAL TUFT (FT) (Fig.4) [Kirkpatrick 1925,10] — A specialized name applied to a group of erect elongate simple setae and fusiform scales arising from the interocular space and the immediately adjacent portion of the vertex; applied in particular to anophelines. (Syn.: vertical tuft, Christophers 1933,10)

FURCA (Fu) [-furcum, Prashad 1918,617] — A forked endoskeletal structure of the thoracic sterna of pterygote insects formed of the sternal apophyses supported on a median inflection; somewhat poorly developed in the pro- and metathoracic segments of mosquitoes; referred to as pro-, meso- or metafurca as appropriate.

The term “furca” is restricted here to the forked endosternal processes. The “furca” of the labellum, previously recommended for use by Knight (1970,26), has been replaced with “labellar sclerite” (see); “labellar abductor apodeme” (see) has been introduced for the “Furca” of Schiemenz (1957,294).

furcasternal suture [Owen 1977,432,] — Applied to the internal median longitudinal line formed where the mesopleurosternal ridges of opposite sides meet and are confluent with the mesosternal ridge.

FURCASTERNUM (Fs) — In apterygote insects, the furcasternum is designated as the area of the thoracic sternum separated from the basisternum by the sternacosta. In pterygote insects where the bases of the sternal apophyses are approximated on the median longitudinal axis to form the furca, the sternacosta is lost and, hence, the separation of the basisternum and furcasternum is usually obscure. In the pro- and metathorax of the mosquito, however, the apterygote condition is retained and a distinct sternacostal suture (absent in the prothorax of some taxa) separates the basisternum and furcasternum. In the mesothorax, the furcasternum is arbitrarily defined as the area of the sternum bearing the furca. Fortunately, the basisternum and furcasternum of the mesothorax are often separated by a secondary line of inflection anterior and lateral to the apophyseal pit.

G

GENA (Ge) (Figs.2-4,6-8) [Giles 1900,7] — The anterolateral area of the cranium extending ventroposteriorly from the anterior tentorial pit behind the clypeus and united ventrally with its mate between the compound eyes. (Syn.: cheek, Giles 1900,7; gulo-mental region, Annett *et al.* 1901, in part, 74; Kinn, Kulagin 1905, in part, 286; postgena, Peterson 1916, in part, Fig.96; anterior postgena, Gater 1935,14; hypostome, Snodgrass 1943, at least in part, 10; hypostomal bridge, Waldbauer 1962, in part, 202) See **hypostomal bridge**.

“Gena” is loosely defined and applied in various ways in different insects, most commonly to the area between the compound eye and the mandible.

GENITALIA (G) [in ♂, Theobald 1901a,231; in ♀, Gjullin 1937,254] — In general, the abdominal structures involved in reproduction. In the narrow or strict sense, the external structures of abdominal segment IX. In mosquitoes, applied to abdominal segments IX (the genital segment) and X (parts of the proctiger may take part in the copulatory process); in some species, abdominal segment VIII may be sexually differentiated from the preceding ones in one or more details and would in such cases be treated as a part of the genitalia. (Syn. for ♂ : armure copulatrice, Dufour 1851,209; armature g nitale, Blanchard 1905,61; hypopygium, Edwards 1914,63; Genitalapparat, Eckstein 1920,226; Geschlechtsorgane, Martini 1921,251; Geschlechtsapparat, Martini 1921,252; terminalia, Freeborn 1924a,189; appareil g nital, S guy 1924,14; terminalium, Hodapp and Jones 1961,832; genitalium, Hodapp and Jones 1961,832; copulatory apparatus, Reid 1968,12. Syn. for ♀ : hypopygium, Christophers 1923,699; ovipositor, Edwards 1941,17; terminalia, Edwards 1941,17)

(1) The term genitalia has been used here in place of "terminalia" because there are other terminal points on the insect body and also because it is difficult to state definitely which of the terminal structures do not somewhere in Culicidae play a role in copulation.

(2) The 180° rotation of the complex of anal and genital parts occurring caudad of abdominal segment VII in male mosquitoes a few hours after emergence has created much confusion in the morphological and taxonomic literature. In an effort to solve this, the terms "tergal" and "sternal" have sometimes been used. This usage is equally confusing because many parts of the genitalia are neither tergal nor sternal in origin. Consequently, the terms "dorsal" and "ventral" are used herein in the prerotation sense, i.e., with their true morphological connotation.

(3) One of the oldest concepts and one that has gained wide acceptance at various times since its inception is that insect genitalia (specifically abdominal segment IX, *sensu stricto*) have been derived from segmental appendages. The appendicular theory of origin for insect genitalia has been supported by a long list of workers (Smith 1969). As originally developed, it held that the genital appendages were derived from the endopodites or exopodites of the coxopodites and/or telopodites and thus were serially homologous with the limbs of other segments.

Snodgrass (1957) showed that the external male genitalia of the Thysanura and Pterygota arise from paired rudiments, primary phallic lobes, usually located behind abdominal sternum IX. Except in certain Orthoptera where the genitalia develop from embryonic appendages, the rudiments always appear during postembryonic development. For this reason and because the undifferentiated rudiments give rise to very different structures in different groups (see Matsuda 1976,73-74), some workers denied the appendicular origin of the genitalia, e.g., Matsuda (1958) and Snodgrass (1963). But as Matsuda (1976) notably disclosed, the appendicular theory is applicable and homologies can be traced if the developmental principles of heterochrony and substitution are applied to the study of the genitalia.

Matsuda's concept of appendicular origin of insect genitalia is followed here, a position which is certain to be unpopular since a largely appendicular theory, when applied to the Culicidae, requires the replacement of several commonly used terms. It should be noted that Matsuda has discredited Smith's (1969) conclusion that the genitalia in both sexes are homologous, structure for structure, in all insect orders.

(4) Ontogenetic studies (Christophers 1922, Anderson 1967; Horsfall and Ronquillo 1970) have shown that the male genitalia (*sensu stricto*) of mosquitoes arise from paired imaginal discs (genital plaque, Christophers 1922,545; imaginal disc 9, Horsfall and Ronquillo 1970,331) located in the anterior part of abdominal segment X of the larva (the posterior part of embryonic abdominal segment IX). The discs become buds which later evert and develop into the primary phallic lobes (proandropodite, Christophers 1922,535; bilateral bud, Horsfall and Ronquillo 1970,329). As growth proceeds, a mass of tissue on the posterior surface of each lobe forms the "hypandropodite" of Christophers (1922,536) and the remaining tissue becomes the gonocoxopodite. The hypandropodite usually proliferates at the basomesal margin of the gonocoxopodite, but in certain taxa a portion of it becomes part of the phallosome (the leaflets of aedeagus in *Anopheles* and the ventral arms in *Culex*). Freeborn (1924a,191) dubbed the combined hypandropodites exclusive of the phallosomal structures the "interbasal fold" (harpagonal fold, Christophers 1922,561; harpagonal fold, Christophers 1960,459) and described the variously-developed hypandropodital parts as projections of this. The structures formed from the hypandropodite at the base of the gonocoxopodite include the claspette, basal mesal lobe, parabasal lobe and subapical lobe. The homologies or partial homologies of these are uncertain.

GNOCOXITE (Gc) (Figs.20-25) [Christophers 1960,457] — The coxite of the gonocoxopodite. In male mosquitoes, the largest unit of the genitalia; the dorsal and ventral surfaces (prerotation sense) with various lobes which are described with appropriate combinations of position adjectives without intent to imply strict homologies; bearing the gonostylus apically. (Syn.: basal lobe, Theobald 1901a,230; basal joint, Theobald 1901b,17; basal segment, Felt 1904,263; side piece, Dyar

1905a,43; basal clasp segment, Felt 1905,453; forceps, Wesché 1906,342; forcipes superiores, Wesché 1906,342; valvulae internae, Wesché 1906,342; basal portion, Christophers 1915b,373; premier article, Brolemann 1919a,430, premier article des forcipules, Brolemann 1919a,431; article basal, Brolemann 1919b,75; 1^{er} article des forcipules, Brolemann 1919b,101; Haltekammer, Eckstein 1920,226; Grundglied der Zange, Martini 1921,253; basiandropodite, Christophers 1922,550; Basalstück, Martini 1922,134; Grundstück, Martini 1922,136; basistyle, Freeborn 1924a,195; basistylus, Cole 1927,415; coxite, Christophers 1933,23; pièce latérale, Senevet 1935,16; basal segment of forceps, Edwards 1941,15; basimere, Crampton 1942,91; clasper, Christophers 1960,398; basal segment of clasper, Spielman 1964,326; Zangengrundglieder, Mohrig 1969,23) See **GENITALIA**.

➤ **GONOCOPODITE (Gp)** — The coxopodite, i.e., the basal segment or coxa, of an appendage of the genital segment, abdominal segment IX. The generalized gonocoxopodite consists of a coxite, the gonocoxite, a stylus, the gonostylus, and an inner process, the volsella. The volsella is absent in most Diptera, including mosquitoes. (Syn.: crochet, de Réaumur 1738,627; grand crochet, de Réaumur 1738,627; forceps, Dufour 1851,209; clasper, Giles 1900,10; basal lobe, Nuttall and Shipley 1901c,479; clasp, Felt 1904,263; grasse pince, Blanchard 1905,61; forcipules genitales, Brolemann 1919a,430; forcipules, Brolemann 1919a,431; Klammerapparat, Eckstein 1920,266; Zange, Martini 1921,252; Klammerorgan, Martini 1921,252; clasping organ, Christophers 1922,534; andropodite, Christophers 1922,535; Valva, Martini 1922,136; Valve, Martini 1923a,576; appendage of the ninth segment, Root 1923,265; gonostyle, Freeborn 1924a,191; paramere, Crampton 1942,86; genital forceps, Crampton 1942,91; exopodite, Rees and Onishi 1951,237; gonopod, Wood *et al.* 1979,36) See **GENITALIA**.

➤ **GONOPORE (Gp)** (Fig. ♀ -27) [in ♂, Belkin 1968,9; in ♀, Snodgrass 1959,72] — In arthropods, any opening of a meso- or ectodermal gonoduct. In male mosquitoes, the opening of the median ejaculatory duct usually located ventrally (prerotational sense) near the base of the aedeagus; in female mosquitoes, the opening of the common oviduct into the vagina. (Syn. for ♂ : genital pore, Spielman 1964,332; genital orifice Spielman 1966,309; genital opening, Belkin 1968,8. Syn. for ♀ : vulva, Macfie and Ingram 1922,158)

GONOSTYLAR CLAW (GC) (Figs.20-25) [Knight and Laffoon 1971a,11] — The differentiated, more or less spiniform seta(e) at or near the apex of the gonostylus in some male mosquitoes; frequently flattened or variously modified and markedly different from other setae; not strictly homologous between all species. (Syn.: spine, Felt 1904,263; articulated apex, Dyar 1905a,43; apical spine, Dyar 1905a,45; terminal spine, Dyar 1905b,54; apical spur, Felt 1905,470; apical tooth, Felt 1905,470; articulated bristle, Wesché 1906,384; Endanhang, Martini 1915,592; Greifanhang, Martini 1915,598; claw, Dyar 1918a,80; troisième article, Brolemann 1919a,431; 3^e article des forcipules, Brolemann 1919b,101; Dorn des Klammerhakens, Eckstein 1920,226; Endborste, Eckstein 1920,227; Enddorn, Martini 1922,137; appendage, Barraud 1923a, in Explanation of Plate LI; appendage of the clasper, Barraud 1923a,776; terminal claw, Root 1923,267; apical claw, Root 1923,272; hook, Freeborn 1924a,199; appendage of the dististyle, Freeborn 1924a,201; claw of clasper, Matheson 1929,15; appendage of the style, Christophers 1933,31; articulated spine of style, Edwards 1941,15; apical style, Ross 1947,22; apical seta, Ross 1947,23; spine of the clasper, Rees and Onishi 1951,237; claw of the clasper, Rees and Onishi 1951,237; dististyle claw, Carpenter and LaCasse 1955,13; spiniform, Belkin 1962,554)

➤ **GONOSTYLUS (Gs)** (Figs.20-25) [Knight and Laffoon 1971a,11] — The stylus of the gonocoxopodite; movable and attached at or near the apex of the gonocoxite; probably representing the exite lobe of the primitive coxopodite. One-segmented, sometimes secondarily subdivided, in male Nematocera; absent in most or all female Diptera. (Syn.: clasper, Theobald 1901a,230; claw, Nuttall and Shipley 1901c,479; terminal joint, Theobald 1901b,17; terminal segment of the clasp, Felt 1904,263; clasp filament, Dyar 1905a,43; terminal segment of clasp, Dyar 1905a,43; clasp, Dyar 1905a,44; terminal clasp, Dyar 1905a,44; terminal segment of the clasper, Dyar 1905a,44; clasp segment, Dyar 1905a,44; terminal segment, Felt 1905,463; terminal clasp segment, Felt 1905,463; apical segment, Felt 1905,469; hook, Wesché 1906,342; terminal portion, Christophers 1915b,375; Greiffaden, Martini 1915,592; filament, Dyar 1918a,76; second article, Brolemann 1919a,430; second article des forcipules, Brolemann 1919a,433; 2^e article des forcipules, Brolemann 1919b,101; Klammerhaken, Eckstein 1920,226; second joint, Edwards 1920,30; Endglied der Zange, Martini 1921,253; epiandropodite, Christophers 1922,550; Greifhaken, Martini 1922,135; Endstück, Martini 1922,136; Chitinfingerling, Martini 1922,136; distal segment, Freeborn 1924a,194; dististyle, Freeborn 1924a,199; dististylus, Cole 1927,415; style, Edwards 1932,5; Greifzange, Swellengrebel and Rodenwaldt 1932,14; distimere, Crampton 1942,91; telomere, Snodgrass 1959,70; distal segment of clasper, Spielman 1964,326) See **GENITALIA**.

GONOTREME (Go) (Figs.25-27) [Snodgrass 1959,68] — The posterior opening of the vagina. In female mosquitoes, bounded by the genital lips. (Syn.: Geschlechtsöffnung, Kulagin 1901,594; atrial opening, Davis 1926,2; copulatory orifice, Curtin and Jones 1961,301; genital opening, Giglioli 1963,151; vaginal opening, Jones 1968,116)

H

HALTER (HI) (Figs.1,12,14,17,19) [Christophers 1901, Fig.1] — The modified, reduced, drumstick-shaped metathoracic wing of most Diptera or mesothoracic wing of male stylopoid Coleoptera. In mosquitoes and other Diptera consisting of a thick base, scabellum, a slender stemlike part, pedicel, and an expanded distal part, capitellum. (Syn.: balancier, de Réaumur 1738,576; maillet, de Réaumur 1738,576; haltere, Giles 1900,9; poiser, Giles 1900,9; balancer, Nuttall and Shipley 1901c,477) Compare **METATHORACIC WING** in the pupa section.

This word is an application of the Latin and Greek word halter (pleural, halteres) for jumping-weight. Prior to about 1950, halter seems to have been the usual spelling used by entomologists, although haltere was also sometimes used. Since 1950 haltere has probably been used more than halter. There is no sound reason for adding an e to halter.

HEAD (Figs.1-4) — The anterior section (tagma) of the insect body bearing the compound eyes, antennae and mouthparts; separated from the thorax by the cervix.

HINDCOXA (C-III) (Figs.12,14) [Komp 1937,244] — The coxa of the hindleg. In mosquitoes, articulating with the metameron laterally and the sternal coxal process of the metabasisternum ventrally. (Syn.: metacoxa, Snodgrass 1912,59; 3rd coxa, Patton and Evans 1929,86; third coxa, Christophers 1960,436; coxa 3, Owen 1977,429)

HINDFEMUR (Fe-III) (Fig.18) [hind femur, Howard *et al.* 1912,62] — The femur of the hindleg.

HINDLEG (Fig.18) [hind leg, Giles 1900,25] — One of the pair of legs of the metathorax. (Syn.: third leg, Nuttall and Shipley 1901c,470; metathoracic leg, Nuttall and Shipley 1901c,472)

HINDTARSUS (Ta-III) (Fig.18) [hind tarsus, Smith 1904,17] — The tarsus of one of the hindlegs.

HINDTIBIA (Ti-III) (Fig.18) [hind tibia, Howard *et al.* 1912,63] — The tibia of one of the hindlegs.

HINDTROCHANTER (Tr-III) (Fig.18) — The trochanter of one of the hindlegs.

HINDUNGUIS (U-III) (Fig.18) — The anterior or posterior unguis of one of the hindlegs. (Syn.: hindclaw, Belkin 1962,550)

HINGE (H) (Fig.27) [Cohér 1948,78] — In female mosquitoes, the point of articulation between the upper and lower vaginal lips. (Syn.: angle of the sigma, Christophers 1923,704; signal angle, Christophers 1923,716)

HUMERAL CROSSVEIN (h) (Figs.17,19) [humeral cross-nervure, Nuttall and Shipley 1901c,475] — The crossvein extending between the costa and subcosta near the base of the wing; dividing cell C into a proximal first cell C and a distal second cell C. (Syn.: transverse shoulder-vein, Skuse 1889,1763; transverse humeral vein, Giles 1900,10; humeral transverse vein, Giles 1902,14)

HUMERAL PLATE (HP) (Figs.17,19) [Knight and Laffoon 1970c,167] — The anterior preaxillary sclerite of the wing base supporting the costa; a small triangular sclerite in the mosquito. (Syn.: subepaulet, Prashad 1918,616; basicosta, Belkin 1962,551)

HYPOPHARYNX (Hy) (Fig.9) [Dimmock 1881,233] — The median postoral appendage of the head. In mosquitoes, lying just ventral to the labrum in the premental gutter; its length is penetrated by the salivary canal. (Syn.: Stechborste, Becher 1882,134; tongue, Nuttall and Shipley 1901c,459; hypopharyngeal stylet, Snodgrass 1959,60)

HYPPOSTIGMAL AREA (HyA) (Figs.12,13) [Wood *et al.* 1979,31] — The weakly sclerotized or membranous area of the anterior mesanepisternum immediately below the mesothoracic spiracle; its boundary with the subspiracular area is usually poorly defined; scales sometimes occur on this area. (Syn.: hypostigial spot, Gjullin 1946,216; hypostigial area, Belkin 1962,548; hypostigma, Knight and Laffoon 1970b,134)

HYPPOSTIGMAL SCALE (HySc) (Fig.16) — One of the scales occurring in a small cluster on the hypostigmal area of the anterior mesanepisternum. (Syn.: hypostigmaler Schuppenfleck, Peus 1933,148; hypostigial spot of scales, Gjullin 1946,216; hypostigmal scale-patch, Natvig 1948,10; hypostigial scale patch, Belkin 1962,548; Hypostigmalfleck, Mohrig 1969,22)

Hypostoma [Schiemenz 1957,274] — The membranous basal part of the proboscis lying ventrally between the genae. (Syn.: labial suture, Robinson 1939,227; hypostome, Snodgrass 1943, in part, 10)

hypostomal bridge [Waldbauer 1962,202] — The parts of the genae united ventrally between the compound eyes. (Syn.: gulo-mental region, Annett *et al.* 1901,74; hypostome, Snodgrass 1943, at least in part, 10) See **GENA**.

I

INNER DIVISION (ID) (Figs.23,25) [Belkin 1962,553] — In *Culex* males, the sternal and most mesal part of the lateral plate of the phallosome in the normal resting position. (Syn.: inner mesosomal plate, Ross 1947,44)

INNER DORSOCENTRAL SCALE (IDSc) (Fig.19) — One of the scales occurring in a more or less distinct longitudinal row located mesad of the dorsocentral setae on the dorsocentral area of the scutum; usually difficult to separate posteriorly from the lateral prescutellar scales. (Syn.: inner dorsocentral line, Berlin 1969,5; submedian band, Wood *et al.* 1979,31; submedian stripe, Wood *et al.* 1979,32; presutural submedian stripe, Wood *et al.* 1979,32; middorsal stripe, Wood *et al.* 1979, including the acrostichal scales, 32)

INSULA (I) (Fig.27) [Christophers 1923,701] — In some female mosquitoes, a median, usually enlarged portion of the lower vaginal lip; often oriented differently than adjacent parts of the lip and connected with them by weakly sclerotized areas; spiculate and usually with setae and tuberculi. (Syn.: îlot pilifère, Brolemann 1919b,95; îlot ventral, Brolemann 1919b,96; îlot pilifère ventral, Brolemann 1919b,97; insula plate, Gerry 1932,36; subgenital plate, Giglioli 1963,151; Mittellappen, Mohrig 1967,82)

INSULAR SETA (IaS) (Figs.25,26) — One of the setae borne on the insula of the female genitalia. (Syn.: insula, Davis 1926,3; insula seta, Gerry 1932,65; trichoid sensillum, Giglioli 1963,151)

INTERANTENNAL GROOVE (I_g) (Figs.4,7,8) [Knight 1970,27] — A median longitudinal groove produced by the approximation of the membranous antennal sockets over the narrow middle part of the frons; often indistinguishable from the interantennal suture.

INTERANTENNAL RIDGE (IR) (Fig.5) [Interantennalleiste, Schiemenz 1957,281] — The apodeme marked externally by the interantennal suture.

INTERANTENNAL SUTURE (Is) (Figs.2,4,7) [Robinson 1939,215] — The median longitudinal suture extending ventrally from the postfrontal sutures to a point near the epistomal suture where it may bear arms which diverge laterally; may be homologous with the frontal sutures of generalized insects; often indistinguishable along the narrow middle part of the frons from the interantennal groove.

INTERLOBAR SPACE [Belkin 1962,553] — In male mosquitoes, the distance between the tergum IX lobes.

Intermedlary [Prashad 1918,616] — The line of thickening occurring where folds form in the region of the alula and calypter when the wing is extended. (Syn.: intermedium, Prashad 1918,627)

Internal palpal hair [Christophers 1915a,364] — One of the very minute setae borne on the inner surface of the maxillary palpi of male *Anopheles*.

INTERNAL PROCESS (IP) [Colless 1965,263] — In some *Culex* males, a more or less prominent projection arising from the inner surface (in the normal resting position) of the lateral plate when the latter is otherwise simple and undivided.

INTERNAL SETA (InS) (Fig.21) — A strong subapical seta arising mesally on the gonocoxite of male *Anopheles*. (Syn.: internal spine, Christophers 1915b,373)

INTEROCULAR SETA (ISe) (Fig.2) [Knight 1970,27] — One of the ocular setae arising on the interocular space; often somewhat longer than other ocular setae. (Syn.: vertical chaeta, Christophers 1915a,363; vertical bristle, Kirkpatrick 1925,10; vertical seta, Christophers 1933,12; frontal bristle, Belkin 1962,547; interorbital bristle, Belkin 1968,49)

INTEROCULAR SPACE (IS) (Figs.2,4,7,8) [inter-ocular space, Christophers 1915a,363] — The narrow part of the vertex between the compound eyes and above the postfrontal sutures. (Syn.: vertex, Giles 1900,6; crown, Giles 1900,6; interocular vertex, Christophers 1933,12; interorbital space, Belkin 1962,547; frons, Gutsevich 1974a,244)

INTERSEGMENTAL APODEME (IA) (Fig.12) [Owen 1977,432] — An often well developed apodeme

borne on the anterior margin of the intersegmental cleft and extending dorsad from the metapleural ridge; perhaps homologous with the third phragma of certain other insects.

INTERSEGMENTAL CLEFT (ICL) (Figs.13,19) [Owen 1977,429] — A fissure separating the metanotum and metapostnotum dorsally and extending ventrad between the metepimeron and metapostnotum on each side to the level of the pleural apophysis (when present); bearing the dorsal part of the intersegmental suture along the caudal margin and the ventral part of the metapleural suture as well as the intersegmental apodeme along its anterior margin.

INTERSEGMENTAL MEMBRANE (IM) (Fig.20) — The membrane connecting the segments of the body and of the appendages.

INTERSEGMENTAL RIDGE (Isr) (Figs.12,14,15) [Owen 1977,432] — The apodeme marked externally by the intersegmental suture. In mosquitoes, between the pro- and mesothorax, an incomplete ridge extending downward between the propleuron and the anterior mesanepisternum and continuing ventrally between the pleural and sternal apophyses along the anterior margin of the meskatopisternum; between the meso- and metathorax, a well developed ridge separating the segments laterally and ventrally; between the metathorax and abdominal segment I, a weakly developed ridge extending dorsad along the posterior margin of the intersegmental cleft. (Syn. for the intersegmental ridge of the prothorax: pleural apophysis, Owen 1977, in part, 430; furcopleural apodeme, Owen 1977, in part 430)

INTERSEGMENTAL SUTURE (Iss) (Figs.12-15) [Owen 1977,429] — In general, a line or groove separating adjacent segments. In the thorax of mosquitoes, applied to a groove produced incidental to a ridge which marks the posterior limits of each segment; between the pro- and mesothorax, a line separating the mesepisternum from the prothorax which is discontinuous between the propleuron and the anterior mesanepisternum; between the meso- and metathorax, a groove arising in the midventral area at the anterior margin of the metabasisternum and extending dorsad to a point near the base of the scutellum; between the metathorax and abdominal segment I, a suture arising near the apex of the metameron and extending dorsad on the caudal edge of the intersegmental cleft. (Syn. for the intersegmental suture of the prothorax: pleural suture 1, Owen 1977, in part, 429)

J

JUGUM (J) A posterior basal lobe or area of the wing set off from the anal area by the axillary incision. In Diptera, probably represented by the alula and upper calypter.

Junctura [Christophers 1922,554] — In male mosquitoes, applied to the floor of the space between the base of the gonocoxite and the proctiger; variously chitinized and in varying degrees of attachment with the gonocoxite, basal piece, paramere, aedeagus or proctiger.

K

knee [Smith 1904,15] — The joint between the femur and tibia.

KNEE SPOT (KS) [Christophers 1913,50] — A group of pale scales occurring at the terminations of the femur, tibia and first tarsomere; normally applied to a band of pale scales occurring at the apex of the femur.

L

LABELLAR ABDUCTOR APODEME (LAA) (Fig.3) — A small cuticular process located below the inner basal margin of each labellum; serving for the attachment of the labellar abductor muscle. (Syn.: Furca, Schiemenz 1957,294)

Use of the term "furca" (see) is restricted herein to the forked ental processes of the thoracic sterna. "Labellar abductor apodeme" is introduced here for the "Furca" of Schiemenz while the "furca" of the labellum, previously recommended for use by Knight (1970,26), has been replaced with "labellar sclerite" (see).

LABELLAR BASAL SCLERITE (LaBS) (Fig.3) [Knight 1970,27] — One of several small sclerites occurring ventrally in the membranous articulation between the prementum and the labella of the labium. (Syn.: sigma, Peterson 1916,46; basales Stützskelet, Vogel 1921,282; basal labellar skeleton, Robinson 1939,228; basal sclerite, Waldbauer 1962,207)

LABELLAR MESIAL SCLERITE (LMs) — One of two narrow sclerotized strips borne on the inner surface of each labellum. (Syn.: mesial sclerite, Waldbauer 1962,207)

Being in the region of the mesial plane of the body, the adjective “mesial” is retained here. “Labellar” has been added to further describe the location of the structure.

LABELLAR SCLERITE (LaS) (Fig.3) [Patton and Evans 1929,78] — 1. In general, one of several cuticular plates borne on each labellum. 2. In the restricted sense of Patton and Evans, the prominent basal sclerite on each labellum. (Syn.: furca, Peterson 1916, Figs.380-381)

Use of the term “furca” (see) is restricted herein to the forked ental processes of the thoracic sterna. “Labellar sclerite” is used here as a replacement for the “furca” of the labellum which was previously recommended for use by Knight (1970,26) while “labellar abductor apodeme” (see) has been introduced for the “Furca” of Schiemenz.

LABELLUM (La) (Figs.1,3,4) [labella, Dimmock 1881,238] — In Diptera, one lobe of a partially bilobed structure situated at the apex of the labium; between the lobes on the midline is the ligula; each labellum possesses several labellar sclerites which possibly represent labial palpal segments. (Syn.: terminal lobe, Dimmock 1881,238; lobe of the labium, Dimmock 1881,238; Endlippe, Becher 1882,134; paraglossa, Kellogg 1899,355; labial plapus, Theobald 1901b,4; Halbolive, Schaudinn 1904,408; labial palp, Marshall 1938,61; labial lobe, Robinson 1939,228; labellar lobe, Lee 1974,189)

LABIAL BASAL SETA (LBS) (Figs.1-3) [Knight 1970,27] — One in a row of setae occurring ventrally near the base of the labium. (Syn.: basal labial hair, Christophers 1915a,364; basal labial chaeta, Christophers 1915a, legend to Pl. XIX; sublabbial hair, Christophers 1960,418; basal bristle, Belkin 1962,547)

LABIAL SCLERITE (LSc) [Labialsklerit, Schiemenz 1957,274] — One of two small cuticular plates borne immediately proximal to the prementum; receiving the cardino-prementalis from the cardo.

LABIUM (Lb) [Murphy 1883,463] — The fused third or posterior pair of gnathal appendages. In adult mosquitoes, the elongate stout part of the proboscis consisting of the prementum which forms a sheath for the fascicle, a pair of short labella articulated with the distal end of the prementum and a short ligula between the labella. (Syn.: étui, de Réaumur 1738,582; Unterlippe, Becher 1882,134; under lip, Muir 1883,465; sheath, Muir 1883,465; second maxillae, Nuttall and Shipley 1901c,463; lower lip, Annett *et al.* 1901,74 and Theobald 1901b,3; galea, Mitchell 1907,3; proboscis sheath, Lang 1920,12; labial sheath, Waldbauer 1962,202) Compare **LABIUM** in the larva section.

LABRAL LEVER (LL) (Figs.5-8) [Snodgrass 1959,62] — A hook-shaped apodeme arising from each side of the dorsal part of the labrum; a muscle attached at its innermost end has its opposite attachment on the proximal end of the ventral wall of the labrum; possibly homologous with the “torma” of certain other Diptera (see **TORMA** in the larva section). (Syn.: endosternite, Annett *et al.* 1901,83; ala of the clypeus, Thompson 1905,156; Lamina frontalis, Kulagin 1905,288; torma, Peterson 1916, Figs.504-505; ala of clypeus, Robinson 1939,219; ala clypealis, Robinson 1939,223; clypeal lever, Snodgrass 1943,14; clypeal apodeme, Christophers 1960,418; labral apodeme, Waldbauer 1962,203)

LABROPALATUM (Lp) [Laffoon and Knight 1973,83] — The part of the palatum formed by the oral surface of the labrum. (Syn.: epipharynx, Dimmock 1881,233)

LABRUM (Lr) (Figs.2,4-9) [MacLoskie 1887,106] — The median preoral appendage articulated with the clypeus by the clypeolabral suture. In mosquitoes, lying anterior to the mandibles in the premental gutter; the labrum forms the food meatus. (Syn.: labrum, Dimmock 1881, in part, 233; epipharynx, Dimmock 1881, in part, 233; labrum-epipharynx, Dimmock 1881,233; Oberlippe, Becher 1882,134; upper lip, Muir 1883,465; sting, Muir 1883,465; Schildchen, Kulagin 1905, in part, 287; Clypeus, Kulagin 1905, in part, 287; labium, Mitchell 1907,3; clypeal fossa, Robinson 1939, in part, 215; anteclypeus, Crampton 1942, in part 141; dorsal labral sclerite, Christophers 1960, in part, 418; dorsal plate, Christophers 1960, in part, 428)

LACINIA (Lc) [Wesché 1904,32] — The inner endite lobe of the maxilla. In mosquitoes, the blade-like part of the maxilla lying ventral to the hypopharynx in the premental gutter. (Syn.: maxilla, Dimmock 1881,233; Oberkiefer, Becher 1882,134; mandible, Murphy 1883,464; maxillary lobe, Kellogg 1899,355; maxillary lancet, Giles 1900,24; first maxilla, Nuttall and Shipley 1901c,459; maxilla blade, Thompson 1905,150; palpifer, Mitchell 1907,3; galea, Peterson 1916,39; Maxillensülett, Vogel 1921,260; blade, Patton and Evans 1929,71; maxillary stylet, Robinson 1939,233; maxillary blade, Snodgrass 1943,9; maxillary lacinia, Anderson and Horsfall 1963,73)

LATERAL ANTERIOR PROMONTORY SCALE (APSL) — One of the scales usually forming a tuft on the lateral corner of the anterior promontory in Anophelinae. (Syn.: lateral tuft, Christophers 1915a, legend to Pl. XIX; lateral scale-tuft, Christophers 1933,15)

LATERAL ANTERIOR PROMONTORY SETA (LAPS) (Fig.19) — One of the setae occurring in a

small cluster on the lateral corner of the anterior promontory at or near the anterior end of the dorsocentral setae.

LATERAL ARM (LA) (Fig.23) [Belkin 1962,553] — In *Culex* males, the variously developed lateral process (in the normal resting position) of the outer division of the lateral plate of the phallosome. (Syn.: third piece, Dyar and Knab 1909,33; supplementary division of the harpago, Edwards 1914,64; lateral process, Christophers 1922,553; lateral process of lateral plate of phallosome, Christophers and Barraud 1923,835; external process of lateral plate of phallosome, Barraud 1934,4; lateral teeth of phallosome, Carpenter *et al.* 1946,35; basal lobe, Ross 1947,48; ventral arm, Spielman *et al.* 1974,194; lateral spine, Sirivanakarn 1976,16)

LATERAL BASAL PROCESS (LBP) (Fig.25) [Sirivanakarn 1976,3] — In male *Culex* mosquitoes, a lateral projection at the base of the outer division of the lateral plate. (Syn.: appendage b, Freeborn 1924a,206; process b, Freeborn 1924a,206; basal process of lateral plate of phallosome, Barraud 1934,4; basal projection, Ross 1947,44)

LATERAL FLANGE (LF) (Figs.6-9) [Sinton and Covell 1927,303] — The lateral expansion of the posterior part of the cibarium. (Syn.: chitinous wing, Nuttall and Shipley 1903,169; Fulcrum, Kulagin 1905,304; cornu, Peterson 1916,Figs.504-505; cornua, Snodgrass 1943,13; fulcral cornu, Robinson 1939,219; ventrale Fulcralapophyse, Schiemenz 1957, in part, 283; dorsale Fulcralapophyse, Schiemenz 1957, in part, 283; ventral flange, Chen 1972,285)

LATERAL PLATE (LP) (Figs.23,25) [Christophers 1922,552] — In *Culex* males, one of the pair of variously developed lateral sclerotizations of the phallosome located between the aedeagus and proctiger; often consisting of inner and outer divisions which may also be subdivided; conceivably homologous with the opisthophallic sclerite. (Syn.: harpago, Felt 1904,263; uncus, Felt 1904,264; lateral phallosomic plate, Christophers 1922,552; mesosomal plate, Roth 1943,120; dorsal process, Colless 1965,263; dorsal lobe, Sirivanakarn 1968,83; lateral aedeagal plate, Knight and Laffoon 1971a,12)

LATERAL PRESCUTELLAR SCALE (SSPL) (Figs.16,19) — One of the prescutellar scales occurring in a line on each lateral margin of the prescutellar area of the scutum; difficult to separate anteriorly from the dorsocentral scales. (Syn.: lateral prescutellar line, Berlin 1969,5)

LATERAL SCUTAL FOSSAL SCALE (SFSL) (Fig.16) — One of the scales occurring in a more or less distinct line on the lateral margin of the scutal fossa above the ante- and postpronotum; may be continuous posteriorly with the antealear scales. (Syn.: lateral prescutal scale line, Belkin 1962,548; lateral marginal line, Berlin 1969, including the antealear scales, 5; lateral band, Wood *et al.* 1979, including the antealear scales, 31)

LATERAL SCUTAL FOSSAL SETA (LSFS) (Fig.16) — One of the setae occurring in a small group on the lateral margin of the scutal fossa above the postpronotum. (Syn.: antero-marginal chaeta, Christophers 1960,438; lateral prescutal bristle, Belkin 1962,548)

LATERAL SCUTELLAR SCALE (LSSc) (Fig.16) — One of the scales occurring in a small group on each lateral lobe of the scutellum. (Syn.: lateral scutellar scale patch, Belkin 1962,549)

LATERAL SCUTELLAR SETA (LSS) (Figs.11,12,14,16,19) [lateral scutellar chaeta, Christophers 1960,438] — One of the setae occurring in a small group on each lateral lobe of the scutellum.

LATEROTERGITE (Lt) (Fig.1) [Belkin 1962,552] — The lateral part of abdominal tergum I when more or less distinctly separated from the median dorsal part; usually not visible from above.

LEAFLET OF AEDEAGUS (Lae) [Knight and Laffoon 1971a,12] — In male Anophelinae, one of the elongate leafletlike structures usually occurring at the apex of the aedeagus; homologous with the ventral arms in *Culex* (Christophers 1922,568). (Syn.: leaflet, Christophers 1915b,377; epimere, Christophers 1922,548; phallosome leaflet, Ross and Roberts 1943,2; leaflet of mesosome, Matheson 1944,15; mesosomal leaflet, Roth 1944,106; leaflet of phallosome, Carpenter and LaCasse 1955,14)

LEG (Fig.1) — In animals, one of the paired appendages ordinarily used in locomotion and support. In insects, applied only to the three pairs of thoracic legs; in most insects, composed of the coxa, trochanter, femur, tibia, tarsus and posttarsus. In Diptera, the coxal surfaces are described as though the coxa was in the normal resting position, the surfaces being the outer, inner, anterior and posterior; the surfaces of the other leg segments are described as though the leg were extended horizontally perpendicular to the insect's longitudinal axis, the surfaces being the dorsal, ventral, anterior and posterior; individual legs and leg segments are denoted by prefixing fore-, mid- or hind- as appropriate, thus foreleg, midfemur, hindtrochanter, etc.

LIGULA (Lg) (Figs.3,4) [Becher 1882, Fig.156] — The unjoined or fused proximal lobes (glossae and paraglossae) of the labium. In adult mosquitoes, the sharp-pointed lobe occurring distally on the midline of the labium between the labella. (Syn.: ligule, MacLoskie 1887,106; glossa, Kellogg 1899,355; Zünglein, Schaudinn 1905,408; Zünglein, Vogel 1921,264; median process of haustellum, Patton and Evans 1929,78; Lingula, Martini 1931,4; tongue, Robinson 1939,227; ligular lobe, Snodgrass 1959,60)

LOWER CALYPTER (LC) (Fig.17) [Belkin 1962,551] — The proximal calypter of the dipteran wing; typically situated below the upper calypter. (Syn.: tegula, Christophers 1960,444; basal calypter, Owen 1977,436)

lower flap of the side-piece [Edwards 1920,28] — In male mosquitoes, the dorsal (prerotational sense) surface of the gonocoxite. (Syn.: lower flap, Edwards 1920,28; dorsal surface, Christophers 1922, in part, 556; ventral flap, Freeborn 1924a,203)

LOWER MESEPIMERAL SCALE (LMSc) (Fig.16) — One of the scales occurring in a group on the ventroanterior quarter of the mesanepimeron. (Syn.: lower mesepimeral scale patch, Belkin 1962,548)

LOWER MESEPIMERAL SETA (MeSL) (Figs.13,16) [Edwards 1921,266] — One of the setae occurring in groups on the anterior, middle and/or posterior area of the mesanepimeron below the level of the metathoracic spiracle. (Syn.: epimeral hair, Christophers 1915a,369; anterior epimeral hair, Christophers 1915a,369; soies métapleurales inférieures, Séguy 1924,13; lower mesepimeral group; Matheson 1929,6; lower mesepimeral bristle, Matheson 1929,9; lower hypopleural bristle. Patton and Evans 1929,275; Hinterhaar, Swellengrebel and Rodenwaldt 1932,13; mesepimeral seta, Gater 1935,27; middle mesepimeral bristle, Belkin 1962,548; posterior mesepimeral bristle, Belkin 1962,548; anterior mesepimeral bristle, Belkin 1962,548)

LOWER MESKATEPISTERNAL SCALE (MScL) (Figs.13,16) — One of the scales occurring in a group located immediately in front of the lower meskatepisternal setae. (Syn.: lower sternopleural scale patch, Belkin 1962,548)

LOWER MESKATEPISTERNAL SETA (MkSL) (Figs.12-14,16) — One of the setae occurring in a more or less vertical line along the posterior margin of the meskatepisternum at about the level of the mesotrochantin; sometimes continuous with the upper meskatepisternal setae. (Syn.: lower episternal chaeta, Christophers 1915a, legend to Pl. XIX; untere Sternopleuralborste, Martini 1923b,27; lower mes-episternal bristle, Kirkpatrick 1925,14; Unterhaar, Swellengrebel and Rodenwaldt 1932,13; lower sternopleural group, Christophers 1933,14; lower sternopleural seta, Gater 1935,27; posterior sternopleural bristle, Belkin 1962,550; lower mesepisternal seta, Knight and Laffoon 1970b,134; lower katepisternal seta, Wood *et al.* 1979,31)

LOWER OCULAR SETA (LOcs) [Knight 1970,29] — One of the ocular setae occurring along the lateral margin of the compound eye. (Syn.: lower orbital bristle, Belkin 1968,49; temporal bristle, Tanaka *et al.* 1979,8)

LOWER PLEUROTERTGITE (LPt) (Figs.12,13) — The lower division of the pleurotergite located immediately above the metathoracic spiracle; bearing internally an apodeme, lower pleurotergite apodeme, along its upper margin. (Syn.: lower laterotergite, Owen 1977,429)

LOWER PLEUROTERTGITE APODEME (LPtA) (Fig.12) — The apodeme borne along the upper margin of the lower pleurotergite; lending support to the walls of the mesopostnotum. (Syn.: lower laterotergite apodeme, Owen 1977,434)

LOWER POSTPRONOTAL SCALE (LPSc) (Fig.16) — One of the scales occurring in a group on the ventral part of the postpronotum. (Syn.: middle posterior pronotal scale patch, Belkin 1962,549)

This term is introduced here for Belkin's "middle patch" of scales because his "lower patch" occurs on what is recognized herein as the proepimeron and the "middle patch" actually occurs on the lower part of the postpronotum.

LOWER PREALAR SCALE (LPPrSc) (Fig.16) — One of the scales occurring in a group on the posterior mesanepisternum below the prealar setae. (Syn.: lower prealar scale patch, Belkin 1962,549)

LOWER PROEPISTERNAL SCALE (PScL) — One of the proepisternal scales occurring in a group mesad of the forecoxa and below the upper proepisternal scales; sometimes continuous with the upper proepisternal scales dorsolaterally. (Syn.: prosternal scaling, Belkin 1962,549)

This term is introduced here for Belkin's "prosternal scaling" because the scales are borne on the lower part of what is recognized herein as the proepisternum. The term distinguishes the scales

from a group of scales borne on the upper part of the same sclerite.

LOWER PROEPISTERNAL SETA (PeSL) (Fig.16) — One of the proepisternal setae occurring in a group mesad of the forecoxa and below the upper proepisternal setae. (Syn.: prosternal seta, Knight and Laffoon 1970b,139; probasisternal seta, Lunt and Nielsen 1971,72)

This term is introduced as a replacement for "prosternal seta," previously recommended for use by Knight and Laffoon, because the setae are borne on the lower part of what is recognized herein as the proepisternum. The term distinguishes the setae from a group of setae which occupy an upper position on the same sclerite.

LOWER VAGINAL LIP (LVL) (Figs.25-27) [Laffoon and Knight 1971,33] — In female mosquitoes, the sclerotized and pigmented rim of the floor of the vagina; articulated with the upper vaginal lip at the hinge; its median area is joined to the insula; usually spiculate. (Syn.: bride ventrale, Brolemann 1919b,94; brides perioviductales, Brolemann 1919b, including the upper vaginal lip, 101; sigma, Christophers 1923, including part of the upper vaginal lip, 700; anterior lip of the atrium, Barraud 1928,364; anterior lip of atrium, Barraud 1928,365; sigma, Gerry 1932, 36; peritrial chitinization, Christophers 1933, including the upper vaginal lip, 31; insular plate, Christophers 1933,32; peritrial sclerite, Crampton 1942, including the upper vaginal lip, 82; preatrial sclerite, Crampton 1942,82; anterior sigma, Coher 1948,78; stigmata, Rees and Onishi 1951,241; ventral arc of sigma, Snodgrass 1959,68; ventral lip, Curtin and Jones 1961, 302; ventral vaginal lip, Curtin and Jones 1961,302; sclerotized ring, Anderson and Horsfall 1963, including the upper vaginal lip, 74; ninth sternite, Giglioli 1963,151; lower lip, Spielman 1964,335; lower genital lip, Spielman 1964,337; kraniale Genitalspange, Mohrig 1967,68)

LOWER VAGINAL SCLERITE (LVS) (Fig.27) [Reinert 1974b,51] — In female mosquitoes, a pigmented sclerite of the vaginal floor other than the lower vaginal lip; usually absent; well developed in certain *Aedes* species, e.g., those of the subgenera *Neomacleaya* and *Verrallina*. (Syn.: preatrial plate, Laffoon 1946,228)

M

MANDIBLE (Mn) [Dimmock 1881,233] — One of the first pair of gnathal appendages. In female mosquitoes, occurring just ventrad of the labrum in the premental gutter; reduced or absent in males. (Syn.: Unterkiefer, Becher 1882,134; maxilla, Murphy 1883,464; lacinia, Mitchell 1907,3; Mandibelstilet, Vogel 1921,260; mandibular stylet, Snodgrass 1959,60; Mandibelblatt, Wenk 1961,256; mandibular blade, Waldbauer 1962,205)

MANDIBULAR SUSPENSORIUM (MSP) (Figs.5,6) [Robinson 1939,222] — A small internal sclerite articulated with the proximal end of the mandible ventrally and the subgenal ridge dorsally. (Syn.: Querstäbchen, Kulagin 1905,287; external cornu of mandible, Patton and Evans 1929,72; Suspensorium, Schiemenz 1957,286; suspensory sclerite, Snodgrass 1959,56; mandibular condyle, Christophers 1960,429; Stäbchen, Wenk 1961,255; suspensorium of the mandible, Waldbauer 1962,203; suspensorium of mandible, Waldbauer 1962,210)

MANDIBULAR TOOTH (MnT) [Lee 1974,197] — One in a series of small toothlike processes occurring distally along the outer margin of each mandible. (Syn.: tooth, Nuttall and Shipley 1901c,461; serration, Stephans and Christophers 1903,167; Zähnen, Vogel 1921,274; mandibular denticle, Robinson 1939,220)

MARGINAL SETA (MaS) [marginal hair, Christophers 1933,14] — A special name applied to any one of the setae occurring along the inner and outer margins of the fourth and fifth palpomeres of the maxillary palpi.

MAXILLA (Mx) [Robinson 1939,217] — One of the second pair of gnathal appendages. In mosquitoes, consisting of a styletlike lacinia (lying along the ventral side of the hypopharynx in the premental gutter), the maxillary palpus and an internal rod comprised of the stipes and cardo; reduced in males. (Syn.: first maxilla, Patton and Evans 1929,71)

MAXILLARY PALPAL INDEX [palpal index, Christophers 1913,67] — Ratio of the length of the fifth (apical) palpomere to the fourth (penultimate) palpomere of the maxillary palpus.

MAXILLARY PALPUS (MPip) (Figs.1-9) [Dimmock 1881,233] — The teleopodite of the maxilla. In mosquitoes, inserted immediately below the clypeus and laterad to the base of the proboscis; varies widely in form according to genus and sex; primitively consisting of five palpomeres. (Syn.: barbe, de Réaumur 1738,580; Taster, Becher 1882,135; palpus, Muir 1883,465; maxillary palp, MacLuskie 1887,107; maxillar palpus, Kellogg 1899,355; palp, Nuttall and Shipley 1901c,455; mouth feeler,

Smith 1904,14; Maxillartaster, Vogel 1921,276; Kiefertaster, Martini 1923b,19; first maxillary palp, Patton and Evans 1929,54; palp of the first maxilla, Patton and Evans 1929,56)

MAXILLARY PALPUS LENGTH — The length of the maxillary palpus expressed as a fraction of the proboscis length. (Syn.: palpal length, Belkin 1962,548)

MAXILLARY TOOTH (MxT) [Maxillarzahn, Martini 1931,61] — One in a series of proximally-directed toothlike processes borne on the outer margin of the distal end of the lacinia. (Syn.: papilla, Dimmock 1881,237; tooth, Murphy 1883,464; hook, Muir 1883, in part, 465; Zähchen, Vogel 1921,274; Dentes maxillares, Martini 1931,61; serration, Gater 1935,19; maxillary denticle, Robinson 1939,220; lateral tooth, Robinson 1939,224)

MAXILLARY TOOTH INDEX (MTI) — The number of teeth on each maxillary lacinia. (Syn.: maxillary index, Gater 1935,20)

MEDIA (M) (Figs.17,19) [Knight and Laffoon 1970c,168] — The usual fourth principal longitudinal vein of the wing; primitively with two branches, media anterior and media posterior, but only the latter occurs in the Holometabola in which it is conventionally called the media. In mosquitoes, the media (i.e., media posterior) branches into media-one-plus-two and media-three-plus-four with the former branching into media-one and media-two. (Syn. excluding media-three-plus-four: 4th longitudinal vein, Skuse 1889,1764; fourth longitudinal vein, Giles 1900,10; fourth long vein, Theobald 1901b,17; fourth vein, Howard *et al.* 1912,61; media, Kirkpatrick 1925,16; medial vein, Matheson 1929,1; fourth forked vein, Patton and Evans 1929,182; vein 4, Barraud 1934,57) For other interpretations of homology see Table 1.

MEDIAN ANTERIOR PROMONTORY SCALE (APSM) — One of the scales usually forming a tuft at the middle of the anterior margin of the anterior promontory in Anophelinae. (Syn.: median scale-tuft, Christophers 1933,14; central tuft, Gater 1935,23)

MEDIAN ANTERIOR PROMONTORY SETA (MAPS) (Figs.11,16,19) [Knight and Laffoon 1970b,134] — Any seta occurring in a small cluster anteriorly on the midline of the anterior promontory. (Syn.: median anterior mesonotal chaeta, Christophers 1960,438)

MEDIAN PRESCUTELLAR SCALE (SSPM) (Fig.16) — One of the prescutellar scales occurring in a transverse line on the anterior margin and/or in a median longitudinal line on the prescutellar area of the scutum. (Syn.: median prescutellar line, Berlin 1969,5)

MEDIAN SCUTAL FOSSAL SCALE (SFSM)(Fig.16) — One of the scales occurring in a group on the central area of the scutal fossa. (Syn.: fossal scale, Belkin 1962,548)

MEDIAN SCUTAL FOSSAL SETA (MSFS) (Figs.11,12,16) — One of the setae occurring in a group near the center of the scutal fossa. (Syn.: lateral anterior mesonotal chaeta, Christophers 1960,438; fossal bristle, Belkin 1962,548)

MEDIAN SCUTELLAR SCALE (MSSc) (Figs.16,19) — One of the scales occurring in a group on the middle lobe of the scutellum. (Syn.: median scutellar scale patch, Belkin 1962,549)

MEDIAN SCUTELLAR SETA (MSS) (Figs.11,12,14,16,19) [median scutellar chaeta, Christophers 1960,438] — One of the setae occurring in a group on the middle lobe of the scutellum.

median ventral tuft [Jones and Wheeler 1965,402] — A small tuft of spicules occurring on the midline of the vaginal floor just inside the lower vaginal lip of *Aedes aegypti* (Linnaeus). (Syn.: median tuft, Jones and Wheeler 1965,405; ventral tuft, Jones and Wheeler 1965,407)

MEDIA-ONE (M₁) (Figs.17,19) [Knight and Laffoon 1970c,168] — The anterior branch of media-one-plus-two which reaches the margin of the wing near the apex. (Syn.: anterior branch, Skuse 1889,1764; media-one-plus-two, Nuttall and Shipley 1901c,475; anterior median vein, Patton and Evans 1929,183; vein 4.1, Barraud 1934,57) For other interpretations of homology see Table 1.

MEDIA-ONE-PLUS-TWO (M₁₊₂) (Figs.17,19) [Knight and Laffoon 1970c,168] — The anterior branch of the media (media posterior) which splits into media-one and media-two near the wing apex. (Syn.: see **MEDIA**) For other interpretations of homology see Table 1.

MEDIA-THREE-PLUS-FOUR (M₃₊₄) (Figs.17,19) [Knight and Laffoon 1970c,168] — The posterior branch of the media (media posterior); with a short basal crossveinlike segment which traditionally has been considered to be the mediocubital crossvein; the longer distal part has been considered to be cubitus-one. (Syn. applied to the short basal segment: posterior cross-vein, Skuse 1889, 1764; medio-cubital cross-nervure, Nuttall and Shipley 1901c,475; basal cross-vein, Howard *et al.* 1912,61; cross-vein 4-5, Barraud 1934,57; medio-cubital cross-vein, Gater 1935,28. Syn. for the distal

part including the mediocubital crossvein as recognized herein: fifth longitudinal vein, Skuse 1889, including cubitus anterior, 1764; cubitus-one, Nuttall and Shipley 1901c,475; fifth vein, Howard *et al.* 1912, including cubitus anterior, 61; branch of fifth longitudinal, Christophers 1933,18; vein 5.1, Barraud 1934,57) For other interpretations of homology see Table 1.

MEDIA-TWO (M₂) (Figs.17,19) [Knight and Laffoon 1970c,168] — The posterior branch of media-one-plus-two. (Syn.: media-three, Nuttall and Shipley 1901c,475; posterior median vein, Patton and Evans 1929,183; posterior branch, Christophers 1933,18; vein 4.2, Barraud 1934,57) For other interpretations of homology see Table 1.

MEDIOCUBITAL CROSSVEIN (mcu) (Figs.17,19) [Knight and Laffoon 1970c,169] — The crossvein extending between the media and cubitus. In mosquitoes and other Diptera, connecting media-three-plus-four and the cubitus anterior. (Syn. including most of media-three-plus-four: 5th longitudinal vein, Skuse 1889, in part, 1764; fifth longitudinal vein, Giles 1900,10; cubitus-one, Nuttall and Shipley 1901c,475; fifth vein, Howard *et al.* 1912,61; branch of the fifth longitudinal vein, Christophers 1933,18) For other interpretations of homology see Table 1.

MEDIOTERGITE (Mdt) (Figs.11,12) [Crampton 1925, Fig.40] — The large median area of the mesopostnotum; sometimes with scales or setae.

MERON (m) — The lateral postarticular area of the coxal base proximal to the basicostal suture. In mosquitoes, more associated with the pleuron than the coxa; present on the meso- and metathorax, mesomeron and metameron, respectively.

MESAL MEMBRANE (MM) (Figs.21,23) [Belkin 1962,553] — In some male mosquitoes, the unsclerotized mesal surface of the gonocoxite. (Syn.: internal surface, Christophers 1922,555; lacuna, Freeborn 1924a,200; hollow of sidepiece, Roth 1943,119; lacuna of paramere, Hodapp and Jones 1961,833)

MESANAPLEURAL SUTURE (MAnS) — The suture occurring between the mesanepisternum and the meskatepisternum. In some mosquitoes, e.g., *Uranotaenia sapphirina* (Osten Sacken), weakly developed between the posterior mesanepisternum and the meskatepisternum. (Syn.: anapleural suture, Owen 1977,435; anapleural suture 2, Owen 1977,429)

MESANEPIMERAL RIDGE (MAeR) (Fig.12) — An internal ridge along the ventral margin of the mesanepimeron serving for the attachment of wing muscles. (Syn.: anepimeral ridge, Owen 1977,432)

MESANEPIMERON (Mam) (Figs.12-14) [Patton and Evans 1929, in part, 86; Wood *et al.* 1979,33] — The large upper area of the mesepimeron. In mosquitoes, bearing scales and setae referred to simply as mesepimeral elements because of the insignificant nature of the meskatepimeron. (Syn.: meskatepimeron, Patton and Evans 1929, in part, 86; subalifer, Owen 1977, in part, 429; anepimeron 2, Owen 1977, in part, 429)

MESANEPISTERNUM (Mas) [Wood *et al.* 1979,32] — The upper area of the mesepisternum separated from the meskatepisternum by the mesanapleural suture. In some Diptera, the mesanepisternum is divided into anterior and posterior mesanepisterna by the membranous anepisternal cleft. (Syn.: anepisternum, Crampton 1925,61)

MESEPIMERAL SCALE (MeSc) [Lee and Woodhill 1944,20] — Any scale borne on the mesepimeron. In mosquitoes, anterior, posterior, upper and lower mesepimeral scales occur on the mesanepimeron. (Syn.: mesepimeralen Schuppenfleck, Peus 1933,152)

MESEPIMERAL SETA (MeS) [Edwards 1921,266] — Any seta borne on the mesepimeron. In mosquitoes, occurring on the mesanepimeron, usually in a group inserted dorsally, but when, as in a few species, a ventral group is also present the latter are termed the lower mesepimeral setae and the former the upper mesepimeral setae.

MESEPIMERON (Mm) (Fig.1) [mesoepimerum, Snodgrass 1912,56] — The area of the mesopleuron posterior to the mesopleural suture. In mosquitoes, divided horizontally into a large mesanepimeron and an insignificant meskatepimeron located immediately below the former; scales and setae which occur on the mesanepimeron are referred to simply as mesepimeral because of the reduced nature of the meskatepimeron. (Syn.: epi-sternum, Christophers 1901,4; metasternum, Nuttall and Shipley 1901c,470; epimerum, Snodgrass 1912,56; Achterbeugel, Rodenwaldt 1921,150; epimeron, Freeborn 1926,339; Hinterbügel, Swellengrebel and Rodenwaldt 1932,13; pteropleurite, Edwards 1941,8; pteropleuron, Edwards 1941,8)

mesepisternal suture [Patton and Evans 1929,86] — The line of demarcation extending along the anterodorsal margin of the combined meskatepisternum and posterior mesanepisternum.

MESEPISTERNUM (Ms) (Fig.1) [Kirkpatrick 1925,14] — The area of the mesopleuron anterior to the

mesopleural suture. In many insects, horizontally divided into an upper mesanepisternum and a lower meskatepisternum.

Snodgrass (1912,56) first identified the area defined here as the episternum of the mesopleuron but did not directly apply the term mesepisternum to it. Most culicidologists have used the term, or its synonyms, for the fused posterior mesanepisternum and meskatepisternum.

➤ **MESKATEPIMERON (Mkm)** (Figs.12-14) [Wood *et al.* 1979,33] — The lower division of the mesepimeron. In mosquitoes, an insignificant strip of cuticle projecting over the dorsal edge of the mesomeron. (Syn.: accessory plate of mesoepimerum, Snodgrass 1912,56)

➤ **MESKATEPISTERNAL BRIDGE (MksB)** (Figs.14,15) — In Diptera, the narrow ridge uniting the ventral extremities of the meskatepisterna between the pro- and mesosterna. (Syn.: sternopleural bridge, Christophers 1960,432; mesepisternal bridge, Knight and Laffoon 1970b,134; preepisternal bridge, Owen 1977,431)

➤ **MESKATEPISTERNAL SCALE (MkSc)** — Any scale borne on the meskatepisternum. In mosquitoes, occurring in two groups, the upper and lower meskatepisternal scales. (Syn.: mesepisternalen Schuppenfleck, Peus 1933,152; sternopleural scale-patch, Natvig 1948,10; sternopleural scale, Belkin 1962,550)

➤ **MESKATEPISTERNAL SETA (Mks)** — Any seta borne on the meskatepisternum. In mosquitoes, occurring in two groups, the upper and lower meskatepisternal setae, along the posterior margin. (Syn.: sternopleural bristle, Edwards 1921,266; soie sternopleurales, Séguy 1924,13; mes-episternal bristle, Kirkpatrick 1925,14; sterno-pleural group, Matheson 1929,6; sternopleural seta, Komp 1937,250; lower sternopleural bristle, Patton and Evans 1929,275; sternopleural chaeta, Christophers 1960,435; untere mesepisternale Borste, Mohrig 1969,21; mesepisternal seta, Knight and Laffoon 1970b,135)

➤ **MESKATEPISTERNUM (Mks)** (Figs.12-14) [Patton and Evans 1929, including the posterior mesanepisternum, 86, Wood *et al.* 1979,33] — The lower area of the mesepisternum. In mosquitoes, separated from the anterior mesanepisternum by the anepisternal cleft; usually united with the posterior mesanepisternum but sometimes separated from it by the mesanapleural suture; united ventrally between the pro- and mesosterna with its mate of the opposite side. (Syn. listed here also include the posterior mesanepisternum (see) unless otherwise noted: meso-sternum. Christophers 1901, Fig.1; Middenbeugel, Rodenwaldt 1921,149; sternopleurite, Crampton 1925, Mks only, 61; Mittelbügel, Swellengrebel and Rodenwaldt 1932,13; sternopleuron, Christophers 1933,14; katepisternum, Crampton 1942, Mks only, 147; sternum, Snodgrass 1959, in part, 64; episternal plate, Snodgrass 1959, in part, 64; ventrales Mesepisternum, Mohrig 1969, Mks only, 21; preepisternum 2, Owen 1977, Mks only, 429)

MESOBASISTERNUM (Mbs) (Fig.15) — The basisternum of the mesothorax. In mosquitoes, often separated from the mesofurcasternum by a secondary line of inflection, otherwise it is not readily discernible. See **FURCASTERNUM**.

MESOCOXYAL CAVITY (MC) (Figs.12,14,15) [Knight and Laffoon 1970b,135] — A coxal cavity of the mesothorax. (Syn.: coxal cavity 2, Owen 1977,431)

MESOFURCA (Mef) (Figs.12,14,15) [mesofurcum, Prashad 1918,617] — The furca of the mesothoracic segment. (Syn.: medifurca, Patton and Evans 1929,87; second furca, Christophers 1960,437)

MESOFURCASTERNUM (Mfs) (Fig.15) — The area of the mesosternum bearing the mesofurca. In mosquitoes, often separated from the mesobasisternum by a secondary inflection, otherwise it is not readily discernible. See **FURCASTERNUM**.

MESOMERON (Msm) (Figs.1,12-14) [Knight and Laffoon 1970b,135] — The meron of the mesothorax located slightly above and immediately behind the midcoxa below the mesepimeron. (Syn.: meta-sternum, Christophers 1901, Fig.1; sternum, Snodgrass 1912,56; postcoxal sclerite, Snodgrass 1912,58; postcoxal plate, Snodgrass 1912,59; hypopleure, Séguy 1924,12; meron, Crampton 1925,62; meseusternum, Patton and Evans 1929,86; meso-merocoxa, Shannon 1931,135; postcoxal lobe, Snodgrass 1959,64)

mesonotal disc [Schick 1970,8] — The area of the scutum comprising the acrostichal and dorsocentral areas.

MESONOTUM (Mn) [Patton and Evans 1929,85] — The notum of the mesothorax. In Diptera, comprised of the acrotergite, scutum (with prescutum) and scutellum. (Syn.: postnotum, LaCasse and Yamaguti 1948,3; notum, Snodgrass 1959,64; mesotergum, Snodgrass 1912,57; notal plate, Snodgrass 1959,65)

Knight and Laffoon (1970b,135) wrongly included the mesopostnotum as a part of the mesonotum.

MESOPLEURAL RIDGE (mr) (Figs.12,14) [Knight and Laffoon 1970b,135] — The pleural ridge marked externally by the mesopleural suture; extending from the pleural apophyseal pit above the midcoxal articulation to the base of the wing. (Syn.: pleural ridge, Owen 1977,432)

MESOPLEURAL SUTURE (ms) (Figs.12-14) [Patton and Evans 1929,86] — The external groove (pleural suture) of the mesopleural ridge; extending from the base of the wing to the midcoxal articulation; separating the mesepisternum from the mesepimeron. (Syn.: pleural sulcus, Snodgrass 1959,64; mesepimeral suture, Christophers 1960,432; pleural suture 2, Owen 1977,429)

Snodgrass (1912,56) first denoted the pleural suture of the mesothorax but did not employ the term mesopleural suture directly.

MESOPLEURON (Mp) [Belkin 1962, in part, 549] — The pleuron of the mesothorax. In winged insects, the principal parts of the mesopleuron include the basalare, subalare, mesepisternum, mesepimeron and mesotrochantin. The mesepisternum is particularly well developed in Diptera. (Syn.: mesopleura, Theobald 1901b,5; mesopleurum, Snodgrass 1912,58)

MESOPLEUROSTERNAL RIDGE (MPSR)(Figs.12,14,15) — The large, posteriorly curved invagination of the mesopleurosternal suture; extending laterally along the anterior margin of the mesocoxal cavity; reaching posteriorly along the body midline to the base of the mesofurca; confluent along the mesal margin with the median longitudinal ridge of the mesosternum. (Syn.: furcasternum 2, Owen 1977,432)

MESOPLEUROSTERNAL SUTURE (MPSS) (Figs.14,15) — The external groove between the meskatepisternum and the mesobasisternum, or the mesosternum when the mesobasisternum is not discernible. (Syn.: pleurosternal suture, Owen 1977,431)

MESOPOSTNOTAL SCALE (MpSc) (Fig.16) — One of the scales occurring in a small cluster on the median posterior area of the mediotergite. (Syn.: postnotal scale, Belkin 1962,549)

MESOPOSTNOTAL SETA (MpnS) (Fig.16) [mesopostnotal hair, Patton and Evans 1929,275] — One of the setae occurring in a small group on the median posterior area of the mediotergite. (Syn.: post-scutellar chaeta, Christophers 1915a,368; postnotal bristle, Edwards 1932,5)

MESOPOSTNOTUM (Mpn) (Figs.1,12,19) [Patton and Evans 1929,85] — The well developed postnotum of the mesothorax; bearing the second phragma along its lateroposterior borders; subdivided into a large median area, mediotergite, and smaller lateral areas, pleurotergites. (Syn.: metanotum, Giles 1900,9; post-scutellum, Christophers 1901,4; postnotum, Snodgrass 1912,56; postnotal plate, Snodgrass 1912,57; Nachrücken, Martini 1923b,19; mésophragme, Séguy 1924,12; Mesophragma, Martini 1931,2)

MESOSTERNAL RIDGE (MesR) (Figs.12,14,22) — The median longitudinal invagination marked externally by the mesosternal suture; confluent anteriorly with the mesal margins of the mesopleurosternal ridges and posteriorly with the intersegmental ridge between the meso- and metathorax; bearing the mesofurca between the coxal cavities. (Syn.: discriminial line, Owen 1977,433; discrimen, Owen 1977,437)

MESOSTERNAL SUTURE (MesS) (Figs.14,15) — The groove produced incidental to the median longitudinal invagination, mesosternal ridge, of the mesosternum; extending from the mesopleurosternal sutures to the intersegmental suture between the meso- and metathorax; bearing the slitlike apophyseal pit between the coxal bases. (Syn.: discriminial line, Owen 1977,431; discrimen, Owen 1977,437)

The term is applied here to the previously unnamed suture. Matsuda (1970,317) referred to the homologous groove in *Tipula* as a “median longitudinal suture.”

MESOSTERNUM (Mst) (Fig.14) [Snodgrass 1912,58] — The sternum of the mesothorax. In mosquitoes its component parts are generally unrecognizable although the mesobasisternum and mesofurcasternum are sometimes separated by what appears to be a secondary line of inflection. (Syn.: sternite 2, Christophers 1960,432; katepisternum 2, Owen 1977, including the mesotrochantin, 431)

MESOTHORACIC SPIRACLE (MS) (Figs.1,12,13) [Nuttall and Shipley 1901c,471] — The spiracle of the mesothorax. In mosquitoes, located just below the scutal margin behind the postpronotum and prespiracular area. (Syn.: stigma of the prothorax, Giles 1900,25; first thoracic stigma, Christophers 1901,4; first spiracle, Nuttall and Shipley 1901c,471; prothoracic spiracle, Theobald 1901b,5; first thoracic spiracle, Snodgrass 1912,55; anterior spiracle, Snodgrass 1912,58; anterior

thoracic spiracle, Patton and Evans 1929,87)

MESOTHORAX (M) — The second or middle segment of the thorax. In Diptera, the largest part of the thorax, especially dorsally, which bears the wings.

MESOTROCHANTIN (Mtr) (Figs.12-14) [Knight and Laffoon 1970b,135] — The precoxal sclerite of the mesopleuron. In mosquitoes, the triangular sclerite lying between the mesokatepisternum and the mesomeron just above the midcoxa. (Syn.: small plate of mesopleurum, Snodgrass 1912,56; pleurotrochantin, Crampton 1925, Fig.40; trochantin, Christophers 1933,14; katepisternum 2, Owen 1977, including the mesosternum, 429; precoxale, Owen 1977, in part, 431)

METABASISTERNUM (Mts) (Figs.14,15) — The basisternum of the metathorax. In mosquitoes, the narrow longitudinal area of the metasternum separated from the mesosternum anteriorly by an intersegmental suture and from the metafurcasternum posteriorly by a sternacostal suture. (Syn.: precoxale, Owen 1977, in part, 431) See **FURCASTERNUM**.

METACOXAL CAVITY (McC) (Figs.12,14,15) [Knight and Laffoon 1970b,135] — The coxal cavity of the metathorax. (Syn.: coxal cavity 3, Owen 1977,431)

METAFURCA (Mf) (Fig.14) [metafurcum, Prashad 1918,617] — The furca of the metasternum. (Syn.: third furca, Christophers 1960,437)

METAFURCASTERNUM (Mfts) (Figs.14,15) — The area of the metasternum bearing the metafurca; usually reduced and not readily discernible. (Syn.: furcasternum 3, Owen 1977,432) See **FURCASTERNUM**.

METAMERAL SCALE (MeSc) (Fig.16) — One of the scales occurring in a small cluster on the metameron.

METAMERON (Mem) (Figs.1,12-14) [Edwards 1941,9] — The meron of the metathorax represented by a vertically narrow sclerite above the hindcoxa. (Syn.: metapleurum, Snodgrass 1912, in part, 56; met-episternum, Kirkpatrick 1925, including the metepisternum, 14; sternopleurite, Freeborn 1926,339; meron, Patton and Evans 1929,86; sternopleuron, Christophers 1933,14; meteusternum, Komp 1937,245; katepisternum 3, Owen 1977, including the metasternum, 429)

METANOTUM (Mtn) (Figs.11-13,19) [Theobald 1901a,234] — By definition, the notum of the metathorax which includes the mesopostnotum; for convenience, normally applied only to the primary sclerotization of the dorsum lying between the meso- and metapostnota. (Syn.: tergum, Snodgrass 1912,56; metatergum, Snodgrass 1912,57; metatergal bridge, Snodgrass 1912,57; notum, Freeborn 1926,339; postmediotergite, Owen 1977, in part, 427)

METAPLEURAL RIDGE (mtr) (Fig.12) — The pleural ridge marked externally by the metapleural suture; extending dorsad from the apophyseal pit (when present) along the posterior margin of the metepisternum. (Syn.: pleural apodeme, Owen 1977, at least in part, 432)

METAPLEURAL SUTURE (mts) (Figs.12,13) [Patton and Evans 1929,87] — The external groove (pleural suture) of the metapleural ridge separating the metepisternum from the metepimeron. In mosquitoes, an irregular groove extending downward from near the base of the halter; sometimes interrupted by the apophyseal pit. (Syn.: pleural suture 3, Owen 1977,429)

Snodgrass (1912,56) first identified the pleural suture of the metathorax but did not directly apply the term "metapleural suture."

METAPLEURON (Mtp) [Carpenter and LaCasse 1955,10] — The pleuron of the metathorax. In mosquitoes only a reduced metepisternum and metepimeron are present. (Syn.: metapleura, Theobald 1901b,5)

METAPOSTNOTUM (Mtpn) (Figs.1,12-14,19) [Snodgrass 1959,65] — The postnotum of the metathorax. In mosquitoes, a narrow plate behind the intersegmental cleft which extends ventrally to the metameron of each side; apparently reflected upon and united with the anterior part of abdominal segment I. (Syn.: postnotum, Snodgrass 1912,56; meteusternum, Gjullin 1946,216)

METASTERNAL RIDGE (MetR) (Figs.14,15) — The median longitudinal invagination of the metasternum (metabasisternum) marked externally by the metasternal suture; extending from the intersegmental suture between the meso- and metathorax to the metafurca. (Syn.: discriminial line, Owen 1977,433)

METASTERNAL SUTURE (MetS) (Figs.14,15) — The groove produced incidental to the median longitudinal invagination, metasternal ridge, of the metasternum (metabasisternum); extending from the intersegmental suture between the meso- and metathorax to the sternacostal suture. (Syn.: discriminial line, Owen 1977,431)

- METASTERNUM (Mtst)** (Figs.12,14) [Snodgrass 1912,59] — The sternum of the metathorax. In mosquitoes, consisting of the metabasisternum and the metafurcasternum which are separated by a sternacostal suture. (Syn.: sternite 3, Christophers 1960,432; katepisternum 3, Owen 1977, including the metameron, 431)
- METATHORACIC SPIRACLE (Mts)** (Figs.1,12-14) [Prashad 1918,618] — The spiracle of the metathorax. In mosquitoes, located just below the pleurotergite between the upper area of the mesepimeron and the halter. (Syn.: stigma of the metathorax, Giles 1900,9; second thoracic stigma, Christophers 1901,4; second thoracic spiracle, Nuttall and Shipley 1901c,471; posterior spiracle, Patton and Evans 1929,86; posterior thoracic spiracle, Patton and Evans 1929,87)
- METATHORAX (Mt)** — The third, posterior segment of the thorax. In Diptera, reduced, appearing as part of the abdomen and bearing the halteres.
- METEPIMERON (Mtm)** (Figs.12,13) [Metepimer, Martini 1923b,19] — The area of the metapleuron posterior to the metapleural suture. In mosquitoes, reduced to a small triangular area which is sometimes poorly separated from the metepisternum and appears to be continuous dorsally with the metanotum. (Syn.: epi-merum, Christophers 1901,4; meta-epimerum, Prashad 1918,617; epimeron, Freeborn 1926,339; anepimeron 3, Owen 1977,429)
- METEPISTERNAL SCALE (MISc)** (Fig.16) [Marks 1974,211] — One of the scales occurring in a small group on the metepisternum just below the metathoracic spiracle. (Syn.: metepisternal hair, Marks 1974,211)
- METEPISTERNUM (Mts)** (Figs.12-14) [Metepisternum, Martini 1923b,19] — The area of the metapleuron anterior to the metapleural suture. In mosquitoes, the area immediately behind and below the metathoracic spiracle. (Syn.: epi-sternum, Christophers 1901,4; metaepisternum, Snodgrass 1912,59; anepisternum, Freeborn 1926,339; dorsales Metepisternum, Peus 1933,148; anepisternum 3, Owen 1977,429)
- MIDCOXA (C-II)** (Fig.12) [mid coxa, Theobald 1901b,5] — The coxa of the midleg. In mosquitoes, articulating with the mesotrochantin laterally and the sternal coxal process of the mesobasisternum ventrally. (Syn.: middle coxa, Christophers 1901,4; mesocoxa, Snodgrass 1912,58; eucoxa, Crampton 1925, Fig.40; 2nd coxa, Patton and Evans 1929,86; second coxa, Christophers 1960,436; coxa 2, Owen 1977,429)
- MIDFEMUR (Fe-II)** (Fig.18) — The femur of the midleg. (Syn.: middle femur, Howard *et al.* 1912,62)
- MIDLEG** (Fig.18) [mid leg, Theobald 1901b,5] — One of the pair of legs of the mesothorax. (Syn.: middle leg, Giles 1900,25; second leg, Nuttall and Shipley 1901c,470; mesothoracic leg, Nuttall and Shipley 1901c,472)
- MIDTARSUS (Ta-II)** (Fig.18) — The tarsus of one of the midlegs. (Syn.: middle tarsus, Howard *et al.* 1912,63)
- MIDTIBIA (Ti-II)** (Fig.18) — The tibia of one of the midlegs.
- MIDTROCHANTER (Tr-II)** (Fig.18) [Harrison and Scanlon 1975,10] — The trochanter of one of the midlegs.
- MIDUNGUIS (U-II)** (Fig.18) [mid unguis, Theobald 1901b,19] — The anterior or posterior unguis of one of the midlegs. (Syn.: midclaw, Belkin 1962,550)
- MOUTH (Mo)** (Figs.5,6,8) [Snodgrass 1959,62] — The anterior opening of the stomodeum located between the cibarium and pharynx; not to be confused with the secondary mouth (anterior opening of the cibarium) or the tertiary mouth (anterior opening of the food meatus). (Syn.: valve, Dimmock 1881,234; pharyngeal valve, Nuttall and Shipley 1903,168; anatomische Mund, Schiemenz 1957,283; Rima oris, Schiemenz 1957,283)

N

- NOTUM (N)** — The tergum of a thoracic segment comprising the primary segmental sclerotization and the preceding intersegmental sclerotization, the acrotergite. In most winged insects, the acrotergite of the mesothorax remains as a narrow anterior strip of the mesonotum while the acrotergite of the metathorax becomes the postnotum of the mesonotum. As in other Pterygota, the mesonotum of mosquitoes has retained the acrotergite and is defined in the classical sense as the notum of the mesothorax. Although it is understood that the notum of the metathorax includes the mesopostnotum, the term "metanotum" is customarily applied to the primary segmental

sclerotization only. See **TERGUM**.

O

OCCIPITAL CONDYLE (OCd) (Figs.2,5,6) [Waldbauer 1962,210] — A projection on either lateral margin of the postocciput to which the cephaliger of a cervical sclerite articulates. (Syn.: Cervical condylus, Schiemenz 1957,274)

OCCIPITAL FORAMEN (OF) (Fig.3) [Thompson 1905,148] — The posterior opening of the head into the cervix. (Syn.: neck foramen, Snodgrass 1943,8)

OCCIPITAL REGION [Gater 1935,15] — The region of the cranium corresponding to the occiput but probably including parts of the vertex and postgenae as well. See **OCCIPUT**.

OCCIPUT (Occ) (Fig.2) [Giles 1900, including the vertex, 6; Nuttall and Shipley 1901c,470] — The posterior dorsal part of the cranium separated from the postocciput by the postoccipital suture. In many insects including mosquitoes, its boundaries with the vertex and postgenae are not delimited; usually with erect scales in mosquitoes. (Syn.: Gena, Schiemenz 1957, including the gena and postgena, 274; Schläfe, Martini 1923b,19; postcranium, Wood *et al.* 1979, including the postocciput, 30)

OCELLUS (Oc) (Figs.2,7) [Thompson 1905,192] — A simple light-perceptive organ with the cuticular part (cornea) formed into a single lens (corneal facet); occurring singly or in groups. In adult mosquitoes, an indistinct ocellus is present on either side of the interantennal groove between the antennal sockets and the postfrontal sutures. (Syn.: Stirnauge, Martini 1923b,19; lateral ocellus, Patton and Evans 1929,54)

OCULAR LINE (OL) (Figs.2,4) [Knight 1970,28] — The area along the anterior border of the vertex between the margin of the compound eye and the row of ocular setae. (Syn.: orbital line, Belkin 1962,58)

OCULAR RIDGE (OR) (Fig.5) [Knight and Laffoon 1970a,71] — The apodeme marked externally by the ocular suture. (Syn.: Orbitalleiste, Schiemenz 1957,275)

OCULAR SCALE (OS) (Figs.2,4) [Christophers 1933,10] — One of the scales occurring on the ocular line of the head.

OCULAR SCLERITE (OSI) (Figs.2-4,7,8) [Christophers 1960,418] — An extremely narrow cranial area encircling the compound eye within the ocular suture.

OCULAR SETA (OcS) (Figs.2,4) [ocular chaeta, Christophers 1915a,363] — One of the setae occurring in a line on the head near the posterior margin of each compound eye; one or more pairs are usually differentiated as interocular setae; the ocular setae along the dorsal margin of the compound eye are the upper ocular setae and those along the lateral margin are the lower ocular setae. (Syn.: ocular bristle, Kirkpatrick 1925,10; orbital bristle, Evans 1938,7; vertical seta, Russell *et al.* 1943,11; orbital hair, Christophers 1960,418; orbital chaeta, Christophers 1960,425; postocular seta, Wood *et al.* 1979,29)

OCULAR SUTURE (OSc) (Figs.2-4,7,8) [Ocularnaht, Schiemenz 1957,274] — A line of inflection encircling the compound eye; forming the ocular ridge internally.

OPISTHOPHALLIC SCLERITE (OPS) (Fig.21) [Belkin 1968,9] — In dixid and some culicid males, a supporting sclerite on each side of the opisthophallus; in *Aedes* subgenus *Verrallina*, fused with its mate to form a dorsal (prerotation sense) transverse bridge between the basal pieces; perhaps homologous with the lateral plate of *Culex*. (Syn.: lateral sclerite, Belkin 1968,9)

OPISTHOPHALLUS (OP) (Fig.21) [Belkin 1968,4] — In dixid and some culicid males, a transverse lobiform element of the phallosome located between the phallus and proctiger; supported on either side by a sclerite, opisthophallic sclerite. The opisthophallus has not been studied or recognized in most mosquitoes but is strongly developed in *Maorigoeldia* and *Aedes* subgenus *Verrallina*.

OUTER DIVISION (OD) (Figs.23,25) [Belkin 1962,553] — In *Culex* males, the dorsal and lateral part of the lateral plate of the phallosome in the normal resting position; variously developed. (Syn.: central plate of the harpago, Dyar and Knab, 1909,35; outer plate of the harpago, Dyar and Knab 1909,36; upper plate, Dyar and Knab 1909,38; lower division of mesosome, Edwards 1921,330; middle mesosomal plate, Ross 1947,44; mediane Sklerit des Aedoeagus, Iglisch 1977,265; mediane Sklerit, Iglisch 1977,266)

OUTER DORSOCENTRAL SCALE (ODSc) (Fig.19) — One of the scales occurring in a rather indistinct row located laterad of the dorsocentral setae on the dorsocentral area of the scutum; usually reaching the posterior margin of the scutum before the lateral lobes of the scutellum. (Syn.: outer dorsocentral line, Berlin 1969,5)

P

P / A [Gutsevich 1974a,247] — The ratio of the length of the fourth palpomere to the total length of the third and fourth flagellomeres. (Syn.: index of P/A, Gutsevich 1974a,247; Pa/A, Gutsevich 1975a,154; index of Pa/A, Gutsevich 1975a,155)

PALATAL SETA (PSe) (Fig.9) — One of four small peglike cibarial setae borne on the anterior hard palate. (Syn.: papilla, Annett *et al.* 1901,84; taste papilla, Annett *et al.* 1901,84; Sinnesorgan, Vogel 1921,272; palatal papilla, Christophers 1933,26; palatal papillar sense organ, Day 1954,520; Sinneshaare, Schiemenz 1957, in part, 186; Geschmackshaare, Schiemenz 1957, in part, 330)

PALATUM (Pal) — The oral surfaces of the labrum and clypeus, bounded posteriorly by the mouth, limited arbitrarily laterally by the lateral margins of the clypeus and the usual dorsal sclerite(s) of the labrum; divided into the labropalatum and clypeopalatum.

PALPIFER (PI) (Figs.2,4,5) [Wesché 1909, Fig.19] — A small lobe laterad of the clypeus at the base of the maxillary palpus; anatomically a lobe of the maxillary stipes to which the maxillary palpus articulates.

PALPOMERE (Pip) [Wood *et al.* 1979,29] — An individual segment of the maxillary palpus. (Syn.: joint, Theobald 1901a,231; palpal joint, Howard *et al.* 1912,52; Tasterglied, Eckstein 1920,232; Glied, Martini 1921,251; segment, Patton and Evans 1929,72; Palpenglied, Swellengrebel and Rodenwaldt 1932,11; palpal segment, Gater 1935,17; palp segment, Robinson 1939,226)

PARABASAL LOBE (PBL) (Fig.21) [Christophers 1922,562] — In male Anophelinae, a variably-developed lobe located dorsobasally (prerotation sense) on the gonocoxite; bearing one or more strongly developed setae, parbasal setae. (Syn.: claspette, Felt 1905,470; Basallappen, Martini 1915,598; Zone parabasale, Senevet 1935,16)

PARABASAL SETA (PBS) (Fig.21) — In male Anophelinae, any distinctive seta usually borne on a lobe, the parbasal lobe, located dorsobasally (prerotation sense) on the gonocoxite. (Syn.: claspette spine, Christophers 1915b,374; basal spine, Edwards 1920,29; parbasal spine, Christophers 1922,562)

PARACOXAL RIDGE (pcr) (Figs.12,14,15) — The apodeme marked externally by the paracoxal suture; extending from the pleural apophysis to the mesopleurosternal ridge. (Syn.: precoxal apodeme, Owen 1977,432)

This term is introduced here as a replacement for “precoxal apodeme” in order to be in agreement with the term “paracoxal suture.”

PARACOXAL SUTURE (pcs) (Fig.12) [Owen 1977,429] — The line of inflection which separates the mesotrochantin from the meskatepisternum; appears to be continuous ventrally with the mesopleurosternal suture; appears to terminate dorsally at the pleural apophyseal pit; with an internal apodeme, the paracoxal ridge.

PARAMERE (Par) (Figs.21-23,25) [Edwards 1920,34] — In male mosquitoes, a lateral sclerite of the phallosome interposed between and articulating with the basal piece and the aedeagus (aedeagal sclerite). (Syn.: harpago, Felt 1904, in part, 263; fourth piece, Dyar and Knab 1909,33; third plate, Dyar and Knab 1909,35; inner plate, Dyar and Knab 1909,36; lower plate, Dyar and Knab 1909,37; uncus, Edwards 1914,64; first plate, Dyar 1918b,89; first uncal plate, Dyar 1818b,91; plate I of uncus, Dyar 1918b,92; uncal plate 1, Dyar 1918b, in Explanation of Plates; first plate of uncus, Dyar 1918b,102; crête latérale, Brolemann 1919a,434; trigonapophyse, Brolemann 1919b,76; parameral plate Christophers 1922,554; dorso-lateral plate, Christophers 1922,554; Hebel, Martini 1922,135; *hinteren Arm des Hebel, Martini 1922, in part, 139; + inneren Hebelarm, Martini 1922, in part, 139; *dorsal arm of the paramere, Matheson 1929, in part, 16; + lateral arm of the paramere, Matheson 1929, in part, 16; *dorsal arm, Matheson 1929, in part, 17; endomere, Crampton 1942,159; + lateral arm, Rees and Onishi 1951, in part 237; *dorsal arm of paramere, Rees and Onishi 1951, in part, 246; + lateral arm of paramere, Rees and Onishi 1951, in part, 246; basal plate, Snodgrass 1959,70; basal plate of aedeagus, Hodapp and Jones 1961,833; *dorsal paramere, Belkin 1962, in

part, 553; ventral paramere, Belkin 1962,554; apodeme of aedeagus, Spielman 1964,326; aedeagus apodeme, Spielman 1964,327; apodeme of the aedeagus, Spielman 1964,329; aedeagal apodeme, Spielman 1964,334)

When the paramere has one or more arms present dorsally, these have sometimes been called dorsal parameres and the remainder of the paramere, the ventral paramere (Belkin, 1962). It is recommended instead that these structures be called arms, e.g., the “dorsal arm of paramere” (synonyms indicated with * above) and “lateral arm of paramere” (synonyms indicated with + above).

PARANOTAL SUTURE (PnS) (Figs. 12,13) — The strongly developed suture separating the paratergite from the scutum; often appearing to be continuous posteriorly with the supraalar groove. (Syn.: dorso-pleural suture, Christophers 1915a, in part, 366; prescutoscutal suture, Owen 1977,429)

PARAPROCT (Ppr) (Figs.21-25) [Freeborn 1924a,191] — In certain primitive insects, a paired lateral sclerite of abdominal segment XI (? sometimes X) near the anus; sometimes applied in higher insects to sclerites of doubtful homology in a similar position. In male mosquitoes, a paired sclerite occurring laterally on the proctiger; basally articulated with tergum X; apparently a part of the cercus. (Syn.: harpe, Felt 1904,263; harpago, Felt 1905,463; major limb, Felt 1905,483; lateral chitinous process, Wesché 1906,346; harpal thickening, Christophers 1915b,377; harpal plate, Dyar 1918b,101; bras péniens, Brolemann 1919a,431; Spreizborste, Eckstein 1920,226; tenth sternite, Edwards 1920,31; tenth sternal plate, Christophers 1922,555; Chitinisierung des Analkegel, Martini 1922,135; chitinized plate of anal segment, Barraud 1923a, in Explanation of Plate LI; ventro-lateral plate, Barraud 1923a,776; X. Sternit, Martini 1928,153; ventro-lateral chitinization, Christophers 1933,30; lateroventral prong of tenth segment, Snodgrass 1959,68; marginal bar, Snodgrass 1959,69; ventral sclerite of proctiger, Christophers 1960,460; ventral plate, Christophers 1960,462; apical paraproct, Hodapp and Jones 1961,832; anal hook, Jones 1968,100; Analzipfel, Iglisch 1977,266)

PARAPROCT CROWN (PpC) (Figs.23,25) — In male *Culex* mosquitoes, a collection of spicules borne at or near the apex of the paraproct. (Syn.: crown of spines, Dyar and Knab 1909,33; harpal comb, Dyar 1918b,104; comb, Dyar 1918b,104; comb of harpe, Dyar 1918b,109; crown of paraproct, Barraud 1934,4; tuft of the tenth sternite, Roth 1943,119; crown, Colless 1965,263)

PARASCUTELLAR INFLECTION (Psi) (Fig.12) [Owen 1977,432] — An internal bladeliike process projecting ventrad from the parascutellum.

PARASCUTELLAR PROCESS (PsP) (Figs.12,14,19) [Owen 1977,427] — The small angular area located near the center of the parascutellum; represented internally by an apodeme which bears the insertion of direct wing muscles.

PARASCUTELLAR SETA (PscS) (Fig. 19) [parascutellar bristle, Belkin 1962,549] — Any seta borne on the parascutellum; usually one or more in number.

PARASCUTELLUM (Psc) (Figs.17,19) [Crampton 1942,147] — The small caudolateral lobe or area of the mesonotum caudad of the posterior notal wing process and cephalolaterad of the scutellum; usually with one or more setae. (Syn.: postalar callus, Belkin 1962,549)

PARATERGAL SCALE (PaSc) (Fig.16) [Belkin 1962,549] — One of the scales occurring in a group on the paratergite. (Syn.: metastigmal Schuppenfleck, Peus 1933,158; metastigmal scale-patch, Natvig 1948,10)

PARATERGITE (Pa) (Figs.1,12,13) [Crampton 1925,61] — A narrow lateral part of the mesonotum just before the wing root; separated from the scutum by the paranotal suture. (Syn.: lateral lobe, Snodgrass 1912,58; paranotal fold, Snodgrass 1959,64; prescutum, Owen 1977,429)

Owen's designation of this structure as the “prescutum” is apparently based on Matsuda's (1970,311) interpretation of the dipteran mesonotum. Matsuda referred to the longitudinal suture which separates the “prescutum” and scutum of *Tipula* as the “prescutoscutal suture” (synonymous with prescutal suture of Snodgrass 1935,192) and termed the groove which extends mesad from its middle the “parapsidal suture.” Crampton (1942,47) stated that the prescutal pits (scutal pits of Owen 1977,429) “indicate the true position of the prescutal suture.” The “parapsidal suture” is, therefore, the vestige of the true prescutal suture. Following the views of Crampton (1925; 1942) and Snodgrass (1912; 1959), the paratergite is considered here as a secondary division of the mesonotum separated from the scutum by a strong suture which herein is named the “paranotal suture.”

PEDICEL [of antenna] (Pe) (Figs.1,2,4,5,7,8) [Patton and Evans 1929,54] — The second or subbasal segment of the antenna. In mosquitoes, usually enlarged and appearing as the basal segment; often bearing setae and/or scales. (Syn.: basal lobe of antenna, Theobald 1901a,230; second segment, Nuttall and Shipley 1901c,459; basal bulb, Nuttall and Shipley 1901c,460; basal joint, Theobald 1901b,2; torus, Howard *et al.* 1912,53; scape, Peterson 1916,Figs.210-211; tormus, Freeborn 1926,339; Basis der Antenne, Swellengrebel and Rodenwaldt 1932,11; Antennenbasis, Swellengrebel and Rodenwaldt 1932,11; second antennal segment, Gater 1935,14; antennal pedicel, Snodgrass 1959,53)

PEDICEL [of halter] (Pc) (Fig.17) [Christophers 1960,452] — The slender, stalklike part of the halter bearing the capitellum distally. (Syn.: rod, Nuttall and Shipley 1901c,477; scape, Prashad 1916,504; stem, Bonne and Bonne-Wepster 1925, in part, 12; stalk, Kirkpatrick 1925,17; midhalter, Carpenter and LaCasse 1955,13)

PEDIMENT (Pd) (Fig.10) [Christophers 1933,26] — The basal part of a cone; bearing the filament anteriorly; the posterior part, crest, extends posteriorly and lies between the bases of adjacent rods.

PHALLOSOME (PH) (Figs.22,23) [Christophers 1922,536] — In male mosquitoes, the complex of structures surrounding the gonopore between the proctiger, gonocoxites and sternum IX; presumably consisting primitively of the basal pieces, parameres, prosophallus, phallus and opisthophallus, e.g., in *Aedes* subgenus *Verrallina*; usually comprised of the basal pieces, parameres and aedeagus, but including the lateral plates in *Culex*; the homologies of the various components are unknown. (Syn.: genital tube, Edwards 1920,32; aedeagus, Edwards 1920,33; median organ, Christophers 1922,534)

PHALLUS (Ph) (Fig.21) [Belkin 1968,8] — In dixid and some culicid males (*Aedes* subgenus *Verrallina*, Reinert 1974a), the median lobe of the phallosome located between the prosophallus and opisthophallus; supported by a sclerite, aedeagal sclerite, on either side which connects with the basal piece (in dixids) or the base of the prosophallic sclerite (in mosquitoes); bearing the aedeagus distally.

PHARYNGEAL PUMP (PP) (Figs.5,6,9) [Pharynxpumpe, Martini 1923b,29] — The bulblike posterior expansion of the pharynx behind the brain and the subesophageal ganglion; opens posteriorly into the esophagus. (Syn.: pumping organ, Dimmock 1881,233; oesophageal pump, Dimmock 1881,239; bulb, Dimmock 1881,239; sucking bulb of the oesophagus, Dimmock 1881, in Explanation of Pl.1; suctorial bulb, Giles 1900,29; pharyngeal bulb, Nuttall and Shipley 1903,171; posterior pharynx, Robinson 1939,219; antlia pharyngealis, Snodgrass 1943,15; Postpharynx, Schiemenz 1957,284; post-pharynx, Christophers 1960,418)

PHARYNX (Pha) (Figs.5-10) [MacLoskie 1887,106] — The part of the stomodeum between the mouth and the esophagus. In mosquitoes, posteriorly developed into a bulblike pharyngeal pump. (Syn.: oesophagus, Dimmock 1881,233; pumping organ, MacLoskie 1888,885; muscular dilation of the oesophagus, Giles 1900,20; pharyngeal pump, Nuttall and Shipley 1903,187; Pumporgan, Schaudinn 1904,411; pump, Thompson 1905,155; antlia, Thompson 1905,155; post-pharynx, Evans 1938,12; anterior pharynx, Robinson 1939, in part, 219; posterior pharynx, Robinson 1939, in part, 219; Postpharynx, Schiemenz 1957, in part, 284; Praepharynx, Schiemenz 1957, in part, 284)

PLEURAL APOPHYSEAL PIT (PAP) (Figs.12,13) [Owen 1977,430] — The external depression marking the point of origin of the pleural apophysis; usually located at the lower end of the pleural suture. Absent in the pro- and metathoracic segments of some species of mosquitoes.

PLEURAL APOPHYSIS (PIA) (Figs.12,14) [Knight and Laffoon 1970b,136] — The internal arm of the pleural ridge; marked externally by the pleural apophyseal pit. (Syn. for pleural apophysis of mesopleuron: ventral pleural arm, Owen 1977,432)

PLEURAL COXAL PROCESS (PCP) (Fig.13) [Snodgrass 1912,56] — The process of the pleuron which articulates with the coxa. In mosquitoes, well developed only in the prothorax on the margin of the proepisternum. (Syn.: pleurocoxal process, Owen 1977,429)

PLEURAL MEMBRANE (PMe) (Figs.1,20,26) [Christophers 1901,4] — The membrane occurring between the tergum and sternum of a body segment. (Syn.: pleuron, Nuttall and Shipley 1901c,478; spiracular membrane, Theobald 1901b,7; Seitenmembran, Martini 1923b,25; lateral wall, Lee and Woodhill 1944,24; pleura, Natvig 1948, 17; membranous area, Snodgrass 1959,67; membranous pleura, Christophers 1960,454)

PLEURAL RIDGE (plr) — The apodeme marked externally by the pleural suture; extending dorsad

from the coxal articulation and separating the episternum from the epimeron; referred to as pro-, meso- or metapleural ridge as appropriate.

PLEURAL SUTURE (pls) [Snodgrass 1912,56] — The external groove of the pleural ridge separating the episternum and epimeron; referred to as pro-, meso- or metapleural suture as appropriate.

PLEURAL THREAD (PIT) (Figs.12,14) [Owen 1977,432] — A strand of cuticle extending from the pleural apophysis to a small projection at the upper end of the mesopleural ridge.

PLEURAL WING PROCESS (pwp) (Fig.13) [Owen 1977,429] — A process of the pleuron located at the upper end of the pleural suture which serves as a fulcrum for the wing. In the mesothorax of mosquitoes, located posterior to the basalare at the apex of the posterior mesanepisternum; in the metathorax of mosquitoes, located behind the basalare at the apex of the metepisternum. (Syn. for the pleural wing process of the mesothorax: hamuloid, Prashad 1918,616)

PLEURON (p) [Christophers 1901,4] — The sclerotization of the pleural or lateral area of a body segment; in the thorax, termed pro-, meso- or metapleuron as appropriate. (Syn. for a thoracic pleuron: pleura, Giles 1900,9; side, Theobald 1901b,5; pleurum, Prashad 1918,613)

PLEUROTERTGITE (Pt) (Figs.11,14) [Crampton 1942,147] — In Diptera, the lateral area of the mesopostnotum above the metathoracic spiracle. In mosquitoes, divided into lower and upper pleurotergites which are represented internally by apodemes.

PLUME SCALE (PISc) (Fig.17,19) [Patton and Evans 1929,282] — One of a set of erect and usually long linear scales which together with the wing vein to which they attach somewhat resemble a plume feather. (Syn.: lateral scale, Theobald 1901a,230; lateral vein scale, Theobald 1901a,234; projecting scale, Christophers 1913,54; outstanding scale, Bonne and Bonne-Wepster 1925,12)

POSTCOXAL APODEME (Pca) (Figs.12,14,15) [Owen 1977,432] — An internal ridge having its origin at the base of the pleural apophysis and extending along the posterior margin of the mesocoxal cavity; receiving the attachment of indirect wing muscles.

POSTCOXALE (Px) (Fig.14) [Owen 1977,431] — The postcoxal part of the pleuron, often united with the sternum. In mosquitoes, present as a narrow band on the caudal margins of the pro- and mesocoxal cavities.

POSTERIOR DORSOCENTRAL AREA (PDA) [Belkin 1962,549] — The part of the dorsocentral area caudad of a point near the median corner of the scutal fossa at about the level of the antearalar area; with scales and setae.

POSTERIOR DORSOCENTRAL SCALE (PDSc) (Fig.16) — One of the scales occurring in a more or less distinct longitudinal row usually located laterad of the posterior dorsocentral setae on the posterior dorsocentral area of the scutum. (Syn.: posterior dorsocentral scale line, Belkin 1962,549; postsutural sublateral band, Wood *et al.* 1979,31; postsutural sublateral stripe, Wood *et al.* 1979,32)

POSTERIOR DORSOCENTRAL SETA (PDS) (Figs.16,19) [posterior dorsocentral bristle, Belkin 1962,549] — A dorsocentral seta occurring on the posterior dorsocentral area; occurring in one or more rows which merge posteriorly with the prescutellar setae.

POSTERIOR HARD PALATE (PHP) (Fig.9) [Thompson 1905,157] — The large platelike posterior area of the clypeopalatum; bearing ventral setae near the base of each lateral flange. (Syn.: posterior palate, von Gernet and Buerger 1966,262)

POSTERIOR MEDIAL SCUTAL SETA (PMSS) (Figs.11,16) [Knight and Laffoon 1970b,137] — One of the setae occurring in a V-shaped group on the midline of the scutum at the posterior end of the row of acrostichal setae and anterior to the prescutellar area. (Syn.: V-shaped group, Lunt and Nielsen 1958,172; postero-medial chaeta, Christophers 1960,438)

POSTERIOR MESANEPISTERNUM (PMas) (Fig.13) — The vertically narrow posterior part of the mesanepisternum; separated from the anterior mesanepisternum by the anepisternal cleft. In mosquitoes, usually united with the meskatepisternum but sometimes separated from it by a weakly developed mesanapleural suture. (Syn.: posterior anepisternum, Crampton 1925,61; anepisternum, Freeborn 1926,339; prealar area, Komp 1937,245; preala, Knight and Laffoon 1970b,138; posterior anepisternum 2, Owen 1977,429)

POSTERIOR MESEPIMERAL SCALE (PMSc) (Fig.16) — One of the scales occurring in a group on the ventroposterior quarter of the mesanepimeron. (Syn.: posterior mesepimeral scale patch, Belkin 1962,548)

POSTERIOR SCUTAL FOSSAL SCALE (SFSP) (Fig. 16) — One of the scales occurring in a more or less distinct line extending diagonally from the scutal angle to the dorsocentral scales along the posterior margin of the scutal fossa. (Syn.: posterior fossal scale line, Belkin 1962,549; posterior fossal line, Berlin 1969,5)

POSTERIOR SCUTAL FOSSAL SETA (PSFS) (Figs. 16, 19) — One of the setae usually occurring in a short row on the posterior margin of the scutal fossa between the scutal angle and the dorsocentral area. (Syn.: posterior fossal bristle, Belkin 1962,549)

POSTERIOR SCUTELLAR RIDGE (PSR) (Figs. 17, 19) [Owen 1977,429] — The external ridge which extends from the lateroposterior angle of the scutellum and unites with the axillary cord of the wing.

POSTERIOR TENTORIAL ARM (PTA) (Figs. 5-8) [Robinson 1939,219] — The apodeme extending anteriorly from the posterior tentorial pit; its apex meeting the apex of the anterior tentorial arm at a visible fusion point; usually with a medial extension which may meet that of the opposite side forming a corpotentorium. (Syn.: posterior arm of the tentorium, Peterson 1916,26; post-tentorium, Patton and Evans 1929,78; posterior arm, Robinson 1939,219)

POSTERIOR TENTORIAL PIT (PTP) (Figs. 3, 4, 6-8) [Robinson 1939,217] — An external depression in the cranium at the base of each posterior tentorial arm; occurring at the lower end of the postoccipital suture. (Syn.: posterior opening, Nuttall and Shipley 1901c,481; invagination of the posterior arm of the tentorium, Peterson 1916, Fig. 96; gular pit, Patton and Evans 1929,54; posterior pit, Snodgrass 1959,52)

posterior wing root [Prashad 1918,615] — Defined by Christophers (1960,435) as a line of thickening at the wing base associated with the bases of the media, cubitus and anal vein; resembling a vein without scales which passes to the wing margin at the junction of the alula and calypter.

postero-lateral bare space [Christophers 1915a,367] — The area of the scutum posterior to the scutal fossa between the dorsocentral setae and the antealar and supraalar setae.

POSTFRONTAL RIDGE (PR) (Fig. 5) [Postfrontalleiste, Schiemenz 1957,284] — The apodeme marked externally by the postfrontal suture. (Syn.: frontal ridge, Knight and Laffoon 1970a,71)

POSTFRONTAL SUTURE (pfs) (Figs. 2, 4, 7, 8) [Robinson 1939,216] — One of two sutures diverging from the coronal suture above the ocelli and separating the interocular space from the frons. In mosquitoes, short and confluent laterally with the ocular suture. (Syn.: frontal suture, Patton and Evans 1929,54)

Knight (1970,26) originally designated these as "frontal sutures," but frontal sutures, when present, occur between the median and lateral ocelli and extend ventrally between the antennal bases. Since in mosquitoes the sutures occur above the lateral ocelli and extend laterad of the antennal bases, they are probably homologous with the postfrontal sutures found in certain other insects. The apodeme marked by the postfrontal sutures is the postfrontal ridge, previously named "frontal ridge" by Knight and Laffoon (1970a,71).

POSTGENA (PG) (Figs. 2-4, 6) [Gater 1935,14] — The lateral and ventral parts of the cranium behind the compound eye. In mosquitoes and many other insects, not differentiated from the gena, occiput and vertex. (Syn.: cheek, Theobald 1901b,2; gena, Theobald 1901b,2; gula, Christophers 1915a,363; gular region, Patton and Cragg 1913,14; Kehle, Martini 1923b,19; occiput, Freeborn 1926, at least in part, 341; tempus, Natvig 1948,3; temple, Natvig 1948,4; Gena, Schiemenz 1957, including the gena and occiput, 274) Compare **postgena** in the larva section.

Peterson (1916, Fig. 96) labelled the gena of *Psorophora ciliata* (Fabricius) as the postgena. According to his definition of the postgena (p. 13), he should have labelled the area of the cranium defined here. Since Peterson's definition was not specifically intended for the Culicidae, Gater (1935,14) is credited with the first correct use of the term "postgena."

POSTGENAL SETA (PgS) (Figs. 2, 4) [postgenal chaeta, Christophers 1933,10] — One of the setae occurring in a group on the postgena at the posteroventral area of the cranium. (Syn.: gular chaeta, Christophers 1915a,363; gular bristle, Kirkpatrick 1925,10; postgenal hair, Christophers 1933,12)

POSTGENITAL LOBE (PGL) (Figs. 1, 25-27) [Laffoon and Knight 1971,33] — In female mosquitoes, the weakly to moderately sclerotized median caudal lobe below the anus and above the upper vaginal lip; setose and with or without an apical median indentation. (Syn.: lower valve, Wesché 1906,360; ventral plate, Felt 1905,474; palmette, Brolemann 1919b,94; palmette sous-anale, Brolemann 1919b,98; ventral process of the tenth segment, Macfie and Ingram 1922,158; ventral process of tenth segment, Macfie and Ingram 1922,167; postgenital plate, Christophers 1923,701;

ventral piece, Freeborn 1926,343; tenth sternite, Martini 1931,68; postpygidial plate, Curtin and Jones 1961,300; subanal plate, Jones 1968,116)

POSTMEDIAN NOTAL WING PROCESS (PNWP) (Fig.17) [Owen 1977,432] — A flange of the scutum located caudad and slightly ventrad of the anterior notal wing process which articulates with the posterior part of the first axillary sclerite. (Syn.: proximal sclerite, Shipley and Wilson 1902,368; flange, Christophers 1960,449; adanal process, Owen 1977, in part, 436)

The postmedian notal wing process articulates with the first axillary sclerite and this fact identifies the process (Matsuda 1970,314). Owen (1970,442) maintained that the "process is formed from the adanal process of Crampton ('42)." Crampton (1942,58), however, identified the "adanal sclerite" ("fourth axillary or adanale") as "a detached portion of the posterior notal wing process." Since the posterior notal wing process (this appears to be absent in mosquitoes) articulates with the third axillary sclerite, Owen's "adanal process" clearly cannot represent Crampton's "adanal sclerite."

POSTMETASTERNAL SCALE (MScP) — One of the scales occurring in a small group on the intersegmental membrane immediately behind the metasternum.

POSTNOTUM (Pn) [Snodgrass 1912,56] — The phragma-bearing plate in the dorsum of a pterothoracic segment; derived from the anterior part (acrotergite) of the following notum. See **MESOPOSTNOTUM** and **METAPOSTNOTUM**.

POSTOCCIPITAL RIDGE (PoR) (Figs.5,6) [Postoccipitaleiste, Schiemenz 1957,273] — The apodeme marked externally by the postoccipital suture.

POSTOCCIPITAL SUTURE (POS) [Postoccipitalnaht, Schiemenz 1957,273] — A line of inflection extending dorsad from each posterior tentorial pit and separating the postocciput from more anterior areas of the cranium; forming the postoccipital ridge internally.

POSTOCCIPUT (POc) (Figs.2,4-6) [Schiemenz 1957,273] — The posterior area of the cranium at the dorsal and lateral margins of the occipital foramen; separated from the more anterior areas of the cranium by the postoccipital suture; bearing a process, occipital condyle, on each lateral margin to which a cervical sclerite articulates. (Syn.: nape, Giles 1900,6; cervix, Theobald 1901b,2; parocciput, Peterson 1916,24; occiput, Patton and Evans 1929, in part, 54; paraocciput, Christophers 1960, in part, 418; postcranium, Wood *et al.* 1979, including the occiput, 30)

Knight (1970,28;29) recommended the terms "nape" and "paraocciput" for parts of this structure. Later, Knight and Laffoon (1970a,72) adopted the term "postoccipital ridge" for the structure which Schiemenz (1957,273) showed separates this area from the more anterior areas of the cranium. Since it seems likely that this area of the cranium is homologous with the postocciput of generalized insects, it is recommended for use as defined herein.

POSTPROCOXAL MEMBRANE (PM) (Figs.12,13) [Knight and Laffoon 1970b,137] — The membrane between the forecoxa and the meskatepisternum; sometimes bearing scales. (Syn.: postcoxal membrane, Belkin 1962,549)

POSTPROCOXAL SCALE (PSc) (Fig.16) — One of the scales occurring in a small group on the postprocoxal membrane. (Syn.: postcoxal membrane scale, Belkin 1962,549; Postkoxalfleck, Mohrig 1969,22)

POSTPRONOTAL SCALE (PpSc) — Any scale borne on the postpronotum. In mosquitoes, occurring in upper and lower groups, the upper and lower postpronotal scales. (Syn.: proepimeral-Schuppe, Peus 1933,148; posterior pronotal scale patch, Belkin 1962,549)

POSTPRONOTAL SETA (PpS) (Figs.11-13,16) [Gjullin 1946,216] — One of the setae occurring in an arcuate line on the upper posterior margin of the postpronotum. (Syn.: proepimeral bristle, Edwards 1921,265; soies propleurales, Séguy 1924,13; posterior pronotals, Freeborn 1926,341; pronotal group, Matheson 1929,6; posterior pronotal hair, Patton and Evans 1929,87; posterior pronotal bristle, Patton and Evans 1929,275; postnotal chaeta, Christophers 1933,17; postpronotal group, Matheson 1944,7; pronotal bristle, Ross 1947,21; posterior pronotal chaeta, Christophers 1960,434)

POSTPRONOTUM (Ppn) (Figs.11-13) [Crampton 1925, Fig.40] — In some Diptera, the posterior division of the pronotum generally lying between the anteppronotum and the scutum cephalad of the scutal angle. In mosquitoes, usually not clearly demarcated ventrally from the proepimeron. (Syn. including the proepimeron unless otherwise noted: epi-sternum, Christophers 1901,4; pleuron of meso-thorax, Christophers 1901, in part, Fig.1; epimerum, Snodgrass 1912,56; proepimerum, Snodgrass 1912,57; proepimeron, Edwards 1921,265; posterior pronotum, Freeborn 1924b,37; posterior pronotal plate, Freeborn 1924b,37; posterior notum, Freeborn 1926,339;

pronotum, Matheson 1929,6; posterior pronotal lobe, Edwards 1941,7; posterior pronotal area, Christophers 1960, Ppn only, 432; posterior pronotal sclerite, Christophers 1960, Ppn only, 438)

POSTSPIRACULAR AREA (PA) (Figs.12,13) [post-spiracular area, Edwards 1941,8] — The sclerotized area of the anterior anepisternum lying posterior to the mesothoracic spiracle; connected or continuous with the subspiracular area ventrally; scales and setae are borne on this area. (Syn.: anepisternum, Freeborn 1926,339; anepisternite, Edwards 1941, in part, 8; anterior anepisternum 2, Owen 1977,429)

POSTSPIRACULAR SCALE (PoSc) (Fig.16) [post-spiracular scale, Ross 1947,21] — One of the scales occurring in a group on the postspiracular area of the anterior mesanepisternum; sometimes extending posteriorly onto the membrane of the anepisternal cleft. (Syn.: parastigmaler Schuppenfleck, Peus 1933,158; parastigmatal scale-patch, Natvig 1948,10; hinterer Parastigmalfleck, Mohrig 1969,22)

POSTSPIRACULAR SETA (PS) (Figs.12,16) [post-spiracular bristle, Edwards 1921,265] — One of the setae occurring in a group on the postspiracular area of the anterior mesanepisternum. (Syn.: anterior episternal chaeta, Christophers 1915a,368; soies rétrostigmatiques, Séguy 1924,13; post-spiracular group, Matheson 1929,6; Poststigmatalborste, Martini 1931,2; postspiracular chaeta, Christophers 1933,17)

POSTTARSUS (Pta) (Figs.18,19) [Knight and Laffoon 1970c,168] — The terminal segment of the arthropod leg distal to the tarsus. (Syn.: pretarsus, Snodgrass 1959,67)

Widespread dissatisfaction with the inappropriate term "pretarsus" has led to several suggestions for substitutes (for a partial synonymy see Dashman 1953,60). "Posttarsus" is regarded as the best replacement. It seems to have been coined independently at least three times (posttarsus, MacGillivray 1923,243,246; posttarsus, Crampton 1942,65; post-tarse, Millot 1949,277). Some other workers, notably Fox and Fox (1964, post-tarsus, 62), have adopted it.

P / P [Gutsevich 1974a,247] — The ratio of the total length of the maxillary palpus to the proboscis length (note that Gutsevich (1974a,245) measured the length of the proboscis from the anterior margin of the clypeus rather than from the labial basal setae). (Syn.: index of P/P, Gutsevich 1974a,248; P/P ratio, Gutsevich 1974a,248; Pa/Pr, Gutsevich 1975a,154; index of Pa/Pr, Gutsevich 1975b,165)

Praefrontalleiste [Schiemenz 1957,285] — The apodeme marked externally by the "Praefrontalnaht." The precise identity and relationship of the structure has not been adequately delineated.

Praefrontalnaht [Schiemenz 1957,274] — Applied to a line delimiting the dorsal area of the frons from the antennal socket laterally.

PREALAR APOPHYSIS (PrAp) (Fig.12) [Owen 1977,432] — An apodeme arising internally from the area of the prealar bridge; an important flight muscle is attached to this structure.

PREALAR BRIDGE (PrB) (Figs.13,17) [Owen 1977,435] — A small sclerite extending dorsad from the upper anterior edge of the posterior mesanepisternum to the supraalar groove. (Syn.: basalare, Christophers 1960,449; basalare epipleurite, Christophers 1960,452)

PREALAR KNOB (PK) (Figs.1,12-14) [pre-alar knob, Edwards 1941,8] — The convex protuberance borne on the upper part of the posterior mesanepisternum anterior to the wing; with scales and setae. (Syn.: pre-alar prominence, Edwards 1921,266)

PREALAR SCALE (PrSc) — Any scale borne anterior to the wing on the posterior mesanepisternum; an upper group occurs among and above the prealar setae and a lower group sometimes occurs below them. (Syn.: prealar scale patch, Belkin 1962,549)

PREALAR SETA (PaS) (Figs.12-14,16) [pre-alar bristle, Edwards 1921,266] — One of the setae occurring in a group on the prealar knob of the posterior mesanepisternum. (Syn.: pre-alar chaeta, Christophers 1915a, legend to Pl. XIX; pre-alar group, Matheson 1929,6; upper sternopleural bristle, Patton and Evans, 1929,275; prealar hair, Christophers 1933,14; prealar tuft, Gillies and DeMeillon 1968,7; obere mesepisternale Borste, Mohrig 1969,21)

pre-antennal suture [Christophers 1960,418] — A line delimiting the ventral area of the frons from the antennal socket laterally. (Syn.: arm of the epicranial suture, Peterson 1916,15)

PREARCULUS (PAR) [Belkin 1962,551] — A more or less distinct crossvein or transverse furrow between the radius and subcosta in line with the arculus.

- PRECUBITAL FURROW (pc)** [Colless 1979,127] — A dorsal furrow in cell M_4 lying near and parallel to the cubitus anterior; ending just short of the cubitomarginal ridge distally; extending proximally at least halfway to the mediocubital crossvein; usually strengthened by a veinlike thickening.
- preepisternal groove** [Owen 1977,430] — The depression between the forecoxae where the proepisterna are separated by the confluent propleurosternal sutures.
- PREMENTAL GUTTER (PrG)** [Knight 1970,29] — The median dorsal longitudinal groove of the prementum which houses the fascicle. (Syn.: groove, Dimmock 1881,233; channel, Dimmock 1881,237; labial groove, Nuttall and Shipley 1901c,464; labial gutter, Patton and Cragg 1913,31; gutter, Lang 1920,12; labial lumen, Snodgrass 1959,60)
- PREMENTUM (P_{rm})** (Figs.2-9) [Crampton 1942,13] — The stipital part of the labium. In mosquitoes, forming the elongate stout ventral part of the proboscis; with a median dorsal groove, premental gutter, holding the fascicle; bearing the ligula and labella distally. (Syn.: sheath, Dimmock 1881,231; labium, Dimmock 1881,233; Mentum, Becher 1882,134; stem, Giles 1900,8; stipes, Giles 1900,8; theca, Peterson 1916,Figs.373,380; haustellum, Patton and Evans 1929,78; labial theca, Robinson 1939,232; body of the labium, Christophers 1960,428)
- PRESCUTAL PIT (PrP)** (Figs.12,13) — A small depression on each side of the anterior part of the scutum from which the obsolescent prescutal suture extends anterolaterally to the scutal margin. (Syn.: scutal pit, Owen 1977,429) See **PARATERGITE**.
- PRESCUTAL SUTURE (PrS)** (Figs.11-13) [Knight and Laffoon 1970b,138] — In many Diptera, the largely obsolescent suture extending caudomesad from the posterior edge of the scutal angle to the prescutal pit. In mosquitoes, represented internally by a ridge. (Syn.: mesonotal suture, Patton and Evans 1929,85; parapsidal suture, Owen 1977,429; transverse suture, Wood *et al.* 1979,31) See **PARATERGITE**.
- PRESCUTELLAR AREA (PrA)** (Figs.11,16,19) [LaCasse and Yamaguti 1950,3] — The median posterior area of the scutum between the acrostichal area and the scutellum; frequently devoid of scales and setae. (Syn.: pre-scutellar bare space, Christophers 1915a, legend to Pl. XIX; antescutellar space, Patton and Evans 1929,290; median area, Christophers 1933, in part, 14; bare space, Edwards 1941,8; bare pre-scutellar space, Edwards 1941,9; prescutellar space, Carpenter *et al.* 1946,28; bare area, Christophers 1960,432; prescutellar depression, Wood *et al.* 1979,31)
- The term "prescutellar area" is recommended here instead of "prescutellar bare space," previously recommended by Knight and Laffoon (1970b,138), or "prescutellar space" for three reasons. First, the word "space" conveys the meaning of a boundless three-dimensional extent; second, the word "area" is in agreement with other terms denoting a particular extent of the scutal surface, e.g., acrostichal area; and third, the area is not entirely "bare" and is sometimes completely covered with scales.
- PRESCUTELLAR SCALE (SScP)** [Schick 1970,9] — Any scale occurring on the prescutellar area of the scutum; usually occurring in a curved line on the lateral and anterior margins; those extending posteriorly from the dorsocentral scales on the lateral margins may be referred to as lateral prescutellar scales; those occurring on the anterior margin and sometimes forming a median longitudinal row may be termed median prescutellar scales.
- PRESCUTELLAR SETA (PrsS)** (Figs.16,19) [prescutellar bristle, Belkin 1962,549] — Any seta usually occurring in several rows on the anterior and/or lateral margins of the prescutellar area; often difficult to separate anteriorly from the dorsocentral setae.
- PRESPIRACULAR AREA (PsA)** (Figs.12,13) [Knight and Laffoon 1970b,138] — The small area of the anterior mesanepisternum just anterior to the mesothoracic spiracle; set off from the postpronotum by a strong ridge; sometimes bearing scales and setae. (Syn.: prespiraculare, Crampton 1925, Fig.40; spiracular area, Carpenter *et al.* 1946,27; prespiracular sclerite, Owen 1977,429)
- PRESPIRACULAR SCALE (PsSc)** (Fig.16) — One of the scales occurring in a small group on the prespiracular area of the anterior mesanepisternum. (Syn.: spiracular scale, Belkin 1962,550)
- PRESPIRACULAR SETA (PsS)** (Fig.16) [pre-stigmatic chaeta, Christophers 1915a, legend to Pl. XIX] — Any seta occurring on the prespiracular area of the anterior mesanepisternum. (Syn.: soies préstigmatiques, Séguy 1924,13; spiracular bristle, Edwards 1921,265; spiracular group, Matheson 1929,6; Stigmalborste, Martini 1931,2; spiracular hair, Christophers 1933,14; spiracular seta, Gater 1935,27; spiracular chaeta, Christophers 1960,434)

PROBASISTERNUM (Pbs) (Figs.14,15) — The basisternum of the prothorax. In mosquitoes, a small triangular sclerite with its base bordering the profurcasternum and its apex tapering to a point between the proepisterna at the mesal margins of the forecoxae.

PROBOSCIS (P) (Fig.1) [Dimmock 1881,231] — The greatly elongated sheathlike labium and the enclosed fascicle. (Syn.: trompe, de Réaumur 1738,575; Rüssel, Becher 1882,134; Saugrüssel, Leon 1904,730; beak, Smith 1904,14; Stechrüssel, Vogel 1921,259; labium, Patton and Evans 1929,77) Compare **PROBOSCIS** in the pupa section.

PROBOSCIS LENGTH [Belkin 1962,548] — The length of the extended proboscis measured from the labial basal setae to the apex of the labella.

PROCOXAL CAVITY (PC) (Figs.12,14,15,) [Knight and Laffoon 1970b,138] — A coxal cavity of the prothorax. (Syn.: coxal cavity 1, Owen 1977,431)

PROCTIGER (Pr) (Figs. ♂-22-24; ♀-25-27) [in ♂, Freeborn 1924a,191; in ♀, Gerry 1932,51] — In insects with poorly defined segmentation behind the genital segments, the entire complex formed by the telson and the postgenital segments (abdominal segments X and XI). In such insects, the telson and abdominal segment XI are entirely membranous (with the frequent exception of the cerci). (Syn. for ♂: harpago, Dyar 1905a, one-half of the proctiger, 43; harpe, Dyar and Knab 1909, one-half of the proctiger, 33; anal lobe, Christophers 1915b,372; pénis, Brolemann 1919a,431; Analkegel, Martini 1921,252; tenth segment, Christophers 1922,534; anal segment, Barraud 1923a,776; tenth abdominal segment, Freeborn 1924a,194; Afterkegel, Martini 1928,129; membrane anale, Senevet 1935,16; lobe of tenth sternite, Ross 1947,39; anal cone, Spielman 1964,327. Syn. for ♀: mamelon, Brolemann 1919b,94; mamelon anal, Brolemann 1919b,101; tenth segment, Christophers 1923,701; anal protuberance, Freeborn 1926,343; anal membrane, Gerry 1932,51; anal segment, Gjullin 1937,256; anal cone, Jones and Wheeler 1965,402; peri-anal membrane, Reinert 1973,4; segment X, Saether 1977,20) Compare **PROCTIGER** in the pupa section.

PROEPIMERAL SCALE (PmSc) (Fig.16) — One of the scales occurring in a group on the proepimeron. (Syn.: lower posterior pronotal scale patch, Belkin 1962,549)

This term is introduced here for Belkin's "lower patch" of scales because they are borne on what is recognized herein as the proepimeron. Belkin's "middle patch" of postpronotal scales is subsequently designated the "lower postpronotal scales."

PROEPIMERON (Pm) (Figs.12,13) [Freeborn 1924b,38] — The area of the propleuron posterior to the propleural suture. In mosquitoes, usually not clearly demarcated from the lower margin of the postpronotum but sometimes separated from it by a weak suture. (Syn.: epimeron, Freeborn 1926,339)

The proepimeron has been considered most often as part of the postpronotum. For additional synonyms see **POSTPRONOTUM**.

PROEPISTERNAL SCALE (PeSc) — Any scale borne on the proepisternum. In mosquitoes, occurring in upper and lower groups, upper and lower proepisternal scales, which may be continuous.

PROEPISTERNAL SETA (PeS) — Any seta borne on the proepisternum. In mosquitoes, occurring in two groups, one above, upper proepisternal setae, and one mesad, lower proepisternal setae, of the forecoxa.

PROEPISTERNUM (Ps) (Figs.1,11-15) [Freeborn 1924b,38] — The area of the propleuron anterior to the propleural suture. In mosquitoes, extending from the antepronotum to the base of the forecoxa where it expands anteroventrally around the coxa to meet its mate of the opposite side. (Syn.: prosternum, Christophers 1901, in part, 4; prosternum, Nuttall and Shipley 1901c,470; episternum, Snodgrass 1912,56; prosternal plate, Prashad 1918,614; prosternal lobe, Edwards 1921, in part, 265; proeusternum, Patton and Evans 1929, in part, 86; eusternum, Patton and Evans 1929, in part, 87; basisternum, Patton and Evans 1929, in part, 87; propleuron, Christophers 1933, in part, 14; precoxal bridge, Crampton 1942, in part, 46; sternite 1, Christophers 1960, in part, 432; katepisternum 1, Owen 1977, in part, 429; precoxale, Owen 1977, in part, 430; preepisternum 1, Owen 1977, in part, 431; probasisternum, Wood *et al.* 1979, in part, 31)

Since the prosternum is clearly composed of the basisternum and furcasternum which are joined along a sternacostal suture, the ventral part of the proepisternum extending before and between the forecoxae is probably part of the ventral arc of the subcoxa (precoxal bridge, or precoxale) and should be considered a part of the episternum rather than part of the sternum. This has been done in the Dixidae by Nowell (1951,215) and recently in the Culicidae by Owen (1977,431) who termed this

area of the proepisternum the "preepisternum."

- PROFURCA (PrF)** — The furca of the prosternum. (Syn.: first furca, Christophers 1960,437)
- PROFURCASTERNUM (Pfs)** (Figs.14,15) — The area of the prosternum posterior to the sternacostal suture and/or the apophyseal pits. (Syn.: furcasternum 1, Owen 1977,430) See **FURCASTERNUM**.
- PRONOTUM (PrN)** (Fig.1) [Komp 1937,243] — The notum of the prothorax. In Diptera, generally narrowed or seemingly absent medially but well developed laterally. In mosquitoes, transversely divided on each side into an antepronotum and a postpronotum. (Syn.: first notal plate, Snodgrass 1959,65; notum, Snodgrass 1959,65)
- PROPLEURAL RIDGE (pr)** (Figs.12,14) — The endopleural apodeme (pleural ridge) marked externally by the propleural suture; extending dorsad between the proepisternum and proepimeron from the dorsal limit of the sternal apophysis above the coxal articulation. (Syn.: episternal apophysis, Owen 1977,430)
- PROPLEURAL SUTURE (ps)** (Fig.13) [Patton and Evans 1929,86] — The external groove (pleural suture) of the propleural ridge; separating the proepisternum and proepimeron above the articulation of the forecoxa.
Snodgrass (1912,56) denoted the pleural suture of the prothorax but did not directly employ the term "propleural suture."
- PROPLEURON (Pp)** — The pleuron of the prothorax. In mosquitoes, consisting of a small proepimeron and a proepisternum.
- PROPLEUROSTERNAL RIDGE (PPSR)** (Figs.12,14,15) — The apodeme marked externally by the propleurosternal suture. (Syn.: basisternum, Owen 1977,430; basisternum 1, Owen 1977,430)
- PROPLEUROSTERNAL SUTURE (PPSS)** (Figs.11,12,14,15) — The external groove between the proepisternum and probasisternum. In mosquitoes, the propleurosternal sutures are confluent anteriorly where they appear as a single suture separating the proepisterna. (Syn.: preepisternal suture, Owen 1977,430; basisternal suture, Owen 1977,430)
- PROSOPHALLIC SCLERITE (POS)** (Fig.21) [Belkin 1968,9] — In male dixids, the transverse sclerite supporting the prosophallus. In some male mosquitoes (*Aedes* subgenus *Verrallina*, Reinert 1974a), one of a pair of sclerites which embody the prosophallus.
- PROSOPHALLUS (PO)** (Fig.21) [Belkin 1968,8] — In dixid and some culicid males, a ventral (prerotation sense) lobelike element of the phallosome located between the bases of the gonocoxites; embodied by a pair of sclerites, prosophallic sclerites, which are fused in dixids; in mosquitoes, known only in *Aedes* subgenus *Verrallina* (Reinert 1974a); possibly homologous with the claspettes.
- PROSTERNUM (Pst)** — The sternum of the prothorax. In mosquitoes, consisting of the probasisternum and profurcasternum which are often separated by a distinct sternacostal suture.
- PROTHORAX (P)** — The first or anterior segment of the thorax. In Diptera, comparatively small, especially dorsally.
- PULVILLUS (Pv)** [Giles 1900,16] — One of two padlike or divided lobes on the posttarsus of some insects; one arising below the base of each unguis.

R

- RADIAL SECTOR (R_g)** (Figs.17,19) [Patton and Evans 1929,183] — The stem of radius-one-plus-two and radius-three-plus-four; splitting from the stem of the radius with radius-one. (Syn.: marginal cross-vein, Skuse 1889, in part, 1763; cross-nervure between R₁ and R₂, Nuttall and Shipley 1901c,475; marginal transverse vein, Theobald 1901b, in part, 18; radio-sector, Christophers 1913,70; radial cross-vein, Gater 1935, in part, 28; cross-vein 1-2, Christophers 1960, in part, 444; radial stem, Harrison and Scanlon 1975,12)
- RADIOMEDIAL CROSSVEIN (rm)** (Figs.17,19) [radio-medial cross-nervure, Nuttall and Shipley 1901c,475] — The crossvein extending between the radius and media. In mosquitoes, connecting radius-four-plus-five and media-one-plus-two. (Syn.: middle cross-vein, Skuse 1889,1763; middle transverse vein, Giles 1900,10; mid-cross vein, Theobald 1901a,235; anterior cross-vein, Howard *et al.* 1912,61; radio-median cross-vein, Kirkpatrick 1925,16; cross-vein 3-4, Christophers 1933,18)
- RADIUS (R)** (Figs.17,19) [Nuttall and Shipley 1901c,475] — The usual third principal longitudinal

vein of the wing. Four-branched in mosquitoes, the stem branching into radius-one and the radial sector, the radial sector branching into radius-two-plus-three and radius-four-plus-five and radius-two-plus-three branching into radius-two and radius-three. (Syn.: vein 2, Edwards 1941,13; radial vein, Christophers 1960,444)

RADIUS-FOUR-PLUS-FIVE (R₄₊₅) (Figs.17,19) [Nuttall and Shipley 1901c, in part, 475] — The posterior branch of the radius; with a short basal crossveinlike segment between the point of separation from radius-two-plus-three and the radiomedial crossvein. (Syn. applied to the short basal segment: supernumerary cross-vein, Skuse 1889,1764; supernumerary transverse vein, Giles 1900,10; cross-nervure between R₁ and R₄₊₅, Nuttall and Shipley 1901c,475; cross-vein 2-3, Christophers 1933,20; sectorial cross-vein, Gater 1935,28. Syn. applied to the distal segment: 3rd longitudinal vein, Skuse 1889,764; third longitudinal vein, Giles 1900,10; third long vein, Theobald 1901b,17; third vein, Howard *et al.* 1912,60; vein 3, Barraud 1934,57)

RADIUS-ONE (R₁) (Figs.17,19) [Nuttall and Shipley 1901c,475] — The anterior branch of the radius terminating anteriorly at the apex of the wing. (Syn.: 1st longitudinal vein, Skuse 1889,1763; first longitudinal vein, Giles 1900,10; first vein, Howard *et al.* 1912,60; vein 1, Barraud 1934,57)

RADIUS-THREE (R₃) (Figs.17,19) [Nuttall and Shipley 1901c,475] — The posterior branch of radius-two-plus-three extending to the wing apex. (Syn.: posterior branch, Christophers 1933,18; vein 2.2, Barraud 1934,57)

RADIUS-TWO (R₂) (Figs.17,19) [Nuttall and Shipley 1901c,475] — The anterior branch of radius-two-plus-three represented by a short vein near the wing apex. (Syn.: anterior branch, Christophers 1933,18; vein 2.1, Barraud 1934,57)

RADIUS-TWO-PLUS-THREE (R₂₊₃) (Figs.17,19) [Knight and Laffoon 1970c,169] — The stem of radius-one and radius-two; branching from the radial sector with radius-three-plus-four. (Syn.: 2nd longitudinal vein, Skuse 1889,1763; second longitudinal vein, Giles 1900,10; second long vein, Theobald 1901b,17; second vein, Howard *et al.* 1912,60; second forked vein, Patton and Evans 1929,182; vein 2, Barraud 1934,57; petiole of vein 2, Ross and Roberts 1943,1)

REMIGIAL SETA (ReS) (Fig.19) [Knight and Laffoon 1970c,169] — In Diptera, any seta occurring on the remigium (the closely associated bases of the subcosta and radius). In mosquitoes, any seta occurring on the posterior margin of the radius proximal to the arculus (the remigium). (Syn.: remigial hair, Menon 1951,68; remigial bristle, Belkin 1962,552)

REMIGIUM (Re) (Figs.17,19) [Prashad 1918,619] — In winged insects, the part of the wing anterior to the vanal fold and distal to the basal fold (sense of Snodgrass 1935,225). In winged Diptera, the closely associated, though separate, bases of the subcosta and of the radius basad of the arculus (sense of Lowne 1890-1892,199;201-202). In mosquitoes and other Diptera, the part of the radius basad of the arculus (restricted sense of Belkin 1962,552). (Syn.: bar, Shipley and Wilson 1902, in part, 367; blade, Shipley and Wilson 1901, in part, 372; stem-vein, Christophers 1933,18)

ROD (Rd) (Fig.10) [Annett *et al.* 1901,85] — One of the specialized spicules comprising the cibarial teeth; having circular, oval or elliptical origins between the crests of the cones; each rod has a tapered or bulbous base and usually has a simple tapered, rodlike termination; bearing small barblike processes laterally.

ROOT (Rt) (Fig.10) [Christophers 1933,28] — A basal supporting ridge of a cone arising from the flat ventral surface of the cibarium.

ROSTRUM (Rs) [Robinson 1939,215] — The snoutlike prolongation of the head consisting dorsally of the clypeus and ventrally of the anterior part of each gena, the proboscis and the maxillary palpi.

S

sabroid [Prashad 1918,625] — A sclerotized saber-shaped bar connected to the base of the cubitus (Owen 1977,442).

SALIVARY CANAL (SC) (Figs.5,6) [Crampton 1942,39] — The canal extending the length of the hypopharynx through which saliva passes from the salivary pump. (Syn.: venemo-salivary duct, MacLuskie 1888, including the common salivary duct, 886; salivary channel, Nuttall and Shipley 1903,188; salivary groove, Nuttall and Shipley 1903,199; salivary gutter, Thompson 1905,151; salivary duct, Patton and Cragg 1913,31; hypopharyngeal canal, Marshall 1938,61; Speichelkanal, Schiemenz 1957,282; salivary outlet canal, Snodgrass 1959,56)

SALIVARY DUCT (SD) (Fig.6) [Nuttall and Shipley 1901c,464] — One of a pair of ducts through

which saliva passes from the salivary glands; fused anteriorly to form the common salivary duct which opens into the salivary pump. (Syn.: ductlet, MacLoskie 1887,107; salivary gutter, Annett *et al.* 1901,76; secondary salivary duct, Nuttall and Shipley 1903,198)

SALIVARY PUMP (SP) (Figs.5,6,9) [Nuttall and Shipley 1903,167] — The modified salivarium into which the common salivary duct opens at the base of the hypopharynx. (Syn.: reservoir, MacLoskie 1888,888; salivary receptacle, Annett *et al.* 1901,76; poison gland, Theobald 1901b,3; Cuticularglocke, Leon 1904,731; Glocke, Leon 1904,731; salivary antlia, Thompson 1905,158; Speichelpumpe, Vogel 1921,272; salivary syringe, Robinson 1939,219; antlia salivarialis, Snodgrass 1943,16; Salivarium, Schiemenz 1957,272)

SCABELLUM (SI) (Fig.17) [Prashad 1916,504] — The bulbous basal part of the halter supporting the pedicel. (Syn.: base, Nuttall and Shipley 1901c,477; stem, Bonne and Bonne-Wepster 1925, in part, 12)

SCAPE (Sc) (Figs.2,5-8) [Patton and Evans 1929,54] — The first or basal segment of the antenna. In mosquitoes, greatly reduced and hidden by the pedicel. (Syn.: first segment, Nuttall and Shipley 1901c,459; basal segment, Howard *et al.* 1912,26; antennal sclerite, Peterson 1916, Fig.10; basal joint, Kirkpatrick 1925,10; basal antennal segment, Gater 1935,14; first antennal segment, Gater 1935,14; antennal scape, Snodgrass 1959,53)

SCUTAL ANGLE (ScA) (Figs.11-13) [Edwards 1941,8] — The more or less distinct angular projection of the scutal margin just anterior to the prescutal suture, or just in front of the prespiracular area when the prescutal suture is not discernible. (Syn.: humeral callus, Prashad 1918,640)

SCUTAL FOSSA (SF) (Figs.11-13) [Knight and Laffoon 1970b,139] — The somewhat-depressed anterolateral area of the scutum (prescutum) extending caudad to the level of the scutal angle and mesad before the prescutal suture to the dorsocentral area. (Syn.: fossa, Christophers 1915a, legend to Pl.XIX; fossal area, LaCasse and Yamaguti 1950,3; humeral area, Belkin 1962, in part, 548; lateral prescutal area, Belkin 1962, in part, 548; presutural sublateral area, Wood *et al.* 1979,32)

SCUTAL FOSSAL SCALE (SFSc) (Fig.19) — Any scale borne on the scutal fossa; often occurring in three more or less distinct groups, the lateral, posterior and median scutal fossal scales. (Syn.: fossal macula, Schick 1970,9; lateral band, Wood *et al.* 1979,31)

SCUTAL FOSSAL SETA (SFS) [Knight and Laffoon 1970b,139] — Any seta borne on the scutal fossa; often occurring in four distinct groups, the anterior, lateral, posterior and median scutal fossal setae.

SCUTELLAR SCALE (ScSc) [Belkin 1962,549] — Any scale borne on the scutellum; frequently separated into distinct median and lateral groups, the median and lateral scutellar scales.

SCUTELLAR SETA (ScS) [scutellar bristle, Christophers 1915a,368] — Any seta occurring on the scutellum. In mosquitoes, usually confined to the caudal margin; occurring in a median and a pair of lateral groups in the Culicinae, the median and lateral scutellar setae, respectively.

SCUTELLUM (Stm) (Figs.1,11,12,14,19) [Giles 1900,9] — The posterior area of a notum separated from the scutum by the scutoscuteellar suture. In Diptera, differentiated only in the mesothorax, hence the scutellum in this order conventionally means the mesoscutellum. In mosquitoes, a transverse lobe which is trilobed in the Culicinae. (Syn.: scutcheon, Giles 1900,9; Schildchen, Martini 1921,250; mesoscutellum, Patton and Evans 1929,85)

SCUTOSCUTELLAR SUTURE (sss) (Figs.11,19) [Knight and Laffoon 1970b,140] — The line of inflection dividing the mesonotum into the scutum and scutellum. (Syn.: transverse suture, Matheson 1929,11; mesoscutellar suture, Patton and Evans 1929,85)

SCUTUM (Scu) (Figs.1,11-13,19) [Christophers 1901,4] — The principal dorsal area of the thorax belonging to the mesonotum; used here for the combined prescutum and scutum because these areas in the mosquito are only separated laterally by an obsolescent prescutal suture. (Syn.: prescutum, Nuttall and Shipley 1901c, in part, 469; scutum, Nuttall and Shipley 1901c, in part, 469; mesonotum, Howard *et al.* 1912,60; mesoprescutum, Patton and Evans 1929, in part, 85; mesoscutum, Patton and Evans 1929, in part, 85)

SECONDARY FRINGE SCALE (SFS) (Figs.17,19) [Christophers 1960,444] — One of the short fusiform scales (shorter than fringe scales) occurring in a row along the ventral surface of the wing edge. (Syn.: fringe scale, Theobald 1901a,230; Randschuppe, Swellengrebel and Rodenwaldt 1932,15)

SECOND AXILLARY SCLERITE (SAxS) (Fig.17) — The axillary sclerite at the base of the wing articulating with the first and third axillary sclerites and situated at the proximal end and along the caudal margin of the remigium. (Syn.: distal sclerite, Shipley and Wilson 1902,368; distal chitinous sclerite, Shipley and Wilson 1902,372; epaulet, Prashad 1918,620; second axillary, Christophers 1960,451)

SECOND PHRAGMA (SeP) (Fig.12) [Knight and Laffoon 1970b,140] — The large apodeme of the mesopostnotum consisting of a pair of oval flaps united at their bases by a narrow ridge; bearing the attachment of some longitudinal flight muscles.

SETA 1-S (1-S) (Fig.27) [Reinert 1976b,3] — In female mosquitoes, the anterior of three paired prominent setae borne on sternum VIII; usually located near the middle of the anterior margin.

SETA 2-S (2-S) (Fig.27) [Reinert 1976b,3] — In female mosquitoes, the middle of three paired prominent setae borne on sternum VIII; position variable but always between seta 1-S and seta 3-S.

SETA 3-S (3-S) (Fig.27) [Reinert 1976b,3] — In female mosquitoes, the posterior of three paired prominent setae borne on sternum VIII; usually located laterally near the posterior margin.

SETAE a-h (a,b,etc.)(Figs.23,25) [Belkin 1962,554] — In male Culicini, the setae borne on the subapical lobe of the gonocoxite; lettered from proximal to distal as indicated in the figures.

soft palate [Nuttall and Shipley 1903,168] — The part of the clypeopalatum between the dorsal and posterior hard palates. (Syn.: membranous dorsal palate, Chen 1972,288)

SPERMATHECA (Spt) [Laffoon and Knight 1971,34] — In most female insects, the usual sperm storage organ; a posteroventral ectodermal caecum of abdominal segment VIII located just behind the common oviduct; attached to the anterodorsal end of the vagina if the latter is developed; usually single but sometimes up to four are present. In mosquitoes, one, two or three may be present, each consisting of a spermathecal capsule at the end of a spermathecal duct.

Most Diptera taxonomists have used spermatheca for the spermathecal capsule only. On the other hand, those morphologists who have studied the internal female reproductive organs have commonly used spermatheca (or its equivalents, receptaculum seminis and seminal receptacle) for the entire caecum, including the spermathecal gland, spermathecal capsule and spermathecal duct when these are differentiated as parts of the spermatheca (von Siebold 1837; Loew 1841a,1841b; Heberdey 1931; Weber 1933; Bonhag 1951; Dupuis 1955,1970; Mühlberg 1970). Some authors (including Snodgrass 1933,1935 and Tuxen 1970) either use the term in both senses or do not make it clear if they include the spermathecal duct as a part of the spermatheca. In some insects the caecum is not differentiated into well-marked areas and spermatheca (or receptaculum seminis) has been used for the entire structure. Continued use of the term spermatheca for only one part of the receptaculum seminis or spermatheca of morphologists is not recommended here. Bonhag (1951) considered the three ducts and their three terminal bulbous enlargements in *Tabanus sulcifrons* Macquart as collectively comprising only one spermatheca. Although there are arguments to support this view, for various reasons, including convenience of reference and precedence, Bonhag's practice should not be adopted.

SPERMATHECAL CAPSULE (SCa) (Figs.16,17) — Any one of the one to four enlarged reservoirs often differentiated at the inner end or ends of the spermathecal ducts; usually functional in sperm storage. In mosquitoes, one to three are present; typically spherical and with darkly pigmented cuticle. (Syn.: orbicelle, Dufour 1851,209; spermothea, Giles 1900,20; spermatheca, Christophers 1901,11; Receptaculum seminis, Kulagin 1901,595; spermatheca, LaCasse and Yamaguti 1950,3; seminal capsule, Laffoon and Knight 1971,33)

"Spermathecal capsule" is introduced here because the structure is a part of the spermatheca just as is the spermathecal duct. If the term "seminal capsule" were to be recommended here as it was previously by Laffoon and Knight (1971,33), then logically the spermathecal duct should be called the "seminal capsule duct." More important, the capsules do not store semen. They store sperm. In mosquitoes, semen consists of sperm and a large amount of accessory gland material. On insemination, the semen is deposited in the bursa inseminalis. Thereafter, the sperm move to the spermathecae and the accessory gland material dissolves and is absorbed into the hemolymph through the wall of the bursa (see, e.g., Clements 1963,297)

SPERMATHECAL CAPSULE PORE (SCaP) (Fig.27) — In female mosquitoes, one of the minute pores located near the orifice of the spermathecal capsule; appearing as small, circular, clear spots in mounted specimens; larger and scattered over most of the surface of the spermathecal capsule in anophelines. (Syn.: pale spot, Macfie and Ingram 1922,159; dot, LaCasse and Yamaguti 1950, in appendix 1, 1; transparent dot, Hara 1959,107; seminal capsule pore, Reinert 1974b,51)

- SPERMATHECAL DUCT (SDu)** (Fig.27) [Christophers 1923,698] — In many female insects, the tube between a spermathecal orifice and a spermathecal capsule; sometimes one duct or part of one serves more than one spermathecal capsule.
- SPERMATHECAL EMINENCE (SE)** (Fig.27) [Christophers 1923,704] — In female mosquitoes, a median projection extending into the vagina from its roof and bearing the apertures of the spermathecal ducts and accessory gland duct; unpigmented in most genera but strongly sclerotized and pigmented in *Aedes* subgenera *Neomacleaya* and *Verrallina*. (Syn.: median plate, Edwards 1941,20; postatrial plate, Laffoon 1946, in part, 228; spermathecal eminence, Hara 1957,53; post-atrial apparatus, Mattingly 1958,45; dorsal plate, Curtin and Jones 1961,300; tuberculum spermathecale, Giglioli 1963,158; spermathecal tubercle, Giglioli 1963,158)
- SPERMATHECAL EMINENCE SPICULE (SES)** (Fig.27) — In some female mosquitoes, one of the outgrowths of the spermathecal eminence; usually borne along the cephalic margin; of various forms. (Syn.: postatrial hair, Laffoon 1946,238; spiny excrescence, Christophers 1923,705)
- SPIRACLE (S)** — In its simplest form, the aperture or opening into a trachea (primary tracheal orifice); in most insects, sunken below the surface of the integument (secondary orifice) thus comprising a chamber, the spiracular atrium (Snodgrass 1935,439) (the spiracular chamber of Keilin 1944,5), and the external opening into this chamber, the spiracular opening. (Syn.: spiraculum, van den Assem and Bonne-Wepster 1964,27)
- SPIRACULAR SCLERITE (SpS)** (Figs.12,13) [Owen 1977,429] — A small sclerite of the metapleuron located immediately below the metathoracic spiracle; apparently an accessory plate of the mesepisternum.
- Sprelzaparat** [Eckstein 1920,117] — The combined phallosome and proctiger.
- SQUAME SCALE (SS)** (Figs.17,19) [Patton and Evans 1929,282] — Any decumbent scale. In mosquitoes, usually only applied to the generally short broad squame scales on the wing veins. (Syn.: median scale, Theobald 1901a,230; median vein scale, Theobald 1901a,234, flat scale, Christophers 1913,54; appressed scale, Bonne and Bonne-Wepster 1925,12; median squame, Christophers 1933,18; lateral squame, Christophers 1933,18; squame, Gater 1935,32; median squame scale, Christophers 1960,444; lateral squame scale, Christophers 1960,444; decumbent scale, Gillies and De Meillon 1968,6)
- STERNACOSTA (Sct)** (Figs.14,15) — An internal transverse ridge connecting the bases of the sternal apophyses and marked externally by the sternacostal suture. Present in the pro- and metathoracic segments of mosquitoes but poorly developed in the latter.
- STERNACOSTAL SUTURE (SctS)** (Fig.15) — The external groove extending between the apophyseal pits and separating the basisternum and furcasternum. Present in the pro- and metathorax of mosquitoes. (Syn.: transverse suture, Owen 1977,430)
- STERNAL APOPHYSEAL PIT (SAP)** (Fig.13) [Owen 1977,430] — The external depression marking the point of origin of the sternal apophysis. The sternal apophyses of the mesothorax of mosquitoes arise from a common pit; absent in the prothorax of some mosquitoes.
- STERNAL APOPHYSIS (StA)** (Figs.12,14,15) [Knight and Laffoon 1970b,140] — One of a pair of apodemes arising from the sternum. In mosquitoes, the sternal apophyses of the pro- and metathorax are connected by an internal transverse ridge, the sternacosta, which is marked externally by the sternacostal suture extending between the apophyseal pits; the sternal apophyses of the mesothorax are borne on a median inflection which is marked externally by a single apophyseal pit.
- STERNAL COXAL PROCESS (SCP)** (Figs.14,15) — The projection of the sternum serving for the ventral point of articulation with the coxa. In mosquitoes, a winglike expansion of the meso- and metabasisterna. (Syn.: ventral process, Owen 1977,431)
- STERNITE** — A subdivision of the sternum; often incorrectly applied to an entire sternum (Snodgrass 1963,9).
- STERNUM (S)** (Fig.1) [Christophers 1901,4] — The ventral sclerotization of a body segment, primary sternum; the definitive sternum, which in the thorax includes the primary sternum, the infracoxal sclerotization of the primitive subcoxal plate and sometimes the intersegmental spinasternum. (Syn. for abdominal sterna: ventral plate, Theobald 1901b,5; pièce sternale, Blanchard 1905,58; sternite, Christophers 1915b,372; région ventrale, Brolemann 1919a,430; venter, Christophers 1933,23; sternal plate, Snodgrass 1959,67)

- STERNUM VIII (VIII-S)** (Figs.20,27) [Delfinado 1967,3] — The sternum of abdominal segment VIII. In female mosquitoes, variable in shape; width usually greater than length; posterior margin may have a median indentation; larger than tergum VIII; setose; scales may be present. (Syn.: sternite du 8^e somite, Brolemann 1919b,93; sternite 8, Brolemann 1919b,96; sternite du 8^e segment, Brolemann 1919b,101; sternite of segment eight, Macfie and Ingram 1922,158; sternite of the eighth segment, Macfie and Ingram 1922,165; sternite of eighth segment, Macfie and Ingram 1922,167; eighth sternite, Macfie and Ingram 1922,169; VIII. Sternit, von der Brelje 1924,73; 8. Sternit, Martini 1928,147; 8th sternite, Christophers 1933,32; sternite VIII, Gater 1935,42; subgenital plate, Edwards 1941,17; eighth abdominal sternite, Crampton 1942,82; anal segment, Curtin and Jones 1961,301; eighth sternum, Curtin and Jones 1961,301)
- STERNUM VIII INDEX (VIII-S index)** [Reinert 1973,4] — In female mosquitoes, sternum VIII length divided by sternum VIII width.
- STERNUM VIII LENGTH (VIII-S length)** [Reinert 1973,4] — In female mosquitoes, the distance between the most anterior and most posterior points of sternum VIII measured ventrally along a straight line parallel to the longitudinal axis of the body.
- STERNUM VIII WIDTH (VIII-S width)** [Reinert 1973,4] — In female mosquitoes, the width of sternum VIII measured ventrally at the widest point along a straight line perpendicular to the longitudinal axis of the body.
- STERNUM IX (IX-S)** (Figs.20-22,24) — The sternum of abdominal segment IX. In male mosquitoes, a small sclerite continuous laterally with tergum IX. (Syn.: ninth tergite, Edwards 1914,63; tergite du somite g nital, Brolemann 1919a,435; tergite du 9^e segment, Brolemann 1919a,439; tergite du 9^e somite, Brolemann 1919b,76; tergite 9, Brolemann 1919b,78; ninth sternite, Edwards 1920,25; IX. Sternit, Martini 1928,152; 9. Sternit, Martini 1931,69; 9th sternite, Christophers 1933,30; sternite of the ninth segment, Edwards 1941,15; 9th abdominal sternite, Crampton 1942,159; ninth sternum, Hodapp and Jones 1961,832; hypandrium, Hodapp and Jones 1961,832; 9th sternum, Hodapp and Jones 1961,832; basal ring, Spielman 1964, including tergum IX, 327; Subgenitalplatte, Iglisch 1977,266; Hypopygium, Iglisch 1977,266)
- STIPES (Stp)** (Figs.5,6) [Wesch  1909,4] — The distal subdivision of the maxilla bearing the galea, lacinia and maxillary palpus. In mosquitoes, a rodlike structure located inside the head ventral to the tentorial arms; posteriorly fused with the cardo to form the stipitocardinal rod; anteriorly articulated with the lacinia and providing support to the maxillary palpus.
- STIPITOCARDINAL ROD (SCR)** [stipito-cardinal rod, Snodgrass 1959,56] — The fused cardo and stipes. (Syn.: chitin-support, Dimmock 1881,237; rod, Nuttall and Shipley 1901c,462; apodeme, Nuttall and Shipley 1901c,462; apodeme of first maxilla, Nuttall and Shipley 1901c,481; chitinous intra-cranial process, Annett *et al.* 1901,78; intercranial chitinous rod, Annett *et al.* 1901,78; maxillary prolongation, Annett *et al.* 1901,79; cardo, Wesch  1904,32; maxillary apodeme, Thompson 1905,150; lacinia, Gater 1935,19; internal apodeme, Waldbauer 1962,206; stipes, Waldbauer 1962,206)
- stylet** [MacLoskie 1888,184] — A general term applied to each of the structures forming the fascicle, i.e., the labrum, mandibles, hypopharynx and maxillae. (Syn.: lancette, de R aumur 1738,580; seta, Dimmock 1881,231; lancet, MacLoskie 1887,106; bristle, Bhatia and Wattal 1957,183; piercing stylet, Waldbauer 1962,201)
- SUBALARE (Sal)** (Figs.1,12-14) [subalar, Christophers 1960,449] — The epimeral epipleurite giving insertion to the posterior pleural wing muscles. In mosquitoes, a longitudinally narrow sclerite located in the membrane below the wing. (Syn.: parapterum, Snodgrass 1912,56; mesothoracic parapterum, Snodgrass 1912,58)
- SUBAPICAL LOBE (SL)** (Figs.23,25) [sub-apical lobe, Edwards 1920,28] — In *Culex* males, a mesal or dorsomesal (prerotation sense) lobe located near or distal to the middle of the gonocoxite; bearing setae a-h. (Syn.: subapical process, Dyar 1905a,45; apical lobe, Dyar 1905a,45; lobe of the side piece, Dyar 1918b,90; lobe of side piece, Dyar 1918b,92; tubercule pilifere, Brolemann 1919a,430; tubercule, Brolemann 1919a,432; apico-mesal shoulder, Ross 1947,21; apical shoulder, Ross 1947,21)
- SUBBASAL PROCESS (SbP)** (Fig.25) [Sirivanakarn 1976,3] — In *Culex* males, a small peglike structure arising ventrally just above the basal lateral arm of the paraproct; articulating with the lateral basal process of the outer division of the lateral plate.
- SUBCOSTA (Sc)** (Figs.17,19) [Knight and Laffoon 1970c,169] — The usual second principal

longitudinal vein of the wing. In mosquitoes, two-branched with subcosta-one ending at the costa and subcosta-two connected to the radius.

Although culicidologists have customarily treated the small part of this vein connected with the radius as the subcostal crossvein, the traditional usage outside of mosquitoes since Comstock (1918) has been to consider this as subcosta-two. This has continued to the present and is accepted here.

SUBCOSTAL SETA (SuS) [Knight and Laffoon 1970c,169] — One of the setae occurring in a group on the base of the subcosta on the ventral surface of the wing. (Syn.: subcostal hair, Menon 1951,68; subcostal bristle, Belkin 1962,552)

SUBCOSTA-ONE (Sc₁) [Knight and Laffoon 1970c,169] — The anterior branch of the subcosta connected distally with the costa. (Syn. including the stem of the subcosta: auxiliary vein, Skuse 1889,1763; subcostal vein, Theobald 1901a,235; subcosta, Nuttall and Shipley 1901c,475)

SUBCOSTA-TWO (Sc₂) [Knight and Laffoon 1970c,169] — The short crossveinlike posterior branch of the subcosta connected with the radius. (Syn.: sub-costal cross-vein, Skuse 1889,1763; sub-costal transverse vein, Giles 1900,10)

Subgenalnaht [Schiemenz 1957,274] — Applied to the line delimiting the gena from the base of the proboscis ventrally.

SUBGENAL RIDGE (SR) (Figs.5,6) [Knight and Laffoon 1970a,73] — The apodeme marked externally by the subgenal suture. In mosquitoes, arising from the ventromesal border of the anterior tentorial arm and continuous mesally with the epistomal ridge. (Syn.: Längsstäbchen, Kulagin 1905,287; genal shelf, Robinson 1939,222; Genalleiste, Schiemenz 1957,287)

SUBGENAL SUTURE (SG) (Figs.2,4) [Knight 1970,30] — A lateral cranial inflection above the bases of the mouthparts. In mosquitoes, the groove, sometimes with an external thickening of cuticle, extending from the lower edge of the anterior tentorial pit between the clypeus and gena. (Syn.: genal suture, Waldbauer 1962,210)

SUBSPIRACULAR AREA (SA) (Figs.12,13) [sub-spiracular area, Edwards 1941,8] — The rather indefinite area of the anterior mesanepisternum lying below the hypostigmal area between the proepimeron and the postspiracular area; usually continuous with or connected to the postspiracular area ventrally; scales and rarely setae may be on this area. (Syn.: epi-merum, Christophers 1901,4; pleuron of meso-thorax, Christophers 1901, in part, Fig.1; accessory sclerite, Freeborn 1926,339; epimeron 1, Owen 1977,429)

SUBSPIRACULAR SCALE (SSc) (Fig.16) [Belkin 1962,550] — One of the scales occurring in a group on the subspiracular area of the anterior mesanepisternum. (Syn.: upper mesepisternal scale-patch, Natvig 1948,10; vorderer Parastigmalfleck, Mohrig 1969,22)

SUBSPIRACULAR SETA (SuS) [subspiracular bristle or hair, Belkin 1962,550] — One of the setae which rarely occur on the subspiracular area of the anterior mesanepisternum.

SUPRAALAR AREA (SaA) (Figs.11-13,19) [supra-alar area, Edwards 1941,9] — The lateral area of the scutum just above and in front of the wing; a line of setae in this area may extend anterior to the posterior end of the paratergite mesad to the antearlar setae; a line of scales in this area is sometimes continuous with an antearlar line. (Syn.: lateral area, Christophers 1933, in part, 14; lateral border, Christophers 1933, in part, 17; supra-ala, Knight and Laffoon 1970b,141)

SUPRAALAR GROOVE (SaG) (Figs.12,13) [Owen 1977,429] — The furrow lateral to the scutum above the wing base; marked internally by a prominent ridge on its mesal side; often appearing to be continuous anteriorly with the paranotal suture. (Syn.: dorso-pleural suture, Christophers 1915a, in part, 366)

SUPRAALAR SCALE (SaSc) (Figs.16,19) — One of the scales occurring on the supraalar area of the scutum; a distinct lateral line of supraalar scales is often present otherwise they are difficult to separate from the antearlar scales. (Syn.: supraalar scale line, Belkin 1962,550; supraalar line, Berlin 1969,5; supraalar macula, Schick 1970, including the antearlar scales, 9)

SUPRAALAR SETA (SaS) (Figs.11,12,16,19) [supra-alar chaeta, Christophers 1915a, legend to P1. XIX] — One of the setae occurring in a cluster on the supraalar area of the scutum; a row of supraalar setae may extend cephalad above the antearlar area or be more or less continuous with the caudal end of a row of antearlar setae. (Syn.: supra-alar bristle, Edwards 1941,8; posterolateral seta, Lunt and Nielsen 1971,72)

SUTURE — Applied either to a seam produced by the union of two areas of sclerotization (as used in vertebrate morphology) or to a groove produced incidental to the formation of a strengthening

ridge on the inner surface of the cuticle; does not apply to a line of weakness marked neither by a groove externally nor by a ridge internally (Matsuda 1965,35).

T

- TARSOMERE (Ta-I₁, Ta-II₄, etc.)** (Fig.18) [Knight and Laffoon 1970c,170] — An individual subsegment of a tarsus. In mosquitoes, five tarsomeres comprise each tarsus; referred to as the first through the fifth tarsomeres of the appropriate tarsus and denoted by adding numerical subscripts (1-5) to the abbreviation of the tarsus. (Syn. for any tarsomere: tarsus, Theobald 1901a,231; tarsal joint, Nuttall and Shipley 1901c,455; segment, Nuttall and Shipley 1901c,472; tarsal segment, James and Liston 1904,14; joint, Smith 1904,17; tarsal, Howard *et al.* 1912,63; Fussglied, Eckstein 1920,233. Syn. for the first tarsomere: metatarsus, Giles 1900,16; 1st tarsal joint, Smith 1904,15. Syn. for the second tarsomere: first tarsal, Theobald 1901a,230; 2nd tarsal joint, Smith 1904,15. Syn. for the third tarsomere: 3rd tarsal joint, Smith 1904,15. Syn. for the fourth tarsomere: 4th tarsal joint, Smith 1904,15. Syn. for the fifth tarsomere: 5th tarsal joint, Smith 1904,15. Syn. collectively applied to the second through the fifth tarsomeres: tarsus, Theobald 1901b,6; foot, Theobald 1901b,7)
- TARSUS (Ta)** [Giles 1900,16] — In arthropods, the usual fifth leg segment located distad to the tibia. In mosquitoes, consisting of five tarsomeres; referred to a fore-, mid- or hindtarsus as appropriate. (Syn.: foot, Giles 1900,16)
- TEGULA (Tg)** (Figs.17,19) [Christophers 1960,444] — A lobe situated at the base of the costa of the forewing of some insects. In mosquitoes, present at the base of the wing but also recognizable as a small lobe located dorsoanteriorly at the base of the halter (Owen 1977,436).
- tentorial bar** [Christophers 1960,418] — The right or left half of the tentorium comprised mainly of the united anterior and posterior tentorial arms. (Syn.: tubular tunnel, Nuttall and Shipley 1901c,467; tubular passage, Nuttall and Shipley 1901c,481; intracranial tunnel, Patton and Cragg 1913,66; intercranial tunnel, Patton and Evans 1929,78; tubular apodeme, Evans 1938,10; Tentoriumarm, Schiemenz 1957,275; Tentoriumrohr, Schiemenz 1957,276; tentorial arm, Snodgrass 1959,52; arm of the tentorium, Waldbauer 1962,206)
- TENTORIUM (Tn)** [Vogel 1921,272] — The pair of endoskeletal struts of the cranium formed chiefly of the fused anterior and posterior tentorial arms. In mosquitoes, the right and left halves of the tentorium are not connected as in generalized insects. See **tentorial bar**.
- TERGITE** — A subdivision of a tergum; often incorrectly applied to an entire tergum (Snodgrass 1963,9).
- TERGUM (Te)** (Fig.1) [Christophers 1901,45] — The dorsal sclerotization of a body segment; called notum in the thorax. (Syn. for abdominal terga: dorsal plate, Theobald 1901b,5; pièce dorsale, Blanchard 1905,58; tergite, Brolemann 1919a,430; région dorsale, Brolemann 1919a,430; Rückenschiene, Martini 1921,250; dorsum, Christophers 1933,23; tergal plate, Menon 1941,208) See **NOTUM**.
- TERGUM VIII (VIII-Te)** (Figs.20,25,27) [Reinert 1973, Fig.70] — The tergum of abdominal segment VIII. In female mosquitoes, variable in shape; usually more or less trapezoidal; setose apically; scales present or absent. (Syn.: tergite 8, Brolemann 1919b,93; tergite du 8^e segment, Brolemann 1919b,101; tergite of segment eight, Macfie and Ingram 1922,158; tergite of eighth segment, Macfie and Ingram 1922,167; eighth tergite, Christophers 1923,701; 8. Tergit, Martini 1931,68; 8th tergite, Hara 1957,45; tergite VIII, Belkin 1962,553)
- TERGUM VIII COMB (VIII-TeC)** — In mosquitoes of the genus *Mansonia*, a row of spiniform setae along and near the posterior margin of tergum VIII. (Syn.: teeth, Macfie and Ingram 1922,171; chitinized comb, Christophers 1923,701; comb of the eighth tergite, Edwards 1930,541; comb, Menon 1941,207)
- TERGUM VIII INDEX (VIII-Te Index)** [Reinert 1973,4] — In female mosquitoes, the tergum VIII length divided by the tergum VIII width. (Syn.: L/W ratio, Davis 1926,4; length/width ratio, Davis 1926,6)
- TERGUM VIII LENGTH (VIII-Te length)** [Reinert 1973,4] — In female mosquitoes, the distance between the most anterior and most posterior points of tergum VIII measured dorsally along a straight line parallel to the longitudinal axis of the body.
- TERGUM VIII WIDTH (VIII-Te width)** [Reinert 1973,4] — In female mosquitoes, the width of tergum VIII measured dorsally at the widest point along a straight line perpendicular to the longitudinal axis of the body.

TERGUM IX (IX-Te) (Figs. ♂-20,22-24; ♀-20,25-27) [in ♀, Reinert 1973, Fig.70] — The tergum of abdominal segment IX. In male mosquitoes, ventral in postrotation position; usually markedly bilobed. In female mosquitoes, a small plate situated between tergum VIII and the cerci (tergum X if present) dorsally; variable in shape and pigmentation; setae present or absent. (Syn. for ♂: ninth sternite, Edwards 1914,63; sternite 9, Brolemann 1919b,83; sternite du 9^e segment, Brolemann 1919b,439; ninth tergite, Edwards 1920,25; IX. Tergit, Martini 1922,136; Rückenplatte, Martini 1928,149; 9. Tergit, Martini 1931,69; 9th tergite, Christophers 1933,30; tergite of the ninth segment, Edwards 1941,15; tergite IX, Christophers 1960,458; epandrium, Hodapp and Jones 1961,832; ninth tergal plate, Hodapp and Jones 1961, in part, 832; ninth tergal bar, Hodapp and Jones 1961, in part, 832; lateral bar of the ninth tergum, Hodapp and Jones 1961, in part, 833; bridge, Belkin 1962, in part, 553; basal ring, Spielman 1964, including sternum IX, 327; bridge of ninth tergum, Knight and Laffoon 1971a, in part, 15. Syn. for ♀: tergite du 9^e somite, Brolemann 1919b,95; tergite 9, Brolemann 1919b,96; tergite du 9^e segment, Brolemann 1919b,101; tergite of segment nine, Macfie and Ingram 1922,158; tergite of the ninth segment, Macfie and Ingram 1922,164; ninth tergite, Macfie and Ingram 1922,166; tergite of ninth segment, Macfie and Ingram 1922,167; 9. Tergit, Martini 1931,68; 9th tergite, Hara 1957,45; tergal sclerite, Snodgrass 1959,72; tergite IX, Christophers 1960,464; ninth tergal plate, Jones and Wheeler 1965,401; ninth tergum, Jones and Wheeler 1965,402; gonotergite, Saether 1977,4; gonocoxite IX, Saether 1977, in part, 4)

TERGUM IX INDEX (IX-Te Index) [Reinert 1973,4] — In female mosquitoes, the tergum IX length divided by the tergum IX width.

TERGUM IX LENGTH (IX-Te length) [Reinert 1973,4] — In female mosquitoes, the distance between the most anterior and most posterior points of tergum IX measured dorsally along a straight line parallel to the longitudinal axis of the body.

TERGUM IX LOBE (IX-TL) (Figs.22-25) — In male mosquitoes, a caudally directed lobe of tergum IX, usually paired; often bearing setae distally. (Syn.: appendage of the eight abdominal segment, Felt 1904,264; appendage of eighth segment, Felt 1904, in chart; appendage of 8th segment, Dyar 1905a,43; appendage of the eighth segment, Dyar 1905b,53; setaceous lobe, Felt 1905,463; lobe of eighth segment, Felt 1905,470; gonapophysis, Howard *et al.* 1912,67; basal appendage, Howard *et al.* 1912,70; ventral process, Christophers 1915b,378; protuberance sternale du 9^e somite, Brolemann 1919b,73; protuberance sternale, Brolemann 1919b,78; lobe of the ninth tergite, Edwards 1920,25; Höcker des 9. Segmentes, Martini 1921,253; lateral lobe, Christophers 1922,551; Lobus des IX Tergit, Martini 1922,136; Lappen des IX. Tergit, Martini 1922,138; process of ninth tergite, Root 1923,272; protuberance epineuse du seg' IX, Séguy 1924,15; eighth sternite, Cole 1927,415; lobe of ninth tergite, Matheson 1929,14; Lobus des 9. Tergit, Martini 1921,6; ventrale Anhängsel, Swellengrebel and Rodenwaldt 1932,14; process of 9th tergite, Christophers 1933,30; process of the ninth tergite, Gater 1935,38; tergal lobe, Crampton 1942,91; lobe of ninth sternite, LaCasse and Yamaguti 1950,3; lobe of the 9th tergum, Hodapp and Jones 1961,832, ninth tergal lobe, Hodapp and Jones 1961,834; tergite lobe, Belkin 1962,554; lobe of IX tergite, Belkin 1962, Fig.408; lobe of the basal ring, Spielman 1964,327)

TERGUM IX WIDTH (IX-Te width) [Reinert 1973,4] — In female mosquitoes, the width of tergum IX measured dorsally at the widest point along a straight line perpendicular to the longitudinal axis of the body.

TERGUM X (X-Te) (Figs. ♂-22-25) [in ♀, Coher 1948,78] — The tergum of abdominal segment X. In male mosquitoes, usually developed as a pair of tergites laterally at the base of the proctiger; often articulating with tergum IX and the basal piece; sometimes confluent with the basal part of the paraproct sclerotization. In female mosquitoes, a small sclerite situated dorsally between tergum IX and the cerci in some species, particularly anophelines. (Syn. for ♂: basal arm, Dyar 1918b,87; branches arguées, Brolemann 1919a,438; piece oblique, Brolemann 1919a,439; tergite 10, Brolemann 1919b,78; lateral process of ventro-lateral plate, Christophers and Barraud 1923,833; lateral arm of the paraproct, Freeborn 1924a,191; tenth sternite, Matheson 1929,15; dorsal arm of the tenth sternite, Matheson 1929, in part, 16; lateral portion of paraproct, Edwards 1941,15; 10th abdominal tergite, Crampton 1942,159; tergum of tenth segment, Snodgrass 1959,68; dorsolateral sclerite, Snodgrass 1959,69; basal paraproct, Hodapp and Jones 1961,832; 10th tergum, Hodapp and Jones 1961,832; basolateral sclerotization, Belkin 1962,553; apodeme of paraproct, Spielman 1964,326; paraproct apodeme, Spielman 1964,327; tenth tergum, Jones and Wheeler 1965,409; basolateral sclerotization of proctiger, Peyton and Hockman 1968,377. Syn. for ♀: tenth tergite, Davis 1926,2; 10. Tergit, Martini 1931,68; 10th tergite, Hara 1957,45; basicercus, Giglioli 1963,151)

TERTIARY FRINGE SCALE (TFS) (Figs.17,19) [Knight and Laffoon 1970c,170] — One of the small linear scales set in two rows on the wing margin, on the dorsal surface just inside the row of fringe

scales and the other on the ventral surface just inside the row of secondary fringe scales; poorly developed or absent in males. (Syn.: border scale, Theobald 1901a,230; ventral basal scale, Christophers 1960, in part, 444; dorsal basal scale, Christophers 1960, in part 444)

THIRD AXILLARY SCLERITE (TaxS) (Fig.17) [Owen 1977,442] — The axillary sclerite at the base of the wing articulating with the first and second axillary sclerites and a process on the posterodorsal margin of the posterior mesanepisternum. (Syn.: unguiculus, Prashad 1918,616; third axillary, Christophers 1960,451)

THORAX (Figs.1,11-14) — The second or intermediate division (tagma) of the insect body; bearing the true legs and wings; comprised of the pro-, meso- and metathoracic segments.

TIBIA (Ti) [Giles 1900,16] — In arthropods, the usual fourth segment of the leg distal to the femur (a patella intervenes in some arachnids); referred to as fore-, mid- or hindtibia as appropriate. (Syn.: shank, Giles 1900,16)

TRANSNOTAL SUTURE (TnS) (Fig.12) [Owen 1977,429] — A transverse suture of a notum. In mosquitoes, the suture separating the antepnotum from the postpronotum.

TROCHANTER (Tr) [Giles 1900,16] — In arthropods, one or two short segments between the coxa and femur; the usual second segment of the leg in insects; referred to as fore-, mid- or hindtrochanter as appropriate.

TUBERCULUS (Tu) (Fig.27) [Reinert 1973, Fig.70] — In female mosquitoes, one or more small, rounded, pale buttonlike structures (campaniform sense organs?) situated on the insula; occasionally with a minute seta or spicule in the center.

U

ulnoid [Prashad 1918,627] — A line of thickening formed at the proximal end of the alula when the wing is extended.

UNGUIFER (Ug) [Christophers 1960,442] — The median dorsal process of the distal tarsomere with which the ungues articulate. (Syn.: unguifer process, Christophers 1960,442)

UNGUIS (U) (Fig.19) [Giles 1900,16] — An anterior or posterior claw of the arthropod posttarsus; either or both may be absent; usually both are present on the posttarsus of mosquitoes; referred to as fore-, mid- or hindungues as appropriate. (Syn.: claw, Giles 1900,16; hook, Nuttall and Shipley 1901c,481; tarsal claw, Smith 1904,15)

UNGUITRACTOR PLATE (Un) (Figs.18,19) [Owen 1977,443] — The ventral sclerite of the posttarsus on which the depressor of the posttarsus is inserted; sometimes (regularly in mosquitoes) produced apically as an empodium. (Syn.: extensor plate, Nuttall and Shipley 1901c,481; unguitactor, Knight and Laffoon 1970c,170)

This term is recommended as a replacement for “unguitactor,” previously recommended for use by Knight and Laffoon (1970c,170), because the latter is the name of the muscle which retracts the ungues.

UPPER CALYPTER (UC) (Figs.17,19) [Belkin 1962,552] — The distal calypter of the dipteran wing; typically situated above the lower calypter. (Syn.: antitegula, Blanchard 1905,59; squama, Belkin 1962,552; distal calypter, Owen 1977,436)

upper flap of the side-piece [Edwards 1920,28] — In male mosquitoes, the ventral (prerotational sense) surface of the gonocoxite. (Syn.: upper flap, Edwards 1920,28; ventral surface, Christophers 1922, in part, 556; dorsal flap of the basistyle, Freeborn 1924a,203; dorsal flap, Freeborn 1924a,203)

UPPER MESEPIMERAL SCALE (UMSc) (Fig.16) — One of the scales occurring in a group on the dorsoposterior quarter of the mesanepimeron; occupying the same area as the upper mesepimeral setae. (Syn.: upper mesepimeral scale patch, Belkin 1962,548)

UPPER MESEPIMERAL SETA (McSU) (Figs.12-14,16) [Edwards 1921,266] — One of the setae occurring in a group on the upper posterior area of the mesanepimeron before the metathoracic spiracle. (Syn.: sub-alar chaeta, Christophers 1915a, legend to Pl. XIX; soies métapleurales supérieures, Séguéy 1924,13; upper mesepimeral group, Matheson 1929,6; upper hypopleural bristle, Patton and Evans 1929,275; obere Mesepimeralborste, Martini 1931,2; sub-alar bristle, Edwards 1932,5; upper mesepimeral bristle, Edwards 1932,5; upper mesepimeral hair, Christophers 1933,14; sub-alar seta, Gater 1935,27; upper mes-epimeral chaeta, Christophers 1960,436)

UPPER MESKATEPISTERNAL SCALE (MScU) (Figs.13,16) — One of the scales occurring in a group located immediately below the upper meskatepisternal setae. (Syn.: upper sternopleural scale patch, Belkin 1962,550)

➤ **UPPER MESKATEPISTERNAL SETA (MksU)** (Figs.12-14,16) — One of the setae occurring in more or less a horizontal line on the upper part of the meskatepisternum. (Syn.: upper episternal chaeta, Christophers 1915a, legend to Pl. XIX; obere Sternopleuralborste, Martini 1923b,27; upper mesepisternal bristle, Kirkpatrick 1925,14; Mittelhaar, Swellengrebel and Rodenwaldt 1932,13; upper sternopleural group, Christophers 1933,14; obere Mesepisternal-Borste, Peus 1933,147; upper mesepisternal seta, Knight and Laffoon 1970b,141; upper katepisternal seta, Wood *et al.* 1979,31)

UPPER OCULAR SETA (UOcS) [Knight 1970,29] — One of the ocular setae occurring along the dorsal margin of the compound eye. (Syn.: supra-ocular chaeta, Christophers 1915a,363; upper orbital bristle, Belkin 1968,49; vertical bristle, Tanaka *et al.* 1979,8)

UPPER PLEUROTERGITE (UPt) (Fig.12) — The upper division of the pleurotergite; bearing internally an apodeme along its upper margin, upper pleurotergite apodeme. (Syn.: upper laterotergite, Owen 1977,429)

UPPER PLEUROTERGITE APODEME (UPIA) (Fig.12) — An apodeme borne along the upper margin of the upper pleurotergite; giving support to the walls of the mesopostnotum. (Syn.: upper laterotergite apodeme, Owen 1977,434)

UPPER POSTPRONOTAL SCALE (UPSc) (Figs.13,16) — One of the scales usually occurring in a large group on the dorsal part of the postpronotum. (Syn.: upper posterior pronotal scale patch, Belkin 1962,549)

UPPER PREALAR SCALE (UPrSc) (Fig.16) — One of the scales occurring principally on the prealar knob among and above the prealar setae. (Syn.: upper prealar scale patch, Belkin 1962,549)

UPPER PROEPISTERNAL SCALE (PScU) (Fig.16) — One of the scales occurring in a group on the proepisternum above the base of the forecoxa; sometimes continuous with the lower proepisternal scales mesoventrally. (Syn.: propleural scale, Belkin 1962,549)

UPPER PROEPISTERNAL SETA (PeSU) (Figs.11-14,16) — One of the proepisternal setae occurring in a group above the forecoxa. (Syn.: prosternal hair, Christophers 1915a, legend to Pl. XIX; prosternal bristle, Edwards 1921,265; soies humérales, Séguy 1924,13; prosternal group, Matheson 1929,6; proepimeral bristle, Patton and Evans 1929,275; propleural bristle, Edwards 1932,4; propleural hair, Christophers 1933,14; propleural seta, Gater 1935,27; proepisternal seta, Komp 1937,243; propleural chaeta, Christophers 1960,434)

Knight and Laffoon (1970b,13) recommended that the setae occurring in this location be referred to as “propleural setae.” Since, however, the setae are borne on the upper part of what is recognized herein as the proepisternum, they are termed “upper proepisternal setae” in order to distinguish them from a group which occupies a lower position on the same sclerite.

UPPER VAGINAL LIP (UVL) (Figs.25-27) [Curtin and Jones 1961,300] — In female mosquitoes, the sclerotized and pigmented rim of the roof of the vagina; articulating anteriorly with the lower vaginal lip at the hinge; the caudal margin is joined to the basoventral margin of the postgenital lobe; usually spiculate. (Syn.: bride dorsale, Brolemann 1919b,94; brides perioviductales, Brolemann 1919b, including the lower vaginal lip, 101; sternite of segment nine, Macfie and Ingram 1922,158; sternite of the ninth segment, Macfie and Ingram 1922,164; sjernite of ninth segment, Macfie and Ingram 1922,167; ninth sternite, Macfie and Ingram 1922,167; sigma, Christophers 1923, in part and including the lower vaginal lip, 700; cowl, Christophers 1923, in part, 702; cowl, Barraud 1928,364; posterior lip of the atrium, Barraud 1928,364; 9. Sternit, Martini 1931,31; peri-atrial chitinization, Christophers 1933, including the lower vaginal lip, 31; periatrinal sclerite, Crampton 1942, including the lower vaginal lip, 82; postatrial sclerite, Crampton 1942,82; posterior sigma, Coher 1948, in part, 78; anterior cowl, Coher 1948, in part, 78; dorsal arc of sigma, Snodgrass 1959,68; upper lip, Curtin and Jones 1961,302; dorsal vaginal lip, Curtin and Jones 1961,302; dorsal lip, Curtin and Jones 1961,302; sclerotized ring, Anderson and Horsfall 1963, including the lower vaginal lip, 74; tenth sternite, Giglioli 1963,153; upper genital lip, Spielman 1964,335; kaudale Genitalspange, Mohrig 1967,68)

➤ **UPPER VAGINAL SCLERITE (UVS)** (Figs.26,27) [Reinert 1973, Fig.70] — In female mosquitoes, a pigmented sclerite of the vaginal roof other than the upper vaginal lip; usually attached to the inner median cephalic margin of the upper vaginal lip; may be continuous with the lip and distinguishable by position only; nonspiculate. (Syn.: U-shaped structure, Macfie and Ingram 1922,158; chitinous loop, Macfie and Ingram 1922,177; inner chitinous bar, Macfie and Ingram 1922,177; chitinous bar, Macfie and Ingram 1922,179; loop of chitin, Macfie and Ingram 1922,180; loop, Macfie and Ingram 1922,182; U-shaped bar of chitin, Macfie and Ingram 1922,182; atrial plate, Christophers 1923,700; U-shaped internal sclerite, Ross 1947,24; horse-shoe-shaped

structure, LaCasse and Yamaguti 1950, appendix 1, 1; V-shaped chitinous median structure, LaCasse and Yamaguti 1950, appendix 1, 6; U-shaped chitinous median structure, LaCasse and Yamaguti 1950, appendix 1, 6; V-shaped chitinous structure, LaCasse and Yamaguti 1950, appendix 1, 7; horseshoe structure, Hara 1957,45; V-shaped structure, Hara 1957,68; post-atrial plate, Mattingly 1958,43; vaginal sclerite, Laffoon and Knight 1971,34; lateral plate, Spielman *et al.* 1974,188)

V

VAGINA (Va) (Figs.26,27) [Kulagin 1901,594] — In most female insects, an ectodermal pouch derived from the posteroventral part of abdominal segment VIII (possibly IX in some insects) and sometimes adjacent parts of the abdominal venter; ending anteriorly at the posterior end of the common oviduct. In mosquitoes and some other insects, the roof of the vagina is formed by the venter of abdominal segment IX; partially divided transversely by the spermathecal eminence and sometimes the upper vaginal sclerites. (Syn.: genital orifice, Macfie and Ingram 1922,158; atrium, Christophers 1923,701; gemeinsamer Geschlechtsgang, Martini 1923b,29; caecum, Freeborn 1926,342; bursa copulatrix, Gater 1935,43; bursa, Gater 1935,43; genital chamber, Crampton 1942,82; genital atrium, Crampton 1942,132; upper atrium, Jones and Wheeler 1965, in part, 402; lower atrium, Jones and Wheeler 1965, in part, 402; vaginal atrium, van Emden and Hennig 1970,135)

This pouch has usually been called the "atrium" in mosquitoes, but the mosquito structure is equivalent to the vagina or genital chamber of other insects. All three terms have been used previously for the structure in mosquitoes and there is no good reason for calling it the atrium in mosquitoes while calling it the vagina or genital chamber in other insects. Snodgrass (1933) defined genital chamber in the broad sense in which vagina is used here; he applied the term vagina only to the type of genital chamber in which the pouch is quite tubular and the posterior opening narrow. Since this distinction is impractical, it is recommended that the pouch be called the vagina without regard to whether it is broadly or narrowly open and tubular or otherwise developed. The common oviduct of most insects is also mainly or entirely an ectodermal tube derived from abdominal segment VIII. The theoretical boundary between it and the vagina is often called the gonopore, though the terminal openings of other gonoducts are also called gonopores. A practical criterion for distinguishing between the vagina and the common oviduct that can be applied to all insects said to have both is apparently wanting.

VEIN — One of the tubular thickenings of a wing often containing blood, tracheae and nerves. The principal longitudinal veins of mosquitoes are the anal vein, costa, cubitus, media, radius and subcosta. (Syn.: nervure, Nuttall and Shipley 1901c,474; wingvein, van den Assem and Bonne-Wepster 1964,28)

VENTRAL AEDEAGAL BRIDGE (VAB) (Figs.22,23) [Knight and Laffoon 1971a,14] — In male mosquitoes, the transverse sclerotization connecting the aedeagal sclerites furthest from the anus. (Syn.: upper bridge, Edwards 1920,35; ventral bridge, Christophers and Barraud 1923,832; ventral bridge of phallosome, Christophers and Barraud 1923,835; ventral bridge of mesosome, Rees and Onishi 1951,246; bridge, Belkin 1962,553)

VENTRAL ARM (VA) (Fig.23) [Sundararaman 1949,307] — In *Culex* males, the lateral pointed process (in normal resting position) of the inner division of the lateral plate of the phallosome; homologous with the leaflets of aedeagus in *Anopheles* (Christophers 1922,568). (Syn.: interior hook, Wesché 1906,350; upper plate, Dyar and Knab 1909,33; first plate of the harpago, Dyar and Knab 1909,35; first branch of the harpago, Dyar and Knab 1909,35; second plate of the uncus, Dyar 1918b,87; second plate, Dyar 1918b,89; uncal plate 2, Dyar 1918b, in Explanation of Plates; plate 2 of uncus, Dyar 1918b,92; second uncal plate, Dyar 1918b, in part, 96; gonapophyses, Brolemann 1919a,431; second division of mesosome, Edwards 1921,331; epimere, Christophers 1922,548; ventral cornu, Christophers 1922,552; ventral cornu of lateral plate, Christophers and Barraud 1923,832; anterior cornu of lateral plate of phallosome, Christophers and Barraud 1923,835; appendage a, Freeborn 1924a,206; process a, Freeborn 1924a,206; apical lobe, Ross 1947,48; distal lobe, Ross 1947,48; dorsal arm of the aedeagus, Spielman 1966, in everted position, 311; dorsal arm of aedeagus, Spielman 1966, in everted position, 312; ventrale Sklerit, Iglisch 1977,266; ventraler Sklerit des Aedoeagus, Iglisch 1977,279)

ventral plate [Thompson 1905,159] — The floor of the cibarium.

VENTRAL POSTGENITAL LOBE INDEX (ventral PGL index) [Reinert 1973,4] — In female mosquitoes, the ventral postgenital lobe length divided by one-half the dorsal postgenital lobe

width.

VENTRAL POSTGENITAL LOBE LENGTH (ventral PGL length) [Reinert 1973,4] — In female mosquitoes, the distance between the most posterior point of the postgenital lobe and the midpoint on the posterior margin of the upper vaginal lip measured ventrally along a straight line parallel to the longitudinal axis of the body.

VENTRAL SETA (VSe) (Fig.9) — One of four small peglike cibarial setae borne ventrally at the posterior margin of the cibarium. (Syn.: ventral papilla, Sinton and Covell 1927,303)

VENTRAL TENTORIAL ARM (VTA) (Fig.5) [ventraler Tentoriumarm, Schiemenz 1957,275] — A small ventral process on the anterior tentorial arm.

VERTEX (V) (Figs.2,4,7,8) [Nuttall and Shipley 1901c,458] — The dorsal surface of the head behind the compound eyes and the interocular space; its boundaries with the occiput, genae and postgenae are not delimited. (Syn.: occiput, Giles 1900, including the occiput, 6)

Kirby (1802,90) introduced this term for the “portio faciei inter occiput et oculos.” Perhaps his use stemmed from the use of the word by Bladh (1767) in defining stemma (“STEMMA. . . in vertice capitis.”). Subsequent definitions have usually been vague, most commonly referring to the part of the head between the eyes and occiput, often with an anterior limit at the back edge of the frons as supposedly marked off by the “frontal suture” or the paired ocelli or both. Definitions have varied from the one extreme of considering the vertex to be a single point at the top of the head (Lowne 1890-1892,120, in adult *Calliphora*) to the other extreme of including the gena and “all of the dorsal and cephalic aspects of the epicranium except the front [frons]” (Peterson 1916,13). Rarely applied to Diptera larvae.

W

WING (W)(Figs.1,17,19) — In adult pterygotous insects, one of the paired organs of flight occurring on the meso- and metathoracic segments. In adult Diptera, the metathoracic wings are represented by the halteres. Compare **MESOTHORACIC WING** in the pupa section.

WING FRINGE (WF) (Fig.17) [Theobald 1901a,234] — In many winged insects, one or more rows of setae or scales projecting beyond the wing margin. In mosquitoes, consisting of four rows of scales, one of fringe scales, one of secondary fringe scales and two of tertiary fringe scales; best developed from just beyond the alula around the posterior margin of the wing to near the wing apex. (Syn.: frange, de Réaumur 1738,578; fringe, Theobald 1901a,230; border-fringe, Theobald 1901b,17)

WING MEMBRANE (WM)(Fig.19) [Theobald 1901b,18] — The thin transparent or translucent tissue of the wing between the veins and/or margins; usually with microtrichia. (Syn.: membrane, Belkin 1962,551)

WING SPOT [Christophers 1913,70] — Dark and pale spots on the wings of mosquitoes correspond to areas with dark and pale scales on the veins. Since the spots on the costa and anterior veins are usually regular and distinct, they are given names which are listed and defined below. The names are those which have been used for the wing spots of anopheline and *Aedes* species but there should be little difficulty in applying them to the wing spots of *Culex* species (for previous treatments of wing spots in *Culex* consult Lien 1968, Matsuo *et al.* 1973a,b and Matsuo *et al.* 1974)

Dark and pale spots occurring on the stem and branches of posterior veins can usually be designated by the adjectives basal, median, preapical or apical preceded by the abbreviation of the vein, e.g., M₁ median pale spot. Pale spots of the wing fringe are termed “pale fringe spots” and are named after the vein at the end of which they occur, e.g., 1A pale fringe spot. (Syn.: spot, Nuttall and Shipley 1901c,476; maculation, Nuttall and Shipley 1901c,476; area, Christophers 1913,46; marking, Evans 1938,17; mark, Reid 1968,9)

Wing spots are illustrated in Figure 17.

Accessory Sector Pale (ASP) [Christophers 1933,18] — The group of pale scales sometimes occurring on the radius at or just distad of the splitting of radius-one and the radial sector and usually separated by a dark spot from the sector pale. (Syn.: accessory sector nodal point, Christophers 1913,57; median spot, Root 1926,691; accessory sector spot, King 1932,310; accessory sectoral pale, Belkin 1962,551)

Apical Dark (AD) [King 1932,310] — The group of dark scales on the costa and radius-one distad of the preapical pale and proximad of the apical pale. (Syn.: apical main costal spot center, Christophers 1913,96)

Apical Pale (AP) [Christophers 1933,18] — The group of pale scales usually occurring at the

extreme apex of the wing distad of the apical dark on the costa and radius-one; sometimes absent. (Syn.: apical nodal point, Christophers 1913,56; apical spot, Root 1926,691; apical white spot, King 1932,310)

Basal Dark (BD) [Russell *et al.* 1943,13] — The group of dark scales occurring between the basal pale and prehumeral pale on the proximal end of the costa. (Syn.: basal accessory spot, Christophers 1913,60; inner accessory dark spot, King 1932, in part, 310; inner prehumeral dark accessory spot, Christophers 1933,18; prehumeral dark mark, Reid 1968,9; inner prehumeral accessory dark spot, Harrison and Scanlon 1975,12)

Basal Pale (BP) [Belkin 1962,551] — The group of pale scales occurring at the extreme base of the costa. (Syn.: basal spot, Root 1926,691; humeral pale spot, Russell *et al.* 1943,13]

Basal Pale Fringe Spot (BPFS) [Harrison 1979,309] — A row of pale fringe scales occurring near the middle of the posterior margin of cell 1A.

Humeral Dark (HD) [Reid 1968,9] — The group of dark scales occurring on the costa between the humeral pale and presector pale. (Syn.: basal accessory spot, Christophers 1913,60; basal accessory pigment area, Christophers 1913,96; outer accessory dark spot, King 1932,310; humeral dark accessory spot, Christophers 1933,18)

Humeral Pale (HP) [Russell *et al.* 1943,13] — The group of pale scales occurring at or slightly distal to the humeral crossvein on the costa. (Syn.: humeral nodal point, Christophers 1913,56; humeral spot, Christophers 1913,58; basal spot, Root 1926,69; humeral pale interruption, Christophers 1933,18)

Median Dark (MD) [Russell *et al.* 1943,13] — A usually large group of dark scales occurring on the costa near the middle of the wing beyond the sector pale. (Syn.: middle main costal spot center, Christophers 1913,96; midcostal spot, King 1932,310; middle dark spot, Christophers 1933,18; middle dark mark, Reid 1968,9)

Pale Fringe Spot (PFS) [Christophers 1913,61] — A row of pale fringe scales named after the vein at the end of which it occurs, e.g., 1A pale fringe spot; an exception is the basal pale fringe spot. (Syn.: fringe spot, Christophers 1913,63)

1A Pale Fringe Spot (1APFS) [Harrison 1979,309] — The pale fringe spot located at the outer end of the anal vein. (Syn.: fringe spot 1A, Harrison and Scanlon 1975,12) See *Pale Fringe Spot*.

Preapical Dark (PD) [Christophers 1933,18] — The group of dark scales occurring beyond the subcostal pale; frequently interrupted by a small pale spot on radius-one. (Syn.: subapical dark costal spot, Christophers 1913,59; subapical main costal spot center, Christophers 1913,96; subapical dark spot, King 1932,310)

Preapical Pale (PP) [Christophers 1933,18] — The group of pale scales occurring between the preapical dark and apical dark on the costa and radius-one. (Syn.: subapical costal spot, Christophers 1913,57; subapical nodal point, Christophers 1913,59; subapical white spot, King 1932,310; accessory subcostal pale, Belkin 1962,551)

Prehumeral Dark (PHD) [Belkin 1962,551] — The group of dark scales occurring on the costa just before the humeral crossvein. (Syn.: basal accessory spot, Christophers 1913,60; basal accessory pigment area, Christophers 1913,96; inner accessory dark spot, King 1932, in part, 310; outer prehumeral dark accessory spot, Christophers 1933,18)

Prehumeral Pale (PHP) [Belkin 1962,551] — The group of pale scales occurring on the costa before the humeral crossvein and usually separated from it by the prehumeral dark. (Syn.: prehumeral pale interruption, Christophers 1933,18; basal spot, Root 1926,691; humeral pale spot, Russell *et al.* 1943,13)

Presector Dark (PSD) [King 1932,310] — The group of dark scales occurring between the presector pale and sector pale; when the presector pale is absent, this spot forms part of the subbasal dark. (Syn.: inner main costal spot center, Christophers 1913,96; first main costal spot, King 1932,310)

Presector Pale (PSP) [Christophers 1933,18] — The group of pale scales often interrupting the subbasal dark to give rise to the humeral dark and presector dark. (Syn.: median spot, Root 1926,691; presector white spot, King 1932,310)

Sector Pale (SP) [Christophers 1933,18] — The group of pale scales occurring on the costa, subcosta and radius before the splitting of radius-one and the radial sector and between the

presector dark and median dark. (Syn.: sector nodal point, Christophers 1913,57; sector spot, Christophers 1913,58; median spot, Root 1926,691; sectoral pale spot, Russell *et al.* 1943,13; sectoral pale area, Belkin 1962,551)


Subbasal Dark (SBD) [Belkin 1962,551] — The large group of dark scales distad of the humeral pale; sometimes including the prehumeral dark or even the basal dark; often interrupted by a pale spot, presector pale, to give rise to the humeral dark and presector dark.

Subcostal Pale (SCP) [Christophers 1933,18] — The group of pale scales occurring on the costa and radius-one at and beyond the end of subcosta-one between the median dark and preapical dark. (Syn.: subcostal nodal point, Christophers 1913,56; subcostal spot, Root 1926,691; subcostal white spot, King 1932,310)

FIGURE 1

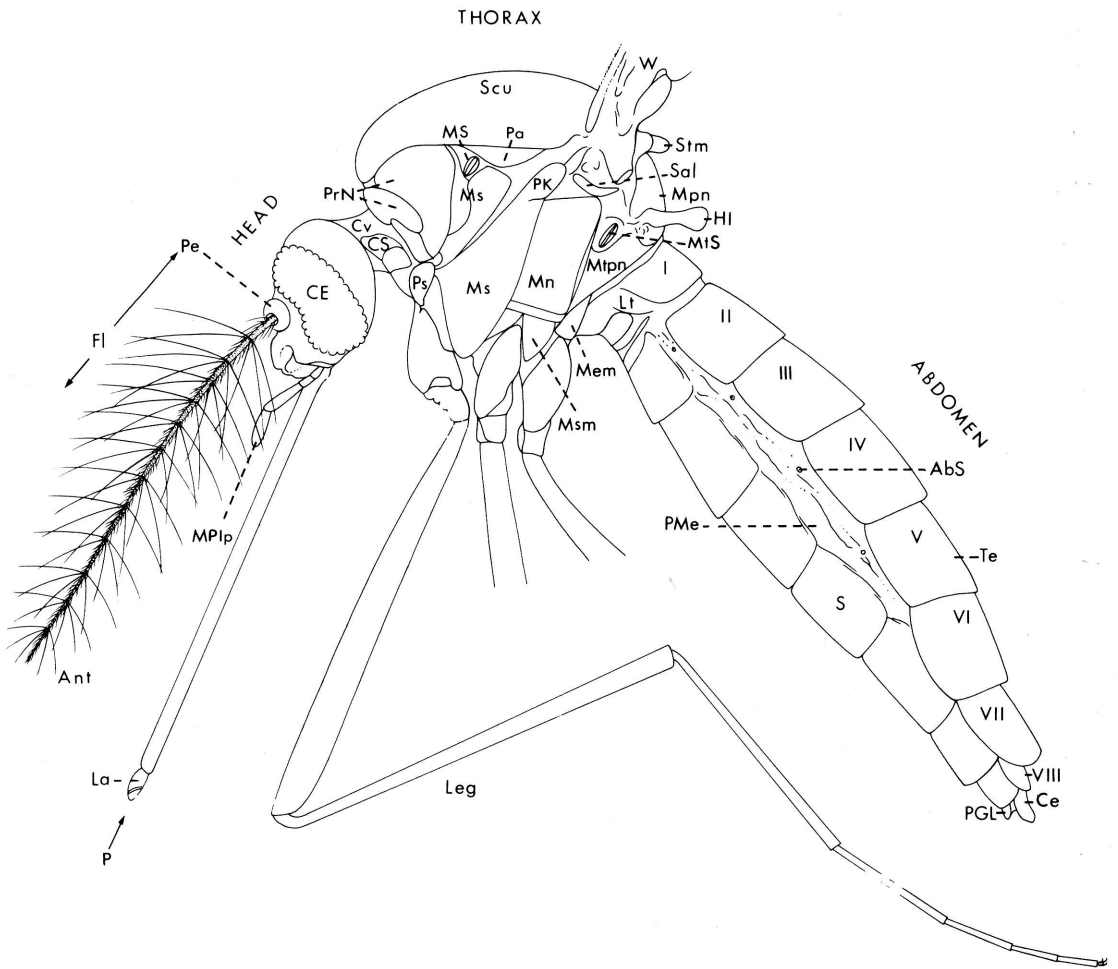
Adult female mosquito (diagramatic). Lateral aspect (left side). Redrawn from Belkin (1962, Fig. 406).

Abbreviations



AbS	- abdominal spiracle
Ant	- antenna
Cø	- cercus
CE	- compound eye
CS	- cervical sclerite
Cv	- cervix
Fl	- flagellum
HI	- halter
La	- labellum
LBS	- labial basal seta
Lt	- laterotergite
Mem	- metameron
Mm	- mesepimeron
MPlp	- maxillary palpus
Mpn	- mesopostnotum
Ms	- mesepisternum
MS	- mesothoracic spiracle
Msm	- mesomeron
Mtpn	- metapostnotum
MtS	- metathoracic spiracle
P	- proboscis
Pa	- paratergite
Pe	- pedicel
PGL	- postgenital lobe
PK	- prealar knob
PMe	- pleural membrane
PrN	- pronotum
Ps	- proepisternum
S	- sternum
Sal	- subalare
Scu	- scutum
Strm	- scutellum
Te	- tergum
W	- wing

Fig.1



Shehri Malikul

FIGURE 2

Aedes (Ochlerotatus) grossbecki Dyar and Knab.

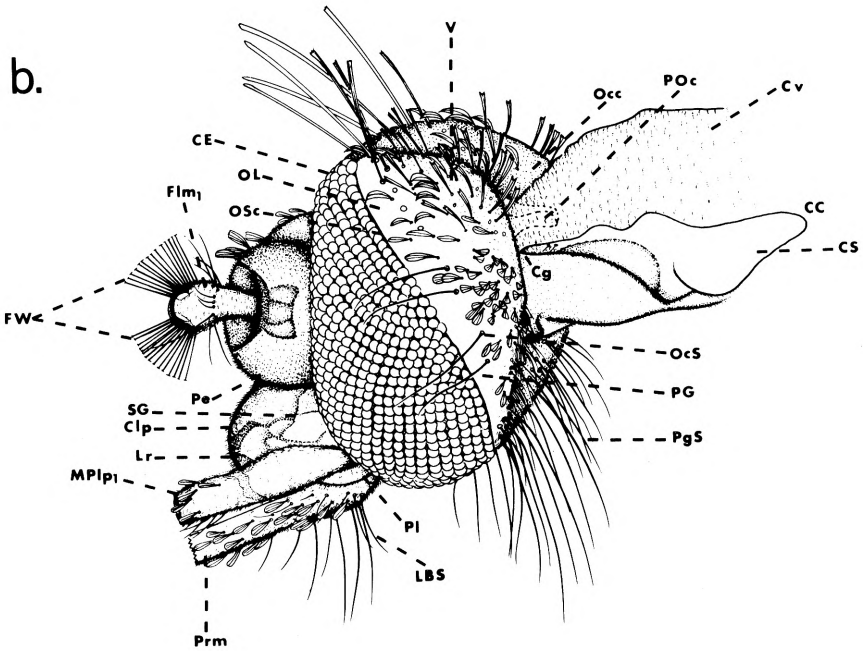
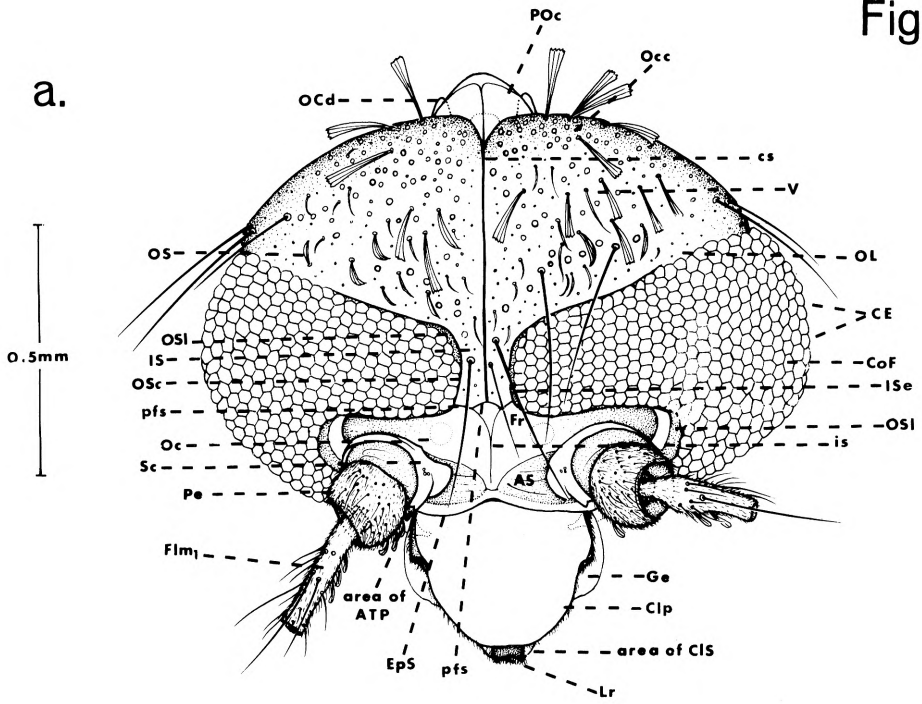
- a. Anterior aspect of female head.
- b. Lateral aspect (left side) of male head.

Abbreviations



AS	- antennal socket
ATP	- anterior tentorial pit
CC	- cervical condyle
CE	- compound eye
Cg	- cephaliger
Clp	- clypeus
CIS	- clypeolabral suture
CoF	- corneal facet
cs	- coronal suture
CS	- cervical sclerite
Cv	- cervix
EpS	- epistomal suture
Fim	- flagellomere
Fr	- frons
FW	- flagellar whorl
Ge	- gena
is	- interantennal suture
IS	- interocular space
ISe	- interocular seta
LBS	- labial basal seta
Lr	- labrum
MPlp	- maxillary palpus
Oc	- ocellus
Occ	- occiput
OCd	- occipital condyle
OcS	- ocular seta
OL	- ocular line
OS	- ocular scale
OSc	- ocular suture
OSI	- ocular sclerite
Pe	- pedicel
pfs	- postfrontal suture
PG	- postgena
PgS	- postgenal seta
PI	- palpifer
POc	- postocciput
Prm	- prementum
Sc	- scape
SG	- subgenal suture
V	- vertex

Fig. 2



Y.C. Lee

FIGURE 3

Aedes (Ochlerotatus) grossbecki Dyar and Knab.

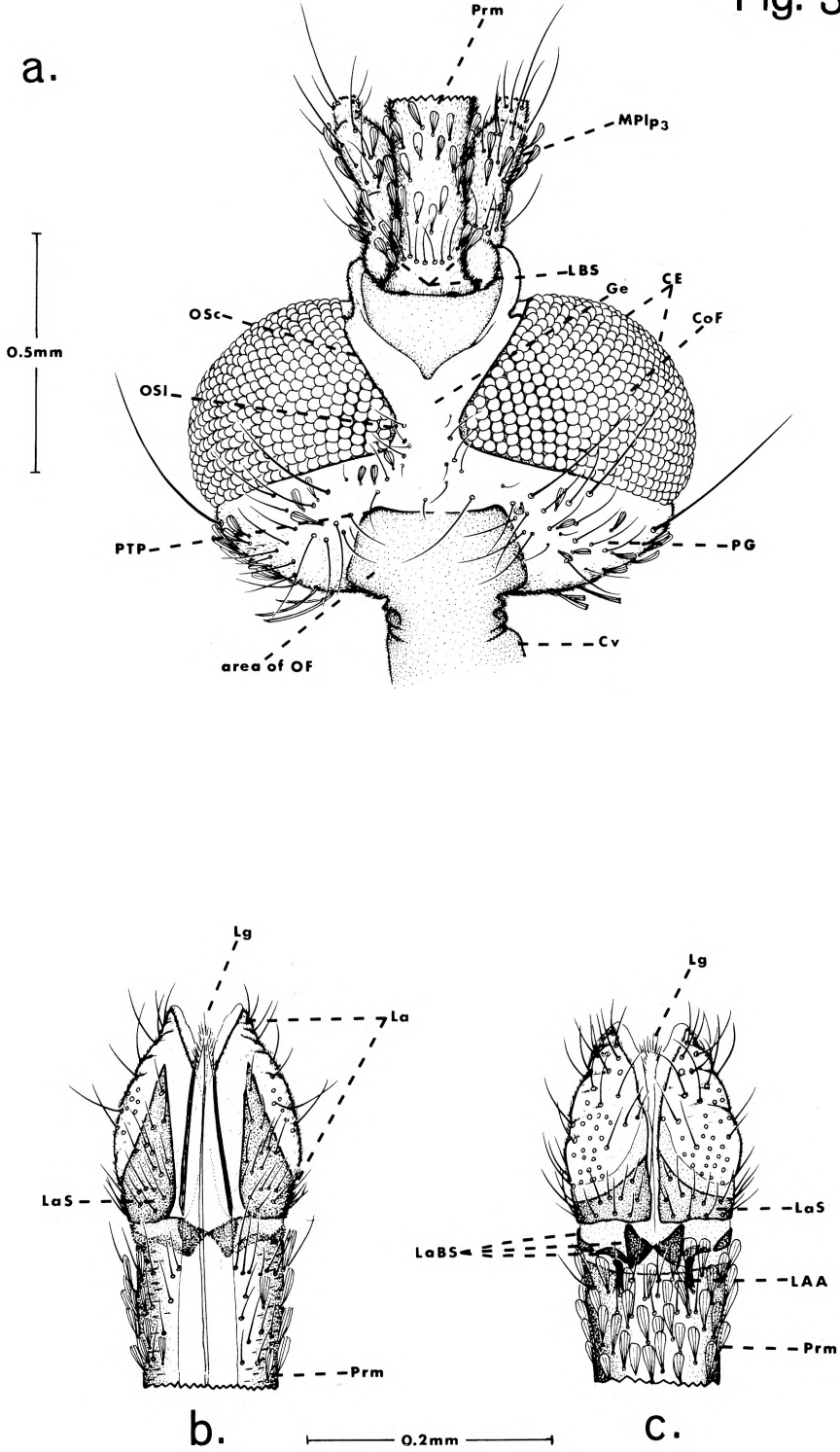
- a. Ventral aspect of female head.
- b. Dorsal aspect of labella and distal part of prementum.
- c. Ventral aspect of labella and distal part of prementum.

Abbreviations

CE	- compound eye
CoF	- corneal facet
Cv	- cervix
Ge	- gena
La	- labellum
LAA	- labellar abductor apodeme
LaBS	- labellar basal sclerite
LaS	- labellar sclerite
LBS	- labial basal seta
Lg	- ligula
MPIp	- maxillary palpus
OF	- occipital foramen
OSc	- ocular suture
PG	- postgena
Prm	- prementum
PTP	- posterior tentorial pit



Fig. 3



Y.C. Lee

FIGURE 4

a. *Aedes (Ochlerotatus) tormentor* Dyar and Knab. Anterior aspect of female head.

b-f. *Anopheles (Anopheles) quadrimaculatus* Say.

b. Lateral aspect (left side) of female head.

c. Dorsal aspect of male head.

d. Ventral aspect of male head.

e. Posteroventral aspect of male head.

f. Ventral aspect of labella and distal part of prementum.

Abbreviations

AS	- antennal socket
ATP	- anterior tentorial pit
CE	- compound eye
Clp	- clypeus
CIS	- clypeolabral suture
CoF	- corneal facet
cs	- coronal suture
Cv	- cervix
Fr	- frons
FT	- frontal tuft
Ge	- gena
ig	- interantennal groove
is	- interantennal suture
IS	- interocular space
La	- labellum
Lg	- ligula
Lr	- labrum
MPip	- maxillary palpus
OcS	- ocular seta
OL	- ocular line
OS	- ocular scale
OSc	- ocular suture
OSI	- ocular sclerite
Pe	- pedicel
pts	- postfrontal suture
PG	- postgena
PgS	- postgenal seta
PI	- palpifer
POc	- postocciput
Prm	- prementum
PTP	- posterior tentorial pit
SG	- subgenal suture
V	- vertex

Fig.4

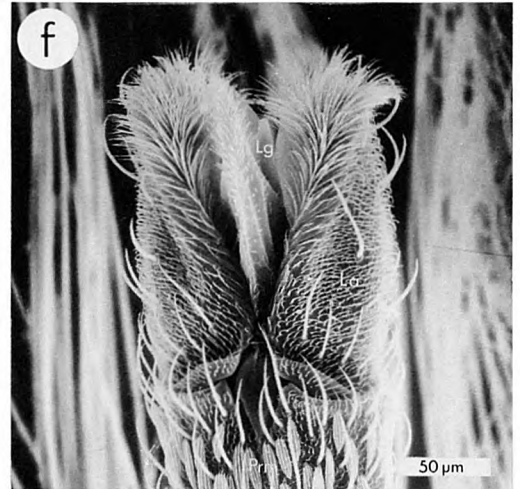
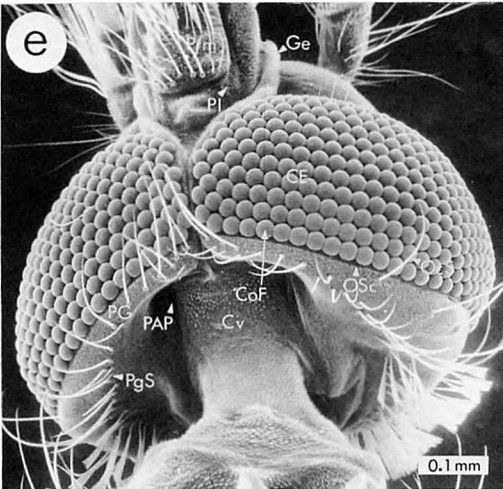
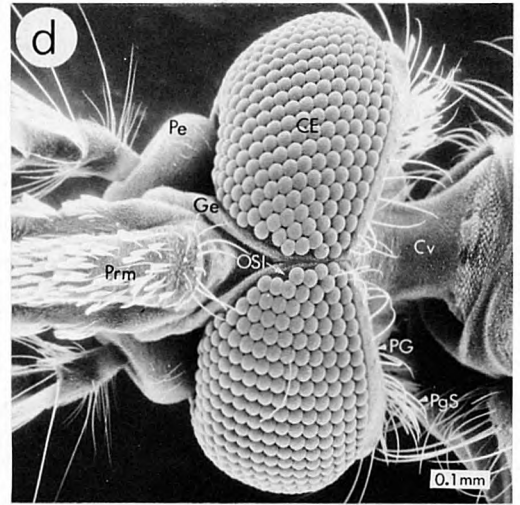
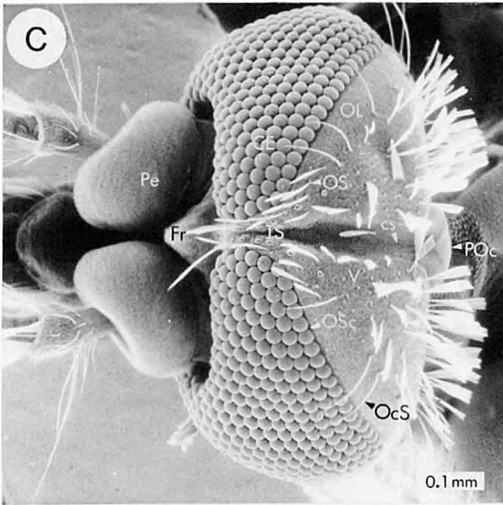
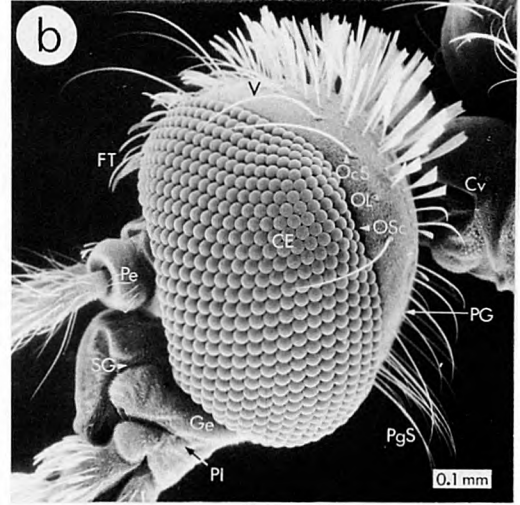
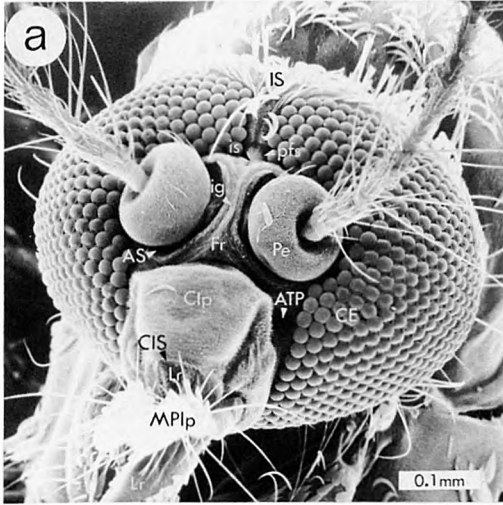


FIGURE 5

Aedes (Ochlerotatus) grossbecki Dyar and Knab.

- a. Lateral aspect (left side) of male head. Lateral wall of clypeus and cranium removed.
- b. Lower half of same.

Abbreviations

ATA	- anterior tentorial arm
Cd	- cardo
CE	- compound eye
Cib	- cibarium
CIS	- clypeolabral suture
CPh	- clypeal phragma
CR	- coronal ridge
CS	- cervical sclerite
CSD	- common salivary duct
Cv	- cervix
ER	- epistomal ridge
Es	- esophagus
Flm	- flagellomere
FW	- flagellar whorl
IR	- interantennal ridge
LL	- labral lever
Lr	- labrum
Mo	- mouth
MPIp	- maxillary palpus
MSp	- mandibular suspensorium
OCd	- occipital condyle
OR	- ocular ridge
Pe	- pedicel
Pha	- pharynx
PI	- palpifer
POc	- postocciput
PoR	- postoccipital ridge
PP	- pharyngeal pump
PR	- postfrontal ridge
Prm	- prementum
PTA	- posterior tentorial arm
Sc	- scape
SC	- salivary canal
SP	- salivary pump
SR	- subgenal ridge
Stp	- stipes
VTA	- ventral tentorial arm

Fig. 5

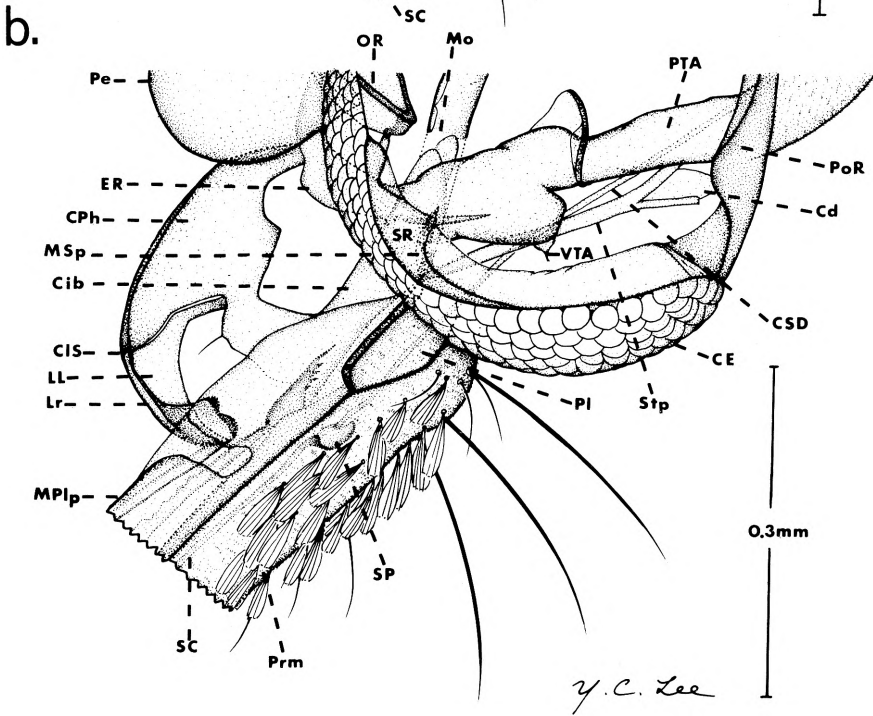
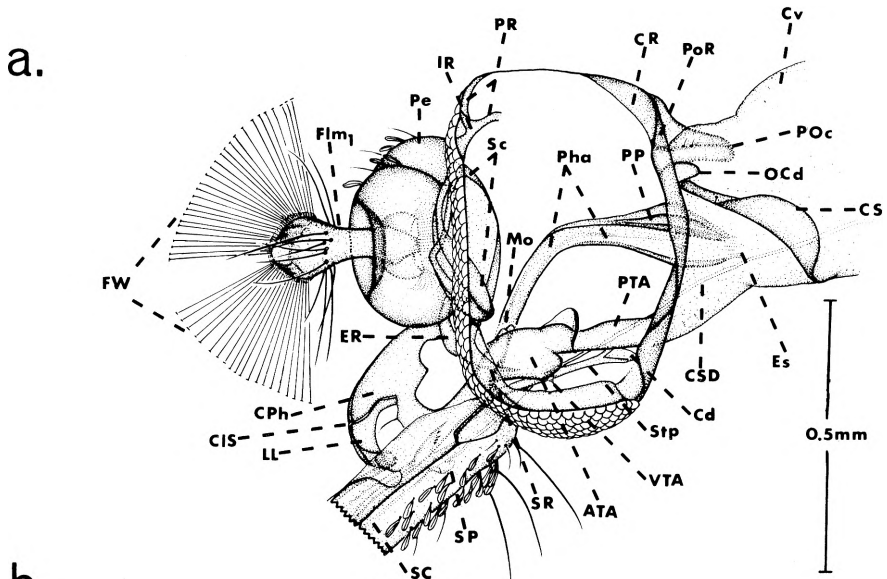


FIGURE 6

Aedes (Ochlerotatus) grossbecki Dyar and Knab.

- a. Lateral aspect (left side) of female head. Lateral wall of clypeus and cranium removed.
- b. Ventral aspect of same.

Abbreviations

ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
Cd	- cardo
CE	- compound eye
Cib	- cibarium
Cip	- clypeus
CIS	- clypeolabral suture
CS	- cervical sclerite
CSD	- common salivary duct
Cv	- cervix
ER	- epistomal ridge
F1m	- flagellomere
Ge	- gena
LF	- lateral flange
LL	- labral lever
Lr	- labrum
Mo	- mouth
MPIp	- maxillary palpus
MSp	- mandibular suspensorium
OCd	- occipital condyle
PG	- postgena
Pha	- pharynx
POc	- postocciput
PoR	- postoccipital ridge
PP	- pharyngeal pump
Prm	- prementum
PTA	- posterior tentorial arm
PTP	- posterior tentorial pit
Sc	- scape
SC	- salivary canal
SD	- salivary duct
SP	- salivary pump
SR	- subgenal ridge
Stp	- stipes

Fig. 6

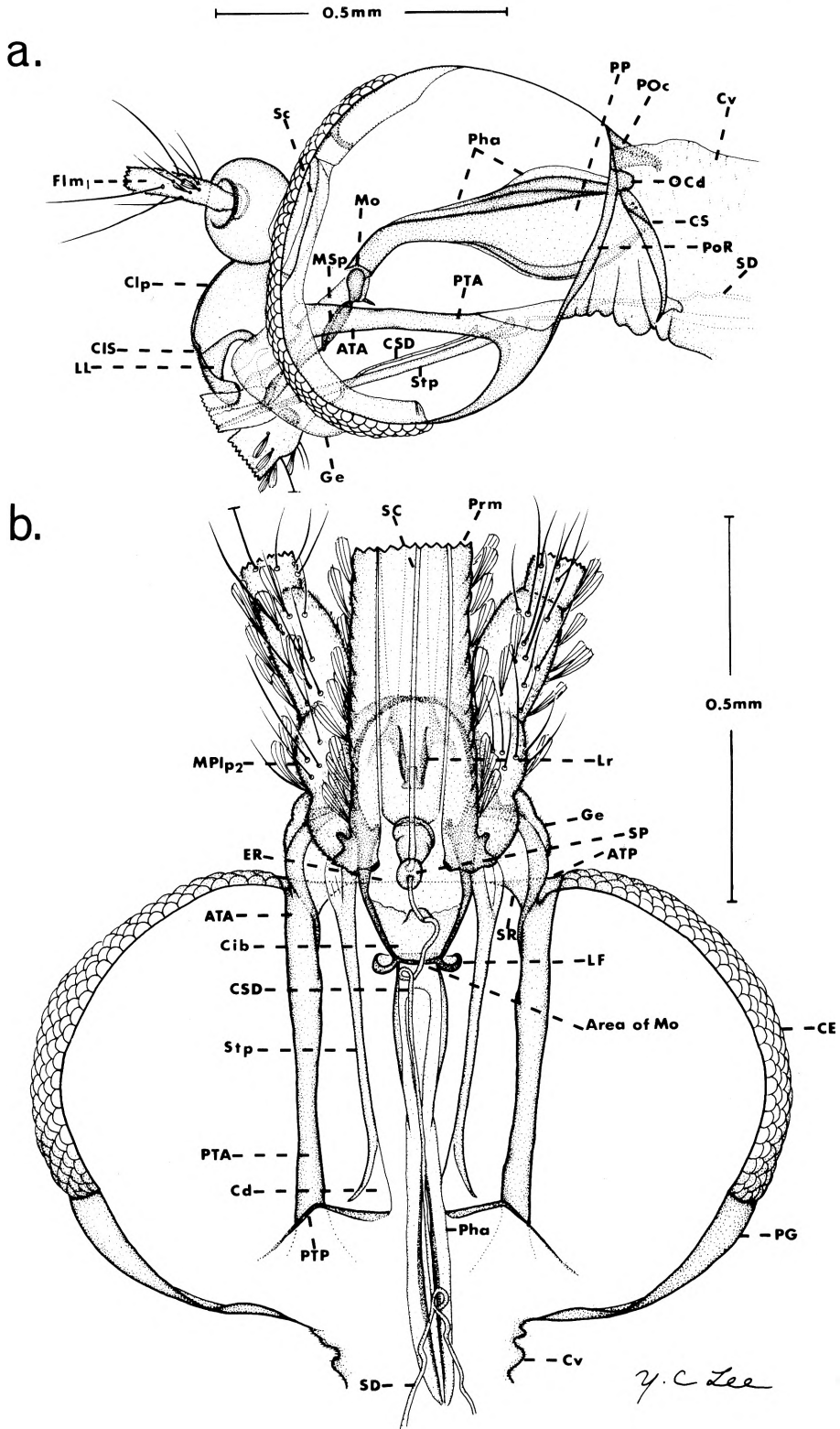


FIGURE 7

Aedes (Aedimorphus) vexans vexans (Meigen).

- a. Anterior aspect of female head.
- b. Same. Internal view at level of dorsoanterior surface of stomodeum. Dotted lines indicate associated external structures.

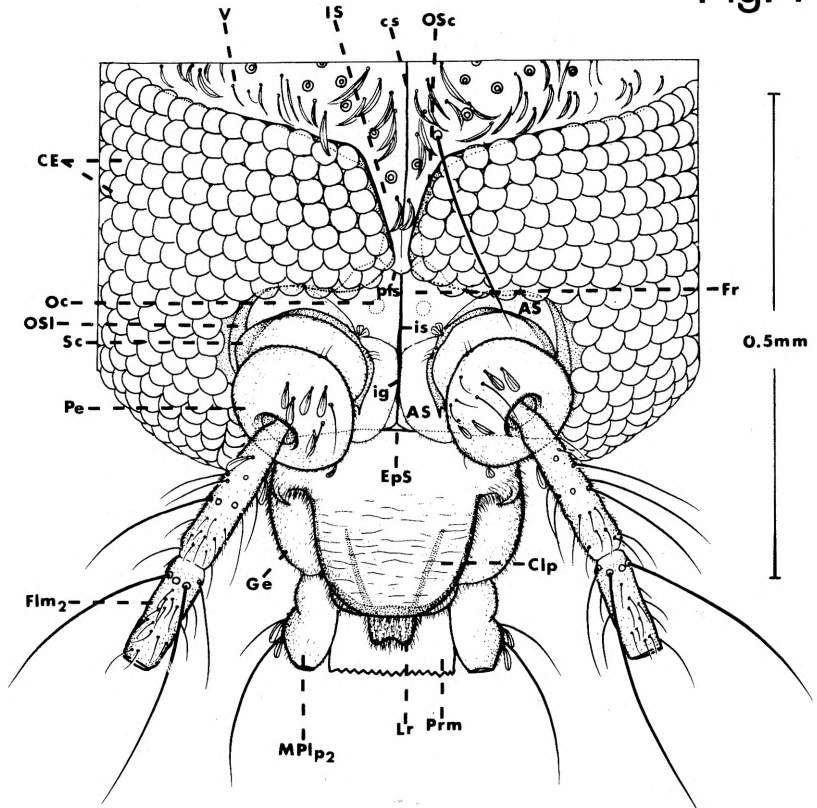
Abbreviations



AS	- antennal socket
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
CE	- compound eye
Cib	- cibarium
Clp	- clypeus
CPh	- clypeal phragma
cs	- coronal suture
EpS	- epistomal suture
F1m	- flagellomere
Fr	- frons
Ge	- gena
ig	- interantennal groove
is	- interantennal suture
IS	- interocular space
LF	- lateral flange
LL	- labral lever
Lr	- labrum
MPlp	- maxillary palpus
Oc	- ocellus
OSc	- ocular suture
OSI	- ocular sclerite
Pe	- pedicel
pfs	- postfrontal suture
Pha	- pharynx
Prm	- prementum
PTA	- posterior tentorial arm
PTP	- posterior tentorial pit
Sc	- scape
V	- vertex

Fig. 7

a.



b.

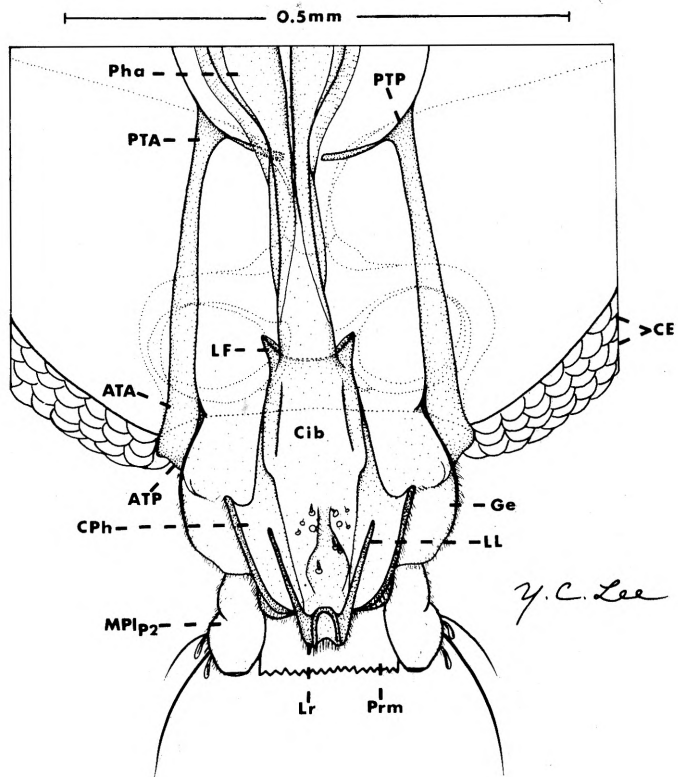


FIGURE 8

Culex (Neoculex) territans Walker.

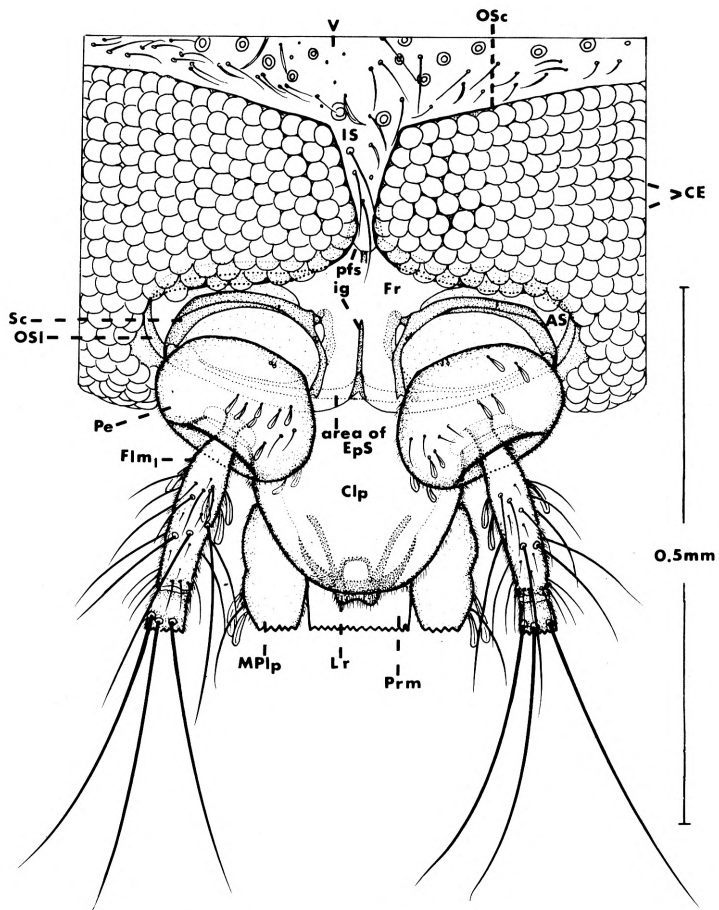
- a. Anterior aspect of female head.
- b. Same. Internal view at level of dorsoanterior surface of stomodeum. Dotted lines indicate associated external structures.

Abbreviations

AHP	-	anterior hard palate
AS	-	antennal socket
ATA	-	anterior tentorial arm
ATP	-	anterior tentorial pit
CA	-	cibarial armature
CE	-	compound eye
Cib	-	cibarium
Clp	-	clypeus
CPh	-	clypeal phragma
DSe	-	dorsal seta
EpS	-	epistomal suture
Flm	-	flagellomere
Fr	-	frons
Ge	-	gena
ig	-	interantennal groove
IS	-	interocular space
LF	-	lateral flange
LL	-	labral lever
Lr	-	labrum
Mo	-	mouth
MPip	-	maxillary palpus
OSc	-	ocular suture
OSI	-	ocular sclerite
Pe	-	pedicel
pfs	-	postfrontal suture
Pha	-	pharynx
Prm	-	prementum
PTA	-	posterior tentorial arm
PTP	-	posterior tentorial pit
Sc	-	scape
V	-	vertex

Fig. 8

a.



b.

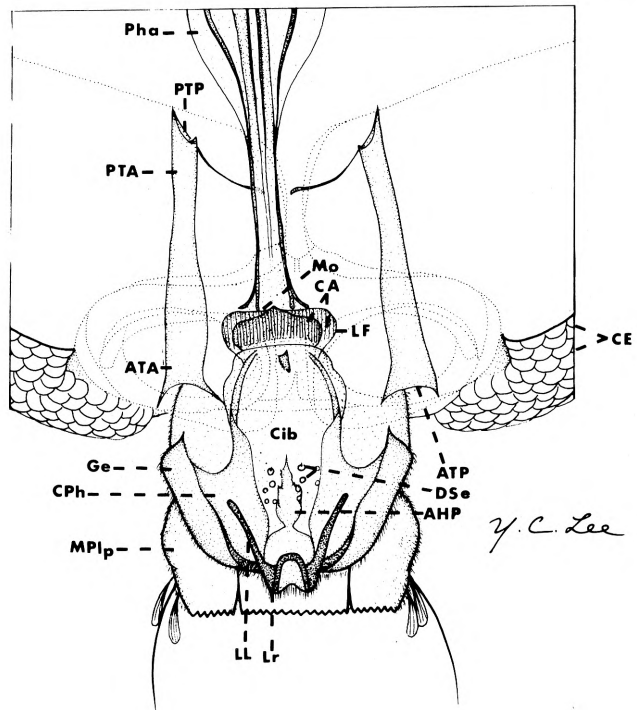


FIGURE 9

- a. Lateral aspect (cut away) of female anopheline head showing cibarium and pharynx. Modified from Christophers (1933,27).
- b. Dorsal aspect of female anopheline cibarium. Redrawn from Christophers (1933,27).
- c. Dorsal aspect of head of *Culex* female showing cibarium and pharynx. Redrawn from Sirivanakarn (1978,487).

Abbreviations

AHP	- anterior hard palate
ATA	- anterior tentorial arm
CC	- cibarial crest
CD	- cibarial dome
Cib	- cibarium
Clp	- clypeus
CSD	- common salivary duct
CT	- cibarial teeth
DSe	- dorsal seta
Hy	- hypopharynx
LF	- lateral flange
Lr	- labrum
MPlp	- maxillary palpus
Pha	- pharynx
PHP	- posterior hard palate
PP	- pharyngeal pump
Prm	- prementum
PSe	- palatal seta
SP	- salivary pump
VSe	- ventral seta

Fig. 9

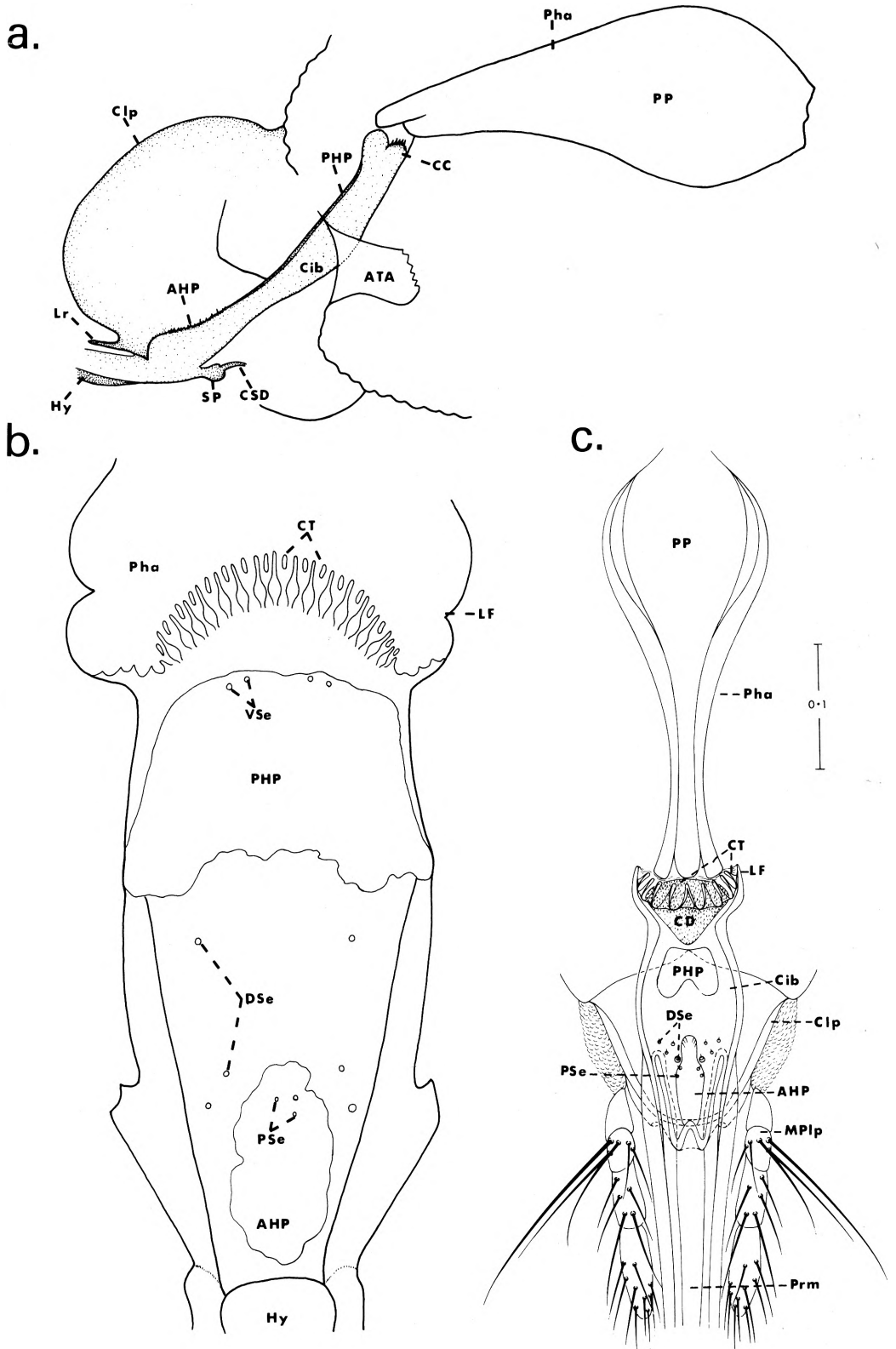


FIGURE 10

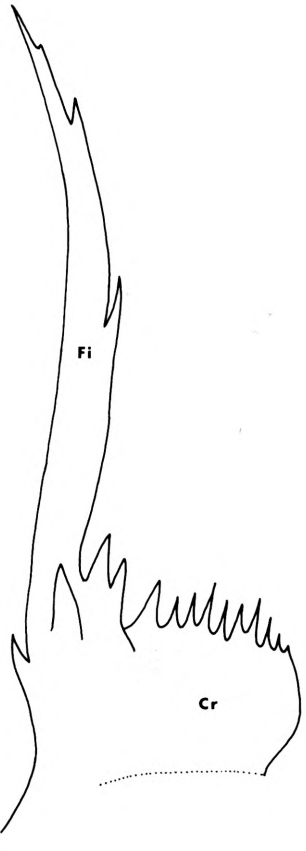
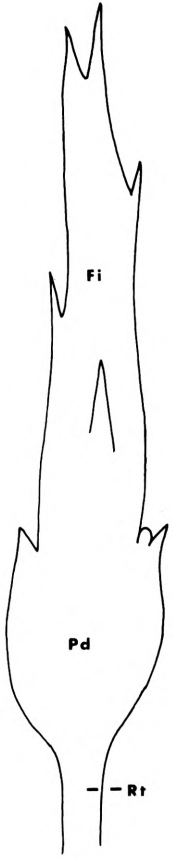
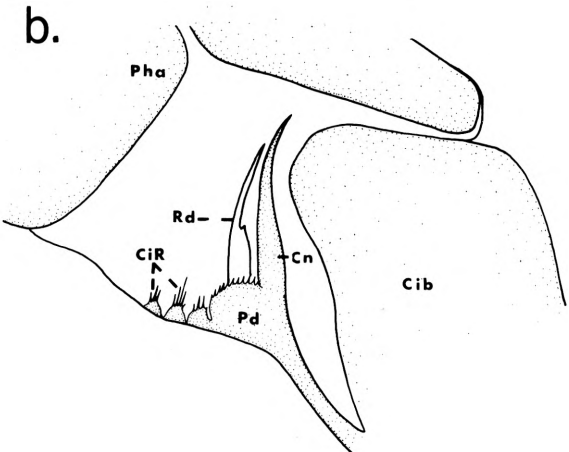
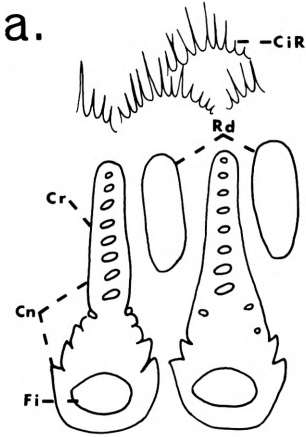
Female anopheline cibarial armature. Redrawn from Christophers (1933,27;28).

- a. Cones and rods as seen from above.
- b. Lateral aspect of function of cibarium and pharynx.
- c. Anterior aspect of cone.
- d. Lateral aspect of cone.
- e. Anterior aspect of rod.
- f. Lateral aspect of rod.

Abbreviations

Cib	- cibarium
CiR	- cibarial ridge
Cn	- cone
Cr	- crest
Fi	- filament
Pd	- pediment
Pha	- pharynx
Rd	- rod
Rt	- root

Fig. 10



c.

d.

e.

f.

FIGURE 11

Thorax of male *Aedes (Ochlerotatus) grossbecki* Dyar and Knab.

a. Anterior aspect.

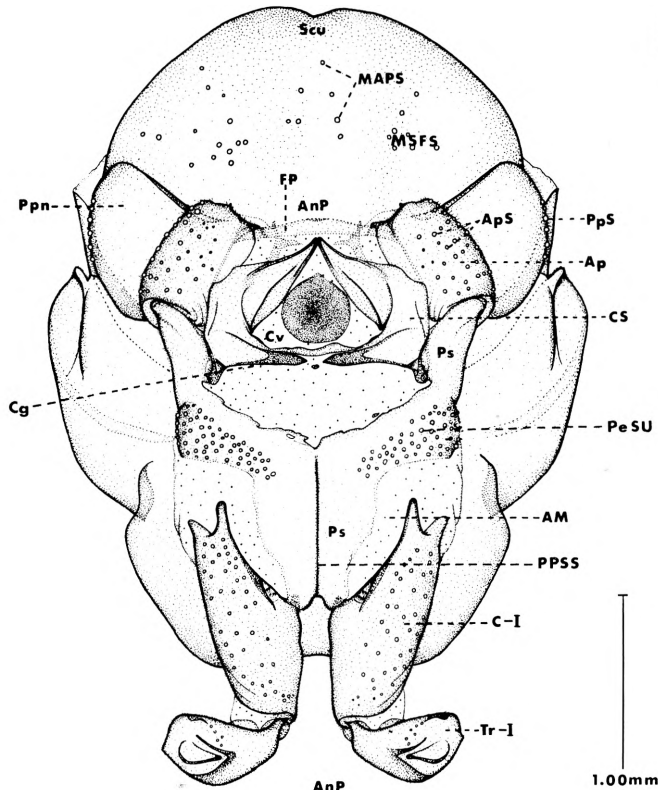
b. Dorsal aspect.

Abbreviations

AA	- acrostichal area
AcS	- acrostichal seta
AM	- anteprocoxal membrane
AnP	- anterior promontory
Ap	- antepronotum
ApS	- antepronotal seta
C-I	- forecoxa
Cg	- cephaliger
CS	- cervical sclerite
Cv	- cervix
DA	- dorsocentral area
DS	- dorsocentral seta
FP	- first phragma
LSS	- lateral scutellar seta
MAPS	- median anterior promontory seta
Mdt	- mediotergite
MSFS	- median scutal fossal seta
MSS	- median scutellar seta
Mtn	- metanotum
PeSU	- upper proepisternal seta
PMSS	- posterior medial scutal seta
Ppn	- postpronotum
PpS	- postpronotal seta
PPSS	- propleurosternal suture
PrA	- prescutellar area
PrS	- prescutal suture
Ps	- proepisternum
Pt	- pleurotergite
SaA	- supraalar area
SaS	- supraalar seta
ScA	- scutal angle
Scu	- scutum
SF	- scutal fossa
sss	- scutoscutellar suture
Stm	- scutellum
Tr-I	- foretrochanter
W	- wing

Fig. 11

a.



b.

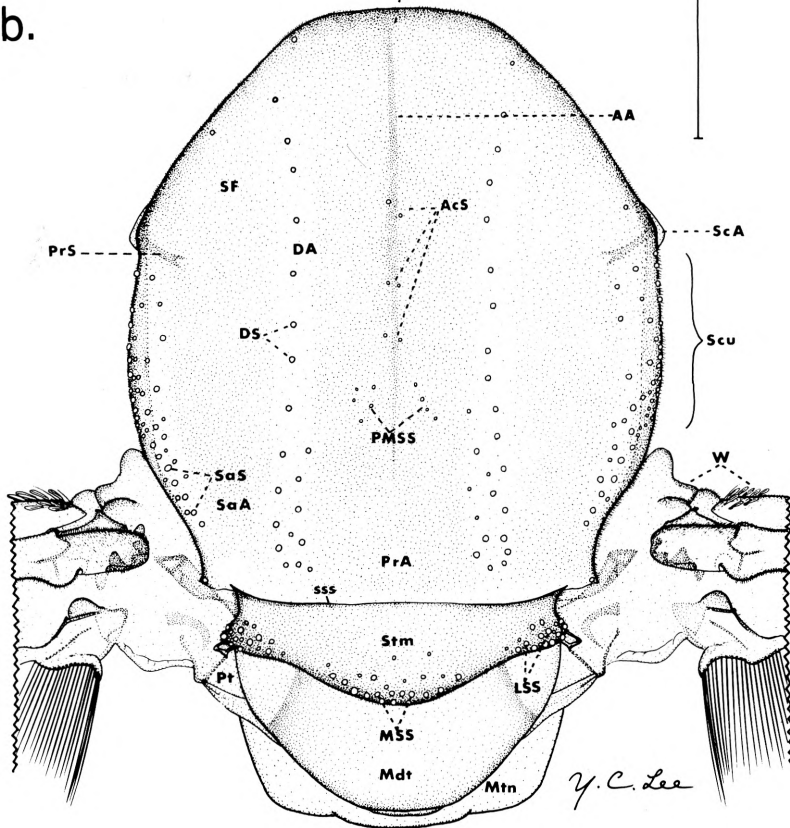


FIGURE 12

a. *Aedes (Ochlerotatus) grossbecki* Dyar and Knab. Lateral aspect (left side) of thorax of male.

b. *Culiseta (Culiseta) inornata* (Williston). Lateral internal aspect (right side) of thorax. Modified from Owen (1977,432).

Abbreviations

Ac	- acrotergite	Mtpn	- metapostnotum
AC	- apophyseal cup	mtr	- metapleural ridge
AEC	- anepisternal cleft	Mtr	- mesotrochantin
AnA	- antealar area	mts	- metapleural suture
AnP	- anterior promontory	Mts	- metepisternum
AnS	- antealar seta	MtS	- metathoracic spiracle
Ap	- antepronotum	Mtst	- metasternum
ApS	- antepronotal seta	Pa	- paratergite
AtS	- antecostal suture	PA	- postspiracular area
Ba	- basalare	PAP	- pleural apophyseal pit
BaA	- basalar apodeme	PaS	- prealar seta
C-I	- forecoxa	PC	- procoxal cavity
C-II	- midcoxa	PcA	- postcoxal apodeme
C-III	- hindcoxa	pcr	- paracoxal ridge
CC	- cervical condyle	pcs	- paracoxal suture
Cg	- cephaliger	PeSU	- upper proepisternal seta
CS	- cervical sclerite	PK	- prealar knob
CxS	- coxal seta	PIA	- pleural apophysis
Cv	- cervix	PIT	- pleural thread
DA	- dorsocentral area	Pm	- proepimeron
DS	- dorsocentral seta	PM	- postprocoxal membrane
FP	- first phragma	PnS	- paranotal suture
HI	- halter	Ppn	- postpronotum
HyA	- hypostigmal area	PpS	- postpronotal seta
IA	- intersegmental apodeme	PPSR	- propleurosternal ridge
isr	- intersegmental ridge	PPSS	- propleurosternal suture
iss	- intersegmental suture	pr	- propleural ridge
LPT	- lower pleurotergite	PrAp	- prealar apophysis
LPtA	- lower pleurotergite apodeme	PrP	- prescutal pit
LSS	- lateral scutellar seta	PrS	- prescutal suture
MAeR	- mesanepimeral ridge	Ps	- proepisternum
Mam	- mesanepimeron	PS	- postspiracular seta
MC	- mesocoxal cavity	PsA	- prespiracular area
McC	- metacoxal cavity	Psi	- parascutellar inflexion
Mdt	- mediotergite	PSP	- parascutellar process
Mef	- mesofurca	SA	- subspiracular area
Mem	- metameron	SaA	- supraalar area
MesR	- mesosternal ridge	SaG	- supraalar groove
MeSU	- upper mesepimeral seta	Sal	- subalare
Mkm	- meskatepimeron	SaS	- supraalar seta
Mks	- meskatepisternum	ScA	- scutal angle
MkSL	- lower meskatepisternal seta	Scu	- scutum
MkSU	- upper meskatepisternal seta	SeP	- second phragma
Mpn	- mesopostnotum	SF	- scutal fossa
MPSR	- mesopleurosternal ridge	SpS	- spiracular sclerite
mr	- mesopleural ridge	StA	- sternal apophysis
ms	- mesopleural suture	Stm	- scutellum
MS	- mesothoracic spiracle	TnS	- transnotal suture
MSFS	- median scutal fossal seta	UPt	- upper pleurotergite
Msm	- mesomeron	UPtA	- upper pleurotergite apodeme
MSS	- median scutellar seta	W	- wing
Mtm	- metepimeron	I	- abdominal segment I
Mtn	- metanotum		

FIGURE 13

- a. *Anopheles (Anopheles) quadrimaculatus* Say. Lateral aspect (left side) of thorax of female.
- b. *Toxorhynchites (Toxorhynchites) brevivalpis* Theobald. Junction of metathorax and abdomen.
- c. *Culex (Melanoconion) opisthopus* Komp. Lateral aspect (left side) of thorax of female.
- d. *Culex (Culex) salinarius* Coquillett. Junction of metathorax and abdomen of female.

Abbreviations

AEC	- anepisternal cleft	MtS	- metathoracic spiracle
AnA	- antealar area	Pa	- paratergite
AnS	- antealar seta	PA	- postspiracular area
AnSc	- antealar scale	PAP	- pleural apophyseal pit
Ap	- antepnotum	PaS	- prealar seta
ApS	- antepnotal seta	PCP	- pleural coxal process
Ba	- basalare	PeSU	- upper proepisternal seta
HyA	- hypostigmal area	PK	- prealar knob
ICI	- intersegmental cleft	Pm	- proepimeron
iss	- intersegmental suture	PM	- postprocoxal membrane
LPt	- lower pleurotergite	PMas	- posterior mesanepisternum
Mam	- mesanepimeron	PnS	- paranotal suture
Mom	- metameron	Ppn	- postpronotum
MeSL	- lower mesepimeral seta	PpS	- postpronotal seta
MeSU	- upper mesepimeral seta	PrB	- prealar bridge
Mkm	- meskatepimeron	PrP	- prescutal pit
Mks	- meskatepisternum	PrS	- prescutal suture
MkSL	- lower meskatepisternal seta	ps	- propleural suture
MkSU	- upper meskatepisternal seta	Ps	- proepisternum
ms	- mesopleural suture	PsA	- prespiracular area
MS	- mesothoracic spiracle	pwp	- pleural wing process
MScL	- lower meskatepisternal scale	SA	- subspiracular area
MScU	- upper meskatepisternal scale	SaA	- supraalar area
Msm	- mesomeron	SaG	- supraalar groove
Mtm	- metepimeron	Sal	- subalare
Mtn	- metanotum	ScA	- scutal angle
Mtpn	- metapostnotum	Scu	- scutum
Mtr	- mesotrochantin	SF	- scutal fossa
mts	- metapleural suture	SpS	- spiracular sclerite
Mts	- metepisternum	UPSc	- upper postpronotal scale

Fig.13

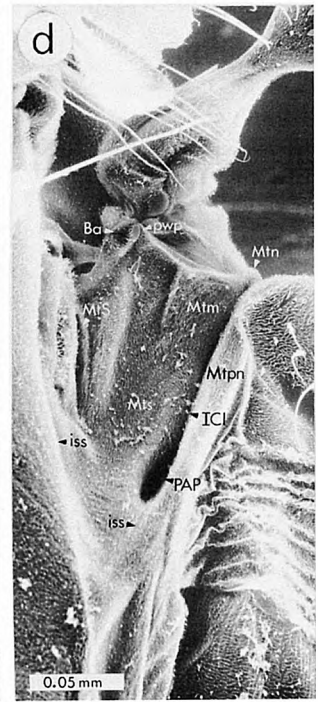
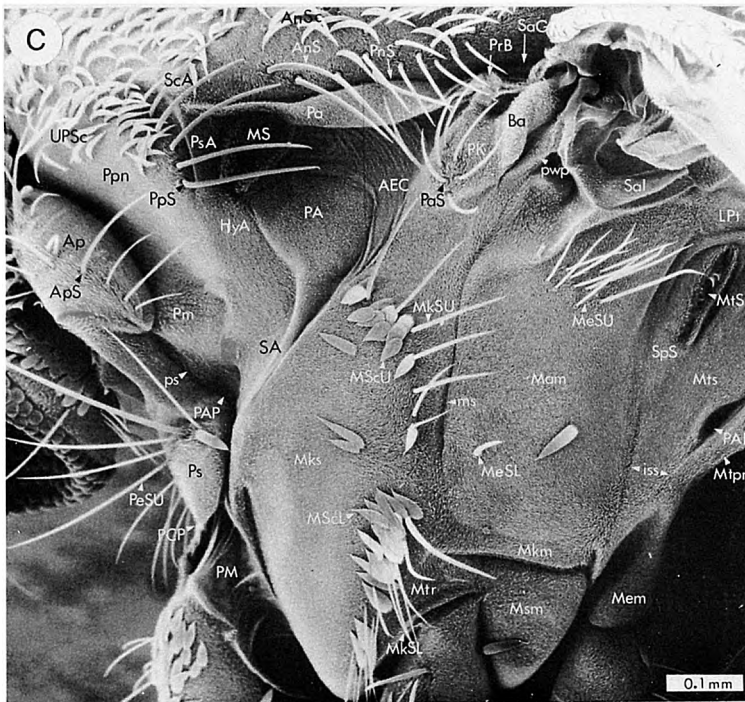
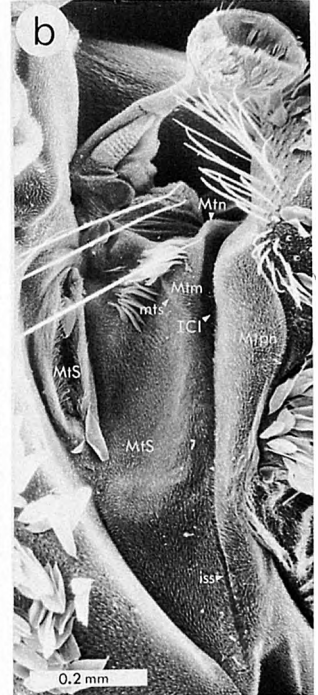
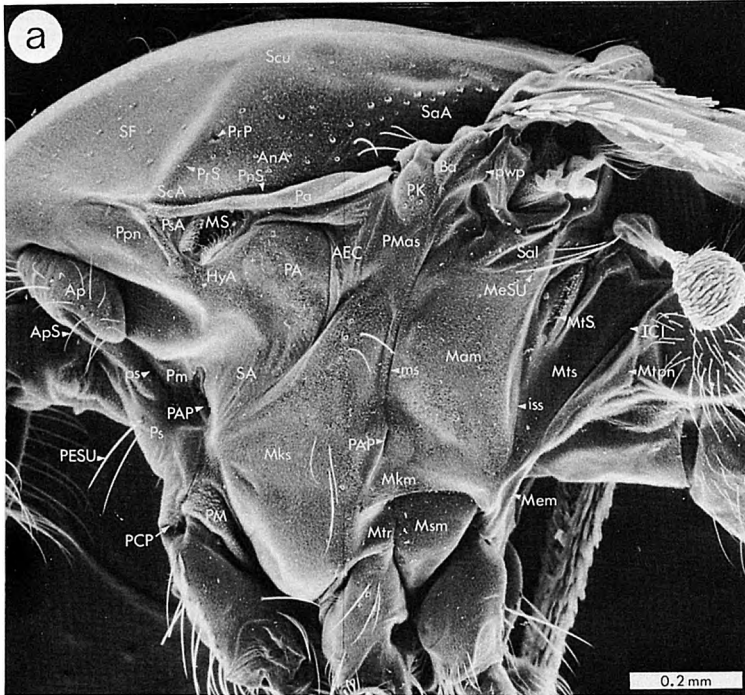


FIGURE 14

a-b. Thorax of male *Aedes (Ochlerotatus) grossbecki* Dyar and Knab.

- a. Posterior aspect.
- b. Ventral aspect.

c. *Culiseta (Culiseta) inornata* (Williston). Dorsal internal aspect of venter of thorax. Modified from Owen (1977,432).

Abbreviations

AC	- apophyseal cup	Mst	- mesosternum
C-III	- hindcoxa	Mtbs	- metabasisternum
CS	- cervical sclerite	Mtfs	- metafurcasternum
Cv	- cervix	Mtn	- metanotum
Fe-III	- hindfemur	Mtpn	- metapostnotum
HI	- halter	Mtr	- mesotrochantin
isr	- intersegmental ridge	Mts	- metepisternum
iss	- intersegmental suture	MtS	- metathoracic spiracle
LSS	- lateral scutellar seta	Mtst	- metasternum
Mam	- mesanepimeron	PaS	- prealar seta
Mas	- mesanepisternum	Pbs	- probasisternum
MC	- mesocoxal cavity	PC	- procoxal cavity
McC	- metacoxal cavity	PcA	- postcoxal apodeme
Mdt	- mediotergite	pcr	- paracoxal ridge
Mef	- mesofurca	PeSU	- upper proepisternal seta
Mem	- metameron	Pfs	- profurcasternum
MesR	- mesosternal ridge	PK	- prealar knob
MesS	- mesosternal suture	PIA	- pleural apophysis
MeSU	- upper mesepimeral seta	PIT	- pleural thread
MetR	- metasternal ridge	PPSR	- propleurosternal ridge
MetS	- metasternal suture	PPSS	- propleurosternal suture
Mf	- metafurca	pr	- propleural ridge
Mkm	- meskatepimeron	Ps	- proepisternum
Mks	- meskatepisternum	Pt	- pleurotergite
MksB	- meskatepisternal bridge	Px	- postcoxale
MksL	- lower meskatepisternal seta	Sal	- subalare
MksU	- upper meskatepisternal seta	SCP	- sternal coxal process
MPSR	- mesopleurosternal ridge	Sct	- sternacosta
MPSS	- mesopleurosternal suture	StA	- sternal apophysis
mr	- mesopleural ridge	Stm	- scutellum
ms	- mesopleural suture	Tr-III	- hindtrochanter
Msm	- mesomeron	W	- wing
MSS	- median scutellar seta	I	- abdominal segment I



Fig. 14

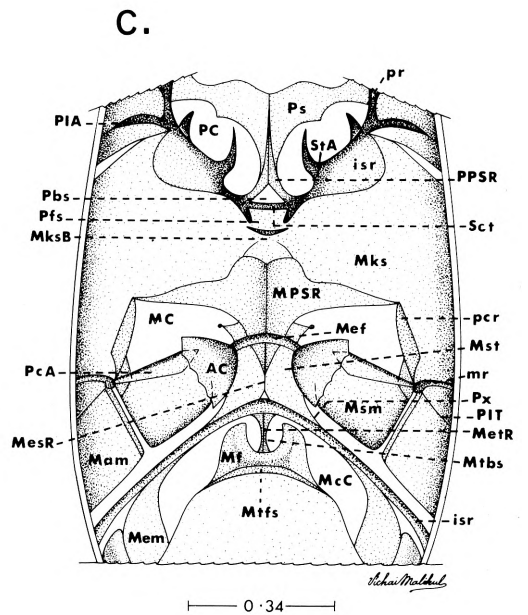
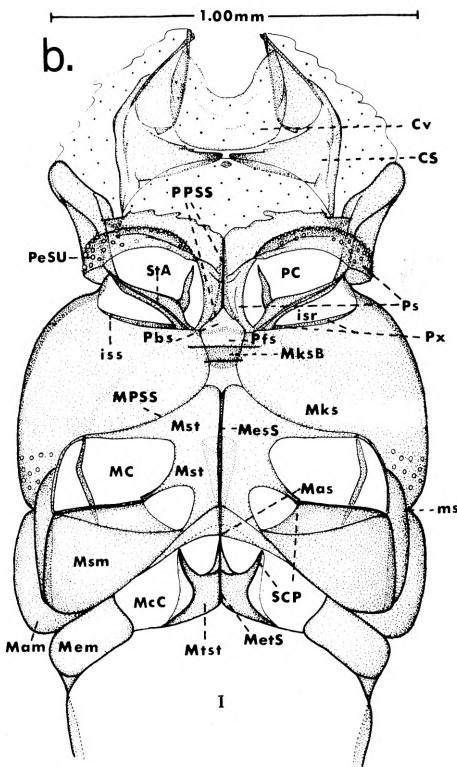
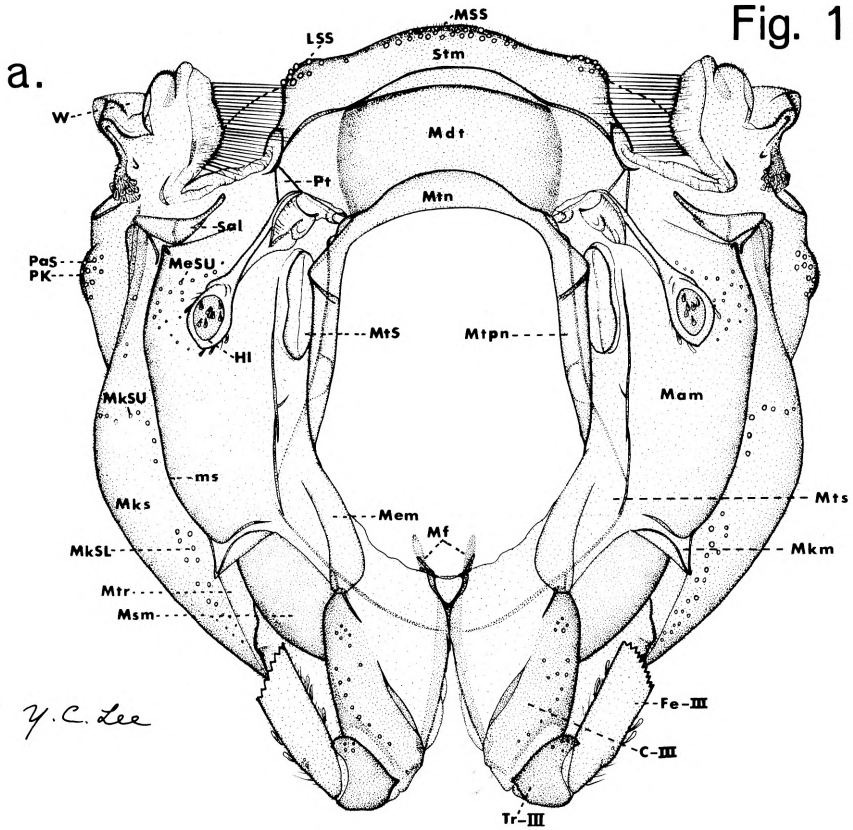



FIGURE 15

Sternal areas of thorax of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.

- a. Ventral aspect (coxae removed). Insert same of pro- and mesosternal area of *Culex (Culex) salinarius* Coquillett.
- b. Laterodorsal (left side) internal aspect.
- d. Dorsal internal aspect of prosternum.
- e. Lateroposterior internal aspect of meso- and metasternum.

Abbreviations



AC	- apophyseal cup
isr	- intersegmental ridge
iss	- intersegmental suture
Mbs	- mesobasisternum
MC	- mesocoxal cavity
McC	- metacoxal cavity
Mef	- mesofurca
MesR	- mesosternal ridge
MesS	- mesosternal suture
MetR	- metasternal ridge
MetS	- metasternal suture
Mf	- mesofurcasternum
MPSR	- mesopleurosternal ridge
MPSS	- mesopleurosternal suture
Mtbs	- metabasisternum
Mtfs	- metafurcasternum
Pbs	- probasisternum
PC	- procoxal cavity
PcA	- postcoxal apodeme
pcr	- paracoxal ridge
Pfs	- profurcasternum
PPSR	- propleurosternal ridge
PPSS	- propleurosternal suture
Ps	- proepisternum
SAP	- sternal apophyseal pit
SCP	- sternal coxal process
SctS	- sternacostal suture
StA	- sternal apophysis

Fig.15

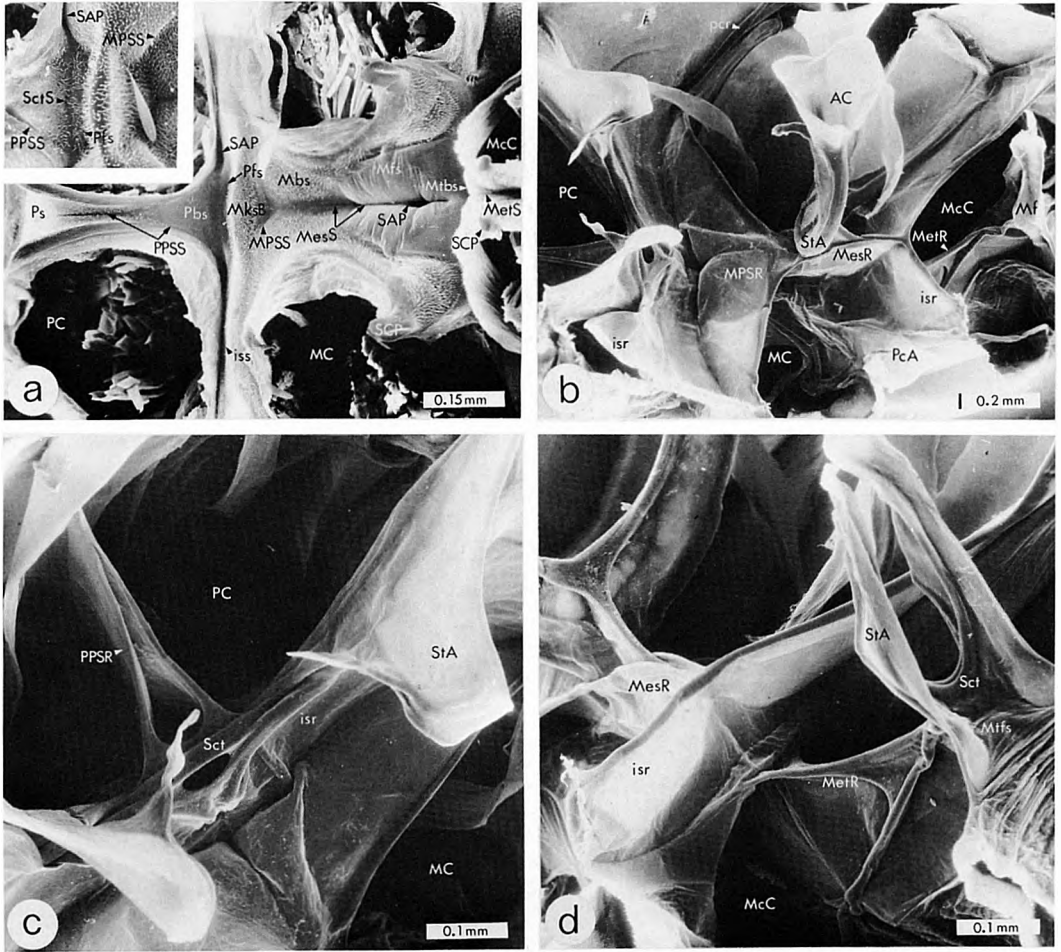


FIGURE 16

Thorax of adult mosquito (diagrammatic) showing location of groups of scales and setae (composite).
Modified from Belkin (1962, Fig.407).

- a-b. Dorsal aspect.
- c. Anterior aspect.
- d-e. Lateral aspect (left side).

Abbreviations

AcS	- acrostichal seta	MtSc	- metepisternal scale
AcSc	- acrostichal scale	PaS	- prealar seta
ADS	- anterior dorsocentral seta	PaSc	- paratergal scale
ADSc	- anterior dorsocentral scale	PDS	- posterior dorsocentral seta
AMSc	- anterior mesepimeral scale	PDSc	- posterior dorsocentral scale
AnS	- antealar seta	PeSL	- lower proepisternal seta
AnSc	- antealar scale	PeSU	- upper proepisternal seta
ApS	- antepronotal seta	PmSc	- proepimeral scale
ApSc	- antepronotal scale	PMSc	- posterior mesepimeral scale
ASFS	- anterior scutal fossal seta	PMSS	- posterior medial scutal seta
CxS	- coxal seta	PoSc	- postspiracular scale
HySc	- hypostigmal scale	PpS	- postpronotal seta
LMSc	- lower mesepimeral scale	PrA	- prescutellar area
LPrSc	- lower prealar scale	PrsS	- prescutellar seta
LPSc	- lower postpronotal scale	PS	- postspiracular seta
LSFS	- lateral scutal fossal seta	PScU	- upper proepisternal scale
LSS	- lateral scutellar seta	PSFS	- posterior scutal fossal seta
LSSc	- lateral scutellar scale	PsS	- prespiracular seta
MAPS	- median anterior promontory seta	PsSc	- prespiracular scale
MeSc	- metamerical scale	SaS	- supraalar seta
MeSL	- lower mesepimeral seta	SaSc	- supraalar scale
MeSU	- upper mesepimeral seta	SFSL	- lateral scutal fossal scale
MkSL	- lower meskatepisternal seta	SFSM	- median scutal fossal scale
MkSU	- upper meskatepisternal seta	SFSP	- posterior scutal fossal scale
MpnS	- mesopostnotal seta	SSc	- subspiracular scale
MpSc	- mesopostnotal scale	SSPL	- lateral prescutellar scale
MScL	- lower meskatepisternal scale	SSPM	- median prescutellar scale
MScU	- upper meskatepisternal scale	UMSc	- upper mesepimeral scale
MSFS	- median scutal fossal seta	UPrSc	- upper prealar scale
MSS	- median scutellar seta	UPSc	- upper postpronotal scale
MSSc	- median scutellar scale		

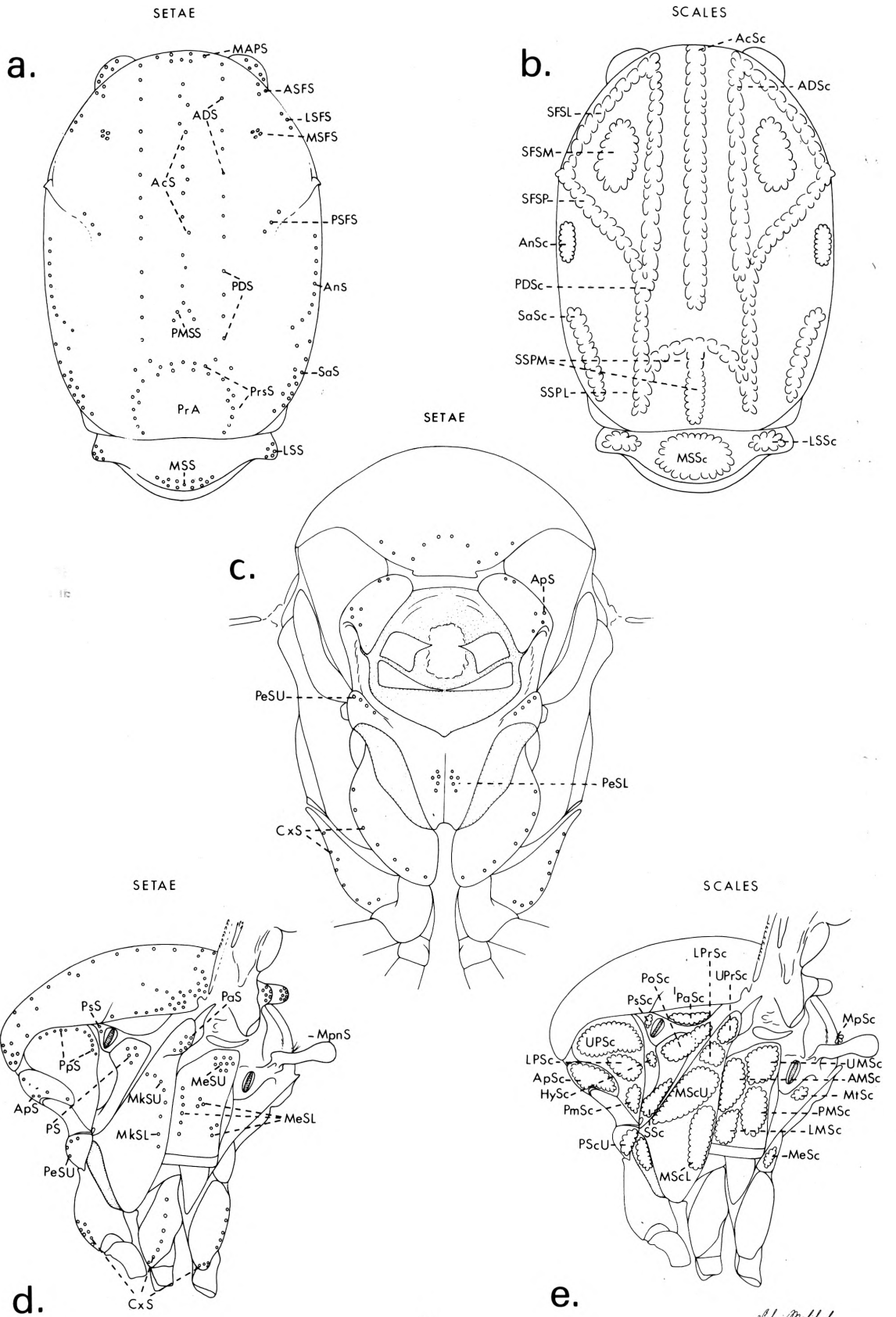


FIGURE 17

- a. Right wing of *Uranotaenia (Uranotaenia) lowii* Theobald. Dorsal aspect.
- b. Left wing of *Aedes (Ochlerotatus) stricticus* (Meigen). Ventral aspect.
- c. Enlarged view of wing margin of b.
- d. Left halter of *Aedes (Ochlerotatus) grossbecki* Dyar and Knab. Lateral aspect.
- e. Articulation of left wing of *Culiseta (Culiseta) inornata* (Williston). Dorsal aspect. Redrawn from Owen (1977,436).
- f. Hypothetical wing of *Anopheles* subgenus *Cellia*. Dorsal aspect of right wing. Redrawn from Harrison (1979,309).

Abbreviations

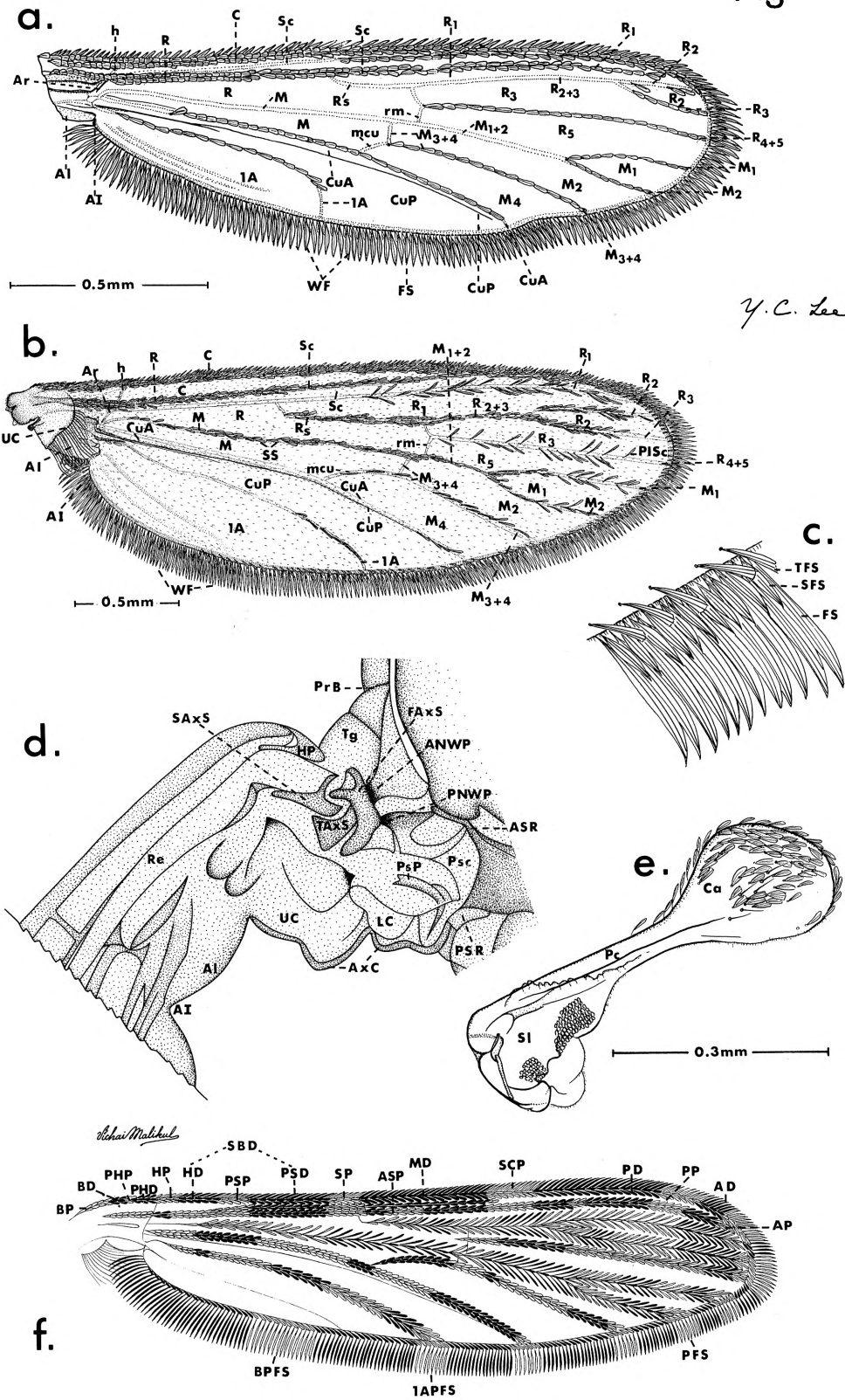
AI	- axillary incision
Al	- alula
ANWP	- anterior notal wing process
Ar	- arculus
ASR	- anterior scutellar ridge
AxC	- axillary cord
C	- costa and cell
Ca	- capitellum
CuA	- cubitus anterior and cell
CuP	- cubitus posterior and cell
FAxS	- first axillary sclerite
FS	- fringe scale
h	- humeral crossvein
HP	- humeral plate
LC	- lower calypter
M	- media and cell
M₁	- media-one and cell
M₁₊₂	- media-one-plus-two
M₂	- media-two and cell
M₃₊₄	- media-three-plus-four
M₄	- cell
mcu	- mediocubital crossvein
Pc	- pedicel
PISc	- plume scale
PNWP	- postmedian notal wing process
PrB	- prealar bridge
Psc	- parascutellum
PsP	- parascutellar process
PSR	- posterior scutellar ridge
R	- radius and cell
R₁	- radius-one and cell
R₂	- radius-two and cell
R₂₊₃	- radius-two-plus-three
R₃	- radius-three and cell
R₄₊₅	- radius-four-plus-five
R₅	- cell

R_s	- radial sector
Re	- remigium
rm	- radiomedial crossvein
SAXS	- second axillary sclerite
Sc	- subcosta and cell
SFS	- secondary fringe scale
SI	- scabellum
SS	- squame scale
TAXS	- third axillary sclerite
TFS	- tertiary fringe scale
Tg	- tegula
UC	- upper calypter
WF	- wing fringe
1A	- anal vein and cell

Wing Spots

AD	- apical dark
AP	- apical pale
ASP	- accessory sector pale
BD	- basal dark
BP	- basal pale
BPFS	- basal pale fringe spot
HD	- humeral dark
HP	- humeral pale
MD	- median dark
PD	- preapical dark
PFS	- pale fringe spot
PHD	- prehumeral dark
PHP	- prehumeral pale
PP	- preapical pale
PSD	- presector dark
PSP	- presector pale
SBD	- subbasal dark
SCP	- subcostal pale
SP	- sector pale
1APFS	- 1A pale fringe spot

Fig. 17



Y. C. Lee

FIGURE 18

Legs of male *Aedes (Ochlerotatus) grossbecki* Dyar and Knab.

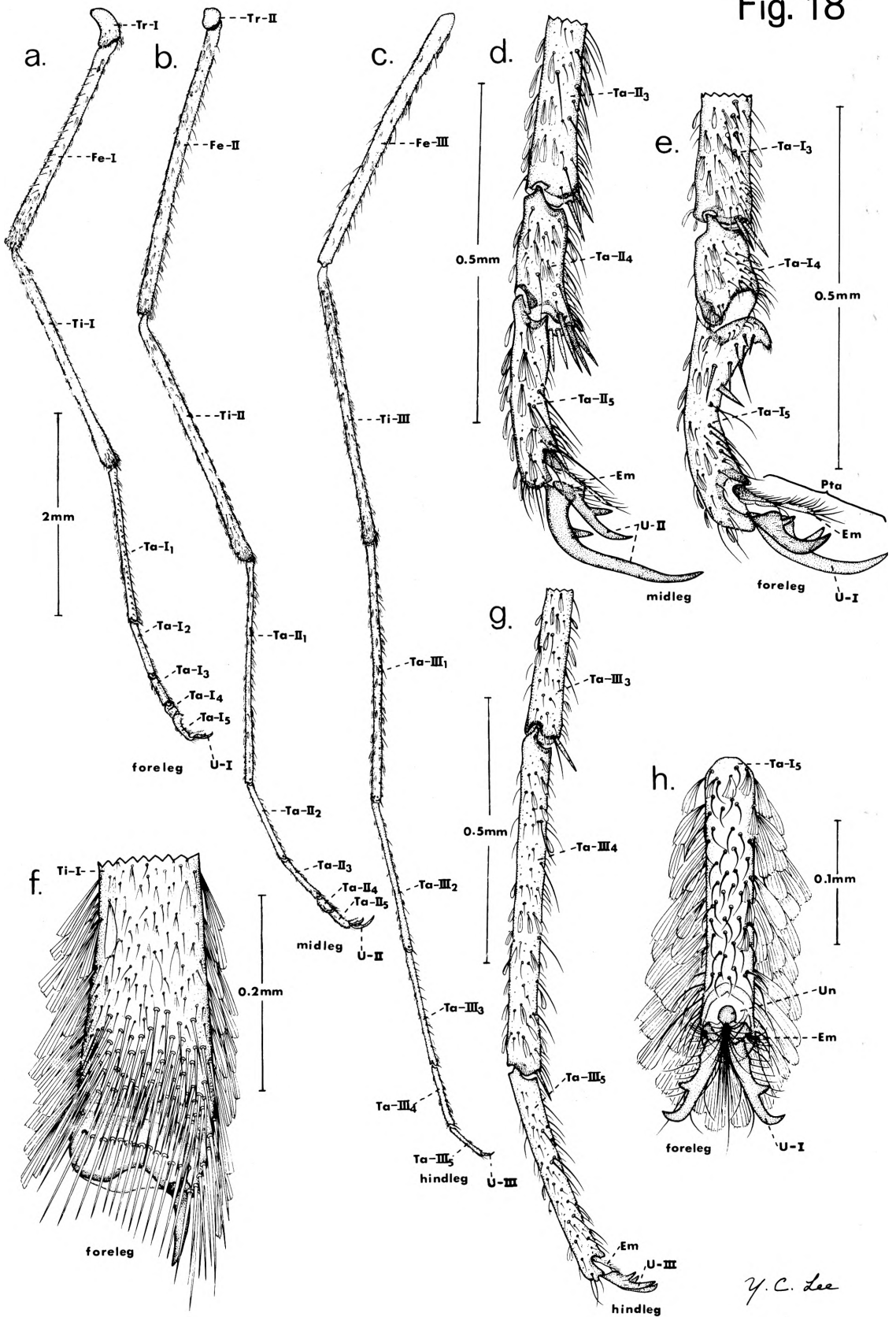
- a. Lateral aspect of foreleg.
- b. Lateral aspect of midleg.
- c. Lateral aspect of hindleg.
- d. Lateral aspect of terminal part of midleg.
- e. Lateral aspect of terminal part of foreleg.
- f. Mesal aspect of terminal part of foretibia.
- g. Lateral aspect of terminal part of hindleg.
- h. Ventral aspect of terminal part of foreleg.

Abbreviations

Em	- empodium
Fe-I	- forefemur
Fe-II	- midfemur
Fe-III	- hindfemur
Pta	- posttarsus
*Ta-I	- foretarsus
*Ta-II	- midtarsus
*Ta-III	- hindtarsus
Ti-I	- foretibia
Ti-II	- midtibia
Ti-III	- hindtibia
Tr-I	- foretrochanter
Tr-II	- midtrochanter
U-I	- foreunguis
U-II	- midunguis
U-III	- hindunguis
Un	- unguitactor plate

***Subscript numerals designated tarsomeres.**

Fig. 18



Y. C. Lee

FIGURE 19

- a. Dorsal aspect of scutum and scutellum of *Culex (Melanoconion) ocosa* Dyar and Knab.
 b-d. *Culiseta (Culiseta) inornata* (Williston).
 b. Dorsal aspect of part of thorax, left wing and halter.
 c. Dorsal aspect of right wing.
 d. Dorsal aspect of area of posterior margin of right wing.
 e. Lateroventral aspect of posttarsus of left midleg of female *Anopheles (Anopheles) quadrimaculatus* Say.

Abbreviations

AcSc	- acrostichal scale	Psc	- parascutellum
ADS	- anterior dorsocentral seta	PscS	- parascutellar seta
Al	- alula	PSFS	- posterior scutal fossal seta
ASR	- anterior scutellar ridge	PsP	- parascutellar process
AtS	- antecostal suture	PSR	- posterior scutellar ridge
C	- costa and cell	Pta	- posttarsus
CuA	- cubitus anterior and cell	R	- radius and cell
CuP	- cubitus posterior and cell	R₁	- radius-one and cell
DS	- dorsocentral seta	R₂	- radius-two and cell
Em	- empodium	R₂₊₃	- radius-two-plus-three
FS	- fringe scale	R₃	- radius-three and cell
h	- humeral crossvein	R₄₊₅	- radius-four-plus-five
HI	- halter	R₅	- cell
HP	- humeral plate	R_s	- radial sector
ICI	- intersegmental cleft	Re	- remigium
IDSc	- inner dorsocentral scale	ReS	- remigial seta
LAPS	- lateral anterior promontory seta	rm	- radiomedial crossvein
LSS	- lateral scutellar seta	SaA	- supraalar area
M	- media and cell	SaS	- supraalar seta
M₁	- media-one and cell	SaSc	- supraalar scale
M₁₊₂	- media-one-plus-two	Sc	- subcosta and cell
M₂	- media-two and cell	Scu	- scutum
M₃₊₄	- media-three-plus-four	SFS	- secondary fringe scale
M₄	- cell	SFSc	- scutal fossal scale
MAPS	- median anterior promontory seta	SS	- squame scale
mcu	- mediocubital crossvein	SSPL	- lateral prescutellar scale
Mpn	- mesopostnotum	sss	- scutoscutellar suture
MSS	- median scutellar seta	Strn	- scutellum
MSSc	- median scutellar scale	TFS	- tertiary fringe scale
Mtn	- metanotum	Tg	- tegula
Mtpn	- metapostnotum	U	- unguis
ODSc	- outer dorsocentral scale	UC	- upper calypter
PDS	- posterior dorsocentral seta	Un	- unguitactor plate
PISc	- plume scale	WM	- wing membrane
PrA	- prescutellar area	1A	- anal vein and cell
PrsS	- prescutellar seta		

Fig.19

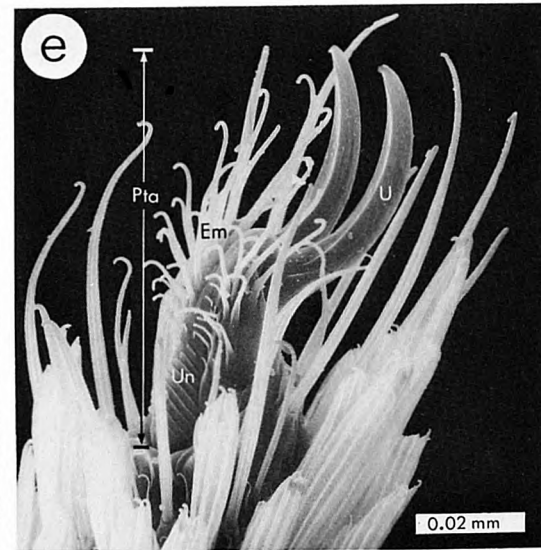
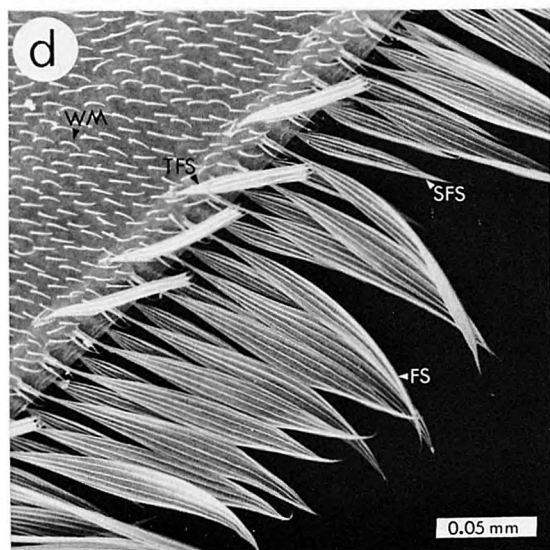
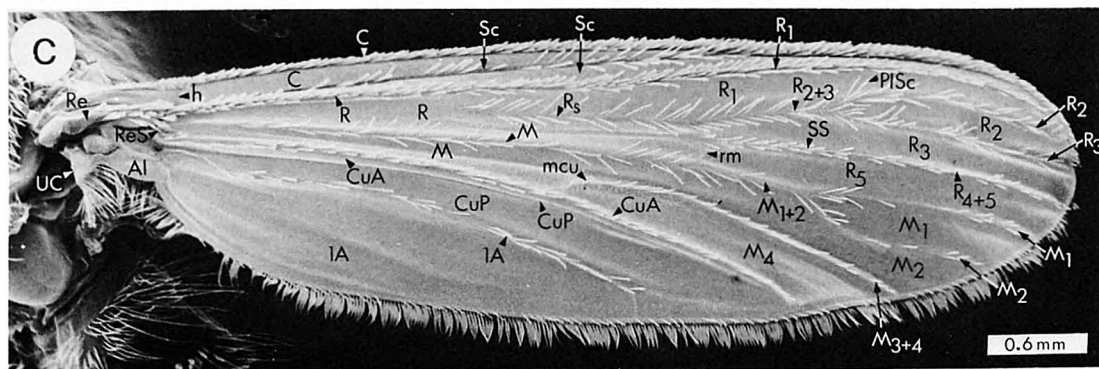
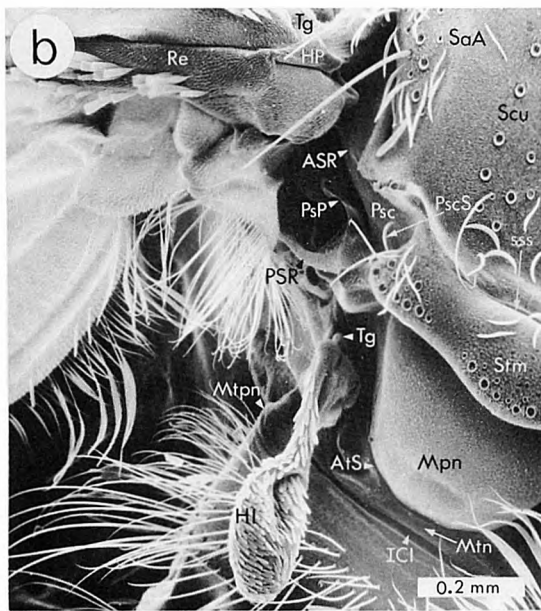
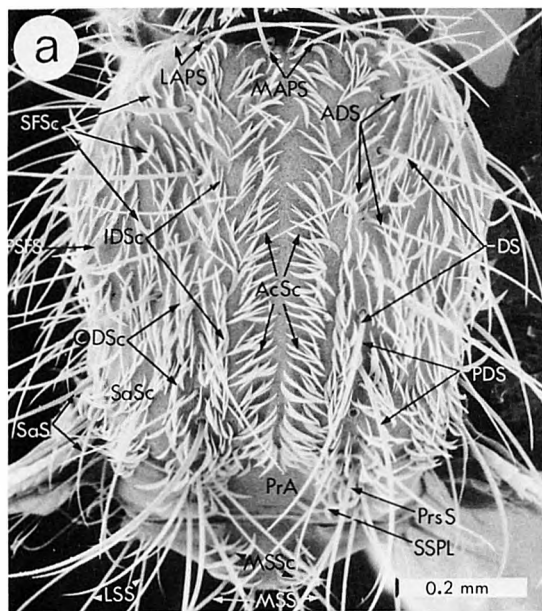


FIGURE 20

tedes (Ochlerotatus) grossbecki Dyar and Knab.

- a. Lateral aspect of female abdomen.
- b. Lateral aspect (left side) of male abdominal segments I and II.
- c. Lateral aspect (left side) of male terminal abdominal segments prior to axial rotation.

Abbreviations



AbS	- abdominal spiracle
BP	- basal piece
Ce	- cercus
CF	- claspette filament
Cl	- claspette
CSt	- claspette stem
Gc	- gonocoxite
GC	- gonostylar claw
Gs	- gonostylus
IM	- intersegmental membrane
Mt	- metathorax
PGL	- postgenital lobe
PMe	- pleural membrane
SCa	- spermathecal capsule
I-IX-S	- sterna I-IX
I-IX-Te	- terga I-IX

Fig. 20

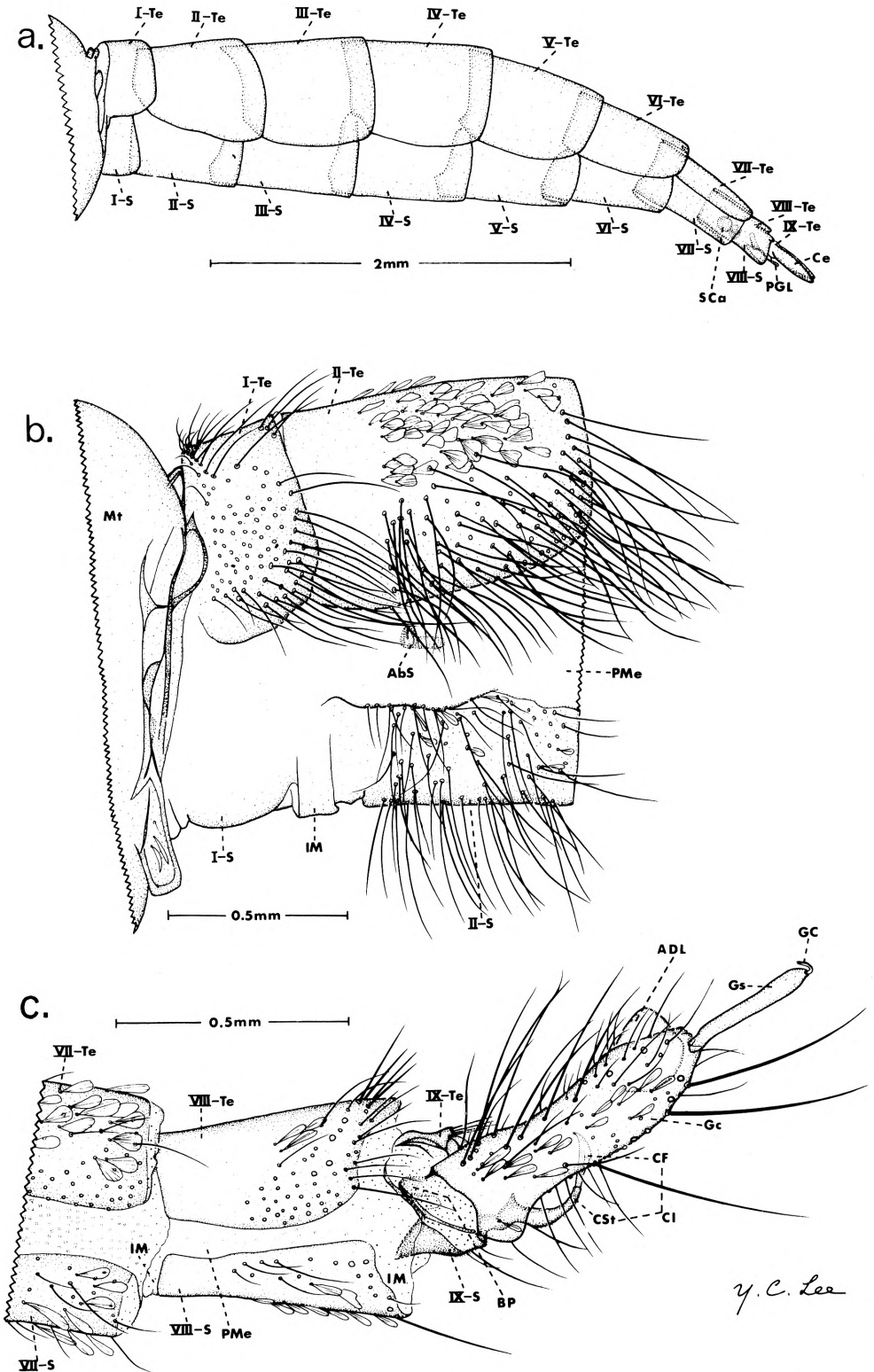


FIGURE 21

- a. Dorsal (prerotation sense) aspect of male genitalia of *Anopheles (Nyssorhynchus) trinkae* Faran
Redrawn from Faran (1979,38).
- b. Dorsal (prerotation sense) aspect of male genitalia of *Aedes (Verrallina) indicus* (Theobald).
Redrawn from Reinert (1974a, Fig.30).

Abbreviations

ADL	-	apicodorsal lobe
Ae	-	aedeagus
AeS	-	aedeagal sclerite
AsS	-	accessory seta
BML	-	basal mesal lobe
BP	-	basal piece
Cl	-	claspette
Gc	-	gonocoxite
GC	-	gonostylar claw
Gs	-	gonostylus
InS	-	internal seta
MM	-	mesal membrane
OP	-	opisthophallus
OPS	-	opisthophallic sclerite
Par	-	paramere
PBL	-	parabasal lobe
PBS	-	parabasal seta
Ph	-	phallus
PH	-	phallosome
PO	-	prosophallus
POS	-	prosophallic sclerite
Ppr	-	paraproct
IX-S	-	sternum IX

Fig. 21

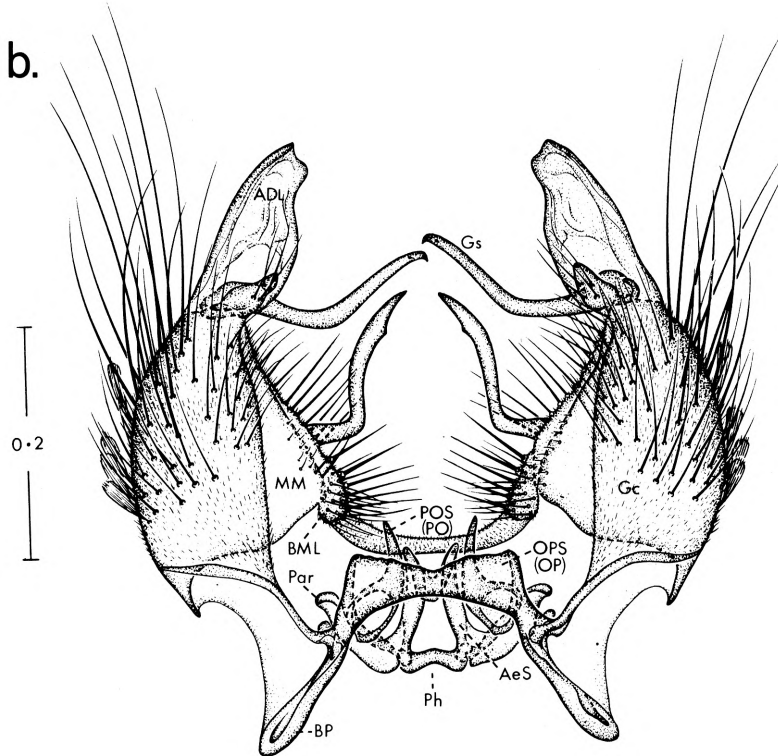
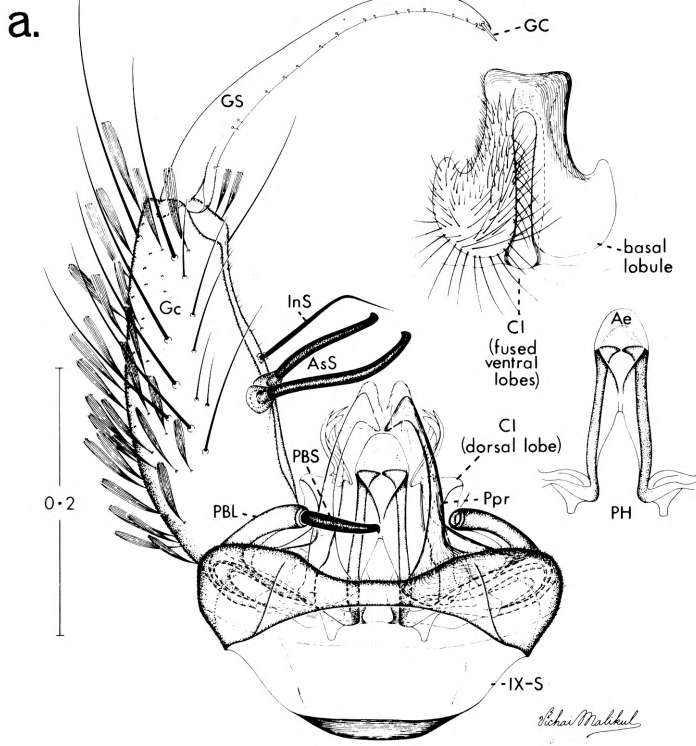


FIGURE 22

a-b. *Aedes (Finlaya) dorseyi* Knight.

a. Dorsal (prerotation sense) aspect of male genitalia.

b. Dorsal (prerotation sense) aspect of phallosome.

c. *Aedes (Ochlerotatus) grossbecki* Dyar and Knab. Ventral (prerotation sense) aspect of male terminal abdominal segments.

d-e. *Aedes (Ochlerotatus) stimulans* (Walker).

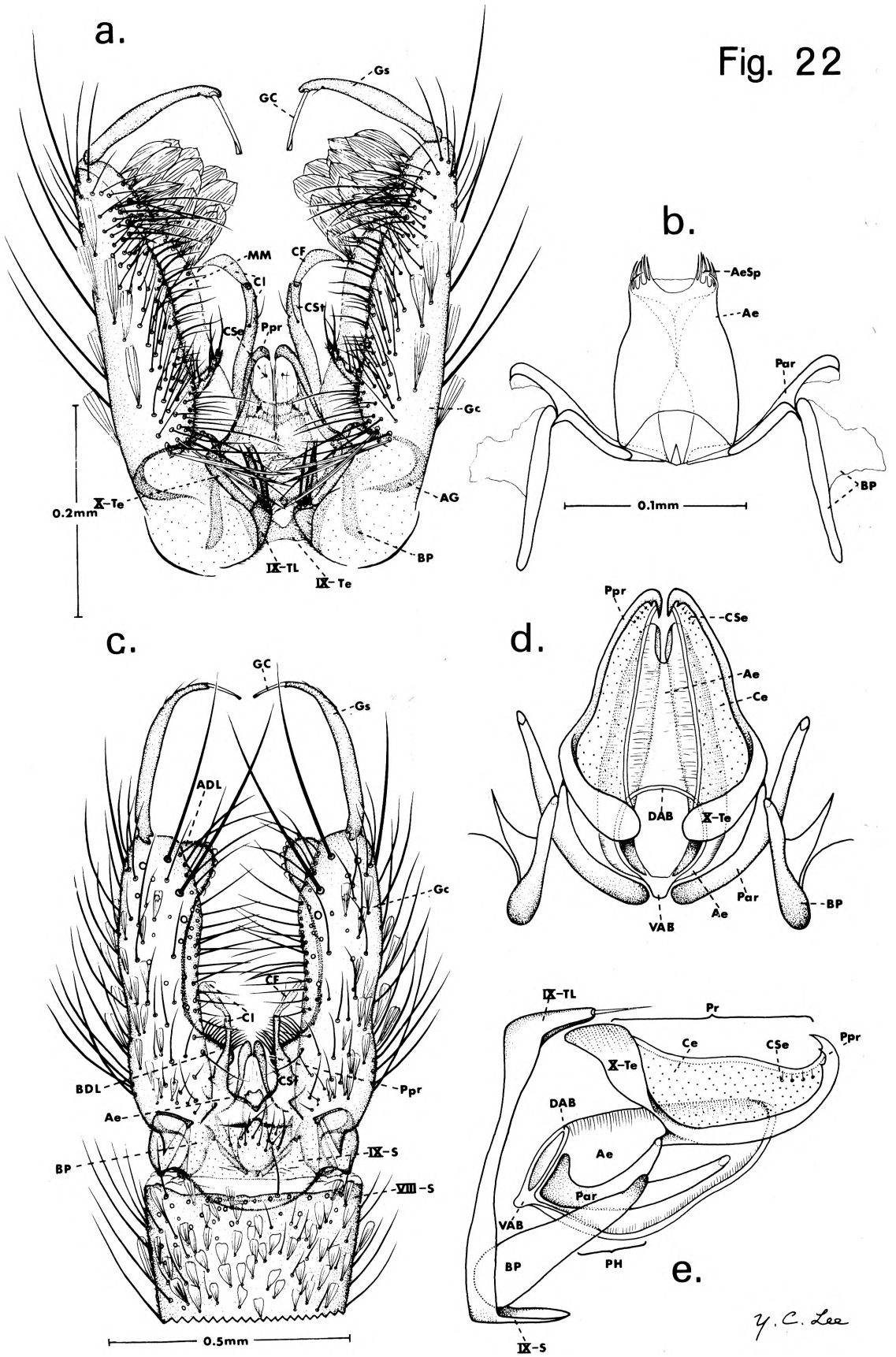
d. Dorsal (prerotation sense) aspect of phallosome and proctiger (diagramatic). Redrawn from Matheson (1929,16).

e. Lateral (left side in prerotation sense) aspect of phallosome and proctiger (diagramatic). Redrawn from Matheson (1929,17).

Abbreviations

ADL	-	apicodorsal lobe
Ae	-	aedeagus
AeSp	-	aedeagal spicule
AG	-	apodeme of gonocoxite
BDL	-	basal dorsomesal lobe
BP	-	basal piece
Ce	-	cercus
CF	-	claspette filament
Cl	-	claspette
CSe	-	cercal seta
CSt	-	claspette stem
DAB	-	dorsal aedeagal bridge
Gc	-	gonocoxite
GC	-	gonostylar claw
Gs	-	gonostylus
MM	-	mesal membrane
Par	-	paramere
PH	-	phallosome
Ppr	-	paraproct
Pr	-	proctiger
VAB	-	ventral aedeagal bridge
VIII-S	-	sternum VIII
IX-S	-	sternum IX
IX-Te	-	tergum IX
IX-TL	-	tergum IX lobe
X-Te	-	tergum X

Fig. 22



Y. C. Lee

FIGURE 23

a,c-f. Male genitalia of *Culex (Culex) pipiens* Linnaeus.

- a. Dorsal aspect (prerotation sense).
- c. Ventral aspect (prerotation sense) of phallosome and proctiger.
- d. Dorsal aspect (prerotation sense) of phallosome.
- e. Mesal aspect of left half (prerotation sense) of phallosome and proctiger.
- f. Lateral aspect of right side (prerotation sense) of phallosome and proctiger.

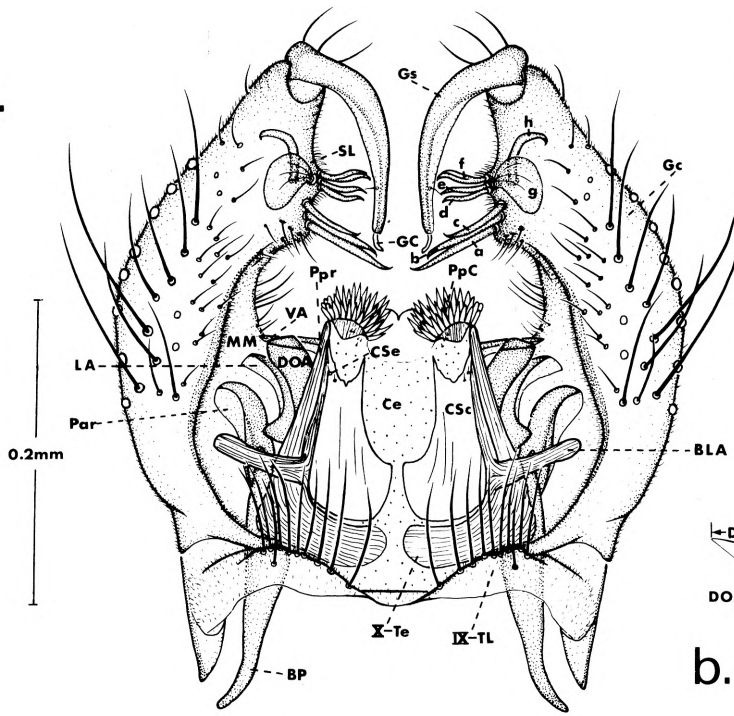
b. Dorsal and ventral arms of lateral plates of *Culex* male (diagrammatic) illustrating measurements (DV and D) used to calculate the ratio DV/D. Redrawn from Dobrotworsky and Drummond (1953,136).

Abbreviations

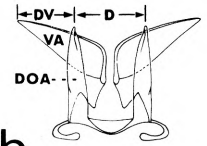
AeS	- aedeagal sclerite
a-h	- setae a-h
BLA	- basal lateral arm
BP	- basal piece
Ce	- cercus
CSc	- cercal sclerite
CSe	- cercal seta
D	- see DV/D in text
DAB	- dorsal aedeagal bridge
DOA	- dorsal arm
DV	- see DV/D in text
Gc	- gonocoxite
GC	- gonostylar claw
Gs	- gonostylus
ID	- inner division
LA	- lateral arm
LP	- lateral plate
MM	- mesal membrane
OD	- outer division
Par	- paramere
PpC	- paraproct crown
Ppr	- paraproct
Pr	- proctiger
SL	- subapical lobe
VA	- ventral arm
VAB	- ventral aedeagal bridge
IX-Te	- tergum IX
IX-TL	- tergum IX lobe
X-Te	- tergum X



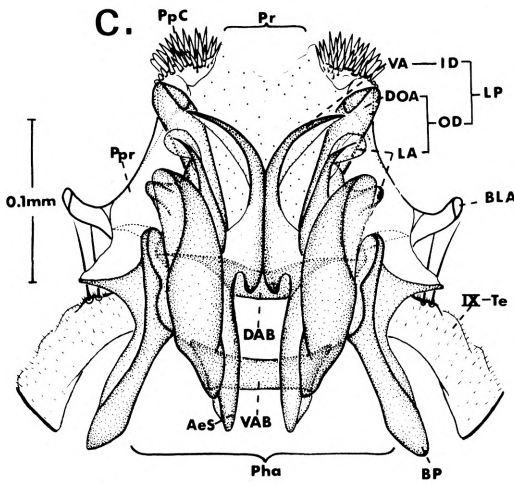
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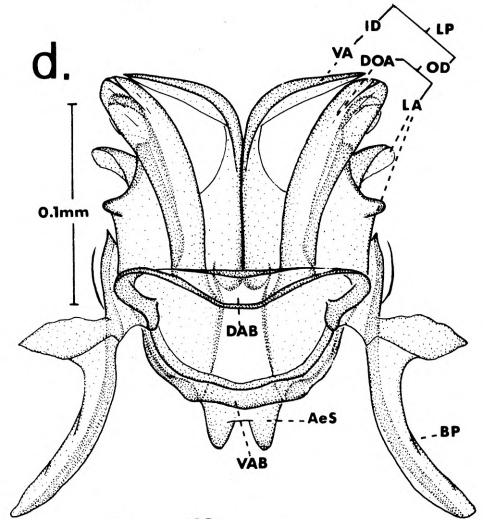
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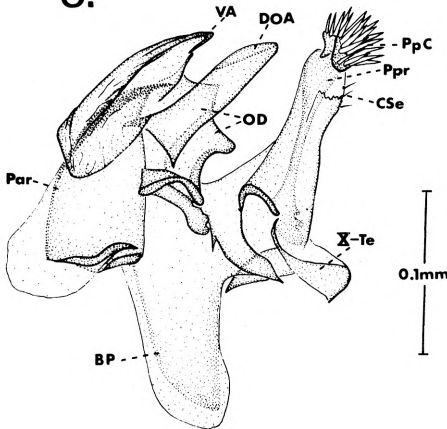
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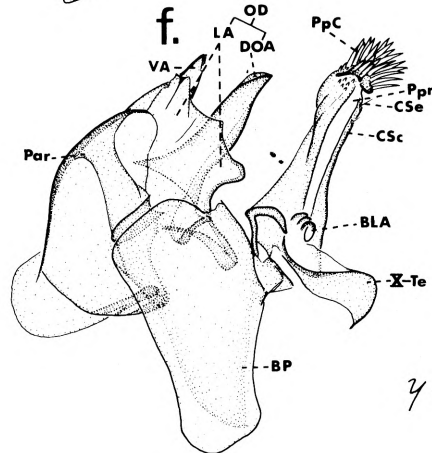
d.



e.



f.



Y. C. Lee

FIGURE 24

- a. Ventral aspect (prerotation sense) of male genitalia of *Anopheles (Anopheles) quadrimaculatus* Say.
- b. Ventral aspect (prerotation sense) of male genitalia of *Aedes (Protomacleaya) triseriatus* (Say).
- c. Dorsal aspect (prerotation sense) of male genitalia of *Aedes (Stegomyia) aegypti* (Linnaeus).
- d. Lateroposterior (left side) (postrotation sense) aspect of male genitalia of *Culiseta (Culiseta) inornata* (Williston).
- e-f. Male genitalia of *Toxorhynchites (Toxorhynchites) brevivalpis* (Theobald).
 - e. Dorsal aspect (prerotation sense).
 - f. Dorsoposterior aspect (prerotation sense).

Abbreviations

AeS	- aedeagal sclerite
BML	- basal mesal lobe
CF	- claspette filament
Cl	- claspette
CSt	- claspette stem
Gc	- gonocoxite
Gs	- gonostylus
Ppr	- paraproct
Pr	- proctiger
IX-S	- sternum IX
IX-Te	- tergum IX
IX-TL	- tergum IX lobe
X-Te	- tergum X

Fig. 24

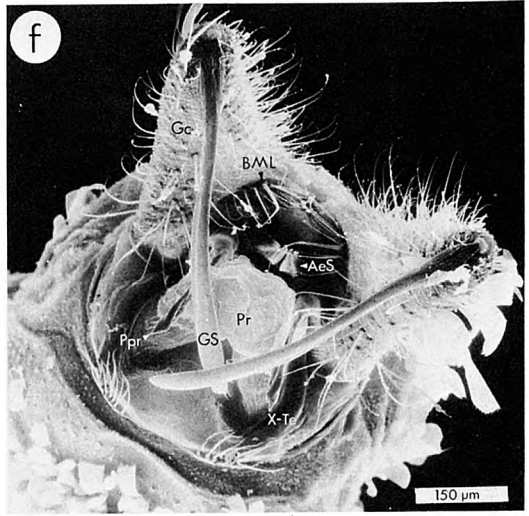
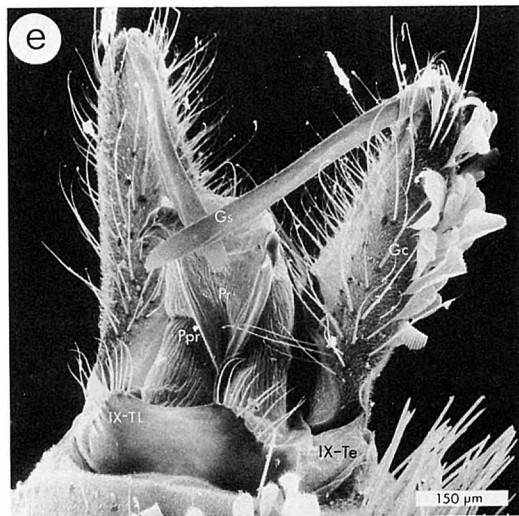
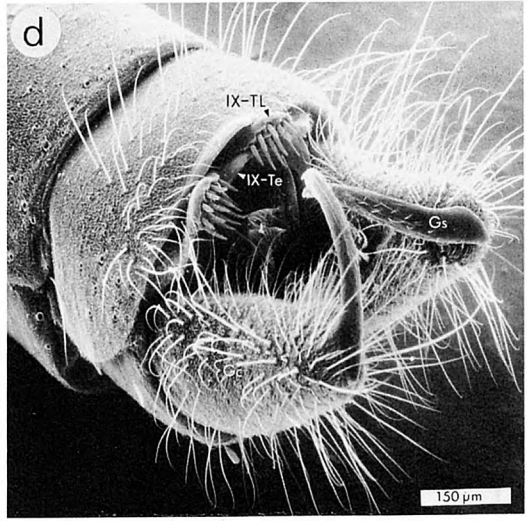
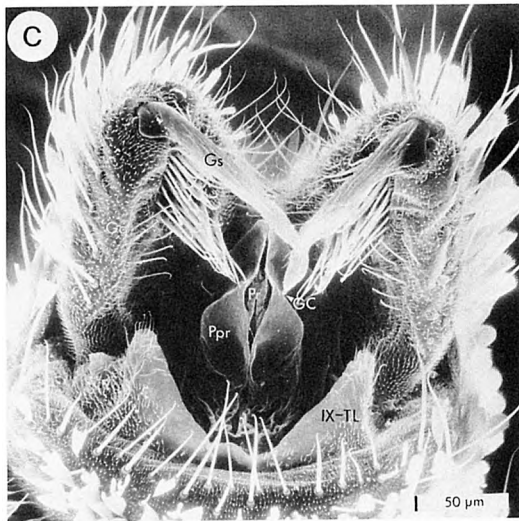
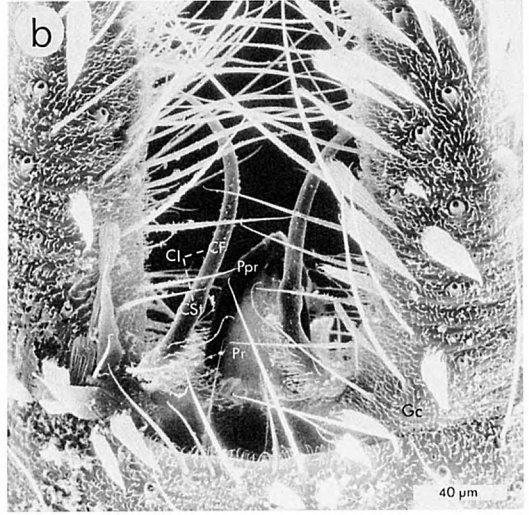
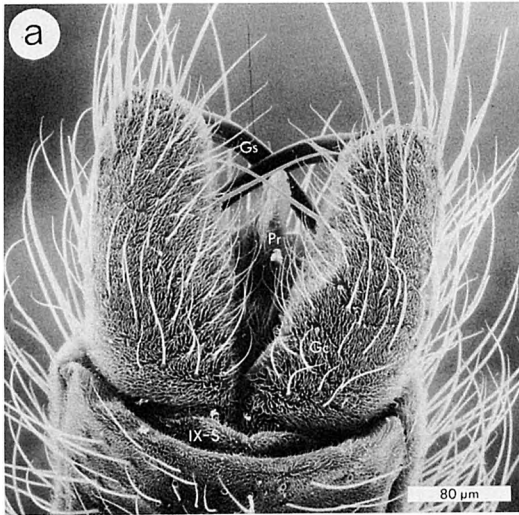


FIGURE 25

- a-b. Extended male genitalia of *Culex (Culex) salinarius* Coquillett.
a. Dorsal aspect (prerotation sense).
b. Lateral aspect (right side) (postrotation sense) with right gonocoxite removed.
- c-d. Resting female genitalia of *Culiseta (Culiseta) inornata* (Williston).
c. Dorsal aspect.
d. Caudal (slightly lateral) aspect.
- e-f. Extended female genitalia of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall).
e. Dorsocaudal aspect.
f. Laterocaudal aspect.

Abbreviations

Ae	- aedeagus
AeS	- aedeagal sclerite
a-h	- setae a-h
BLA	- basal lateral arm
Ce	- cercus
CSc	- cercal sclerite
CSe	- cercal seta
Gc	- gonocoxite
GC	- gonostylar claw
Go	- gonotreme
Gs	- gonostylus
ID	- inner division
IsS	- insular seta
LBP	- lateral basal process
LP	- lateral plate
LVL	- lower vaginal lip
OD	- outer division
Par	- paramere
PGL	- postgenital lobe
PpC	- paraproct crown
Ppr	- paraproct
Pr	- proctiger
SbP	- subbasal process
SL	- subapical lobe
UVL	- upper vaginal lip
VIII-Te	- tergum VIII
IX-Te	- tergum IX
IX-TL	- tergum IX lobe
X-Te	- tergum X

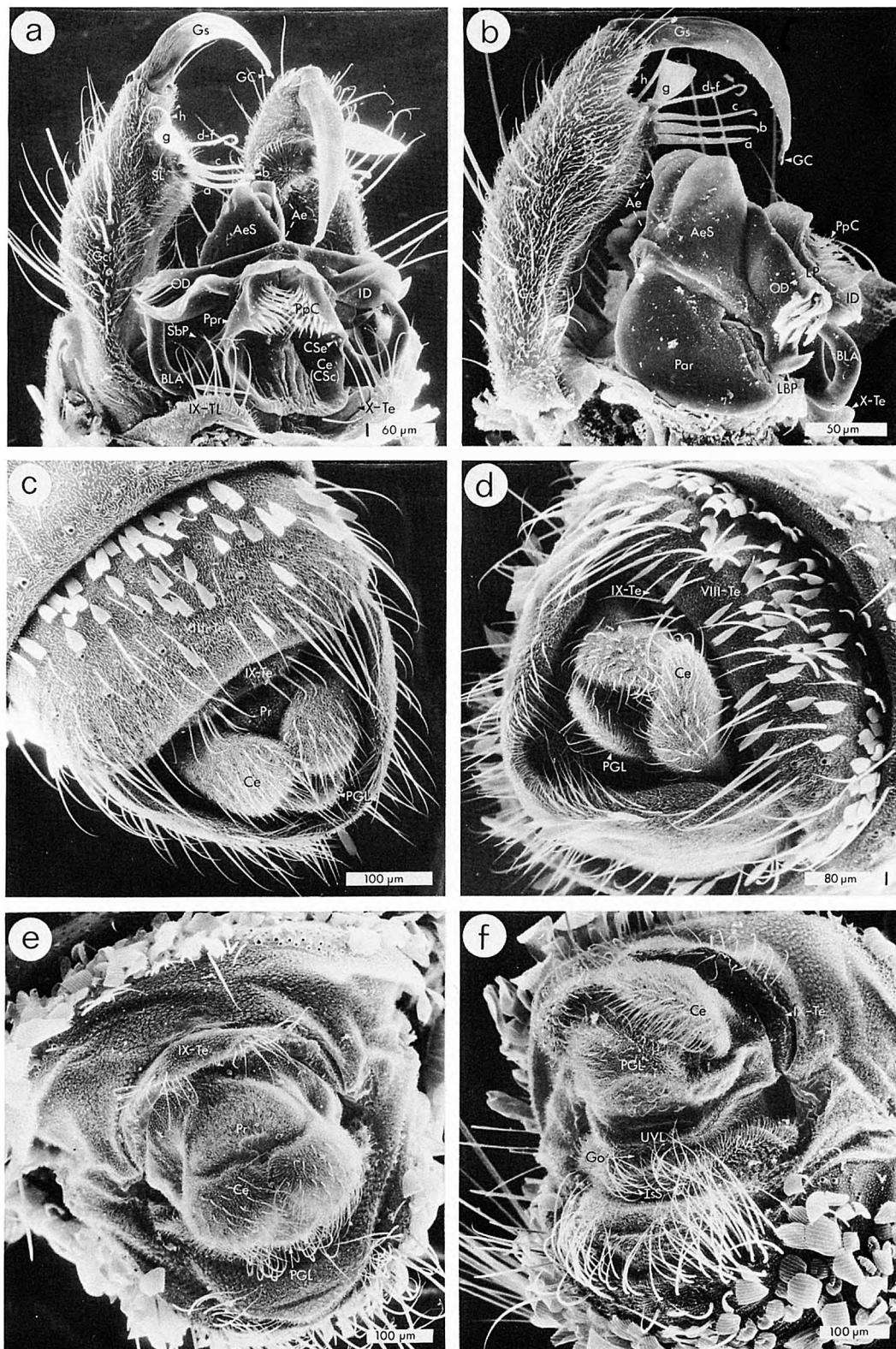


FIGURE 26

- a. *Aedes (Ochlerotatus) grossbecki* Dyar and Knab. Lateral aspect (left side) of terminal female abdominal segments. Scales on dorsal surface of cerci not shown.
- b. *Culex (Neoculex) territans* Walker. Lateral aspect (left side) of terminal female abdominal segments.
- c. *Culex (Culex) pipiens* Linnaeus. Ventral aspect of female genitalia.
- d. *Aedes (Ochlerotatus) vigilax ludlowae* (R. Blanchard). Ventral aspect of female genitalia.
- e. *Aedes (Ochlerotatus) varipalpus* (Coquillett). Ventral aspect of female genitalia. Vagina opened with lower vaginal lip drawn forward (left unsymmetrical just as opened). Four setae on insula not shown.

Abbreviations

Ce	- cercus
Go	- gonotreme
I	- insula
IsS	- insular seta
LVL	- lower vaginal lip
PGL	- postgenital lobe
Pme	- pleural membrane
Pr	- proctiger
SCa	- spermathecal capsule
UVL	- upper vaginal lip
UVS	- upper vaginal sclerite
Va	- vagina
VII-S	- sternum VII
VII-Te	- tergum VII
VIII-S	- sternum VIII
VIII-Te	- tergum VIII
IX-Te	- tergum IX

Fig. 26

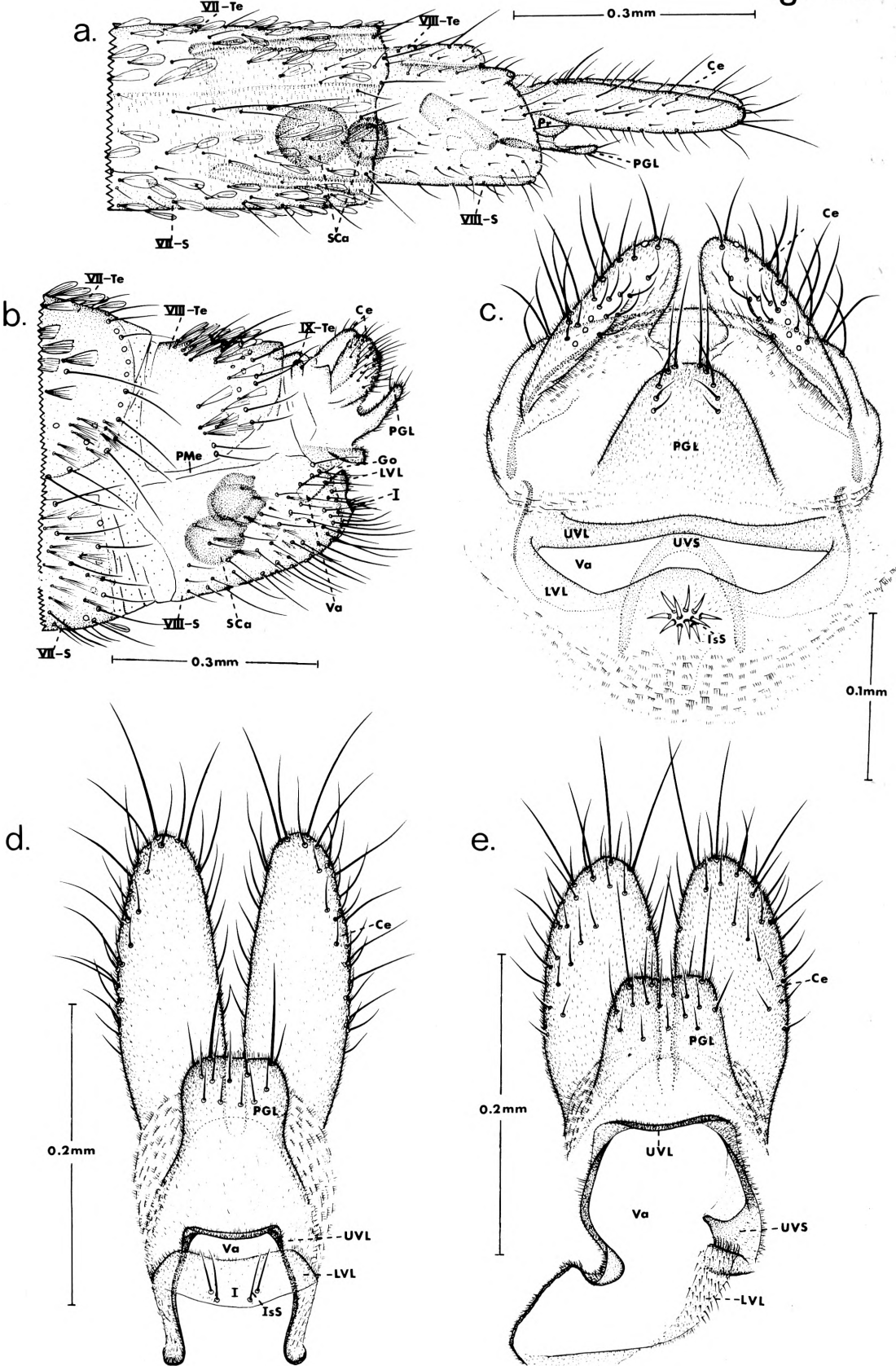


FIGURE 27

- a. *Aedes (Stegomyia) aegypti* (Linnaeus). Composite schematic lateral aspect (left side) of interior of terminal female abdominal segments. Modified from Jones and Wheeler (1965,402).
- b-e. Morphology of female genitalia. Redrawn from Reinert (1974b,56).
- b. Ventral aspect (composite).
 - c. Ventral aspect of sternum VIII.
 - d. Lateral aspect (right side) of spermathecal capsules.
 - e. Dorsal aspect of tergum VIII.

Abbreviations

AGD	- accessory gland duct
AGDB	- accessory gland duct base
BLS	- basolateral seta
Ce	- cercus
Go	- gonotreme
Gp	- gonopore
H	- hinge
I	- insula
LVL	- lower vaginal lip
LVS	- lower vaginal sclerite
PGL	- postgenital lobe
Pr	- proctiger
SCa	- spermathecal capsule
SCaP	- spermathecal capsule pore
SDu	- spermathecal duct
SE	- spermathecal eminence
SES	- spermathecal eminence spicule
Tu	- tuberculus
UVL	- upper vaginal lip
UVS	- upper vaginal sclerite
Va	- vagina
1-S	- seta 1-S
2-S	- seta 2-S
3-S	- seta 3-S
VII-S	- sternum VII
VII-Te	- tergum VII
VIII-S	- sternum VIII
VIII-Te	- tergum VIII
IX-Te	- tergum IX

Fig. 27

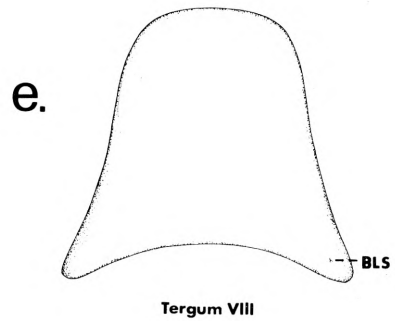
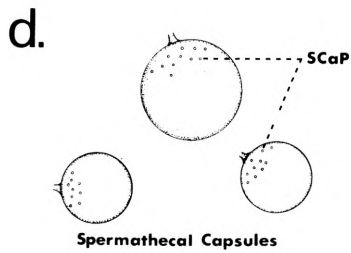
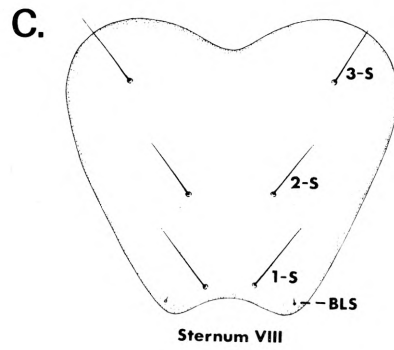
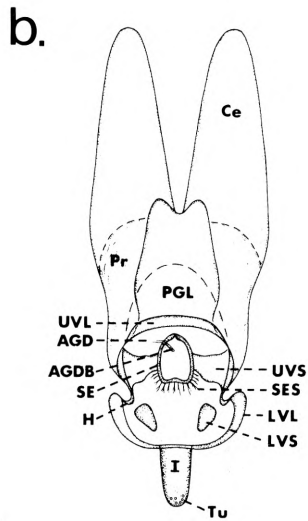
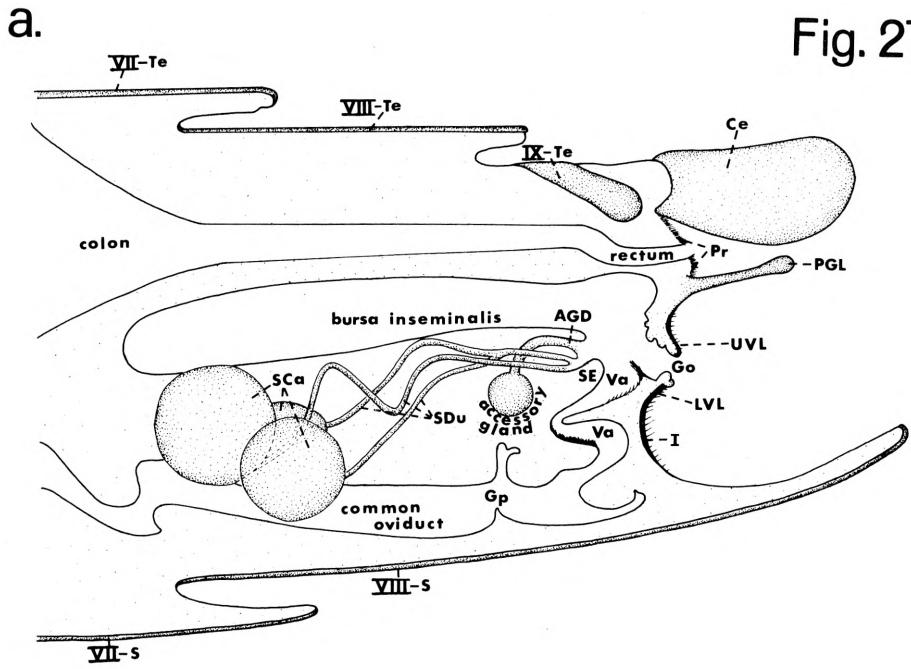


Table 1. Comparison of Terminology for Venation in the M—Cu—A Area of Ptychopterid, Dixid and Culicid Wings.

Comstock 1918 Fig. 365,p. 352	Tillyard 1926 Fig. W27,p. 349	Hennig 1954 Fig.47,p. 280	Séguy 1959 Fig. 97,p. 186	Christophers 1960 Fig. 57.1	Belkin 1962 Fig. 406	Colless and McAlpine 1970*** Fig. 34.17
<i>Dixa</i> sp.	<i>Paradixa</i> <i>tasmaniensis</i> (Tonnoir)	<i>Anopheles</i> <i>maculipennis</i> Meigen	<i>Ptychoptera</i> <i>contaminata</i> (van der Wulp)	<i>Aedes</i> <i>aegypti</i> (Linnaeus)	Generalized mosquito	<i>Anopheles</i> <i>annulipes</i> Walker
M	(M)*	(m)	(MP)	vein 4 [base]	M[base]	(M)
M	(M ₁₊₂)	(m ₁₊₂)	(MP)	vein 4 [part past his m-cu]	M[part past his m-cu]	(M ₁₊₂)
M ₁₊₂	M ₁	m ₁	MP1	vein 4.1	M ₁₊₂	(M ₁)
M ₃	M ₂	m ₂	MP2	vein 4.2	M ₃₊₄	(M ₂)
m-cu	part of M ₃₊₄	part of m ₄	(m-cu)	posterior cross vein	m-cu	part of M ₃₊₄
Cu	Cu ₁	(cu ₁)	(CuA1)	vein 5	Cu [base]	(CuA)
Cu ₁	(m-cu)	[cu _{1a}]**	(CuA1)	vein 5.1 [part before his m-cu]	Cu ₁ [part be- fore his m-cu]	(m-cu)
Cu ₁	most of M ₃₊₄	m ₄	CuA1a	vein 5.1 [part past his m-cu]	Cu ₁ [part past his m-cu]	most of M ₃₊₄
Cu ₂	Cu ₁	cu _{1b}	CuA1b	vein 5.2	Cu ₂	CuA
1st A	Cu ₂	(cu ₂)	not clear (CuA2 or CuP cubital fold or both) cf. other fly Figs.		plical	(CuP) cf. Fig.34.7B
2d A	1A	1a	1A	vein 6	1A	1A

*Parentheses around a symbol means figure not so labelled, but text or other figures make interpretation safe.

**Compare his figure 5.

*** Terminology used herein.

EGG

A

anterior polar specialised area [Christophers 1945,25] — In *Culex* eggs, that part of the outer chorion surrounding the micropyle, actually surrounding the base of the corolla, which appears to be highly ornamented because of the presence of numerous geometrically-arranged outer chorionic tubercles. This area of the outer chorion is not so highly differentiated in most culicid genera. (Syn.: anterior polar surface, Christophers 1945,33; anterior specialized area, Newkirk 1955,62)

apical process [Mattingly 1972a,46] — In *Mansonia* eggs, the slender anterior part of the egg giving it a flasklike appearance. (Syn.: neck, Dyar and Knab 1916,61)

C

CELL — See **INNER CHORIONIC CELL** and **OUTER CHORIONIC CELL**. The term cell is currently in vogue and has been in use longer than its synonyms. Cells of the outer chorion have usually been recognized as those areas separated by the outer chorionic reticulum whereas the inner chorionic reticulum usually has been thought of as a part of the inner chorionic cells. Since the former concept has existed since the turn of the century (Nuttall and Shipley 1901a) and the latter came into being at a much later date (Horsfall *et al.* 1952), both inner and outer chorionic cells are characterized herein in the older sense.

cell boundary [Myers 1967,797] — First used to designate those parts of the inner chorionic reticulum which enclose a cell, but included here are those terms which have been applied to similar parts of the outer chorionic reticulum. (Syn. for parts of the inner chorionic reticulum: wall, Horsfall *et al.* 1952,662; ridge, Horsfall and Craig 1956,370; cell wall, Myers 1967,797; chorionic cell wall, Brust 1974,466; polygonal cell margin, Olson and Meola 1967,98; cell margin, Olson and Meola 1976,98; carina, Olson and Meola 1976,99; polygonal margin, Olson and Meola 1976,99. Syn. for parts of the outer chorionic reticulum: bead, Herms and Frost 1932,241; Luftader, de Buck 1938,679; Rinne, de Buck 1938,679; Luftrinne, de Buck 1938,682; raised boss, Gillies 1955,159; ridge, Hinton and Service 1969,410)

CELLULE (Ce) (Fig.29) [Kalpage and Brust 1968,700] — In some culicine eggs, a tiny impressed or elevated subdivision of an inner chorionic cell bounded by minute ridges or shallow grooves, the cellule wall. (Syn.: tubercle, Myers 1967,796; plaque, Horsfall and Vorhees 1972,124; papule, Olson and Meola 1976,99)

CELLULE WALL (CeW) (Fig.29) [Kalpage and Brust 1968,701] — In some culicine eggs, a tiny ridge or shallow groove completely or incompletely enclosing a cellule of an inner chorionic cell.

CHORION (C) [Marshall 1938,30] — The outer covering or shell of the insect egg secreted by the follicular epithelium and consisting of one or more layers. In mosquito eggs, usually consisting of two layers, the inner and outer chorions, but a delicate middle layer, "lamellate membrane," occurs in *Aedes aegypti* (Linnaeus) (Mathew and Rai 1975,375) and perhaps other species. (Syn.: Eihaut, Leuckart 1855,135; shell, Hurst 1890a,50; egg-capsule, Nuttall and Shipley 1901a,50; eggshell, Theobald 1901b,19; egg shell, Banks 1908,235; covering, Harwood and Horsfall 1957,555)

Hinton (1968a,b) maintained that there is no strict correspondence between layers usually called the exo- and endochorion in different insects and referred to the two layers in mosquito eggs as inner and outer layers of the chorion. Since the eggs of many insects have more than two chorionic layers, Hinton's concept is followed here although the more explicit terms "inner" and "outer chorion" have been adopted from the works of Mattingly for use in the Culicidae.

chorionic pad [Christophers 1960,133] — The "sticky" outer chorion of the egg of *Aedes aegypti* (Linnaeus) when in water before becoming affixed to a solid substratum. The outer chorion of many aedine eggs probably becomes "sticky" in water prior to attachment.

COROLLA (Co) (Figs.30,32) [Marshall 1938,36] — In many mosquito eggs, notably those of the genera *Culex* (Marshall 1938,36), *Toxorhynchites* (Mattingly 1969a,13) and *Culiseta* (Mattingly 1973,222), a delicate frill-like collar surrounding the micropyle; often readily detachable and frequently lost; associated with a micropylar collar in some *Culex* eggs (Mattingly 1975). (Syn.: col, de Réaumur 1738,616; cylindrical knob, Kirby and Spence 1826,93; summit, Kirby and Spence

1826,731; Sommet, Lacordaire 1834, legend to Fig.4; appendage, Miall 1895,112; micropilar apparatus, Stephens and Christophers 1903,69; fringe, Banks 1908,251; Schwimmtrichter, Bresslau 1920,338; striated collar, Nath 1924,152; collar, Nath 1924,158; micropilar cup, Christophers 1945,25; cup, Christophers 1945,25; frill, Christophers 1945,32; rim, Christophers 1945,32; central cup, Muspratt 1951,363; micropylar apparatus, Harwood and Horsfall 1957,558; micropyle cup, Clements 1963,26; anterior cap, Lincoln 1965,10; egg cap, Lincoln 1965,11; anterior cup, Hinton 1968a,145; micropylar cup, Mattingly 1969a,13; apical cup, Mattingly 1969a,14; apical frill, Mattingly 1972c,114; outer-chorionic frill, Mattingly 1972c,119)

D

DECK (De) (Figs.28,31,32) [Christophers 1916,492] — In many anopheline eggs, the tuberculate outer chorion of the ventral surface which normally is not covered by water and is completely or incompletely enclosed by the frill; sometimes divided so that in effect there are two decks, one anterior and one posterior. In the eggs of species of *Hodgesia* (Mattingly and McCrae 1977,334), *Mimomyia* (Mattingly 1970e,161), *Orthopodomyia* (Mattingly 1971a,66) and *Deinocerites* (Mattingly 1973), that part of the ventral surface enclosed by the frill, or the flange in the case of *Orthopodomyia*. (Syn. for anopheline eggs: upper surface, Stephens and Christophers 1902a,11; anterior surface, Stephens and Christophers 1902a,12; demarcated area, Christophers and Barraud 1931,164; anterior demarcated area, Christophers 1933, in part, 46; posterior demarcated area, Christophers 1933, in part, 46; enclosed surface, Evans 1938,35; enclosed area, Evans 1938,86; flat median ridge, Sasa *et al.* 1971,141)

DECK TUBERCLE (DeT) (Fig.28) [Hinton 1968b,497] — In anopheline eggs, one of the outer chorionic tubercles which ornament the deck; a variable number of large deck tubercles with notched or convoluted margins located at each end of the deck are referred to as lobed tubercles. (Syn.: minute reticulation, Nuttall and Shipley 1901a,49; process, Nicholson 1921,408; dorsal process, Nicholson 1921,446; collumella, de Buck and Swellengrebel 1932,1336; granulation, Herms and Frost 1932, legend to Fig.15; granular elevation, Hurlbut 1938b,523)

DEHISCENCE — The splitting of the chorion of the insect egg in the emergence of the nymph or larva. Four modes of dehiscence occur in mosquito eggs (see the works of Mattingly).

Longitudinal — The splitting of the chorion in the direction of the long axis of the egg.

Oblique — The splitting of the chorion in a plane forming an acute angle to the longitudinal axis of the egg.

Spiral — The transverse splitting of an egg in constantly changing planes (helical).

Transverse — The splitting of the chorion of an egg in a plane perpendicular to the longitudinal axis.

Adjectives used to qualify the types of dehiscence include apical (capsular, Iyengar 1969,214), subapical, equatorial, complete and incomplete.

DENTICLE (D) [Boreham 1970,385] — In the eggs of *Mansonia* species, one of the tiny toothlike projections of the inner chorion (Mattingly 1972b,53) located inside the micropylar collar. (Syn.: projection, Lincoln 1965,13; tooth, Mattingly 1972b,54)

dorsoventral diameter [Horsfall *et al.* 1952,619] — A measurement of depth for eggs of *Psorophora* species; may be defined as the maximum depth of an egg measured along a straight dorsoventral line lying perpendicular to the line of projection for the egg length. (Syn.: maximum dorsoventral diameter, Myers 1967,795; greatest dorsoventral diameter, Myers 1967,798) See **EGG WIDTH**.

E

EGG — The first life stage of an insect. (Syn.: ovum, Nuttall and Shipley 1901a,49)

Mosquito eggs are deposited so that they rest either horizontally or vertically. This poses a serious problem when trying to describe the orientation of an egg, e.g., while the terms "upper surface" and "lower surface" are applicable to the horizontally-oriented egg, they are inapplicable to the egg oriented vertically. Since, however, the micropyle is always opposite the head of the developing embryo, it seems fitting that the orientation of the embryo be used as reference for describing the orientation of the deposited egg. This has been done below.

Anterior End [vordere Ende, Leuckart 1855,135] — The end of the egg bearing the micropyle;

adjacent to the head of the embryo. (Syn.: gros bout, de Réaumur 1738,616; vordern Pole, Leuckart 1855,135; oberer Eipole, Leuckart 1855,254; lower end, Hurst 1990a,49; micropylar end, Dyar 1901b,180; polo rombo, Goeldi 1905,88; Pol, Bresslau 1920,338; Eipol, Bresslau 1920,240; Kopfende, Bresslau 1920,345; vorderen Eipole, Bresslau 1920,247; micropilar end, James 1922,267; anterior pole, Patton and Evans 1929,251; pole, Gibbins 1933,257; lower (anterior) end, Christophers 1945,30; cephalic end, Zavortink 1968,26; apical end, Mattingly 1971d,202; anterior tip, Mattingly 1972c,116)

Dorsal Surface [Christophers and Barraud 1931,164] — The surface of the egg opposite the dorsum of the embryo. In anopheline and sometimes other horizontally-oriented eggs, notably of the genus *Aedes*, the lower surface, i.e., the surface in contact with the substratum. (Syn.: under surface, Nuttall and Shipley 1901a,49; lower surface, Stephens and Christophers 1902a,12; dorsum, James and Liston 1904,38; lado dorsal, Goeldi 1905,88; lower side, Mitchell 1907,100; ventral surface, Nicholson 1921,407; lower portion, Pawan 1922a,64; under-surface, Evans and Leeson 1935,37; convex surface, Evans and Leeson 1935,37; general surface, Evans 1938, including the lateral surfaces, 34; ventral side, Abdel-Malek 1949,19; back, Newkirk 1955,61; dorsal side, Horsfall and Craig 1956,370; lower (dorsal) surface, Mattingly 1970e,162; egg dorsum, Boreham and Baerg 1974,564; dorsal egg surface, Tompkins and Williams 1977,109)

Posterior End [Hinterende, Bresslau 1920,342] — The extremity of the egg opposite the end bearing the micropyle; opposed to the hindmost part of the embryo. (Syn.: bout inférieur, de Réaumur 1938,621; upper end, Miall 1895,113; tip, Howard 1896,12; polo delgado, Goeldi 1905,88; Schwanzende, Bresslau 1920,345; pole, Gibbins 1933,257; posterior pole, Gibbins 1933,260; posterior tip, Rozeboom 1937,538; apical (posterior) end, Mattingly 1970a,19)

Ventral Surface [Christophers and Barraud 1931,164] — The surface of the egg opposite the venter of the embryo. In anopheline and sometimes other horizontally-oriented eggs, notably those of the genus *Aedes*, the upper surface. (Syn.: lado ventral, Goeldi 1905,88; Ventralseite, Bresslau 1920,338; Oberseite, Bresslau 1920,343; dorsal surface, Nicholson 1921,407; upper side, Bates 1941,40; dorsal side, Abdel-Malek 1949,19; venter, Horsfall *et al.* 1952,622; upper (ventral) surface, Christophers 1960,132; upper surface, Christophers 1960,132; upper face, Barr and Barr 1969,193)

EGG BATCH [Kumm 1941,93] — The group of eggs deposited by a female mosquito during a single laying. The floating egg batch consisting of eggs which are laterally attached to one another in species of *Coquillettidia*, *Culex*, *Culiseta*, *Trichoprosopon* and *Uranotaenia* is termed an egg raft. (Syn.: lot, Howard 1900a,8; batch, Mitchell 1907,140; egg-batch, Theodor 1925,377)

EGG CAP (EC) [Eikalotte, Bresslau 1920,348] — The usually small anterior lidlike part of the chorion which may completely or incompletely separate from the posterior part following oblique, spiral or transverse dehiscence. (Syn.: lid, Hurst 1890a,50; trap-door, Hurst 1890a,50; cap, Nuttall and Shipley 1901a,51; operculum, Banks 1908,251; Eideckel, Bresslau 1920,348; egg-cap, Christophers 1945,26; hatching cap, Frohne 1953,113; apical cap, Mattingly 1970b,63; anterior cap, Mattingly and McCrae 1977,334)

EGG LENGTH [Eilänge, Bresslau 1920,343] — The maximum distance measured along a straight line between the anterior and posterior ends of an egg. (Syn.: length, Howard 1896,12; greatest length, Strickland 1914,321)

EGG LENGTH/WIDTH RATIO (l/w) [Harbach and Knight 1978b,257] — The numerical value obtained by dividing the egg width into the egg length. (Syn.: length/breadth ratio, Mattingly 1969a,13; length/width ratio, Mattingly 1971d,205; l/w ratio, Mattingly 1971d,205; length:diameter ratio, Horsfall and Voorhees 1972,125)

EGG RAFT [Stephens and Christophers 1903,67] — In the culicine genera *Coquillettidia*, *Culex*, *Culiseta*, *Trichoprosopon* and *Uranotaenia*, the floating mass (egg batch) of laterally cohering, vertically-oriented eggs. (Syn.: radeau, de Réaumur 1738,615; bateau, de Réaumur 1738,615; boat, Kirby and Spence 1826,81; raft, Hurst 1890a,49; egg-raft, Miall 1895,112; mass, Howard 1896,11; egg-mass, Howard 1896,11; egg mass, Howard 1896,11; egg boat, James and Liston 1904,7; raft mass, James and Liston 1904, legend to plate I in text; cluster, Knab 1904,246; egg-cluster, Knab 1904,247; egg cluster, Knab 1904,248; egg boat, Mitchell 1907,155; clutch, Aitken *et al.* 1968,452)

EGG WIDTH [Harbach and Knight 1978b,258] — The greatest side to side distance measured along a straight line lying in a plane perpendicular to the line of projection for the egg length. (Syn.: diameter, Howard 1896,12; greatest breadth, Nuttall and Shipley 1901a,49; greatest width, Dyar and

Currie 1904,219; largura, Goeldi 1905,94; width, Mitchell 1907,217; breadth, Theobald 1907,107; maximum breadth, Gillies 1955,158; maximum diameter, Newkirk 1955,61; maximum width, Zavortink 1968,26)

F

FLANGE (Fg) [Marshall 1938,36] — In *Orthopodomyia* eggs, one of the flattened longitudinal ribs borne on each side of the egg; bearing a series of holes, *lacunae*, traversed by little bars, *transverse trabeculae* (Mattingly 1970e,161). (Syn.: transverse ridge, Howard *et al.* 1917,890; veined gelatinous veil, Zavortink 1968,26; lateral flange, Mattingly 1970e,160)

This formation of the *Orthopodomyia* egg is probably homologous with the anopheline frill (Mattingly, pers. corres.). It is so modified, however, that it is worthy of a separate name.

FLOAT (F) (Figs.28,32) [Nuttall and Shipley 1901a,74] — In anopheline eggs, a narrow, longitudinal part of the outer chorion containing a hollow space and bearing a series of transverse ridges on its outer wall; multiple floats occur in *Chagasia* eggs otherwise two is the usual number, one on each side and at varying distances from the ventral midline. (Syn.: clasping membrane, Howard 1900b, in part, 36; rim, Nuttall and Shipley 1901a,49; lateral float, Stephens and Christophers 1902b,5; air cell, Stephens and Christophers 1903,69; appendices lateraes, Goeldi 1905,130; azas, Goeldi 1905,130; abas lateraes, Goeldi 1905, legend to Fig.131, P1. 0; lateral membranous puff, Mitchell 1907,216; frill-float, Christophers 1916,492; Schwimmapparat, Bresslau 1920,342; Schwimmblase, Bresslau 1920,343; air-float, Theodor 1925,377; air-pocket, Gibbins 1933, in part, 258; peripheral frill, Mattingly 1971e,35; air float, Gutsevich *et al.* 1974,17)

FLOAT LENGTH [Rozeboom 1937,538] — In anopheline eggs, the maximum length of one of the floats measured along a straight line from its anterior to its posterior margin. (Syn.: length of the float, Herms and Freeborn 1920,73; length of lateral float, Gibbins 1933,262; length of float, Hurlbut 1938b,523)

FLOAT LENGTH / EGG LENGTH RATIO (f/e) [Harbach and Knight 1978b,260] — In anopheline eggs with a pair of floats, the decimal fraction obtained by dividing the egg length into the float length. (Syn.: length of float/length of egg, D'Abrera 1944,342)

FLOAT RIDGE (FR) (Figs.28,31) [Christophers and Barraud 1931,164] — In anopheline eggs, one of the raised sections of a float; appearing membranous in slide preparations as compared to the grooves on each side. (Syn.: wrinkle, Howard 1900b,36; air chamber, Nuttall and Shipley 1901a,49; ribbing, Nuttall and Shipley 1901a,49; air cell, Stephens and Christophers 1903,221; tubos, Goeldi 1905,130; corrugation, Stanton 1913,131; frill, Strickland 1914,322; compartment, Herms and Freeborn 1920,74; air-cell, Theodor 1925,377; chamber, Patton and Evans 1929,256; ridge, Christophers and Barraud 1931,164; float-ridge, Christophers 1933,46; air-chamber, Gibbins 1933,258; cell, Gibbins 1933,260; stria, Evans 1938,34; intercostal membrane, Bates and Hackett 1939,1556; float-chamber, Gillies 1955,158; float rib, Reid 1962,33; rib, Hinton 1968b,497; float chamber, Mattingly 1969b,41; striation, Mattingly 1969b,41)

FLOAT RIDGE NUMBER [Harbach and Knight 1978b,260] — In anopheline eggs with a pair of floats, the number of float ridges per float. (Syn.: Rippenzahl, Bresslau 1920,343; number of float ridges, Rozeboom 1938,98; number of ribs, Hinton 1968b,504)

float termination [Christophers and Barraud 1931,166] — In float-bearing anopheline eggs, the flattened terminal compartment (float ridge) at each end of the float. (Syn.: float-termination, Christophers 1933,46)

FLOAT WIDTH [Harbach and Knight 1978b,260] — In anopheline eggs with a pair of floats, the maximum distance along a straight line from the dorsal to the ventral margin of the float. (Syn.: width of float, Hinton 1968b,503)

FRILL (Fr) (Figs.28,31,32) [Stephens and Christophers 1902a,12] — In many anopheline eggs and eggs of the genera *Hodgesia* (Mattingly and McCrae 1977,334) and *Mimomyia*, a narrow, usually ribbed, ridgelike formation of the outer chorion located on or near the ventral surface and commonly enclosing an area termed the "deck." In anopheline eggs, the frill may 1) completely or incompletely enclose an undivided deck, 2) in essence be two frills, one surrounding the anterior part and the other the posterior part of a divided deck, or 3) have the form of a collar around the anterior or posterior end of the egg. In *Hodgesia* eggs, a short frill encloses a narrow deck on the ventral surface at the posterior end. In *Mimomyia* eggs, the frill completely encloses an undivided deck. (Syn. for *Mimomyia* eggs: peripheral frill, Mattingly 1970e,161. Syn. for anopheline eggs: clasping membrane, Howard 1900b, in part, 36; fringelike structure, Stephens and Christophers

1902a,11; fringe, Stephens and Christophers 1902a,12; rim, Stephens and Christophers 1903,69; abas, Goeldi 1905, legend to Fig.123 [*sic*, 132], P1 0; attached edge of membrane, Mitchell 1907,216; frilled cuticle, Strickland 1914,321; dorsal process, Nicholson 1921, in part, 446; air-pocket, Gibbins 1933, in part, 258; collar, Gibbins 1933,261; dorsal frill, Kumm 1941,95; anterior collar, Causey *et al.* 1944,3; posterior collar, Causey *et al.* 1944,3; extra-chorial rim, Newkirk 1955,62)

H

HORN (H) [Dyar and Knab 1916,63] — In the eggs of *Mansonia humeralis* Dyar and Knab, perhaps other *Mansonia* eggs as well, one of the elongate pointed projections arising at the anterior end. The relationship of the horns to the micropylar collar is presently unknown. (Syn.: apical horn, Mattingly 1972a,47)

I

INNER CHORION (IC) [Mattingly 1969c,74] — The innermost of usually two layers of chorion secreted by the follicular epithelium; with a smooth outer surface in anophelines, toxorhynchitines and many culicines; sculptured in most aedines. (Syn.: Chorion, Leuckart 1855,135; shell, Mitchell 1907,11; Endochorion, Bresslau 1920,340; inner wall, Nicholson 1921,507; egg shell, Pawan 1922a,64; vitelline membrane, Nath 1924,157; eggshell, de Buck and Swellengrebel 1932,1337; chorionic envelope, Evans 1938,34; inner layer, Newkirk 1955,61; main shell, Harwood 1958,464)

The inner chorion is secreted by the follicular epithelium (Nicholson 1921; Harwood and Horsfall 1957; Mathew and Rai 1975) and therefore cannot be regarded as the vitelline membrane (Nath 1924; Beckel 1958; King 1964; Mathew and Rai 1975). The vitelline membrane is defined as the plasma membrane of an ovum, the mature but unfertilized egg cell.

INNER CHORIONIC CELL (ICC) (Figs.29,31) [Harbach and Knight 1978b,262] — In many mosquito eggs, mainly those of aedine species, an area of the inner chorion bounded by elements of the inner chorionic reticulum; differing in shape in different areas of the surface. For brevity, "cell" may be used when referring to the inner chorion or inner chorionic sculpture. (Syn.: central area, Horsfall *et al.* 1952,620; disc, Horsfall *et al.* 1952,620; center portion, Horsfall *et al.* 1952,622; intracellular space, Craig and Horsfall 1960,14; face, Horsfall *et al.* 1970,1713; polygonal disc, Olson and Meola 1976,96) See **CELL**.

INNER CHORIONIC RETICULUM (ICR) (Figs.29,31) [Mattingly 1970c,88] — In many mosquito eggs, particularly those of aedine species, a feature of the inner chorionic sculpture consisting of an interconnected system of ridges which separates adjacent inner chorionic cells; corresponding exactly with the boundaries of the follicular epithelial cells which secrete the chorion. This structure may be referred to simply as a "reticulum" depending upon circumstance and usability. (Syn.: reticulation, Horsfall and Craig 1956,370; chorionic reticulation, Craig and Horsfall 1958,856; cellular reticulation, Craig and Horsfall 1960,12; egg chorion reticulation, Reinert 1972b,89; endochorionic reticulation, Olson and Meola 1976,96)

INNER CHORIONIC SCULPTURE (ICS) (Fig.29) [Harbach and Knight 1978b,263] — In many mosquito eggs, primarily aedine eggs, the pattern of impressed and raised markings of the inner chorion; usually consisting of cells bounded by a ridgelike reticulum. (Syn.: chorionic marking, Horsfall and Craig 1956,368; surface sculpturing, Horsfall and Craig 1956,370; chorionic sculpturing, Craig and Horsfall 1960,11; chorionic sculpture, Lincoln 1965,9; chorionic pattern, Myers 1967,795; reticulated pattern, Aitken *et al.* 1968,452; chorion sculpturing, Reinert 1972a,60; surface pattern, Brust 1974,466)

L

LOBED TUBERCLE (LoT) (Figs.28,31,32) [Hinton 1968b,497] — In anopheline eggs, one of the variable number of large deck tubercles with notched margins that are usually located at the anterior and posterior ends of the deck. (Syn.: circular spot, Howard 1900b,36; polygonal area, Stephens and Christophers 1903,221; knob, Mitchell 1907,216; boss, Nicholson 1921,406; process, Nicholson 1921,408; nodule, Christophers and Barraud 1931,165; end bulb, Herms and Frost 1932,242; globular structure, Herms and Frost 1932,242; endbulb, Herms and Frost 1932, legend to Fig.12; tubercle, Christophers 1933,46; terminal bulb, Matheson and Hurlbut 1937,242; circular structure, Hurlbut 1938b,523; anterior boss, D'Abrera 1944,341; posterior boss, D'Abrera 1944,341)

M

maximum breadth [Lee and Woodhill 1944,117] — The maximum width of an anopheline egg

exclusive of the floats.

median area [Christophers 1933,46] — In anopheline eggs, the area of the ventral surface between the two parts of a divided deck.

meshwork [James 1923,9] — The system of cells belonging to the outer chorion; can also be applied to the inner chorionic system. (Syn.: reticular meshwork, Mattingly 1971c,130)

micropylar apparatus [Nath 1924,152] — The outer chorion secreted between the anterior end of the egg and the nurse cells; comprising the micropylar disc and micropylar collar. (Syn.: rolhamento, Goeldi 1905,94; tampa, Goeldi 1905, legend to Fig.41, P1. E; aparelhode fechamento, Goeldi 1905, legend to Fig.87, P1. H; Mikropyleapparat, Bresslau 1920,346; micropyle apparatus, Nicholson 1921,406; micropylar cup, Mattingly 1970d,97; cup, Mattingly 1970e,161; apical cup, Mattingly 1971a,66; micropyle, Gutsevich *et al.* 1974,16)

micropylar area [Christophers 1960,136] — An undefined part of the surface of an egg in the vicinity of the micropyle. (Syn.: micropilar area, De Meillon 1934,272; micropylar region, Baerg and Boreham 1974,632)

MICROPYLAR COLLAR (MIC) (Figs.28,29,31,32) [Hinton 1968b,498] — In many mosquito eggs, the prominent, usually thickened and darkened annular wall or ridge encircling the micropylar disc. (Syn.: Kranz, Leuckart 1855,136; azelhas, Goeldi 1905, in part, 94; vesiculas, Goeldi 1905, in part, legend to Fig.30, P1. C; cushion, Howard *et al.* 1917,534; Schwimmtrichter, Bresslau 1920,338; collar, Herms and Freeborn 1920,75; supporting ring, Nicholson 1921,409; ring, Marshall 1938,32; ring of pellicle, Horsfall *et al.* 1952,620; pellicular ring, Harwood and Horsfall 1957,558; apical corolla, Mattingly 1970a,17; apical collar, Mattingly 1970c,91; annular ridge, Gutsevich *et al.* 1974,16)

MICROPYLAR DISC (MID) (Figs.28,29,31,32) [Nath 1924,158] — In many mosquito eggs, a thin, thick or raised area of outer chorion surrounding the micropyle; often encircled by a micropylar collar. (Syn.: disc, Nicholson 1921,409; micropilar area, Christophers and Barraud 1931,167; apical disc, Iyengar 1935,424; sclerotized disc, Mattingly 1970d,94)

micropylar funnel [Nath 1924,158] — The anatomical passage or channel through the chorion which cavity is defined as the micropyle. (Syn.: funnel, Nicholson 1921,409; micropylar apparatus, Patton and Evans 1929,250; canal, Gutsevich *et al.* 1974,16)

MICROPYLAR MOUND (MIM) [Harbach and Knight 1978b,266] — In certain *Culex* and *Psorophora* eggs, perhaps others, a dome or lobe of inner chorion lying directly under the micropylar disc; pierced at its center by the micropyle. (Syn.: knob, Mitchell 1907,217; Vorsprung, Bresslau 1920,340; micropylar process, Patton and Evans 1929,250; micropyle mound, Horsfall *et al.* 1952,620; papilla, Berlin and Pandian 1973,227; endochorionic lobe, Mattingly 1976,224; sclerotized lip, Mattingly 1976,225; disc, Mattingly 1976,226; lip, Mattingly 1976,226)

MICROPYLAR PLUG (MIP) [Harwood and Horsfall 1957,558] — In many mosquito eggs, a piece of inner chorion which obstructs or fills in the micropyle. (Syn.: spine, Banks 1908,251; protuberance, Banks 1908,251; stopper, Nicholson 1921,409; egg-spike, Christophers 1945,25; plug, Harwood and Horsfall 1957,560, micropyle plug, Clements 1963,26; egg spike, Lincoln 1965,10; micropylar apparatus, Hinton 1968a,148)

micropylar tube [Nath 1924,158] — In unlaidd and newly laid *Culex* eggs, the channel or passage extending through the degenerating nurse cells enclosed by the corolla; continuous with the micropylar funnel; its cavity is by nature a part of the micropyle. (Syn.: micropilar funnel, Christophers 1945,27; micropyle channel, Clements 1963,26; micropyle funnel, Clements 1963,27)

MICROPYLE (MI) (Figs.28-32) [Leuckart 1855,135] — In insect eggs, one or more minute openings in the chorion through which spermatozoa enter. In mosquito eggs, a single pore located at the anterior end which is often filled with a micropylar plug and surrounded by a micropylar disc. (Syn.: micropile, Christophers and Barraud 1931,164; micropylar opening, Harwood and Horsfall 1957,560)

O

OUTER CHORION (OC) [Mattingly 1969c,74] — The outermost of usually two layers of chorion secreted by the follicular epithelium; always sculptured and usually formed into a corolla and/or micropylar collar around the micropyle at the anterior end of an egg. (Syn.: Exochorion, Leuckart 1855,135; membrane, Nuttall and Shipley 1901a,49; pellicula, Goeldi 1905,88; pellicle, Theobald

1910,23; gelatinous covering, Howard *et al.* 1917,890; reticular membrane, Herms and Freeborn 1920,73; outer wall, Nicholson 1921,407; chorion, Nicholson 1921,407; enveloping membrane, James 1922,267; capsule, Pawan 1922a,64; investing capsule, Pawan 1922a,64; enveloping layer, James 1923,9; membranous sheath, Gibbins 1933,258; membranous covering, Gibbins 1933,261; external membrane, Hurlbut 1938b,523; membrane exochorialis, Callot and Dao-Van-Ty 1942-1943,145; outer layer, Newkirk 1955,61; outer chorionic pellicle, Mattingly 1970b,63; endochorion, Mathew and Rai 1975,369)

outer chorionic cap [Mattingly 1971e,34] — In certain mosquito eggs, particularly those of the genera *Trichoprosopon*, *Hodgesia* and *Uranotaenia*, the set-off posterior part of the outer chorion, the anterior part being relatively difficult to observe, unadorned or absent. (Syn.: posterior outer chorionic cap, Mattingly 1974,234; posterior cap, Mattingly 1974,234; chorionic cap, Mattingly 1974,238; posterior chorionic cap, Mattingly and McCrae 1977,234)

OUTER CHORIONIC CELL (OCC) (Figs.29-32) [Harbach and Knight 1978b,269] — In many mosquito eggs, an area of the outer chorion bounded by elements of the outer chorionic reticulum; differing in shape and relief in different areas of the surface. When referring to the outer chorion or outer chorionic sculpture, the term "cell" may be used for brevity. (Syn.: hexagonal area, Nuttall and Shipley 1901a,49; polygonal marking, Stephens and Christophers 1902a,12; polygonal area, James and Liston 1904,39; hexagon, Mitchell 1907,11; cell, Mitchell 1907,217; Polygon, Bresslau 1920,342; mesh, de Buck and Swellengrebel 1932,1338; facet, Newkirk 1955,61; exochorionic facet, Newkirk 1955,61; polygonal field, Hinton and Service 1969,410; reticular mesh, Mattingly 1971a,66; section, Matsuo *et al.* 1972,360; polygonic cell, Zaim *et al.* 1977,490) See **CELL**.

OUTER CHORIONIC RETICULUM (OCR) (Figs.29,31) [Harbach and Knight 1978b,270] — In many mosquito eggs, a feature of the outer chorionic sculpture consisting of an interconnected system of ridges and/or tubercles, or an interrelated chain of unconnected tubercles, which separates adjacent outer chorionic cells; corresponding exactly with the boundaries of the follicular epithelial cells which secrete the chorion. This structure may be referred to simply as a "reticulum" depending upon circumstance and usability. (Syn.: reticulation, Nuttall and Shipley 1901a,49; reticular pattern, Stephens and Christophers 1903,221; hexagonal reticulation, Howard *et al.* 1917,534; network, James 1923,9; polygonal network, Christophers and Barraud 1931,167; reticulum, Herms and Frost 1932,241; exochorionic network, Newkirk 1955,61; air channel reticulum, Christophers 1960,132; air channel, Christophers 1960,136; air-channel, Christophers 1960,136; chorionic reticulum, Mattingly 1970c,88; reticular network, Mattingly 1971b,123; chorionic reticulation, Mattingly 1971d,204; pentagonal network, Sasa *et al.* 1971,141; ridged network, Matsuo *et al.* 1972,358; ridge network, Matsuo *et al.* 1972,359; mesh-like area, Mathew and Rai 1975,369)

OUTER CHORIONIC SCULPTURE (OCS) [Harbach and Knight 1978b,270] — The pattern of impressed and raised markings of the outer chorion; often consisting of cells bounded by a reticulum. (Syn.: sculpturing, Howard 1900b,36; sculpture, Mitchell 1907,11; air cell pattern, Banks 1908,257; Felderung, Bresslau 1920,342; polygonal Felderung, Bresslau 1920,345; ornamentation, Christophers and Barraud 1931,165; polygonal pattern, Kumm 1941,96; hexagonal pattern, Lee and Woodhill 1944,77; exochorionic pattern, Myers 1967,795; exochorionic marking, Myers 1967,796; egg sculpturing, Aitken *et al.* 1968,453; surface pattern, Gillies and De Meillon 1968,13; chorionic sculpturing, Barr and Barr 1969,193; chorionic ornamentation, Mattingly 1969a,13; surface ornamentation, Mattingly 1970c,91; reticular ornamentation, Mattingly 1971a,66; outer chorionic ornamentation, Mattingly 1973,224; exochorion sculpturing, Berlin and Subramanian 1974,265; reticular sculpturing, Mattingly 1975,22; reticulate pattern, Zaim *et al.* 1977,489)

OUTER CHORIONIC TUBERCLE (OCT) (Figs.28-32) [Harbach and Knight 1978b,270] — A small rounded or irregularly-shaped prominence of the outer chorion. When discussing or describing either the outer chorion or the outer chorionic sculpture, this structure may be referred to simply as a "tubercle." (Syn.: Tuberkel, Leuckart 1855,135; Buckel, Leuckart 1855,135; granule, Dyar 1901b,181; air-chamber, Theobald 1901b,21; air cell, Stephens and Christophers 1903,68; vesiculas, Goeldi 1905,19; camaras aéreas, Goeldi 1905,19; elementos, Goeldi 1905,88; perolas, Goeldi 1905,98; mamillão, Goeldi 1905,109; espinhos, Goeldi 1905,118; saliencias, Goeldi 1905, legend to Fig. 117. Pl. N; knob, Mitchell 1907,11; puff, Mitchell 1907,11; spine-like process, Mitchell 1907,11; air-cell, Banks 1908,254; air chamber, Banks 1908,255; hair, Busck 1908,76; hemispherical body, Boyce 1910,243; recumbent spine, Howard *et al.* 1917,534; granulation, Howard *et al.* 1917,637; callosity, Howard *et al.* 1917,836; chorion process, James 1922,267; tubercle, Pawan 1922a,64; spikelet, Pawan 1922b,482; boss, James 1923,9; spot, De Meillon 1934,273; stippling, De Meillon 1934,274; Säulchen, de Buck 1938,680; Blase, de Buck 1938,680; exochorionic boss, Marshall 1938,31;

exochorial boss, Marshall 1938,32; nodule, Marshall 1938,36; elevation, Rozeboom 1938,97; cylindrico-conical projection, Christophers 1945,26; projection, Christophers 1945,26; exochorion projection, Christophers 1945,27; conical projection, Christophers 1945,29; exochorionic papilla, Christophers 1945,31; exochorionic process, Christophers 1945,31; bleb, Christophers 1945,31; spiculate projection, Muspratt 1951,362; spiculose projection, Horsfall *et al.* 1952,620; dot, Horsfall *et al.* 1952,622; collumella, Frohne 1953,113; scale, Newkirk 1955,62; hemispherical translucent projection, Belkin and McDonald 1956,110; hummock, Christophers 1960,132; chorionic body, Christophers 1960,133; tuberosity, Christophers 1960,133; papilla, Christophers 1960,135; refractive body, Christophers 1960,136; accessory mass, Christophers 1960,136; accessory body, Christophers 1960,136; peg, Christophers 1960,153; air bubble, Craig and Horsfall 1960,14; vertical pillar, Lincoln 1965,10; vertical projection, Lincoln 1965,10; disc, Lincoln 1965,13; excrescence, Aitken *et al.* 1968,452; vertical knob, Hinton 1968a,147; vertical tubercle, Hinton 1968a,148; outer chorionic papilla, Mattingly 1970b,63; refringent papilla, Mattingly 1970b,63; refringent body, Mattingly 1970b,63; apical papilla, Mattingly 1970b,63; peripheral papilla, Mattingly 1970c,88; main outer chorionic papilla, Mattingly 1970c,88; conical spine, Mattingly 1971d,204; circular wart, Berlin and Subramanian 1974,263; vesicle, Boreham and Baerg 1974,564; pillar-like structure, Mathew and Rai 1975,369; pillar-like elevation, Mathew and Rai 1975,733; endochorionic pillar, Mathew and Rai 1975,375; chorionic pillar, Mathew and Rai 1975,379)

P

polygonal cell [Olson and Meola 1976,96] — A component of the inner chorion consisting of an inner chorionic cell and the elements of the reticulum which enclose it. (Syn.: hexagonal area, Horsfall *et al.* 1952,622)

posterior polar specialised area [Christophers 1945,25] — In *Culex* eggs, a circular area of the outer chorion at the posterior end which bears tubercles of larger size and different shape than those borne on lateral areas. (Syn.: posterior polar area, Christophers 1945,32; posterior specialized area, Newkirk 1955,62; posterior polar depression, Hinton 1968a, in part, 148)

T

tag [Christophers and Barraud 1931,164] — In anopheline eggs where the frill is incomplete in the middle of the ventral surface, the right and left sides of both its anterior and posterior parts often have a free flaplike terminus, the tag.

FIGURE 28

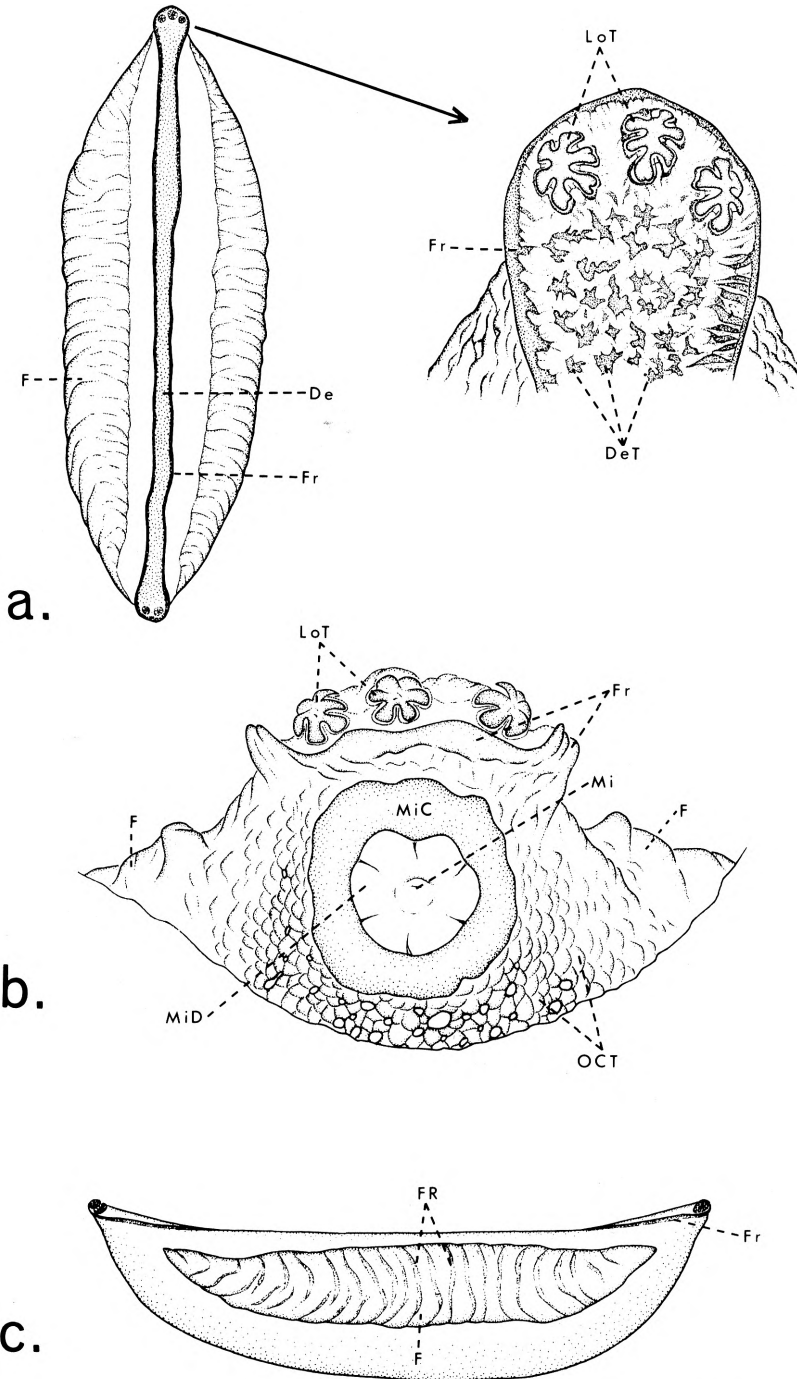
Egg of *Anopheles (Cellia) aconitus* Dönitz.

- a. Ventral surface (anterior end at top).
- b. Anterior end.
- c. Lateral (left) aspect (anterior end at right).

Abbreviations

De	- deck
DeT	- deck tubercle
F	- float
Fr	- frill
FR	- float ridge
LoT	- lobed tubercle
Mi	- (vicinity of) micropyle
MiC	- micropylar collar
MiD	- micropylar disc
OCT	- outer chorionic tubercle

Fig.28



C. Chang

FIGURE 29

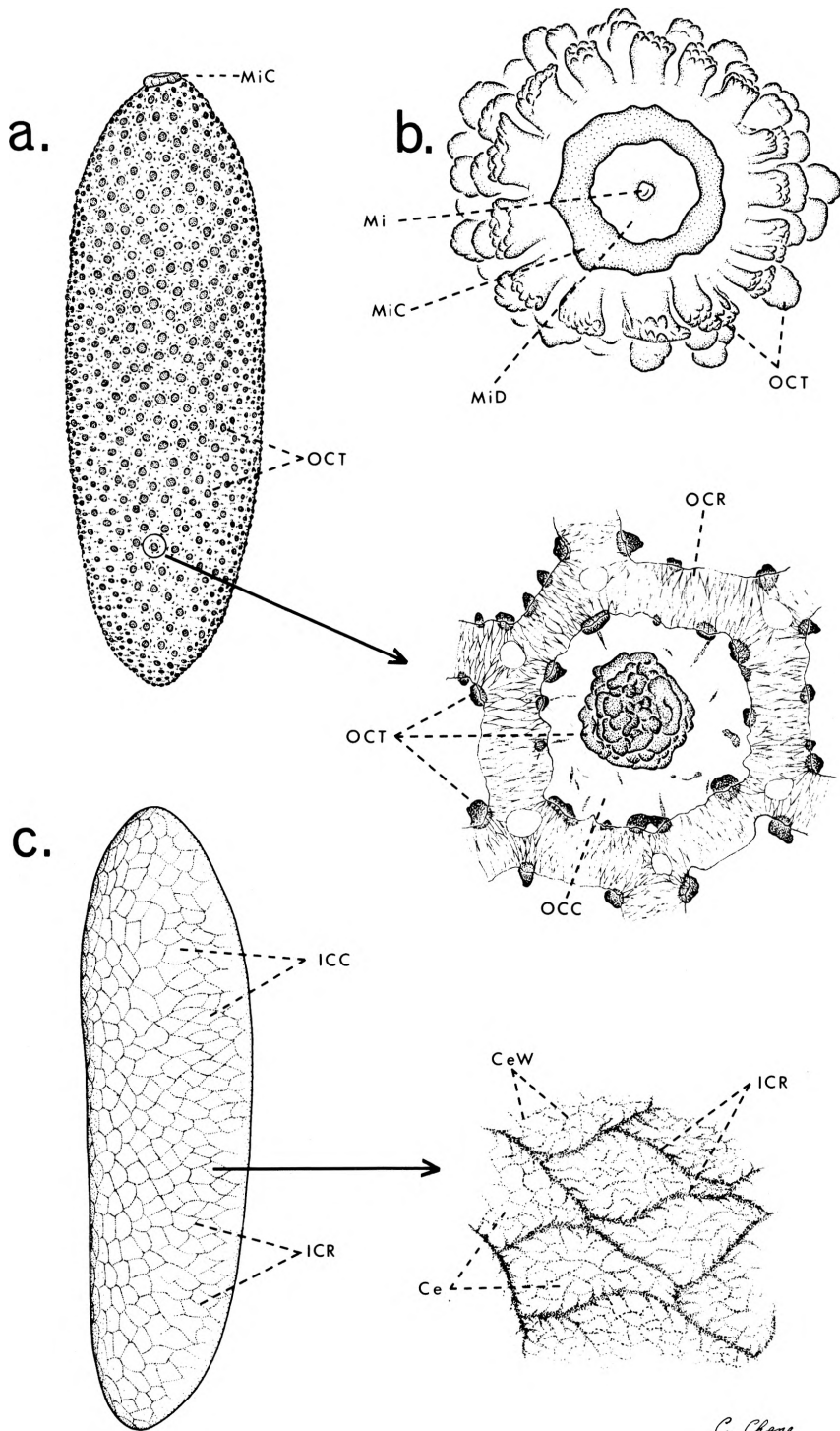
Egg of *Aedes (Stegomyia) aegypti* (Linnaeus).

- a. Ventral surface (anterior end at top) of outer chorion with blow-up showing outer chorionic sculpture.
- b. Anterior end.
- c. Lateral (left) aspect of inner chorion with blow-up of inner chorionic sculpture (anterior end at top).

Abbreviations

Ce	-	cellule
CeW	-	cellule wall
ICC	-	inner chorionic cell
ICR	-	inner chorionic reticulum
Mi	-	micropyle
MiC	-	micropylar collar
MiD	-	micropylar disc
OCC	-	outer chorionic cell
OCR	-	outer chorionic reticulum
OCT	-	outer chorionic tubercle

Fig. 29



C. Chang

FIGURE 30

a-b. Egg of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.

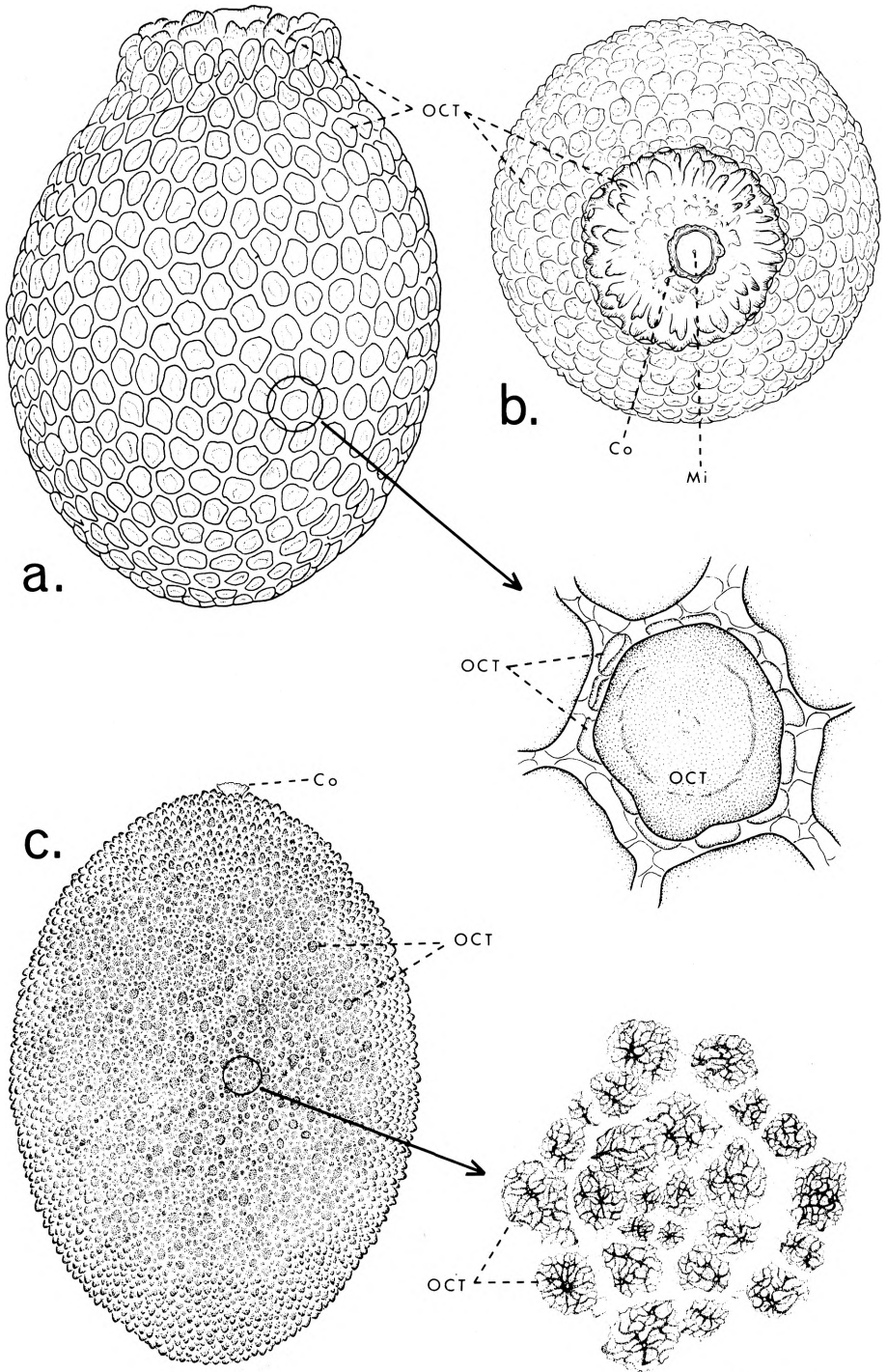
- a. Lateral aspect (anterior end at top) with blow-up of outer chorionic sculpture. Outer chorionic cell is stippled in total at center. Note absence of outer chorionic reticulum.
- b. Anterior end.

c. Egg of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall). Lateral aspect (anterior end at top) with blow-up of outer chorionic sculpture. A pentagonal outer chroionic cell is at center. Note absence of outer chorionic reticulum.

Abbreviations

- Co** - corolla
- Mi** - micropyle
- OCT** - outer chorionic tubercle

Fig. 30



C. Chang

FIGURE 31

a-d. Egg of *Aedes (Stegomyia) aegypti* (Linnaeus).

- a. Outer chorionic cell of ventral surface.
- b. Outer chorionic cells of lateral surface.
- c. Anterior end.
- d. Inner chorionic cells and reticulum.

e. Egg of *Anopheles (Cellia) aconitus* Dönitz. Slightly lateral (right) aspect of posterior end.

Abbreviations

De	-	deck
Fr	-	frill
FR	-	float ridge
ICC	-	inner chorionic cell
ICR	-	inner chorionic reticulum
LoT	-	lobed tubercle
Mi	-	micropyle
MiC	-	micropylar collar
MiD	-	micropylar disc
OCC	-	outer chorionic cell
OCR	-	outer chorionic reticulum
OCT	-	outer chorionic tubercle

Fig. 31

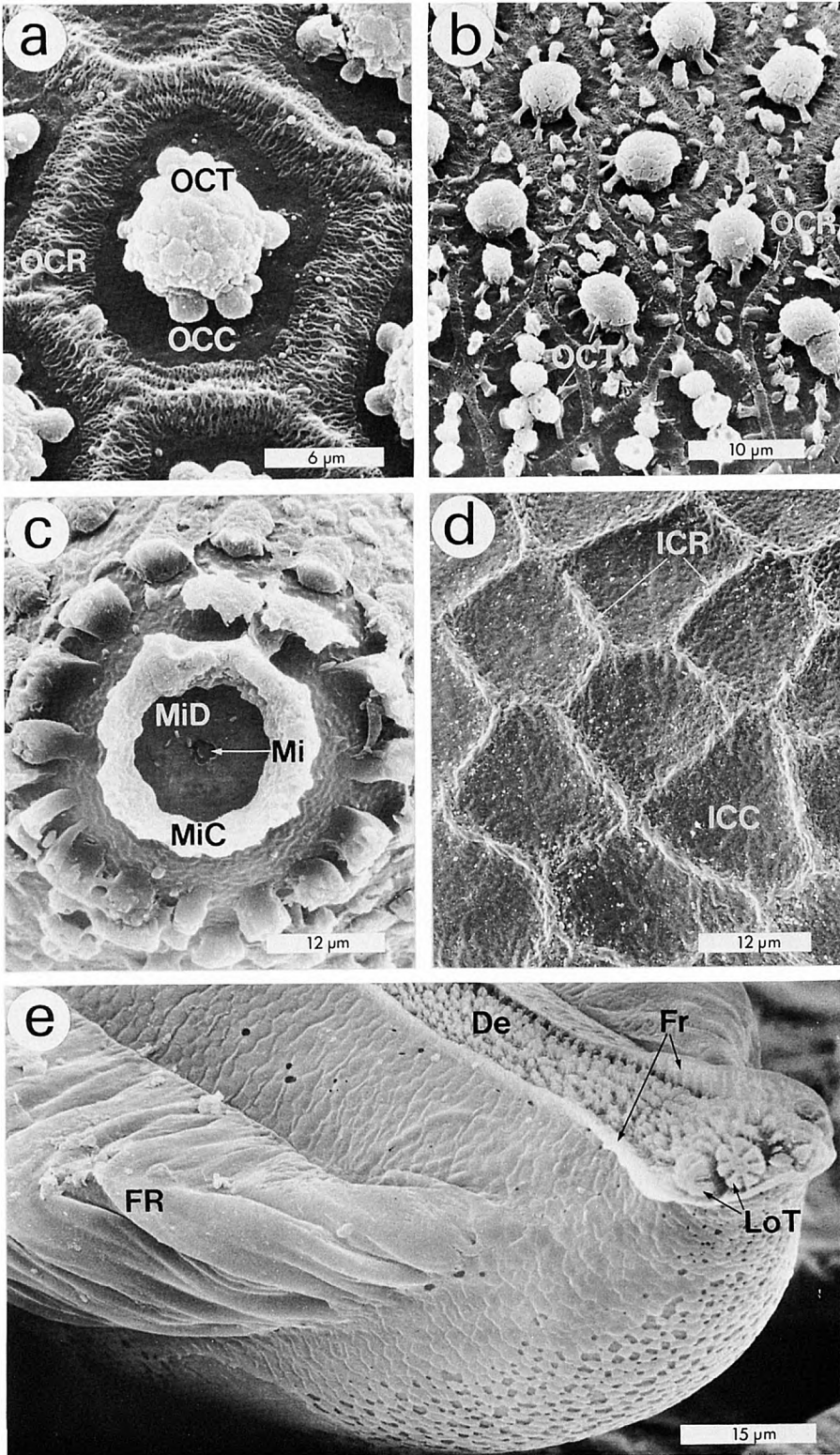


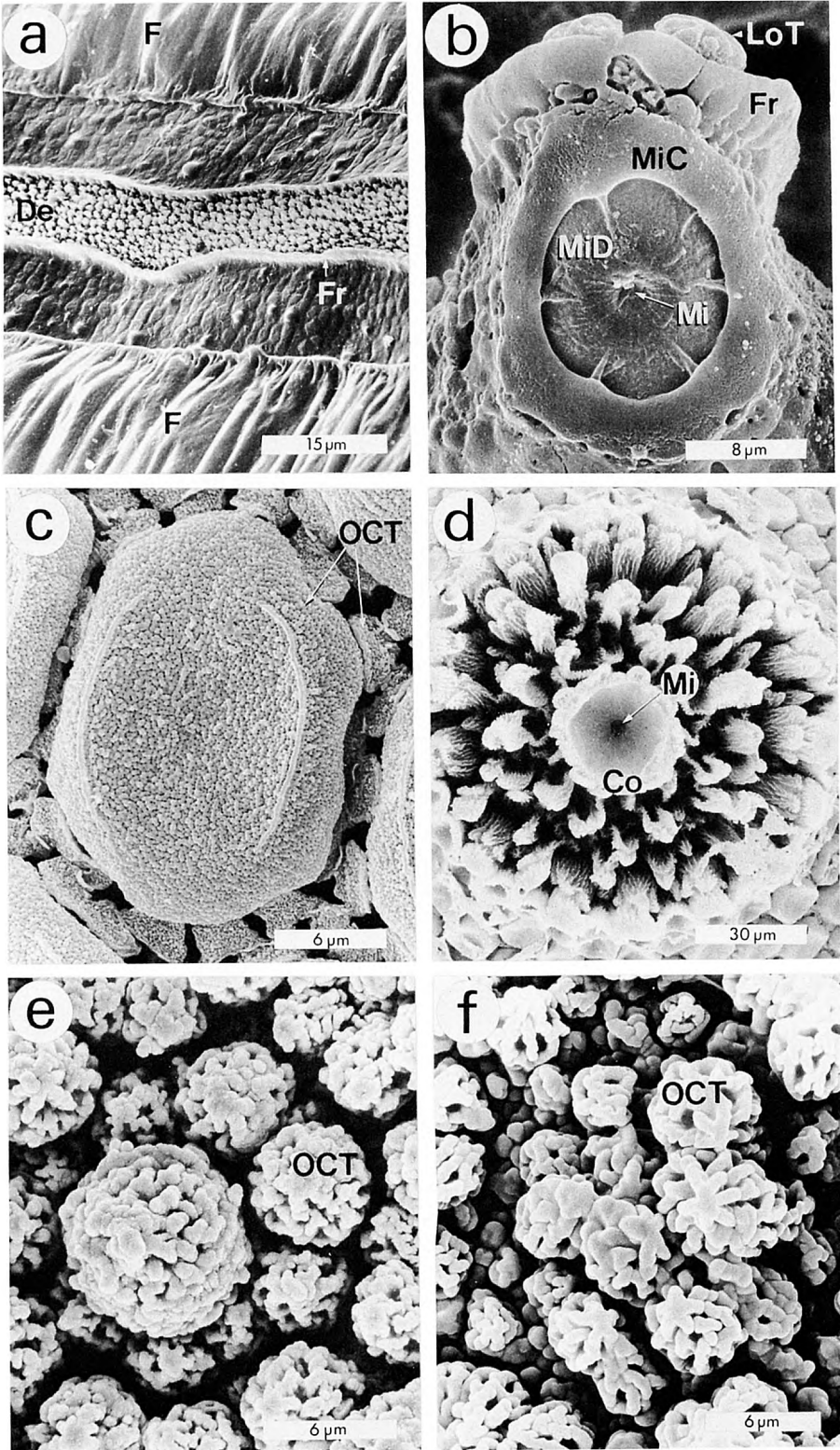
FIGURE 32

- a-b. Egg of *Anopheles (Cellia) aconitus* Dönitz.
 - a. Central area of ventral surface.
 - b. Anterior end.
- c-d. Egg of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
 - c. Outer chorionic cell.
 - d. Anterior end.
- e. Egg of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
 - c. Outer Chorionic cell.
 - d. Anterior end.
- e. Egg of *Toxorhynchites (Toxorhynchites) amboinensis* (Doleschall). Outer chorionic cell (with one large and seven smaller tubercles).
- f. Egg of *Toxorhynchites (Lynchiella) rutilus* (Coquillett). Outer chorionic cell (somewhat poorly delimited).

Abbreviations

Co	- corolla
De	- deck
F	- float
Fr	- frill
LoT	- lobed tubercle
Mi	- micropyle
MiC	- micropylar collar
MiD	- micropylar disc
OCT	- outer chorionic tubercle

Fig. 32



LARVA

A

ABDOMEN (Fig.72) — The third, posterior division (tagma) of the insect body. In mosquito larvae, consisting of nine apparent segments.

ABDOMINAL PUNCTURE (p-III,p-IV,p-V) (Figs.66,67,72) — The puncture which occurs medially on the dorsolateral area of abdominal segments III to V; also present in mosquito pupae (see Figs.75,77,78). (Syn.: dorsal sensillum, Belkin 1962,560)

ABDOMINAL SEGMENT (I,II,etc.) (Figs.59-61,66-68,72) — One of the annular subdivisions of the insect abdomen. Nine are apparent in mosquito larvae.

ABDOMINAL SEGMENT VIII (VIII) (Figs.59-62) — In most nematoceros larvae, the apparent eighth segment of the abdomen; structurally comprising embryonic abdominal segments VIII and IX. In mosquito larvae, bearing a siphon and/or spiracular apparatus dorsally.

ABDOMINAL SEGMENT X (X) (Figs.59-62) — In most nematoceros larvae, the ultimate or apparent ninth abdominal segment; largely comprising embryonic abdominal segment X but probably including parts of the true ninth and eleventh segments and the telson. (Syn.: Höcker, Haller 1878,93; Tracheenkiemen tragenden Höcker, Haller 1878,94; Tracheenkiemenhöcker, Haller 1878,101; Analleddet, Meinert 1886,377; ninth segment, Howard 1900b,25; anal segment, Dyar 1901a,178; last segment, Smith 1902a,272; ninth abdominal segment, Johannsen 1903,414; anal lobe, Christophers, 1922,541; Schwanzsegment, Stadtmann-Averfeld 1923,114; Endsegment, Martini 1931,84; 10th segment, Puri 1931,39; terminal segment, Snodgrass 1959,26; last abdominal segment, Gutsevich *et al.* 1974,36)

ACCESSORY TEETH (Act) (Figs.46,50) [Foote 1952,449] — In anopheline larvae, a group of peglike teeth borne on the mesodorsal margin of the mandible; located immediately posterior to and closely associated with the base of the posterior dorsal tooth; in some culicine larvae, a smaller group of similar structures are closely associated with the posterior dorsal tooth. (Syn.: cluster of finger-shaped processes, Puri 1931, in part, 24; subterminal teeth, Puri 1931, in part, 25; chitinous pad covered with spines, LaCasse and Yamaguti 1948,13; Molarteil, Schremmer 1949,190; accessory spines, Foote 1952,449; molar region, Clements 1963,35; mesal pecten, Knight 1971b,196; accessory denticles, Gardner *et al.* 1973,165)

ACCESSORY TERGAL PLATE (ATP) (Fig.59) [Belkin 1962,560] — In some anopheline larvae, one of the small median or submedian dorsal sclerites located posterior to the tergal plates of abdominal segments I-VII. See **MEDIAN ACCESSORY TERGAL PLATE** and **SUBMEDIAN ACCESSORY TERGAL PLATE**.

ANAL PAPILLA (APP) (Figs.59-62,64,65) [Analpapillerne, Meinert 1886,337] — In mosquito and other dipterous larvae, one of usually four soft elongate processes borne posteriorly around the anus of abdominal segment X; presumably representing the modified cerci of embryonic abdominal segment XI (Matsuda 1976). (Syn.: Tracheenkieme, Haller 1878,93; Kiemenblätchen, Raschke 1887,12; gill, Hurst 1890a,50; flap, Howard 1896,13; gill flap, Howard 1896,13; terminal flap, Howard 1896,13; tracheal gill, Packard 1898,464; anal tubercle, Giles 1900,40; anal process, Dyar 1901a,179; anal finger, Dyar 1901b,181; anal flap, Howard 1901,151; anal plate, Theobald 1901b,27; process, Theobald 1901b,27; caudal fin, Theobald 1901b,31; papilla, Theobald 1901b,33; anal gill, Smith 1902b,303; blood gill, Johannsen 1903,397; anal appendage, Johannsen 1903,405; anal tracheal gill, Smith 1904,21; anal lobe, Snodgrass 1959,27)

ANAL PAPILLA-SADDLE INDEX [Harbach and Knight 1978a,55] — The length of the dorsal anal papillae divided by the saddle length. (Syn.: gill-saddle index, Marshall 1938,52; gill saddle index, Woodhill and Pasfield 1941,203)

ANTENNA (A) (Figs.33-35,37,38,40-44) — One of the paired anterior appendicular organs of the insect head. In mosquito larvae, inserted anterolaterally; consisting of a narrow ringlike scape which is often united with a large distal part, the fused pedicel and flagellum. (Syn.: flagellum, Patton and Evans 1929,235; shaft, Patton and Evans 1929,235; scape, Laffoon and Knight 1973, excluding seta 6-A,55)

- ANTENNAL PROMINENCE (APr)** (Figs.33,35-39,42-45) [Christophers 1960,188] — The anterolateral antenna-bearing lobe of the cranium; a part of the ocular lobe of certain authors. (Syn.: antennal peduncle, Lewis 1949,63; peduncle of the antenna, Lewis 1949,63)
- ANTENNAL PUNCTURE (AP)** (Figs.37,40) [Laffoon and Knight 1973,32] — A small puncture located dorsally near the base of the antenna. (Syn.: basal sensillum, Belkin 1962,560)
- ANTENNAL RIDGE (AR)** (Figs.33,35-41) [Laffoon and Knight 1973,32] — The thickened rim around the outer margin of the antennal socket; presumably not an antennaria (Yuasa 1920,256) or antennal sclerite (Snodgrass 1935,107).
- ANTENNAL SOCKET (AS)** (Figs.35-45) [DuPorte 1946,394] — The membranous area of the head into which the base of the antenna is set. (Syn.: antennal foramen, Cook 1944b,40; antacoria, Laffoon and Knight 1973,31)
- ANTENNIFER (Af)** (Figs.35,37-39) [Laffoon and Knight 1973,32] — An attached or detached pivot on the sclerotized rim of the antennal socket on which the antenna articulates. In some mosquito larvae, two detached presumed antennifers are present.
- ANTERIOR DORSAL TOOTH (ADT)** (Fig.50) [Pao and Knight 1970,124] — The more anterior of the two dorsal teeth of the mandible; usually bearing one or two cusps. (Syn.: mesal dorsal dentes, Shalaby 1956,150; cephalic subgroup of the dorsal dentes, Shalaby 1957a,152)
- ANTERIOR MANDIBULAR ARTICULATION (AMA)** [Cook 1944b,50] — In mosquito larvae and most other insects, the junction line along which the preartis and precoila come into contact during mandibular movements; the mandibular articulation associated with the clypeus. (Syn.: dorsal mandibular joint, Crawford 1933,27; articulation of the maxilla with the zygous trabecula [in Russian], Becker 1938b,750; anterior articulation of the mandible, Farnsworth 1947,138; inneres Mandibelgelenk, Schremmer 1949,190; anterior articulation of mandible, Menees 1958b,128; anterior articulation, Snodgrass 1959,17; dorsal articulation, Snodgrass 1959,17)
- ANTERIOR MEDIAN PROCESS (AMPc)** (Figs.59,64) [Harbach and Knight 1978a,55] — In anopheline larvae, an elevated dome- or knoblike membranous area situated posteriorly on the midline of the anterior spiracular lobe of the spiracular apparatus; in some species, produced into an elongate process, e.g., in *Chagasia* species. (Syn.: filamentous appendage, Komp 1942,18; filamentous projection, Komp 1942,85; transparent knob, Reid 1968,37; domed area, Reid 1968,38; knob, Reid 1968,38; stigmal process, Reid 1968,38; stigmal filament, Reid 1968,38; stigmal club, Reid 1968,38)
- ANTERIOR PALATAL BAR (APB)** (Figs.34,36-41) [Cook 1944c,71] — A transverse labropalatal structure formed of a pair of well-sclerotized lateral parts articulating on the mesal tormal processes and a short, pale, flexible interposed mesal unit. (Near syn., originally used for one lateral part only: trabecula palatina, Shipitzina 1936,354; epipharyngeal bar, Snodgrass 1959,13; transverse postpalatal bar, Pao and Knight 1970,122. Syn.: transversal girdle, Becker 1938a,439; anterior palatal crossbar, Cook 1944b,48; transverse girdle, Farnsworth 1947, 141; transverse bar, Shalaby 1956,146; anterior inter-tormal bar, Menees 1958b,131; postpalatal bar, Christophers 1960,198)
- ANTERIOR SPIRACULAR LOBE (ASL)** (Figs.59-61,63,64) [Harbach and Knight 1978a,56] — The anterior, unpaired flaplike projection of the spiracular apparatus. In mosquito larvae, bearing setae 3- (usually a puncture), 4- and 5-S on its posterolateral margins; partly homologous with the saw of *Mansoniini* larvae. (Syn.: Hudfold, Meinert 1886,394; fan-shaped piece, Nuttall and Shipley 1901a,65; fan-shaped flap, Nuttall and Shipley 1901a,65; fan-shaped plate, Nuttall and Shipley 1901a,65; median anterior fan-shaped plate, Nuttall and Shipley 1901a,65; anterior piece, Howard *et al.* 1912,92; transverse movable pad, Christophers 1922,538; vordere mittlere Klappe, Martini 1923a,530; vordere Klappe, Montschadsky 1927,486; vordere Lappen, Montschadsky 1927,495; anterior pad, Puri 1931,38; medio-dorsal valve, Marshall 1938,48; anterior flap, Komp 1942,18; petit clapet, Sautet and Audibert 1946,46; petit clapet médian, Sautet and Audibert 1946,46; clapet central, Sautet and Audibert 1946,47; median valve, Hopkins 1952,16; anterior perispiracular lobe, Christophers 1960,218; median dorsal valve, Belkin 1962,561; median dorsal lobe, Belkin 1962,561; anterior spiracular valve, Knight and Laffoon 1971b,168; anterior lobe, Gutsevich *et al.* 1974,30; anterior valve, Gutsevich *et al.* 1974,30; anterior median dorsal valve, Harrison and Scanlon 1975,20)
- ANTERIOR SPIRACULAR LOBE PLATE I (ASLP^I)** (Figs.59-61,63,64) [Harbach and Knight 1978a,56] — The inner sclerite (that nearest the spiracular openings) of the anterior spiracular lobe of the spiracular apparatus. (Syn.: movable transverse plate, Imms 1908,107; fan-like plate, Imms

1908,130; transverse plate, Howard *et al.* 1912,92; fan-shaped plate, Christophers 1922,538; tergal plate, Patton and Evans 1929,241; pre-spiracular plate, Evans 1938,21; inner flap of medio-dorsal valve, Marshall 1938,49; anterior plate, Komp 1942,18)

ANTERIOR SPIRACULAR LOBE PLATE II (ASLP^{II}) (Figs.59,60,63) [Harbach and Knight 1978a,56] — The somewhat weakly developed outer sclerite (that nearest abdominal segment VIII or the distal margin of the siphon) of the anterior spiracular lobe of the spiracular apparatus. (Syn.: outer flap of medio-dorsal valve, Marshall 1938,49; outer plate of anterior lobe, Christophers 1960,221)

ANTERIOR TENTORIAL ARM (ATA) (Figs.33-35,37-41,44) [Cook 1944b,40] — The apodeme extending posteriad from the anterior tentorial pit; ending free (in some insects) or in contact with the posterior tentorial arm (in most insects); sometimes with secondary arms. In mosquito larvae, in contact with the posterior tentorial arm. (Syn.: anterior arm, Cook 1944b,47; tentorial arm, DuPorte 1946,394; Tentorialstab, Schremmer 1949,181; anterior arm of the tentorium, Christophers 1960,203)

ANTERIOR TENTORIAL PIT (ATP) (Figs.33-35,37,40,44) [Cook 1944b,40] — An external depression in the cranium at the base of each anterior tentorial arm. In mosquito larvae, occurring near the dorsolateral end of the cibarial bar close to its junction with the postantennal buttress. (Syn.: tentorial invagination, DuPorte 1946,394; anterior tentorial invagination, DuPorte 1946,412)

ANTEROLATERAL SPIRACULAR LOBE (LSL) (Figs.59-61,63,64) [Harbach and Knight 1978a,57] — One of the anterior of two bilateral pairs of flaplike projections of the spiracular apparatus. In mosquito larvae, weakly developed (indistinct) in the tribe Mansoniini. (Syn.: triangular flap, Nuttall and Shipley 1901a,65; conical papilla, Johannsen 1903,409; lateral flap, Howard *et al.* 1912,92; lateral papilla, Christophers 1922,538; vordere seitliche Klappe, Martini 1923a,530; seitliche Lappen, Montschadsky 1927,495; mittlere Lappen, Montschadsky 1927,496; seitliche Klappe, Montschadsky 1927,496; flap, Evans 1938,30; latero-dorsal valve, Marshall 1938,48; petit clapet, Sautet and Audibert 1946,46; petit clapet latéraux, Sautet and Audibert 1946,46; clapet latéraux, Sautet and Audibert 1946,46; lateral valve, Hopkins 1952,16; lateral lobe, Snodgrass 1959,28; lateral perispiracular lobe, Christophers 1960,218; dorsolateral valve, Belkin 1962,561; dorsolateral lobe, Belkin 1962,561; lateral spiracular valve, Knight and Laffoon 1971b,168)

ANTEROLATERAL SPIRACULAR LOBE PLATE I (LSLP^I) (Figs.59-61,63,64) [Harbach and Knight 1978a,57] — The inner sclerite (that nearest the spiracular openings) of one of the anterolateral spiracular lobes of the spiracular apparatus. (Syn.: inner flap of latero-dorsal valve, Marshall 1938,49; inner plate of lateral perispiracular lobe, Christophers 1960,218; supporting plate, Gutsevich *et al.* 1974,34)

ANTEROLATERAL SPIRACULAR LOBE PLATE II (LSLP^{II}) (Figs.59-61,63) [Harbach and Knight 1978a,57] — The often poorly delimited outer sclerite (that nearest abdominal segment VIII or the distal margin of the siphon) of one of the anterolateral spiracular lobes of the spiracular apparatus. (Syn.: outer flap of latero-dorsal valve, Marshall 1938,49)

ANTEROMEDIAN PALATAL BRUSH (APBr) (Figs.33-37,39,42-44) [Laffoon and Knight 1973,34] — In most mosquito larvae, the distal, unpaired palatal brush formed by some of the long filaments attached to the anteromedian palatal lobe. (Syn.: Palatumzipfel, Schremmer 1949,184; median tuft of bristles, Jones 1960,459; palatum, Manning 1978,801)

ANTEROMEDIAN PALATAL FILAMENT (APF) — Any labropalatal filament between the inner edges of the lateral palatal penicular areas. (Syn.: median bristle, Farnsworth 1947,147; Palatumborste, Schremmer 1949,184; palatal hair, Shalaby 1956,143; ental palatal hair, Shalaby 1957a,148; supra-palatal hair, Shalaby 1957a,148; palatal spine, Shalaby 1957b,272; anteromedian palatal hair, Laffoon and Knight 1973,34)

ANTEROMEDIAN PALATAL LOBE (APL) (Figs.36,39) [Laffoon and Knight 1973,34] — The distal, unpaired labropalatal lobe; usually bearing a brush of filaments. (Syn.: Palatum, Raschke 1887,139; labrum, Patton and Evans 1929,235; antero-median lobe, Becker 1938a,439; median lobe, Farnsworth 1947,140; median labral brush, Pucat 1965,50)

ANTEROMEDIAN PALATAL PENICULAR AREA (APPA) [Laffoon and Knight 1973,34] — In many mosquito larvae, the specialized cuticular area bearing the brush on the anteromedian palatal lobe.

ARCUATE THICKENING (ArT) (Fig.47) [Harbach and Knight 1977a,26] — A partial or complete

looplike band of cuticle extending anteriorly from the dorsal part of the U-shaped rod of the mandible; representing the rim of the depression in which is borne mandibular sweeper 2. (Syn.: arcuate suture, Knight 1971b,204)

AUXILIARY VENTRAL TOOTH (AVT) (Figs.48-50) [Harbach and Knight 1977a,27] — In some mosquito larvae, a small tooth located posterior to and in line with the ventral teeth of the mandible; usually bearing two or three cusps.

B

BASAL BAND (BB) (Fig.50) [Pao and Knight 1970,124] — In many mosquito larvae, a semicircular or linear band of cuticle which represents the rim of the depression in which the mandibular rake is borne.

BASAL NOTCH (BN) (Fig.52) [Gardner *et al.* 1973,167] — In some culicine larvae, a small gap or slit between the galeastipital stem and the laciniastipes on the ventrobasal margin of the maxilla.

basal ring [Tanaka *et al.* 1979,21] — A pedicel supporting one or more setae, e.g., setae 1-Mx.

basal supporting plate [Imms 1908,131] — In anopheline larvae, a “chitinised sclerite” (Imms 1908,107) located anteriorly at the base of the spiracular apparatus and extending laterally to the pecten plate on each side of abdominal segment VIII. (Syn.: chitinised sclerite, Imms 1908,107; presiphonic fold, Christophers 1922, in part, 538; lateral siphonic area, Christophers 1922, in part, 538)

BLACK-SPOT AREA (BA) (Figs.34-39) [Thompson 1905,167] — The darkly pigmented, ventromesally directed middle division of the paraclypeal lobe. (Syn.: pretentorium, Patton and Evans 1929,232)

bordering line of larval head [Thompson 1905, P1.15] — A “line” believed to be an effect given by seeing the clypeolabral ridge through the part of the clypeus which overlaps it. (Syn.: border line, Thompson 1905,169)

BOSS (B) [Belkin 1962,561] — In certain mosquito larvae, a more or less sclerotized elevated area without a grid at the base of the ventral brush. See **GRID**.

C

CARDO (Cd) (Figs.38,51,52,54) [Chaudonneret 1962,476] — The basal subdivision of the maxilla. In larval Diptera, a small usually rod-shaped sclerite articulating with the lateralia. In mosquito larvae, bearing seta 6-Mx and often fused with the maxillary palpus, e.g., in *Hodgesia*, *Tripteroides* and *Trichoprosopon*, partially attached to the margin of the lateralia, e.g., in *Culiseta*, *Culex*, *Deinocerites*, *Opifex* and most *Aedes*, or completely united with the lateralia, e.g., in *Armigeres* and *Toxorhynchites*. (Syn.: tresidet Chitinplate, Meinert 1886,377; basal piece, Puri 1931,27; stipes, Puri 1931,27; first segment of maxillary palp, Salem 1931,401; palpifer, Cook 1944b,43; maxillary palpifer, Cook 1944b,57; triangular sclerite, Cook 1949,8; ventral sclerite of the maxilla, Foote 1952,461; maxillary apodeme, Shalaby 1956,153; pigmented and sclerotized apodeme, Shalaby 1958,445; small sclerite, Snodgrass 1959,18; sclerite at base of palpus, Snodgrass 1959,18; cardo-basisstipes, Pucat 1965,57; fused cardo and basisstipes, Pucat 1965,58; hypostomal sclerite, Harbach and Knight 1977b,134)

Since Yin (1970) has shown that the seta (6-Mx) borne on this sclerite is innervated by a branch of the maxillary nerve, the sclerite is regarded here as a subdivision of the maxilla rather than a fragment of the cranium as was believed by Harbach and Knight (1977b) and Knight and Harbach (1977).

cardolacinal line [Pao and Knight 1970,128] — The line formed by the bases of the spicules forming laciniarastrum 2.

CEPHALIC PAPILLA (CPa) (Figs.38,40,41,45) [Lewis 1949,66] — In certain mosquito larvae, one of one or more paired protruding vesicular expansions of cephalic articulatory membranes; in at least some cases serving as a gill. (Syn.: accessory gill, Komp 1923,125; accessory tracheal gill, Komp 1923,134; gill, Komp 1923,134; cephalic gill, Lewis 1949,62; cephalic tracheal gill, Lewis 1949,65; head gill, Lewis 1949,66; bladder-like organ, Hopkins 1952,22; bladder, Hopkins 1952,23)

CERVIX (Cv) (Figs.42,44) — The membranous tube connecting the thorax to the head at the margins of the occipital foramen. In mosquito larvae, bearing setae 18- and 19-C laterally and a small sclerite, the ventromedian cervical sclerite, on its ventral midline. (Common Syn.: neck)

- chitinous apodeme of epipharynx** [Pucat 1965,44] — Incorrectly attributed by Pucat to Imms as his name for the torma. Imms (1908,104) did describe the torma as “a chitinous apodeme of the epipharynx,” but did not name it “chitinous apodeme of epipharynx.”
- CIBARIAL BAR (CB)** (Figs.33-38,40,44) [Cook 1944b,41] — In mosquito and some other nematocerous larvae, a paired cranial element of the cibarial wall just anterior to the mouth, its dorsolateral part being a narrow process of the clypeus in front and lateralia behind, its ventromesal part being an arm of uncertain homology extending dorsolaterad from the labiohypopharynx; when present, the precoila, anterior tentorial pit, lateral oral bar and outer end of the epistomal suture are often or always associated with it. (Syn.: Verbindungsleiste, Schremmer 1949,181; mandibular apodeme, Shalaby 1956, in part, 149; hypopharyngeal bar, Snodgrass 1959,11; chitinous bar, Christophers 1960,202; suspensorium, Christophers 1960,202)
- CIBARIUM (Cib)** — The part of the preoral cavity between the clypeopalatum and the hypopharynx. Compare **CIBARIUM** in the adult section.
- clypeal suture** [Shalaby 1956,140] — In certain insects, used either 1) in the sense of the epistomal suture or 2) in the sense of a transverse suture dividing the clypeus into an anteclypeus or preclypeus and a postclypeus. In mosquito larvae, incorrectly applied in the works of Shalaby. See **CLYPEUS**.
- CLYPEOLABRAL RIDGE (CIR)** (Figs.35,37-39,41) [Laffoon and Knight 1973,35] — In most insects, the internal ridge associated with the clypeolabral suture when this suture is not entirely membranous. In mosquito larvae, apparently normally or always continuous in association with the full length of the clypeolabral suture between the apices of the opposite clypeolabral straps; generally appearing slightly to much darkened partially because the observer usually sees two layers of cuticle (this ridge and the overlapping part of the clypeus) at once. (Syn.: clypeolabral inflection, DuPorte 1946,394) See **CLYPEUS**.
- CLYPEOLABRAL STRAP (CStr)** (Figs.34-38,41,45) [Laffoon and Knight 1973,36] — A paired straplike cranial process comprised of the end of the clypeolabral ridge and the adjacent lateral corners of the paraclypeal lobe and median labral plate, articulating distally with the base of the torma.
- CLYPEOLABRAL SUTURE (CIS)** (Figs.35,38-41,43) [clypeo-labral suture, Patton and Evans 1929,232] — The transverse suture separating the labrum and clypeus. In mosquito larvae, sometimes difficult to trace mesally because of the curvature of the head; terminating at the apex of the clypeolabral strap, difficult to distinguish from other parts of this strap. (Syn.: clypeal suture, Shalaby 1956,140; clypeolabral sulcus, Snodgrass 1959,5)
- CLYPEOPALATUM (Cp)** (Figs.34,36,38,39,44,45) [Laffoon and Knight 1973,36] — The part of the palatum formed by the under surface of the clypeus, the roof of the cibarium. In mosquito larvae and some other insects, the part of the palatum behind the tormae and intertorma. (Syn.: epigusta, Patton and Evans 1929,238; post-epipharynx, Patton and Evans 1929,238; post-epipharyngeal lobe, Christophers 1960,198)
- CLYPEUS (Cip)** [Menees 1958b,128] — The median facial sclerite basal to the labrum; giving origin to the dorsal cibarial muscles; usually bounded anteriorly by the clypeolabral suture and posteriorly by the epistomal suture; if the transverse part of the epistomal suture is absent, the frons and clypeus are continuous and thus form a frontoclypeus. In larval insects, the dorsal apotome, if present, is commonly formed from parts of the frons and clypeus; often misidentified in mosquito larvae. Compare **CLYPEUS** in the adult section.
- Clypeus was apparently first used for mosquito larvae by Meinert (1886,376). The limits he intended for his “Clypeus” are not clear but it seems certain he meant to include an anterior area of the clypeus, the median labral plate and part of the labropalatum including the lateral palatal penicular area but not the anteromedian palatal lobe. Nuttall and Shipley (1901a,56) wrote that the “‘clypeus’ of Meinert” “is hinged on to the rest of the head” and thus apparently excluded the median labral plate and any part of the clypeus even though Meinert had included these in this concept of “Clypeus.” The clypeus of Howard *et al.* (1912,84) and Salem (1931,397) apparently includes only the median labral plate; that of Cook (1944b,40) and Farnsworth (1947,138) is the dorsal apotome plus, just distal to this apotome, the area of the clypeus between imaginary extensions of the frontal ecdysial lines along the margins made by the abrupt deflection of the clypeus on each side; that of DuPorte (1946,394; 1957,67) is the part of the clypeus distal to a line between the anterior mandibular articulations; that of Menees (1958b,128) and apparently of Snodgrass (1959,6) and Christophers (1960,198) is the clypeus interpreted here.
- Shalaby (1956,140; 1957a-c) interpreted the dorsal apotome plus the anterior median area of the

clypeus as being the frons, and he called the median labral plate and (1957a,146; 1957b-c) the "paraclypeal phragma" the clypeus. He regarded the "clypeus" as being divided into a preclypeus and a postclypeus by a clypeal suture. When ordinary permanent mounts of cleared mosquito larvae or larval exuviae are studied, four transverse lines can be seen in the area of the median labral plate by careful observation and focusing; these are, in the proximal-to-distal sequence in which they are usually seen: the inner edge of the clypeolabral ridge, the outer edge of this ridge (which is along the course of the clypeolabral suture), the edge of the median labral plate bordering the labropalatum and the edge of the bulge of this plate as seen in profile. It is difficult to know which of these four lines are the three transverse lines of Shalaby (his fronto-clypeal suture or fronto-postclypeal suture, clypeal suture and labro-clypeal suture) in his interpretations of this area in the four mosquito species he studied, particularly as it appears he was not consistent in his application of these terms.

Except in instars 2-4 of *Psorophora ciliata* (Fabricius), it is probable that the fronto-clypeal suture of Shalaby is sometimes the inner and sometimes the outer end of the clypeolabral ridge, that his clypeal suture is sometimes the outer end of the clypeolabral ridge and sometimes the edge of the median labral plate bordering the labropalatum, and that his labro-clypeal suture is probably the edge of the distal bulge of the median labral plate seen in profile. The nature of his preclypeus and postclypeus vary according to his identification of his sutures; in three of his papers (1957a-c) he considered the "paraclypeal phragmata" to be parts of his preclypeus.

Shalaby (1957a,146) referred to his fronto-clypeal suture as the fronto-postclypeal suture, but reported that it was absent in *Aedes aegypti* (Linnaeus), apparently because the clypeolabral ridge of this species is relatively inconspicuous. Thus he thought a "fronto-postclypeus" was formed in *Ae. aegypti* by fusion of his postclypeus and frons.

Shalaby (1957c,430) studied *Ps. ciliata*, which like other species with late instars preying on relatively large animals, has a labropalatum somewhat different from the usual type. Shalaby's labro-clypeal suture, preclypeus, clypeal suture and postclypeus in the last three instars of this species all seem to be thin sclerotized labropalatal areas or boundaries of such areas.

COLLAR (Col) (Figs.33-35,37,38,40-42,44) [Cook 1944b,43] — In many animals, a circular or semicircular strip or band at the back of the head or front of the trunk or thorax, the morphological makeup varying with the taxa. In mosquito larvae, the modified, usually heavily pigmented, posterior rim of the cranium, including much of the postocciput, the back edge of the gula and a band just in front of the main part of the postoccipital suture. (Syn.: occiput, Patton and Evans 1929,232; postocciput, Snodgrass 1959,4; cervical collar, Christophers 1960,197)

columella [Iyengar 1928,282] — In anopheline larvae, the basal stalk of Nuttall and Shipley's organ supporting the more membranous bilobed part. (Syn.: basal pedicel, Iyengar 1921,216; pedicel, Iyengar 1921,216; base, Puri 1931,29; cup part, Chang and Richart 1951,at least in part, 290)

COMB (C) (Figs.60,62,65) [Dyar 1903,23] — In most culicine and first stage anopheline larvae, a row or patch of specialized spicules centered on each side of abdominal segment VIII; sometimes arising from a sclerite, the comb plate. (Syn.: Raekker af Torne, Meinert 1886,377; Borsten des vorletzten Leibesgliedes, Raschke 1887,161; lateral comb, Dyar 1901a,178; side comb, Dyar 1901a,179; patch, Smith 1903,311; patch of scales, Smith 1904,19; patch of combs, Smith 1904,19; patch of pectens, Smith 1904,19; scale patch, Smith 1904,20; scale-patch, Smith 1904,21; scale band, Smith 1904,196; lateral patch, Smith 1904,221; row of spines, Patton and Cragg 1913,201; Doppelkamm, Tänzer 1921, including the pecten in anophelines, 139; Striegelkamm, Tänzer 1921,143; Striegel, Tänzer 1921,157; secondary comb, Baisas 1947, in first stage anopheline larvae, 204)

COMB PLATE (CP) [Belkin 1962,560] — In certain culicine larvae, a lateral sclerite on abdominal segment VIII which bears the comb scales; sometimes the comb plates of opposite sides are joined dorsally; not homologous with the tergal plate of anopheline, *Orthopodomyia* or *Corethrella* (Chaoboridae) larvae; also not homologous with the large setal support plate which commonly bears setae 2- through 5-VIII in toxorhynchitine larvae. (Syn.: basal plate, Dyar 1902,51; transverse plate, Dyar 1903,26; band, Smith 1904,185; plate, Felt 1905,444; sclerite, Gutsevich *et al.* 1974,32)

COMB SCALE (CS) (Figs.60,62,65) [Felt 1904,264] — In most culicine and first stage anopheline larvae, one of the specialized spicules forming the comb; of variable form but usually scale- or spinelike; often bearing a fringe of spinules or denticles. (Syn.: Schmetterlingsschuppenartige Organ, Haller 1878,94; Chitintaender, Meinert 1886,377; Raekker, Meinert 1886,377; Borste, Raschke 1887,137; tooth, Dyar 1901a,178; spine, Dyar 1902,51; comb tooth, Dyar 1903,27; scale, Smith 1903,311; comb, Smith 1904,19; pecten, Smith 1904,19; Striegelborste, Tänzer 1921,143; Striegeldorn, Stadtmann-Averfeld 1923,111; Striegelzahn, Martini 1923a,547; lateral comb spine, Patton 1931,144; comb-scale, Marshall 1938,50; secondary comb tooth, Baisas 1947, in anophelines,

206; lateral comb scale, Abdel-Malek 1949,21)

COMPOUND EYE (CE) (Figs.33,35,37,38) [Hurst 1890b,170] — A light-perceptive organ consisting of an aggregation of optic elements (ommatidia) generally located on each side of the head. Apparently rarely functional in endopterygotous larvae. In mosquito larvae, apparently present in a developing state during all instars; becoming prominently pigmented and perhaps functional in older larvae. (Syn.: Øjnene, Meinert 1886,376; œil, Meinert 1886,490; Hauptauge, Raschke 1887,155; primordia of the compound eye of the imago, Imms 1907,292; lateral eye, Wesenberg-Lund 1921, including the stemma, 10; Komplexauge, Constantineanu 1930, 294; eye, Marshall 1938, including the stemma, 41; imaginal eye, Russell *et al.* 1943,14; anlagen of the adult eye, DuPorte 1946,393; primordial ommatidia of the adult, Farnsworth 1947,138; primordia of imaginal eye, Farnsworth 1947,147; eye spot, Peterson 1951, including the stemma, 223; larval eye, Shalaby 1957a, including the stemma, 146; adult eye, Pao and Knight 1970,117)

CORONAL ECDYSIAL LINE (CEL) (Fig.39) [Laffoon and Knight 1973,37] — The median unpaired posterior part of the epicranial ecdysial line; considered absent if the paired frontal ecdysial lines reach the posterior cranial margin separately. In mosquito larvae, sometimes absent, sometimes short and ending posteriorly in the coronal gap in late instars. (Syn.: coronal suture, Cook 1944b,52, though some authors have included the entire coronal gap as a part of the coronal suture; occipital stem, Pucat 1965,49) See **ECDYSIAL LINE**.

CORONAL GAP (CG) (Figs.33,34,37,40,42) [Laffoon and Knight 1973,37] — In many nematoceros larvae, the narrow or broad emargination in the posterodorsal edge of the cranium to which the epicranial ecdysial lines extend. In mosquito larvae, present in late instars; sometimes regarded as part of the coronal ecdysial line. (Syn.: occipital cleft, Snodgrass 1959,5)

CRANIUM [Cook 1944b,40] — The sclerotized skull-like part of the head. (Common syn.: head capsule)

CRATAL SETA (CrS) [Knight and Laffoon 1971b,161] — One of the ventral brush setae borne on the grid. (Syn.: cratal tuft, Marshall 1938,49; cratal hair, Woodhill and Pasfield 1941,202)

crest of the pharynx [Thompson 1905,171] — When viewed in cross section, the pharynx of non-predatory mosquito larvae is crescentic in shape with the lateral arms curving dorsad. The lateral recesses or walls of the crescent have been termed "crests of the pharynx" by Thompson and many later authors. (Syn.: elliptic flat ring, Johannsen 1903,413; pharyngeal crest, Thompson 1905,172; lateral crest, Imms 1907,297; couronne épineuse pharyngienne, Sautet 1935,98; crest, Christophers 1960,289; lateral arm, Jones 1960,462)

CUSP (c) [Harbach and Knight 1977a,28] — One of the pointed projections located at or near the apex of the dorsal teeth and the auxiliary ventral tooth of the mandible; rarely are the ventral teeth cusped.

cuticular wing [Iyengar 1928,282] — In anopheline larvae, the expanded more membranous part of each lobe of Nuttall and Shipley's organ. (Syn.: lamellar expansion, Iyengar 1921,216; cuticular expansion, Iyengar 1921,216; membranous part, Chang and Richart 1951,288)

D

distal lacinal seta [Tanaka *et al.* 1979,22] — In culicine and toxorhynchitine larvae, seta 5-Mx; in anopheline and dixid larvae, a seta supposedly borne just mesad of seta 5-Mx but which presence has not been confirmed. (Syn.: seta 6-Mx, Tanaka *et al.* 1979,22)

DORSAL APOTOME (DAP) (Figs.33,35-43) [Laffoon and Knight 1973,37] — In many immature insects, the cranial area bounded laterally by the frontal ecdysial lines and apically by an imaginary line between the most apical parts of the frontal ecdysial lines; there is no necessary homology between the cranial area included in the dorsal apotome of different insects. In mosquito larvae, perhaps homologous with the dorsal apotome of mosquito pupae. (Syn.: scutum du troisième métamère, Meinert 1886,490; facial apotome, DuPorte 1957,67; cephalic apotome, Snodgrass 1959,6; apotome, Wood *et al.* 1979,39. At least partial synonyms as used by some authors include: clypeofrons, clypeus, epistoma, frons, frons-clypeal area, front, and frontoclypeus)

DORSAL BRUSH (DB) (Figs.64,65) [Wesenberg-Lund 1921,15] — Setae 2- and 3-X; arising in a group from the dorsocaudal angle of abdominal segment X. (Syn.: Analborster, Meinert 1886,377; dorsal tuft, Dyar 1901a,179; dorsal hairs, Nuttall and Shipley 1901a,74; Schwanzborsten, Tanzer 1921,145; swimming brush, Wesenberg-Lund 1921,15; subdorsal hairs, Christophers 1922,543; Schwanzhaare, Stadtmann-Averfeld 1923,114; Endborsten, Stadtmann-Averfeld 1923,124;

Schwanzfächer, Stadtmann-Averfeld 1923,127; balancing bristles, Patton and Evans 1929,237; clinging bristles, Patton and Evans 1929,237; anchoring bristles, Patton and Evans 1929,244; dorsal fin, Tate 1932,118; hooked hairs, Marshall 1942,25; caudal setae, Hopkins 1952,18; caudal hairs, Christophers 1960,194)

DORSAL ECDYSIAL LINE (DEL) [Laffoon and Knight 1973,37] — In arthropods, any dorsal preformed line of weakness along which the cuticle splits (usually) or bends during ecdysis. See **ECDYSIAL LINE**.

DORSAL FRINGE (DF) [Christophers 1960,290] — In many mosquito larvae, one of the pharyngeal fringes borne dorsal to the laterodorsal pharyngeal sclerite in the lateral margin of the pharynx; a primary dorsal fringe is borne on the mediodorsal pharyngeal sclerite; secondary dorsal fringes arise from the walls of the pharynx dorsal to the primary dorsal fringe.

DORSAL MANDIBULAR SPINE (DMSp) (Fig.50) [Harbach and Knight 1977a,28] — In many mosquito larvae, a small spine arising immediately dorsal to the base of the dorsal mandibular seta. (Syn.: lateral dorsal spine, Pao and Knight 1970,124; dorsal spine 2, Gardner *et al.* 1973,165)

DORSAL MAXILLARY SUTURE (DMxS) (Figs.51-54) [Harbach and Knight 1977b,132] — The variably developed seam occurring on the dorsal surface of the maxillary body; extending from the maxillary brush to the base of the maxillary body where it is continuous with the stipital arm; serving as a boundary between the laciniastipes and galeastipes. (Syn.: strip of chitin, Mitchell 1906,15; longitudinal suture, Howard *et al.* 1912,86; chitinous ridge, Salem 1931,401; branch of the pedicle, Crawford 1933,28; thickened ridge, Christophers 1960,206; suture on the oral side, Pucut 1965,56; maxillary suture, Gardner *et al.* 1973,167; maxillary ridge, Manning 1978,806; lacinal suture, Tanaka *et al.* 1979,19)

DORSAL ORAL BRUSH (DOB) (Figs.45,58) [Harbach and Knight 1977d,391] — In many mosquito larvae, a fringe or covering of filaments located on or near the dorsal oral sclerite at the dorsal margin of the mouth.

DORSAL ORAL SCLERITE (DOS) (Figs.45,58) [Harbach and Knight 1977d,391] — In many mosquito larvae, a small crescentic plate located just inside the mouth on the midline of the dorsal wall of the pharynx; often bearing a fringe or covering of filaments, the dorsal oral brush, on or near its inner (posterior) margin. (Syn.: transverse crescentic sclerite, Thompson 1905,171; crescentic sclerite of pharynx roof, Thompson 1905, Fig.33; crescent, Christophers 1960,289; sclerite supra-oral, Chaudonneret 1962,477)

DORSAL PHARYNGEAL SCLERITE (DPHs) (Figs.45,58) [Harbach and Knight 1977d,391] — In many mosquito larvae, one of a pair of laterally symmetrical, roughly lunulate plates of the dorsal wall of the pharynx. (Syn.: dorsal plate, Thompson 1905, the pair of sclerites, 171; roof of the pharynx, Thompson 1905, the pair of sclerites, 171; longitudinal sclerite, Thompson 1905, in part, 172; chitinous plate, Imms 1907,297; rigid plate, Imms 1907,297; median membranous portion, Farnsworth 1947, the pair of sclerites, 144; dorsal wall of the pharynx, Farnsworth 1947, the pair of sclerites, 147; dorsal plate, Christophers 1960,289; sclérite médial dorsal du filtre pharyngien, Chaudonneret 1962,486)

DORSAL PREMENTAL TEETH (DPT) — In some mosquito and dixid larvae, a row or series of teeth located on each side of the midline of the labiohypopharynx immediately ventral to the salivary meatus; sometimes borne on a ridge as in certain *Uranotaenia* larvae; seta 1-Lh is sometimes closely associated with or lies near the ventral margin of the teeth. (Syn.: dorsal prelabial teeth, Harbach and Knight 1977c,339)

DORSAL RAMUS (DRa) (Figs.55,56) [Harbach and Knight 1977c,339] — In anopheline and dixid larvae, a rodlike structure joining the cibarial bars immediately dorsal to the hypopharynx; in most culicine larvae, the dorsal rami are not fused but when viewed from a certain angle the hypopharyngeal bar sometimes obscures the rami and appears to join the cibarial bars. (Syn.: expansion aliforme, Chaudonneret 1962,485)

DORSAL TEETH (DT) (Figs.48,50) [Foote 1952,449] — Two usually small broadened teeth situated dorsal to the ventral teeth of the mandible; identified as the anterior dorsal tooth and the posterior dorsal tooth. (Syn.: lower teeth, Salem 1931,402; distal fang [in Russian], Becker 1938b,751; dorsal tooth, LaCasse and Yamaguti 1948,8; dorsal saw, LaCasse and Yamaguti 1948,8; Incisivi, Schremmer 1949, including the ventral teeth, 190; Kauzähne, Schremmer 1949, including the ventral teeth, 192; dorsal group of dentes, Shalaby 1956,150; incisor region, Clements 1963, including the ventral teeth, 35)

dorsal valve [Edwards 1919,86] — In *Mansoniini* larvae, the tubercle bearing seta 2-S at the dorsal base of the spiracular apparatus. (Syn.: anterior valve, Edwards 1919,86; boss, Marshall 1938,267)

DORSOMENTAL TOOTH (DmT) [Laffoon and Knight 1973,38] — In nematoceros larvae, one of the distal teeth or serrations of the dorsomentum. (Syn.: submental serration, Pucati 1965,61; mental tooth, of authors)

DORSOMENTUM (Dm) (Figs.34-36,38,40-44) [Laffoon and Knight 1973,38] — In some mosquito and chironomid larvae, the upper and more distal of the two subdivisions produced when the mentum is completely (in mosquito larvae) or incompletely (in chironomid larvae, Saether 1971,1247) divided by a transverse inflection of membrane; probably not strictly homologous between mosquito and chironomid larvae. (Syn.: lèvre elle-meme, Meinert 1886,490; prolongement de la même, Meinert 1886,490; under lip, Nuttall and Shipley 1901a,55; labial plate, Felt 1904,282; mental sclerite, Thompson 1905,168; mental plate, Howard *et al.* 1912,87; mentum, Patton and Cragg 1912,199; submentum, Cook 1944b, in part in culicines,45; hypostomium, Snodgrass 1959,8; hypostomial lobe, Snodgrass 1959,21; hypochile, Chaudonneret 1962,475; submental plate, Pucati 1965,59; mentum plate, Tanaka *et al.* 1979,14)

E

ECDYSIAL LINE (EL) — In immature arthropods, any preformed line of weakness of the cuticle involved in opening or folding at ecdysis. (Syn.: ecdysial suture, DuPorte 1946,394; cleavage line, Snodgrass 1959,5; ecdysial cleavage line, Matsuda 1965,58)

Hinton (1963,40) listed the main synonyms for this term and gave reasons for using ecdysial line in preference to its synonyms. He also (1963,40) introduced the terms dorsal ecdysial line and ventral ecdysial line, primarily for those lines as they occur on the head. Laffoon and Knight (1973,37;59) used these terms in a collective sense to include such lines not only on the head but also on other body regions. For convenience they introduced four new terms for particular ecdysial lines of the head. Three incorporated the same adjectives used for old terms when these lines were regarded as sutures. Thus prior to their work, the epicranial ecdysial line was known as the epicranial suture while its subdivisions, the coronal ecdysial line and frontal ecdysial lines, were called the coronal suture and frontal sutures. They called any ventral ecdysial line on the head a hypocranial ecdysial line, employing the adjectival form of hypocranium as a convenient counterpart of epicranial.

EGG-BUSTER (EBu) [Howard *et al.* 1912,97] — In many insects, a specialized structure of the embryonic or first stage larval cuticle thought to aid in opening the egg chorion during hatching. In first stage mosquito larvae, a specialized median oval area of the dorsal apotome consisting of a pale peripheral area and a dark central conelike area. (Syn. including terms apparently intended for the central dark area only: egg buster, Landis 1923,29; egg breaker, Hearle 1929,96; egg-tooth, Gater 1934,26; egg-breaker, Marshall 1938,11; hatching spine, Harwood and Horsfall 1957,556; egg-breaker spine, Christophers 1960,162)

EPICRANIAL ECDYSIAL LINE (EEL) [Laffoon and Knight 1973,39] — In many immature arthropods, any part of the dorsal ecdysial line extending onto the cranium; usually made up of an unpaired coronal ecdysial line and paired frontal ecdysial lines. (Syn.: epicranial suture, Patton and Evans 1929,234; cephalic cleavage line, Snodgrass 1959,5) Early authors generally failed to distinguish between the parts of the epistomal suture and epicranial ecdysial line which parallel each other. See **ECDYSIAL LINE**.

epicranial plate [Marshall 1938,40] — The larval cranium exclusive of the dorsal apotome.

EPICRANIUM [Thompson 1905,170] — In insects, the upper and lateral parts of the cranium, indefinitely delimited laterally from the hypocranium when the latter is formed; often defined in other ways, for example, as the entire cranium or as the cranium except the clypeus, eyes, postmentum and gula. In mosquito larvae, loosely the top of the cranium about as far laterally as the lower margin of the compound eyes.

epipharyngeal process [Shalaby 1957a,152] — Shalaby reported that three pairs of "epipharyngeal processes" occur in *Aedes aegypti* (Linnaeus) (1957a) and *Culex pipiens quinquefasciatus* (Say) (1957b). Two of the three pairs are setae 3-Lp while the third, described as H-shaped, is interpreted to be the mesal intertormal apodemes and part of the intertorma between them. Shalaby (1957c) reported that second through fourth stage larvae of *Psorophora ciliata* (Fabricius) had epipharyngeal processes in numbers varying from three pairs in the second to five or six pairs in the fourth instar. His description indicates that these were large midpalatal brush filaments.

epipharynx — Used in at least three separate ways in mosquito larvae: 1) for all, or nearly all, of the

palatum (Schremmer 1949,180; Menees 1958b,133; Chaudonneret 1962,474); 2) for the midpalatal lobe (Raschke 1887,143; Thompson 1905,168; Imms 1907,296; Salem 1931,395; Becker 1938a,439); and 3) for the set of parts comprised of the intertorma, the midpalatal brush and, when present, the setae 3-Lp (Shalaby 1956,141 and 1957a-c; Christophers 1960,202). None of these usages could be morphologically equivalent to the original use of epipharynx for a particular lobe of the bee clypeopalatum nor to the common use in adult Diptera for the lower side of the labrum.

Epipharynxapparat [Schremmer 1949,202] — Schremmer applied this term to the combination of the intertorma, midpalatal brush and, judging from his discussions (1949,1050a-b), to the midpalatal lobe. He (1950b,484) erroneously equated the Epipharynxapparat and Cook's (1944a) palatum but Cook included parts (anteromedian palatal lobe, torma, etc.) not included in the Epipharynxapparat by Schremmer. Epipharynxapparat has been anglicized as epipharyngeal apparatus (Snodgrass 1959,15) and epipharynx apparatus (Clements 1963,34). These and later authors have used the terms loosely so that it is often difficult to know if an author included the midpalatal penicular areas, setae 3-Lp, the intertorma and midpalatal penicular areas, the general cuticular area near these parts, a lobe supposedly restricted to the posteromesal part of the midpalatal lobe, the entire midpalatal lobe, or some combination of the preceding parts. Probably usually the combination of the midpalatal lobe and midpalatal brush was intended.

EPISTOMAL RIDGE (ER) (Figs.33,35,37,38,40,41) [Laffoon and Knight 1973,39] — The cranial inflection marked externally by the epistomal suture. In mosquito larvae, discontinuous mesally, well developed just lateral to the part of the frontal ecdysial line posteromesal to the antennal socket, less prominent on the upper part of the cibarial bar and terminating near the precoila as the long arm known as the anterior tentorial arm.

EPISTOMAL SUTURE (Eps) (Figs.33,35,37,38,40-42) [Laffoon and Knight 1973,40] — The suture marking the boundary between the frons and clypeus; terminating laterally in the anterior tentorial pits; often incomplete. In mosquito larvae, incomplete mesally, prominent just lateral to the part of the frontal ecdysial line posteromesal to the antennal socket, continuing ventromesad along the cibarial bar and ending at the anterior tentorial pit; early authors generally failed to distinguish between the posterior part of the epistomal suture and the part of the frontal ecdysial line it parallels.

exoparartis [Shalaby 1956,154] — In some insects, an arm of the parartis, a "swelling located at the proximal end of the subcardo or cardo....," which "articulates on the external surface of the paracoila..." (MacGillivray 1923,98). In mosquito larvae, misapplied by Shalaby (1956, and his later works) and Pao and Knight (1970) to a point at the base of the maxillary palpus which articulates with the merostipital process (their "maxillary apodeme") when the latter is present. (Syn.: short sclerotized rod, Shalaby 1956,153)

F

falciiform apodeme [Christophers 1960,198] — The part of the epistomal ridge posterior to a point just mesad of the antennal socket, i.e., the part which parallels the frontal ecdysial line. (Syn.: scythe-shaped area, Thompson 1905,168; scythe-shaped thickening, Thompson 1905, in Explanation of Plates)

flabella [Thompson 1905,169] — Thompson, and later Wesenberg-Lund (1921,16), used flabella (plural, flabellae), a misspelling of flabellum (plural, flabella) collectively for the lateral palatal brush and a lobe of indefinite extent bearing it, not merely the lateral palatal penicular area. Becker (1938a,439) restricted flabella to this brush and penicular area only. Certain later authors have considered flabella as a rejected synonym either of the lateral palatal penicular area (as penicular area, Cook 1944b,41; as hairbearing sclerite, Shalaby 1956,144) or the lateral palatal brush (as lateral labral brush, Pucat 1965,44)

flabellar inner retraction insertlon [Pucat 1965,44] — Pucat attributed this term to Thompson (1905) and regarded it as a rejected synonym of torma. Thompson did not use this term though he did label (1905, Fig.31) one end of the tormal apodemal bar as "insertion inner retractor flabellae," perhaps not meaning to create a term and certainly not intending even to describe the entire tormal apodemal bar in this manner.

flabellar outer retraction insertlon [Pucat 1965,44] — Pucat attributed this term to Thompson (1905) and regarded it as a rejected synonym of tormal apodemal bar (her posterior tormal apodeme). Thompson did not use the term though he did label (1905, Fig.31) one end of the tormal apodemal bar as "insertion outer retractor flabellae," perhaps not meaning to create a term and

certainly not intending to even describe the entire tormal apodemal bar in this manner.

FLAGELLUM (FI) (Fig. 45) — The third segment of the antenna. In mosquito larvae, usually unrecognizably fused with the pedicel, and often the scape; possibly comprised of three flagellomeres, one basad of seta 1-A, *flagellomere 1* (Flm₁) (Syn.: basal part, Belkin 1962, including the pedicel and scape, 560), one between seta 1-A and setae 2- and 3-A, *flagellomere 2* (Flm₂) (Syn.: distal part, Belkin 1962, 560) and in Mansonini larvae, one distal to setae 2- and 3-A, *flagellomere 3* (Flm₃) (Syn.: distal part, Belkin 1962, 300); seta 5-A may represent additional distal flagellomeres.

floor of pharynx [Christophers 1960, 290] — The part of the pharynx lying ventral to and including the lateroventral pharyngeal sclerites. (Syn.: ventral surface, Cook 1944b, 43; floor of the pharynx, Christophers 1960, 290)

FRINGING SETA (FS) (Fig. 64) [Harbach and Knight 1978a, 63] — In *Chagasia* and dixid larvae, one of the setae bordering the outer margins of the posterolateral spiracular lobes of the spiracular apparatus; also bordering the anterolateral spiracular lobes of dixid larvae; vestiges of the fringing setae appear as a corrugated or undulated membrane in many mosquito larvae (see Fig. 64c, d, e). (Syn.: fringing hair, Reid 1968, 46)

frons — The dorsal topographic area of the insect head lying behind (or “dorsal” to) the clypeus; delimited posteriorly and laterally in various ways by different authors and in different insects and stages and thus not morphologically equivalent except in limited cases; usually bearing the origins of the dorsal pharyngeal muscles and most labral muscles. In mosquito larvae, arbitrarily regarded as the posterior part of the dorsal apotome behind the undeveloped transverse part of the epistomal suture; used by some authors for the entire dorsal apotome. Compare **frontoclypeus**. See **FRONS** in the adult section.

FRONTAL ECDYSIAL LINE (FEL) (Figs. 33, 35, 37-42) [Laffoon and Knight 1973, 41] — In many immature arthropods, one of the arms of the epicranial ecdysial line; course varying widely among insects; often not homologous between different insects. In mosquito larvae, apparently normally ending in the lateral part of the clypeus about opposite the antennal socket; some authors have failed to distinguish the apical part of this line and the part of the epistomal suture lying parallel and slightly lateral to it. (Syn.: frontal suture, Patton and Evans 1929, 234; clypeofrontal suture, Cook 1944b, 40; frontoclypeal suture, Belkin 1962, 559) See **ECDYSIAL LINE**.

frontal pit [Patton and Evans 1929, 232] — In insects, conceptually a synonym of anterior tentorial pit. Patton and Evans misapplied it to a point by the black-spot area (which they misidentified as the “pretentorium”) distal to the anterior tentorial pit.

frontoclypeal suture — In insects, a conceptual synonym of epistomal suture. Apparently it has never been applied to the mosquito larval epistomal suture as interpreted herein. It has been applied in various ways in mosquito larvae according to the users' interpretations of the frons and clypeus. Patton and Evans (1929, 234) said it is an “imaginary line drawn across the head, joining the two frontal pits [see],” but they said the pretentorium “marks the position of the frontal pit” and they misidentified the black-spot area as the pretentorium; thus they located this suture somewhat distal to the epistomal suture. Shalaby (1956, 140; 1957b-c) apparently applied “frontoclypeal suture” to a part of the clypeolabral ridge (see **CLYPEUS**). DuPorte (1957, 68) indicated that Cook (1944b) interpreted the frontal ecdysial lines (his cleavage lines) as the frontoclypeal suture, but Cook actually called them the clypeofrontal suture. Belkin (1962, 559) did call these lines the frontoclypeal suture.

frontoclypeus — In some insects, the dorsal topographic area of the head comprised of the frons and clypeus; usually used for cases in which the transverse part of the epistomal suture is not developed; not morphologically equivalent in all insects possessing it because the posterior and lateral limits are arbitrary (see **frons**). In mosquito larvae and many other immature insects, most of its area is included within the dorsal apotome. (Syn.: clypeofrons, Matsuda 1965, 58)

frontogenal inflection [DuPorte 1946, 394] — DuPorte applied this term to the developed part of the epistomal ridge with at least a part of the paraclypeal lobe and indicated that the “frontogenal inflection extends ventrally from this point [anterior tentorial pit] along the lateral edge of the clypeal area to the clypeolabral...inflection.” This “lateral edge of the clypeal area” would be the paraclypeal lobe which is an external, lateral part of the clypeus and not an internal inflection or ridge. DuPorte used frontogenal inflection in some other insects in the same way as in mosquito larvae, in some other insects for the lateral part of the epistomal ridge only and in still others for a different internal ridge.

fronto-postclypeal suture [Shalaby 1957a, 146] — A term used by Shalaby for the “suture” between

the parts he called the frons and postclypeus; it thus fits his concept (1956,140) of fronto-clypeal suture. See **CLYPEUS**.

fronto-postclypeus [Shalaby 1957a,146] — Shalaby (1957a-c) applied this term to a sclerite he thought was formed in certain species and instars by the fusion of the parts he called the frons and postclypeus. See **CLYPEUS**.

G

GALEA (Gi) (Figs.51,54) [Harbach and Knight 1977b,133] — The outer endite lobe of the maxilla. In mosquito larvae, either united with part of the stipes to form the galeastipes or united with the mesal part of the stipes and the lacinia to form the maxillary body; in anopheline and dixid larvae, a small triangular area partly separated from the main part of the maxillary body by the galeastipital fissure.

GALEASTIPES (Gst) (Figs.52,54) [Harbach and Knight 1977b,133] — Recognizable in many mosquito larvae, mostly culicines, as the lateral half of the maxillary body; representing the fused stipes and galea which are partly separated in anophelines and dixids; usually bearing the maxillary brush and setae 1-, 3-, 4- and 5-Mx, the maxillary palpus is articulated laterally at its base; the dorsal and ventral maxillary sutures, when present, separate it from the laciniastipes. (Syn.: lobe externe, Meinert 1886,490; Innenfläche, Schremmer 1949, in part, 196; galea, Shalaby 1957a,156; dististipes, Pucat 1965,57; cardogalea, Pao and Knight 1970,128; cardostipes, Gardner *et al.* 1973,168)

GALEASTIPITAL FISSURE (GSF) (Figs.51,54) [Harbach and Knight 1977b,133] — In most anopheline and dixid larvae, a strip or wedge of thin and/or weakly sclerotized cuticle which partly separates the stipes and galea on the ventral surface of the maxillary body. (Syn.: fissure, Crawford 1933,27; cleft, Shalaby 1956,153)

GALEASTIPITAL STEM (GSS) (Figs.52,54) [Harbach and Knight 1977b,133] — In some culicine larvae, a slender mesoventral extension of the galeastipes; usually separated from the laciniastipes basally by the basal notch; sometimes more directly articulated with the paracoila than the parartis and/or often narrowly fused to the lateralia; in some species where the stem is undeveloped, this area of the galeastipes is contiguous with the parartis and articulates with the paracoila, e.g., in *Eretmapodites*. (Syn.: entoparartis, Pao and Knight 1970,130; pseudoartis, Tanaka *et al.* 1979,21)

gena [DuPorte 1946,394] — In insects, a loosely defined paired part of the cranium, applied in various ways in different insects, most commonly to the area between the compound eye and the mandible (see **postgena** and **subgena**, both of which are arbitrarily separated from the gena and often said to be parts of it). In mosquito larvae, used by DuPorte and several later authors for ill-defined parts of the cranium. See **GENA** in the adult section.

GRID (G) (Figs.59,60,62,65) [Marshall 1938,49] — The network of sclerotized ridges which bear the cratal setae of the ventral brush; with transverse grid bars at the base of individual setae; sometimes with lateral grid bars which may be confluent with the ventroposterior margin of the saddle. (Syn.: leistenartige Verdickung, Raschke 1887,137; basal apparatus, Nuttall and Shipley 1901a,63; semicircular basal pieces, Theobald 1901b,33; barred area, Dyar 1903,24; ridged area, Smith 1904,21; chitinous base, Imms 1907,294; chitinous plate, Howard *et al.* 1912,94; oval cribriform plate, Christophers 1922,543; ventral fan-plate, Christophers 1922,543; Chitinleiste, Stadtmann-Averfield 1923,114; chitinous bar, van den Assem and Bonne-Wepster 1964,25) See **BOSS**.

GULA (Gu) [Laffoon and Knight 1973,42] — In some insects, the sclerotized part of the gular area. This term has been defined in somewhat different ways by some authors. In mosquito larvae, applies in general to the midventral rear border of the cranium, the sclerotization of which is continuous with the submentum. See **LABIOGULA**.

GULAR AREA (GuA) [Laffoon and Knight 1973,42] — In most insects, the midventral rear part of the head and midventral part of the cervix; bounded anteriorly by a pregular suture (if present) or by an imaginary line between the front edges of the posterior tentorial pits, laterally by the gular suture (if present) and a line projected posteriad from it or (if the gular suture is absent) by a line projected posteriad from the back edge of the posterior tentorial pit, and posteriorly by the prosternum; may consist entirely of gular membrane or, especially in prognathous insects, of membrane and one or more sclerites (the gula). In mosquito larvae, includes the midventral rear edge of the cranium and a large area of gular membrane.

GULAR MEMBRANE (GuM) [Laffoon and Knight 1973,42] — The unsclerotized part of the gular area.

gular pit [Patton and Evans 1929,232] — A point in the hypostomal suture at or near where the mentum is inflected into the oral surface of the labiogula.

GULAR SUTURE (GS) [Laffoon and Knight 1973,42] — In mosquito larvae and certain other insects, the paired suture lateral to the gula; a part of the postoccipital suture.

The gular suture is frequently misidentified along with the gula, consequently it has been used in several different ways in different insects. The gular suture of Dodge (1945,163) includes the present gular suture and the part of the hypostomal suture bordering the submentum. The gular suture of Patton and Evans (1929,232). (Syn.: gular-mental suture, Patton and Evans 1929,238) includes the present gular suture and the hypostomal suture as far forward along the submentum as the point which they identified as the gular pit (see).

H

hair-bearing sclerite [Salem 1931,396] — Salem used this term for the combined lateral palatal penicular area, lateral palatal plate and, probably, the lateral palatal tessellated area. Shalaby (1956,142) applied it to the lateral palatal penicular area only.

HEAD (Figs.33-44) — The anterior section (tagma) of the insect body bearing the compound eyes, antennae and mouthparts; separated from the thorax by the cervix.

HYPOCRANIAL ECDYSIAL LINE (HEL) (Figs.33-38,40,42) [Laffoon and Knight 1973,43] — In many immature insects, any ecdysial line extending anteriorly from the posteroventral margin of the cranium. In some instars of some mosquito larvae, such a line occurs medially. (Syn.: median suture, Cook 1944b,44; epigular suture, Menees 1958a,27; median postgenal suture, Crosskey 1960,7) See **ECDYSIAL LINE**.

HYPOCRANIUM [Howard *et al.* 1912,86] — In insects with cranial parts on the ventral aspect of the head, the part of the cranium facing ventrad; indefinitely delimited laterally and often not homologous among different insects. In mosquito larvae, including the labiogula and the lateralia about as far laterally as the lower margins of the compound eyes.

HYPOPHARYNGEAL BAR (HyB) (Fig.56) [Harbach and Knight 1977c, 339] — In some mosquito larvae, a sclerotized rodlike internal structure of the hypopharynx; sometimes appearing as a complete loop around the salivary meatus, e.g., in *Eretmapodites*, but the ventral half of the loop is usually not attached to the dorsal half, weakly developed and/or absent. (Syn.: hypopharyngeal area, Cook 1944b, Fig.23A; plaque supra-salivaire, Chaudonneret 1962,486; chitinous cover, Pao and Knight 1970,132)

HYPOPHARYNX (Hy) (Figs.55-57) [Thompson 1905,169] — The median postoral appendage of the head. In mosquito, dipterid and certain other nematoceros larvae, separated from the prelabium by the salivary meatus, but united with it laterally by the cibarial bars to form the labiohypopharynx. In most culicine larvae, the hypopharynx bears a pair of earlike lobes, the superlinguae, which are united with the median lingua to form the definitive hypopharynx. (Syn.: arch of heavy chitin. Thompson 1905,170; hypopharyngeal sclerite, Thompson 1905, Fig.31; main dorsal part, Shalaby 1957d, in part, 268. The "hypopharynx of some authors, e.g., Snodgrass (1959,19) and Pao and Knight (1970,132) included that part of the labiohypopharynx dorsal to the lateral premental and prementoligular teeth.)

hypostomal area [Christophers 1960,200] — The part of the cranium lateral to the hypostomal suture and mesal to a line along the postcoila continued posteriorly toward the occipital foramen. Christophers considered this area to represent the base of the maxilla.

HYPOSTOMAL RIDGE (HR) (Figs.35-41) [Laffoon and Knight 1973,43] — The intercranial ridge associated with the hypostomal suture. In mosquito larvae, faint or undeveloped from the postcoila to the point near where the lateralia approach the anterolateral corner of the submentum, well-marked for at least a short distance posteriorly along the border between the lateralia and the submentum; sometimes clearly marked to its termination at the posterior tentorial pit; often faint or absent posteriorly.

HYPOSTOMAL SUTURE (HyS) (Figs.34,35,37-40,42,44) [Menees 1958b,125] — The sector of the subgenal suture between the postcoila and the posterior tentorial pit. In mosquito larvae, faint or undeveloped from the postcoila to near the point where the lateralia approach the anterolateral corner of the submentum, then distinct for at least a short distance posteriorly forming the border between the lateralia and the submentum; sometimes traceable to the posterior tentorial pit; often faint or absent posteriorly. (Syn.: premaxillary suture, Cook 1944b,52; submental-postgenal suture, Shalaby 1956,140; maxillary suture, Belkin 1962,559)

Inner flap [Marshall 1938,48] — One of the inner sclerites (those nearest the spiracular openings) of the spiracular lobes of the spiracular apparatus; termed herein the anterior, anterolateral or posterolateral spiracular lobe plates I. (Syn.: inner plate, Christophers 1960,221)

Inner lobe [Iyengar 1921,217] — In anopheline larvae, the mesal lobe of the bilobed proximal part of Nuttall and Shipley's organ.

Inner sclerotized pharyngeal ring [Farnsworth 1947,147] — A band of cuticle which corresponds to the membranous cuticle connecting the bases of the filaments of a secondary dorsal fringe; having the appearance of a ringlike sclerite under the light microscope.

INNER SPIRACULAR TOOTH (IST) (Figs.63,83) — In Mansoniini larvae, one in a set of bilaterally paired spicules at the distal end of posterolateral spiracular lobe plate I; retracted into the spiracular apparatus when not being used to anchor the structure in plant tissue. (Syn.: hook, Ingram and Macfie 1917b,138; tooth on inner tube, Wesenberg-Lund 1918,303; tooth of lateral sclerite of inner tube, Marshall 1938,266; gros crochet latéraux, Guille 1975,259; inner spiracular hook, Harbach and Knight 1978a,65)

Inner tube [Wesenberg-Lund 1918,306] — In Mansoniini larvae, the internal wall of the modified spiracular apparatus largely comprised of the anterior spiracular lobe (saw), spiracular processes and posterolateral spiracular lobe plates I.

INTERTORMA (In) (Figs.33,35-39,41) [Laffoon and Knight 1973,44] — In some insects, a labropalatal sclerite at or near the posteroventral boundary of the labrum between the tormae; sometimes incomplete laterally or mesally. In mosquito larvae, complete and with one or two pairs of labral retractor muscles inserted on it. (Syn.: epipharyngeal sclerite, Salem 1931,395; trabecula epipharyngealis, Shipitzina 1936,354; trabecula labri posterior, Shipitzina 1936,354; epipharyngeal bar, Shipitzina 1936,361; endoskeletal arch, Becker 1938a,440; posterior palatal bar, Cook 1944b,42; palatal bar, Cook 1944b,54; posterior inter-tormal bar, Menees 1958b,131; post-epipharyngeal bar, Christophers 1960,205)

K

knoblike process of lateral apodeme [Pao and Knight 1970,121] — Pao and Knight applied this term to the basal part of the torma abutting the apex of the clypeolabral strap and including the adjacent swollen area to a point just beyond the insertion of seta 1-Lp, though not including any posterior arm of the torma. (Syn.: knob-like process of apodeme, Salem 1931,396)

L

LABIAL PALPUS (LP) (Figs.55-57) [palpe labial, Chaudonneret 1962,486] — One of a pair of teleopodites of the insect labium. In mosquito and certain other nematoceros larvae, vestigial labial palpi are represented by a membranous area on each side of the ligula or prementoligular teeth; usually bearing four or five peglike setae. (Syn.: clear circular area, Puri 1931,28; clear patch, Puri 1931,28; window of hypopharynx [in Russian], Becker 1938b,744; zone claire, Senevet 1946,319; membranous area, Farnsworth 1947,144; fensterartige Öffnung, Schremmer 1949,201; ovale, dünn-chitinige Stelle, Schremmer 1949,201; ovale Fenster, Schremmer 1949,201; membranous, unpigmented area, Shalaby 1956,160; intermediate region, Shalaby 1957a,161; circular pigmented area, Shalaby 1957c,438; prelabial membranous area, Harbach and Knight 1977c,347)

LABIOGULA (LG) (Figs.34,37-42,44) [Laffoon and Knight 1973,44] — In mosquito larvae and certain other prognathous insects, a sclerite formed by the fusion of the gula and the submentum. (Syn. as used by these authors, not necessarily by others: Submentum, Bischoff 1922,9(Fig.6); labial plate, Landis 1923,29; maxillary plate, Cook 1944b,44; gula, Dodge 1945,163; labial area, Christophers 1960,198; labial sclerite, Belkin 1962,559; subgena, Pucat 1965,46; hypostoma. Pao and Knight 1970,118)

LABIOHYPOPHARYNX (Lh) (Figs.34-38,41,55-57) [Snodgrass 1959,21] — In mosquito and certain other nematoceros larvae, the protruding surface located between the mouth and the dorsomentum; comprising the prelabium and hypopharynx which are joined and supported by the cibarial bars from the lateral cranial walls; forming the ventroposterior wall of the preoral cavity. (Syn.: partie inférieure du pharynx, Meinert 1886,490; hypopharynx, Johannsen 1903,401; labium, WeschÉ 1910,12; prementum, Farnsworth 1947, in part, 144; Hypopharynxkörper, Schremmer 1949,186; Hypopharynxkomplex, Schremmer 1949,199; labiohypopharyngeal body, Menees

1958a,27; labiohypopharyngeal complex, Snodgrass 1959,19; labium and hypopharynx, Christophers 1960,205; labial and hypopharyngeal rudiments, Christophers 1960,206)

LABIUM (Lb) — The fused third or posterior pair of gnathal appendages; divided into a distal prelabium, comprised of the prementum, ligula and labial palpi, and a proximal postlabium (postmentum) which may be subdivided by a transverse suture into a distal mentum and a proximal submentum. In mosquito larvae, the proximal limit of the labium is the imaginary pregular suture (see **GULAR AREA**), its lateral margin is arbitrarily taken as the hypostomal suture and its anterior limit is an imaginary transverse line behind the salivary orifice. Compare **LABIUM** in the adult section.

labro-clypeal suture [Shalaby 1956,142] — In some insects, sometimes used for the epistomal suture. In mosquito larvae, misapplied by Shalaby (1956,1957a-c). See **CLYPEUS**.

LABROPALATUM (Lp) (Figs.34,36,38,39,44,45) [Laffoon and Knight 1973,45] — The part of the palatum formed by the oral surface of the labrum. In mosquito larvae, the entire labral wall except the median labral plate; including within its posterior margin the paired tormae and the intertorma.

LABRUM (Lr) [Laffoon and Knight 1973,45] — The median preoral appendage articulated with the clypeus by the clypeolabral suture. In mosquito larvae, its adoral surface is represented by the median labral plate; its oral surface by the labropalatum.

labrum-epipharynx [Patton and Evans 1929,232] — Applied by Patton and Evans, and later Salem (1931,393), to the mesal part of the labropalatum from the anteromedian palatal lobe to the intertorma, inclusive.

LABULA (L) (Figs.47,49) [Gardner *et al.* 1973,166] — In some mosquito larvae, the dorsoposterior part or lip of the mandibular lobe. (Syn.: labula of piliferous process, Tanaka *et al.* 1979,16)

LABULAR SPINE (LSp) [Gardner *et al.* 1973,166] — In larvae of the *Aedes varipalpus* complex, a spine on the posterior border of the labula.

LACINIA (Lc) — The inner endite lobe of the maxilla. In mosquito larvae, either united with part of the stipes to form the laciniastipes or united with the mesal part of the stipes and the galea to form the maxillary body.

LACINIARASTRUM (LR) [Harbach and Knight 1977b,135] — A row of setae or spicules borne on the inner margin of the lacinia. In mosquito and dixid larvae, one of as many as three rows of variously developed spicules, laciniarastra 1-3, borne on the mesodorsal surface of the laciniastipes, or the maxillary body when the limits of the laciniastipes are indistinct. (Syn.: Reihe von Borsten, Rasche 1887,142; patch of short hairs, Mitchell 1906,16; row of spines, Wesché 1910,12; hairy area, Christophers 1960,206; row of short hairs, Pucac 1965,56; lateral hairs of the lacinia, Pucac 1965,58; bristles of the lacinia, Pucac 1965,59; cardolacinal mat, Pao and Knight 1970,128; maxillary hair group, Gardner *et al.* 1973,168)

LACINIARASTRUM 1 (LR₁) (Figs.51-54) [Harbach and Knight 1977b,135] — In mosquito and dixid larvae, the most mesal of the laciniarastra borne on the maxillary body, or the laciniastipes when distinguishable; often consisting of setiforms, spinules or blades but varying widely in form. (Syn.: series of long stiff hairs, Wesenberg-Lund 1921,19; maxillary group of hairs 1, Gardner *et al.* 1973,167)

LACINIARASTRUM 2 (LR₂) (Figs.51-54) [Harbach and Knight 1977b,135] — In mosquito and dixid larvae, a row of spicules borne between laciniarastra 1 and 3 on the mesodorsal surface of the maxillary body, or the laciniastipes when distinguishable; sometimes consisting of divided filaments and extending to a point near the maxillary brush. (Syn.: coating of long, soft hairs, Wesenberg-Lund 1921, including laciniarastrum 3,19; row of stiff hairs, Pao and Knight 1970,128; maxillary hair group 2, Gardner *et al.* 1973,168)

LACINIARASTRUM 3 (LR₃) (Figs.51,52,54) [Harbach and Knight 1977b,135] — In mosquito and dixid larvae, the most lateral of the laciniarastra borne on the mesodorsal surface of the maxillary body, or the laciniastipes when distinguishable; usually consisting of filaments. (Syn.: coating of long, soft hairs, Wesenberg-Lund 1921, including laciniarastrum 2, 19; maxillary hair group 3, Gardner *et al.* 1973,168)

LACINIASTIPES (LSI) (Figs.52,54) [Harbach and Knight 1977b,135] — Recognizable in many mosquito larvae, mostly culicines, as the mesal half of the maxillary body; representing the fused stipes and lacinia which cannot be separately distinguished; bearing the laciniarastra and seta 2-Mx

mesodorsally; the dorsal and ventral maxillary sutures, when present, serve as boundaries between the laciniastipes and galeastipes. (Syn.: lobe interne, Meinert 1886,490; mentale Fläche, Schremmer 1949,196; lacinia, Shalaby 1957a,156; cardolacinia, Pao and Knight 1970,128; lacinial sclerite, Gardner *et al.* 1973, ventral part only, 168)

LACINIASTIPITAL EXPANSION (LSE) (Figs.51,52,54) [Harbach and Knight 1977b,136] — In many mosquito larvae, the dorsally located, sometimes poorly-developed, basal expansion of the laciniastipes which extends laterad from a point where the stipital arm and the dorsal maxillary suture merge; usually serving for the attachment of the cranial flexor of the lacinia but the stipital adductor is sometimes attached to it as well.

LARVA — The second stage in the life cycle of a holometabolous insect. Mosquito larvae go through four stadia, i.e., there are four instars.

lateral artils [Tanaka *et al.* 1979,14] — The merostipital process or the basal articulatory part of the maxillary palpus.

LATERAL GRID BAR (LGB) (Figs.60,65) [Harbach and Knight 1978a,65] — In some mosquito larvae, one of the more or less strongly developed longitudinal sclerotizations forming the lateral margins of the grid; sometimes confluent with the ventroposterior margin of the saddle. (Syn.: Brücke, Stadtmann-Averfeld 1923,118; Chitinbrücke, Stadtmann-Averfeld 1923,124; lateral bar, Belkin 1962, Fig.412)

LATERALIA (Lat) (Figs.33-44) [Bischoff 1922,9(Fig.6)] — In most immature insects, the lateral and ventral areas of the cranium lateral to the epicranial ecdysial lines, excluding any ventral apotomes and the submentum or labiogula if either can be distinguished from the adjacent cranial parts.

LATERAL INTERTORMAL APODEME (LIA) [Laffoon and Knight 1973,45] — In some insects, the paired apodeme on which one of the lateral labral retractor muscles is inserted laterally on the intertorma. In anopheline larvae, distinct and inserted at the extreme lateral end of the intertorma; in culicine larvae, apparently not developed as an independent apodeme, but possibly an element of the tormal apodeme, the latter serving for the insertion of both lateral labral retractor muscles. (Syn.: messorial apodeme, Cook 1944b, in part, 48; apodeme of the external messorial muscle, Farnsworth 1947,147)

LATERAL ORAL BAR (LOB) (Figs.33,35,37,45,58) [Laffoon and Knight 1973,46] — A curved sclerite at each lateral angle of the mouth, articulated anteriorly with the cibarial bar just mesal to the precoila and posteriorly with the laterodorsal pharyngeal sclerite; possibly homologous with the part of the hypopharyngeal suspensorial bar located at the lateral angle of the mouth in generalized insects (see the discussion by Snodgrass 1959,11). (Syn.: apodeme supporting pharynx wall, Thompson 1905, Fig.33; short apodeme, Thompson 1905,170; spiral osselet, Crawford 1933,30; U-shaped sclerite of the pharynx, Farnsworth 1947,147; Chitinspange, Schremmer 1949,211; Pharynxlippenspange, Schremmer 1949,213; lateral oral apodeme, Christophers 1960,188; arc chitineux de liaison, Chaudonneret 1962,476; arc chitineux des angle buccaux, Chaudonneret 1962,483; arc de liaison, Chaudonneret 1962,485)

LATERAL PALATAL BRUSH (LPB) (Figs.33-45) [Laffoon and Knight 1973,46] — In certain nematocerous larvae, the paired palatal brush borne anterolaterally on the labropalatum distal to the median labral plate and the torma; sometimes reduced to a few filaments. In mosquito larvae, with a few to hundreds of filaments supported by the lateral palatal crossbars. (Syn.: rotary organ, Nuttall and Shipley 1901a,56; vortex organ, Nuttall and Shipley 1901a,56; whirling organ, Nuttall and Shipley 1901a,56; whorl organ, Theobald 1901b,30; mouth whorl, Forrest 1901,127; maxillary fan, Smith 1903,311; mouth brush, Smith 1904,18; rotary mouth brush, Smith 1904,19; maxillary brush, Smith 1904,184; mouth-brush, Howard *et al.* 1912,35; lateral brush, Howard *et al.* 1912,86; feeding brush, Patton and Cragg 1913,197; hairbrush, Wesenberg-Lund 1921,16; hairtuft, Wesenberg-Lund 1921,16; lateral tuft of labrum, Wesenberg-Lund 1921,37; lateral tuft of the labellum, Wesenberg-Lund 1921,126; Strudelapparat, Bischoff 1922,7; cephalic fan, Puri 1931,25; labral brush, Cook 1944b,52; lateral mouth brush, Farnsworth 1947,147; flabellum, Christophers 1960,198; lateral labral brush, Pucat 1965,45; lateral flabella, Pao and Knight 1970,120)

LATERAL PALATAL BRUSH FILAMENT (LPBF) — In mosquito and some other nematocerous larvae, any specialized filament of the lateral palatal brush; inserted in holes along the lateral palatal crossbars (see Manning 1978). (Syn.: fimbria, Cook 1944b,43; pectinate hair, Shalaby 1957a,147; flabellar hair, Christophers 1960,200; simple hair, Pao and Knight 1970,121; lateral palatal brush hair, Laffoon and Knight 1973,46; labral brush hair, Manning 1978,803)

- LATERAL PALATAL CROSSBAR (LPC)** [Laffoon and Knight 1973,46] — In many mosquito larvae, one of the specialized sclerotized rods extending transversely across the lateral palatal penicular area; the bases of the lateral palatal brush filaments are inserted in holes along these rods (see Manning 1978). (Syn.: cross-bar, Christophers 1960,204; sclerotized rod, Pucac 1965,51; cross bar, Pucac 1965,51)
- LATERAL PALATAL PENICULAR AREA (LPPA)** (Figs.35,37) [Laffoon and Knight 1973,47] — In certain nematocerous larvae, the specialized cuticular area bearing the lateral palatal brush. (Syn.: penicular area, Cook 1944b,41; lateral penicular area, Cook 1944b,54; hair-bearing sclerite, Shalaby 1956,142; flabellar plate, Christophers 1960,198; basal plate of the flabellum, Christophers 1960,200; flabellar plaque, Christophers 1960,203; torma, Pao and Knight 1970,120)
- LATERAL PALATAL PLATE (LPP)** (Figs.34-36,37,39,41,45) [Cook 1944b,42] — In mosquito and dixid larvae, a sclerite intercalated between the torma and the lateral palatal penicular area. (Syn.: lamina infraflabellaris, Becker 1938a,432; lamina infraflabellaris anterior, Becker 1938a,432; subflabellar sclerite, Becker 1938a,439; lateral labral plate, Shalaby 1956,146; connective plate, Snodgrass 1959,14; scallop, Christophers 1960,198; brush sclerite, Pucac 1965,52; labral brush sclerite, Pucac 1965,52; torma, Pao and Knight 1970,120)
- LATERAL PLATE (LP)** (Fig.62) [Smith 1904,259] — In *Orthopodomyia* larvae, a small transverse lateral sclerite located cephalad of the saddle and perhaps belonging to embryonic abdominal segment IX; the lateral plates of opposite sides may join to form a complete ring; probably not homologous with the saddleacus. (Syn.: lateral band, Tate 1932,117; lateral chitinised band of anal segment, Tate 1932,20; sclerotized band, Zavortink 1968,7)
- LATERAL PREMENTAL SPICULES (LP_{Sp})** (Figs.56,57) — In certain culicine larvae, a group of variously developed spicules located lateroventral to the lateral premental teeth of the labiohypopharynx. (Syn.: lateral premental plate, Gardner *et al.* 1973,171; accessory dental processes, Harbach and Knight 1977c,337; lateral premental processes, Harbach 1978,305)
- LATERAL PREMENTAL TEETH (LPT)** (Figs.55-57) [Harbach 1978,304] — In mosquito and dixid larvae, the bilaterally paired, usually heavily sclerotized and thickened teeth or toothed processes which flank the labial palpi on the midventral region of the labiohypopharynx; in some culicines, occurring in three interconnected groups, lateral premental teeth 1-3. (Syn.: lateral lobed processes, Johannsen 1903, at least in part, 417; lateral lobes, Johannsen 1903, at least in part, 424; toothed plates, Wesché 1910,12; plates of chitin, Wesenberg-Lund 1921,20; dens of diametrical ring [in Russian], Becker 1938b,744; serrate, sclerotized plates, Cook 1944b,45; crête antérieure, Senevet 1946,319; lateral arms, Shalaby 1957, in part, 160; lateral spines, Shalaby 1956, in part, 163; spiny blade-like structures, Shalaby 1957a,161; caudo-lateral region, Shalaby 1957b,280; cephalo-lateral ends, Shalaby 1957c,437; lateral region, Shalaby 1957d,269; transverse cephalic region, Shalaby 1959,210; toothed ridges, Christophers 1960,208; crêtes labiales, Chaudonneret 1962,480; serrated sclerites, Pucac 1965,59; premental plates, Pao and Knight 1970,132; lateral prelabial teeth, Harbach and Knight 1977c,341)
- LATERAL PREMENTAL TEETH 1 (LPT₁)** (Figs.56,57) [Harbach 1978,304] — In some culicine larvae, the dorsalmost group of lateral premental teeth occurring on the labiohypopharynx; usually connected with the premental dental arch or the prementoligular teeth. (Syn.: upper row of teeth, Salem 1931, including lateral premental teeth 2, 408; cephalic group, Shalaby 1957a,161; cephalic row, Shalaby 1957b,280; lateral groups, Shalaby 1957b,280; cephalic lateral group of spines, Shalaby 1957b,280; lateral spines, Shalaby 1957d,269; anterolateral toothed premental plate, Pao and Knight 1970,132; dorsal premental plate, Gardner *et al.* 1973,171; lateral prelabial teeth 1, Harbach and Knight 1977c,342)
- LATERAL PREMENTAL TEETH 2 (LPT₂)** (Figs.56,57) [Harbach 1978,304] — In some culicine larvae, the middle group of lateral premental teeth occurring on the labiohypopharynx. (Syn.: upper row of teeth, Salem 1931, including lateral premental teeth 1, 408; median group, Shalaby 1957a,161; intermediate row, Shalaby 1957b,280; cephalic row, Shalaby 1957d,269; midlateral toothed premental plate, Pao and Knight 1970,132; middle premental plate, Gardner *et al.* 1973,171; lateral prelabial teeth 2, Harbach and Knight 1977c,342)
- LATERAL PREMENTAL TEETH 3 (LPT₃)** (Figs.56,57) [Harbach 1978,304] — In some culicine larvae, the ventalmost group of lateral premental teeth on the labiohypopharynx. (Syn.: lower row of teeth, Salem 1931,408; caudal group, Shalaby 1957a,161; caudal row, Shalaby 1957b,280; lateral groups, Shalaby 1957b,280; caudo-lateral group of spines, Shalaby 1957b,280; dents latérales, Chaudonneret 1962,475; dent laterale du labium, Chaudonneret 1962,485; posterolateral toothed premental plate, Pao and Knight 1970,132; ventral premental plate, Gardner *et al.* 1973,171; lateral

prelabial teeth 3, Harbach and Knight 1977c,342)

lateral siphonic area [Christophers 1922,538] — In anopheline larvae, a convex area of the body wall located between the spiracular apparatus and the pecten plate on each side of abdominal segment VIII; continuous anteriorly with the “presiphonic fold;” partly homologous with the “basal supporting plate” of Imms (1908,131).

LATERAL TORMAL PROCESS (LTP) (Fig.39) [Laffoon and Knight 1973,47] — A laterally directed triangular process borne distad to the middle of the toma; giving rise to the tormal apodeme or part of it. (Syn.: lateral process of apodeme, Salem 1931,396; lateral process, Salem 1931,399; anterior process, Shalaby 1956,145; anterior process of apodeme, Shalaby 1956,147; anterior process of the labral apodeme, Shalaby 1956,164; medial process of the labral apodeme, Shalaby 1957a,273; lateral process of the lateral apodeme, Pao and Knight 1970,121)

LATERODORSAL PHARYNGEAL SCLERITE (LDPhS) (Fig.58) [sclérite pharyngien latéral dorsal, Chaudonneret 1962,476] — In many mosquito larvae, one of a pair of laterally symmetrical, often indefinite laminae of the pharynx which articulate with the lateral oral bars anteriorly and bear the insertions of the lateral dilators of the pharynx. (Syn.: Chitinleiste, Raschke 1887, in part, 144; rod-like thickening of the intima, Imms 1907,297; chitinous rod-like thickening, Imms 1907,317; cartilaginous band, Crawford 1933,30; external sclerotized pharyngeal ring, Farnsworth 1947,147; lateral plate, Christophers 1960,289; sclérite latéral dorsal du filtre pharyngien, Chaudonneret 1962,477; sclérite latéro-dorsal du filtre pharyngien, Chaudonneret 1962,486)

LATEROVENTRAL PHARYNGEAL SCLERITE (LVPhS) (Fig.58) [Harbach and Knight 1977d,393] — In many mosquito larvae, one of a pair of laterally symmetrical, usually indefinite laminae located immediately ventral to the laterodorsal pharyngeal sclerites in the lateral walls of the pharynx; more heavily sclerotized and more clearly delimited posteriorly.

LIGULA (Lg)(Figs.55-57) [Harbach 1978,303] — The unjoined or fused proximal lobes (glossae and paraglossae) of the labium. In anopheline, some culicine and certain chironomid larvae, an elevated, usually cusped tongue-like structure located between the labial palpi; in other culicines, unrecognizably fused with the premental cusps and premental dental arches to form the complex of prementoligular teeth. (Syn.: three-pointed process, Wesché 1910,12; central process, Wesché 1910,12; median tooth, Puri 1931,28; peg-like structure, Salem 1931,404; peg-like process, Salem 1931,408; bi-apical dens [in Russian], Becker 1938b,744; median projection, Farnsworth 1947,144; Firstzacken, Schremmer 1949, including the premental ridge teeth, 200; caudal arm, Shalaby 1956,160; ridge teeth, Menees 1958a, including the premental ridge teeth, 30; paraglossa, Menees 1958a, including the premental ridge teeth, 30; glossa, Menees 1958a, including the premental ridge teeth, 30; premental pouches, Pao and Knight 1970, including the premental cusps in part, 132; median fossae, Gardner *et al.* 1973,171; prelabial crown, Harbach and Knight 1977c,345)

LINGUA (Ln) (Fig.57) [Harbach 1978,303] — In many insects, the median part of the hypopharynx; united with the lateral superlinguae to form the definitive hypopharynx.

lobe [Iyengar 1921,216] — In anopheline larvae, one of the rounded divisions of the proximal bilobed part of Nuttall and Shipley's organ supported by the “columella.” (Syn.: apical lobe, Iyengar 1928,282)

M

MANDIBLE (Mn) (Figs.33,35-38,40,41,46-49) — One of the first pair of gnathal appendages. In mosquito larvae, borne on the underside of the head where each is implanted obliquely in the membranous area that extends anteriorly from the margin of the lateralialia to the cibarial bar; typically flattened lobes with their mesal ends produced into strongly sclerotized teeth and a spiculate lobe. (Syn.: maxilla [in Russian], Becker 1938b,750)

MANDIBULAR ABDUCTOR APODEME (MabA) (Figs.40,41,46-48) [Knight 1971b,190] — An apodeme of the mandible which provides attachment for the mandibular abductor muscle. In mosquito larvae, attached under the V-shaped ridge or to the lateroventral end of the U-shaped rod when the former is absent. (Syn.: apodeme, Farnsworth 1947,142)

MANDIBULAR ADDUCTOR APODEME (Mada) (Figs.33,36,40,46-48) [Knight 1971b,190] — An apodeme of the mandible which provides attachment for the mandibular adductor muscle. In mosquito larvae, attached to the mesal end or to a posterior projection of the mesal end of the ventral arm of the U-shaped rod. (Syn.: large apodeme, Farnsworth 1947,143; adductor tendon of mandible, Christophers 1960,206; mandibular apodeme, Pao and Knight 1970,126)

MANDIBULAR BRUSH (MnB) (Figs.46-49) [Shalaby 1956,152] — A group of prominent, curved, acute spicules linearly arranged and varying in position from the dorsoanterior (in most species) to the dorsomesal margin (in predaceous species) of the mandible; the number of spicules is reduced in predaceous species; the most lateral spicules may be flattened and plumose in anophelines. (Syn.: Braemme af Børster, Meinert 1886, including the mandibular comb, 377; brushes of hairs, Nuttall and Shipley 1901a,55; lateral comb, Mitchell 1906,12; fringe, Howard *et al.* 1912,86; flabelliform plastins [in Russian], Becker 1938b,752; Bogenborsten, Schremmer 1949, in part, 190; Putzkamm, Schremmer 1949, in part, 190; Borstenkamm, Schremmer 1949, in part, 194; Mandibelkamm, Schremmer 1949, in part, 194; comblike fringe, Snodgrass 1959,16; peigne de nettoyage dorsal, Chaudonneret 1962,475; peigne de nettoyage dorsal de la mandibule, Chaudonneret 1962,486; mandibular fan, Dodge 1966,339; mandibular comb, Knight 1971b, in part in anophelines, 192)

MANDIBULAR BRUSH SPICULE (MnBS) — One of the elements of the mandibular brush; commonly bearing villi in suspension feeders and serrations in predators; the lateralmost spicules may be flattened and plumose in anophelines. (Syn.: hair, Howard *et al.* 1912,86; bristle, Salem 1931,402; mandibular brush seta, Harbach and Knight 1977a,31)

MANDIBULAR COMB (MnC) (Figs.47,49) [Shalaby 1957a,155] — A linearly-arranged group of variously developed spicules borne on the ventroanterior margin of the mandible; extending mesally from a point near the sella to a point close to mandibular rake blade 1. In some anophelines, a single, branched spicule closely associated with the lateralmost spicule of the mandibular brush. (Syn.: Braemme af Børste, Meinert 1886, including the mandibular brush, 377; marginal comb, Mitchell 1906,13; combing apparatus, Wesenberg-Lund 1921,18; comb-like fringe, Christophers 1960, including the mandibular brush, 206)

MANDIBULAR COMB SPICULE (MnCS) (Fig.46) — One of the elements of the mandibular comb; often in the form of dendrites or echinoids; a single mandibular comb spicule is present in some anophelines. (Syn.: seta-bearing tubercle, Howard *et al.* 1912,86; tubercle carrying thorns, Wesenberg-Lund 1921,18; serrated process, Shalaby 1957b,278; mandibular comb element, Harbach and Knight 1977a,31)

MANDIBULAR LOBE (MnL) (Figs.46-49) [Harbach and Knight 1977a,32] — A lightly sclerotized, rounded protuberance on the mesal margin of the mandible just posterior to the mandibular teeth; bearing as many as five groups of spicules, mandibular lobe spicules 1-5; highly reduced or absent in predaceous species. (Syn.: Chitinwucherung, Raschke 1887,141; Chitinfortsatz, Raschke 1887,161; projection below last tooth, Mitchell 1906,13; chitinous projection, Howard *et al.* 1912,86; fork-like lobe, Wesenberg-Lund 1921,18; finger-like process, Salem 1931,402; small protuberance, Puri 1931,27; anvil-shaped projection, Crawford 1933,27; mandibular palp, LaCasse and Yamaguti 1948,8; membranous process, Shalaby 1956,153; seta-bearing lobe, Snodgrass 1959,16; molar lobe, Christophers 1960,206; molar process of mandible, Christophers 1960,206; petit lobe ventral sétigère, Chaudonneret 1962,476; lobe ventral de la mandibule, Chaudonneret 1962,486; piliferous process, Gardner *et al.* 1973,166)

MANDIBULAR LOBE SPICULE (MLS) — One of the cuticular projections borne on the mandibular lobe; in as many as five groups, mandibular lobe spicules 1-5. (Syn.: seta, Puri 1931,27; hair, Knight 1971b,196; piliferous process hair, Gardner *et al.* 1973,166; mandibular lobe seta, Harbach and Knight 1977a,32)

MANDIBULAR LOBE SPICULES 1 (MLS₁) (Figs.47,49) — A cluster of spicules borne apically on the labula of the mandibular lobe; usually in the form of spinules. (Syn.: mesal group of hairs, Shalaby 1957a,154; MP₁ group of hairs, Knight 1971b,196; piliferous process hairs 1, Gardner *et al.* 1973,166; mandibular lobe setae 1, Harbach and Knight 1977a,32)

MANDIBULAR LOBE SPICULES 2 (MLS₂) (Figs.46,47,49) — A cluster of small spicules borne apically on the anterior lip of the mandibular lobe; often in the form of spinules. (Syn.: intermediate group of hairs, Shalaby 1957a,153; MP₂ group of hairs, Knight 1971b,196; piliferous process hairs 2, Gardner *et al.* 1973,166; mandibular lobe setae 2, Harbach and Knight 1977a,32)

MANDIBULAR LOBE SPICULES 3 (MLS₃) (Figs.47,49) — A cluster of spicules situated on the anterodorsal margin of the labula of the mandibular lobe; often in the form of spinules or simple filaments. (Syn.: mesal dorsal cluster of hairs, Shalaby 1957b,277; MP₃ group of hairs, Knight 1971b,196; piliferous process hairs 3, Gardner *et al.* 1973,166; mandibular lobe setae 3, Harbach and Knight 1977a,32) The spine which occurs on the mandibular lobe of *Anopheles quadrimaculatus* Say (Shalaby 1956,150) is probably homologous with this group of spicules.

MANDIBULAR LOBE SPICULES 4 (MLS₄) (Figs.47,49) — An often linearly-arranged group of

spicules situated lateral to mandibular lobe spicules 2 on the anterior or anteroventral surface of the mandibular lobe; usually in the form of simple filaments. (Syn.: lateral group of hairs, Shalaby 1957a,153; MP₁ group of hairs, Knight 1971b,196; piliferous process hairs 4, Gardner *et al.* 1973, 166; mandibular lobe setae 4, Harbach and Knight 1977a,32)

MANDIBULAR LOBE SPICULES 5 (MLS₅) (Figs.47,49) — A linearly-arranged group of spicules beginning dorsally at either the base of the labula or the mandibular lobe proper and extending either anteriorly along the base of the lobe or laterally onto the body of the mandible; often in the form of flattened simple filaments. (Syn.: lateral dorsal cluster of hairs, Shalaby 1957b,277; MP₅ group of hairs, Knight 1971b,196; piliferous process hairs 5, Gardner *et al.* 1973,166; mandibular lobe setae 5, Harbach and Knight 1977a,32)

MANDIBULAR LOBE SPINE (MLSp) [Harbach and Knight 1977a,33] — In some mosquito larvae, one of several minute tubercles or spinelike projections located posteriorly at the base of the mandibular lobe. (Syn.: piliferous process spine, Gardner *et al.* 1973,166)

MANDIBULAR PILOSE AREA (MnPA) (Figs.46,47,49) [Harbach and Knight 1977a,33] — In many mosquito larvae, a group or covering of fine filaments located anterodorsally on the mandible; extending from the rim of the sella along the base of the mandibular brush; in anophelines, the filaments at the rim of the sella are sometimes long and easily confused with setae 2e-Mn. (Syn.: mandibular spur 2, Knight 1971b, in part in some species, e.g., *Anopheles*, 196)

MANDIBULAR PUNCTURE (MnP) (Figs.46-49) — A small puncture occurring lateroposteriorly on the dorsal surface of the mandible near the preartis; bearing a small dome-shaped projection or conical peg (? seta). (Syn.: mandibular ring, Knight 1971b,204; mandibular pit organ, Harbach and Knight 1977a,33)

MANDIBULAR RAKE (MnR) (Figs.47,49) [Harbach and Knight 1977a,33] — A serried rank of variably-shaped spicules arising ventral and posterior to the ventral teeth of the mandible; the anterior spicules are typical blades, mandibular rake blades; the posterior spicules are usually plumose, pectinate or serrate and are referred to simply as mandibular rake spicules. (Syn.: acinaciform outgrowths [in Russian], Becker 1938b,752; pectinate brush, Knight 1971b,196)

MANDIBULAR RAKE BLADE (MRB) [Harbach and Knight 1977a,33] — One of the flattened, elongate anterior spicules of the mandibular rake; usually one to three in number, mandibular rake blades 1-3, they are extremely variable in size and form; often bearing aciculae or toothlike processes. (Syn.: sabre-shaped spine, Puri 1931,24; Zahnstange, Schremmer 1949,190; transparent arm, Foote 1952,450; serrated group of dentes, Shalaby 1956,148; serrated tooth, Clements 1963,35)

MANDIBULAR RAKE BLADE 1 (MRB₁) (Figs.46,47,81) [Harbach and Knight 1977a,33] — The most anterior and largest of the mandibular rake blades; usually pectunculate. (Syn.: articulate serrate spine, Mitchell 1906,12; movable spine, Howard *et al.* 1912,86; movable dentated tooth, Wesenberg-Lund 1921,18; ventral blade, LaCasse and Yamaguti 1948,8; lateral tooth, Shalaby 1956,150; soie falciforme ventrale, Chaudonneret 1962,475; soie falciforme ventrale de la mandibule, Chaudonneret 1962,486; ventral blade 1, Gardner *et al.* 1973,165)

MANDIBULAR RAKE BLADE 2 (MRB₂) (Fig.46) [Harbach and Knight 1977a,33] — The spicule located immediately posterior to mandibular rake blade 1; the middle of the three mandibular rake blades presently known. (Syn.: medial tooth, Shalaby 1956,150; ventral blade 2, Gardner *et al.* 1973,165)

MANDIBULAR RAKE BLADE 3 (MRB₃) (Fig.46) [Harbach and Knight 1977a,33] — The most posterior of the three mandibular rake blades presently known; similar in size and shape to mandibular rake blade 2. (Syn.: mesal tooth, Shalaby 1956,150)

MANDIBULAR RAKE SPICULE (MRS) (Figs.46,47) — One of the posterior elements of the mandibular rake; usually in the form of filaments of various size and type. (Syn.: pectinate hair, Shalaby 1957a,153; plumose hair, Shalaby 1957b,277; pectinate brush, Pao and Knight 1970,124; mandibular rake seta, Harbach and Knight 1977a,34)

MANDIBULAR SPICULOSE AREA (MSA) (Figs.46-49) — A grouping of various types of small spicules located laterodorsally on the mandible; sometimes extending onto the ventral surface; in anophelines, commonly bearing a row of filaments, the mandibular spiculose area brush. (Syn.: group C hairs, Mitchell 1906,14; minute sensory hairs, Puri 1931,24; dorsal bristles [in Russian], Becker 1938b,753; microspines, Shalaby 1957a,155; spinose area, Knight 1971b,190; mandibular spinose area, Harbach and Knight 1977a,34)

MANDIBULAR SPICULOSE AREA BRUSH (MSAB) (Figs.46,49) — In anopheline larvae, a

linearly-arranged group of variously developed filaments occurring dorsally within the mandibular spiculose area. (Syn.: mandibular spinose area brush, Harbach and Knight 1977a,34)

MANDIBULAR SWEEPER (MnS) (Figs.46,48,49) [Harbach and Knight 1977a,34] — A linear group of filaments arising along the dorsal basal margin of the mandible; often divided into two groups, an adoral group, mandibular sweeper 1, and an oral group, mandibular sweeper 2; in many species, mandibular sweeper 2 is borne within the arcuate thickening. (Syn.: spines of the maxilla [in Russian], Becker 1938b,750; Stopfkamm, Schremmer 1949,190; soies de gavage, Chaudonneret 1962,479; soies de gavage de la mandibule, Chaudonneret 1962,486; mandibular brush, Clements 1963,34; mandibular hairs, Pao and Knight 1970,126)

MANDIBULAR SWEEPER 1 (MnS₁) (Figs.47,49) [Harbach and Knight 1977a,34] — In many mosquito larvae, a group of filaments situated on the dorsal basal margin of the mandible and arising along the U-shaped rod; located lateral to mandibular sweeper 2 when the latter is present. (Syn.: group A hairs, Mitchell 1906,14; MdH₁ group, Knight 1971b,204; lateral subgroup of mandibular hairs, Pao and Knight 1970,128)

MANDIBULAR SWEEPER 2 (MnS₂) (Figs.47,49) [Harbach and Knight 1977a,35] — In many mosquito larvae, a linear group of filaments situated mesal to mandibular sweeper 1 on the dorsal basal margin of the mandible; often located above the basal margin and borne within the arcuate thickening. (Syn.: group B hairs, Mitchell 1906,14; MdH₂ group, Knight 1971b,204; mesal subgroup of mandibular hairs, Pao and Knight 1970,128)

MANDIBULAR SWEEPER FILAMENT (MnSF) — An element of the mandibular sweeper; often branch-tipped or barbed. (Syn.: mandibular sweeper seta, Harbach and Knight 1977a,35)

MANDIBULAR TEETH (MnT) (Figs.47,50) [Marshall 1938,44] — A cluster of heavily sclerotized projections occurring on the mesodistal margin of the mandible; including the dorsal teeth, ventral teeth, accessory teeth and an auxiliary ventral tooth; the auxiliary ventral tooth and the accessory teeth are often absent. (Syn., some of which include the dorsal mandibular spine, mandibular rake (at least in part) and/or the basal band: Taender, Meinert 1886,377; Zähne, Raschke 1887,140; chewing teeth, Nuttall and Shipley 1901a,55; biting part, Mitchell 1906,12; teeth, Smith 1908,24; chitinized teeth, Wesché 1910,12; composite teeth, Salem 1931,402; terminal teeth, Puri 1931,25; teeth of the mandible, Crawford 1933,27; radula [in Russian], Becker 1938b,751; cutting organ of mandible, LaCasse and Yamaguti 1948,8; mandibular cutting organ, LaCasse and Yamaguti 1948,13; cutting organ, LaCasse and Yamaguti 1948,18; Kauabschnitt, Schremmer 1949,190; dentes-bearing area, Shalaby 1956, in part, 148; mandibular molar area, Menees 1958b,35; toothed process, Snodgrass 1959,16; molar process, Surtees 1959,10)

MAXILLA (Mx) (Figs.34,35,37,38,40,41,51-54) — One of the second pair of gnathal appendages. In mosquito larvae, borne on the transverse margin of the lateralia lateral to the mentum and posterior to each mandible; typically flattened lobelike appendages consisting of the variously developed and fused parts of the generalized insect maxilla which include the cardo, stipes, lacinia, galea and maxillary palpus. (Syn.: maxillary palpus, Smith 1908,24; mandible [in Russian], Becker 1938b,754)

Maxillargelenk [Schremmer 1949,196] — The junction of the maxillary body and the maxillary palpus. These structures are sometimes fused basally, e.g., in *Malaya* and *Uranotaenia* larvae, rather than freely articulated.

MAXILLARY BODY (MxBo) (Figs.51,53,54) [Gardner *et al.* 1973,167] — The principal part of the maxilla consisting of the fused lacinia, galea and mesal part of the stipes; dorsal and ventral maxillary sutures demarcate the lacinia- and galeastipes in a number of culicine larvae. (Syn.: lobe des mâchoire, Meinert 1886,490; mittleren grösseren Theil, Raschke 1887,141; innerer Theil, Raschke 1887,161; Maxillarlade, Bischoff 1922,9(Fig.6); inner piece, Puri 1931,27; lacinia and galea, Puri 1931,27; main part of the maxilla, Crawford 1933,27; lobe of mandible [in Russian], Becker 1938b,744; stipes, Cook 1944b,43; stipe, Foote 1952,450; cardostipes, Shalaby 1958,152; principal part of each maxilla, Snodgrass 1959,18; main maxillary lobe, Snodgrass 1959,18; main lobe, Pucat 1965,56; dististipes plus the lacinia, Pucat 1965,58; mesostipes, Tanaka *et al.* 1979,18)

MAXILLARY BRUSH (MxB) (Figs.51-54) [Shalaby 1957a,155] — In mosquito and dixid larvae, a collection of variously-developed spicules arising distally from the maxillary body, or the galeastipes when distinguishable. (Syn.: Büschel, Raschke 1887,142; hooked hairs at edge of maxilla, Nuttall and Shipley 1901a,74; tuft A, Mitchell 1906,16; brush, Wesché 1910,12; tuft of hairs, Wesenberg-Lund 1921,19; terminal brush, Wesenberg-Lund 1921,19; tuft of bristles, Salem

1931,400; fringe of leaflike acicular structures, Crawford 1933,28; comb of the mandibular lobe [in Russian], Becker 1938b,758; Reihe von Hakenborsten, Schremmer 1949,198; row of long, slightly bent hairs, Foote 1952,450; maxillary combs, Shalaby 1957c,437; fan shaped cluster of setae, Shalaby 1958, in part, 443; cluster of short hairs, Shalaby 1958, in part, 444; brushes bearing long setae, Snodgrass 1959, in part, 18; combs of shorter setae, Snodgrass 1959, in part, 18; brush of hairs, Christophers 1960,206; brush of long hairs, Pucac 1965,56; brush of dististipes, Pucac 1965,57; brush of simple hairs, Pucac 1965,58; apical brush of hairs, Pucac 1965,58; fan of hairs, Dodge 1966,339)

MAXILLARY BRUSH SPICULE (MxBS) — One of the variously-developed spicules of the maxillary brush; typically lamellate blades in anopheline larvae. (Syn.: hooked hair, Nuttall and Shipley 1901a,74; Hakenborste, Schremmer 1949,196; maxillary brush hair, Pucac 1965,59; maxillary brush seta, Harbach and Knight 1977b,138)

MAXILLARY PALPAL SPICULE (MPS) (Figs.51,53,54) [Harbach and Knight 1977b,140] — In mosquito and dixid larvae, one of the spicules occurring on the maxillary palpus; located on the dorsal surface in anophelines and near its apex in toxorhynchitines and some culicines (primarily predaceous species). (Syn.: minute hair, Nuttall and Shipley 1901a,56; minute spinous projection, Puri 1931,27)

MAXILLARY PALPUS (MPip) (Figs.33,36,41,51-54) — The teleopodite of the maxilla. In mosquito and dixid larvae, a laterally located cylindrical or fusiform lobe which is supported by the stipes in dixids and articulated or fused basally with the maxillary body in mosquito larvae; part of the stipes has been incorporated into the maxillary palpus in anophelines, toxorhynchitines and many culicines. (Syn.: Palpe, Meinert 1886,377; palpe maxillaire, Meinert 1886,490; äusseren kleineren Theil, Raschke 1887,141; äusseren Theil, Raschke 1887,161; palp, Nuttall and Shipley 1901a,56; palpus, Mitchell 1906,15; basal process, Smith 1908,24; basal appendage, Wesenberg-Lund 1921,19; Stipes der Maxille, Bischoff 1922,9 (Fig.6); second segment of palp, Salem 1931,401; maxillary palp, Christophers 1933,40; mandibular palp [in Russian], Becker 1938b,744; palpostipes, Tanaka *et al.* 1979,14)

The merostipes appears to have been completely incorporated into the maxillary palpus of anopheline, toxorhynchitine and some culicine larvae. For simplicity, the entire complex in these cases is called the maxillary palpus.

MAXILLARY PILOSE AREA (MxPA) (Figs.51,52,54) [Harbach and Knight 1977b,141] — In mosquito and dixid larvae, a grouping or covering of fine filaments located lateral to the dorsal maxillary suture on the membranous dorsal surface of the maxillary body, or the galeastipes when distinguishable; covering most of the dorsal surface in anophelines and dixids; probably absent in all or most toxorhynchitines. (Syn.: Borstenflur, Schremmer 1949,199)

MAXILLARY SPICULOSE AREA (MSPA) (Fig.52) [Harbach and Knight 1977b,141] — In some culicine larvae, a grouping of minute spicules located on the lateral surface of the maxillary body, or the galeastipes when distinguishable. (Syn.: microspines, Shalaby 1957b,278; spinules, Shalaby 1958,444; spines, Pao and Knight 1970,130)

MAXILLARY STYLUS (MxS) — In certain *Topomyia* larvae, perhaps other sabethines as well, a large spur- or clawlike process borne at the apex of the maxillary body; apparently a modified, articulated anterior element of laciniastrum I used to grasp and cram prey into the mouth.

medial region [Shalaby 1957a,161] — In culicine larvae, the central area of the labiohypopharynx between the salivary meatus and the premental cusps and/or setae 1-Lh; this area is often rugose. (Syn.: plaque infra-salivaire, Chaudonneret 1962,482; medial area, Pao and Knight 1970,132; medial area of hypopharynx, Pao and Knight 1970,133; sclerotized corrugated area, Gardner *et al.* 1973,170)

MEDIAN ACCESSORY TERGAL PLATE (MATP) (Fig.59) [Evans 1938,28] — In some anopheline larvae, a small dorsal sclerite located immediately posterior to the tergal plate on the midline of abdominal segments I-VII. (Syn.: circular dot, Smith 1904,167; circular spot, Smith 1904,171; posterior tergal plate, Puri 1931,37; accessory plate, Gillies and De Meillon 1968,10)

MEDIAN DORSAL CAUDAL PROCESS (MDCP) [Belkin 1962,561] — In some mosquito larvae, a small median dorsal process of the caudal margin of the saddle which extends to the base of the dorsal brush.

MEDIAN LABRAL PLATE (MLP) (Figs.33,35,38-43) [Cook 1944b,60] — The dorsal sclerite of the labrum; separated from the dorsal apotome by the clypeolabral suture. (Syn.: shelf, Thompson 1905,168; anterior shelf, Thompson 1905,169; clypeus, Howard *et al.* 1912,84; ante-clypeus, Puri

1931,17; preclypeus, Puri 1931,17; clypeo-labral suture, Salem 1931,394; Labrum, Schremmer 1949,180; labral flap, Belkin 1951,684; dorsal labral sclerite, Christophers 1960,418; dorsal sclerite of labrum, Pucat 1965,53)

MEDIAN PLATE (MdP) (Fig.59) [Christophers 1922,538] — In anopheline larvae, a large sclerite located centrally on the dorsal surface of the spiracular apparatus which receives the attachment of the muscles which close the latter; homologous with the spiracular apodeme, posterolateral lobe plates I and the posterior median plate found in culicine and toxorhynchitine larvae. (Syn.: chequered plate, Nuttall and Shipley 1901a, in part, 65; median posterior plate, Nuttall and Shipley 1901a, in part, 65; checkered plate, Johannsen 1903,409; median plate, Imms 1908, in part, 107; median transverse plate, Imms 1908, in part, 107; chitinous peg, Imms 1908, in part, 131; terminal plate of spiracular lobe, Imms 1908, in part, 131; median plate of scoop, Christophers 1933,33; Zentralplatte, Montschadsky 1925,92; central plate, Gutsevich *et al.* 1974,34)

MEDIAN RAMUS (MRa) (Figs.55,56) [Harbach and Knight 1977c,343] — A branch of each cibarial bar extending along the dorsal margin of the premental component of the labiohypopharynx; usually indistinct and/or completely incorporated into the prementum. (Syn.: transverse ridge, Shalaby 1956,158)

MEDIODORSAL PHARYNGEAL SCLERITE (MDPhS) (Figs.45,58) [Harbach and Knight 1977d,393] — In many mosquito larvae, one of a pair of prominent, dorsoventrally flattened, crescentic riblike thickenings located immediately mesal and/or slightly dorsal to the laterodorsal pharyngeal sclerites in the lateral walls of the pharynx; bearing the primary dorsal fringes. (Syn.: Chitinleiste, Raschke 1887,144; lamella, Johannsen 1903,413; subsidiary band, Crawford 1933,30; chitinous ray, Crawford 1933,30; median sclerotized pharyngeal ring, Farnsworth 1947,147; Filterkamm, Schremmer 1949, including the primary dorsal fringe, 210; Filterkamm des Pharynx, Schremmer 1949, including the primary dorsal fringe, 211; Chitinbogen, Schremmer 1949,212; Kammbase, Schremmer 1949,212; riblike thickening, Snodgrass 1959,21; rib, Snodgrass 1959,21; filter-bearing rib of pharynx, Snodgrass 1959,33; sclérite dorsal moyen du filtre pharyngien, Chaudonneret 1962,486; rod, Clements 1963,36)

MEDIOVENTRAL PHARYNGEAL SCLERITE (MVPhS) (Figs.45,58) [Harbach and Knight 1977d,393] — In many mosquito larvae, one of a prominent pair of dorsoventrally flattened, crescentic riblike thickenings located immediately mesal and/or slightly ventral to the lateroventral pharyngeal sclerites in the lateral walls of the pharynx; bearing the primary ventral fringes. (Syn.: Chitinleiste, Raschke 1887,144; lamella, Johannsen 1903,413; subsidiary band, Crawford 1933,30; chitinous ray, Crawford 1933,30; Filterkamm, Schremmer 1949, including the primary ventral fringe, 210; Filterkamm des Pharynx, Schremmer 1949, including the primary ventral fringe, 211; Chitinbogen, Schremmer 1949,212; Kammbase, Schremmer 1949,212; riblike thickening, Snodgrass 1959,21; rib, Snodgrass 1959,21; filter-bearing rib of pharynx, Snodgrass 1959,33; sclérite moyen ventral du filtre pharyngien, Chaudonneret 1962,486; rod, Clements 1963,36)

membranous area [Pao and Knight 1970,130] — The transparent cuticle located at the base of setae I-Mx in *Aedes vexans* (Meigen); probably homologous with the transparent, membranous cuticle which surrounds and/or forms the pedicel(s) that bear(s) the seta(e) in other mosquito larvae. (Syn.: oval membranous area, Shalaby 1957a,157; spinose lobe, Christophers 1960,206)

MENTUM (Mt) [Laffoon and Knight 1973,49] — In many insects, the part of the postmentum distal to the submentomental suture. In most mosquito and some other nematoceros larvae, the proximal part is produced distad as a transverse fold, the ventromentum, under the distal triangular part, the dorsomentum. (Syn.: under lip, Nuttall and Shipley 1901a,55; metastoma, Nuttall and Shipley 1901a,74; labial plate, Felt 1904,267; submentum, Imms 1907,293; mental plate, Patton and Cragg 1913,198)

MEROSTIPES (mSt) [Harbach and Knight 1977b,141] — In dixid larvae, the easily recognized lateral part of the stipes bearing the maxillary palpus and articulating dorsally with the base of the mandible. In some mosquito larvae, mostly anophelines and toxorhynchitines, incorporated into the maxillary palpus but retaining its articulation with the mandible; homologous with the merostipital sclerite and the merostipital process found in many other mosquito larvae.

MEROSTIPITAL PROCESS (mSP) (Fig.52) [Harbach and Knight 1977b,141] — In many culicine larvae, a small, strongly sclerotized band or strip of cuticle attached to the base of the maxillary palpus; articulated with the base of the mandible just mesal to the postartis; homologous with the merostipes of dixids and the merostipital sclerite of some other culicines; completely incorporated into the maxillary palpus in toxorhynchitines, anophelines and some culicines permitting the

maxillary palpus to articulate directly with the base of the mandible, as well as with the postartis in anophelines. (Syn.: secondary process, Cook 1944b,44; sclerotized rod, Shalaby 1956,153; exoparartis, Shalaby 1956,155; maxillary apodeme, Shalaby 1957a,157; sclerotized process, Pucut 1965,56; lateral artus, Tanaka *et al.* 1979,14)

MEROSTIPITAL SCLERITE (mSS) (Fig.54) [Harbach and Knight 1977b,142] — In many culicine larvae, a small band of cuticle located laterally below the base of the maxillary palpus; articulated with the base of the mandible just mesal to the postartis; homologous with the merostipes of dixids and the merostipital process of some other culicines.

MESAL INTERTORMAL APODEME (MIP) [Laffoon and Knight 1973,49] — In some insects, the paired apodeme of the intertorma on which the medial labral retractor muscle is inserted. In anopheline larvae, these apodemes are fused forming one mesal secondary apodeme; in culicine larvae, apparently very short and separate if present. (Syn.: epipharyngeal process (see), Shalaby 1957a, only his most mesal pair, 152)

MESAL TORMAL PROCESS (MTP) (Fig.39) [Laffoon and Knight 1973,49] — A mesally directed process borne distad to the middle of the torma. (Syn.: medial process, Shalaby 1956,145; medial process of apodeme, Shalaby 1956,147; medial process of the labral apodeme, Shalaby 1957a,151; median process, Shalaby 1957a,168; anterior process of the labral apodeme, Shalaby 1957b,273; medial process of the lateral apodeme, Pao and Knight 1970,121)

MESOTHORAX (M) (Figs.59-62,66-68,72) — The second or middle segment of the thorax. In mosquito larvae, fused with the pro- and metathorax; with a series of 14 pairs of circumferentially arranged setae.

METATHORAX (T) (Figs.59-62,66-68,72) — The third, posterior segment of the thorax. In mosquito larvae, fused with the mesothorax; with a series of 13 pairs of circumferentially arranged setae.

microspine [Shalaby 1956,158] — Supposedly one of numerous tiny spinelike processes occurring in three rows on the hypopharynx of *Anopheles quadrimaculatus* (Say). Harbach and Knight (1977c,344) examined the labiohypopharynx of this species and were unable to locate the "microspines." The structures are probably nothing more than folds which often occur in the lightly sclerotized, almost fleshy surface of the hypopharynx.

MIDPALATAL BRUSH (MB) (Figs.34,36,39-41,43-45) [Laffoon and Knight 1973,49] — A paired palatal brush of variously developed filaments attached to the midpalatal lobe. (Syn.: palatal brush, Foote 1952,449; epipharyngeal brush, Pao and Knight 1970,123)

MIDPALATAL BRUSH FILAMENT (MBF) — Any specialized filament of the midpalatal brush. (Syn.: chisel-shaped spine, Shipitzina 1936,362; epipharyngeal hair, Shipitzina 1936,362; knife-shaped spine, Shipitzina 1936,362; epipharyngeal spine, Christophers 1960,198; midpalatal brush hair, Laffoon and Knight 1973,49)

MIDPALATAL LOBE (ML) [Laffoon and Knight 1973,49] — A labropalatal lobe located between the tormae behind the anterior palatal bar; ending posteriorly in the intertorma; guarding the entrance of the cibarium; bearing the midpalatal brushes. (Syn.: Epipharynx, Rasche 1887,143; median palatal lobe, Cook 1944b,42; postpalatal lobe, Christophers 1960,198)

MIDPALATAL PENICULAR AREA (MPA) [Laffoon and Knight 1973,50] — The specialized cuticular area bearing the midpalatal brush; (Syn.: palatal penicular area, Cook 1944b,42)

MOUTH (Mo) — The anterior opening of the stomodeum. In mosquito larvae, the opening into the pharynx from the preoral cavity; situated in the anterior region of the head between the palatum and the labiohypopharynx.

N

NOTAL PLATE (NP) (Fig.62) [Harbach and Knight 1978a,68] — In larvae of the *Anopheles minimus* species group and the genus *Orthopodomyia*, one of a number of small, usually paired sclerites occurring on the dorsal surface of the thorax; their occurrence, size, number and location are variable. (Syn.: thoracic plate, Reid 1968,318)

NUTTALL AND SHIPLEY'S ORGAN (NSG) (Figs.59,64) [Harbach and Knight 1978a,68] — In anopheline larvae, a bilobed membranous structure borne dorsally on each side of the prothorax; holds the thorax to the water's surface during feeding; retracted into the thorax upon submersion. (Syn.: notched process, Nuttall and Shipley 1901a,60; flabellum, Nuttall and Shipley 1901a,74; flap, Nuttall and Shipley 1901a,74; bifid process, Theobald 1901b,32; flap-like body, Stephens and

Christophers 1903,233; dorsal notched process, Imms 1907,317; thoracic appendage, Iyengar 1921,216; contractile appendage, Iyengar 1921,216; appendage, Iyengar 1921,216; contractile thoracic appendage, Iyengar 1928,281; thoracic supporting organ, Patton and Evans 1929,241; thoracic clinging organ, Patton and Evans 1929,241; accessory supporting organ, Patton 1931,148; notched organ, Puri 1931,29; notched organ of Nuttall and Shipley, Christophers 1933,35; thoracic notched organ, Marshall 1938,50; retractile organ, King and Bradley 1941,63; retractile appendage, King and Bradley 1941,63; prepupal respiratory trumpet, Chang and Richart 1951,290; notched shoulder organ, Gutsevich *et al.* 1974,28; shoulder organ, Gutsevich *et al.* 1974,28)

O

OCCIPITAL FORAMEN (OF) (Figs.37-39) — The posterior opening of the head into the cervix.

ocular lobe [Cook 1944b,40] — In insects, applied by some authors to the part of the cranium including the compound eye, stemmata and an ill-defined adjacent area. In mosquito larvae, applied by some authors to most of the lateralia behind the antennal socket.

ORAL SPICULE (OSp) (Fig.58) — In predatory mosquito larvae, one of the spines or spinules which line the ventral margin of the mouth and typically project into the pharynx; may be homologous in part with the ventral oral brush (medially) and the pharyngeal fringes (laterally) found in many non-predatory species; apparently aids in securing prey. (Syn.: oral spine, Harbach and Knight 1977d,394)

outer case [Ingram and Macfie 1917b,137] — In Mansoniini larvae, the external part of the spiracular apparatus, largely comprised of posterolateral spiracular lobe plates II. (Syn.: outer tube, Wesenberg-Lund 1918,306)

outer flap [Marshall 1938,48] — One of the outer sclerites (those nearest abdominal segment VIII or the distal margin of the siphon) of the spiracular lobes of the spiracular apparatus; termed herein the anterior, anterolateral and posterolateral spiracular lobe plates II. (Syn.: outer plate, Christophers 1960,221)

outer lobe [Puri 1931,32] — In anopheline larvae, the lateral lobe of the bilobed proximal part of Nuttall and Shipley's organ.

OUTER SPIRACULAR TOOTH (OST) (Figs.63,83) — The Mansoniini larvae, one in a group of two or three spicules belonging to one of two bilaterally paired sets, an anterolateral and a posterolateral pair, borne on the somewhat membranous cuticle between the apex of posterolateral spiracular lobe plates II and the inner spiracular teeth; capable of being retracted into the apical lumen of the spiracular apparatus when not being used to anchor the structure in plant tissue. (Syn.: hook, Ingram and Macfie 1917b,138; tooth on the apex of outer tube, Wesenberg-Lund 1918,303; tooth of outer tube, Marshall 1938,266; crochet ventro-latéraux, Guille 1975,258; crochet dorso-latéraux, Guille 1975,259; outer spiracular hook, Harbach and Knight 1978a,69)

P

PALATAL BRUSH (PBr) [Laffoon and Knight 1973,50] — In nematoceros larvae, any brush of close-set filaments of the palatum. See **ANTEROMEDIAN PALATAL BRUSH**, **LATERAL PALATAL BRUSH** and **MIDPALATAL BRUSH**.

This term was previously applied by Foote (1952,449) but to the midpalatal brush only.

PALATAL TESSELLATED AREA (PTAr) (Figs.33,35,36,39-41,43) [Laffoon and Knight 1973,50] — The bossed membranous surface intervening between the median labral plate and the anteromedian palatal and lateral palatal penicular areas. (Syn.: tessellated membrane, Christophers 1960,200, but not that of Pucat 1965,50)

PALATUM (Pal) (Fig.38) [Cook 1944b,38] — The oral surfaces of the labrum and clypeus, bounded posteriorly by the mouth, limited arbitrarily laterally by the lateral margins of the clypeus and the usual dorsal sclerite(s) of the labrum; divided into the labropalatum and clypeopalatum. In mosquito larvae, the entire labral wall except the median labral plate is considered to be palatal, as is the roof of the cibarium between the lower lateral margins of the clypeus. (Syn.: Epipharynx, Schremmer 1949,180)

paraclypeal fold [Cook 1944b,40] — The part of the epistomal suture parallel to and just lateral to the frontal ecdysial line. (Syn.: frontogenal sulcus, DuPorte 1946,394; frontogenal suture, DuPorte 1957,68)

PARACLYPEAL LOBE (PL) (Figs.33,34,36-39,42,44,45) [Cook 1944b,42] — In those immature insects in which the frontal ecdysial line extends into the clypeus, that paired part of the clypeus lateral to the ecdysial line; confluent anteriorly with the median area of the clypeus if the ecdysial line does not reach the clypeolabral suture; not strictly homologous among insects because of the variable location of the frontal ecdysial line. In mosquito larvae, with three ventrolateral lobes, the most anterior closely associated with the clypeolabral suture and lateral part of the median labral plate, followed by the black-spot area and posteriorly by the clypeal part of the cibarial bar; with a narrow dorsal posterior strip between the frontal ecdysial line and the epistomal suture, this strip confluent posteriorly with the frons; forming a part of the lateralia.

paraclypeal phragma [Cook 1944b,40] — The combined epistomal ridge and cibarial bar. The cibarial bar is not a phragma or part of one although the lateral end of the epistomal ridge is associated with it in mosquito larvae. The term paraclypeal phragma has since been applied to the epistomal ridge or part of it, sometimes in combination with other adjacent parts, in various dipteran larvae and adults.

PARACOILA (Pla) (Figs.34-36,38,39) [Laffoon and Knight 1973,51] — In most insects, the part of the cranium articulating with the parartis of the maxilla, specifically the articulating surface and the adjacent specialized, usually thickened cranial cuticle; usually condyloid. In at least some mosquito larvae, developed as a slender, nearly vertical rod projecting almost perpendicular to the hypostomal ridge just behind the outer edge of the mentum. (Syn.: second ossicle, Crawford 1933,29; fulcral lever [in Russian], Becker 1938b,756; sclerotized rod, Farnsworth 1947,143; Gelenkstab (GSt₂), Schremmer 1959,185; rod of the submentum, Menees 1958a,28, rod of submentum, Menees 1958a,30; submaxillary apodeme, Christophers 1960, in part, 206; articular bar, Clements 1963,37)

PARARTIS (Pat) (Figs.53,54) [Harbach and Knight 1977b,143] — In most insects, the part of the maxilla articulating with the paracoila; often forming a condyle. In culicine and toxorhynchitine larvae, the usually heavily sclerotized and produced ventromesobasal corner of the stipital arm; in anopheline and dixid larvae, the parartis articulates with the paracoila through a sclerotized bar, the rod of parartis.

PECTEN (PT) (Figs.59,60,64,65) [Dyar 1901a,179] — In culicine larvae, a comblike row of variously developed spicules borne posterolaterally on the basal part of the siphon; in anopheline and dixid larvae, borne on the posterior margin of the pecten plate. (Syn.: Borsten des Siphon, Raschke 1887,161; toothed lateral arch, Nuttall and Shipley 1901a, including the pecten plate, 65; toothed plate, Nuttall and Shipley 1901a, including the pecten plate, 65; row of teeth, Smith 1902a,272; row of spines, Smith 1903,311; spines, Smith 1904,19; siphonal spines, Wesché 1910,15; spines of the siphon, Wesché 1910, in explanation to Pl. I; Atemkamm, Tänzer 1921,137; Doppelkamm, Tänzer 1921, including the comb in anophelines, 139; Dornkamm, Tänzer 1921,142; Zahnreihe, Stadtmann-Averfeld 1923,124; toothed lateral plate, Puri 1931, including the pecten plate, 38; spiracular pecten, Gater 1934,20; primary comb, Baisas 1947, in anophelines, 204; siphonal pecten, van den Assem and Bonne-Wepster 1964,25)

The pecten of anopheline larvae was believed to be homologous with the comb of culicines until the work of Christophers (1922). Only first stage anopheline larvae bear a comb.

PECTEN PLATE (PP) (Figs.59,64) [Belkin 1962,561] — In anopheline and dixid larvae, a more or less lateral sclerite bearing the pecten along its posterior margin; in some anopheline larvae, connected with its mate posteriorly via the U-shaped band; partly homologous with the siphon of other mosquito larvae. (Syn.: ring, Nuttall and Shipley 1901a, including the U-shaped band, 64; toothed lateral arch, Nuttall and Shipley 1901a, including the pecten, 65; toothed plate, Nuttall and Shipley 1901a, including the pecten, 65; chitinous skeleton, Nuttall and Shipley 1901a, including the U-shaped band, 74; triangular plate, Smith 1904,167; plate, Smith 1904,171; chitinous arch, Patton and Cragg 1913, including the U-shaped band, 200; lateral plate, Howard *et al.* 1917,969; arched plate, Patton 1931,148; toothed lateral plate, Puri 1931, including the pecten, 38; bar, Puri 1931,38; triangular sclerite, Marshall 1938,50; basal plate, Belkin 1950,694)

Belkin's (1962,561) definition of the pecten plate differs from the one here in that it includes the pair of sclerites and the connecting U-shaped band.

PECTEN ROW LENGTH INDEX [Schick 1970,15] — In siphon-bearing mosquito larvae, the distance from the base of the siphon, measured along the dorsal margin, to the most distal pecten spine.

PECTEN SPINE (PS) (Figs.59,60,64,65,83) [Pectendorn, Martini 1923a,548] — One of the specialized

spicules comprising the pecten; of various forms but usually spinelike with a denticulate margin. (Syn.: Zähnen, Haller 1878,95; Børste, Meinert 1886,377; tooth, Nuttall and Shipley 1901a,64; spine, Smith 1902b,299; pecten tooth, Dyar 1903,27; pecten, Felt 1904,264; scale, Macfie 1917,301; Kammzinke, Tänzer 1921, in an anopheline, 140; Dornenkammborste, Tänzer 1921,149; thorn, Wesenberg-Lund 1921,14; hair, Wesenberg-Lund 1921,14; Kammzahn, Stadtmann-Averfeld 1923,125; pecten scale, Hearle 1929,97; primary comb tooth, Baisas 1947, in anophelines, 206; bristle, Snodgrass 1959,28)

PEDICEL (Pe) (Fig.45) — The second or subbasal segment of the antenna. In mosquito larvae, usually unrecognizably fused with the flagellum but at least partially separated from it by a weak suture in some taxa, particularly anophelines; often united with the scape as well.

PENICULAR AREA (PA) [Laffoon and Knight 1973,51] — In arthropods, any specialized cuticular area bearing a brush of regularly-arranged spicules; limited peripherally by the attachment points of the marginal elements of the brush. Several specific penicular areas occur in mosquito larvae. See **ANTEROMEDIAN PALATAL PENICULAR AREA**, **LATERAL PALATAL PENICULAR AREA** and **MIDPALATAL PENICULAR AREA**.

This term was previously applied by Cook (1944b,41) but to the lateral palatal penicular area only.

PENTAD SETA [Knight and Laffoon 1971b,161] — Any one of setae 1- to 5-VIII. (Common syn.: pentad hair)

pharyngeal filter [filtre pharyngien, Chaudonneret 1962,477] — The system of pharyngeal fringes borne by the lateral walls of the pharynx which strain food particles from the current produced by the expansion and contraction of the pharynx. (Syn.: Reusenapparat, Raschke 1887,144; sieve, Johannsen 1903,413; pharyngeal filter apparatus, Snodgrass 1959,21)

PHARYNGEAL FRINGE (PhF) [Christophers 1960,290] — In many mosquito and certain other nematoceros larvae, one of a number of rows of filaments situated in the lateral recesses of the pharynx which collectively function to retain food particles in the pharynx. In mosquito larvae, primary fringes are borne on the inner edges of the mediodorsal and medioventral pharyngeal sclerites. (Syn.: group of setae, Imms 1907,317; row of bristles, Salem 1931,410; concentric row of fimbriae, Cook 1944b,43; row of fimbriations, Cook 1944b,48; brush of fine hairs, Snodgrass 1959,21; filter brush, Snodgrass 1959,23; fringe, Christophers 1960,289; filtering comb, Jones 1960,462; pharyngeal comb, Clements 1963,36)

PHARYNGEAL FRINGE FILAMENT (PhFF) — In many mosquito and certain other nematoceros larvae, one of the often branched or branch-tipped spicules comprising a pharyngeal fringe. (Syn.: Haar, Raschke 1887,144; Reusenhaar, Raschke 1887,162; cilium, Johannsen 1903,413; bristle-like seta, Imms 1907,297; éspine, Sautet 1935,98; éspine pharyngienne, Sautet 1935,99; fimbria, Cook 1944b,43; fimbriation, Cook 1944b,46; seta, Farnsworth 1947,145; Filterkammzahne, Schremmer 1949,217; filament, Christophers 1960,290; pharyngeal hair, Pucat 1965,62; pharyngeal fringe element, Harbach and Knight 1977d,395)

PHARYNX (Pha) (Figs.33,35,37,58) — The part of the stomodeum between the mouth and the esophagus. In most mosquito and certain other nematoceros larvae, the lateral walls of the pharynx bear a set of fringes which function to retain food particles.

PLEURAL SETAL GROUP [Knight and Laffoon 1971b,162] — Ventrolateral setae 9-12 of any thoracic segment; borne on a common tubercle. (Common syn.: pleural group)

POSTABDOMINAL SPIRACLE (PAS) (Figs.63,64) [Keilin 1944,5] — In mosquito and other dipterous larvae, one of a pair of functional spiracles belonging to embryonic abdominal segment VIII. (Syn.: Spirake, Meinert 1886,394; stigma, Hurst 1890a,54; spiracle, Theobald 1901b,33; dorsal spiracle, Snodgrass 1959,28; terminal spiracle, Christophers 1960,218)

POSTANTENNAL BUTTRESS (PB) (Figs.33,37,38,40,41) [Cook 1944b,41] — In mosquito and some other nematoceros larvae, a wide cranial inflection extending from near the base of the cibarial bar to behind the antennal socket. (Syn.: subgenal inflection, DuPorte 1946,394)

POSTARTIS (Poa) (Figs.46-49) [Shalaby 1956,150] — In most insects, the part of the mandible articulating with the postcoila; often forming a condyle. In mosquito larvae, a small posteroventral process borne at the lateral third of the U-shaped rod of the mandible; the maxillary palpus is secondarily associated with it basally. (Syn.: Drehpunkt, Raschke 1887,141; chitinous apodeme, Salem 1931,402; chitinous process, Puri 1931,27; ventral mandibular process, Crawford 1933,27; mandibular arm, Farnsworth 1947,142; Gelenkfortsatz, Schremmer 1949,190; posterior basal articular point, Snodgrass 1959,16; mandibular ventral artis, Pao and Knight 1970,126; ventral artis

of mandible, Tanaka *et al.* 1979,14; ventral artis, Tanaka *et al.* 1979,16)

postclypeus [Shalaby 1956,143] — In some insects, the proximal sclerite of the clypeus when the clypeus is transversely divided by a suture. In mosquito larvae, misapplied by Shalaby (1956,1957a-c). (Syn.: post clypeus, Shalaby 1956,140) See **CLYPEUS**.

POSTCOILA (Pot) (Figs.34-41) [Laffoon and Knight 1973,52] — In most insects, the part of the cranial surface articulating with the postartis of the mandible, including the adjacent specialized, usually thickened cranial cuticle; often forming an acetabulum. In mosquito larvae, a small anteroventral marginal cranial process along with the adjacent short longitudinal apodemalous ridge; the maxillary palpus is secondarily associated with it basally. (Syn.: posterior mandibular articulatory process, Cook 1944b,44; ventral articulation of the mandible, Foote 1952,449; mandibular apodeme, Shalaby 1957a, in part, 154; maxillary apodeme, Shalaby 1957b, in part, 271; posterior articulation of mandible, Snodgrass 1959,20; submaxillary apodeme, Christophers 1960,198)

posterior angle [Christophers 1960,289] — In non-predatory mosquito larvae, the narrow posterior part of the pharynx which projects dorsally where the various pharyngeal sclerites converge.

POSTERIOR DORSAL TOOTH (PDT) (Fig.50) [Pao and Knight 1970,124] — The more posterior of the two dorsal teeth of the mandible; usually bearing two or more cusps. (Syn.: lateral dorsal dentes, Shalaby 1956,150; caudal subgroup of the dorsal dentes, Shalaby 1957a,152)

POSTERIOR MANDIBULAR ARTICULATION (PMA) (Fig.38) [Cook 1944b,49] — In most insects, the junction line along which the postartis and postcoila come into contact during mandibular movements. (Syn.: ventral mandibular joint, Crawford 1933,27; posterior articulation, Cook 1944b,43; posterior articulation of the mandible, Farnsworth 1947,147; äusseres Mandibelgelenk, Schremmer 1949,190; posterior articulation of mandible, Menees 1958b,128)

POSTERIOR MEDIAN PLATE (PMP) (Figs.60,61,63,64) [Harbach and Knight 1978a,71] — In culicine and toxorhynchitine larvae, a small sclerite located between posterolateral spiracular lobe plates I immediately posterior to the spiracular apodeme; in anopheline larvae, apparently part of the median plate. (Syn.: hintere Fortsatz, Montschadsky 1925,92; posterior median process, Christophers 1960,218; posterior process, Gutsevich *et al.* 1974,35)

POSTERIOR MEDIAN PROCESS (PMPc) (Fig.63) [Christophers 1960,221] — In certain culicine larvae, a filamentous projection arising from the posterior margin of the spiracular apodeme (forming part of a common spiracular opening when the posterior median process is present) and protruding caudad between the posterolateral spiracular lobes of the spiracular apparatus. (Syn.: median caudal filament, Belkin 1962,561; central filament, Colless 1965,263)

posterior process of the apodeme [Shalaby 1956,146] — Shalaby applied this term in *Anopheles quadrimaculatus* Say to a structure which cannot be identified from his information; it is probably a part of either the lateral intertormal apodeme or the tormal apodeme. (Syn.: posterior process, Shalaby 1956,167)

POSTERIOR SPIRACULAR PLATE (PSP) (Fig.63) [Harbach and Knight 1978a,72] — In Mansoniini larvae, the sclerotized platelike structure closing in the posterior margin of the spiracular apparatus between the posterolateral spiracular lobes; probably developed from the membrane connecting the lobes; washboardlike in *Mansonia* larvae. (Syn.: ventral membrane, Ingram and Macfie 1917b,137; ventral piece of outer tube, Wesenberg-Lund 1918,303; lancet-shaped plate, Wesenberg-Lund 1918,306)

POSTERIOR TENTORIAL ARM (PTA) (Figs.33-35,38-41) [Cook 1944b,57] — The apodeme extending anteriorly from the posterior tentorial pit; ending free (in some insects) or in contact with the anterior tentorial arm (in most insects); sometimes with secondary arms. In mosquito larvae, in contact with the anterior tentorial arm. (Syn.: gular apodeme, Dodge 1945,164; posterior arm, Christophers 1960,203)

POSTERIOR TENTORIAL PIT (PTP) (Figs.34,35,37,38,40-42,44) [Cook 1944b,52] — An external depression in the cranium at the base of each posterior tentorial arm; situated at the junction of the hypostomal and postoccipital sutures when these are present.

POSTEROLATERAL SPIRACULAR LOBE (PSL) (Figs.59-61,63,64) [Harbach and Knight 1978a,72] — One of the posterior of two bilateral pairs of flaplike projections of the spiracular apparatus; highly developed in larvae of the tribe Mansoniini. (Syn.: posterior lobe, Johannsen 1903,409; posterior piece, Howard *et al.* 1912,92; lateral chitinous lamella, Ingram and Macfie 1917b, in a *Mansonia* larva, 137; ventral valve, Edwards 1919, in a *Mansonia* larva, 85; posterior

valve, Edwards 1919, in a *Mansonia* larva, 86; scoop, Christophers 1922, the pair of lobes in anophelines, 538; hintere Klappe, Martini 1923a,530; Hinterklappe, Martini 1923a,531; grand clapet, Sautet and Audibert 1946,45; posterior perispiracular lobe, Christophers 1960,218; ventrolateral valve, Belkin 1962,561; ventrolateral lobe, Belkin 1962,561; postero-lateral spiracular valve, Knight and Laffoon 1971b,168)

POSTEROLATERAL SPIRACULAR LOBE PLATE I (PSLP^I) (Figs.60,61,63,64) [Harbach and Knight 1978a,72] — In culicine and toxorhynchitine larvae, the inner sclerite (that nearest the spiracular openings) of one of the posterolateral spiracular lobes of the spiracular apparatus; apparently part of the median plate in anopheline larvae. (Syn.: ventral piece, Ingram and Macfie 1917b, in a *Mansonia* larva, 138; ventral piece of inner tube, Wesenberg-Lund 1918, in a *Mansonia* larva, 303; inner flap of ventral valve, Marshall 1938,49)

POSTEROLATERAL SPIRACULAR LOBE PLATE II (PSLP^{II}) (Figs.59-61,63) [Harbach and Knight 1978a,72] — The often poorly delimited outer sclerite (that nearest abdominal segment VIII or the distal margin of the siphon) of one of the posterolateral spiracular lobes of the spiracular apparatus. (Syn.: lateral plate, Imms 1908,107; ventral lateral piece of outer tube, Wesenberg-Lund 1918, in part in a *Mansonia* larva, 303; dorsal lateral piece of outer tube, Wesenberg-Lund 1918, in part in a *Mansonia* larva, 303; lateral piece, Wesenberg-Lund 1918, in a *Mansonia* larva, 309; lateral plate of scoop, Christophers 1933,33; lateral wall of scoop, Gater 1934,24; ventral plate, Evans 1938,30; outer flap of ventral valve, Marshall 1938,49; posterior plate, Komp 1942,18; lower surface (base) of posterior lobe, Gutsevich *et al.* 1974,34)

postgena — In insects, a loosely defined part of the cranium, applied in various ways in different insects, most commonly for an indefinite ventrolateral part of the lateralia between the gena and the postoccipital suture; sometimes considered as part of the gena, sometimes as a separate area. In mosquito larvae, used by several authors, e.g., Shalaby (1956,140), Snodgrass (1959,4) and Pucat (1965,46), in various ways for ill-defined parts of the lateralia and sometimes the labiogula. Compare **POSTGENA** in the adult section.

POSTLABIUM (PLb) [Laffoon and Knight 1973,53] — The basal part of the labium proximal to the prelabium; comprised of a single sclerite, postmentum, or divided by a suture into a distal part, mentum, and a proximal part, submentum. In mosquito larvae, extending anteriorly to the base of the prementum, laterad to the hypostomal suture and posteriorly to the level of the posterior tentorial pits.

POSTMENTUM (Pmt) [Laffoon and Knight 1973,53] — The sclerite or sclerites collectively of the postlabium. In mosquito larvae and many other insects, divided transversely by the submentomental suture into the distal mentum and the proximal submentum; in mosquito larvae, the sclerotization of the submentum is continuous with that of the gula (see **LABIOGULA**). (Syn.: Mentum, Raschke 1887, perhaps including the gula, 142)

POSTOCCIPITAL RIDGE (PoR) [Laffoon and Knight 1973,53] — The apodeme marked externally by the postoccipital suture. In mosquito larvae, apparently faint or absent in part of its course; seemingly continuous with a ridge coursing to the midventral line.

POSTOCCIPITAL SUTURE (POS) (Laffoon and Knight 1973,54) — A line of inflection extending dorsad from each posterior tentorial pit and separating the postocciput from more anterior areas of the cranium; forming the postoccipital ridge internally. In mosquito larvae, faint and sometimes only partly developed; interrupted dorsally by the coronal gap in late instars; coursing through the collar for most of its length; seemingly branching ventrolaterally into a suture continued to the ventromeson and the true postoccipital suture which continues anteriorly as the gula suture to the posterior tentorial pit. (Syn.: postoccipital sulcus, Snodgrass 1959,4)

POSTOCCIPUT (POc) (Fig.37) [Laffoon and Knight 1973,54] — The posterior area of the cranium at the dorsal and lateral margins of the occipital foramen; separated from the more anterior areas of the cranium by the postoccipital suture. In mosquito larvae, the narrow posterior part of the collar; interrupted dorsally by the coronal gap; ventrally continuous with the gula.

POSTTORMA (Pit) (Figs.33-37,39,41,44,45) [Laffoon and Knight 1973,54] — A small triangular sclerite of the clypeopalatum intercalated between the black-spot area of the paraclypeal lobe and a posterior arm of the torma; bearing seta 2-Lp. (Syn.: lower triangular plate, Salem 1931,396; triangular plate, Pao and Knight 1970,122)

PREARTIS (Pra) (Figs.46-49) [Shalaby 1956,150] — In most insects, the part of the mandible articulating with the precoila; often forming a condyle. In mosquito larvae, a small posterodorsal

process borne at the lateral third of the U-shaped rod of the mandible. (Syn.: articulation antérieure de la mandibule, Chaudonneret 1962,485; mandibular dorsal artis, Pao and Knight 1970,126; dorsal artis of mandible, Tanaka *et al.* 1979,14; dorsal artis, Tanaka *et al.* 1979,16)

preclypeus [Puri 1931,17] — In some insects, the distal sclerite of the clypeus when the clypeus is transversely divided by a suture. In mosquito larvae, misapplied by Puri and some other authors to the median labral plate and by Shalaby (1956,140; 1957a-c) in at least two different ways. See **CLYPEUS**.

PRECOILA (Pc) (Figs.38,41) [Laffoon and Knight 1973,54] — In most insects, the part of the clypeal surface articulating with the preartis of the mandible, along with the adjacent specialized, usually thickened cuticle; often forming an acetabulum. In mosquito larvae, the terminal part of the clypeal element of the cibarial bar. (Syn.: dorsal articulation of the mandible, Foote 1952,449)

PRECRATAL SETA (PcrS) [Knight and Laffoon 1971b,162] One of the ventral brush setae borne anterior to the grid. (Syn.: precratal tuft, Marshall 1938,49; pre-cratal hair of ventral brush, Woodhill and Pasfield 1941,202; detached hair of ventral brush, Belkin 1962,561)

PRELABIUM (plb) (Figs.55,56) [Harbach and Knight 1977c,348] — The distal part of the labium comprising the prementum, ligula and labial palpi. In mosquito and certain other nematocerous larvae, separated from the hypopharynx by the salivary meatus but united with it laterally by the cibarial bars to form the labiohypopharynx.

PREMENTAL APODEME (PAP) [Harbach 1978,303] — Observable in some mosquito larvae, a small ingrowth located on each lateral margin of the prementum; receiving the insertion of a cranial adductor muscle which is probably homologous with one of two pairs of tentorio-premental muscles found in generalized insects. (Syn.: protuberance for insertion of muscles of hypopharynx [in Russian], Becker 1938b,744; hypopharyngeal apodeme, Gardner *et al.* 1973,170; prelabial apodeme, Harbach and Knight 1977c,345)

PREMENTAL CORDATE PROCESS (PCP) (Figs.55,57) [Harbach 1978,305] — In anopheline larvae, a large heart-shaped flaplike structure located dorsal to and closely associated with the ventral premental spicules; the reduced homologous structure in culicines, when present, is considered as one of the ventral premental spicules. (Syn.: semi-circular plate, Puri 1931,28; pouch-shaped outgrowth [in Russian], Becker 1938b,744; heart-shaped flap, Farnsworth 1947,144; Chitinlamelle, Schremmer 1949,200; heart-shaped structure, Menees 1958a,30; labial palpi, Menees 1958a,30; prelabial cordate process, Harbach and Knight 1977c,345) The "premental spine" of Pao and Knight (1970,132) appears to be homologous with the anopheline structure, but owing to its reduced nature in culicines it is included with the ventral premental spicules.

PREMENTAL CUSPS (PCu) (Figs.56,57) [Harbach 1978,304] — In dixid and some mosquito larvae, a group of small denticles located centrally on the labiohypopharynx; incorporated into the complex of prementoligular teeth in many culicines; seemingly homologous for the most part with the anopheline premental ridge teeth. (Syn.: curved plate with spines, Wesché 1910, including the premental dental arches, 12; minute spines, Salem 1931,403; hypopharyngeal spines, Shalaby 1957a,161; mesal spines, Shalaby 1957b,280; mesal spine, Shalaby 1957d,269; premental pouches, Pao and Knight 1970, in part and including the ligula, 132; central cusps, Gardner *et al.* 1973, in part, 171; prelabial cusps, Harbach and Knight 1977c, in part, 346; prelabial denticulus, Harbach and Knight 1977c, in part, 346)

PREMENTAL DENTAL ARCH (PDA) (Figs.56,57) [Harbach 1978,304] — In many mosquito larvae, a heavily sclerotized curved ridge- or rodlike thickening connecting the lateral premental teeth and the ligula dorsally; often grooved and/or bearing small teeth or denticles; in many culicines, mainly sabethines, incorporated, at least in part, into the complex of prementoligular teeth; apparently poorly developed or unrecognizable in anophelines. (Syn.: curved plate with spines, Wesché 1910, including the premental cusps, 12; dorsal fossa, Gardner *et al.* 1973,171; prelabial dental arch, Harbach and Knight 1977c,346)

PREMENTAL MALA (PM) (Figs.55,57) [Harbach 1978,304] — In anopheline and certain culicine larvae, one of a pair of denticulate tritural surfaces borne on each dorsolateral surface of the labiohypopharynx adjacent to the lateral premental teeth; probably homologous with the hypopharyngeal malae of dixid larvae (Harbach 1978,328); the accessory teeth of the mandibles occlude with the premental malae. (Syn.: nodules, Puri 1931, in part, 28; teeth, Cook 1944b, in part, 47; tooth-like spines, Farnsworth 1947, in part, 144; Seitenfläche des Hypopharynxkörper, Schremmer 1949,200; hypopharyngeal spines, Shalaby 1956, in part, 160; side of hypopharynx, Menees 1958a,30; prelabial mala, Harbach and Knight 1977c,346)

PREMENTAL RIDGE TEETH (PRT) (Figs.55,57) [Harbach 1978,304] — In anopheline larvae, several large teeth located along the elevated midline of the prementum between the premental malae; seemingly homologous with the culicine premental cusps. (Syn.: tri-apical dens [in Russian], Becker 1938b,744; series of heavy teeth, Farnsworth 1947,144; Firstzacken, Schremmer 1949, including the ligula, 200; teeth, Shalaby 1956,160; ridge teeth, Menees 1958a, including the ligula, 30; glossa, Menees 1958a, including the ligula, 30; paraglossa, Menees 1958a, including the ligula, 30; prelabial denticulus, Harbach and Knight 1977c, in part, 346; prelabial ridge teeth, Harbach and Knight 1977c, in part, 347)

PREMENTAL TEETH (PT) [Harbach 1978,304] — The bilaterally paired assemblage of teeth and denticles located dorsal and lateral to the labial palpi; comprising an interconnected group of lateral premental teeth which flank the labial palpi and a premental dental arch which curves around the dorsal margin of each labial palpus and is united with the ligula.

PREMENTOLIGULAR TEETH (PLT) (Figs.56,57) [Harbach 1978,304] — In many mosquito larvae, a highly variable, usually heavily sclerotized toothed or cusped prominence located between the labial palpi; comprising the unrecognizably fused premental cusps, at least the mesal parts of the premental dental arches and the ligula. (Syn.: mesal region of each paragnathus, Shalaby 1957a,161; median prelabial teeth, Harbach and Knight 1977c,343)

PREMENTUM (Pm) [Puri 1931,38] — The stipital part of the labium. In mosquito and certain other dipteran larvae, the major component of the labiohypopharynx; bearing the vestigial ligula and labial palpi dorsally; united with the hypopharynx laterally by the cibarial bars; ventrally reflected into the mentum at the base of the dorsomentum; its lateral limits are usually poorly defined or obscure. (Syn. at least in part: mittlere Partien der Unterlippe, Raschke 1887,162; labium, Thompson 1905,169; saddle-shaped sclerite, Thompson 1905,170; plate, Wesenberg-Lund 1921,20; paragnatha, Shalaby 1957a,161; spiny and sclerotized structures, Shalaby 1957d,266; ventral part, Shalaby 1957d,268; labial plate, Christophers 1960,208)

PREORAL CAVITY (PrC) [Christophers 1960,205] — The space enclosed by the palatum, hypopharynx and gnathal appendages. In mosquito larvae, the largely closed-in space formed by the palatum, mandibles, maxillae, dorsomentum and labiohypopharynx; receiving posteriorly the wide slitlike opening of the pharynx, the true mouth. (Syn.: mouth cavity, Salem 1931,410)

presiphonic fold [Christophers 1922,538] — In anopheline larvae, a poorly delimited foldlike modification of the body wall located anteriorly at the base of the spiracular apparatus; believed to be partly homologous with the "basal supporting plate" of Imms (1908,131).

PRIMARY DORSAL FRINGE (PDF) (Figs.45,58) [Harbach and Knight 1977d,395] — In many mosquito larvae, a prominent row of usually branch-tipped filaments borne on the inner edge of a mediodorsal pharyngeal sclerite. (Syn.: Filterkamm, Schremmer 1949, including the mediodorsal pharyngeal sclerite, 210; Filterkamm des Pharynx, Schremmer 1949, including the mediodorsal pharyngeal sclerite, 211)

PRIMARY MAXILLARY ARTICULATION (PMxA) [Harbach and Knight 1977b,144] — In most mosquito larvae and other insects, the junction line along which the parartis and paracoila come into contact during maxillary movements; in anopheline and dixid larvae, between the rod of parartis and the paracoila. (Syn.: dorsal articulatory point, Farnsworth 1947,143)

PRIMARY VENTRAL FRINGE (PVF) (Figs.45,58) [Harbach and Knight 1977d,395] — In many mosquito larvae, a prominent row of usually branch-tipped filaments borne on the inner edge of a medioventral pharyngeal sclerite. (Syn.: Filterkamm, Schremmer 1949, including the medioventral pharyngeal sclerite, 210; Filterkamm des Pharynx, Schremmer 1949, including the medioventral pharyngeal sclerite, 211)

PROTHORAX (P) (Figs.59-62,66-68,72) — The first or anterior segment of the thorax. In mosquito larvae, fused with the mesothorax; with a series of 15 pairs of circumferentially arranged setae.

R

RELATIVE SIPHON LENGTH [Schick 1970,15] — The siphon length divided by the saddle length.

respiratory fossa [Christophers 1922,538] — In anopheline larvae, the depression conforming to the sunken or concave dorsal surface of the spiracular apparatus. (Syn.: respiratory recess, Nuttall and Shipley 1901a,65)

ROD OF PARARTIS (RPat) (Figs.51,54) [Tanaka *et al.* 1979,20] — In dixid, anopheline and certain culicine larvae, a small sclerotized rod located between and articulating with the paracoila and the stipital arm of the maxillary body mesoventrally; the stipital adductor muscle is inserted on it in anophelines. (Syn.: first ossicle, Crawford 1933,27; lever [in Russian], Becker 1938b,756; sclerotized arm, Farnsworth 1947,143; sclerotized arm of the maxilla, Farnsworth 1947,143; Gelenkstab (GSt₁), Schremmer 1949,196; entoparartis, Shalaby 1956,154; rod of the cardo, Menees 1958a,28; condyle of the cardo, Menees 1958a,28; rod of cardo, Menees 1958a,30; basal arm of the cardo, Menees 1958a,30; articular bar, Clements 1963,34; cardo, Harbach and Knight 1977b,130)

roof of pharynx [Christophers 1960,290] — The part of the pharynx lying dorsal to and including the laterodorsal pharyngeal sclerites. (Syn.: dorsal plate, Thompson 1905, at least in part, 171; dorsal surface, Cook 1944b,43; dorsal pharyngeal plate, Cook 1944b,55; pharyngeal roof, Christophers 1960,289)

RUDIMENTARY SPIRACLE (rs) (Figs.60,61,64,66,67,72) [Felt 1905,445] — In insects, a closed, non-functional spiracle. In mosquito larvae, usually recognized as a tiny, well sclerotized rodlike thickening (representing the swollen and constricted walls of a spiracle to which is attached a thin strand or cord, a collapsed trachea) extending inward from the cuticle of the body wall; usually dorsolaterally located on the meso- and metathorax and abdominal segments I-VII. (Syn.: chitinous cord, Hurst 1890a, including the collapsed trachea, 54; vestigial spiracle, Dodge 1945,163; lateral spiracle, Snodgrass 1959,28; spiracular puncta, Christophers 1960,298; spiracular sensillum, Belkin 1962,560)

S

SADDLE (Sa) (Figs.59-62,64,65) [Johannsen 1903,409] — In mosquito and some other nematocerous larvae, a large sclerite usually covering most of the dorsal and lateral surfaces of abdominal segment X; sometimes continuous ventrally to form a girdle. (Syn.: Chitinschildchen, Raschke 1887,136; Chitinschild, Raschke 1887,160; chitinous plate, Packard 1898,465; plate, Dyar 1903,24; dorsal plate, Dyar 1903,24; chitinized plate, Johannsen 1903,409; tergum, Imms 1908,108; schield, Wesenberg-Lund 1921,15; Chitinsattel, Stadtmann-Averfeld 1923,114; 10th abdominal tergum, Patton and Evans 1929,245; anal saddle, Hearle 1929,97; dorsal chitinous plate, Patton 1931,143; anterior tergal plate, Puri 1931,39; dorsal saddle, Tate 1932,118; dorsal chitinised saddle, Tate 1932,118; tergal plate, Christophers 1933,42; tergite X, Evans 1938,31; tenth tergite, Evans 1938,31; dorsal tergal plate, Komp 1942,16; ring, Belkin 1962,561; collar, van den Assem and Bonne-Wepster 1964,25)

Saddle is morphologically an unacceptable term but due to its widespread use for mosquito larvae it is recommended for use. Note that the sclerite is referred to as a saddle whether it is borne saddlelike on abdominal segment X or forms a complete ring around it. There is no need to adopt another term for the latter case when this can be referred to as a complete saddle.

SADDLE ACUS (SaA) (Fig.60) [Harbach and Knight 1978a,75] — In some mosquito larvae, a small sclerite often attached anterolaterally to the saddle. (Syn.: acus, Belkin 1962,561)

SADDLE LENGTH — The middorsal length of the saddle measured along a straight line parallel to the longitudinal axis of abdominal segment X.

SADDLE MARGINAL SPICULE (SMS) (Figs.61,64) — In certain mosquito larvae, one in a row of posteriorly projecting spicules borne along the caudolateral margin of the saddle. (Syn.: posterior dorsal saddle spine, Woodhill and Pasfield 1941,202; spine, Woodhill and Pasfield 1941,203; spicule, Hopkins 1952,20; marginal spicule, Belkin 1962,561; denticle, Gutsevich *et al.* 1974,37)

SADDLE / SIPHON INDEX [Colless 1965,263] — The ratio of the siphon length (note that Colless measured this along the posterior or ventral margin instead of the dorsal margin as defined herein) to the saddle length.

SALIVARY MEATUS (SM) (Figs.55-57) [Harbach 1978,302] — The space or passage between the hypopharynx and the prementum at the inner end of which is the salivary orifice. (Syn.: salivary orifice, Gardner *et al.* 1973,170; salivary slit, Harbach and Knight 1977c,350)

SALIVARY ORIFICE (SO) [Snodgrass 1959,19] — The opening of the salivary duct(s) into the salivary meatus between the bases of the hypopharynx and prementum. (Syn.: orifice of the salivary duct, Thompson 1905,170; opening of the salivary glands, Puri 1931,28; opening of the salivary duct, Salem 1931,409; salivary duct opening, Cook 1944b,45; orifice of the common salivary duct, Farnsworth 1947,144; salivary duct orifice, Farnsworth 1947,147; Speicheldrüsenkanal, Schremmer

1949,200; salivary opening, Shalaby 1957c,437; opening of the common salivary duct, Christophers 1960,208)

SAW (SAW) (Fig.63) [Ingram and Macfie 1917b,138] — In *Mansoniini* larvae, the anterior serrated plate of the spiracular apparatus; at least partly homologous with the anterior spiracular lobe of other mosquito larvae. (Syn.: median plate, Wesenberg-Lund 1918,306; flat piece with saw-like dorsal keel, Edwards 1919,85; scie dorsale, Guille 1975,258; scie siphonique, Guille 1975,271)

SCAPE (Sc) (Figs.33-36,45) — The first or basal segment of the antenna. In mosquito larvae, greatly reduced and often unrecognizably fused with the pedicel and flagellum; sometimes detached.

SECONDARY DORSAL FRINGE (SDF) (Fig.58) [Harbach and Knight 1977d,396] — In many mosquito larvae, one of usually one to three rows of filaments borne by the walls of the pharynx between the lateral edge of a dorsal pharyngeal sclerite and a mediodorsal pharyngeal sclerite; the bases of the filaments are connected by a strip of membranous cuticle which gives the fringe the appearance of arising from a sclerite.

SECONDARY MAXILLARY ARTICULATION (SMxA) [Harbach and Knight 1977b,145] — In many nematocerous and brachycerous larvae, a secondary point of articulation formed between the maxilla and mandible basally. In mosquito and dixid larvae, a junction line along which a point just mesal to the postartis of the mandible, sometimes the postartis as well, and a lateral part or remnant of the stipes (merostipes), which may be completely incorporated into the maxillary palpus, come into contact during maxillary and mandibular movements.

SECONDARY VENTRAL FRINGE (SVF) (Fig.45) [Harbach and Knight 1977d,396] — In many mosquito larvae, one of usually two to four rows of filaments borne by the walls of the pharynx ventral to the medioventral pharyngeal sclerite; it is uncertain whether or not two fringes arise directly from (in anophelines) or closely oppose (in culicines) the sides of the ventral pharyngeal sclerite; the bases of the filaments are connected by a strip of membranous cuticle which gives the fringe the appearance of arising from a sclerite.

SELLA (Se) (Figs.46,47) [Gardner *et al.* 1973,164] — A saddle-shaped depression (? alveolus) in the laterodistal margin of the mandible; bearing setae 2-Mn. (Syn.: sclerotized socket, Shalaby 1956,152)

seller hairs 2 [Gardner *et al.* 1973,164] — Applied to a group of fine hairlike structures situated mesal to setae 2e-Mn in *Uranotaenia sapphirina* (Osten Sacken). Observations have shown that structures located mesal to setae 2e-Mn are actually situated outside of the sella. Gardner (pers. corres.) now believes that these structures are mandibular comb spicules. (Syn.: MdS₂, Tanaka *et al.* 1979,9)

SETA, larval — Beginning with Martini (1923), a number of individuals have participated in the development of a sound nomenclatural system for the larval setae. Their various systems are detailed in a comparative manner in Tables 2-15 (setae of the mouth region are not included). This work crested with the detailed studies of Belkin (1950,1952,1953,1954a,1954b,1960,1962) and the system perfected by him has been in general use ever since.

In the Tables, each setal name in the various previously prepared nomenclatural systems is correlated with the name used for it by Belkin (1962) for an equivalent taxon. For example, Martini's (1923) terminology, developed primarily with anophelines, was tabulated by comparing the anopheline figures illustrating his system with an anopheline drawing in Belkin (1962).

At the present time, 116 and 222 pairs of setae are recognized respectively on the pupa and fourth stage larva of at least some species. The discovery (Belkin 1960;1962) that the developing pupal setae are each connected by a sensory neuron to their homolog in the fourth stage larva has made it possible to work out the ontogenetic homologies of the pupal setae. Presently the fate in the pupa of many larval setae is unknown. It would seem possible that their vestiges, while not producing setae, are at least present in the pupa as cells comparable to those normally occurring at the base of a setae and that techniques might subsequently be developed which would permit their recognition.

In order to aid visualization of setal position variation within groups of related species, Figures 69a,69b,70a, 70b and 71a have been prepared as composites of the thorax and abdominal segments I through VI of the species of Culicini, Anophelinae, *Uranotaeniini*, Sabethini and Aedini, respectively. The figures of the abdominal segments attempt to illustrate the total area on which a seta may occur. It was not found practical to do this with the thorax due to the extreme variation in shape and contour which occurs there. Consequently, the figures of the thorax simply illustrate the relationship in position of one seta to another.

The setal definitions all begin with the word **SETA** and are arranged numerically for each body area. The body area treatments begin with the antenna and proceed posteriorly to abdominal segment X.

Because of the considerable variation which occurs throughout the Culicidae in vertical and horizontal orientation of the living larva and of its terminal parts, it was found impractical to describe the positional relationships of the setae in terms of their true morphological orientation. Instead, all descriptions of positional relationships are based upon a simple horizontal orientation of all sections of the body.

The larval setae are distributed by pairs as follows:

Antenna	6	Abdominal Segment I	12
Cranium	19	Abdominal Segment II	15
Labropalatum	3	Abdominal Segment III	15
Mouth	1	Abdominal Segment IV	15
Mandible	4	Abdominal Segment V	15
Maxilla	15	Abdominal Segment VI	15
Labiohypopharynx ...	6	Abdominal Segment VII	15
Prothorax	15	Abdominal Segment VIII	7
Mesothorax	14	Siphon and Spiracular Apparatus .	13
Metathorax	13	Abdominal Segment X	4
		Total	222

SETA, antennal — In fourth stage larvae, particular setae in the set of six which occur on the antenna, individually numbered by their approximate position from base to apex and bearing the hyphenated suffix "A."

SETA 1-A (Figs.66-68,72) — The dorsal seta borne proximal to the other antennal setae, except in *Toxorhynchites* in which it arises slightly distal to setae 2- and 3-A. (Syn.: See Table 2)

SETA 2-A (Figs.67,68,72) — The subapical seta on the mesoventral surface between the base of seta 1-A and the antennal apex, except in *Toxorhynchites* as previously noted (see **SETA 1-A**); sometimes as in *Mansoniini* arising well before the apex, or arising apically as in *Anophelinae*; in the *Anophelinae* and some *Uranotaeniini*, flattened and bladelike; arises dorsoventral in some taxa due to an apparent antennal rotation. (Syn.: See Table 2)

SETA 3-A (Figs.67,68,72) — The subapical seta borne on the lateroventral surface of the antenna; paired with seta 2-A; in some taxa it may occur with seta 2-A on the mesal surface where it is then ventral to 2-A; flattened and bladelike in *Anophelinae* and some *Uranotaeniini*. (Syn.: See Table 2)

SETA 4-A (Figs.66-68,72) — The seta borne on the upper median margin of the antennal apex; seemingly lateral in *Anophelinae* but actually occurring in the same relative position, the distal part of the antenna having rotated on its axis sufficiently to bring the ventral surface mesad and even somewhat dorsad. (Syn.: See Table 2)

SETA 5-A (Figs.67,68,72) — A peglike seta borne at the center of the antennal apex, slightly preapical in some culicines; distinctive in being opaque basally and hyaline distally, the two parts being sharply demarcated. (Syn.: See Table 2)

SETA 6-A (Figs.68,72) — The seta borne on the dorsolateral margin of the antennal apex; not as sharply tapered as setae 2-, 3- and 4-A; usually with a transverse transparent part near its base. (Syn.: See Table 2)

SETA, cranial — A maximum of 19 pairs of setae are known to occur on the fourth stage larval cranium. These are designated by numerals beginning anterodorsally and proceeding posteriorly and ventrally, each numeral bearing the hyphenated suffix "C."

SETA O-C and SETA 1-C — The two pairs of setae routinely occurring on the median labral plate; in *Toxorhynchites*, setae 3- and 4-C also appear to be located on the median labral plate.

SETA O-C (Figs.66-68) — The lateral seta on the median labral plate and the most anterolateral seta of the cranium; minute, usually ventral in position; apparently absent in some taxa. (Syn.: See Table 3)

SETA 1-C (Figs.66-68) — The mesal seta on the median labral plate and the most anteromesal seta of the cranium; usually single, often spiniform. (Syn.: See Table 3; also, labral spine)

SETA 2-C to SETA 8-C — The series of setae (maximally consisting of seven pairs) occurring on the dorsal apotome; in *Toxorhynchites* setae 3- and 4-C are situated on the median labral plate.

SETA 2-C (Fig.66) — The most anteromesal seta of the dorsal apotome, just posterior to the median

labral plate; interpreted as being absent when only one of the seven pairs of setae of this series is missing; usually well developed in anophelines; absent in most culicines and toxorhynchitines. (Syn.: See Table 3)

SETA 3-C (Figs.66,68) — The most anterolateral seta of the dorsal apotome, just posterior to the median labral plate; well developed in anophelines; in culicines, sometimes arising from underside the head; in Sabethini and *Toxorhynchites*, associated with seta 0-C on the median labral plate; interpreted as being absent along with seta 2-C when two of the seven pairs of this series are missing. (Syn.: See Table 3, also, clypeal hair)

SETA 4-C (Figs.66-68,72) — Generally the most anterior and/or anteromesal seta in the series of setae 4- to 8-C on the dorsal apotome; in *Toxorhynchites*, occurring on the median labral plate where it is interpreted as being the most mesal seta; occasionally lateral to seta 5-C, e.g., in *Aedes (Huaedes)*. (Syn.: See Table 3)

SETA 5-C (Figs.66-68,72) — The most posteromesal of setae 4- to 8-C. (Syn.: See Table 3 also, inner postantennal hair)

SETA 6-C (Figs.66-68,72) — The seta located anterior and/or lateral to seta 5-C. (Syn.: See Table 3; also, mid postantennal hair)

SETA 7-C (Figs.66-68,72) — The most anterolateral of setae 4- to 8-C. (Syn.: See Table 3; also, outer postantennal hair)

SETA 8-C (Figs.66-68,72) — Usually the most posterior (always the most posterolateral) of setae 4- to 8-C; in *Toxorhynchites*, indistinguishably aligned with setae 5-, 6- and 7-C, interpreted by Belkin (1962) as being between setae 6- and 7-C. (Syn.: See Table 3; also, vertical hair)

SETA 9-C to SETA 14-C — The series of six setae occurring on the lateralia.

SETA 9-C (Figs.66-68,72) — The seta situated immediately lateral to the frontal ecdysial line, usually more or less opposite seta 8-C; its alveolus is visible from the dorsal aspect. (Syn.: See Table 3)

SETA 10-C (Figs.66-68,72) — The seta situated lateroventral to seta 9-C and near the stemma; its alveolus is usually visible from the dorsal aspect. (Syn.: See Table 3; also, dorsal eye hair)

SETA 11-C (Figs.66-68,72) — The seta located dorsolaterally near the base of the antenna; may sometimes arise sufficiently dorsad that its alveolus is visible from above. (Syn.: See Table 3)

SETA 12-C (Figs.66-68,72) — The seta (with seta 13-C) borne posterior and ventral to seta 11-C and ventral to the compound eye; usually situated posterior to seta 13-C, when linearly arranged with 13-C it is interpreted as being the more mesal seta. (Syn.: See Table 3; also, ventral eye hair)

SETA 13-C (Figs.66-68,72) — The seta (with seta 12-C) borne posterior to seta 11-C and ventral to the compound eye; usually anterior to seta 12-C, when linearly arranged with 12-C it is interpreted as being the more lateral seta. (Syn.: See Table 3)

SETA 14-C (Figs.66-68,72) — The seta situated immediately posterior to the base of the maxilla; the most mesoventral seta of the lateralia. (Syn.: See Table 3)

SETA 15-C (Figs.66-68,72) — The seta situated on the labiogula, usually anteriorly; the only seta arising on this cranial area. (Syn.: See Table 3)

SETA 16-C and SETA 17-C — In certain *Culex* larvae, the two small setae borne on the lateralia much closer to the postocciput than any other cranial setae (Collins 1959).

SETA 16-C — The more distant from the postocciput of setae 16- and 17-C; if only one of these setae is present, it is interpreted as being 16-C (Belkin 1962, Fig.163).

SETA 17-C — The closer to the postocciput of setae 16- and 17-C; if only one of these setae is present, 17-C is regarded as being absent.

SETA 18-C and SETA 19-C — Two small setae borne ventrolaterally on the cervix at the level of the ventromedian cervical sclerite (Hockman and Reinert 1974). These setae are obscured in many mounted whole larvae by the retraction of the head and folding of the cervix, and in exuviae by the rupturing and displacement of the cervix by the emerging pupa.

SETA 18-C — The more lateral seta of setae 18- and 19-C; when only one of these is present, it is interpreted as being 18-C.

SETA 19-C — The more ventral or anterior seta of setae 18- and 19-C; when only one of these is present, 19-C is regarded as being absent.

- SETA, mouth region** — A total of 29 setae (or multiple setae) are known to occur on the areas and appendages about the mouth. These are numbered individually on each area or appendage, each number being followed by a hyphen and the abbreviation for the appropriate area or appendage. Three pairs occur on the labropalatum (Lp), one at the margin of the mouth (Mo), four on the mandible (Mn), 15 on the maxilla (Mx) and six on the labiohypopharynx (Lh).
- SETA 1-Lp** (Fig.39) — A small seta borne laterally on the torma. (Syn.: seta 1-MP, Knight and Laffoon 1971b,164)
- SETA 2-Lp** (Fig.39) — A small seta borne on the posttorma. (Syn.: seta 2-MP, Knight and Laffoon 1971b,164)
- SETA 3-Lp** (Figs.39,44) — Either of two peglike setae situated on the labropalatum between the midpalatal brushes; the anterior one is designated seta 3a-Lp and the posterior one as seta 3b-Lp. (Syn.: epipharyngeal process (see), Shalaby 1957a, excluding his most mesal pair, 152; epipharyngeal sensillum, Burgess and Rempel 1966,734; midpalatal sensillar rod, Laffoon and Knight 1973,50)
- SETA 1-Mo** (Fig.58) — Either of two small peglike setae occurring at the lateral margin of the mouth near the cibarial bar; the more lateral one is designated seta 1a-Mo and the more mesal one as 1b-Mo. (Syn.: sensille, Chaudonneret 1962,486; oral sensorium, Harbach and Knight 1977d,394)
- SETA 1-Mn** (Fig.50) — In many culicine larvae, a long curved spiniform seta arising a short distance lateral to ventral tooth-4 of the mandible and projecting mesally. (Syn.: dorsal spine 1, Gardner *et al.* 1973,165; dorsal mandibular seta, Harbach and Knight 1977a,28)
- SETA 2-Mn** (Figs.48,49) — Any seta borne in the sella of the mandible; there are usually four prominent setae, which proceeding dorsoventrally are designated setae 2a- through 2d-Mn, and a variable number of fine setae, setae 2e-Mn, which arise mesal to the bases of the former. (Syn.: cycle-shaped hair, Nuttall and Shipley 1901a,55; simple articulate spine, Mitchell 1906,13; dorsal spine, Smith 1908,24; stiff bristle, Wesché 1910,12; spine, Howard *et al.* 1912,86; movable spine, Wesenberg-Lund 1921,18; upper bristle, Salem 1931,402; sickle-shaped hair, Puri 1931,24; falciform outgrowth [in Russian], Becker 1938b,752; pectinate spine, LaCasse and Yamaguti 1948,13; corner spine, LaCasse and Yamaguti 1948,18; Sichelborste, Schremmer 1949,190; curved spine, Foote 1952,449; soie falciforme dorsale, Chaudonneret 1962,475; soie falciforme dorsale de la mandibule, Chaudonneret 1962,486; lateral bristle, Clements 1963,34; mandibular bristle, Pucut 1965,55; mandibular spur, Pao and Knight 1970,126; sellar seta, Gardner *et al.* 1973,164)
- SETA 2a-Mn** (Figs.46,47) — The most dorsal seta borne in the sella of the mandible; usually the longest of the 2-Mn setae. (Syn.: MdS₁, Knight 1971b,190; sellar seta 1, Gardner *et al.* 1973,164)
- SETA 2b-Mn** (Figs.46,47) — A large seta borne in the sella of the mandible immediately adjacent to seta 2a-Mn. (Syn.: MdS₃, Knight 1971b, including seta 2c-Mn, 196; sellar seta 2, Gardner *et al.* 1973,164; MdS₃, Tanaka *et al.* 1979,9)
- SETA 2c-Mn** (Figs.46,47) — A large seta borne in the sella of the mandible immediately adjacent to seta 2d-Mn. (Syn.: MdS₃, Knight 1971b, including seta 2b-Mn, 196; sellar seta 3, Gardner *et al.* 1973,164; MdS₄, Tanaka *et al.* 1979,9)
- SETA 2d-Mn** (Figs.46,47) — The most ventral seta borne in the sella of the mandible; often short, transparent and saw-shaped. (Syn.: MdS₄, Knight 1971b,196; sellar seta 4, Gardner *et al.* 1973,164; MdS₅, Tanaka *et al.* 1979,9)
- SETA 2e-Mn** (Figs.47,49) — Any one of a variable number of fine setae arising mesal to the bases of the much larger setae 2a- through 2d-Mn in the sella of the mandible. (Syn.: mandibular spur 2, Knight 1971b,196; sellar hair 1, Gardner *et al.* 1973,164; accessory sellar seta, Harbach and Knight 1977a,25)
- SETA 3-Mn** (Figs.46,49) — In anopheline and some *Aedes* larvae, perhaps other culicines as well, a seta (or each of two setae) borne on the mandible ventrally near the mandibular spiculose area. (Syn.: seta 0-MP, Knight 1971b,190; seta 1-Md, Tanaka *et al.* 1979,9; mandibular seta, Tanaka *et al.* 1979,16)
- SETA 4-Mn** (Fig.49) — Known only in a few culicine larvae, a small peglike seta located at the base of the mandibular lobe. (Syn.: mandibular peg organ, Harbach and Knight 1977a,33)
- SETA 1-Mx** (Figs.51-54) — A usually paired peglike seta borne on the dorsal surface of the maxillary body, or galeastipes when distinguishable; usually located near the dorsal maxillary suture but sometimes borne apically (extremely so in *Uranotaenia* larvae). (Syn.: spine, Mitchell 1906,15;

double spine, Mitchell 1906,16; finger-shaped papilla, Puri 1931,27; stout bristle, Salem 1931,401; membranous appendage, Shalaby 1957a,157; papilliform membranous appendage, Shalaby 1957b,278; maxillary spur, Pao and Knight 1970,130; dorsal maxillary seta, Gardner *et al.* 1973,168; galeal sensorium, Harbach and Knight 1977b,133; stipital sensorium, Tanaka *et al.* 1979,21)

SETA 2-Mx (Figs.51-54) — A seta borne on the mesodorsal surface of the maxillary body, or the laciniastipes when distinguishable; usually located between laciniarastra 2 and 3. (Syn.: maxillary spine, Foote 1952,450; short needle-like spine, Shalaby 1959,209; seta 3-MP, Pao and Knight 1970,128; proximal lacinial seta, Tanaka *et al.* 1979,19; seta 5-Mx, Tanaka *et al.* 1979,19)

SETA 3-Mx (Figs.51,52) — A seta borne dorsally on the maxillary body, or the galeastipes when distinguishable; occurring near the distolateral margin in most culicines. (Syn.: single or double conspicuous hair, Christophers 1960, including seta 4-Mx, 206; seta 4-MP, Pao and Knight 1970,130; galeal seta, Tanaka *et al.* 1979,20; seta 7-Mx, Tanaka *et al.* 1979,20)

SETA 4-Mx (Figs.51-54) [Tanaka *et al.* 1979,21] — A seta borne ventrally on the maxillary body, or the galeastipes when distinguishable; occurring near the distolateral margin in most culicines. (Syn.: subapical spine, Smith 1908,24; thorn-like hair, Wesenberg-Lund 1921,19; maxillary spine, Shalaby 1956,153; single or double conspicuous hair, Christophers 1960, including seta 3-Mx, 206; seta 5-MP, Pao and Knight 1970,130; seta 7-MP, Knight and Laffoon 1971b, in anophelines, Fig.44b; ventral stipital seta, Tanaka *et al.* 1979,21)

SETA 5-Mx (Figs.51-54) — A seta occurring distomesally on the maxillary body, or the galeastipes when distinguishable, at the base of the maxillary brush; almost always located at the apex of the dorsal maxillary suture. (Syn.: long and pigmented spine, Shalaby 1957a,158; pigmented spine, Shalaby 1957b,279; short and pigmented spine, Shalaby 1958,442; short pigmented spine, Shalaby 1958,444; seta 7-MP, Knight and Laffoon 1971b, in culicines, 164; dorsal (mesal) stipital seta, Tanaka *et al.* 1979, in anophelines, 22; seta 2-Mx, Tanaka *et al.* 1979, in anophelines, 22; distal lacinial seta, Tanaka *et al.* 1979, in culicines and toxorhynchitines, 22; seta 6-Mx, Tanaka *et al.* 1979, in culicines and toxorhynchitines, 22)

SETA 6-Mx (Figs.51,52,54,66-68) — A prominent seta borne on the cardo or the anterior margin of the lateralia at the base of the maxilla. (Syn.: long sensory hair, Puri 1931,27; double bristle, Salem 1931,401; paired bristle, Salem 1931,402; basal maxillary hair, Marshall 1938,43; small hair, Foote 1952,452; stout and plumose bristle, Shalaby 1956,153; maxillary apodeme bristle, Shalaby 1956,155; two-branched hair, Shalaby 1957a,157; short, stout and plumose bristle, Shalaby 1958,445; seta 6-MP, Pao and Knight 1970,131; seta 18-C, Harbach and Knight 1977b,145; seta 20-C, Harbach and Knight 1977b,175; cardinal seta, Tanaka *et al.* 1979,18; seta 1-Mx, Tanaka *et al.* 1979,18)

SETA 7-Mx (Fig.51) — In anopheline and *Mimomyia* larvae, a seta borne laterally on the maxillary palpus; prominent and dendritic in anophelines. (Syn.: large stout hair, Puri 1931,27; palp hair, Marshall 1938,43; palpal hair, Foote 1952,461; branched bristle, Shalaby 1956,153; maxillary palpal bristle, Shalaby 1956,155; unique bristle, Shalaby 1958,445; seta 8-MP, Knight and Laffoon 1971b,164; seta 7-MP, Harbach and Knight 1977b,146; lateral stipital seta, Tanaka *et al.* 1979,18; seta 3-Mx, Tanaka *et al.* 1979,18)

SETA 8-Mx to SETA 15-Mx — The series of setae (maximum of seven) located at the apex of the maxillary palpus. The homologies of these are somewhat tentative. They are presently based on similarities between anopheline and *Uranotaenia* larvae. If the maxillary palpus of certain anophelines is rotated so that the dorsal pair of setae (8- and 9-Mx) lie laterally, the positions of the structures more or less correspond to the positions of those in *Uranotaenia* species. An additional twisting of the palpus and a fusion of the centrally located setae, which appears to have taken place in *Uranotaenia*, would account for the observed positions of the structures. The setae of *Uranotaenia* species are easily homologized with those of most other culicines and toxorhynchitines. (Generic syn.: Borste, Raschke 1887,142; spine, Mitchell 1906,15; apical tooth, Smith 1908,24; sensory appendage, Howard *et al.* 1912,86; digit-like prolongation, Wesenberg-Lund 1921,19; bristle, Salem 1931,402; appendage, Marshall 1938, in anophelines, 46; terminal appendage [in Russian], Becker 1938b,744; terminal hair, Belkin 1950,686; sensorium, Shalaby 1956,153; soft apical papilla, Christophers 1960,206; maxillary palpal sensorium, Harbach and Knight 1977b,138; palpal sensorium, Tanaka *et al.* 1979,22)

SETA 8-Mx (Figs.51-53) — The more ventral (in culicines and toxorhynchitines) or the more lateral (in anophelines) of a pair of usually pedicel-borne peglike setae located dorsolaterally at the apex of the maxillary palpus. (Syn.: trind Børste, Meinert 1886,394; spine, Nuttall and Shipley 1901a,45;

- spine-like sensory appendage, Puri 1931,28; finger-shaped appendage, Puri 1931,28; mesal sensorium, Shalaby 1956,153; first sensorium, Pao and Knight 1970,130; sensorium 1, Gardner *et al.* 1973,169; maxillary palpal sensorium 1, Harbach and Knight 1977b,139; palpal sensorium 1, Tanaka *et al.* 1979,22)
- SETA 9-Mx** (Figs.51-53) — The more dorsal (in culicines and toxorhynchitines) or the more mesal (in anophelines) of a pair of usually pedicel-borne peglike setae located dorsolaterally at the apex of the maxillary palpus. (Syn.: trind Børste, Meinert 1886,394; spine, Nuttall and Shipley 1901a,56; spine-like sensory appendage, Puri 1931,28; finger-shaped appendage, Puri 1931,38; mesal sensorium, Shalaby 1956,153; second sensorium, Pao and Knight 1970,130; sensorium 2, Gardner *et al.* 1973,169; maxillary palpal sensorium 2, Harbach and Knight 1977b,139; palpal sensorium 2, Tanaka *et al.* 1979,22)
- SETA 10-Mx** (Fig.51) — In anopheline larvae, the most dorsal of three usually foliform setae located mesally at the apex of the maxillary palpus; in culicine larvae, believed to have fused with seta 11-Mx to form a stalk, sac or chamber containing a pincushion or peglike seta, seta 15-Mx. (Syn.: Blade, Meinert 1886,394; lamella, Nuttall and Shipley 1901a,56; plate, Nuttall and Shipley 1901a,74; leaf-like sensory appendage, Puri 1931,28; leaf-like appendage, Puri 1931,28; leaflet-like appendage, Christophers 1933,40; leaflet, Marshall 1938,50; lateral sensorium, Shalaby 1956,153; maxillary palpal sensorium 3, Harbach and Knight 1977b,139)
- SETA 11-Mx** (Fig.51) — In anopheline larvae, the middle of the three usually foliform setae located at the apex of the maxillary palpus; in culicine larvae, believed to have fused with seta 10-Mx to form a stalk, sac or chamber containing a pincushion or peglike seta, seta 15-Mx. (Syn.: Blade, Meinert 1886,394; leaf-like sensory appendage, Puri 1931,28; leaf-like appendage, Puri 1931,28; leaflet-like appendage, Christophers 1933,40; leaflet, Marshall 1938,50; Plattchen, Schremmer 1949,196; lateral sensorium, Shalaby 1956,153; maxillary palpal sensorium 4, Harbach and Knight 1977b,139)
- SETA 12-Mx** (Figs.51-53) — In anopheline larvae, the most ventral of the three usually foliform setae located at the apex of the maxillary palpus; in culicine and toxorhynchitine larvae, the more or less mesodorsally located, usually peglike seta. (Syn.: Blade, Meinert 1886,394; leaf-like sensory appendage, Puri 1931,28; leaf-like appendage, Puri 1931,28; leaflet-like appendage, Christophers 1933,40; leaflet, Marshall 1938,50; lateral sensorium, Shalaby 1956,153; third sensorium, Pao and Knight 1970,130; sensorium 3, Gardner *et al.* 1973,169; maxillary palpal sensorium 5, Harbach and Knight 1977b,140; palpal sensorium 3, Tanaka *et al.* 1979,22)
- SETA 13-Mx** (Figs.51-53) — In culicine and toxorhynchitine larvae, an often pedicel-borne, peglike seta located mesally at the apex of the maxillary palpus; in anopheline larvae, a peglike seta located lateroventrally at the apex. (Syn.: dolkformet Børste, Meinert 1886,394; spine-like sensory appendage, Puri 1931,28; finger, Christophers 1933,40; finger-shaped appendage, Marshall 1938,46; Dorne, Schremmer 1949,196; fourth sensorium, Pao and Knight 1970,130; sensorium 4, Gardner *et al.* 1973,169; maxillary palpal sensorium 6, Harbach and Knight 1977b,140; palpal sensorium 4, Tanaka *et al.* 1979,22)
- SETA 14-Mx** (Figs.51,52) — In culicine and perhaps toxorhynchitine larvae, a peglike seta located mesoventrally at the apex of the maxillary palpus; in anopheline larvae, a flask- or conelike seta located laterally at the apex. (Syn.: spine, Nuttall and Shipley 1901a,56; spine-like sensory appendage, Puri 1931,28; cone-shaped appendage, Puri 1931,28; cone, Christophers 1933,40; finger-shaped appendage, Marshall 1938,46; minute accessory sensorium, Pao and Knight 1970,130; sensorium 5, Gardner *et al.* 1973,169; maxillary palpal sensorium 7, Harbach and Knight 1977b,140; palpal sensorium 5, Tanaka *et al.* 1979,22)
- SETA 15-Mx** (Fig.52) — In many culicine larvae, a tiny pincushion or peglike seta contained in a stalk, sac or chamber located centrally at the apex of the maxillary palpus; believed to represent the fused setae 10- and 11-Mx of anophelines. (Syn.: ampulla, Gardner *et al.* 1973,170; maxillary palpal sensorium 3 + 4, Harbach and Knight 1977b,139)
- SETA 1-Lh** (Figs.55-57) — The paired, usually peglike seta occurring on the premental part of the labiohypopharynx between the salivary meatus and the lateral premental teeth; in anopheline larvae, quite small and sometimes difficult to distinguish from the denticles of the premental malae. (Syn.: spine, Wesché 1910,12; blunt anterior process, Salem 1931,408; crête postérieur, Senevet 1946,321; hypopharyngeal process, Shalaby 1957a,161; hypopharyngeal spine, Shalaby 1957d,269; papilla-like process, Pucat 1965,60; hypopharyngeal peglike process, Pao and Knight 1970,132; prelabial sensorium 1, Harbach and Knight 1977c,347; premental sensorium, Harbach 1978,305)

- SETA 2-Lh to SETA 6-Lh** — The series of setae occurring on the vestigial labial palpus; four occur in culicines and toxorhynchitines and five in anophelines. (Generic syn.: Spur, Raschke 1887,143; spine, Johannsen 1903,417; taste hair, Wesché 1910,12; hair, Wesché 1910,12; thorn of chitin, Wesenberg-Lund 1921,20; peg-like structure, Salem 1931,404; peg-like process, Salem 1931,408; appendice articule, Senevet 1946,319; movable spine, Shalaby 1956,160; premental papilla, Pao and Knight 1970,132; prelabial sensorium, Harbach and Knight 1977c,347; labial palpal sensorium, Harbach 1978,303)
- SETA 2-Lh** (Figs.55-57) — The dorsalmost peglike seta occurring on each labial palpus; in many culicines, seta 2-Lh is paired with seta 3-Lh and the former is the more mesal of the two. (Syn.: two-ended process, Wesché 1910, including seta 3-Lh, 12; apical papilla, Pao and Knight 1970, including seta 3-Lh, 132; apical premental papilla, Pao and Knight 1970, including seta 3-Lh, 133; dorsal premental papilla, Gardner *et al.* 1973, including seta 3-Lh, 171; prelabial sensorium 2, Harbach and Knight 1977c,348; labial palpal sensorium 1, Harbach 1978,303)
- SETA 3-Lh** (Figs.55-57) — A peglike seta located immediately ventral to seta 2-Lh on each labial palpus; in many culicines, seta 3-Lh is paired with seta 2-Lh and the former is the more lateral of the two. (Syn.: two-ended process, Wesché 1910, including seta 2-Lh, 12; apical papilla, Pao and Knight 1970, including seta 2-Lh, 132; apical premental papilla, Pao and Knight 1970, including seta 2-Lh, 133; dorsal premental papilla, Gardner *et al.* 1973, including seta 2-Lh, 171; prelabial sensorium 3, Harbach and Knight 1977c,348; labial palpal sensorium 2, Harbach 1978,303)
- SETA 4-Lh** (Figs.55-57) — A peglike seta located immediately dorsal to seta 5-Lh on each labial palpus. (Syn.: middle papilla, Pao and Knight 1970,132; middle premental papilla, Pao and Knight 1970,134; prelabial sensorium 4, Harbach and Knight 1977c,348; labial palpal sensorium 3, Harbach 1978,303)
- SETA 5-Lh** (Figs.55-57) — The ventralmost peglike seta located on each labial palpus. (Syn.: basal papilla, Pao and Knight 1970,132; basal premental papilla, Pao and Knight 1970,133; ventral premental papilla, Gardner *et al.* 1973,171; prelabial sensorium 5, Harbach and Knight 1977c,348; labial palpal sensorium 4, Harbach 1978,303)
- SETA 6-Lh** (Figs.55,57) — In anopheline larvae, a usually foliform or bladelike seta arising from each labial palpus beside the ligula. (Syn.: leaflike structure, Farnsworth 1974,144; Fingerförmiges Organ, Schremmer 1949,200; prelabial dental lamella, Harbach and Knight 1977c,346; labial palpal sensorium 5, Harbach 1978,303)
- SETA, thoracic** — In fourth stage larvae, maxima of 15 pairs of setae are known on the prothorax, 14 on the mesothorax and 13 on the metathorax. Each of these setae is individually designated first by a numeral showing its actual or in some cases presumed primitive position in the “basic pattern” of the Culicidae in which seta 1 arises closest to the dorsal longitudinal midline with the positions of successively higher-numbered setae following progressively and circumferentially toward the ventral longitudinal midline, and second by a hyphen and a capital letter P, M or T indicating a position on the pro-, meso- or metathorax respectively. In a series of publications by Belkin (1950 through 1962), presumptive segmental homologies have been established between all of the setae of the thorax and the first seven abdominal segments except for seta 0-P.
- SETA 0-P** (Figs.66-72) — A dorsal prothoracic seta borne posterior to a line between setae 3- and 4-P; homologs for this seta on succeeding segments are not known to occur (Belkin 1950,687). (Syn.: See Table 4)
- SETA 1-P, SETA 1-M and SETA 1-T** (Figs.66-72) — The seta borne nearest the dorsal midline of the pro-, meso- and metathorax; the positions of setae 1-, 2- and 3-P are usually close-set in a series, 1-P is interpreted as having the most posterior and/or mesal position of the three. (Syn.: See Tables 4-6)
- SETA 2-P, SETA 2-M and SETA 2-T** (Figs.66-72) — The dorsal seta located in the second position in the circumferential series of thoracic setae; in some taxa, seta 2 may be posterior to seta 3. (Syn.: See Tables 4-6)
- SETA 3-P, SETA 3-M and SETA 3-T** (Figs.66-72) — The dorsal seta located in the third position in the circumferential series of thoracic setae; nearly always closely associated with setae 1 and 2 on the prothorax; may be anterior to and even widely separated from these setae on the meso- and metathorax of some taxa; in cases where setae 3 and 4 of the latter two segments become more or less longitudinally aligned, the anterior seta is interpreted as being seta 3. (Syn.: See Tables 4-6)
- SETA 4-P, SETA 4-M and SETA 4-T** (Figs.66-72) — The dorsal seta usually arising fourth from the dorsal midline; on the mesothorax of some anophelines it is posterior or posterolateral to seta 5-M

and thus fifth from the dorsal midline; in cases where setae 3 and 4 of the meso- and metathorax become more or less longitudinally aligned, the posterior seta is interpreted as being seta 4; in *Toxorhynchites*, seta 3-T is closely associated with 4-T in a position immediately anterior to setae 1- and 2-T. (Syn.: See Tables 4-6)

SETA 5-P, SETA 5-M and SETA 5-T (Figs.66-72) — The dorsolateral seta arising fifth from the dorsal midline; if occurring more or less longitudinally aligned with either seta 5 or seta 6, it is interpreted as being more anterior. (Syn.: See Tables 4-6)

SETA 6-P, SETA 6-M and SETA 6-T (Figs.66-72) — The dorsolateral seta arising sixth from the dorsal midline in the circumferential series of thoracic setae; if more or less longitudinally aligned with either seta 5 or seta 7, it is interpreted as being the most posterior. (Syn.: See Tables 4-6)

SETA 7-P, SETA 7-M and SETA 7-T (Figs.66-72) — The dorsolateral seta arising seventh from the dorsal midline in the circumferential series of thoracic setae, except that if seta 6 and 7 are nearly equidistant from the dorsal midline, the more anterior seta is interpreted as seta 7 even if slightly more mesal. (Syn.: See Tables 4-6)

SETA 8-P, SETA 8-M and SETA 8-T (Figs.66-72) — The lateroventral seta arising eighth from the dorsal midline in the circumferential series of thoracic setae. (Syn.: See Tables 4-6)

SETA 9-P to SETA 12-P, SETA 9-M to SETA 12-M and SETA 9-T to SETA 12-T — The four (three in early instars of some species) setae borne on a common, usually partially sclerotized, lateroventral tubercle of each thoracic segment just external to the outer end of the epidermal invagination of the imaginal leg rudiment.

SETA 9-P, SETA 9-M and SETA 9-T (Figs.66-72) — The dorsal (when viewed laterally) or external (when viewed ventrally) anterior seta in the group of setae 9 to 12; elongate and usually branched. (Syn.: See Tables 4-6)

SETA 10-P, SETA 10-M and SETA 10-T (Figs.66-72) — The ventral (when viewed laterally) or mesal (when viewed ventrally) seta in the group of setae 9 to 12; usually the longest seta in the group. (Syn.: See Tables 4-6)

SETA 11-P, SETA 11-M and SETA 11-T (Figs.66-72) — The dorsal (when viewed laterally) or external (when viewed ventrally) posterior seta in the group of setae 9 to 12; usually reduced in size. (Syn.: See Tables 4-6)

SETA 12-P, SETA 12-M and SETA 12-T (Figs.66-72) — The ventral (when viewed laterally) or mesal (when viewed ventrally) posterior seta in the group of setae 9 to 12. (Syn.: See Tables 4-6)

SETA 13-P (Figs.66,69,70) — The lateroventral or ventral prothoracic seta borne anterior (in anophelines) or mesal (in many sabethines) to the tubercle bearing setae 9- to 12-P; absent in most culicines. (Syn.: See Table 4)

SETA 13-M (Figs.66,67,69-72) — The lateroventral or ventral mesothoracic seta associated with the tubercle-borne setae 9- to 12-M. (Syn.: See Table 5)

SETA 13-T (Figs.66-72) — The metathoracic seta located closest to the ventral midline. (Syn.: See Table 6)

SETA 14-P and SETA 14-M (Figs.66-72) — The seta located closest to the ventral midline on the pro- and mesothorax; on the prothorax, sometimes aligned longitudinally with seta 13-P; absent from the metathorax. (Syn.: See Tables 4 and 5)

SETA, abdominal — In fourth stage larvae, a maximum of 12 pairs of setae are found on abdominal segment I, 15 pairs on abdominal segments II through VII, seven pairs on abdominal segment VIII, 13 pairs on the siphon (pecten plate in anophelines) and spiracular apparatus (derived from embryonic abdominal segments VIII and IX), and four pairs on abdominal segment X. The terminology for these setae consists of an Arabic number for each indicating its presumed primitive sequential relationship in the Culicidae in which seta 1 is closest to the dorsal longitudinal midline with the higher-numbered setae following progressively around the side to the ventral longitudinal midline, connected by a hyphen with a capitalized Roman numeral indicating the abdominal segment on which the seta occurs.

SETA, abdominal segments I to VII — In fourth stage larvae, a maximum of 12 pairs of setae are found on abdominal segment I, with setae 0, 8 and 14 presumed to be those which are absent. A maximum of 15 pairs of setae are found on each of abdominal segments II through VII. The sequential Arabic numerals applied to the setae of abdominal segments I through VII are believed

to indicate serial homologies down the row of segments, ontogenetic homologies between the larval stages as well as with the pupa and phylogenetic homologies throughout the Culicidae. Typically on these abdominal segments, setae 0 to 5 are dorsal, 6 to 9 lateral and 10 to 14 ventral. Serial homologies for setae 0 to 5 are most clearly apparent on abdominal segment I and for setae 6 to 14 on abdominal segment II. On these segments the setae designated are typically present in a consecutive numerical sequence or in departures from this which can be more or less readily determined. In determining serial homologies, similarities in setal branching and development should be noted, as well as relative position. Difficult setae can sometimes be named through a process of elimination.

SETA 0-II to SETA 0-VII (Figs.66-72) — The most anterior of the dorsal setae on abdominal segments II to VII; inconspicuous except in some sabethines where it may be prominent and stellate; an apparent homolog of this seta occurs on abdominal segment VIII; absent from abdominal segment I. (Syn.: See Tables 8-12)

SETA 1-I to SETA 1-VII (Figs.66-72) — The dorsal seta nearest both the posterior margin and the longitudinal midline of abdominal segments I to VII; seta 3-VI and sometimes seta 2-VI may be nearer in some taxa (in such cases these setae can be identified through a process of elimination); usually well developed, may be stellate or palmate in some taxa. (Syn.: See Tables 7-12)

SETA 2-I to SETA 2-VII (Figs.66-72) — The dorsal seta nearest (except for the minute seta 0) to both the anterior margin and the longitudinal midline of abdominal segments I to VII; occasionally so atypically placed as to be identifiable only through a process of elimination, e.g., in *Aedes (Alanstonea)*. (Syn.: See Tables 7-12)

SETA 3-I to SETA 3-VII (Figs.66-72) — The dorsal seta sequentially in line lateral to seta 2 on abdominal segment I, variable in position on succeeding segments but determinable based on branching, development and relative position, usually mesal to seta 4 on abdominal segments I, VI and VII, even with or lateral to seta 4 on abdominal segments II to V where it is associated with seta 5; on abdominal segment VI it arises in the vicinity of seta 1 in some taxa. (Syn.: See Tables 7-12)

SETA 4-I to SETA 4-VII (Figs.66-72) — The dorsal seta sequentially in line lateral to seta 3 on abdominal segment I, variable in position on succeeding segments, usually lateral to seta 3 on abdominal segments I, VI and VII, even with or mesal to seta 3 on abdominal segments II to V, usually located anterior and mesal to seta 5 (more often lateral on VII); stellate in some taxa. (Syn.: See Tables 7-12)

SETA 5-I to SETA 5-VII (Figs.66-72) — The dorsal seta sequentially in line lateral to seta 4 on abdominal segment I, its position relative to seta 4 is variable on succeeding segments but it is identifiable because of its very characteristic dorsal position on the posterolateral angle of the segment, usually proximal and dorsal to seta 6. (Syn.: See Tables 7-12)

SETA 6-I to SETA 6-VII (Figs.66-72) — The lateral seta borne regularly on the prominent lateral bulge about midway between the dorsal and ventral longitudinal midlines on abdominal segments I to VII; well developed on abdominal segments I and II, commonly somewhat less well-developed on III to VI, still smaller on VII. (Syn.: See Tables 7-12)

SETA 7-I to SETA 7-VII (Figs.66-72) — The lateral seta either directly ventral or slightly posteroventral to seta 6 on abdominal segments I to VII; when reduced, as is often the case on abdominal segments III to VII, it can be identified by its position relative to seta 6; stellate in some taxa. (Syn.: See Tables 7-12)

SETA 8-II to SETA 8-VII (Figs.66-72) — The lateral seta nearest the anterior margin of abdominal segments II to VII; absent from abdominal segment I. (Syn.: See Tables 8-12)

SETA 9-I to SETA 9-VII (Figs.66-72) — The lateral seta associated anteriorly, posteriorly or ventrally with seta 7 on abdominal segments I to VII; stellate in some taxa. (Syn.: See Tables 7-12)

SETA 10-I to SETA 10-VII (Figs.66-72) — The seta with setae 11, 12 and 13 on abdominal segments I to VII comprising a transverse median or somewhat posterior group of ventral setae so diversely positioned and developed down the line of segments as frequently to obscure the recognition of serial homologies. Theoretically, setae 10 and 11 can be identified by tracing their sensory neurons to their homologs in the developing pupa. This is possible because setae 12 and 13 are absent (rarely one may be anomalously present) in the pupa. In the larva, not only are setae 12 and 13 routinely present (12 is absent on abdominal segment I in some taxa), but they arise in such a variety of relationships to each other and to setae 10 and 11 as to make positive identifications very difficult. If the pupa of the species being examined is available, setae 11 and 12 can in most cases be recognized through cross comparisons. In many taxa, abdominal segment II is helpful because setae 10

through 13 are identifiably arranged sequentially from laterad to mesad. From this segment one can proceed anteriorly and posteriorly, identifying setae by noting similarities in development and relative position. Seta 13 is the nearest of the group to the ventral longitudinal midline on abdominal segment II, and in many taxa it is also the most developed (sometimes even stellate) of the four grouped ventral setae on the more posterior segments. (Syn.: See Tables 7-12)

SETA 11-I to SETA 11-VII (Figs.66-72) — See the discussion under **SETA 10-I to SETA 10-VII**. Seta 11 is stellate in some sabethines, usually shorter than seta 10 and, on abdominal segment II, is always situated anterior and typically ventral to seta 10; its relationship with seta 10 regarding appearance and relative position closely approximates that found on the pupa. (Syn.: See Tables 7-12)

SETA 12-I to SETA 12-VII (Figs.66-72) — See the discussion under **SETA 10-I to SETA 10-VII**. Seta 12 is interpreted as being absent when only three in the group of setae 10 to 13 are present on abdominal segment I. (Syn.: See Tables 7-12)

SETA 13-I to SETA 13-VII (Figs.66-72) — See the discussion under **SETA 10-I to SETA 10-VII**. Seta 13 is the nearest of the group to the ventral longitudinal midline of abdominal segment II; in many taxa, it is the most developed (sometimes even stellate) of the four grouped ventral setae on at least the more posterior segments. (Syn.: See Tables 7-12)

SETA 14-I to SETA 14-VII (Figs.66-72) — The ventral seta of abdominal segments I to VII located close to the longitudinal midline far forward on the intersegmental membrane; minute except in some sabethines; typically absent from abdominal segments I and II; an apparent homolog is present on abdominal segment VIII. (Syn.: See Tables 8-12)

SETA, abdominal segment VIII — Of the seven pairs of setae which occur on this segment, the minute setae 0 and 14 are treated as homologs of those similarly designated on abdominal segments I to VII. The numerical designations applied from dorsal to ventral to the other five pairs of setae are arbitrary and do not imply homologies with setae of the segments anterior and posterior to VIII.

SETA 0-VIII (Figs.66-68) — The minute seta borne anteriorly on the dorsal surface of abdominal segment VIII in the same relative position as the corresponding seta on the preceding segments. (Syn.: See Table 13)

SETA 1-VIII (Figs.66-68,72) — Usually the most dorsal seta borne on abdominal segment VIII; often almost directly anterior to seta 2-VIII; typically branched. (Syn.: See Table 13)

SETA 2-VIII (Figs.66-68,72) — The second seta in the set of setae 1- to 5-VIII; located anteroventral to seta 1-VIII in anophelines; located ventral, posteroventral or posterior to seta 1-VIII in culicines and toxorhynchitines, often unbranched in these taxa. (Syn.: See Table 13)

SETA 3-VIII (Figs.66-68,72) — The middle seta in the set of setae 1- to 5-VIII; usually conspicuously branched and typically the most posterior in the set. (Syn.: See Table 13)

SETA 4-VIII (Figs.66-68,72) — The seta located ventral to seta 3-VIII in the set of setae 1- to 5-VIII; usually branched. (Syn.: See Table 13)

SETA 5-VIII (Figs.66-68,72) — The most ventral of the conspicuous setae of abdominal segment VIII; usually branched. (Syn.: See Table 13)

SETA 14-VIII (Figs.66-68) — The minute ventral seta of abdominal segment VIII located anteriorly on the intersegmental membrane in the same relative position as the corresponding seta on the preceding segments. (Syn.: See Table 13)

SETA, siphon and spiracular apparatus—The siphon (pecten plate in anophelines) and spiracular apparatus possess 13 pairs of setae of uniform occurrence. Additional setae occur in sabethines but since they do not occur in other taxa they are regarded as being adventitious and are therefore not included in the standard setal nomenclature. The setae on these structures are numbered from proximal to distal. No homologies are implied with setae borne elsewhere on the abdomen. The terminology consists of an Arabic number for each seta connected by a hyphen with the capital letter "S." The structures referred to above are comprised of parts of embryonic abdominal segments VIII and IX.

SETA 1-S (Figs.66-68,72) — In anopheline larvae, the seta closely associated with and usually located posterior to the pecten below the posterolateral spiracular lobe; in other mosquito larvae, borne laterally or ventrally on the siphon; in species where more than one seta is borne in a similar position on the siphon, they are designated as seta 1a-S, seta 1b-S, etc. proceeding distad from the most proximal seta. (Syn.: See Table 14)

- SETA 2-S** (Figs.66-68,72) — In anopheline larvae, the seta borne on the pecten plate; in other mosquito larvae, borne on the dorsal preapical area of the siphon or on the membrane just beyond its apex (in *Mansoniini* and some *Sabethini*). (Syn.: See Table 14)
- SETA 3-S, SETA 4-S and SETA 5-S** (Figs.66,72) — Respectively, the minute anterior, middle and posterior close-set setae borne laterally on the unpaired anterior spiracular lobe; seta 3-S is usually represented by a puncture. (Syn.: See Table 14)
- SETA 6-S and SETA 7-S** (Figs.66-68,72) — Respectively, the proximal and distal setae of the paired anterolateral spiracular lobe. (Syn.: See Table 14)
- SETA 8-S** (Figs.66-68,72) — The proximal seta borne on the outer surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe. (Syn.: See Table 14)
- SETA 9-S** (Figs.66-68,72) — The distal seta borne preapically on the surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe; in *Mansoniini* larvae, a small, previously undescribed seta located near the outer spiracular teeth (Fig.83h). (Syn.: See Table 14)
- SETA 10-S** (Fig.72) — The seta borne basally on the posterior margin of the inner surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe. (Syn.: See Table 14)
- SETA 11-S** (Figs.66,72) — The more proximal of the two setae borne apically on the inner surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe. (Syn.: See Table 14)
- SETA 12-S** (Figs.66,72) — The more distal of the two setae borne apically on the inner surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe; with an expanded base and a proximal kink in *Uranotaenia* species of the subgenus *Uranotaenia* (Harbach 1979).
- SETA 13-S** (Figs.66,72) — The seta borne medially on the anterior margin of the inner surface (when the postabdominal spiracles are closed) of the paired posterolateral spiracular lobe; minute and perhaps vestigial in species of *Uranotaenia* (Harbach 1979) (compare **SETA 12-S**). (Syn.: See Table 14)
- SETA, abdominal segment X** — Four pairs of setae are of uniform occurrence on this segment. No homologies with other abdominal setae are implied by the numbers assigned to these setae.
- SETA 1-X** (Figs.66-68,72) — The lateral seta of abdominal segment X borne on the saddle, usually near the posterior margin. (Syn.: See Table 15)
- SETA 2-X** (Figs.66-68,72) — The seta located closest to the dorsal longitudinal midline of abdominal segment X and slightly posterior to the saddle; along with seta 3-X, referred to as the dorsal brush. (Syn.: See Table 15)
- SETA 3-X** (Figs.66-68,72) — The seta borne on abdominal segment X immediately lateral to seta 2-X; along with seta 2-X, referred to as the dorsal brush. (Syn.: See Table 15)
- SETA 4-X** (Figs.66-68,72) — Any seta of the ventral brush, the variable number of paired or unpaired setae arising from the ventral longitudinal midline of abdominal segment X; the most anterior seta is designated as seta 4a-X, the next posterior one as 4b-X, etc. (Syn.: See Table 15 and **VENTRAL BRUSH**)
- SETA x-X, SETA y-X and SETA z-X** — The paired accessory setae located on the side of abdominal segment X on the membranous part or on the saddle, seta x-X being the most proximal; one or more pairs are present in some *Mansoniini* and *Uranotaenia*. (Syn.: accessory lateral hair, Belkin 1962,561; accessory saddle hair, Belkin 1962,561)
- SETA 1-S PLACEMENT INDEX** [hair 1-S placement index, Schick 1970,15] — The distance from the dorsal base of the siphon to the alveolus of seta 1-S, measured along the same line of projection as the dorsal siphon length, divided by the dorsal siphon length.
- SETAL SUPPORT PLATE (SSP)** (Figs.59-61,71) [Harbach and Knight 1978a,76] — In mosquito larvae and other soft-bodied insects, one of the small sclerites from which arise one or more setae; these may or may not cover an elevation or tubercle. Note that a seta or setae may arise directly from a tubercle (or the body wall) without being supported by a thickened plate. In these cases the setae are said to arise from a tubercle rather than a setal support plate. (Syn.: basal plaque, Christophers 1960,214; root, Reid 1968,32. Other common syn. include: plate, tubercle, basal tubercle, chitinous base and papilla.)

SETAL SUPPORT PLATE SPINE (SSPS) (Figs.59,60) [Harbach and Knight 1978a,76] — A spinelike process of a setal support plate. In mosquito larvae, occurring mainly on the thorax; well developed on the thorax of *Aedes (Stegomyia)* larvae. (Syn.: ventral hook, Macfie 1917,300; ventral thoracic hook, Macfie 1917,300; chitinous hook, Patton and Evans 1929,246; lateral tooth-like process, Patton 1931,145. Common syn.: spine)

shoulder hairs [Christophers 1933,38] — Collectively, setae 1-, 2- and 3-P.

side-piece [Howard *et al.* 1912,85] — Used by Howard *et al.* for a vague area probably including the lateral palatal plate and perhaps also the lateral palatal penicular area. Cited without a hyphen (side piece) by Cook (1944b,42) and Shalaby (1956,146) as a synonym of lateral palatal plate (Shalaby's lateral labral plate).

SIPHON (S) (Figs.63-65,67,68,72) [Sipho, Raschke 1887,136] — In culicine, toxorhynchitine and certain chaoborid larvae, the dorsally-located, elongate sclerotized tube (incompletely developed in early instars) of abdominal segment VIII; bearing the spiracular apparatus at its apex; structurally comprising parts of embryonic abdominal segments VIII and IX; at least partly homologous with the pecten plate and U-shaped band of anopheline larvae. (Syn.: respiratory tube, Packard 1870,368; Atemröhre, Haller 1878,95; Aanderør, Meinert 1886,377; tube, Hurst 1890a,50; respiratory siphon, Hurst 1890b,170; respiratory syphon, Giles 1900,35; breathing horn, Giles 1900,40; air tube, Dyar 1901a,178; breathing tube, Theobald 1901b,29; anal siphon, Smith 1902b,299; anal tube, Smith 1902b,301; syphon tube, Stephens and Christophers 1903,80; Atemtubus, Stadtmann-Averfeld 1923,116; Siphonalrohr, Montschadsky 1927,485; breathing siphon, Iyengar 1928,294; siphon-tube, Barraud 1934,5; postabdominal respiratory siphon, Keilin 1944,34; postabdominal spiracular siphon, Keilin 1944,37; air siphon, Abdel-Malek 1949,22)

By their definitions, some of the synonyms listed here include the apically-borne spiracular apparatus. According to Jardine (1913,204) "siphon" is derived from the Greek word *siphon* meaning simply "a tube." Although the siphon is not always parallel-sided as is a true cylinder, by definition it includes only the open-ended, sclerotized tubular part encompassing an extension of abdominal segment VIII which bears the postabdominal spiracles and their closing apparatus (spiracular apparatus) at its apex.

SIPHON ACUS (SA) (Fig.60) [Harbach and Knight 1978a,77] — In some mosquito larvae, a small sclerite often attached posterolaterally to the base of the siphon; in *Mansonia* larvae, sometimes forming a complete ring. (Syn.: acus, Barraud 1923b,496; baso-siphonal projection, Woodhill and Pasfield 1941,202; appendice chitineux basal, Sautet and Audibert 1946,51; acus of siphon, van den Assem and Bonne-Wepster 1964,24; auricle, Gutsevich *et al.* 1974,32)

SIPHON INDEX [Belkin 1962,561] — The ratio of the siphon length to the siphon width. (Syn.: syphonic index number, Stephens and Christophers 1903,81; syphonic index, Christophers 1906,4; syphonic index, Paton and Cragg 1913,201; siphonal index, Marshall 1938,48; siphon-index, Colless 1965,263)

SIPHON LENGTH [Belkin 1962,561] — The dorsal (anterior) length of the siphon measured in a straight line from base to apex.

SIPHON WIDTH [Belkin 1962,561] — The width at the midlength of the siphon measured at a right angle to the longitudinal axis.

SPIRACLE (S) — In its simplest form, the aperture or opening into a trachea (primary tracheal orifice); in most insects, sunken below the surface of the integument (secondary orifice) thus comprising a chamber, the spiracular atrium (Snodgrass 1935,439) or spiracular chamber (Keilin 1944,5), and the external opening into this chamber, the spiracular opening. In mosquito larvae, the spiracles of the meso- and metathorax and abdominal segments I-VII are rudimentary spiracles which are non-functional; postabdominal spiracles of abdominal segment VIII are functional.

SPIRACULAR APODEME (Sad) (Figs.60-64) [Christophers 1960,218] — In culicine and toxorhynchitine larvae, the usually hollow funnel-shaped ingrowth of the dorsal surface of the spiracular apparatus located between but largely posterior to the postabdominal spiracles; receiving the muscles responsible for folding up the spiracular apparatus and hence closing the spiracles; partly homologous with the median plate of anopheline larvae. (Syn.: Chitinblad, Meinert 1886,391; tendon corné, Meinert 1886,490; Chitinzapfen, Raschke 1887,151; Hohlzapfen, Raschke 1887,163; hollow tooth, Packard 1898,465; hollow peg, Imms 1908,107; median peg, Imms 1908,107; chitinous peg, Imms 1908,131; spur, Howard *et al.* 1912,93; stirrup-shaped piece, Howard *et al.* 1912,93; axial rod, Ingram and Macfie 1917b,138; chitin rod, Wesenberg-Lund 1918,303; chitin staff, Wesenberg-Lund 1918,307; hollow horn, Christophers 1922,539; Sipho-hebel, Montschadsky

1925,92; Hebel, Montschadsky 1927,485; chitinous rod, Patton 1931,143; entonnoir chitineux, Sautet and Audibert 1946,44; apodeme, Snodgrass 1959,29; stirrup, Gutsevich *et al.* 1974, including the posterior median plate, 35; bâtonnet de chitine, Guille 1975,259)

SPIRACULAR APPARATUS (Sap) (Figs.59-65) [Christophers 1922,537] — In mosquito and certain other dipterous larvae, a five-lobed valvular structure (including the spiracular apodeme or equivalent) encompassing the postabdominal spiracles; structurally comprising parts of embryonic abdominal segments VIII and IX; borne at the apex of a siphon in culicine, toxorhynchitine and certain other nematocerous larvae; highly modified in *Mansonia* and *Coquillettidia* larvae for piercing plant tissues. (Syn.: valvular apparatus, Hurst 1890b,170; stigmatic apparatus, Nuttall and Shipley 1901a,62; respiratory apparatus, Nuttall and Shipley 1901a,64; respiratory organ, Nuttall and Shipley 1901a,65; stigmatic syphon, Stephens and Christophers 1903,237; stigmatic plate, Imms 1907,316; spiracular lobe, Imms 1908,107; breathing apparatus, Wesché 1910,15; Stigmalplatte, Montschadsky 1927,480; respiratory plate, Patton 1931,147; sclerotized plate, King and Bradley 1941,63; appareil terminal respiratoire, Sautet and Audibert 1946,44; perispiracular apparatus, Belkin 1950,694; peritremal structure, Snodgrass 1959,28; terminal apparatus, Snodgrass 1959,29; spiracular peritreme, Clements 1963,53; spiracular valve, Clements 1963,53; stigmal plate, Gutsevich *et al.* 1974,29)

SPIRACULAR FILAMENT (SF) (Fig.63) [Harbach and Knight 1978a,79] — In some *Uranotaenia* larvae, a short or elongate filamentous process with an enlarged base borne externally on the posterolateral margin of each postabdominal spiracle. (Syn.: Härchen von dem chätoiden Typus, Montschadsky 1930,581; tracheal filament, Peyton 1977,4)

spiracular lobe [Belkin 1950,682] — “The homolog of the siphon” (Belkin 1962,561) bearing the postabdominal spiracles, spiracular apparatus and pecten plate. Belkin’s (1962) definition of “siphon” is vague but probably includes the external sclerotized tube (siphon) and internal structures. Since he states that the “sclerotized part of the siphon [is] probably homologous with [the] pecten plate,” and since by definition his “pecten plate” includes the U-shaped band, his “spiracular lobe” includes the pecten plate and U-shaped band defined herein.

SPIRACULAR LOBE (SL) [Harbach and Knight 1978a,79] — One of five rounded flaplike projections of the spiracular apparatus; highly modified in *Mansoniini* larvae. There is an unpaired anterior spiracular lobe and paired anterolateral and posterolateral spiracular lobes. (Syn.: Zipfel, Haller 1878,93; Klappenzipfel, Haller 1878,93; Klappe, Meinert 1886,391; Hudflige, Meinert 1886,391; Siphoklappe, Raschke 1887,160; valve, Hurst 1890a,50; flap, Miall 1895,101; closing lobe of the siphon, Packard 1898,464; siphonal lobe, Packard 1898,465; lobe, Giles 1900,44; tooth, Dyar 1901b,181; Verschlussklappe, Tänzer 1921,158; Atemklappe, Martini 1923a,459; Flügel, Montschadsky 1925,93; Lappen, Montschadsky 1927,485; perispiracular valve, Marshall 1938,48; clapet, Sautet and Audibert 1946,44; perispiracular lobe, Christophers 1960,194)

SPIRACULAR OPENING (SOp) (Figs.59-61,63) [Howard *et al.* 1912,91] — In insects, the secondary orifice of a functional spiracle. In mosquito larvae, the secondary aperture of a postabdominal spiracle. (Syn.: orifice de la tracheé, Meinert 1886,490; respiratory opening, Theobald 1901b,33; opening of the stigma, Patton and Cragg 1913,200; air opening, Patton 1931,143; spiraculum, van den Assem and Bonne-Wepster 1964,27)

SPIRACULAR PROCESS (SPc) (Figs.59,60,63) [Stigmenfortsatz, Montschadsky 1927,486] — In culicine and perhaps toxorhynchitine larvae, a median arm of the spiracular apodeme extending around the posterior margin of each postabdominal spiracle (spiracular opening?); in anopheline larvae, a poorly or well developed crescentic sclerotization along the posterior margin of each postabdominal spiracle; that in anophelines is not strictly homologous with its counterpart in other taxa. (Syn.: lateral piece, Ingram and Macfie 1917b,138; lateral piece of the inner tube, Wesenberg-Lund 1918,303; spiracular chitinisation, Christophers 1933,35; process of spiracle, Gutsevich *et al.* 1974,34)

STEMMA (St) (Figs.33,35,37,38) [Christophers 1960,325] — In many endopterygotous larvae, any one of the one to several paired lateral ocelluslike light-perceptive organs of the lateralia; composed of a few large optic elements unlike the ommatidia of compound eyes. In mosquito larvae, one consisting of five elements occurs somewhat posteroventral to each compound eye; persisting into the pupa and adult. (Syn.: Biøje, Meinert 1886,376; ocelle, Meinert 1886,490; Nebenaug, Raschke 1887,155; simple eye, Hurst 1890b,170; ocellus, Hurst 1890b,174; larval eye, Nuttall and Shipley 1901a,74; accessory eye, Howard *et al.* 1912,84; lateral eye, Wesenberg-Lund 1921, including the compound eye, 10; eye-spot, Puri 1931,17; eye, Marshall 1938, including the compound eye, 41; larval eye, Shalaby 1957a, including the compound eye, 146; pupal eye, Marshall 1938,54; larval

ocellus, Christophers 1960,325; lateral ocellus, Clements 1963,14)

STERNAL PLATE (SIP) [Harbach and Knight 1978a,80] — In certain anopheline larvae, and larvae of the chaoborid genus *Corethrella* (Belkin 1962,539), a small sclerite borne cephalad on the ventral margin of abdominal segment VIII. (Syn.: chitinized plate, Puri 1931,119; median sclerotized plate, Reid 1968,147; ventral sclerotized plate, Reid 1968,152; sclerotized plate, Reid 1968,161; ventral plate, Harrison and Scanlon 1975,20)

STIPES (Stp) — The distal subdivision of the maxilla bearing the galea, lacinia and maxillary palpus. In mosquito larvae, the lateral part of the stipes, the merostipes of dixid larvae, either 1) has been incorporated into the maxillary palpus, 2) remains as a band of cuticle, merostipital process, attached to the base of the palpus or 3) exists as a small sclerite, merostipital sclerite, below the palpus; the mesal part of the stipes has united with the galea and lacinia to form the maxillary body (the maxillary body consists of distinct galea- and laciniastipes in some species).

STIPITAL ARM (SAr) (Figs.51-53) [Harbach and Knight 1977b,148] — The apodematus ridge located mesally at the base of the maxillary body, or the laciniastipes when distinguishable; continuous with the dorsal maxillary suture; in culicines, usually providing attachment for the stipital adductor muscle and bearing the parartis ventrally; in anophelines, articulating with the rod of parartis. (Syn.: black pedicle, Crawford 1933,27; arculus [in Russian], Becker 1938b,756; sclerotized rod-like structure, Cook 1944b,44; entoparartis, Shalaby 1957a, including the parartis, 157; cardostipital arm, Harbach and Knight 1977b,131)

SUBANTENNAL RIDGE (SuR) (Figs.33,35,40) [Laffoon and Knight 1973,56] — The inner supporting ridge of the subantennal suture.

SUBANTENNAL SUTURE (SSi) (Figs.33,35,37,38,40,42,43) [Menees 1958b,138] — In insects, applied to certain sutures ventral to the antennal socket; probably used for several sutures not all homologous with each other. In mosquito larvae, the suture associated with the subantennal ridge; appearing as a short line laterally below the antennal prominence.

SUBDENTAL TUBERCLE (ST) (Fig.50) [Gardner *et al.* 1973,165] — One of the small tuberculiform or nodulelike projections sometimes occurring on the sides or at the bases of ventral teeth 1-3.

Gardner *et al.* (1973,165) applied this term to the small projections occurring on the posterior surface of ventral teeth 1 and 2 in *Aedes communis* (De Geer). They named these structures according to the tooth on which they occurred, e.g., subdental tubercle 2 is located on ventral tooth 2. Similar projections are also common on the anterior, dorsal and ventral surfaces of ventral teeth 1, 2 and 3. Harbach and Knight (1977a,53) called each of these structures a subdental tubercle and suggested that the names of specific tubercles include the surface on which or near which they occur, e.g., posterior subdental tubercle 2.

SUBMAXILLARY SCLERITE (SSc) [Harbach and Knight 1977b,148] — In some *Uranotaenia* and perhaps other mosquito larvae, a lightly sclerotized, setose sclerite located ventrally between the maxillary body and the hypostomal ridge; forming part of the membrane which connects the base of the maxilla and the hypostomal ridge.

SUBMEDIAN ACCESSORY TERGAL PLATE (SATP) [Harbach and Knight 1978a,81] — In some anopheline larvae, one of usually a pair of small dorsal sclerites borne on each side of the midline immediately posterior to the median accessory tergal plates of abdominal segments I-VII. (Syn.: oval plate, Puri 1931,38; small rounded plate, Gater 1934-20; accessory tergal plate, Evans 1938,28; accessory plate, Gillies and De Meillon 1968,10)

SUBMENTONTAL SUTURE (SSu) (Figs.38,39) [Laffoon and Knight 1973,56] — In many insects, the transverse suture dividing the postmentum into a distal part, the mentum, and a proximal part, the submentum; often weak or absent; probably not homologous among all insects said to have it. In mosquito larvae, a transverse membranous area just distal to the labiogula, often hidden from below by the projecting anterior part of the labiogula; in anopheline larvae, the distal edge is limited by the well-sclerotized base of the ventromentum; in culicine larvae, not well demarcated from the ventromentum, but perhaps arbitrarily the ventromentum is regarded as the spicule-bearing and the submentontal suture as the non-spiculate part of this area.

SUBMENTUM (Smt) [Laffoon and Knight 1973,57] — In many insects, the part of the postmentum behind the submentontal suture. In mosquito larvae, delimited basally only by an imaginary line between the front edges of the posterior tentorial pits and laterally by the posterior part of the hypostomal suture; forming, along with the gula, the labiogula.

Past workers have incorrectly applied this term in mosquito larvae. The interpretation here is based partly on the embryological evidence given by Menees (1958a,27) although this interpretation

differs with him in that it follows Das (1937,71), DuPorte (1960,655; 1962,38) and Matsuda (1965,88) (authors who did not mention mosquito larvae in the discussions cited) in considering the base of the submentum to be level with the front ends of the postoccipital suture at the posterior tentorial pits. The submentum of Menees is the labiogula, he regarded the gula to be part of the submentum. Snodgrass (1959,7) thought the mosquito larval labium was greatly reduced and represented only by the part termed the prementum, he did not identify the submentum. Other authors have applied submentum to various parts, that of Patton and Evans (1929,232) being the labiogula, that of Shalaby (1956,140) being the labiogula less a transverse anterior area he called the mentum, that of Cook being the dorsomentum in culicines (1944b,44) and the mentum in anophelines (1944b,47), that of Imms (1907,293), Pucac (1965,43) and Puri (1931,7) being the mentum, and that of Salem (1931,407) and some other authors being the ventromentum.

SUPERLINGUA (SI) (Fig.57) [Harbach 1978,303] — In many insects, one of a pair of lateral lobes of the hypopharynx; united with the median lingua to form the definitive hypopharynx. (Syn.: lobe-like structure, Shalaby 1956,158; ear-shaped lateral lobe, Shalaby 1957b,280; lateral lobe-like structure, Shalaby 1957d,269; valve of the salivary orifice, Gardner *et al.* 1973,170)

T

TENTORIUM (Tn) — The pair of endoskeletal struts of the cranium formed chiefly of the fused anterior and posterior tentorial arms. In mosquito larvae, the right and left halves of the tentorium are not connected as in generalized insects.

TERGAL PLATE (TP) (Figs.59,62) [Imms 1907,317] — In anopheline larvae, a small sclerite occurring anteriorly on the dorsal midline of abdominal segments I-VIII; in *Orthopodomyia* and *Corethrella* (Chaoboridae) larvae, generally larger sclerites located on the dorsal surface of abdominal segments VI-VIII and VII-VIII, respectively; the tergal plates of *Orthopodomyia* may not be strictly homologous with those of anopheline and *Corethrella* larvae. (Syn. for anopheline larvae: tergum, Nuttall and Shipley 1901a,66; chitinized plate, Smith 1904,167; dorsal plate, Smith 1904,171; main tergal plate, Evans 1938,28; abdominal plate, Gillies and De Meillon 1968,10; main abdominal plate, Gillies and De Meillon 1968,15. Syn. for *Orthopodomyia* larvae: abdominal plate, Howard *et al.* 1917,878; dorsal plate, Howard *et al.* 1917,879; plate, Tate 1932,111; dorsal chitinized plate, Tate 1932,117; dorsal sclerotized plate, Chapman 1964,435)

tessellated membrane — In arthropods, any membrane with a surface resembling a mosaic. Christophers (1960,200) used this term in mosquito larvae for the palatal tessellated area. Pucac (1965,50) used "tessellated membrane" for an area composed of the palatal tessellated area, anteromedian palatal penicular area and the membranous part of the lateral palatal penicular area (compare **tessellated membranous area**).

tessellated membranous area [Pao and Knight 1970,120] — The area composed of the palatal tessellated area, the lateral palatal penicular area and the anteromedian palatal penicular area. Compare **tessellated membrane**.

THORAX (Figs.59-62,66-68,72) — The second or intermediate division (tagma) of the insect body. The thorax of mosquito larvae is composed of the fused pro-, meso- and metathorax which are distinguished by series of bilaterally paired, circumferentially arranged setae.

TORMA (To) (Figs.33-41,44,45) [Schremmer 1949,181] — In most insects, a sclerotized area in the posterolateral deflexed part of the main labral sclerite; normally bearing the lateral labral retractor muscle insertions; often extending well onto the palatum; sometimes detached from the main labral sclerite. In mosquito larvae, an elongate, detached, usually very dark sclerite transmitting movement to the lateral palatal brush; shallowly apodematous anterolaterally; bearing the tormal apodeme. (Syn.: apodeme, Thompson 1905,169; Praemandibel, Bischoff 1922,9(Fig.6); apodeme of feeding brush, Salem 1931,396; apodeme of the feeding-brush, Salem 1931,398; spindle osselet, Crawford 1933,25; trabecula flabellaris, Shipitzina 1936,354; trabecula labri anterior, Shipitzina 1936,354; flabellar bar, Shipitzina 1936,361; anterior bar, Shipitzina 1936,362; longitudinal lever, Becker 1938b,439; messor, Cook 1944b,40; labral apodeme, Shalaby 1956,145; flabellar apodeme, Christophers 1960,198; chitinous apodeme of epipharynx, Pucac 1965,44; labral brush apodeme, Pucac 1965,45; lateral apodeme, Pao and Knight 1970,121)

Peterson (1916,189) introduced this term. Confusion about the nature and extent of the torma began with him and has continued to the present. He applied it in orthopteroids to the "chitinized pieces which belong to the lateral portions of the epipharynx in the region of the clypeo-labral suture and connect with the clypeus or labrum at the lateral ends of the suture." Peterson's paper was mainly on the head of adult Diptera and he appears to have used the term torma in Diptera in at least three different ways, perhaps none of them representing a homolog of his orthopteroid torma.

His torma in adult *Simulium* (Fig.497) includes a dorsolateral and a ventrolateral bar later interpreted by Wenk (1962,92) as a "Querstäbchen" and the "Torma." Peterson's torma in adult *Tabanus* (Fig.494) includes a distal part Bonhag (1951,187) called "proximal sclerite of labrum" and paired proximal parts Snodgrass (1953,8) considered to be ridges which "represent the beginning of paraclypeal phragmata in other flies." Peterson's torma in adult *Musca* includes an exposed part (Fig.72) called the clypeus by Snodgrass (1953,3) and paired hidden ridges (Fig.600) interpreted by Snodgrass (1953,7) as paraclypeal phragmata in *Calliphora* and by MacGillivray (1923,145) as the paratormae in "specialized Diptera." Later interpretations of the torma in insects other than Diptera have generally been in harmony with Peterson's use in orthopteroids (e.g., Yuasa 1920,161; Crampton 1921,31; Yuasa 1923,336; MacGillivray 1923,31; Snodgrass 1928,97; Hayes 1930,106; Das 1937,42; Cook 1944a,4; Hinton 1958,186). Occasional workers have used torma for adult Diptera, applying it to part or all of one of the parts Peterson called the torma in Diptera (e.g., MacGillivray 1923,54, *Tabanus*; Joblin 1926,329, hippoboscids; Jobling 1928,212, *Culicoides*).

The term torma has been used for various nematocerous larvae by Crampton (1930,245, Tanyderidae), Tokunaga (1930,5, Tipulidae; 1932,10, Chironomidae), Cook (1944a,7, Bibionidae; 1944c,70, Chironomidae), Anthon (1943,18, Anisopodidae), Hennig (1948,30, many nematocerous families; 1950,9, additional nematocerous families), etc. Most of these authors on larval Diptera applied torma to an individual sclerotized part of the labrum. Torma has been applied to mosquito larvae by Patton and Evans (1929,232), Hennig (1948,36), Schremmer 1949,181), Hennig (1950,55), Menees (1958b,131), Snodgrass (1959,13), Jones (1960,459), Chaudonneret (1963,369), Matsuda (1965,231), Pucat (1965,45) and Pao and Knight (1970,120). Of these authors, Schremmer, Menees, Snodgrass, Matsuda and Pucat all used torma in mosquito larvae in the sense used here. Patton and Evans referred to the median labral plate as "fused tormae" and, in discussing the "feeding brushes," indicated that the "plates to which the hairs are attached are probably a part of the fused tormae." Hennig (1948,1950) referred to the "Mundbürsten" as "Tormae," though possibly intending to include one or more of the associated paired sclerites. The "torma (*sensu lato*)" of Chaudonneret includes the sclerotized areas collectively on which the labral retractor muscles are inserted, thus including the intertorma as well as the torma, but his "torma (*sensu stricto*)" is the sclerite on which one (the most anterior in mosquito larvae) of the lateral labral retractor muscles is inserted via an apodeme, thus his anopheline torma *s. str.* is the torma while his culicine torma *s. str.* is, in his view, only the anterolateral part of the torma. Pao and Knight used torma for the lateral palatal penicular area.

The criteria for recognition of the insect torma are vague. Several authors have restricted it to a sclerotized posterolateral extension of the main dorsal sclerotized area of the labrum. Usually a lateral labral retractor muscle is inserted on it, but Hinton (1958,186) listed several Mecoptera families in which the larval torma is "well developed" but the muscle is absent. In most insects, the torma extends only a short distance onto the palatum, but in some it is long and even branched. It is then a problem as to whether the entire sclerotized extension should be called the torma. This problem is especially difficult in those larval Nematocera with one to several paired and unpaired sclerites on the labropalatum. The conventional practice of restricting the term torma in mosquito larvae to the paired sclerite on which one or two lateral labral retractor muscles are inserted via apodemes has been followed here. When the labropalatum has been more carefully studied, it may be necessary to revise the terminology. Possibly the torma should be extended in Nematocera to include the intertorma because the median labral retractor muscles are inserted on the intertorma. Or, perhaps it should be extended to include any labropalatal sclerite.

TORMAL APODEMAL BAR (TAB) (Figs.35,37,39) [Laffoon and Knight 1973,58] — In at least some culicine larvae, the darkly pigmented, prominent, well-sclerotized, curved barlike unit of the tormal apodeme; connected to the lateral tormal process by a pale flexible part of the tormal apodeme and probably similarly connected to the intertorma; serving for the attachment of the lateral labral retractor muscles. (Syn.: medial process of apodeme, Salem 1931,396; posterior process of the labral apodeme, Shalaby 1957a,150; posterior process, Shalaby 1957a,162; posterior process of the apodeme, Shalaby 1957b,275; stirrup apodeme, Christophers 1960,200; stirrup, Christophers 1960,205; posterior tormal apodeme, Pucat 1965,45; posterior process of the lateral apodeme, Pao and Knight 1970,121)

TORMAL APODEME (ToA) [Laffoon and Knight 1973,58] — Any apodeme of a torma. One is present in mosquito larvae. (Syn.: messorial apodeme, Cook 1944b,42, but compare **LATERAL INTERTORMAL APODEME**) See **TORMAL APODEMAL BAR**.

tormal plate [Jones 1960,460] — A generic term for the torma and intertorma.

tormal sclerite [Menees 1958b,136] — A generic term for the torma, intertorma and anterior palatal bar.

TRANSVERSE GRID BAR (TGB) (Figs.60,65) [Harbach and Knight 1978a,83] — One of the transverse sclerotizations supporting the bases of individual cratal setae; sometimes joined laterally by lateral grid bars. (Syn.: Reiter, Stadtmann-Averfeld 1923,118; transverse bar, Belkin 1962, Fig.412)

triangular sclerite of posterior palatal bar [Farnsworth 1947,147] — A pair of triangular-shaped structures arising from the posterior edge of the intertorma just lateral of the midventral line, the presence of which have not been confirmed.

U

U-SHAPED BAND (UB) (Figs.59,65) [Marshall 1938,50] — In some anopheline larvae, a sclerotized strip of cuticle located posteriorly at the base of the spiracular apparatus and connecting the pecten plates of opposite sides of abdominal segment VIII; partly homologous with the siphon of other mosquito larvae. (Syn.: ring, Nuttall and Shipley 1901a, including the pecten plates, 64; chitinous skeleton, Nuttall and Shipley 1901a, including the pecten plates, 74; transverse chitinous band, Imms 1908,107; chitinous arch, Patton and Cragg 1913, including the pecten plates, 200; bar, Patton 1931,148; bar of chitin, Puri 1931,39; sclerotized band, Komp 1942,18; pecten plate, Belkin 1962, including the pecten plates, 561; arc, Gutsevich *et al.* 1974,23)

U-SHAPED ROD (UR) (Figs.46-49) [Pao and Knight 1970,126] — The U-shaped thickened basal rim of the mandible; appearing as a rodlike structure in the light microscope with the base of the U being lateral and its arms extending mesad; the arms sometimes meet or are fused mesally to give the rod the appearance of being a narrow ellipse; the pre- and postartis are projections of the rod. (Syn.: thickened rim, Puri 1931,27; U-osselet, Crawford 1933,27; Sehnenplatte des Adductor mandibulae, Schremmer 1949, in part, 190; Sehnenplatte, Schremmer 1959, in part, 191)

V

VENTRAL BRUSH (VB) (Figs.64,65) [Dyar 1901a,178] — Setae 4-X; usually a more or less linear series of irregularly paired setae borne posteroventrally on the midline of abdominal segment X; often divided into two groups, a posterior group of cratal setae borne on a grid and an anterior group of precratal setae borne cephalad of the grid. (Syn.: Svømmevifte, Meinert 1886,377; Steuerruder, Raschke 1887,137; vertical fin, Miall 1895,115; swimming fan, Giles 1900,35; ventral fan, Nuttall and Shipley 1901a,64; ventral hairs, Nuttall and Shipley 1901a,74; tail-fan, Theobald 1901b,29; fan, Theobald 1901b,29; caudal fan, Theobald 1901b,31; brush, Dyar 1903,24; anal tuft, Smith 1904,19; hair tufts, Smith 1904,21; eventail natatoire, Blanchard 1905,105; ventral tuft, Felt 1905,445; tail-fin, Imms 1908,108; ventral beard, Wesché 1910,15; Schwanzruder, Tänzer 1921,147; vertikale Ruder, Tänzer 1921,147; Schwimmfächer, Tänzer 1921,147; ventral swimming brush, Wesenberg-Lund 1921,15; ventral hair fan, Christophers 1922,543; anal fan, Barraud 1923a,936; Ruder, Martini 1923a,529; Ruderplatte, Stadtmann-Averfeld 1923,114; Steuerplatte, Stadtmann-Averfeld 1923, 114; ventral fin, Patton and Evans 1929,237; ventral caudal hairs, Gater 1934,23; fin, Marshall 1938,51; anal fin, Deonier 1943,385; beard, Hopkins 1952,18; ventral caudal tuft, Reid 1968,39. (See Table 15)

VENTRAL ECDYSIAL LINE (VEL) [Laffoon and Knight 1973,59] — In arthropods, any ventral preformed line of weakness along which the cuticle splits (usually) or bends during ecdysis. See **ECDYSIAL LINE**.

VENTRAL FRINGE (VF) [Christophers 1960,290] — In many mosquito larvae, one of the pharyngeal fringes borne ventral to the lateroventral pharyngeal sclerite in the lateral margin of the pharynx; a primary ventral fringe is borne on the medioventral pharyngeal sclerite; secondary ventral fringes arise from the walls of the pharynx ventral to the primary ventral fringe.

VENTRAL MAXILLARY SUTURE (VMxS) (Figs.52,54) [Harbach and Knight 1977b,149] — In some culicine larvae, a groove or furrow on the ventral surface of the maxillary body between the galea- and laciniastipes; extending from a point mesal to the maxillary brush to the basal notch; often appearing only as line of slightly more heavily sclerotized cuticle.

VENTRAL ORAL BRUSH (VOB) (Figs.45,58) [Harbach and Knight 1977d,397] — In many culicine and perhaps some anopheline larvae, a covering of filaments located on the posterior margin of the ventral oral sclerite; apparently functioning to clean the mandibular sweepers and to retain food particles in the pharynx.

VENTRAL ORAL FRINGE (VOF) (Figs.45,58) [Harbach and Knight 1977d,397] — In many mosquito larvae, usually one or two rows of small flattened filaments located at the ventral margin

- of the mouth between the ventral oral sclerite and the labiohypopharynx; often borne on or forming a flap of cuticle in culicines. (Syn.: plaque de la valvule orale ventrale, Chaudonneret 1962,486)
- VENTRAL ORAL SCLERITE (VOS)** (Fig.58) [Harbach and Knight 1977d,397] — In many mosquito larvae, a small rounded plate located just inside the mouth on the midline of the ventral wall of the pharynx at about the level of the dorsal oral sclerite; usually bearing a covering of filaments, the ventral oral brush, along its posterior border. (Syn.: oval plate, Christophers 1960,289; plaque infra-orale, Chaudonneret 1962,483)
- VENTRAL PHARYNGEAL SCLERITE (VPhS)** (Fig.58) [Harbach and Knight 1977d,397] — In many mosquito larvae, a narrow band of sometimes lightly sclerotized cuticle extending along the lateroventral margin of the pharynx from the anterior part of the ventral oral sclerite; with or without one or two secondary ventral fringes; in many cases, one or two fringes appear to arise close to each side of the sclerite but not directly from it. (Syn.: sclérite médial ventral du filtre pharyngien, Chaudonneret 1962,486)
- VENTRAL PREMENTAL SPICULES (VPSp)** (Figs.55-57) — In mosquito and dioxid larvae, a variable collection of blades, filaments, spinules or other spicules borne on the ventral margin of the labiohypopharynx. (Syn.: central brush of spines, Wesché 1910,12; circle of hairs, Wesenberg-Lund 1921,20; semi-circular plates, Puri 1931,28; hairs, Salem 1931,408; fimbriae, Cook 1944b,45; organe antérieur, Senevet 1946,319; sclerotized teeth, Farnsworth 1947,144; caudal spines, Shalaby 1957a,161, triangular shaped structure, Shalaby 1957b,280; apically serrated hairs, Pucat 1965,59; premental scales, Pao and Knight 1970, in part, 132; premental hairs, Pao and Knight 1970, in part, 132; prelabial outgrowths, Harbach and Knight 1977c,347; ventral premental processes, Harbach 1978,305). The "premental spine" of Pao and Knight (1970,132) appears to be homologous with the anopheline premental cordate process, but owing to its reduced nature it is considered as one of the ventral premental spicules.
- VENTRAL RAMUS (VRa)** (Figs.55,56) [Harbach and Knight 1977c,351] — A branch of each cibarial bar extending along the lateral margin of the labiohypopharynx; well sclerotized and easily observed in most anophelines, but usually weakly developed or unrecognizable in culicines.
- VENTRAL TEETH (VT)** (Figs.46,48-50) [Foote 1952,449] — A row of closely associated teeth located ventrally on the mesodistal margin of the mandible; consisting of a principal tooth, ventral tooth 0, with three teeth, ventral teeth 1-3, on its posterior side and as many as four teeth, ventral teeth-1 to -4, on its anterior side. (Syn.: upper teeth, Salem 1931,402; ventral fang of the radula [in Russian], Becker 1938b,751; ventral saw, LaCasse and Yamaguti 1948,8; Incisivi, Schremmer 1949, including the dorsal teeth, 190; Kauzähne, Schremmer 1949, including the dorsal teeth, 192; ventral group of dentes, Shalaby 1956,148; incisor region, Clements 1963, including the dorsal teeth, 35; ventral tooth, Pao and Knight 1970,124)
- VENTRAL TOOTH 0 (VT₀)** (Fig.50) [Gardner *et al.* 1973,165] — The principal tooth of the complex of ventral teeth of the mandible; the largest and most prominent of the ventral teeth. (Syn.: main tooth, Pao and Knight 1970,124; principal tooth, Knight 1971b,196; ventral tooth, Tanaka *et al.* 1979,16)
- VENTRAL TOOTH 1 (VT₁)** (Fig.50) [Gardner *et al.* 1973,165] — A tooth located immediately posterior to ventral tooth 0 on the mandible; usually smaller than ventral teeth 0 and 3 and occasionally bearing subdental tubercles. (Syn.: first denticle, Pao and Knight 1970,124; VT₁, Knight 1971b,196; mesal denticle (VT₁), Tanaka *et al.* 1979,16)
- VENTRAL TOOTH 2 (VT₂)** (Fig.50) [Gardner *et al.* 1973,165] — A tooth located between and usually larger than ventral teeth 1 and 3 of the mandible; occasionally bearing subdental tubercles. (Syn.: second denticle, Pao and Knight 1970,124; VT₂, Knight 1971b,196; mesal denticle (VT₂), Tanaka *et al.* 1979,16)
- VENTRAL TOOTH 3 (VT₃)** (Fig.50) [Gardner *et al.* 1973,165] — The posteriormost ventral tooth of the mandible; usually smaller than ventral tooth 2 and occasionally bearing subdental tubercles. (Syn.: third denticle, Pao and Knight 1970,124; VT₃, Knight 1971b,196; mesal denticle (VT₃), Tanaka *et al.* 1979,16)
- VENTRAL TOOTH -1 (VT₋₁)** (Fig.50) [Gardner *et al.* 1973,165] — In some culicine larvae, a small tooth located immediately anterior to the base of ventral tooth 0 of the mandible. (Syn.: lateral denticle (VT₋₁), Tanaka *et al.* 1979,16)
- VENTRAL TOOTH -2 (VT₋₂)** (Fig.50) [Gardner *et al.* 1973,165] — In some aedine larvae, a small curved tooth occurring at the base of ventral tooth -4 of the mandible. (Syn.: lateral denticle (VT₋₂), Tanaka *et al.* 1979,16)

- VENTRAL TOOTH -3 (VT_{.3})** [Gardner *et al.* 1973,165] — Known only in some larvae of the Atrachea section of the genus *Uranotaenia*, a small tooth located between ventral tooth -2 and ventral tooth -4 of the mandible. (Syn.: lateral denticle (VT_{.3}), Tanaka *et al.* 1979,16)
- VENTRAL TOOTH -4 (VT_{.4})** (Figs.46,49,50) [Gardner *et al.* 1973,165] — In many mosquito larvae, the most anterior of the ventral teeth of the mandible; characteristically spinelike when present. (Syn.: anterior spine, LaCasse and Yamaguti 1948,8; ventral spine, Foote 1952,449; mesal dorsal spine, Pao and Knight 1970,124; VT_{.1}, Knight 1971b,196; lateral denticle (VT_{.4}), Tanaka *et al.*
- ventrolateral plate** [Pao and Knight 1970,132] — The area of the prementum lateral to the lateral premental teeth and ventral to the salivary meatus; often with rod of spindle-shaped markings when observed under the light microscope; often appearing rugose in the scanning electron microscope. (Syn.: ventrolateral plate of hypopharynx, Pao and Knight 1970,134)
- VENTROMEDIAN CERVICAL SCLERITE (VmCS)** [Reinert 1976a,205] — In some mosquito larvae, primarily of the genus *Aedes*, a small pigmented plate occurring on the ventral median area of the cervix; its pigmentation and development is variable.
- VENTROMENTUM (Vm)** (Figs.34-44) [Laffoon and Knight 1973,59] — In some mosquito and chironomid larvae, the lower and more proximal of the two transverse, usually projecting, specialized subdivisions produced when the mentum is completely (in mosquito larvae) or incompletely (in chironomid larvae, Saether 1971,1237) divided by a transverse inflection of membrane; in anopheline larvae, developed as a well-sclerotized, apically dentate projection; in culicine larvae, hardly distinguishable from the adjacent membranes, but somewhat arbitrarily considered to be the narrow or broad, transverse, apparently lightly sclerotized, spiculate area distal to the membrane regarded as the submentomental suture; probably not strictly homologous among all mosquito larvae and certainly not from mosquito larvae to chironomid larvae. (Syn.: submentum, Salem 1931,407; aulaeum, Cook 1944b,45; auleum, Foote 1952,449; glossa, Shalaby 1956,154)
- vertex** [DuPorte 1957,67] — The posterior part of the dorsal apotome behind the ends of the epistomal suture along with a vaguely defined dorsolateral part of the cranium. See **VERTEX** in the adult section.
- VESICLE (v)** (Fig.45) [Dahl 1978,209] — A tiny conical, rounded or ridgelike elevation of the cuticula; commonly occurring in rows or arranged to produce a polygonal pattern on the cranium.
- V-SHAPED RIDGE (VR)** (Fig.47) [Harbach and Knight 1977a,41] — In many mosquito larvae, a ridge of thickened cuticle extending anteriorly outward from the U-shaped rod near the postartus of the mandible; the mandibular abductor apodeme is attached under this ridge external to the U-shaped rod. (Syn.: V-shaped suture, Pao and Knight 1970,126)

FIGURE 33

Anopheles (Anopheles) quadrimaculatus Say. Head of fourth stage larva. Alveoli shown but setae omitted.

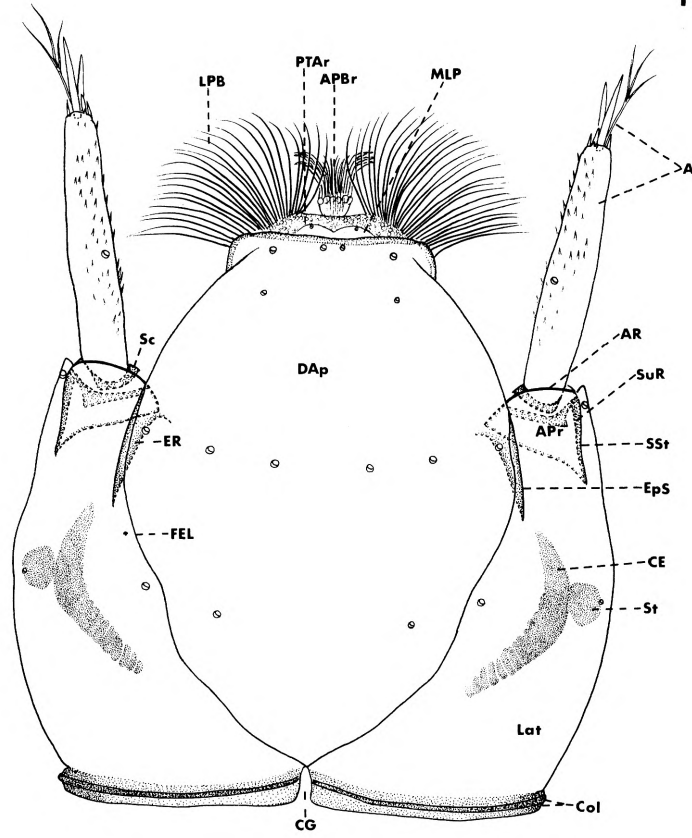
- a. Dorsal aspect. External except for epistomal ridge and ridges supporting antenna. To promote clarity, many filaments omitted from lateral palatal brushes. Mandibles and maxillae removed.
- b. Anterodorsal aspect as seen with dorsal apotome removed. Antennae, eyes, lateral palatal brushes and maxillae (except for the palpi) are omitted.

Abbreviations

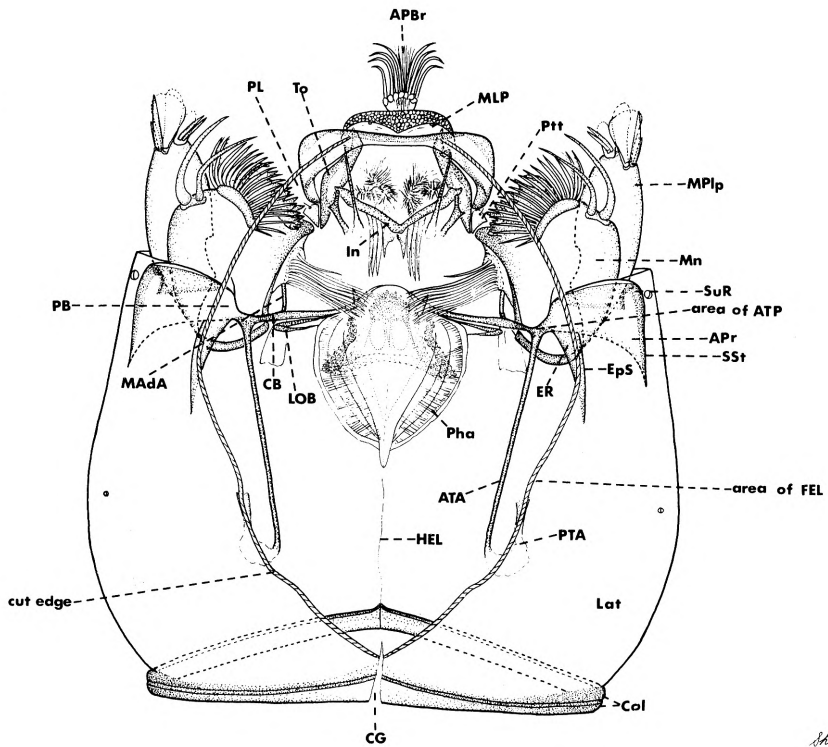
A	- antenna
APBr	- anteromedian palatal brush
APr	- antennal prominence
AR	- antennal ridge
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
CB	- cibarial bar
CE	- compound eye
CG	- coronal gap
Col	- collar
DAP	- dorsal apotome
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
In	- intertorma
Lat	- lateralia
LOB	- lateral oral bar
LPB	- lateral palatal brush
MAdA	- mandibular adductor apodeme
MLP	- median labral plate
Mn	- mandible
MPIp	- maxillary palpus
PB	- postantennal buttress
Pha	- pharynx
PL	- paraclypeal lobe
PTA	- posterior tentorial arm
PTAr	- palatal tessellated area
Ptt	- posttorma
Sc	- scape
SSt	- subantennal suture
St	- stemma
SuR	- subantennal ridge
To	- torma



a.



b.



Shuling Tang

FIGURE 34

Anopheles (Anopheles) quadrimaculatus Say. Head of fourth stage larva. Alveoli shown but setae omitted. To improve clarity, many filaments omitted from palatal brushes.

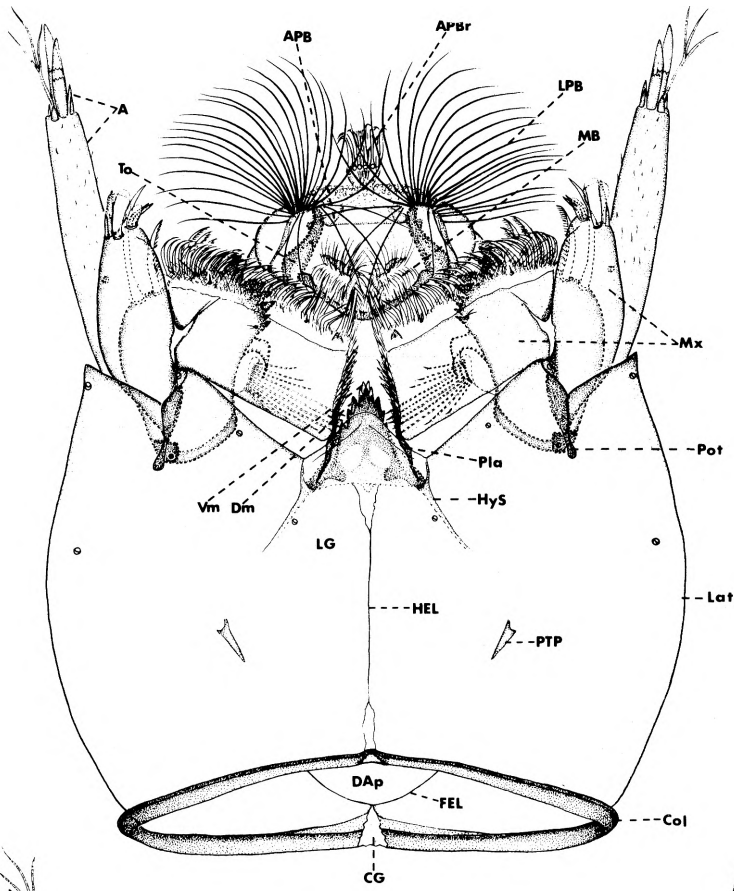
a. Posteroventral aspect. Mandible shown through maxilla.

b. Posteroventral aspect. Mandibles and maxillae removed. Some internal structures shown.

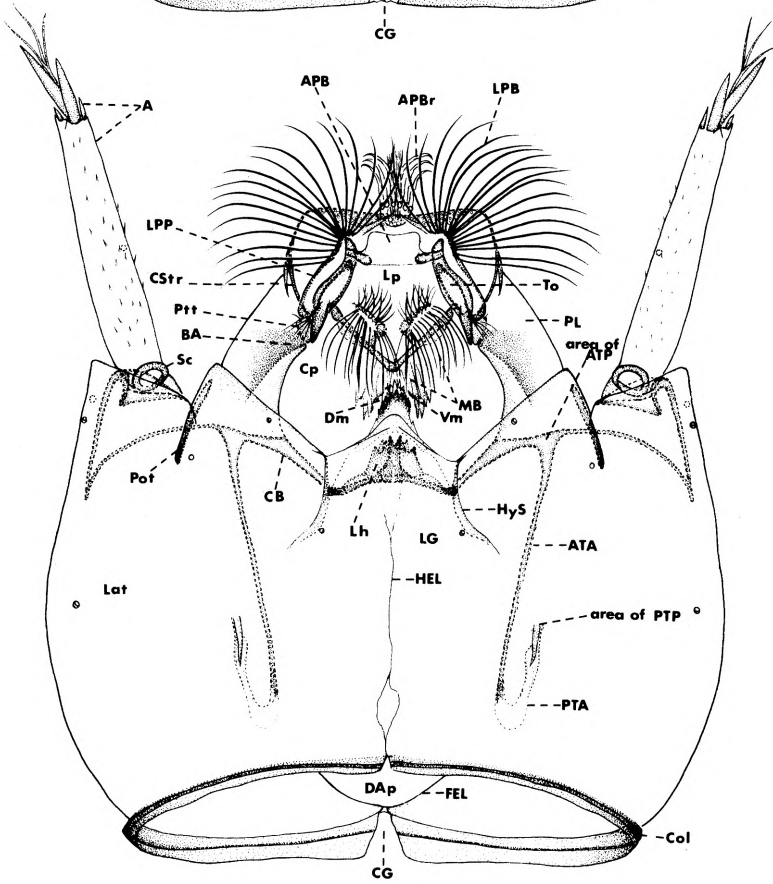
Abbreviations

A	- antenna
APB	- anterior palatal bar
APBr	- anteromedian palatal brush
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
BA	- black-spot area
CB	- cibarial bar
CG	- coronal gap
Col	- collar
Cp	- clypeopalatum
CStr	- clypeolabral strap
DAp	- dorsal apotome
Dm	- dorsomentum
FEL	- frontal ecdysial line
HEL	- hypocranial ecdysial line
HyS	- hypostomal suture
Lat	- lateralia
LG	- labiogula
Lh	- labiohypopharynx
Lp	- labropalatum
LPB	- lateral palatal brush
LPP	- lateral palatal plate
MB	- midpalatal brush
Mx	- maxilla
PL	- paraclypeal lobe
Pla	- paracoila
Pot	- postcoila
PTA	- posterior tentorial arm
PTP	- posterior tentorial pit
Ptt	- posttorma
Sc	- scape
To	- torma
Vm	- ventromentum

a.



b.



G. C. Lee

FIGURE 35

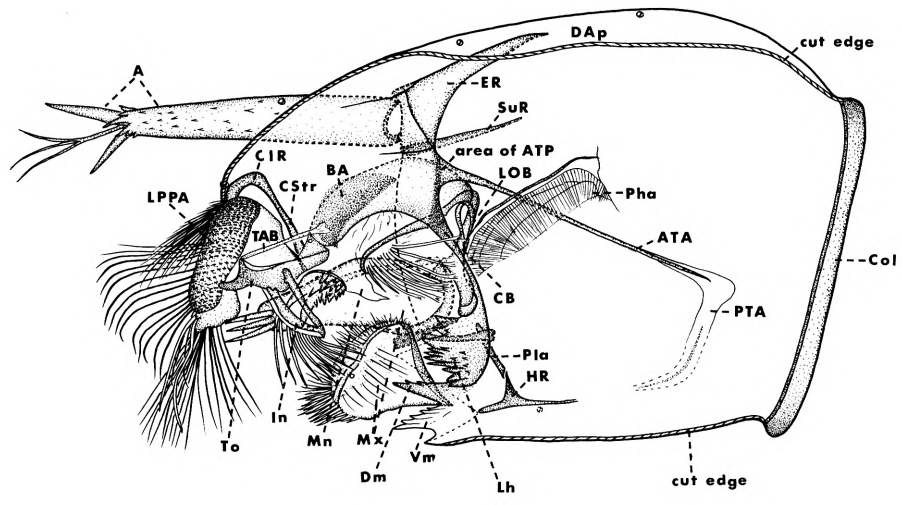
Anopheles (Anopheles) quadrimaculatus Say. Head of fourth stage larva. Alveoli shown but most setae omitted.

- a. Ental aspect of head cut longitudinally to left of midline.
- b. Lateral aspect of left part of head shown in a. Eyes omitted. Most fine detail of mandibles and maxillae omitted.
- c. Distal aspect.

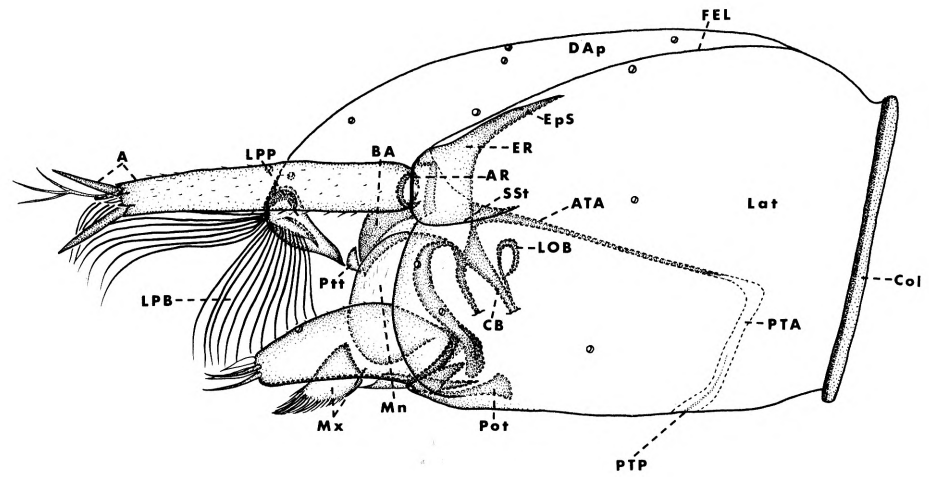
Abbreviations

A	- antenna
Af	- antennifer
APBr	- anteromedian palatal brush
APr	- antennal prominence
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
BA	- black-spot area
CB	- cibarial bar
CE	- compound eye
CIR	- clypeolabral ridge
CIS	- clypeolabral suture
Col	- collar
CStr	- clypeolabral strap
DAP	- dorsal apotome
Dm	- dorsomentum
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
HEL	- hypocranial ecdysial line
HR	- hypostomal ridge
HyS	- hypostomal suture
In	- intertorma
Lat	- lateralia
Lh	- labiohypopharynx
LOB	- lateral oral bar
LPB	- lateral palatal brush
LPP	- lateral palatal plate
LPPA	- lateral palatal penicular area
MLP	- median labral plate
Mn	- mandible
Mx	- maxilla
Pha	- pharynx
Pla	- paracoila
Pot	- postcoila
PTA	- posterior tentorial arm
PTAr	- palatal tessellated area
PTP	- posterior tentorial pit
Ptt	- posttorma
Sc	- scape
SSt	- subantennal suture
St	- stemma
SuR	- subantennal ridge
TAB	- tormal apodemal bar
To	- torma
Vm	- ventromentum

a.



b.



c.

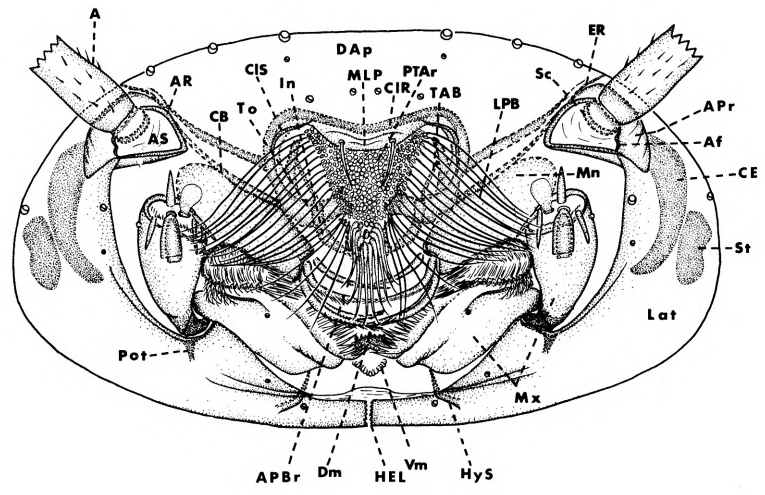


FIGURE 36

Anopheles (Anopheles) quadrimaculatus Say. Head of fourth stage larva.

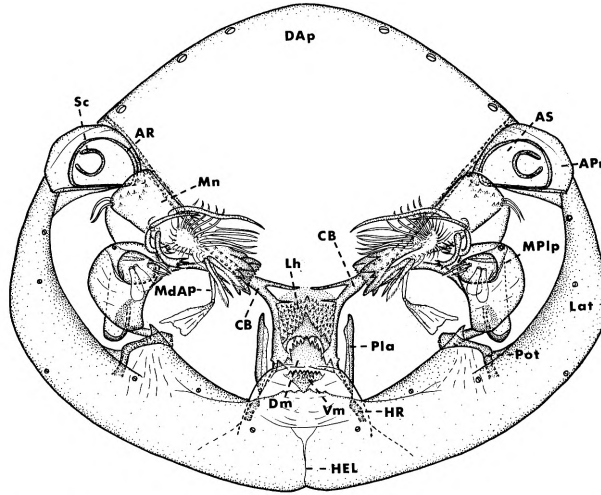
- a. Distal aspect, focused inward to level of labiohypopharynx. Most setae omitted. Maxillae removed except for palpi.
- b. Distal part of lower surface. Mandible and maxilla removed. Only a part of midpalatal brush filaments shown.
- c. Midpalatal lobe structures. Lower surface.
- d. Mentum and associated structures. Lower surface.

Abbreviations

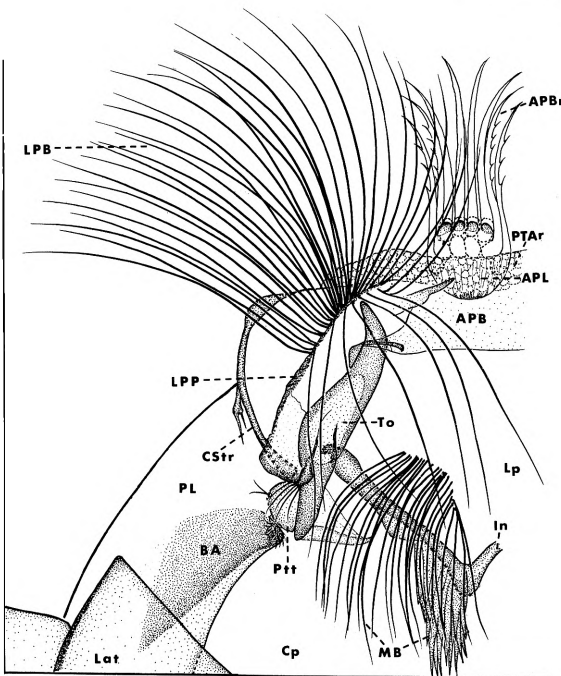
APB	- anterior palatal bar
APBr	- anteromedian palatal brush
APL	- anteromedian palatal lobe
APr	- antennal prominence
AR	- antennal ridge
AS	- antennal socket
BA	- black-spot area
CB	- cibarial bar
Cp	- clypeopalatum
CStr	- clypeolabral strap
DAP	- dorsal apotome
Dm	- dorsomentum
HEL	- hypocranial ecdysial line
HR	- hypostomal ridge
In	- intertorma
Lat	- lateralia
LG	- labiogula
Lh	- labiohypopharynx
Lp	- labropalatum
LPB	- lateral palatal brush
LPP	- lateral palatal plate
MAAdA	- mandibular adductor apodeme
MB	- midpalatal brush
Mn	- mandible
MPip	- maxillary palpus
PL	- paraclypeal lobe
Pla	- paracoila
Pot	- postcoila
PTAr	- palatal tessellated area
Ptt	- posttorma
Sc	- scape
To	- torma
Vm	- ventromentum

Fig. 36

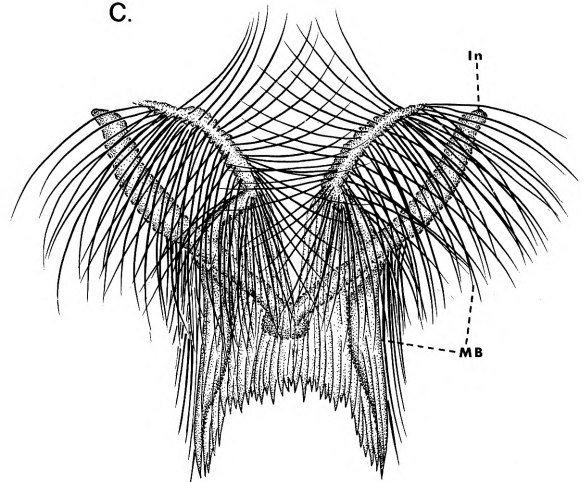
a.



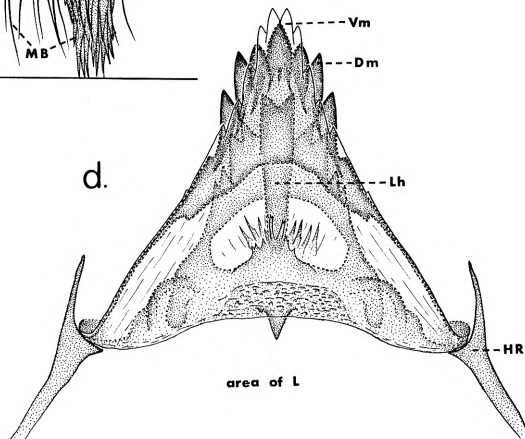
b.



c.



d.



G. C. Lee

FIGURE 37

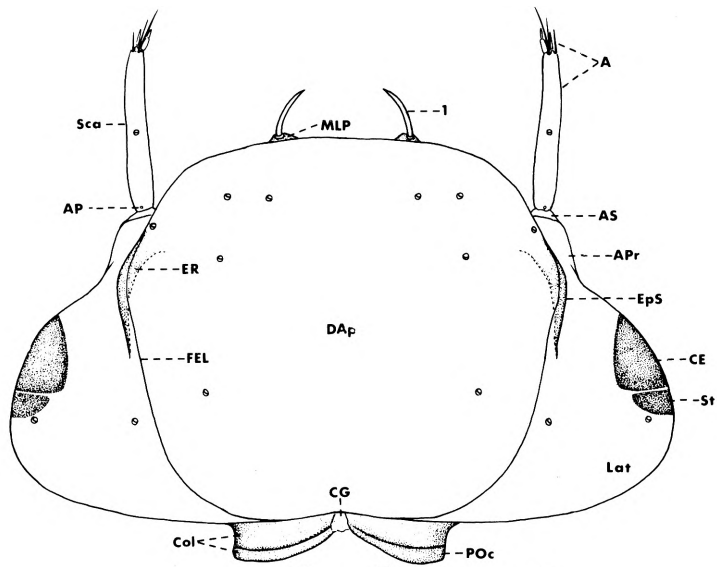
Aedes (Ochlerotatus) fulvus pallens Ross. Head of fourth stage larva. In a and c, alveoli shown but most setae omitted.

- a. Anterodorsal aspect. External except for epistomal ridge and compound eyes.
- b. Anterodorsal aspect as seen with dorsal apotome removed. Antennae, eyes, maxillae and most setae omitted.
- c. Posteroventral aspect. External. Some internal sclerotized structures omitted.

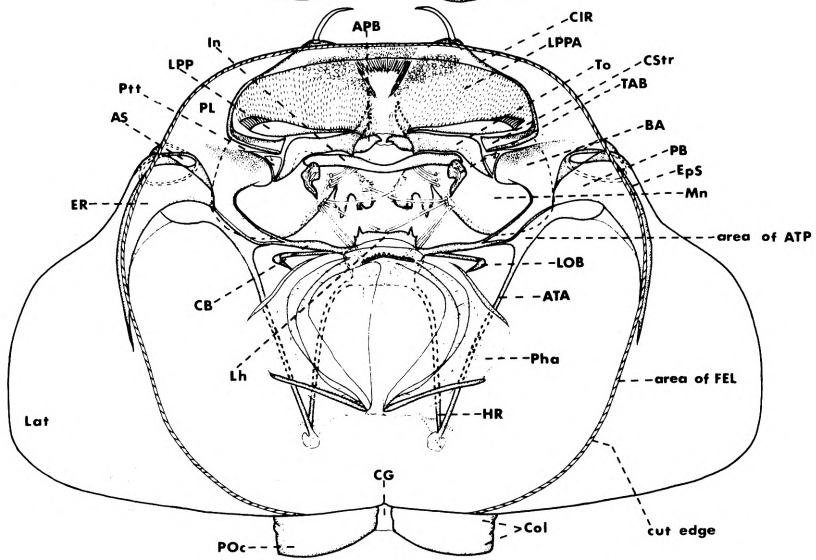
Abbreviations

A	- antenna
Af	- antennifer
AP	- antennal puncture
APB	- anterior palatal bar
APBr	- anteromedian palatal brush
APr	- antennal prominence
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
BA	- black-spot area
CB	- cibarial bar
CE	- compound eye
CG	- coronal gap
CIR	- clypeolabral ridge
Col	- collar
CStr	- clypeolabral strap
DAP	- dorsal apotome
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
HEL	- hypocranial ecdysial line
HR	- hypostomal ridge
HyS	- hypostomal suture
In	- intertorma
Lat	- lateralia
LG	- labiogula
Lh	- labiohypopharynx
LOB	- lateral oral bar
LPB	- lateral palatal brush
LPP	- lateral palatal plate
LPPA	- lateral palatal penicular area
MLP	- median labral plate
Mn	- mandible
Mx	- maxilla
OF	- occipital foramen
PB	- postantennal buttress
Pha	- pharynx
PL	- paraclypeal lobe
POc	- postocciput
Pot	- postcoila
PTP	- posterior tentorial pit
Ptt	- posttorma
SSt	- subantennal suture
St	- stemma
TAB	- tormal apodemal bar
To	- torma
Vm	- ventromentum
1	- seta 1-C

a.



b.



c.

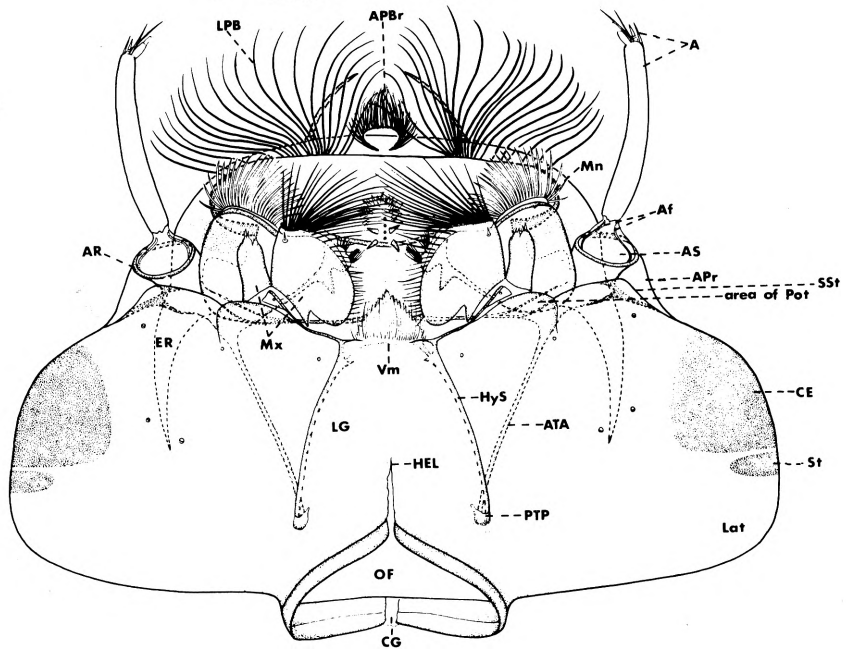


FIGURE 38

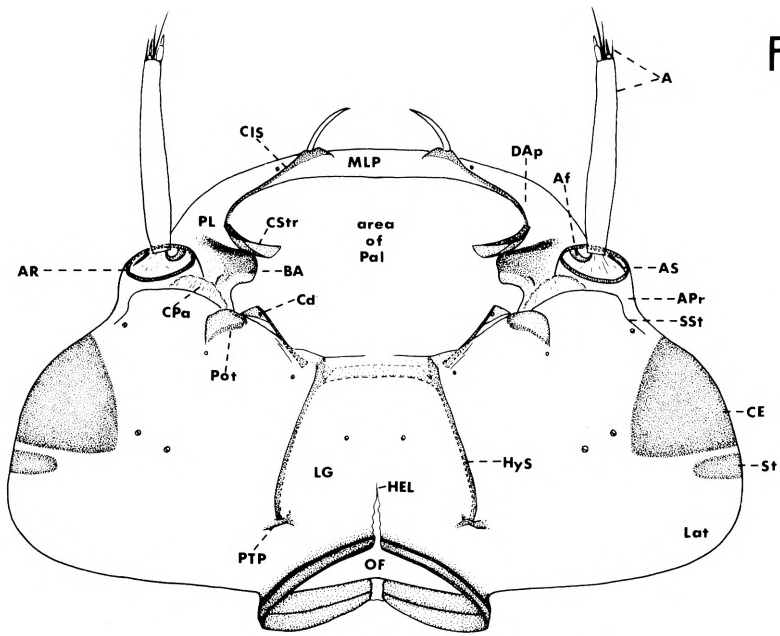
Aedes (Ochlerotatus) fulvus pallens Ross. Head of fourth stage larva.

- a. Posteroventral aspect. Mouthparts, details of palatum and most setae omitted.
- b. Lateral aspect. Some internal sclerotized structures indicated by stippling. Cibarial bar and mandible slightly displaced.
- c. Distal aspect. Eyes, antennae, anteromedian and lateral palatal brushes and articulating membranes omitted. Mandibles and maxillae shown in cross-section.

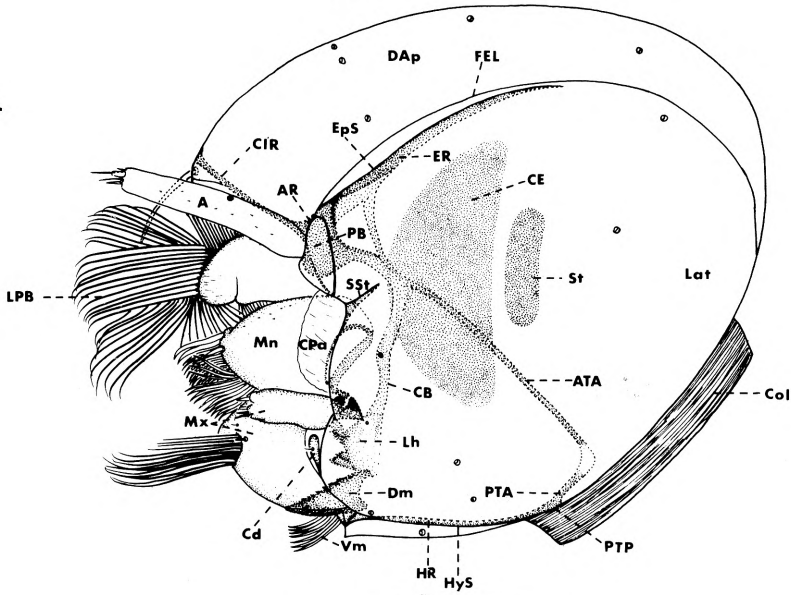
Abbreviations

A	- antenna
Af	- antennifer
AMA	- anterior mandibular articulation
APB	- anterior palatal bar
APr	- antennal prominence
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
BA	- black-spot area
CB	- cibarial bar
Cd	- cardo
CE	- compound eye
CIR	- clypeolabral ridge
CIS	- clypeolabral suture
Col	- collar
Cp	- clypeopalatum
CPa	- cephalic papilla
CStr	- clypeolabral strap
DAp	- dorsal apotome
Dm	- dorsomentum
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
HEL	- hypocranial ecdysial line
HR	- hypostomal ridge
HyS	- hypostomal suture
In	- intertorma
Lat	- lateralia
LG	- labiogula
Lh	- labiohypopharynx
Lp	- labropalatum
LPB	- lateral palatal brush
MLP	- median labral plate
Mn	- mandible
Mx	- maxilla
OF	- occipital foramen
Pal	- palatum
PB	- postantennal buttress
Pc	- precoila
PL	- paraclypeal lobe
Pla	- paracoila
PMA	- posterior mandibular articulation
Pot	- postcoila
PTA	- posterior tentorial arm
PTP	- posterior tentorial pit
SSt	- subantennal suture
SSu	- submentomental suture
St	- stemma
To	- torma
Vm	- ventromentum
1	- seta 1-C

a.



b.



c.

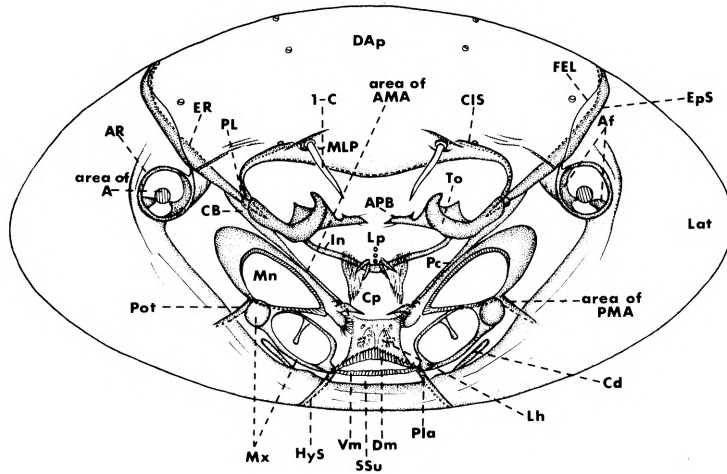


FIGURE 39

Aedes (Ochlerotatus) fulvus pallens Ross. Head structures of fourth stage larva.

- a. Transverse section showing ental aspect of proximal part.
- b. Palatal tessellated area. Ectal aspect.
- c. Palatum. Seen through dorsal apotome. To promote clarity, many filaments omitted from palatal brushes.
- d. Anterior palatal bar and torma. Posteroventral aspect.
- e. Cranium. Distal part of lower surface. Anteromedian palatal lobe, lateral palatal brush, lateral palatal penicular area, antenna, mandible and maxilla removed.
- f. Anterior palatal bar and midpalatal lobe. Simplistic view of midpalatal brush.
- g. Ventromentum. Lower surface. Dorsomentum visible through ventromentum.

Abbreviations

Af	- antennifer
APB	- anterior palatal bar
APBr	- anteromedian palatal brush
APL	- anteromedian palatal lobe
APr	- antennal prominence
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
BA	- black-spot area
CEL	- coronal ecdysial line
CIR	- clypeolabral ridge
CIS	- clypeolabral suture
Cp	- clypeopalatum
CStr	- clypeolabral strap
DAP	- dorsal apotome
FEL	- frontal ecdysial line
HR	- hypostomal ridge
HyS	- hypostomal suture
In	- intertorma
Lat	- lateralia
LG	- labiogula
Lp	- labropalatum
LPB	- lateral palatal brush
LPP	- lateral palatal plate
LTP	- lateral tormal process
MB	- midpalatal brush
MLP	- median labral plate
MTP	- mesal tormal process
OF	- occipital foramen
PL	- paraclypeal lobe
Pla	- paracoila
Pot	- postcoila
PTA	- posterior tentorial arm
PTAr	- palatal tessellated area
Ptt	- posttorma
SSu	- submentomental suture
TAB	- tormal apodemal bar
To	- torma
Vm	- ventromentum
1-3	- setae 1-, 2- and 3-Lp

Fig. 39

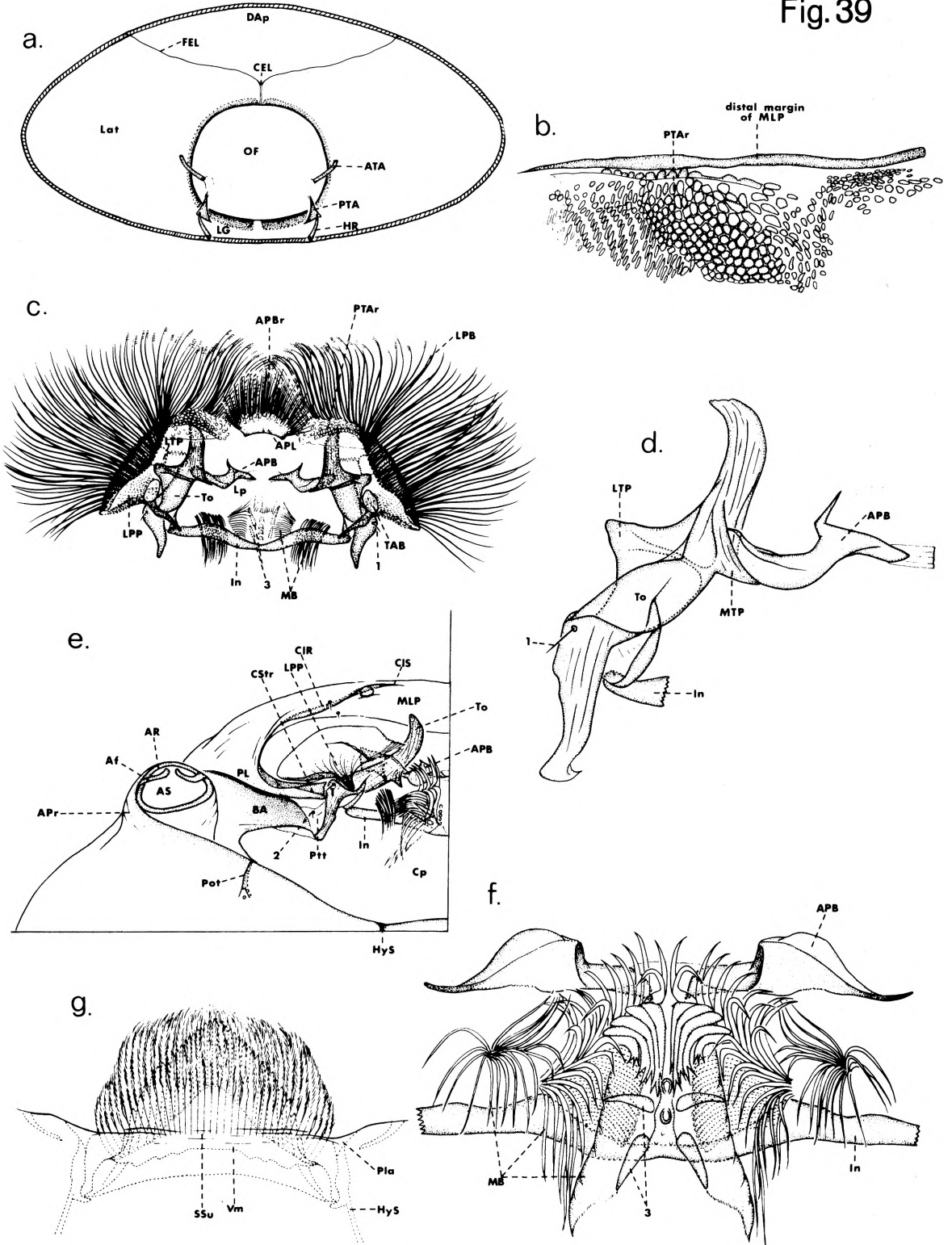


FIGURE 40

Toxorhynchites (Toxorhynchites) brevipalpis Theobald. Head of fourth stage larva. Alveoli shown but setae omitted. Eyes omitted.

a. anterodorsal aspect. Some internal structures shown.

b. Posteroventral aspect. Some internal structures shown. Antennae omitted.

Abbreviations

A	- antenna
AP	- antennal puncture
APB	- anterior palatal bar
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
CB	- cibarial bar
CG	- coronal gap
CIS	- clypeolabral suture
Col	- collar
CPa	- cephalic papilla
DAP	- dorsal apotome
Dm	- dorsomentum
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
HEL	- hypostomal ecdysial line
HR	- hypostomal ridge
HyS	- hypostomal suture
Lat	- lateralia
LG	- labiogula
LPB	- lateral palatal brush
MABa	- mandibular abductor apodeme
MAdA	- mandibular adductor apodeme
MB	- midpalatal brush
MLP	- median labral plate
Mn	- mandible
Mx	- maxilla
PB	- postantennal buttress
Pot	- postcoila
PTA	- posterior tentorial arm
PTAr	- palatal tessellated area
PTP	- posterior tentorial pit
SSt	- subantennal suture
SuR	- subantennal ridge
To	- toma
Vm	- ventromentum

Fig. 40

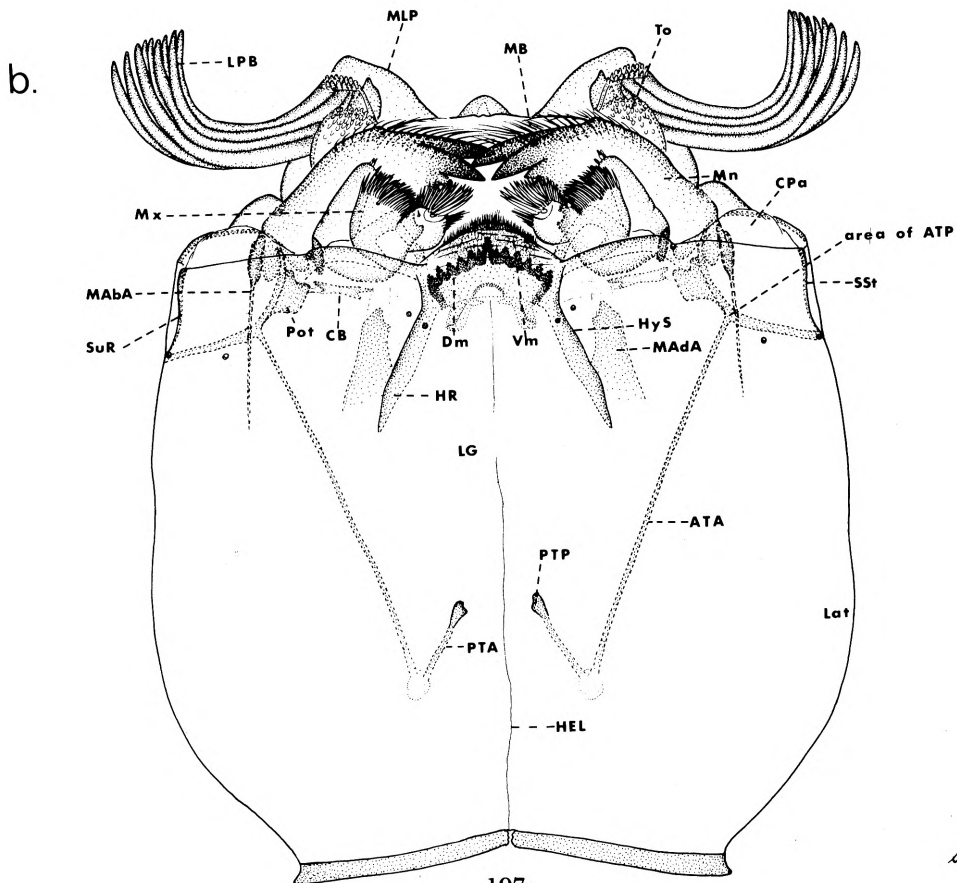
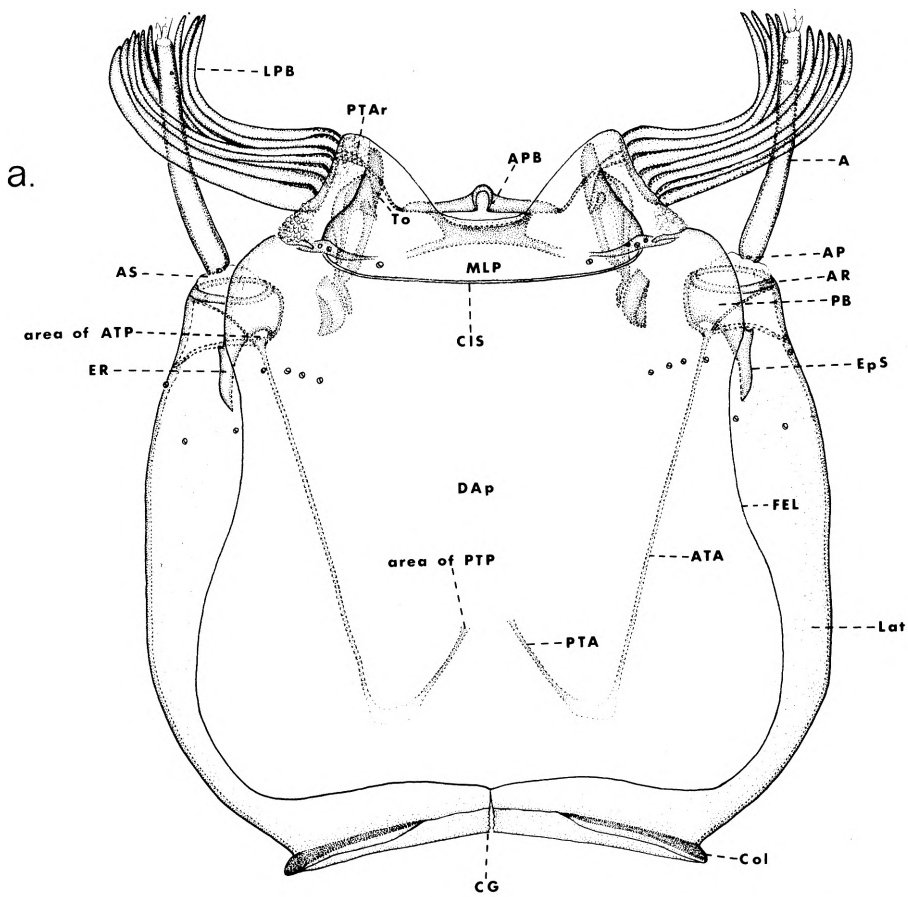


FIGURE 41

Toxorhynchites (Toxorhynchites) brevipalpis Theobald. Head of fourth stage larva. Alveoli shown but setae omitted. Eyes omitted.

- a. Distal aspect. Antennae omitted.
- b. Lateral aspect. Left section of head shown in a.
- c. Ental aspect of longitudinal section cut near midline.

Abbreviations

A	- antenna
APB	- anterior palatal bar
AR	- antennal ridge
AS	- antennal socket
ATA	- anterior tentorial arm
CIR	- clypeolabral ridge
CIS	- clypeolabral suture
Col	- collar
CPa	- cephalic papilla
CStr	- clypeolabral strap
DAP	- dorsal apotome
Dm	- dorsomentum
EpS	- epistomal suture
ER	- epistomal ridge
FEL	- frontal ecdysial line
HR	- hypostomal ridge
In	- intertorma
Lat	- lateralia
LG	- labiogula
Lh	- labiohypopharynx
LPB	- lateral palatal brush
LPP	- lateral palatal plate
MABa	- mandibular abductor apodeme
MB	- midpalatal brush
MLP	- median labral plate
Mn	- mandible
MPip	- maxillary palpus
Mx	- maxilla
PB	- postantennal buttress
Pc	- precoila
Pot	- postcoila
PTA	- posterior tentorial arm
PTAr	- palatal tessellated area
PTP	- posterior tentorial pit
Ptt	- posttorma
To	- torma
Vm	- ventromentum

Fig. 41

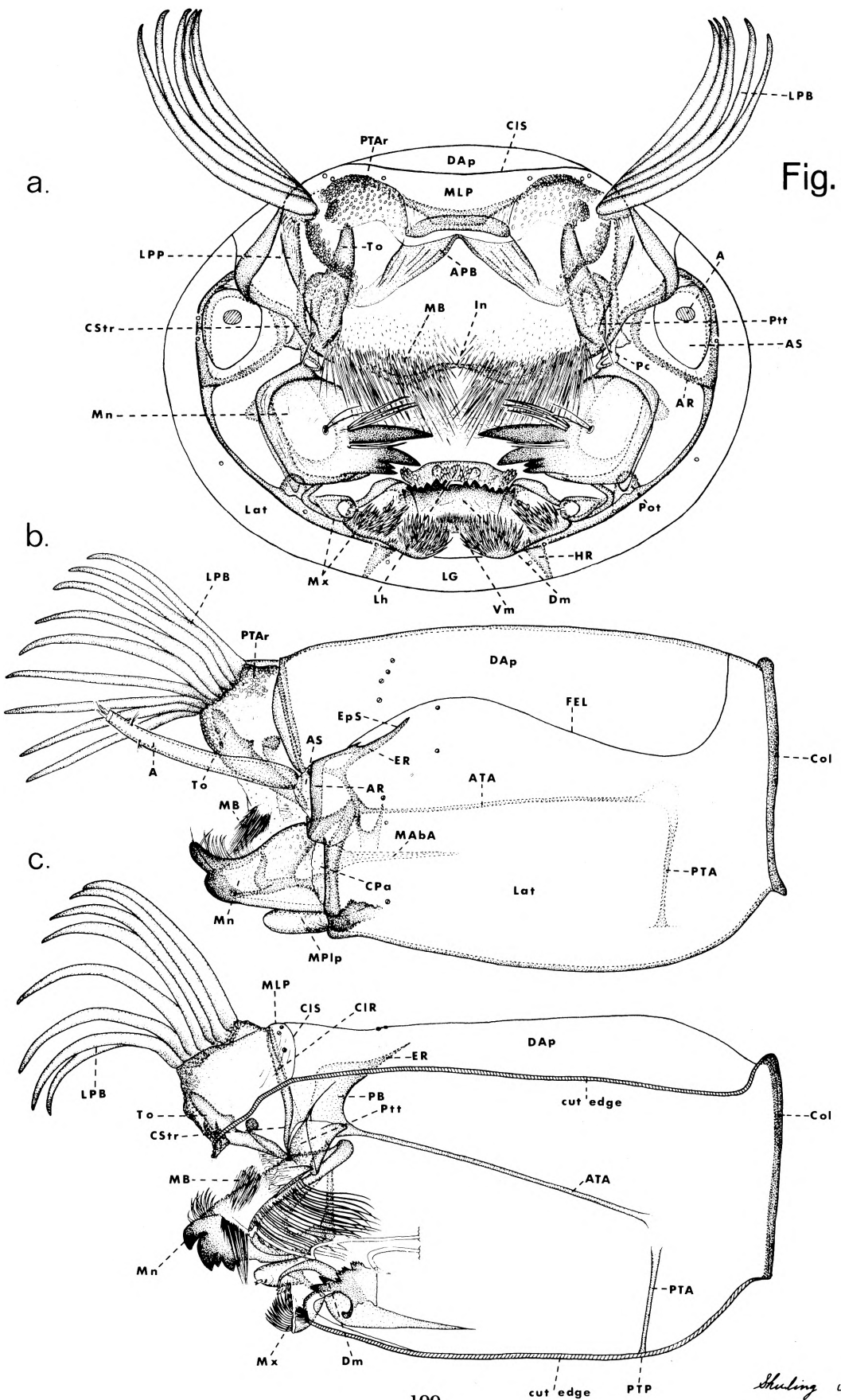


FIGURE 42

a,c,e. *Anopheles (Nyssorhynchus) albimanus* Wiedemann. Head of fourth stage larva.

b,d,f. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann). Head of fourth stage larva.

a,b. Lateral (left) aspect.

c,d. Dorsal aspect.

e,f. Ventral aspect.

Abbreviations

A	- antenna
APBr	- anteromedian palatal brush
APr	- antennal prominence
AS	- antennal socket
CG	- coronal gap
Col	- collar
Cv	- cervix
DAP	- dorsal apotome
Dm	- dorsomentum
EpS	- epistomal suture
FEL	- frontal ecdysial line
HEL	- hypocranial ecdysial line
HyS	- hypostomal suture
Lat	- lateralia
LG	- labiogula
LPB	- lateral palatal brush
MLP	- median labral plate
Mn	- mandible
MPIp	- maxillary palpus
Mx	- maxilla
PL	- paraclypeal lobe
PTP	- posterior tentorial pit
SSi	- subantennal suture
Vm	- ventromentum

Fig. 42

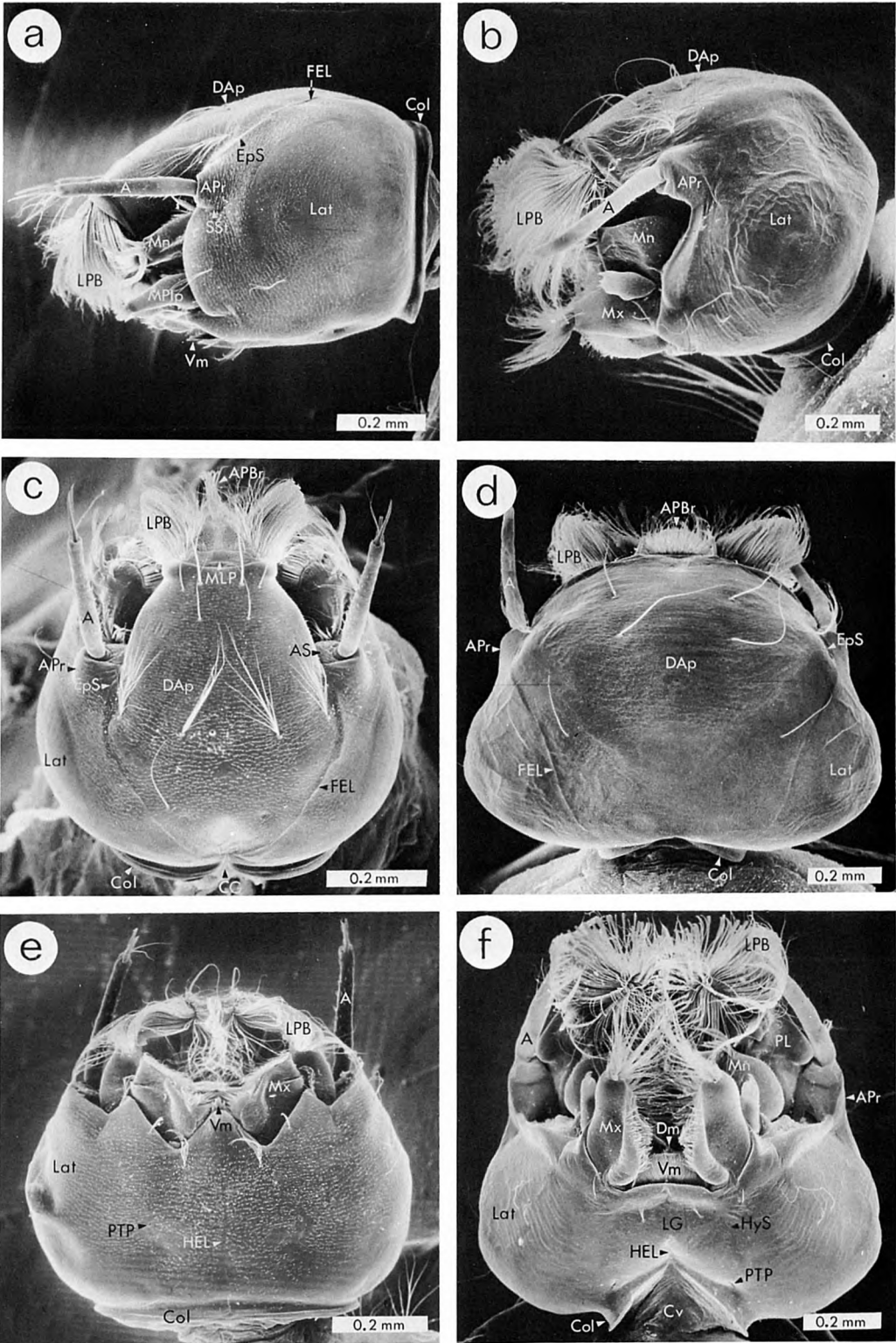


FIGURE 43

Distal aspects of heads of fourth stage larvae.

a. *Anopheles (Nyssorhynchus) albimanus* Wiedemann.

b. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann).

c. *Toxorhynchites (Toxorhynchites) brevivalpis* Theobald.

Abbreviations

A	- antenna
APBr	- anteromedian palatal brush
APr	- antennal prominence
AS	- antennal socket
CIS	- clypeolabral suture
DAP	- dorsal apotome
Dm	- dorsomentum
Lat	- lateralia
LPB	- lateral palatal brush
MB	- midpalatal brush
MLP	- median labral plate
Mn	- mandible
Mx	- maxilla
PTAr	- palatal tessellated area
SSt	- subantennal suture
Vm	- ventromentum

Fig. 43

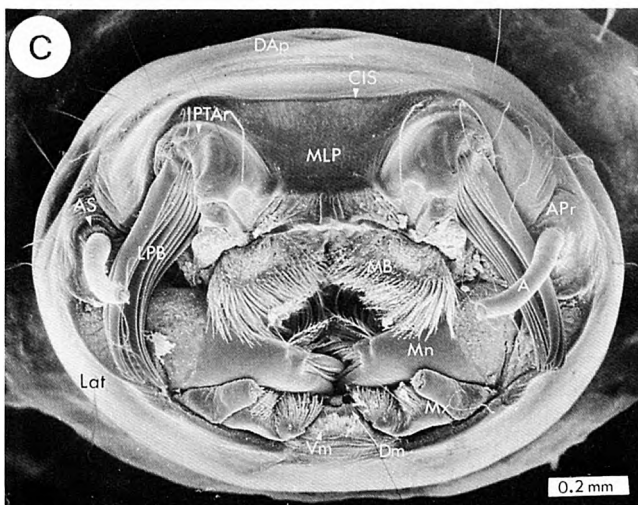
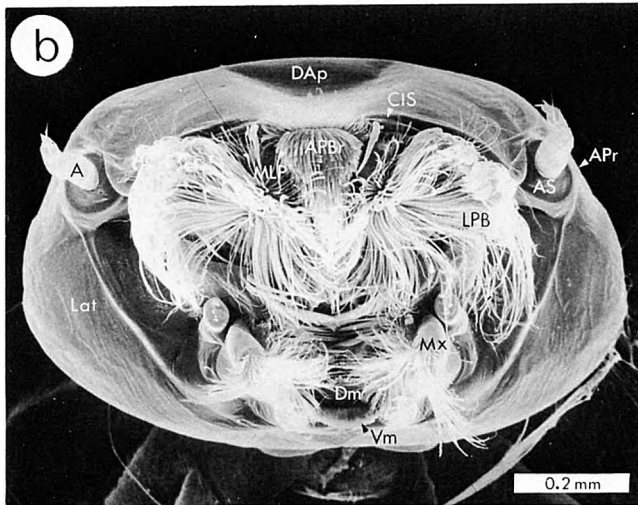
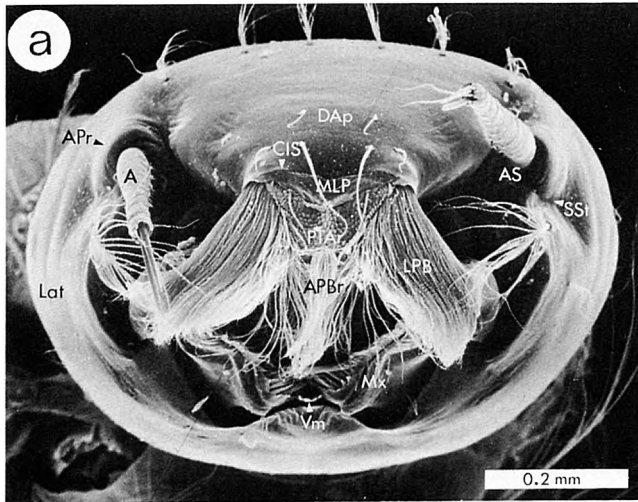


FIGURE 44

Aedes (Ochlerotatus) taeniorhynchus (Wiedemann). Head of fourth stage larva.

- a. Ventral aspect. Mandibles and maxillae removed.
- b. Ventral aspect of distal part. Maxillary bodies removed.

Abbreviations

A	- antenna
APBr	- anteromedian palatal brush
APr	- antennal prominence
AS	- antennal socket
ATA	- anterior tentorial arm
ATP	- anterior tentorial pit
CB	- cibarial bar
Col	- collar
Cp	- clypeopalatum
Cv	- cervix
Dm	- dorsomentum
HyS	- hypostomal suture
Lat	- lateralia
LG	- labiogula
Lp	- labropalatum
LPB	- lateral palatal brush
MB	- midpalatal brush
Mn	- mandible
MPIp	- maxillary palpus
PL	- paraclypeal lobe
PTP	- posterior tentorial pit
Ptt	- posttorma
To	- torma
Vm	- ventromentum
3	- seta 3-Lp

Fig. 44

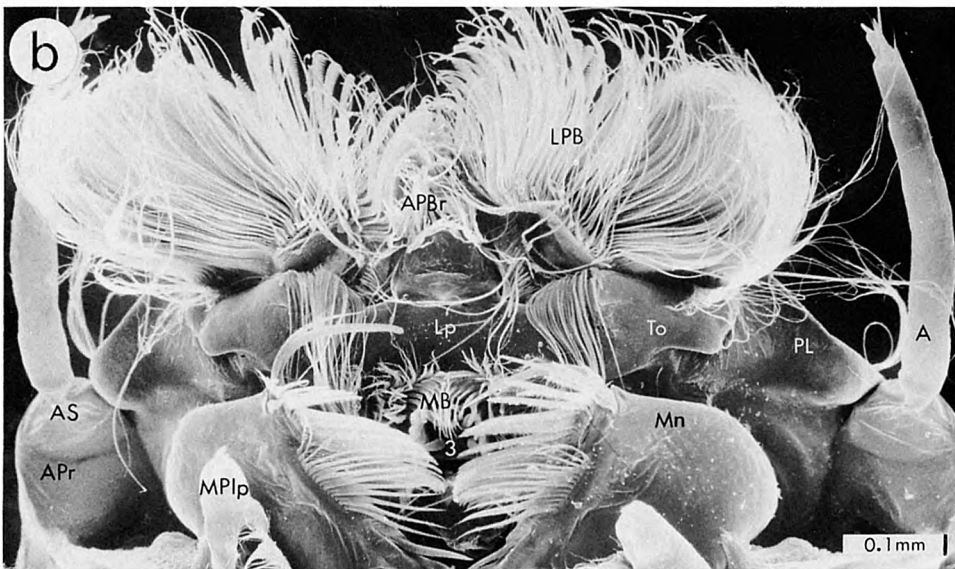


FIGURE 45

a,b. *Anopheles (Nyssorhynchus) albimanus* Wiedemann. Fourth stage larva.

a. Palatum. Ventral aspect.

b. Mesal surface of proximal part of antenna.

c. *Culex (Melanoconion) pilosus* (Dyar and Knab). Cephalic papilla of fourth stage larva.

d. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann). Fourth stage larva. Vesicles of dorsal apotome.

e,f. *Anopheles (Nyssorhynchus) albimanus* Wiedemann. Fourth stage larva.

e. Lateral (right) aspect of distal part of dorsal half of pharynx.

f. Dorsal aspect of ventral half of pharynx.

Abbreviations

APr	- antennal prominence
Cp	- clypeopalatum
CPa	- cephalic papilla
CStr	- clypeolabral strap
DOB	- dorsal oral brush
DOS	- dorsal oral sclerite
Es	- esophagus
Fl	- flagellum
LOB	- lateral oral bar
Lp	- labropalatum
LPB	- lateral palatal brush
LPP	- lateral palatal plate
MB	- midpalatal brush
MDPhS	- mediodorsal pharyngeal sclerite
Mn	- mandible
MPIp	- maxillary palpus
MVPhS	- medioventral pharyngeal sclerite
PDF	- primary dorsal fringe
Pe	- pedicel
PL	- paraclypeal lobe
Ptt	- posttorma
PVF	- primary ventral fringe
Sc	- scape
SVF	- secondary ventral fringe
To	- torma
v	- vesicle
VOB	- ventral oral brush
VOF	- ventral oral fringe

Fig. 45

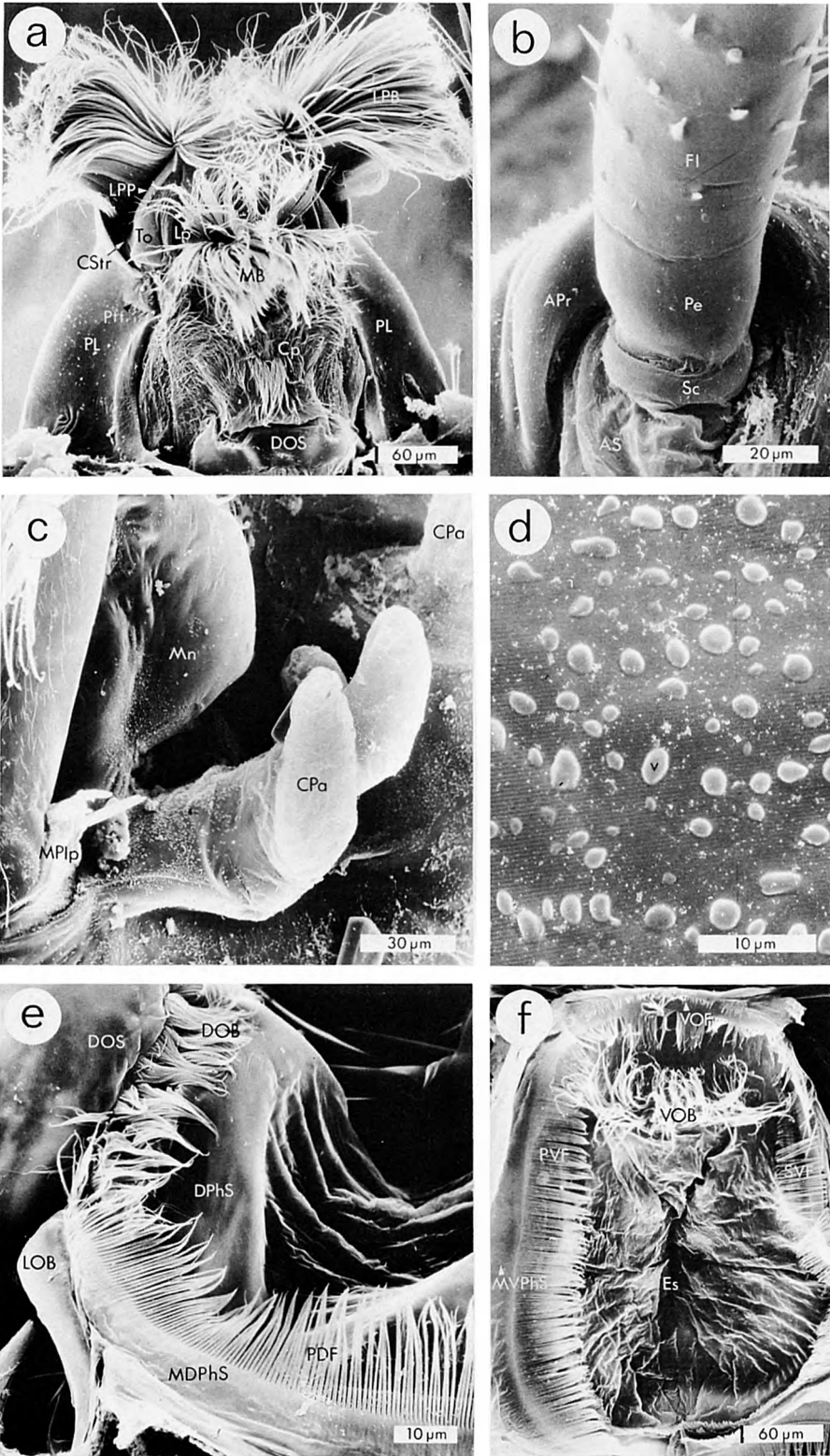


FIGURE 46

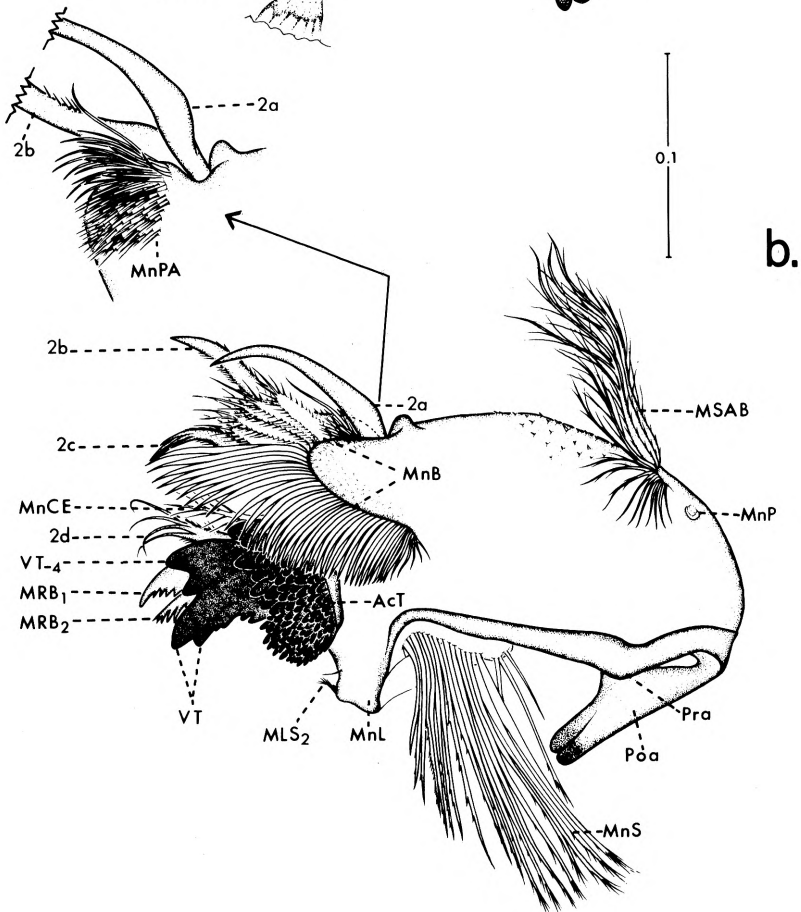
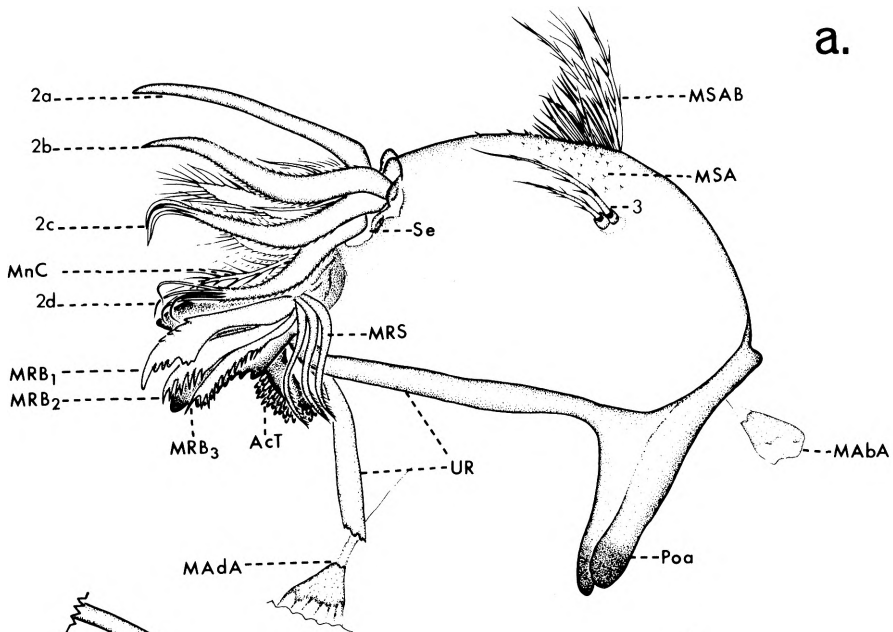
Anopheles (Anopheles) crucians Wiedemann. Mandible of fourth stage larva.

- a. Ventral aspect of left mandible.
- b. Dorsal aspect of right mandible.

Abbreviations

AcT	- accessory teeth
MAbA	- mandibular abductor apodeme
MAdA	- mandibular adductor apodeme
MLS₂	- mandibular lobe spicules 2
MnB	- mandibular brush
MnCS	- mandibular comb spicule
MnL	- mandibular lobe
MnP	- mandibular puncture
MnPA	- mandibular pilose area
MnS	- mandibular sweeper
MRB₁	- mandibular rake blade 1
MRB₂	- mandibular rake blade 2
MRB₃	- mandibular rake blade 3
MRS	- mandibular rake spicule
MSA	- mandibular spiculate area
MSAB	- mandibular spiculate area brush
Poa	- postartis
Pra	- preartis
Se	- sella
UR	- U-shaped rod
VT	- ventral teeth
VT₄	- ventral tooth -4
2a	- seta 2a-Mn
2b	- seta 2b-Mn
2c	- seta 2c-Mn
2d	- seta 2d-Mn
3	- seta 3-Mn

Fig. 46



C. Chang

FIGURE 47

Culex (Culex) pipiens quinquefasciatus Say. Mandible of fourth stage larva.

- a. Ventral aspect of left mandible.
- b. Dorsal aspect of right mandible.

Abbreviations

ArT	- arcuate thickening
L	- labula
MAbA	- mandibular abductor apodeme
MAdA	- mandibular adductor apodeme
MLS₁	- mandibular lobe spicules 1
MLS₂	- mandibular lobe spicules 2
MLS₃	- mandibular lobe spicules 3
MLS₄	- mandibular lobe spicules 4
MLS₅	- mandibular lobe spicules 5
MnB	- mandibular brush
MnC	- mandibular comb
MnL	- mandibular lobe
MnP	- mandibular puncture
MnPA	- mandibular pilose area
MnR	- mandibular rake
MnS₁	- mandibular sweeper 1
MnS₂	- mandibular sweeper 2
MnT	- mandibular teeth
MRB₁	- mandibular rake blade 1
MRS	- mandibular rake spicule
MSA	- mandibular spiculose area
Poa	- postartis
Pra	- preartis
So	- sella
UR	- U-shaped rod
VR	- V-shaped ridge
2a	- seta 2a-Mn
2b	- seta 2b-Mn
2c	- seta 2c-Mn
2d	- seta 2d-Mn
2e	- seta 2e-Mn

Fig. 47

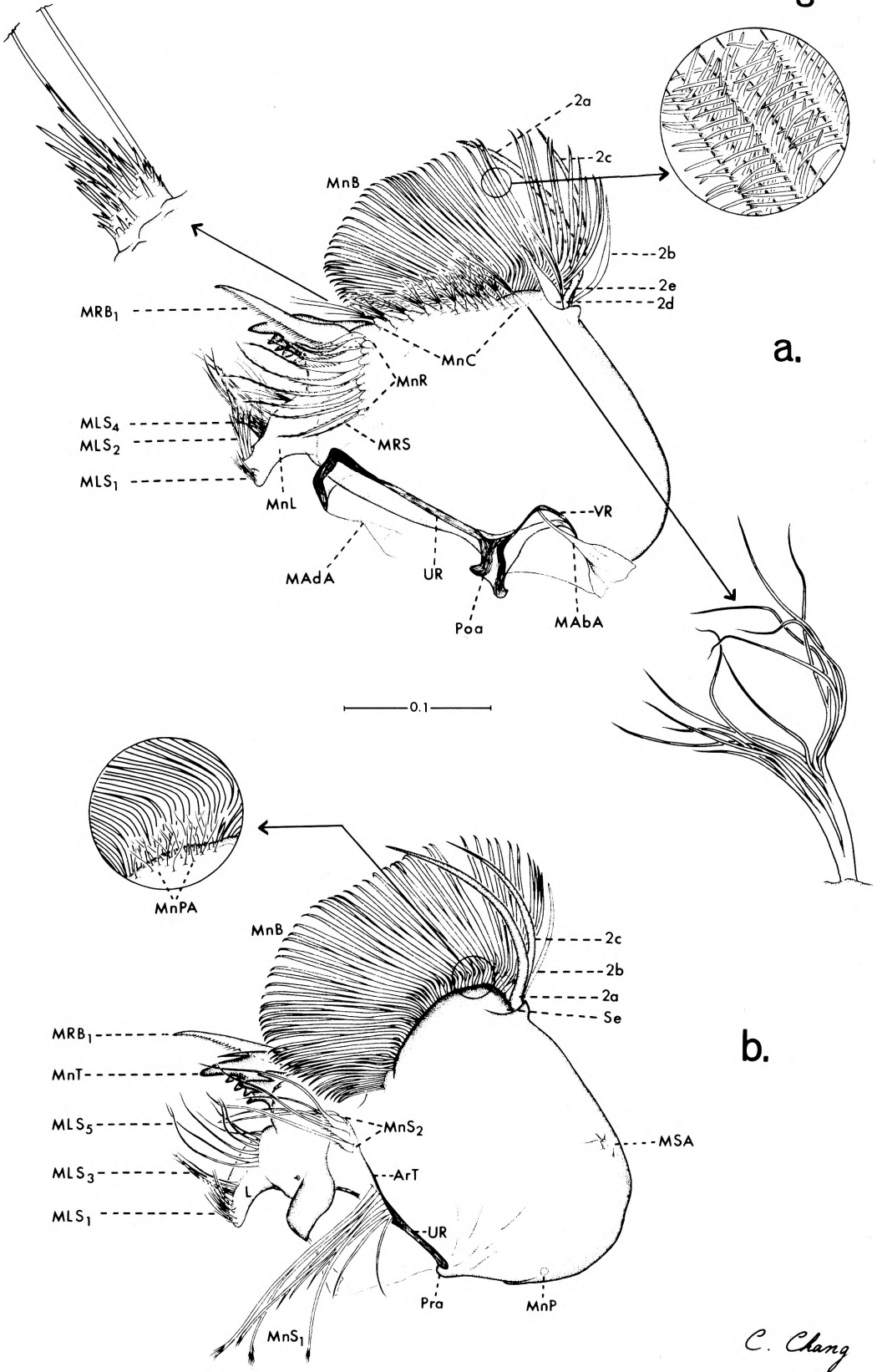


FIGURE 48

Toxorhynchites (Toxorhynchites) brevipalpis Theobald. Mandible of fourth stage larva.

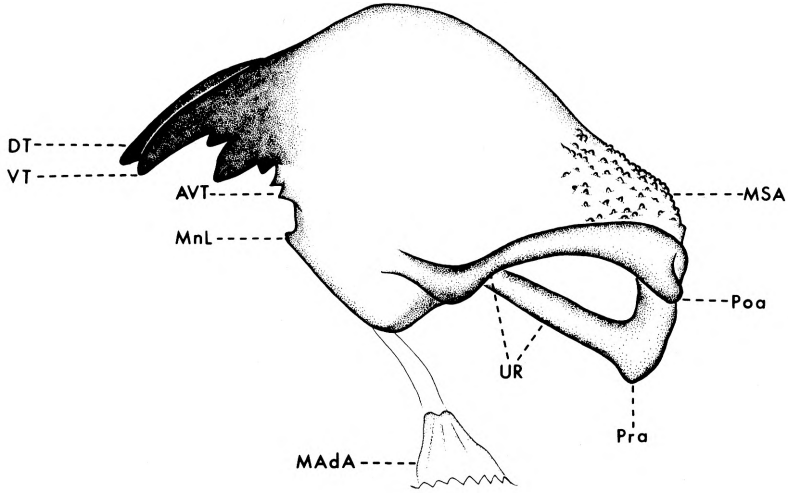
- a. Ventral aspect of left mandible.
- b. Dorsal aspect of right mandible.

Abbreviations

AVT	- auxiliary ventral tooth
DT	- dorsal tooth
MAbA	- mandibular abductor apodeme
MAdA	- mandibular adductor apodeme
MnB	- mandibular brush
MnL	- mandibular lobe
MnP	- mandibular puncture
MnS	- mandibular sweeper
MSA	- mandibular spiculate area
Poa	- postartis
Pra	- preartis
UR	- U-shaped rod
VT	- ventral teeth
2	- setae 2-Mn

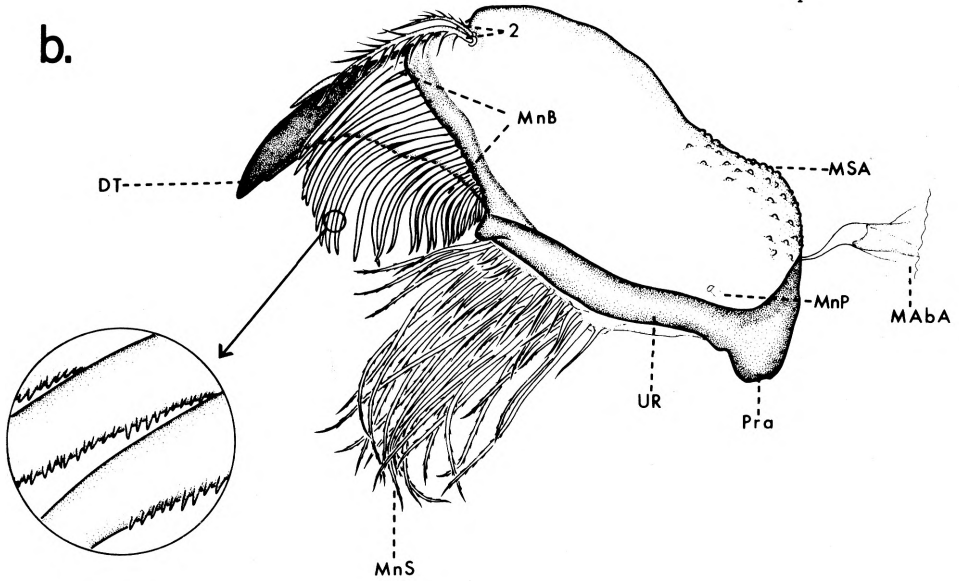
Fig. 48

a.



0.2

b.



C. Chang

FIGURE 49

- a,b. *Anopheles (Anopheles) crucians* Wiedemann. Left mandible of fourth stage larva.
a. Dorsal aspect.
b. Ventral aspect.
- c,d. *Culex (Culex) pipiens quinquefasciatus* Say. Right mandible of fourth stage larva.
c. Ventral aspect.
d. Dorsal aspect.
- e,f. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Right mandible of fourth stage larva.
e. Ventral aspect.
f. Dorsal aspect.

Abbreviations

AVT	- auxiliary ventral tooth
DT	- dorsal teeth
L	- labula
MLS ₁	- mandibular lobe spicules 1
MLS ₂	- mandibular lobe spicules 2
MLS ₃	- mandibular lobe spicules 3
MLS ₄	- mandibular lobe spicules 4
MLS ₅	- mandibular lobe spicules 5
MnB	- mandibular brush
MnC	- mandibular comb
MnL	- mandibular lobe
MnP	- mandibular puncture
MnPA	- mandibular pilose area
MnR	- mandibular rake
MnS	- mandibular sweeper
MnS ₁	- mandibular sweeper 1
MnS ₂	- mandibular sweeper 2
MSA	- mandibular spiculose area
MSAB	- mandibular spiculose area brush
Poa	- postartis
Pra	- preartis
Se	- sella
UR	- U-shaped rod
VT	- ventral teeth
VT ₋₄	- ventral tooth -4
2	- setae 2-Mn
2e	- seta 2e-Mn
3	- seta 3-Mn
4	- seta 4-Mn

Fig. 49

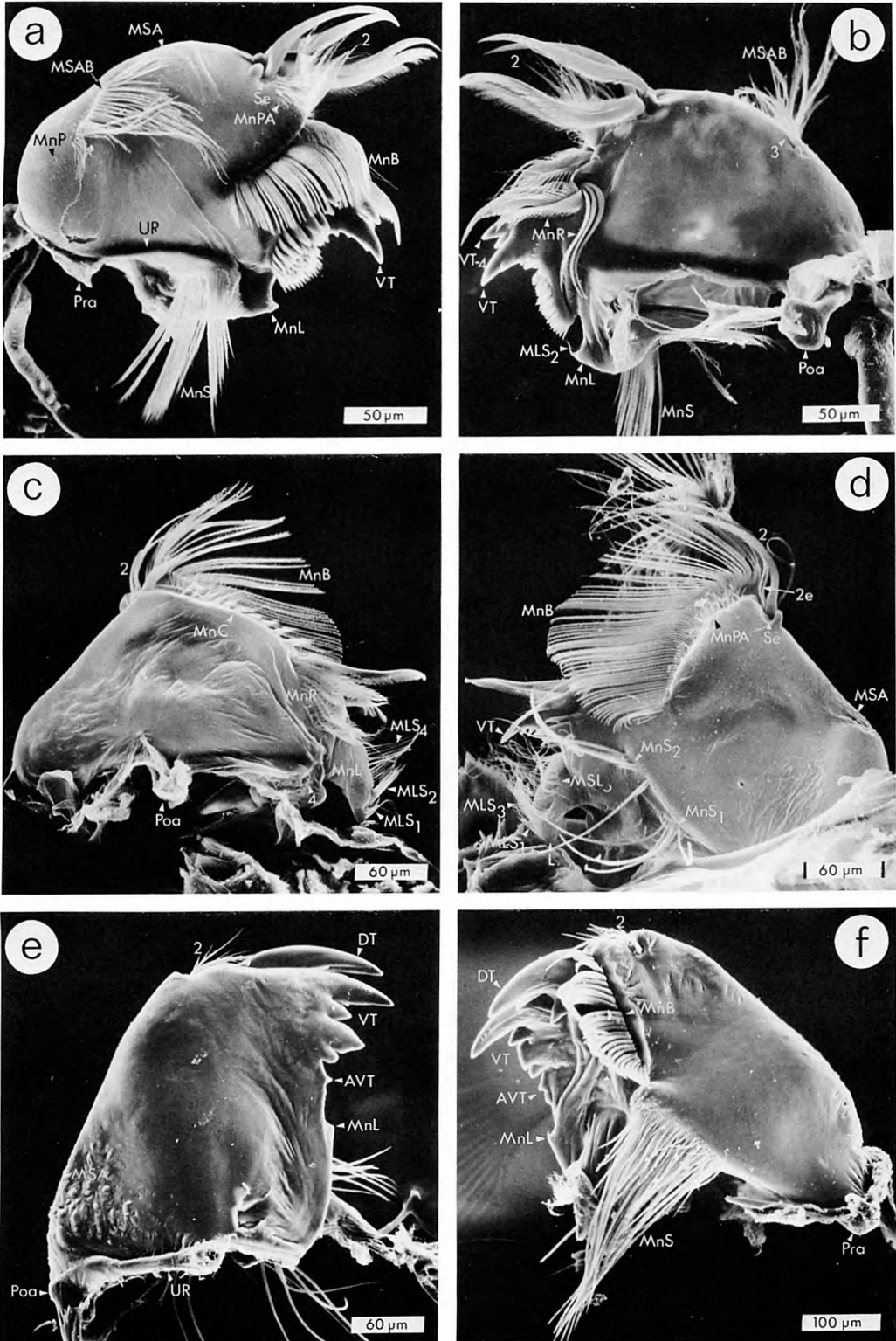


FIGURE 50

a,b. *Culex (Culex) pipiens quinquefasciatus* Say. Mandibular teeth of fourth stage larva.

a. Ventral aspect.

b. Dorsal aspect.

c,d. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann). Mandibular teeth of fourth stage larva.

c. Ventral aspect.

d. Dorsal aspect.

e. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Anteroventral aspect of mandibular teeth of fourth stage larva.

f,g. *Anopheles (Anopheles) crucians* Wiedemann. Mandibular teeth of fourth stage larva.

f. Ventral aspect.

g. Dorsal aspect.

Abbreviations


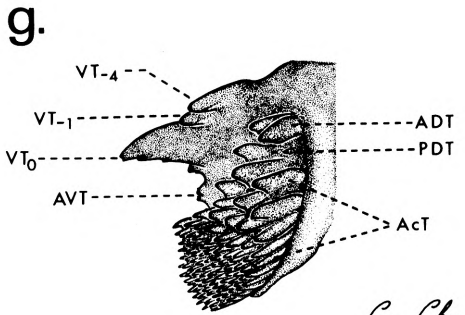
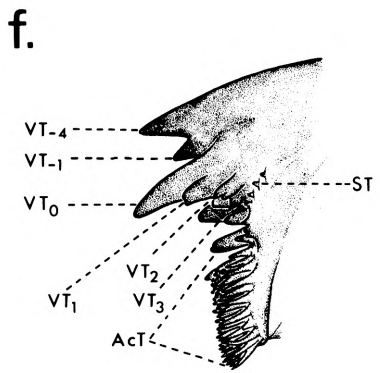
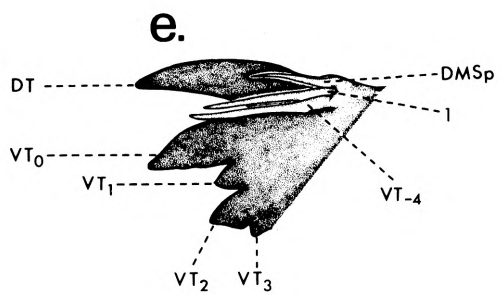
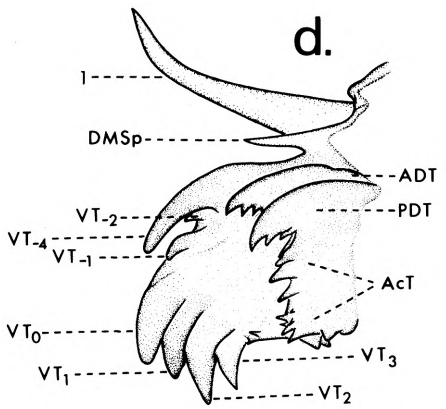
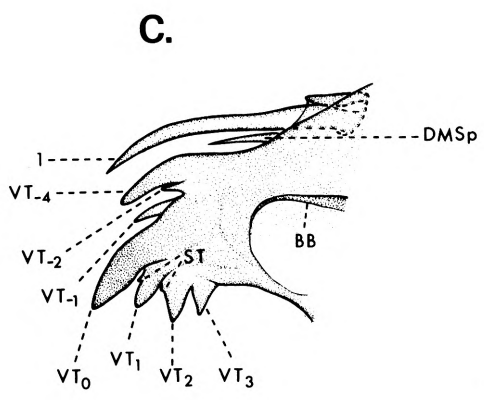
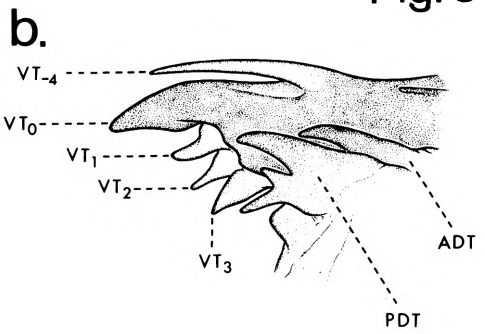
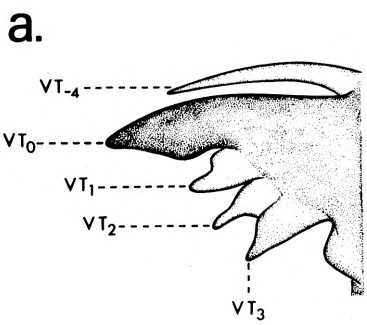
AcT	- accessory teeth
ADT	- anterior dorsal tooth
AVT	- auxiliary ventral tooth
BB	- basal band (mandibular rake omitted)
DMSp	- dorsal mandibular spine
DT	- dorsal tooth
 PDt	- posterior dorsal tooth
ST	- subdental tubercle
VT₀	- ventral tooth 0
VT₁	- ventral tooth 1
VT₂	- ventral tooth 2 (bicuspid in <i>An. crucians</i>)
VT₃	- ventral tooth 3
VT₋₁	- ventral tooth -1
VT₋₂	- ventral tooth -2
VT₋₄	- ventral tooth -4
1	- seta 1-Mn

Fig. 50



C. Chang

FIGURE 51

Anopheles (Anopheles) crucians Wiedemann. Maxilla of fourth stage larva.

- a. Ventral aspect of left maxilla.
- b. Dorsal aspect of right maxilla.

Abbreviations

Cd	- cardo
DMxS	- dorsal maxillary suture
GI	- galea
GSF	- galeastipital fissure
LR₁	- laciniarastrum 1
LR₂	- laciniarastrum 2
LR₃	- laciniarastrum 3
LSE	- laciniastipital expansion
MPIp	- maxillary palpus
MPS	- maxillary palpal spicules
MxB	- maxillary brush
MxBo	- maxillary body
MxPA	- maxillary pilose area
RPat	- rod of parartis
SAr	- stipital arm
1-14	- setae 1- to 14-Mx

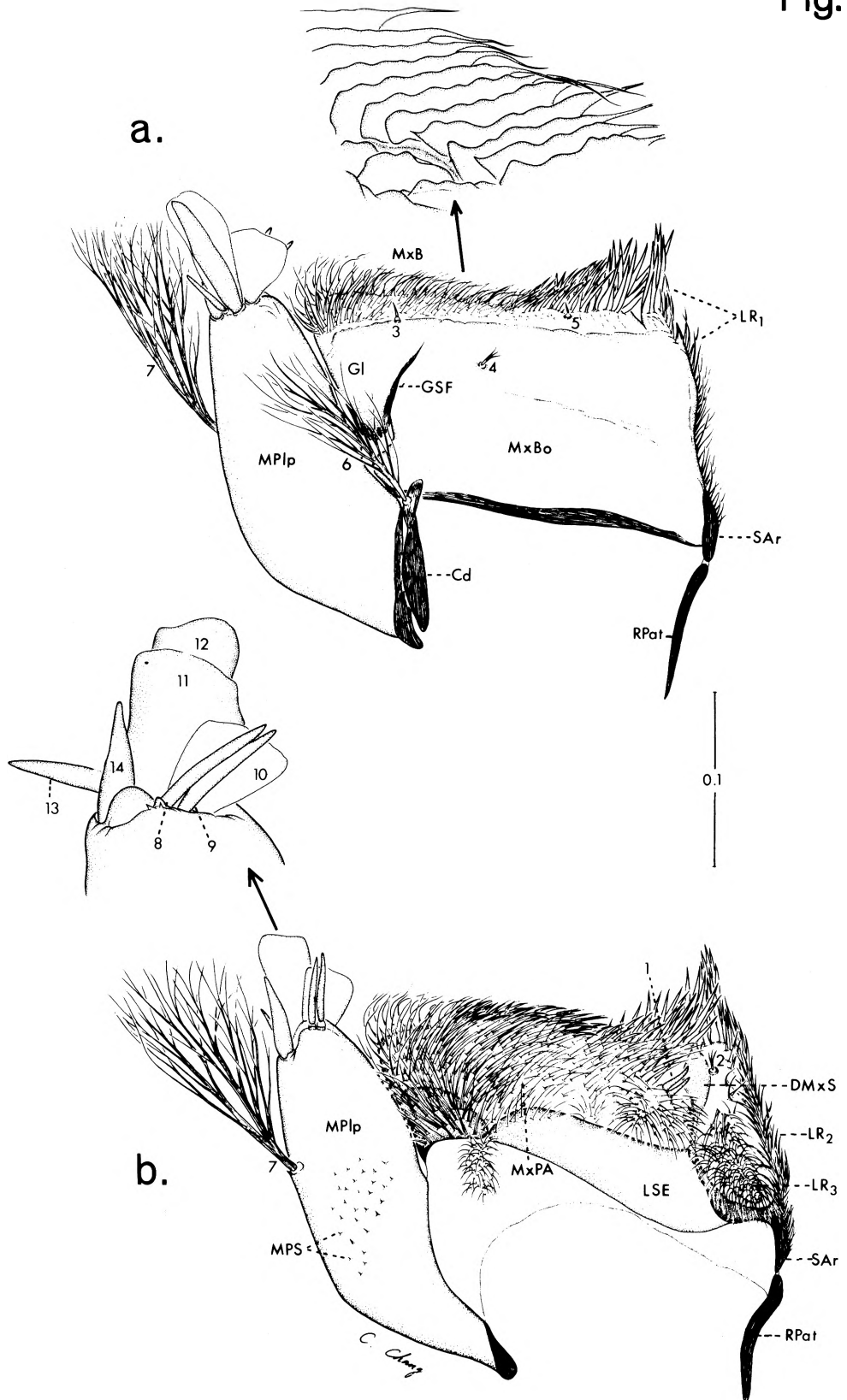


FIGURE 52

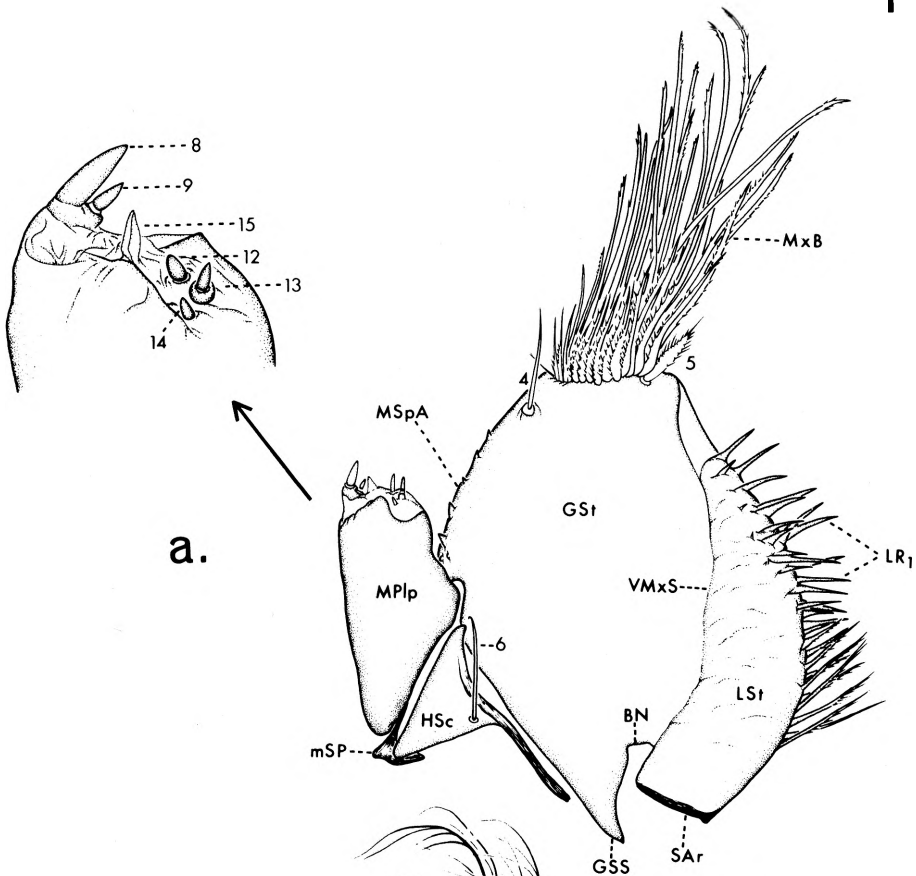
Aedes (Ochlerotatus) taeniorhynchus (Wiedemann). Maxilla of fourth stage larva.

- a. Ventral aspect of right maxilla.
- b. Dorsal aspect of left maxilla.

Abbreviations

BN	- basal notch
Cd	- cardo
DMxS	- dorsal maxillary suture
GSS	- galeastipital stem
GSt	- galeastipes
LR₁	- laciniarastrum 1
LR₂	- laciniarastrum 2
LR₃	- laciniarastrum 3
LSE	- laciniastipital expansion
LSt	- laciniastipes
MPip	- maxillary palpus
mSP	- merostipital process
MSpA	- maxillary spiculate area
MxB	- maxillary brush
MxPa	- maxillary pilose area
SAr	- stipital arm
VMxS	- ventral maxillary suture
1-15	- setae 1- to 15-Mx (setae 7-, 10- and 11-Mx not present; seta 15-Mx housed in the structure indicated)

Fig. 52



b.

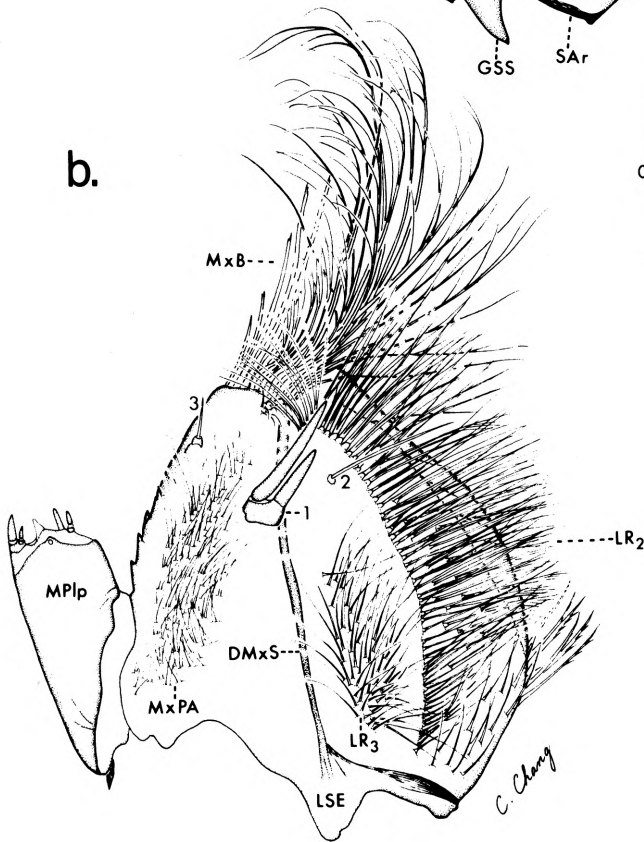


FIGURE 53

Toxorhynchites (Toxorhynchites) brevipalpis Theobald. Maxilla of fourth stage larva.

- a. Ventral aspect of left maxilla.
- b. Dorsal aspect of right maxilla.

Abbreviations

DMxS	- dorsal maxillary suture
LR₁	- laciniarastrum 1
LR₂	- laciniarastrum 2
MPIp	- maxillary palpus
MPS	- maxillary palpal spicule
MxB	- maxillary brush
MxBo	- maxillary body
Pat	- parartis
SAr	- stipital arm
1	- seta 1-Mx
2	- seta 2-Mx
4	- seta 4-Mx
5	- seta 5-Mx
8	- seta 8-Mx
9	- seta 9-Mx
12	- seta 12-Mx
13	- seta 13-Mx

Fig.53

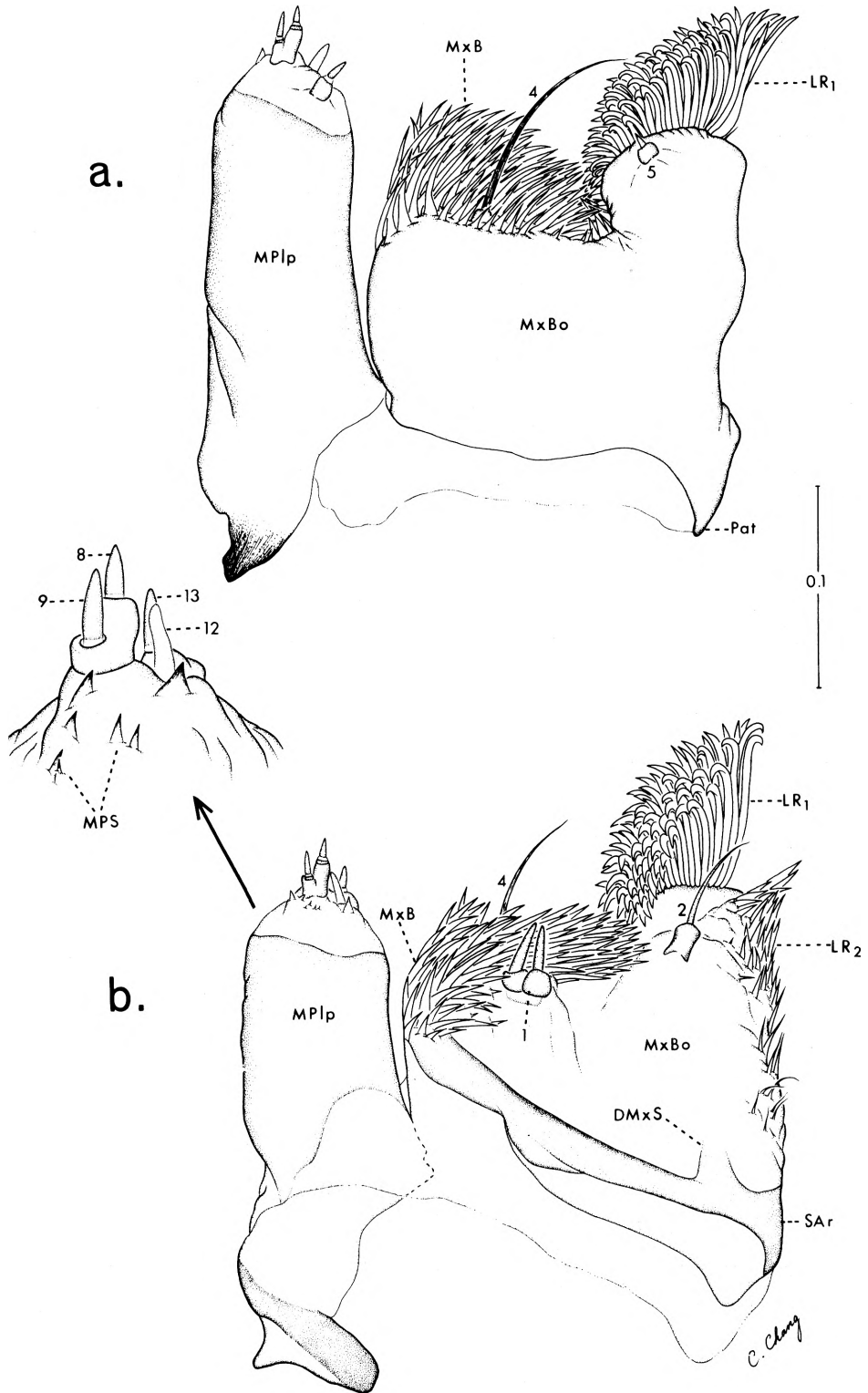


FIGURE 54

a,b. *Anopheles (Anopheles) crucians* Wiedemann. Right maxilla of fourth stage larva.

- a. Dorsal aspect.
- b. Ventral aspect.

c,d. *Opifex fuscus* Hutton. Left maxilla of fourth stage larva.

- a. Dorsal aspect.
- b. Ventral aspect.

e,f. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Maxillae of fourth stage larva.

- e. Dorsal aspect of right maxilla.
- f. Ventral aspect of left maxilla.

Abbreviations

Cd	- cardo
DMxS	- dorsal maxillary suture
Gl	- galea
GSF	- galeastipital fissure
GSS	- galeastipital stem
GSt	- galeastipes
LR₁	- laciniarastrum 1
LR₂	- laciniarastrum 2
LR₃	- laciniarastrum 3
LSE	- laciniastipital expansion
LSt	- laciniastipes
MPIp	- maxillary palpus
MPS	- maxillary palpal spicule
mSS	- merostipital sclerite
MxB	- maxillary brush
MxBo	- maxillary body
MxPA	- maxillary pilose area
Pat	- parartis
RPat	- rod of parartis
VMxS	- ventral maxillary suture
1	- seta 1-Mx
2	- seta 2-Mx
4	- seta 4-Mx
5	- seta 5-Mx
6	- seta 6-Mx

Fig. 54

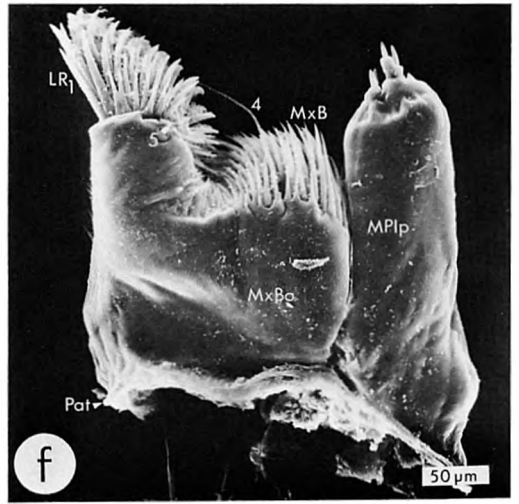
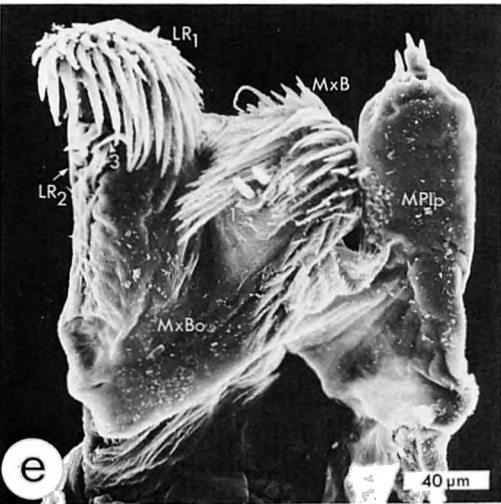
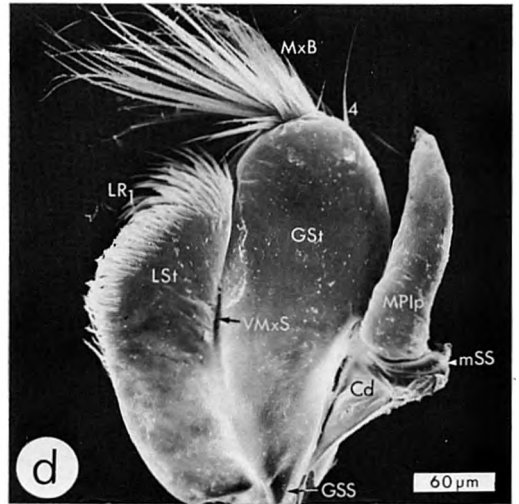
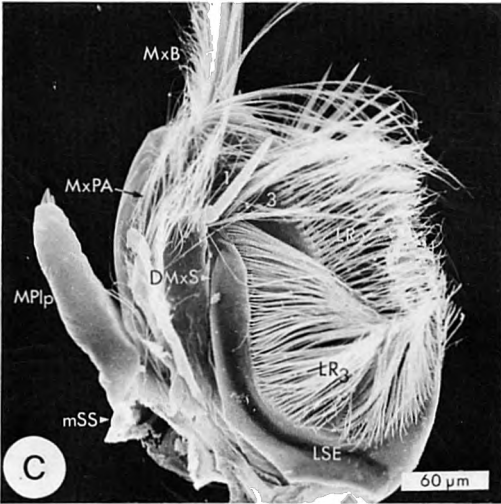
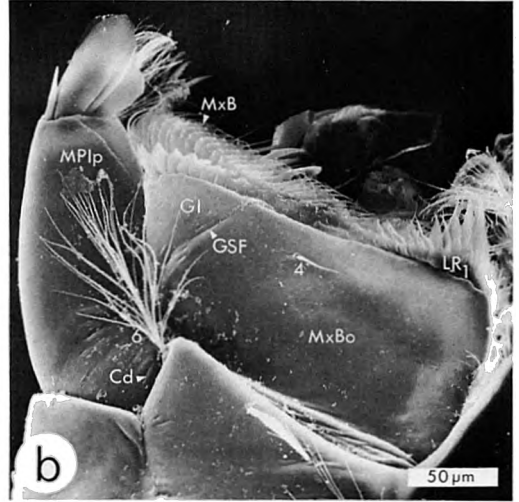
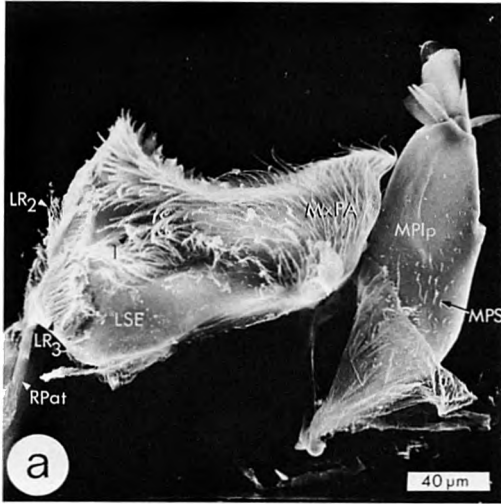


FIGURE 55

Anopheles (Nyssorhynchus) albimanus Wiedemann. Labiohypopharynx of fourth stage larva.

- a. Anterior aspect.
- b. Lateral (right) aspect.

Abbreviations

CB	- cibarial bar
DRa	- dorsal ramus
Hy	- hypopharynx
Lg	- ligula
LP	- labial palpus
LPT	- lateral premental teeth
MRa	- median ramus
PCP	- premental cordate process
pLb	- prelabium
PM	- premental mala
PRT	- premental ridge teeth
SM	- salivary meatus
VPSp	- ventral premental spicules
VRa	- ventral ramus
1-6	- setae 1- to 6-Lh

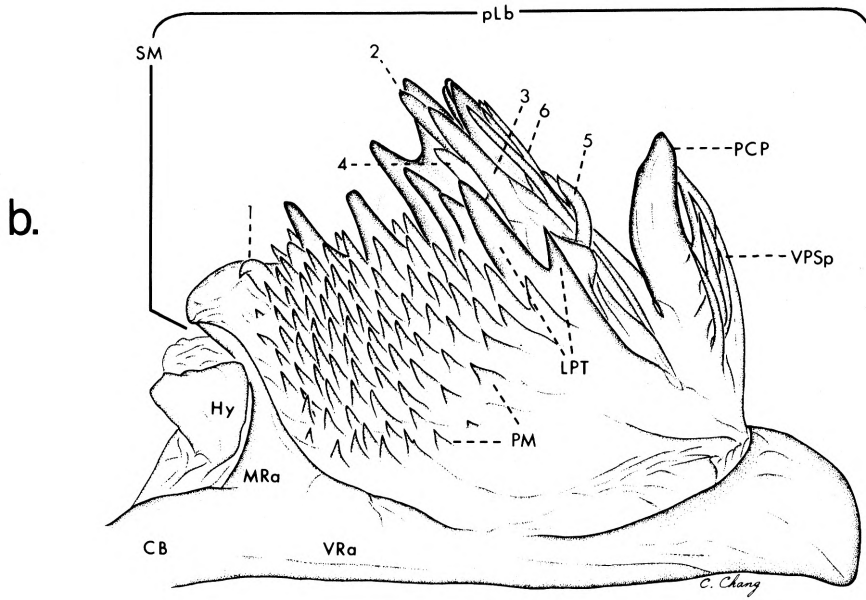
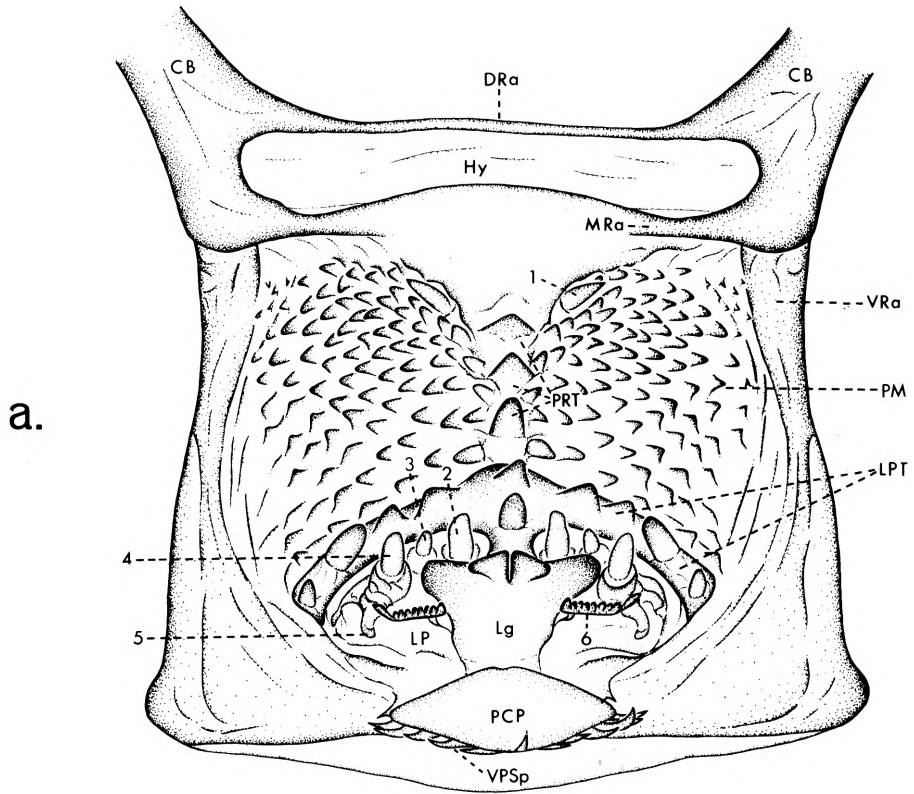


FIGURE 56

a,b. *Aedes (Ochlerotatus) canadensis* (Theobald). Labiohypopharynx of fourth stage larva.

a. Anterior aspect.

b. Lateral (right) aspect.

c. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Anterior aspect of labiohypopharynx of fourth stage larva.

Abbreviations

CB	- cibarial bar
DRa	- dorsal ramus
Hy	- hypopharynx
HyB	- hypopharyngeal bar
Lg	- ligula
LP	- labial palpus
LPSp	- lateral premental spicules
LPT	- lateral premental teeth
LPT₁	- lateral premental teeth 1
LPT₂	- lateral premental teeth 2
LPT₃	- lateral premental teeth 3
MRa	- median ramus
PCu	- premental cusps
PDA	- premental dental arch
pLb	- prelabium
PLT	- prementoligular teeth
SM	- salivary meatus
VPSp	- ventral premental spicules
VRa	- ventral ramus
1-5	- setae 1- to 5-Lh

Fig. 56

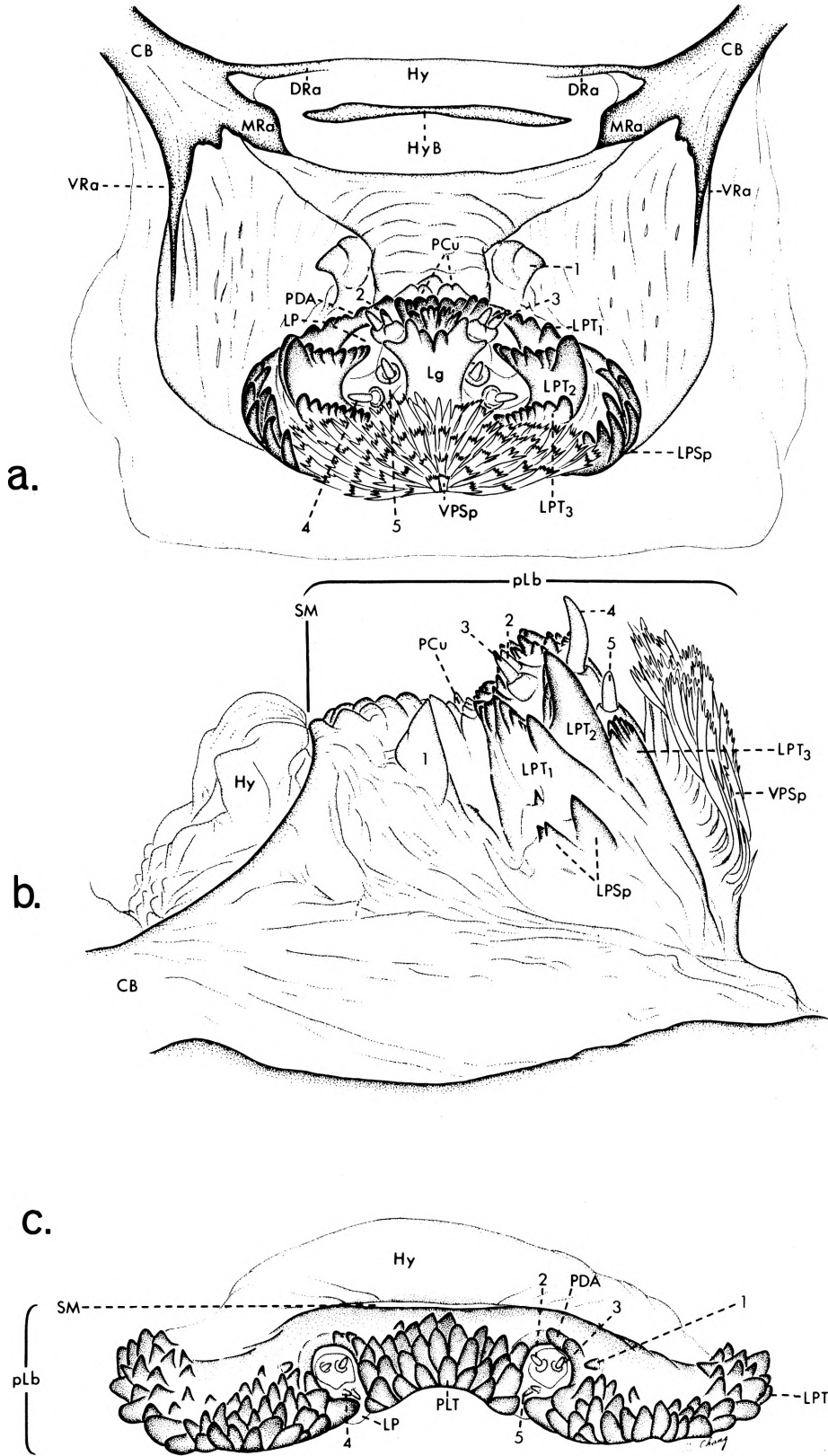


FIGURE 57

Anterior aspects of labiohypopharynges of fourth stage larvae.

- a. *Bironella (Brugella) hollandi* Taylor.
- b. *Opifex fuscus* Hutton.
- c. *Aedes (Ochlerotatus) canadensis* (Theobald).
- d. *Limatus durhamii* Theobald.
- e. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.

Abbreviations

Hy	- hypopharynx
Lg	- ligula
Ln	- lingua
LP	- labial palpus
LPSp	- lateral premental spicules
LPT	- lateral premental teeth
LPT₁	- lateral premental teeth 1
LPT₂	- lateral premental teeth 2
LPT₃	- lateral premental teeth 3
PCP	- premental cordate process
PCu	- premental cusps
PDA	- premental dental arch
PLT	- prementoligular teeth
PM	- premental mala
PRT	- premental ridge teeth
SI	- superlingua
SM	- salivary meatus
VPSp	- ventral premental spicules
1-6	- setae 1- to 6-Lh

Fig. 57

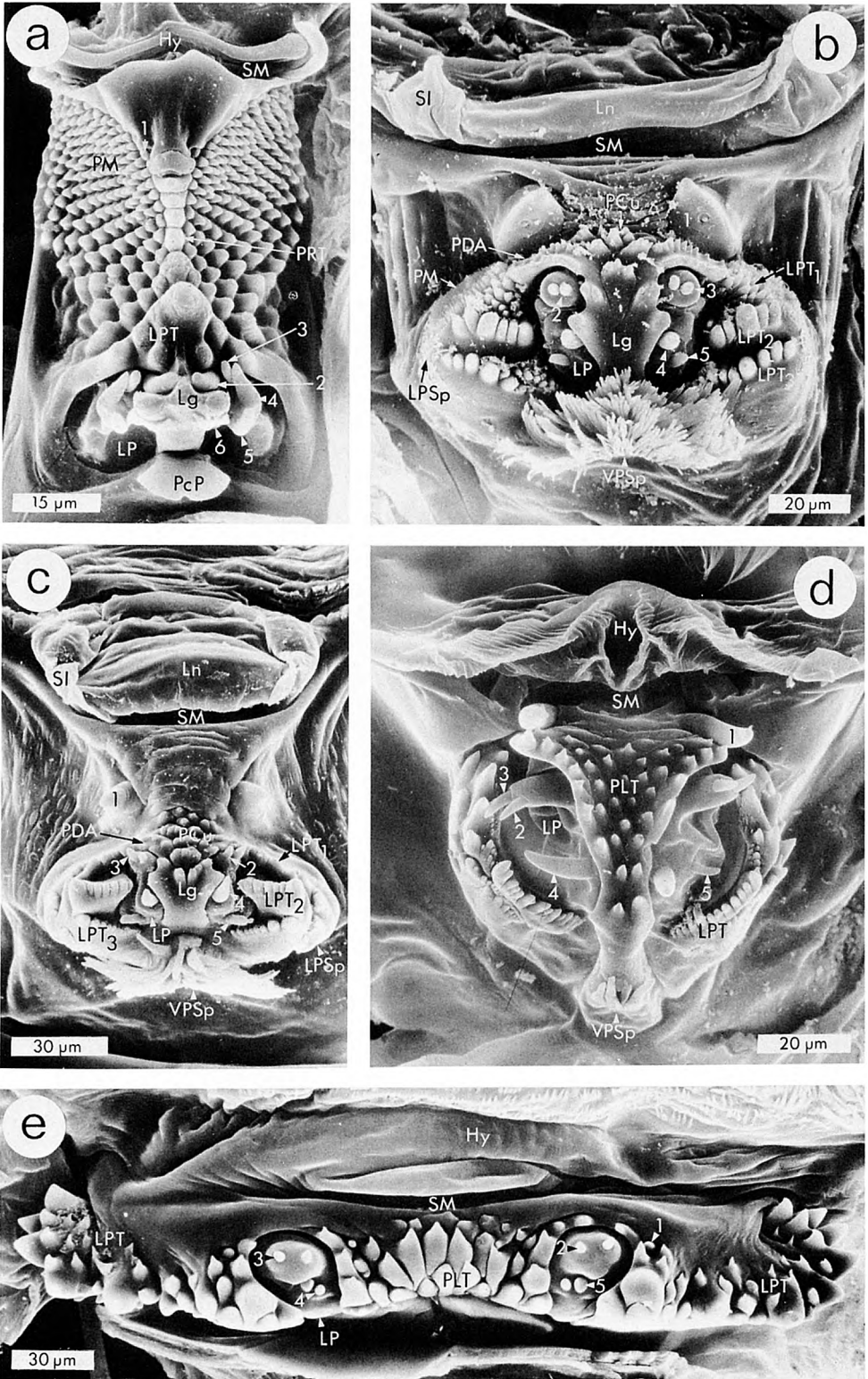


FIGURE 58

a-c. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann). Pharynx of fourth stage larva.

a. Ventral aspect of dorsal half of pharynx.

b. Dorsal aspect of ventral half of pharynx.

c. Interolateral aspect of the ventral pharyngeal fringes at position of arrow in b when pharynx is expanded.

d. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Dorsal aspect of ventral part of the pharynx with attached labiohypopharynx of fourth stage larva.

Abbreviations

CB	- cibarial bar
DOB	- dorsal oral brush
DOS	- dorsal oral sclerite
DPhS	- dorsal pharyngeal sclerite
LDPhS	- laterodorsal pharyngeal sclerite
Lh	- labiohypopharynx
LOB	- lateral oral bar
LVPhS	- lateroventral pharyngeal sclerite
MDPhS	- mediodorsal pharyngeal sclerite
MVPhS	- medioventral pharyngeal sclerite
OSp	- oral spicules
PDF	- primary dorsal fringe
PVF	- primary ventral fringe
SDF	- secondary dorsal fringes
SVF	- secondary ventral fringes
VOB	- ventral oral brush
VOF	- ventral oral fringe
VOS	- ventral oral sclerite
VPhS	- (area of) ventral pharyngeal sclerite
1	- seta 1-Mo

Fig. 58

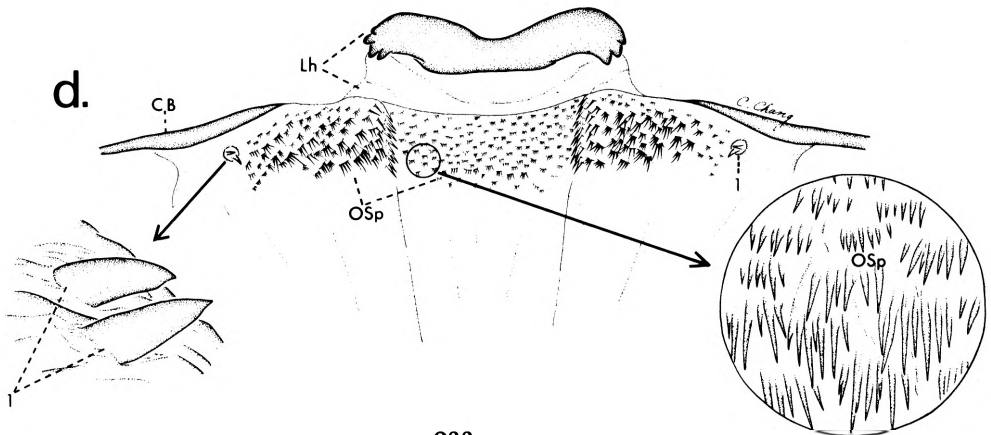
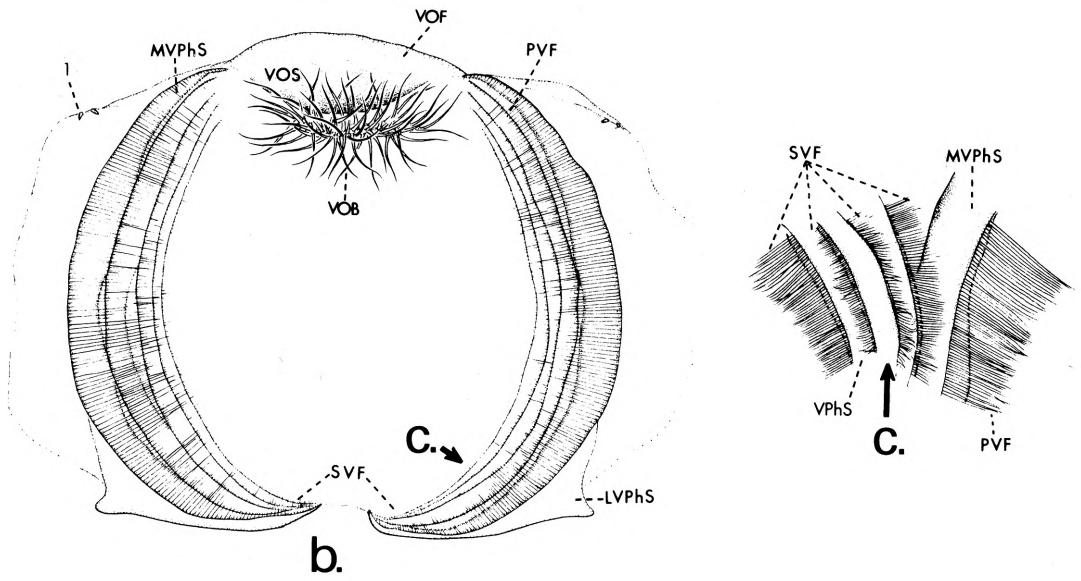
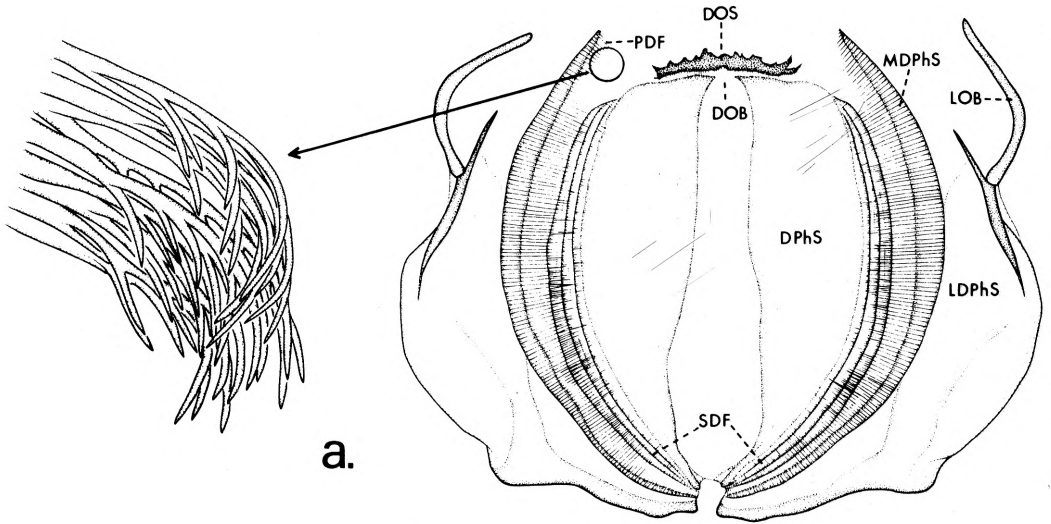


FIGURE 59

a-d. *Anopheles (Anopheles) crucians* Wiedemann. Fourth stage larva.

- a. Dorsal and ventral aspects of thorax and abdominal segments I-VI.
- b. Lateral (left) aspect of abdominal segments VII, VIII and X.
- c. Dorsal aspect of spiracular apparatus.
- d. Lateral (left) aspect of pecten, pecten plate and spiracular apparatus.

e. *Anopheles (Cellia) stephensi* Liston. Dorsal aspect of left Nuttall and Shipley's organ of fourth stage larva.

Abbreviations

AMPc	- anterior median process
APP	- anal papilla
ASL	- anterior spiracular lobe
ASLP'	- anterior spiracular lobe plate I
ASLP''	- anterior spiracular lobe plate II
ATP	- accessory tergal plate
G	- grid
LSL	- anterolateral spiracular lobe
LSLP'	- anterolateral spiracular lobe plate I
LSLP''	- anterolateral spiracular lobe plate II
M	- mesothorax
MATP	- median accessory tergal plate
MdP	- median plate
NSG	- Nuttall and Shipley's organ
P	- prothorax
PP	- pecten plate
PS	- pecten spine
PSL	- posterolateral spiracular lobe
PSLP''	- posterolateral spiracular lobe plate II
Pt	- pecten
Sa	- saddle
SAP	- spiracular apparatus
SOP	- spiracular opening
SPc	- spiracular process
SSP	setal support plate
SSPS	- setal support plate spine
T	- metathorax
TP	- tergal plate
UB	- U-shaped band
I-X	- abdominal segments

Fig. 59

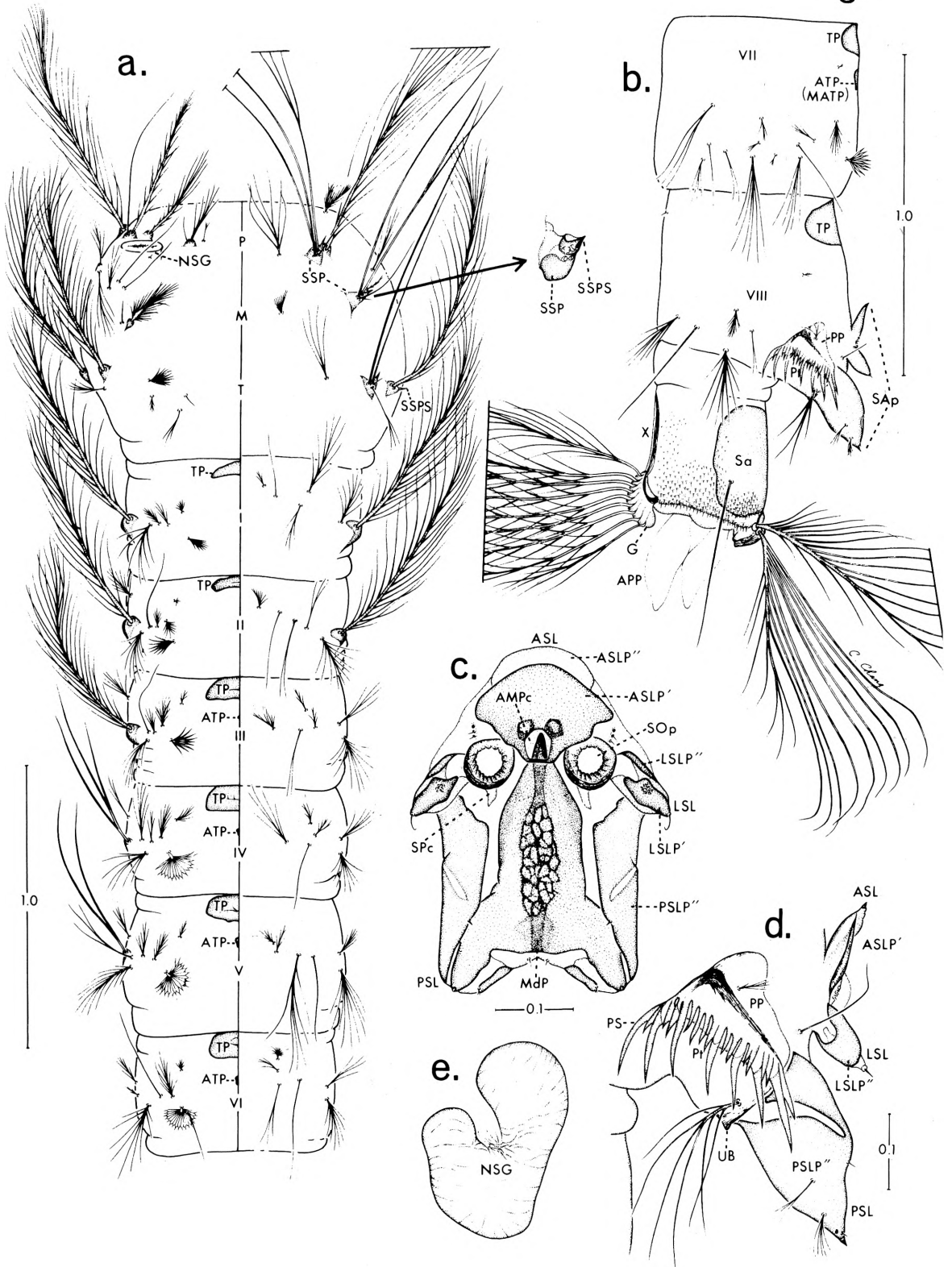


FIGURE 60

Culiseta (Culiseta) inornata (Williston). Fourth stage larva.

- a. Dorsal and ventral aspects of thorax and abdominal segments I—VI.
- b. Dorsal aspect of spiracular apparatus.
- c. Lateral (left) aspect of abdominal segments VII, VIII and X.

Abbreviations

APP	- anal papilla
ASL	- anterior spiracular lobe
ASLP'	- anterior spiracular lobe plate I
ASLP''	- anterior spiracular lobe plate II
C	- comb
CS	- comb scale
G	- grid
LGB	- lateral grid bar
LSL	- anterolateral spiracular lobe
LSLP'	- anterolateral spiracular lobe plate I
LSLP''	- anterolateral spiracular lobe plate II
M	- mesothorax
P	- prothorax
PMP	- posterior median plate
PS	- pecten spine
PSL	- posterolateral spiracular lobe
PSLP'	- posterolateral spiracular lobe plate I
PSLP''	- posterolateral spiracular lobe plate II
Pt	- pecten
rs	- rudimentary spiracle
S	- siphon
SA	- siphon acus
Sa	- saddle
SaA	- saddle acus
SAd	- spiracular apodeme
SAP	- spiracular apparatus
SOP	- spiracular opening
SPc	- spiracular process
SSP	- setal support plate
SSPS	- setal support plate spine
T	- metathorax
TGB	- transverse grid bar
I-X	- abdominal segments

Fig. 60

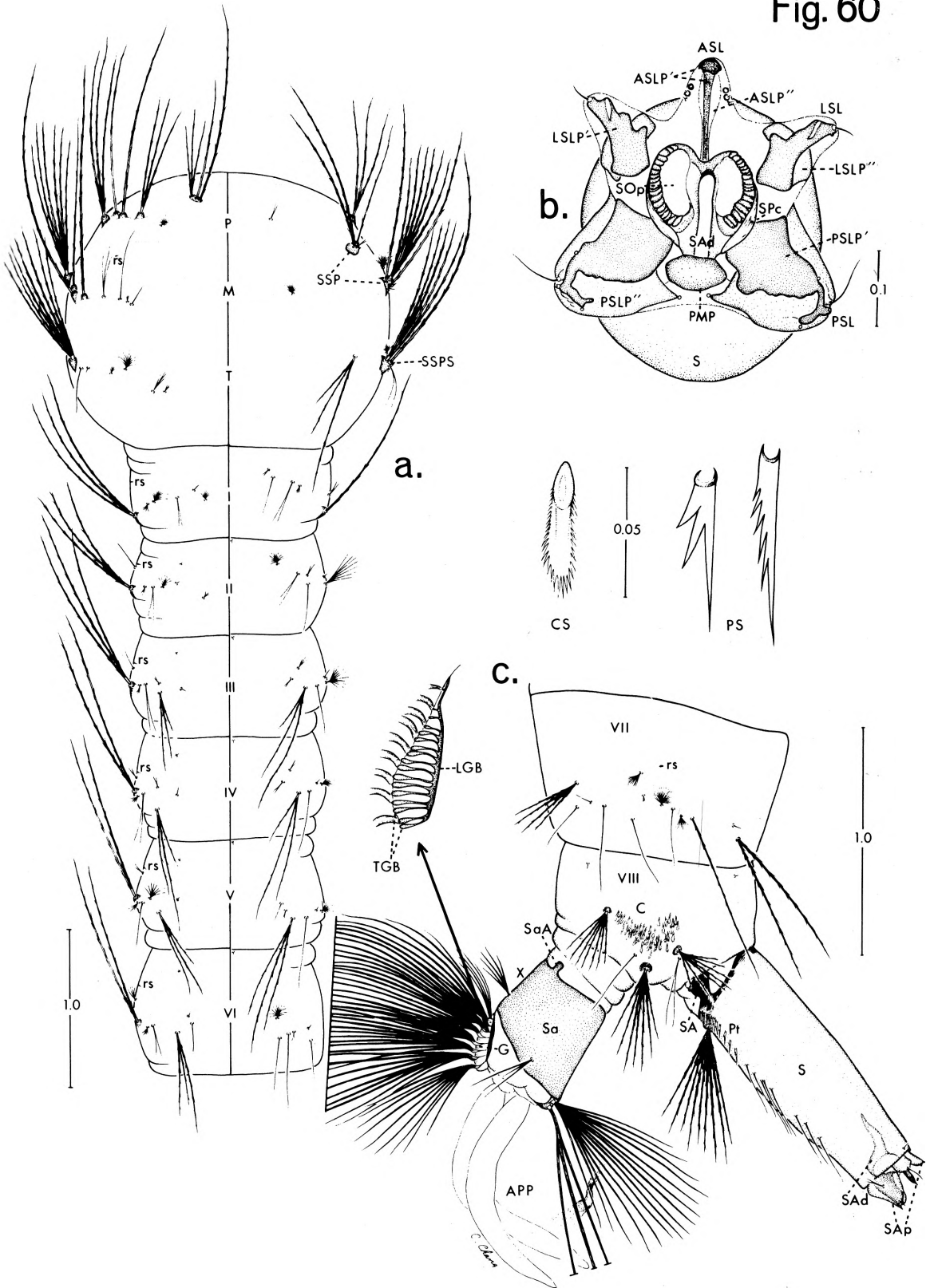


FIGURE 61

Toxorhynchites (Toxorhynchites) brevipalpis Theobald. Fourth stage larva.

- a. Dorsal and ventral aspects of thorax and abdominal segments I-VI.
- b. Dorsal aspect of spiracular apparatus.
- c. Lateral (left) aspect of abdominal segments VII, VIII and X.

Abbreviations

APP	- anal papilla
ASL	- anterior spiracular lobe
ASLP'	- anterior spiracular lobe plate I
LSL	- anterolateral spiracular lobe
LSLP'	- anterolateral spiracular lobe plate I
LSLP''	- anterolateral spiracular lobe plate II
M	- mesothorax
MSp	- marginal spicules
P	- prothorax
PMP	- posterior median plate
PSL	- posterolateral spiracular lobe
PSLP'	- posterolateral spiracular lobe plate I
PSLP''	- posterolateral spiracular lobe plate II
rs	- rudimentary spiracle
S	- siphon
Sa	- saddle
SAd	- spiracular apodeme
SAP	- spiracular apparatus
SOp	- spiracular opening
SSP	- setal support plate
T	- metathorax
I-X	- abdominal segments

Fig. 61

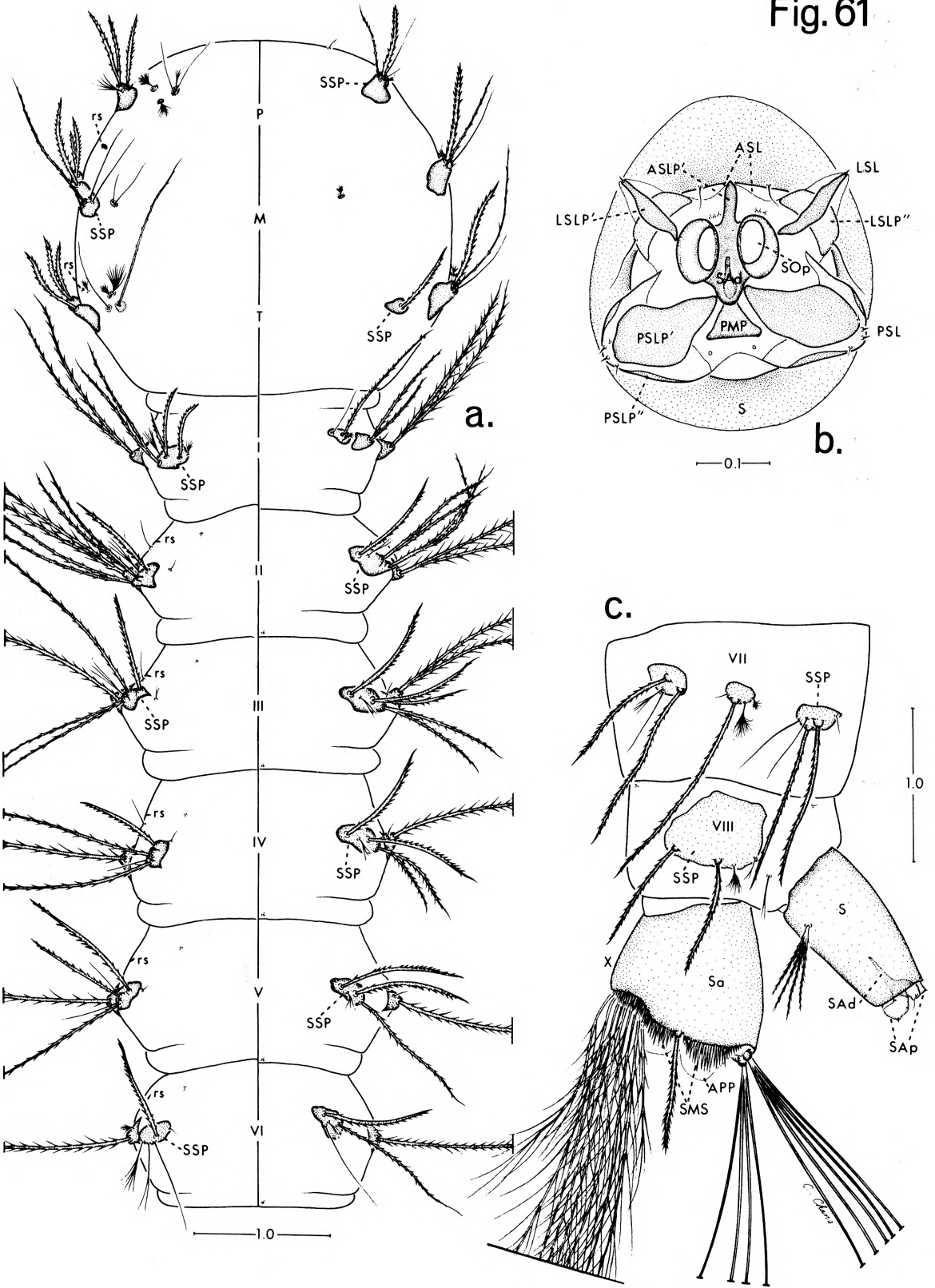


FIGURE 62

- a. *Anopheles (Cellia) pampanai* Buettiker and Beales. Dorsum of thorax of fourth stage larva.
b. *Anopheles (Cellia) minimus* Theobald. Dorsum of thorax of fourth stage larva.
c. *Orthopodomyia fascipes* (Coquillett). Fourth stage larva. Lateral (left) aspect of abdominal segments VII, VIII and X.

Abbreviations

APP	- anal papilla
C	- comb
CS	- comb scale
G	- grid
LP	- lateral plate
M	- mesothorax
NP	- notal plate
P	- prothorax
S	- siphon
Sa	- saddle
SAd	- spiracular apodeme
SAP	- spiracular apparatus
T	- metathorax
TP	- tergal plate
VII-X	- abdominal segments

Fig. 62

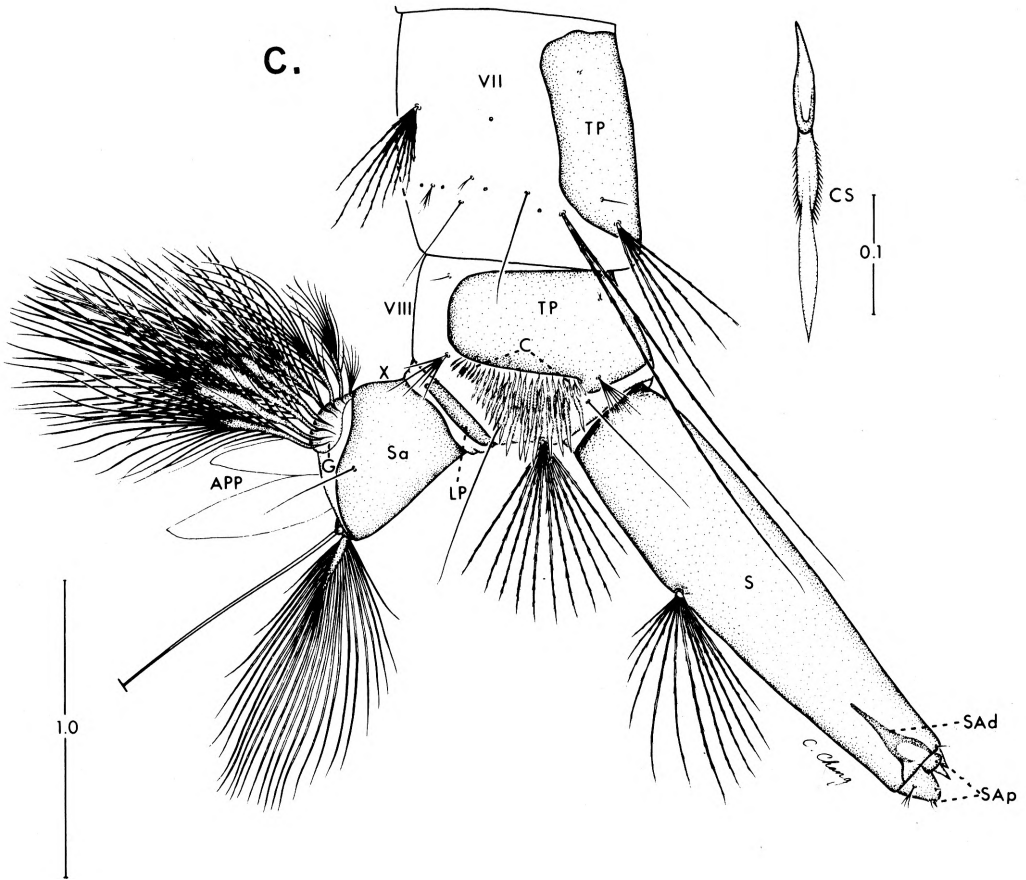
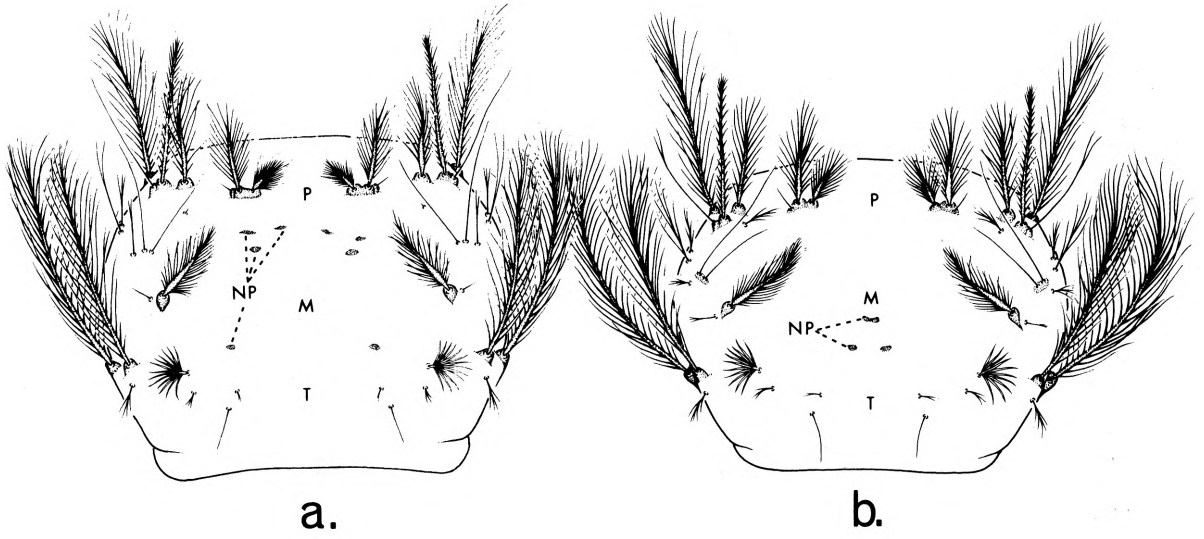


FIGURE 63

- a. *Uranotaenia (Pseudoficalbia) unguiculata* Edwards. Dorsal aspect of spiracular apparatus of fourth stage larva. (Modified from Montschadsky 1930, Fig.12, P1.8)
- b. *Culex (Culex) nigripalpus* Theobald. Dorsal aspect of spiracular apparatus of fourth stage larva.
- c,d. *Mansonia (Mansoniodes) uniformis* (Theobald). Lateral (right) aspects of siphon and spiracular apparatus of fourth stage larva.
- c. External structure.
- d. Internal structure.

Abbreviations

ASL	- anterior spiracular lobe
ASLP'	- anterior spiracular lobe plate I
ASLP''	- anterior spiracular lobe plate II
IST	- inner spiracular teeth
LSL	- anterolateral spiracular lobe
LSLP'	- anterolateral spiracular lobe plate I
LSLP''	- anterolateral spiracular lobe plate II
OST	- outer spiracular teeth
PAS	- postabdominal spiracle
PMP	- posterior median plate
PMPc	- posterior median process
PSL	- posterolateral spiracular lobe
PSLP'	- posterolateral spiracular lobe plate I
PSLP''	- posterolateral spiracular lobe plate II
PSP	- posterior spiracular plate
S	- siphon
SAd	- spiracular apodeme
SAW	- saw
SF	- spiracular filament
SOp	- spiracular opening
Spc	- spiracular process

Fig. 63

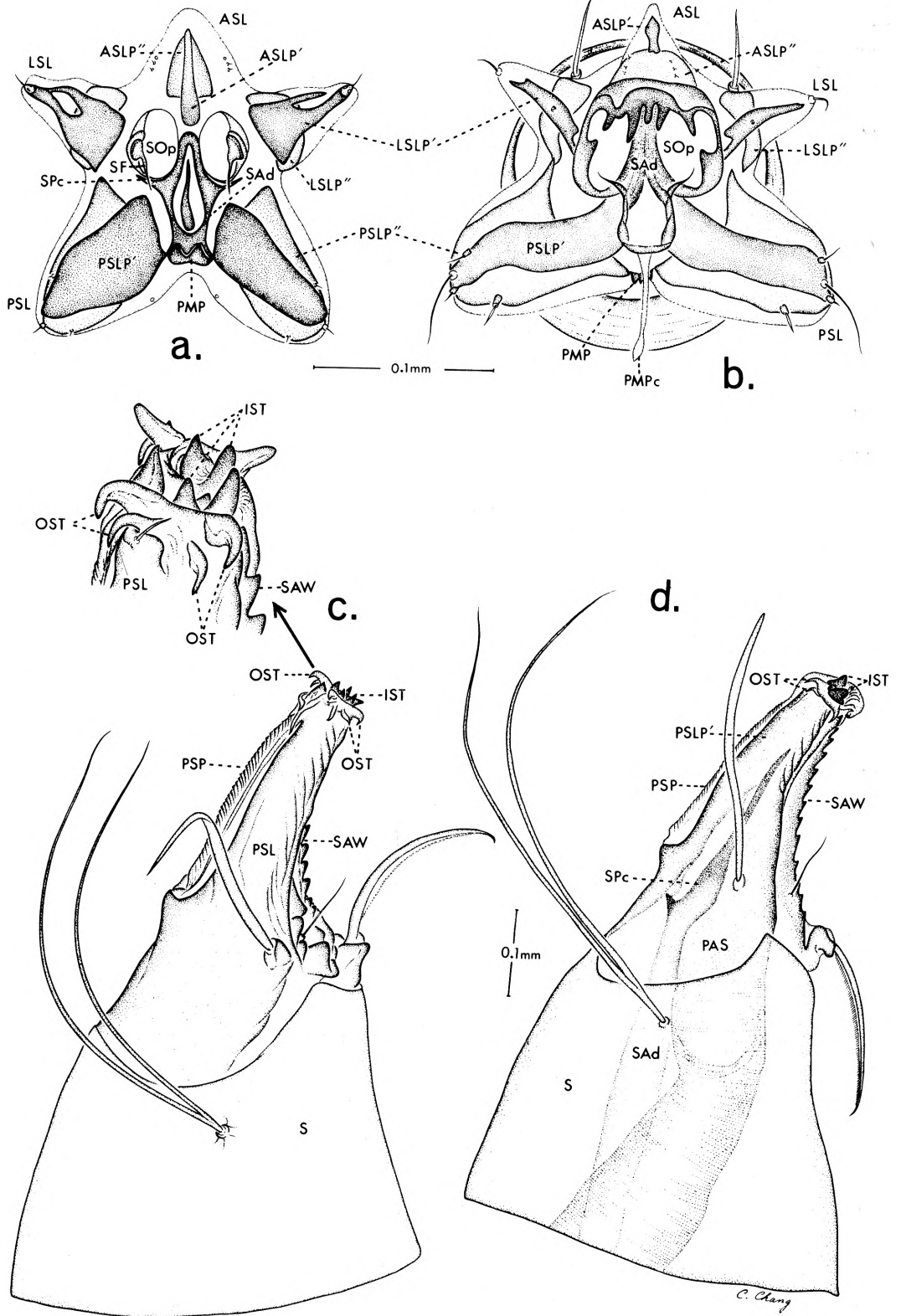


FIGURE 64

- a. *Anopheles (Cellia) stephensi* Liston. Right Nuttall and Shipley's organ of fourth stage larva.
- b. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Rudimentary spiracle of abdominal segment V of fourth stage larva.
- c. *Anopheles (Anopheles) crucians* Wiedemann. Lateral (left) aspect of pecten, pecten plate and spiracular apparatus of fourth stage larva.
- d. *Chagasia bathana* (Dyar). Dorsal aspect of spiracular apparatus of fourth stage larva.
- e. *Uranotaenia (Pseudoficalbia) quadrimaculata* Edwards. Dorsal aspect of spiracular apparatus of fourth stage larva.
- f. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Lateral (left) aspect of abdominal segment X and anal papillae of fourth stage larva.

Abbreviations

AMPc	- anterior median process
APP	- anal papilla
ASL	- anterior spiracular lobe
ASLP'	- anterior spiracular lobe plate I
DB	- dorsal brush
FS	- fringing setae
LSL	- anterolateral spiracular lobe
LSLP'	- anterolateral spiracular lobe plate I
NSG	- Nuttall and Shipley's organ
PAS	- postabdominal spiracle
PMP	- posterior median plate
PP	- pecten plate
PS	- pecten spine
PSL	- posterolateral spiracular lobe
PSLP'	- posterolateral spiracular lobe plate I
Pt	- pecten
rs	- rudimentary spiracle
S	- siphon
Sa	- saddle
SAd	- spiracular apodeme
SMS	- saddle marginal spicules
UB	- U-shaped band
VB	- ventral brush

Fig. 64

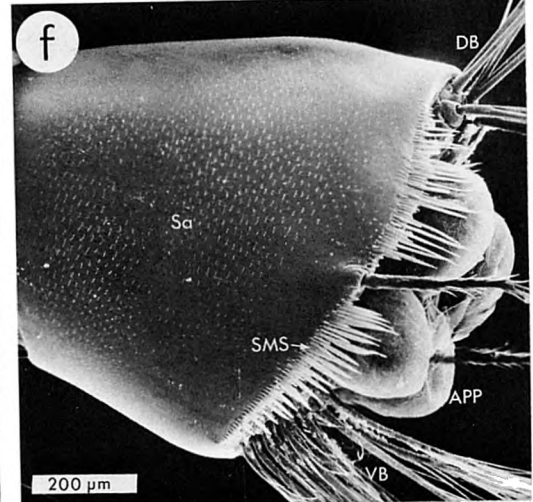
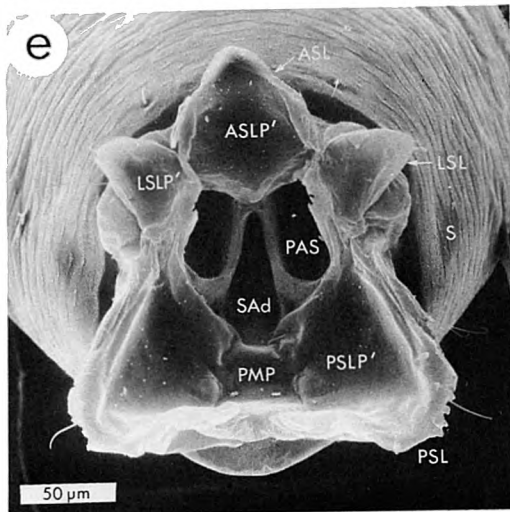
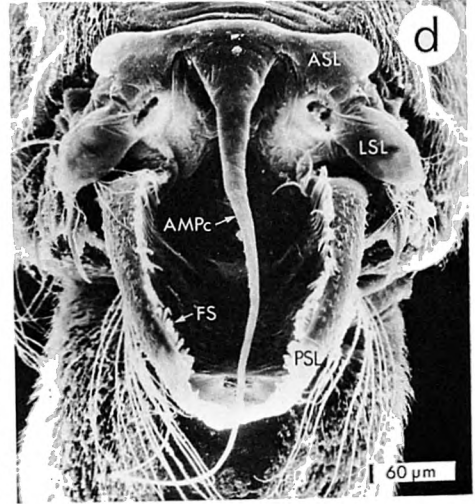
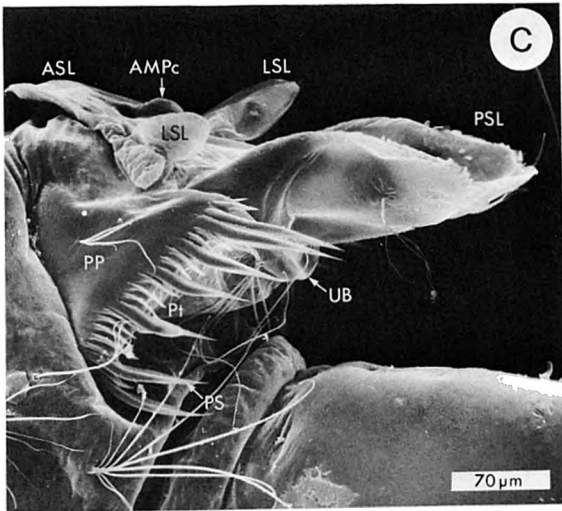
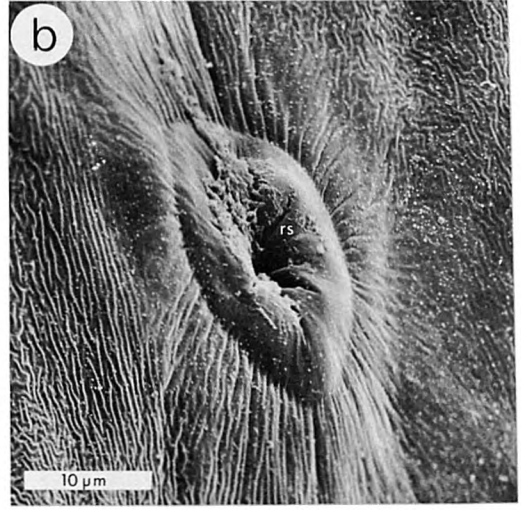
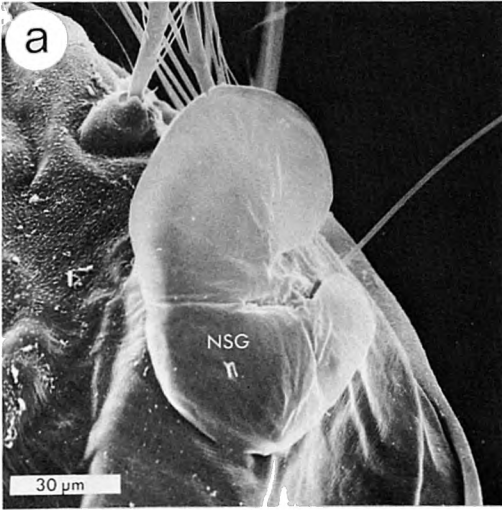


FIGURE 65

Aedes (Ochlerotatus) taeniorhynchus (Wiedemann). Fourth stage larva.

- a. Lateral (right) aspect of abdominal segments VIII and X.
- b. Pecten spines.
- c. Comb scales.
- d. Grid.

Abbreviations

APP	-	anal papilla
C	-	comb
CS	-	comb scale
DB	-	dorsal brush
G	-	grid
LGB	-	lateral grid bar
PS	-	pecten spine
Pt	-	pecten
S	-	siphon
Sa	-	saddle
SAP	-	spiracular apparatus
TGB	-	transverse grid bar
VB	-	ventral brush

Fig. 65

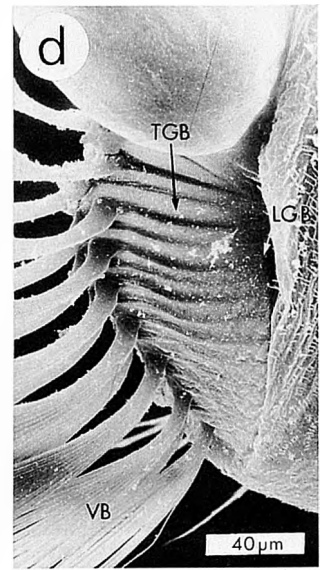
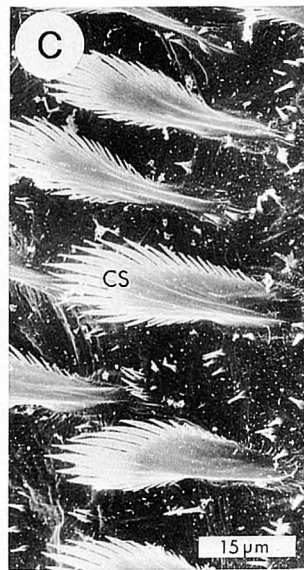
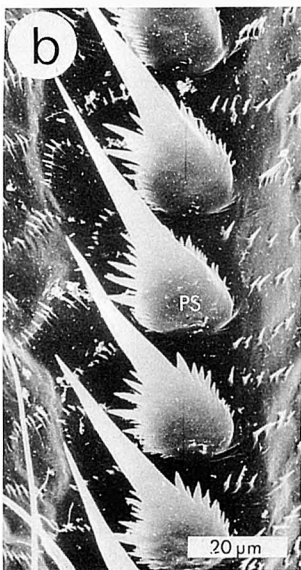
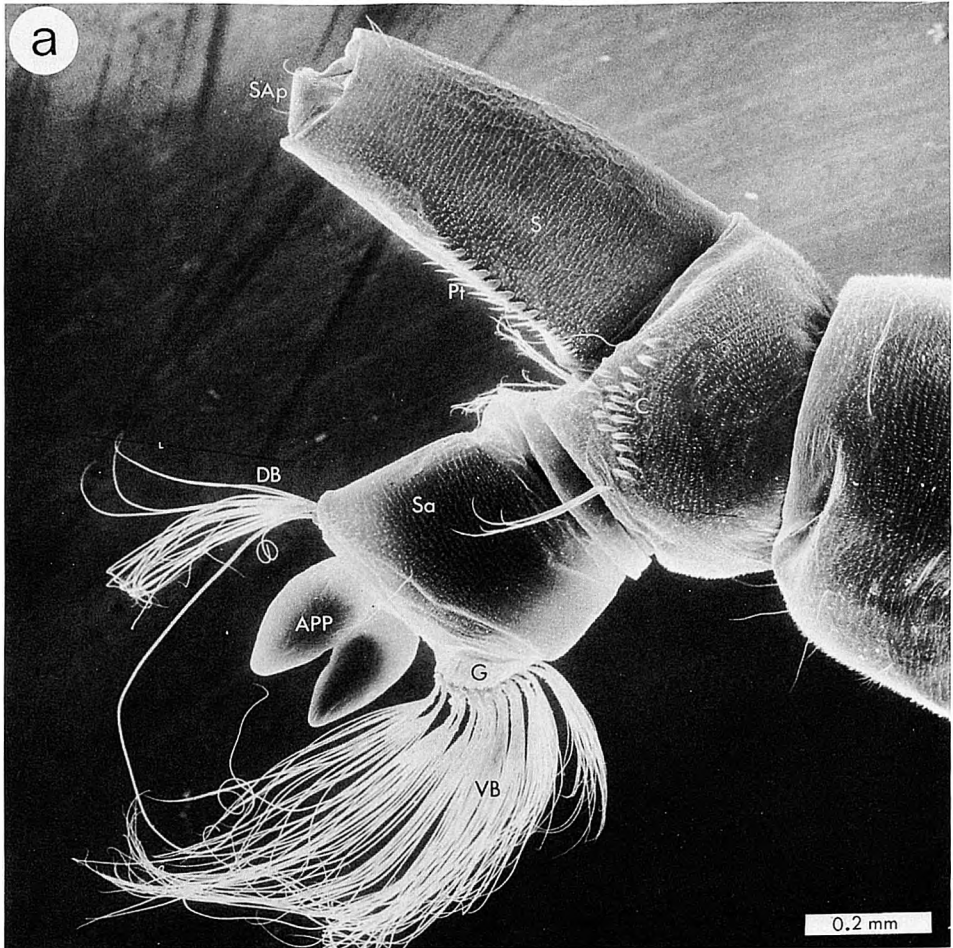


FIGURE 66

Chaetotaxy of Anophelinae (composite). Dorsal and ventral aspects of head, thorax and abdominal segments I-VI; lateral aspect of abdominal segments VII-X.

Abbreviations

A	- antenna
C	- cranium
M	- mesothorax
p	- abdominal puncture
P	- prothorax
rs	- rudimentary spiracle
S	- spiracular apparatus
T	- metathorax
I-X	- abdominal segments
6-Mx	- seta 6-Mx

Fig. 66

Anophelinae

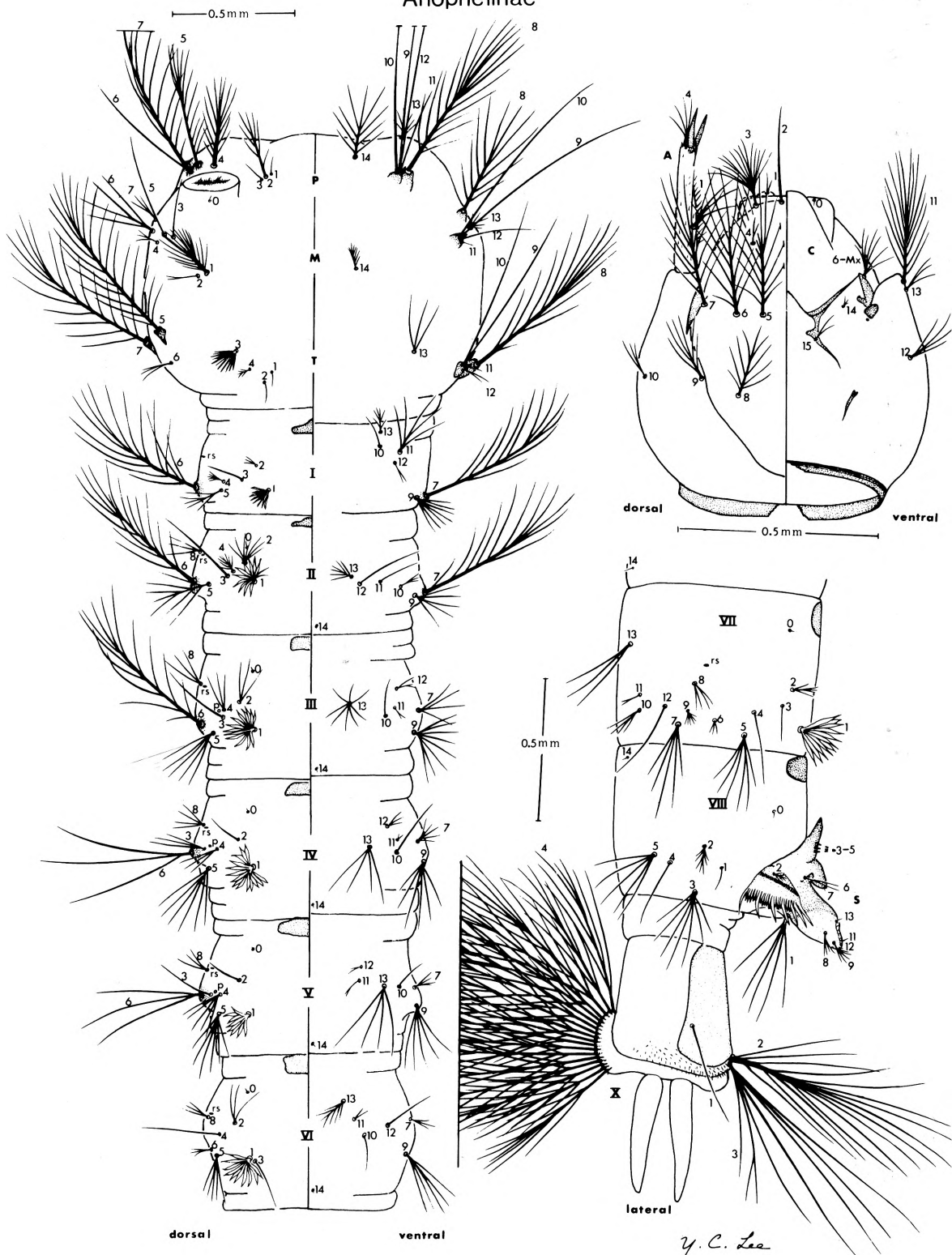


FIGURE 67

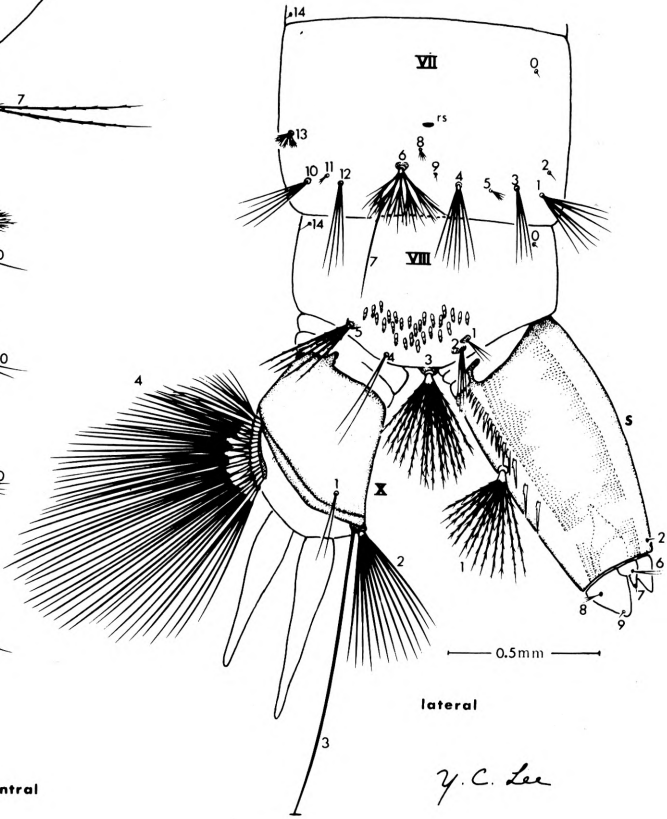
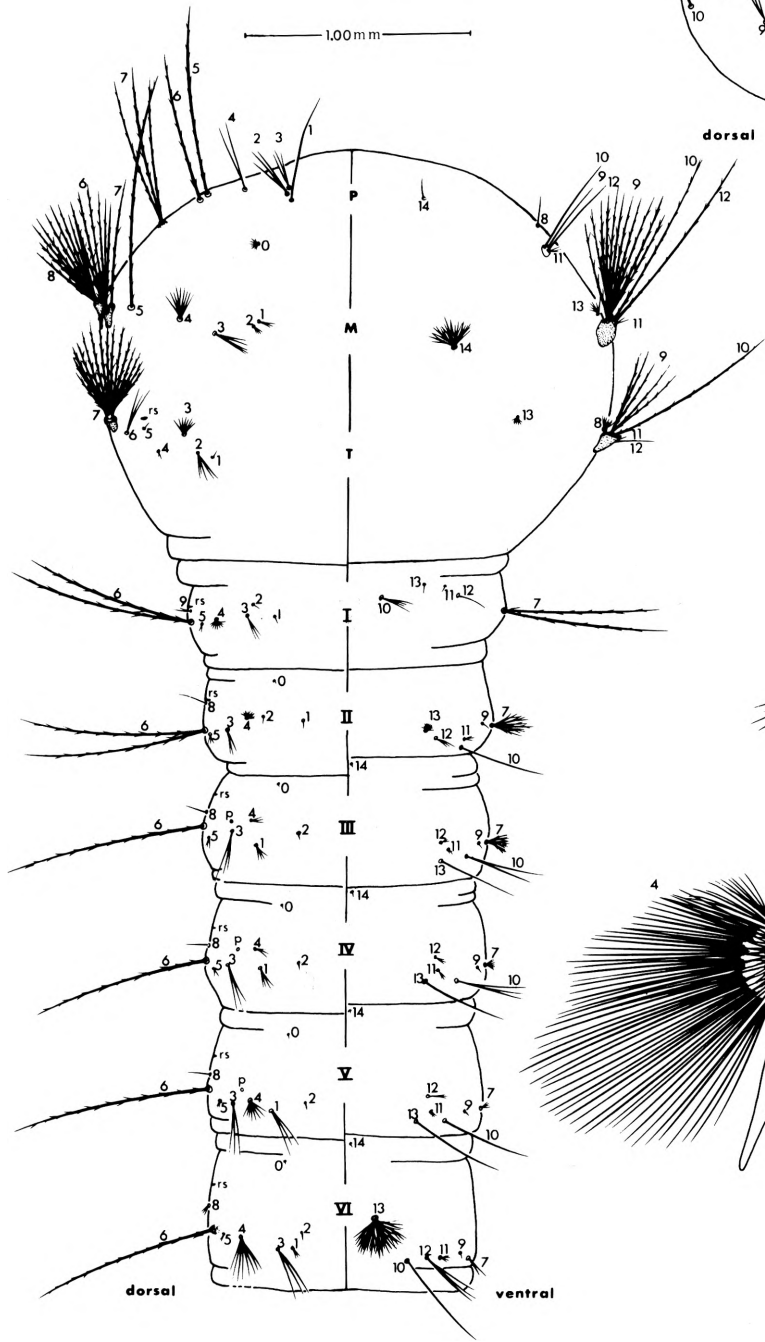
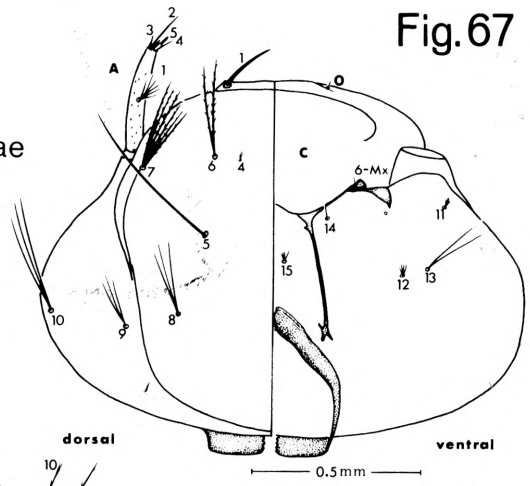
Chaetotaxy of Culicinae (composite). Dorsal and ventral aspects of head, thorax and abdominal segments I-VI; lateral aspect of abdominal segments VII-X.

Abbreviations

A	- antenna
C	- cranium
M	- mesothorax
P	- abdominal puncture
P	- prothorax
rs	- rudimentary spiracle
S	- siphon; spiracular apparatus
T	- metathorax
I-X	- abdominal segments
6-Mx	- seta 6-Mx

Fig.67

Culicinae



Y.C. Lee

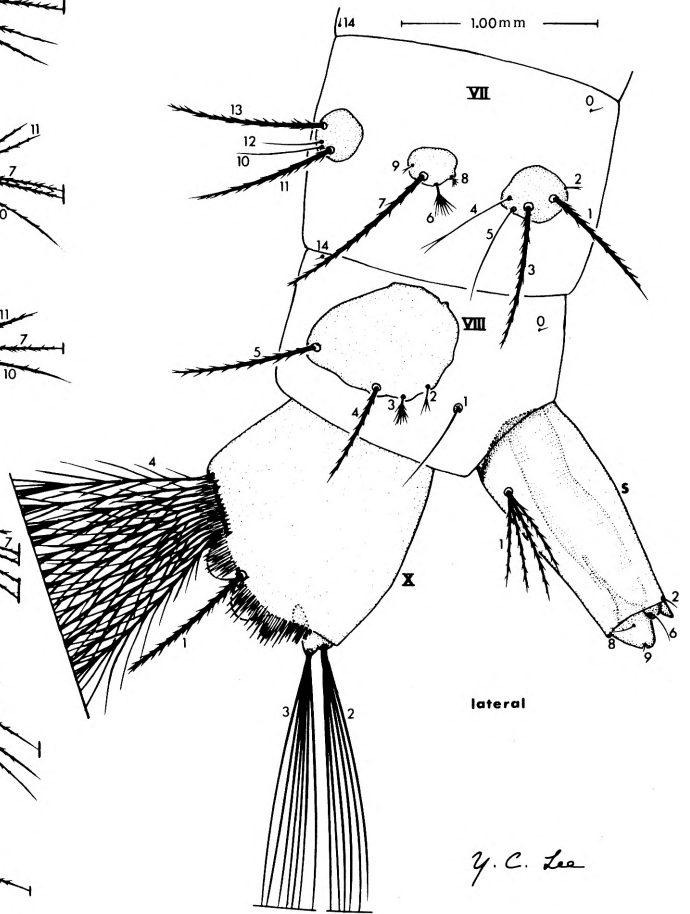
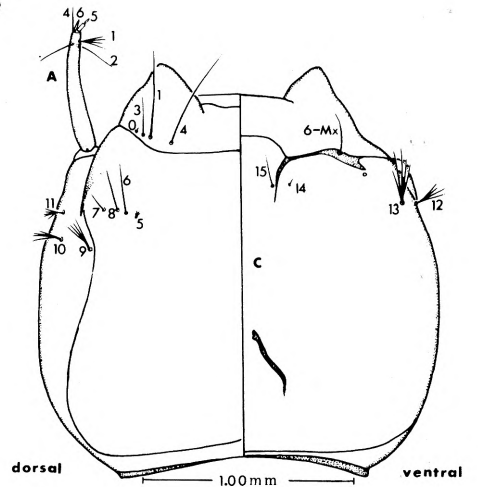
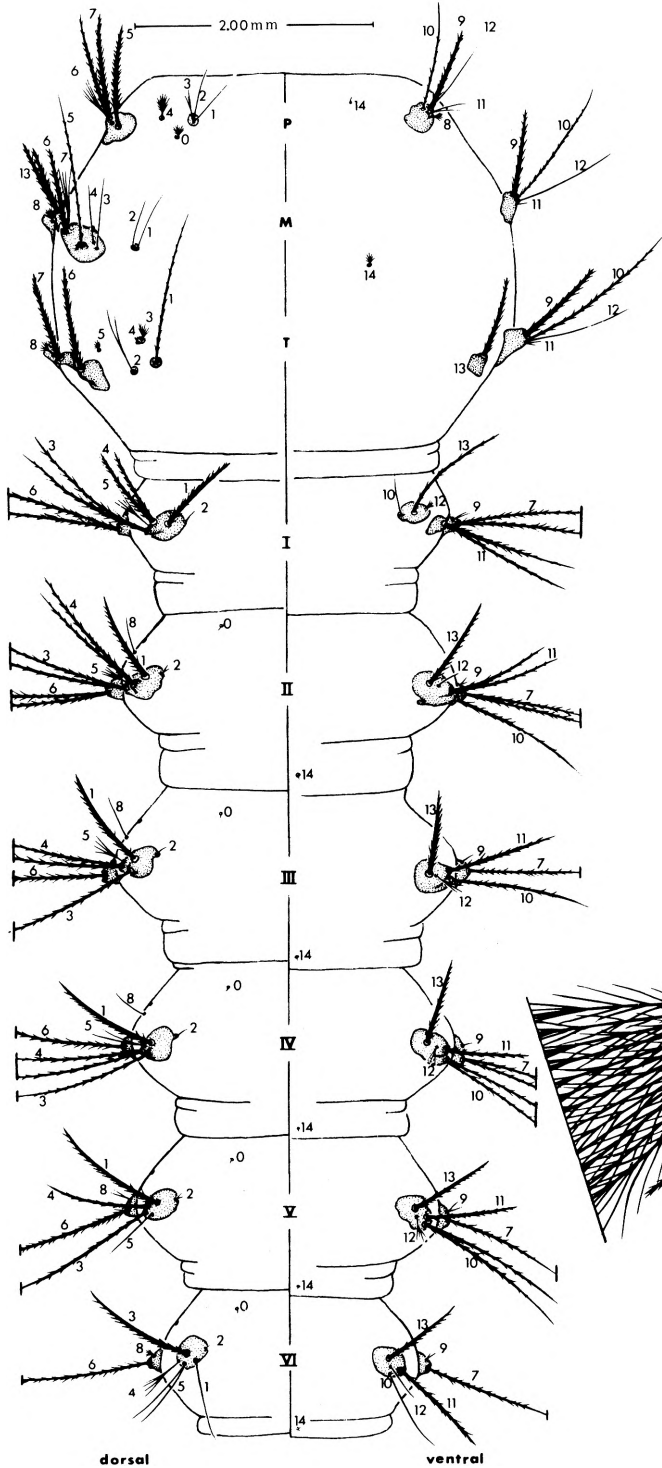
FIGURE 68

Chaetotaxy of Toxorhynchitinae (composite). Dorsal and ventral aspects of head, thorax and abdominal segments I-VI; lateral aspect of abdominal segments VII-X.

Abbreviations

- A** - antenna
- C** - cranium
- M** - mesothorax
- P** - prothorax
- S** - siphon: spiracular apparatus
- T** - metathorax
- I-X** - abdominal segments
- 6-Mx** - seta 6-Mx

Toxorhynchitinae



Y. C. Lee

FIGURE 69

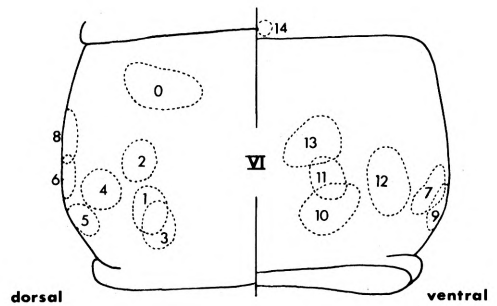
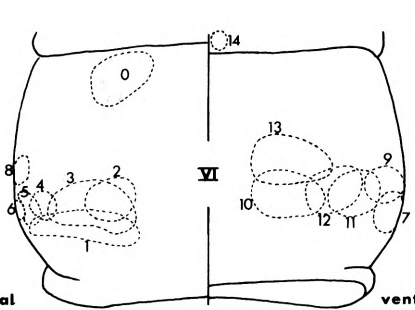
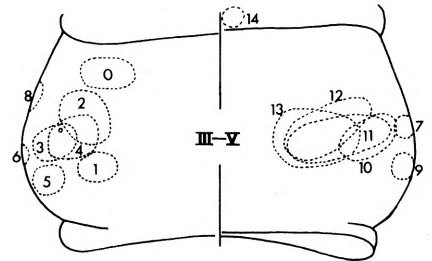
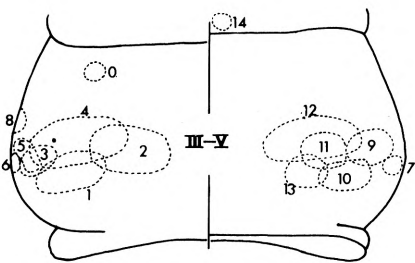
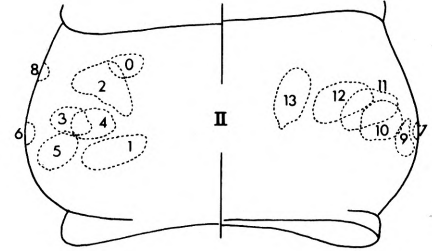
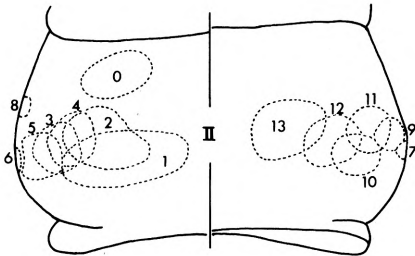
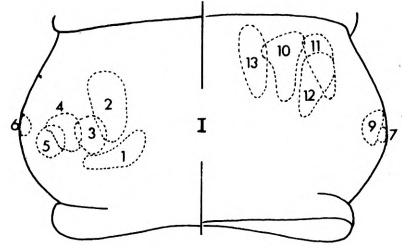
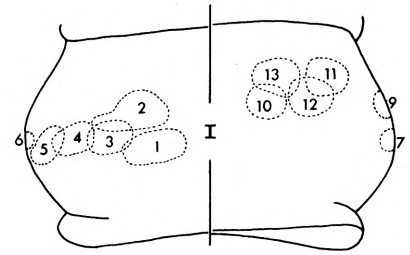
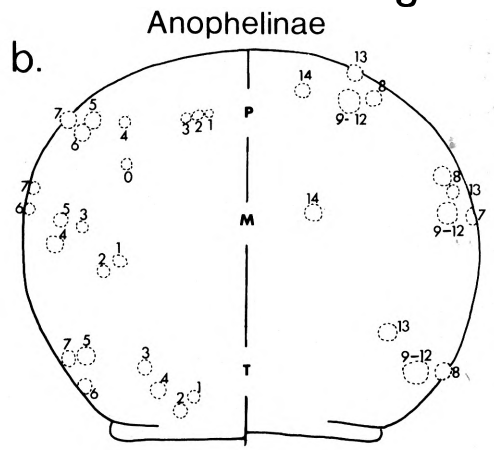
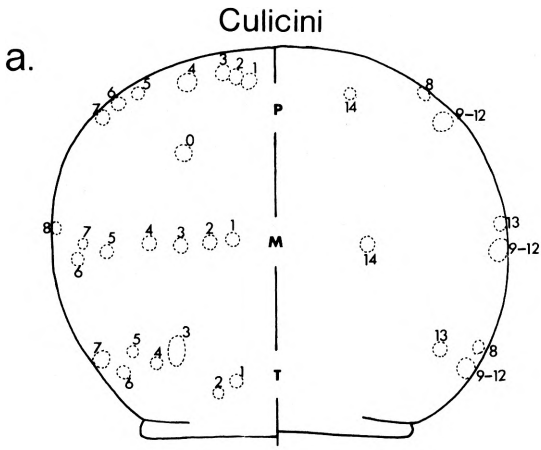
Dorsal and ventral aspects of thorax and selected abdominal segments. Composite drawing illustrating setal location relationships for thorax and actual area occupied by each seta (when present) for abdominal segments I-VI.

- a. Culicini.
- b. Anophelinae.

Abbreviations

- M** - mesothorax
- P** - prothorax
- T** - metathorax
- I-VI** - abdominal segments

Fig. 69



dorsal

ventral

dorsal

ventral

FIGURE 70

Dorsal and ventral aspects of thorax and selected abdominal segments. Composite drawing illustrating setal location relationships for thorax and actual area occupied by each seta (when present) for abdominal segments I-VI.

- a. Uranotaeniini.
- b. Sabethini.

Abbreviations

- M** - mesothorax
- P** - prothorax
- T** - metathorax
- I-VI** - abdominal segments

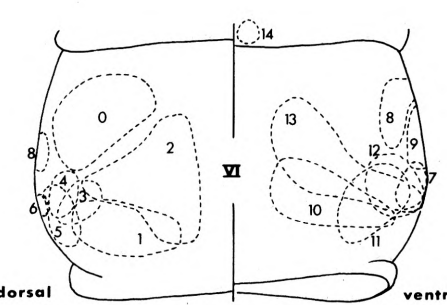
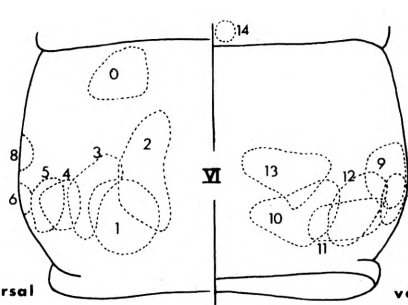
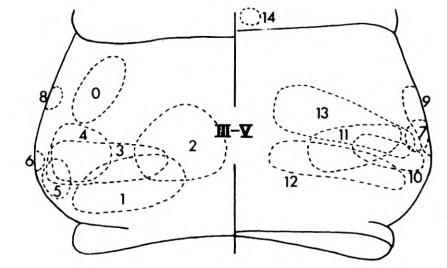
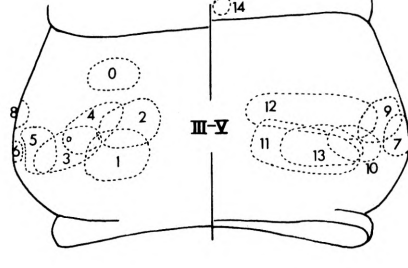
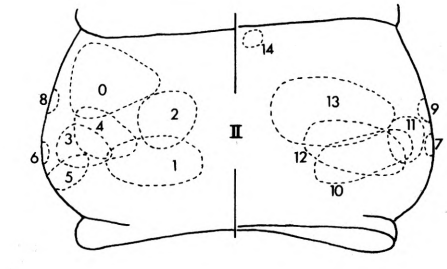
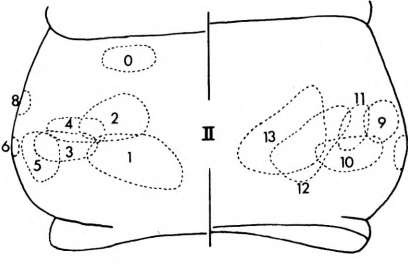
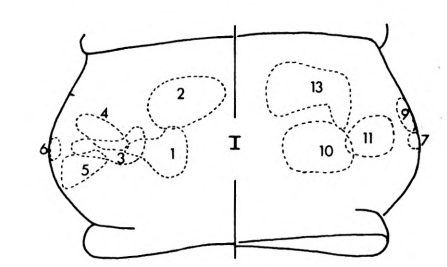
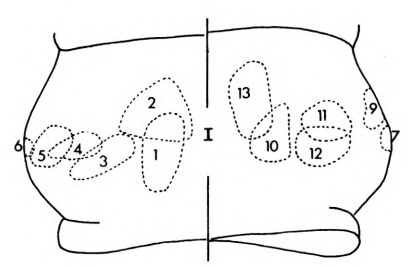
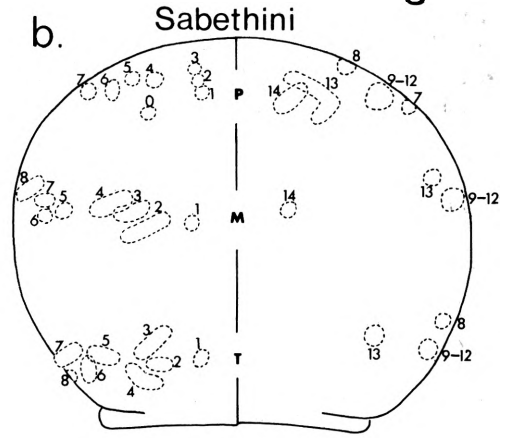
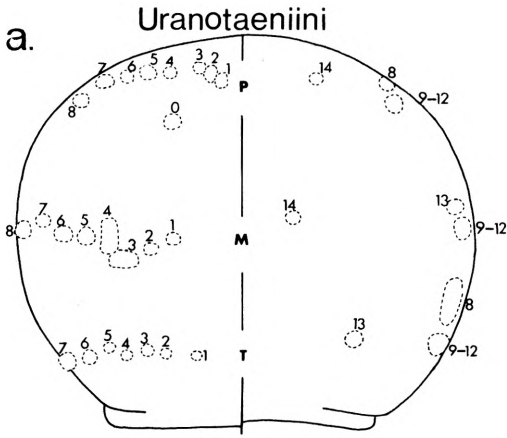


FIGURE 71

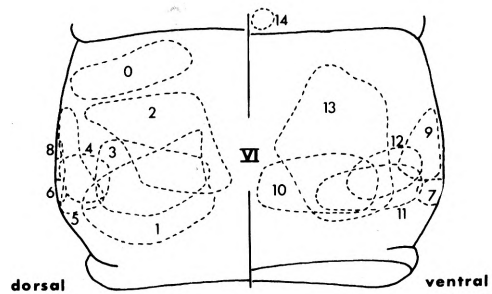
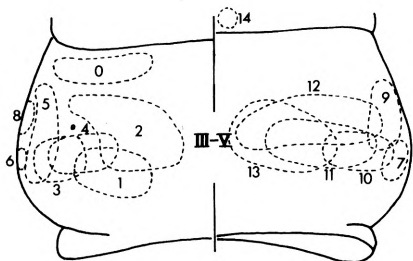
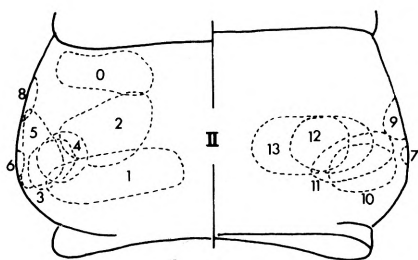
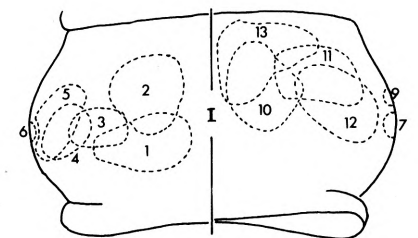
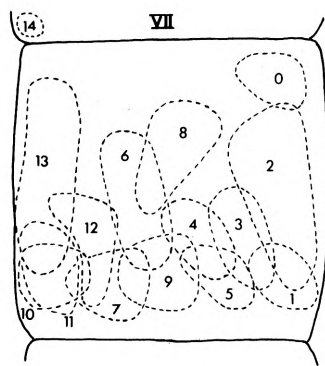
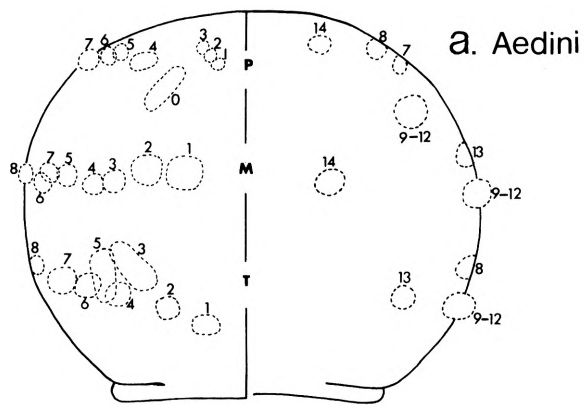
a. Aedini. Dorsal and ventral aspects of thorax and selected abdominal segments. Composite drawing illustrating setal location relationships for thorax and actual area occupied by each seta (when present) for abdominal segments I-VII.

b-d. Anophelinae. Thoracic pleural setal groups. Redrawn from Puri (1931, Figs. C-E, Pl. XII).

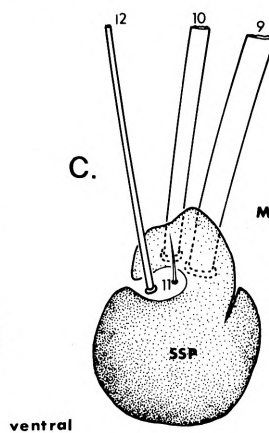
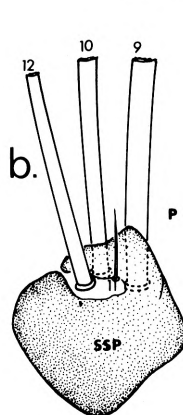
e. *Culex (Melanoconion) atratus* Theobald. Metathoracic pleural setal group. Redrawn from Foote (1952,457).

Abbreviations

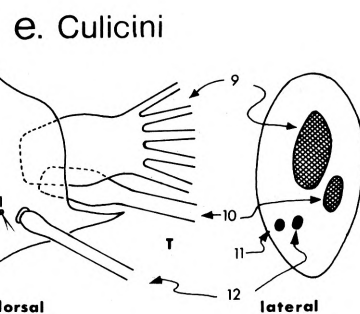
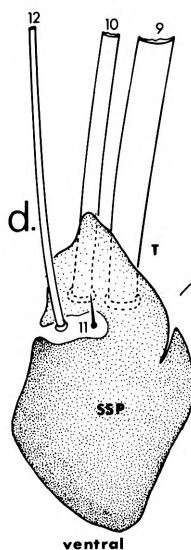
M	- mesothorax
P	- prothorax
SSP	- setal support plate
T	- metathorax
I-VII	- abdominal segments



Anophelinae



ventral



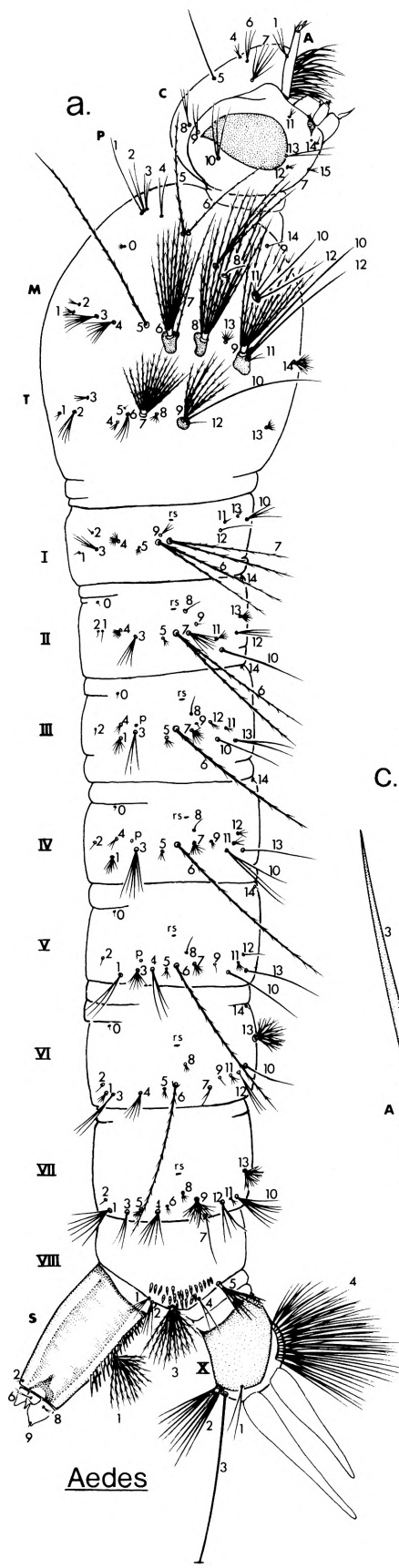
ventral

FIGURE 72

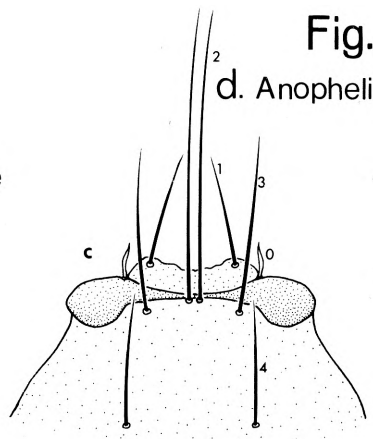
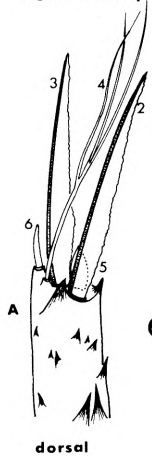
- a. *Aedes (Ochlerotatus) fulvus pallens* Ross. Lateral aspect of fourth stage larva.
- b. Anophelinae. Apex of antenna. Redrawn from Puri (1931, Fig.2, Pl. IV.)
- c. Culicinae. Apex of antenna.
- d. Anophelinae. Anterodorsal margin of head. Redrawn from Puri (1931, Fig.2, Pl. XX).
- e. Anophelinae. Dorsal aspect of spiracular apparatus. Modified from Puri (1931, Fig.7, Pl. XX).
- f. Culicinae. Lateral aspect of spiracular apparatus. Redrawn from Belkin (1962, Fig.412).
- g. Culicinae. Dorsal aspect of spiracular apparatus. Redrawn from Belkin (1962, Fig.412).

Abbreviations

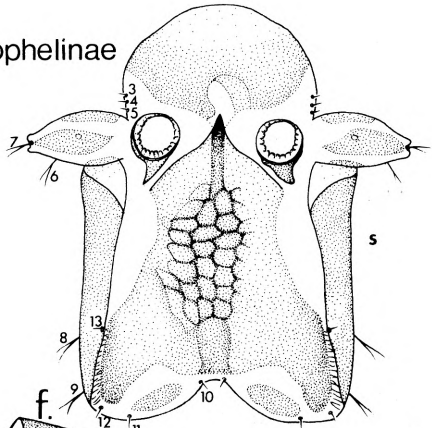
A	- antenna
C	- cranium
M	- mesothorax
P	- prothorax
S	- siphon; spiracular apparatus
T	- metathorax
I-X	- abdominal segments



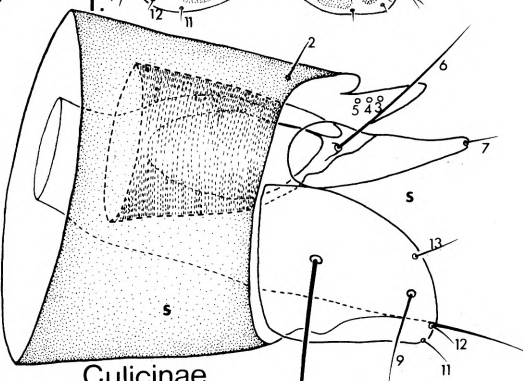
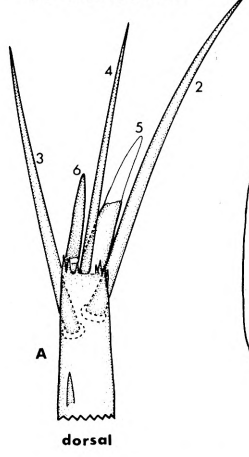
b. Anophelinae



e. Anophelinae



c. Culicinae



g. Culicinae

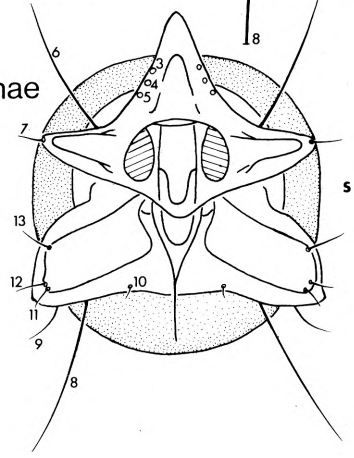




Table 2. Comparison of Terminology for Setae on the Antenna of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Edwards and Given 1928 p. 328	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Dodge 1946 p. 57	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	culicine	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	anopheline and culicine (1st instar)	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
11	11.(not named)	--	10.antennal **	11.antennal	11.antennal	11.antennal	11.antennal	11.shaft	1.antennal shaft	11.antennal tuft	--	1
--	--	--	--	--	--	subapical antennal (C) sabre-like spine (A)***	--	--	2.inner subapical(C) dorsal sabre(A)	subapical	--	2
--	--	--	--	--	--	" "	--	10.	3.outer subapical(C) ventral sabre(A)	spines	--	3
10	10.(not named)	--	--	10.terminal	10.terminal antennal	10.terminal antennal	10.terminal antennal	--	4.terminal antennal	10.terminal spine	--	4
--	--	--	--	--	--	hyaline process	--	--	5.hyaline process	papilla	--	5
--	--	--	--	--	--	finger-like process	--	--	6.finger process	apical spine	--	6

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table unless otherwise indicated.

***C indicates culicine and A anopheline.

†Terminology used herein.

Table 3. Comparison of Terminology for Setae on the Cranium of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Edwards and Given 1928 p. 328	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Dodge 1946 p. 57	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	culicine	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	anopheline and culicine (1st instar)	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex (Melanoconion)</i>	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
—	—	—	(Fig. but not named)	—	outer preclypeal	1a. outer preclypeal	—	4. outer preclypeal	0. outer preclypeal	1a. outer preclypeal spine	1a. outer preclypeal	0
1	1. not named	clypeal spine	1. inner preclypeal	1. inner preclypeal	1. inner preclypeal	1. inner preclypeal	1.	1. preclypeal spine	1. inner preclypeal (A) clypeal spine (C)	1. preclypeal spine	1. inner preclypeal	1
2	2. inner anterior clypeal**	—	2. inner anterior clypeal	2. inner clypeal	2. inner anterior clypeal	2. inner clypeal	2. inner clypeal	—	2. inner clypeal	inner anterior clypeal	2. inner clypeal (A)	2
3	3. outer anterior clypeal	—	3. outer anterior clypeal	3. outer clypeal	3. outer anterior clypeal	3. outer clypeal	3. outer clypeal	3. outer clypeal	3. outer clypeal	3. outer anterior clypeal	3. outer clypeal (A)	3
4	4. posterior clypeal	d	4. posterior clypeal	4. posterior clypeal	4. posterior clypeal	4. postclypeal	4. postclypeal (A) accessory head (C)***	2. inner-clypeal	4. postclypeal	4. posterior clypeal	4. post clypeal	4
5	5. frontal	C	5. frontal	5. inner frontal	5. median frontal	5. inner frontal	5. frontal (A) upper head (C)	6. B	5. inner frontal (A) upper head (C)	5. upper head	6. inner frontal	5
6	6. frontal	B	6. frontal	6. middle frontal	6. submedian frontal	6. mid frontal	6. frontal (A) lower head (C)	5. C	6. mid frontal (A) lower head (C)	6. lower head	5. middle frontal	6
7	7. frontal	A	7. frontal	7. outer frontal	7. lateral frontal	7. outer frontal	7. ante-antennal (C) frontal (A)	7. A	7. outer frontal (A) preantennal (C)	7. pre-antennal	7. outer frontal	7
8	8. inner occipital	e	8. sutural	8. sutural	8. sutural	8. sutural	8. inner occipital	8. sutural	8. sutural	8. inner clypeo-frontal	8. sutural	8
9	9. outer occipital	—	9. trans-sutural	9. trans-sutural	9. transsutural	9. trans-sutural	9. outer occipital	9. trans-sutural	9. transsutural	9. outer clypeo-frontal	9. transsutural	9
14	14. (he could not find it)	—	14. orbital	14. orbital	14. orbital	14. supraorbital	14. orbital	14. orbital	10. orbital	14. orbital	10. supra-orbital	10
12	12. (not named)	—	12. sub-antennal or basal	12. subantennal	12. subantennal	12. basal	12. subantennal	12. sub-antennal	11. subantennal	12. sub-antennal	13. basal	11
15	15. (not named)	—	15. infra-orbital	15. infra-orbital	15. infraorbital	15. infraorbital	—	15. infra-orbital	12. infraorbital	15. posterior infra-orbital	12a. infra-orbital	12
13	13. (not named)	—	13. sub-basal or post-mandibular	13. postmandibular	13. (not named)	13. sub-basal	—	13. sub-basal or post-mandibular	13. subbasal or postmandibular	13. anterior infra-orbital	12. subbasal or postmandibular	13
18	18. (not named)	—	18. post-maxillary	18. postmaxillary	18. (not named)	18. postmaxillary	—	18. post-maxillary	14. postmaxillary	18. outer pre-maxillary	14. postmaxillary	14
20	20. (not named)	—	20. sub-mental	20. submental	20. submental	20. submental	—	20. submental	15. submental	20. inner pre-maxillary	15. submental	15

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table unless otherwise indicated.

***C indicates culicine and A anopheline.

†Terminology used herein.

Table 4. Comparison of Terminology for Setae on the Prothorax of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baies and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
—	—	0	0.dorsal submedian**	—	0	0	0	0	0	0
1	1.anterior sub-median thoracic	1.inner sub-median prothoracic	1.inner submedian prothoracic***	1	1	1	1	1	1	1
2	2. "	2.middle sub- median prothoracic	2.middle submedian prothoracic***	2	2	2	2	2	2	2
3	3. "	3.outer sub-median prothoracic	3.outer submedian prothoracic***	3	3	3	3	3	3	3
4	4	4	4.lateral prothoracic	4	4	4	4	4	4	4
5	5	5	5. "	5	5	5	5	5	5	5
6	6	6	6. "	6	6	6	6	6	6	6
7	7	7	7. "	7	7	7	7	7	7	7
8	8	8	8.ventral hair of lateral series	8	8	8	8	8	8	8
9	9	9	9.pleural	9	9	9	9	9	9	9
10	10	10	10. "	10	10	10	10	10	10	10
11	12	11	11. "	11	11	11	11	11	11	11
12	11	12	12. "	12	12	12	12	12	12	12
(mentioned, not numbered)	(14)"shoulder hair"	14	14.subcervical	14	13(C) **** 14(A)	14	13	—	—	13
13	13	13	13.ventral submedian	13	13(A)	13	14	13	13	14

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table.

***Collectively called "shoulder hairs."

****C indicates culicine and A anopheline.

†Terminology used herein.

Table 5. Comparison of Terminology for Setae on the Mesothorax of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
1	1	1	1.large dorsal**	1	1	1	1	1	1	1
2	2	2	2.small dorso-lateral	2	2	2	2	2	2	2
3	3	3	3. "	3	3	3	3	3	3	3
5	5	5	5. "	5	5	4	4	4	4	4
4	4	4	4. "	4	4	5	5	5	5	5
6	6	6	6. "	6	6	6	6	6	6	6
7	7	7	7. "	7	7	7	7	7	7	7
9	8	8	8.large lateral	8	8	8	8	8	8	8
10	10	9	9.pleural	9	9	9	9	9	9	9
11	11	10	10. "	10	10	10	10	10	10	10
12	13	11	11. "	11	11	11	11	11	11	11
13	12	12	12. "	12	12	12	12	12	12	12
8	9	14	14.small lateral	14	14	14	13	14	14	13
14	14	13	13.submedian	13	13	13	14	13	13	14

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table.

†Terminology used herein.

Table 6. Comparison of Terminology for Setae on the Metathorax of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
2	2	3	3.small dorso-lateral**	3	3	1	1	1	1	1
1	1	4	4.small dorso-lateral	4	4	2	2	2	2	2
4	4	1	1.representing palmate	1	1	3	3	3	3	3
3	3	2	2.small dorso-lateral	2	2	5	4	4	4	4
5	5	5	5.large lateral	5	5	4	5	5	5	5
6	6	6	6.small	6	6	6	6	6	6	6
7	7	7	7.large lateral	7	7	7	7	7	7	7
8	8	8	8. "	8	8	8	8	8	8	8
10	10	9	9.pleural	9	9	9	9	9	9	9
11	11	10	10. "	10	10	10	10	10	10	10
12	12	11	11. "	11	11	11	11	11	11	11
9	9	12	12. "	12	12	12	12	12	12	12
13	13	13	13.submedian ventral	13	13	13	13	13	13	13

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table.

†Terminology used herein.

Table 7. Comparison of Terminology for Setae on Abdominal Segment I of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
—	—	1	—	1	—	1	1	1	1	1
—	—	2	—	2	—	0	2	2	2	2
—	—	4	—	3	—	3	3	3	3	3
—	—	3	—	4	—	4	4	4	4	4
—	—	5	—	5	—	5	5	5	5	5
—	—	6	—	6	—	6	6	6	6	6
—	—	7	—	7	—	7	7	7	7	7
—	—	—	—	—	—	—	—	—	—	—
—	—	9	—	9	—	8	8	8	8	9
—	—	12	—	12	—	11	13	12	11	10
—	—	11	—	10	—	9	9	9	10	11
—	—	10	—	11	—	—	10	10	—	12
—	—	13	—	13	—	13	13	11	12	13

*Cited as *An. bifurcatus*.

†Terminology used herein.

Table 8. Comparison of Terminology for Setae on Abdominal Segment II of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
—	—	0	0.submedian dorsal**	0	—	2	0	—	0	0
1	1	1	1.palmate	1	—	1	1	1	1	1
2	2	2	2.prepalmate	2	—	0	2	2	2	2
4	4	4	4.small dorso-- lateral	4	—	4	4	4	4	3
3	3	3	3. "	3	—	3	3	3	3	4
5	5	5	5.dorso-- lateral	5	—	5	5	5	5	5
6	6	6	6.lateral	6	—	6	6	6	6	6
7	7	7	7.lateral	7	—	7	7	7	7	7
8	8	8	8.stigmatic	8	—	8	8	8	8	8
9	9	9	9.ventro-- lateral posterior	9	—	10	9	9	9	9
10	10	10	10.ventro-- lateral small	10	—	11	10	10	10	10
11	11	11	11. "	11	—	9	11	11	11	11
12	12	12	12. "	12	—	12	12	12	12	12
13	13	13	13.submedian ventral	13	—	13	13	13	13	13
—	—	—	—	—	—	14	14	—	—	14

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table.

†Terminology used herein.

Table 9. Comparison of Terminology for Setae on Abdominal Segment III of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrinaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
—	—	0	—	0	—	2	0	—	0	0
—	—	1	—	1	—	1	1	1	1	1
—	—	2	—	2	—	0	2	2	2	2
—	—	4	—	4	—	4	3	3	4	3
—	—	3	—	3	—	3	4	4	3	4
—	—	5	—	5	—	5	5	5	5	5
—	—	6	—	6	—	6	6	6	6	6
—	—	7	—	7	—	12	7	7	7	7
—	—	8	—	8	—	10	8	8	8	8
—	—	9	—	9	—	8	9	9	9	9
—	—	10	—	10	—	7	10	10	10	10
—	—	11	—	11	—	9	12	11	11	11
—	—	12	—	12	—	11	11	13	12	12
—	—	13	—	13	—	13	13	12	13	13
—	—	0'	—	—	—	14	14	—	14	14
—	—	—	—	—	—	—	—	—	—	s**

*Cited as *An. bifurcatus*.

**s = dorsal sensillum. Termed an abdominal puncture herein.

†Terminology used herein.

Table 10. Comparison of Terminology for Setae on Abdominal Segments IV and V of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripterooides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
(IV only)	(V only)		(V only)							
0	—	0	0	0	—	2	0	—	0	0
1	1	1	1	1	—	1	1	1	1	1
2	2	2	2	2	—	0	2	2	2	2
4	4	4	4	4	—	4	4	4	4	3
3	3	3	3	3	—	3	3	3	3	4
5	5	5	5	5	—	5	5	5	5	5
6	6	6	6	6	—	6	6	6	6	6
7	7	7	7	7	—	12	7	7	7	7
8	8	8	8	8	—	10	8	8	8	8
9	9	9	9	9	—	8	9	9	9	9
10	10	10(IV) 12(V)	12	12	—	7	10	10	10	10
11	12	11(IV) 10(V)	11	10(IV) 12(V)	—	9	12	11	11	11
12	13	12(IV) 11(V)	10	11(IV) 13(V)	—	11	11	13	12	12
13	11	13	13	13(IV) 11(V)	—	13	13	12	13	13
—	—	0'	—	—	—	14	14	—	14	14
—	—	—	—	—	—	—	—	—	—	s**

*Cited as *An. bifurcatus*.

**s = dorsal sensillum. Termed an abdominal puncture herein.

†Terminology used herein.

Table 11. Comparison of Terminology for Setae on Abdominal Segment VI of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripterooides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
0	--	0	0	0	--	2	0	--	0	0
1	1	1	1	1	--	1	1	1	1	1
2	2	3	3	2	--	0	2	2	2	2
3	3	2	missing	3	--	3	3	3	3	3
4	4	4	4	4	--	4	4	4	4	4
5	5	5	5	5	--	5	5	5	5	5
6	6	6	6	6	--	6	6	6	6	6
7	7	7	7	7	--	7	7	7	7	7
8	8	8	8	8	--	10	8	8	8	8
9	9	9	9	9	--	8	9	9	9	9
10	11	10	11	11	--	11	12	12	--	10
12	12	11	10	12	--	9	10	11	11	11
11	10	12	12	10	--	12	11	10	12	12
13	13	13	13	13	--	13	13	13	13	13
--	--	0'	--	--	--	14	14	--	14	14

*Cited as *An. bifurcatus*.

†Terminology used herein.

Table 12. Comparison of Terminology for Setae on Abdominal Segment VII of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
0	—	0	not numbered on drawing	0	—	2	0	—	0	0
1	1	1	—	1	1	1	1	1	1	1
2	2	2	—	2	2	0	2	2	2	2
3	3	3	—	3	3	4	3	3	3	3
4	4	4	—	4	4	3	4	4	4	4
5	5	5	—	5	5	5	5	5	5	5
6	6	6	—	6	6	6	6	6	7	6
7	7	7	—	9	7	7	7	7	10	7
8	8	8	—	8	8	10	8	9	8	8
9	9	9	—	7	9	8	9	8	9	9
10	11	10	—	11	10	11	11	12	11	10
11	12	11	—	12	11	14	12	11	12	11
12	10	12	—	10	12	12	10	10	—	12
13	13	13	—	13	13	13	13	13	13	13
—	—	0'	—	—	—	—	14	—	14	14

*Cited as *An. bifurcatus*.

†Terminology used herein.

Table 13. Comparison of Terminology for Setae on Abdominal Segment VIII of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
0	—	0-VIII	0.submedian dorsal**	0	—	—	0	1	0	0
6	6	7-VIII	7.subjecten	6	β (A) α (C)***	1	1	7	1	1
7	7	8-VIII	8.small lateral	7	α (A) β (C)	3	2	6	2	2
9	9	9-VIII	9.ventro-lateral posterior	9	γ	5	3	9	3	3
11	11	10-VIII	10.small ventro-lateral	11	δ	6	4	11	4	4
13	13	13-VIII	13.submedian ventral	13	ϵ	13	5	13	5	5
—	—	—	—	—	—	—	14	13	14	14

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table.

***C indicates culicine and A anopheline.

†Terminology used herein.

Table 14. Comparison of Terminology for Setae on the Siphon* and Spiracular Apparatus of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)**	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkerii</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
g	g	9. post- spiracular***	9. post- spiracular	g	—	—	1	ventral tufts & lateral hairs	siphon	1
h	h	6-VIII	6.pecten	h	—	—	2	apical spine	apico-dorsal	2
1	1	1-VIII	1.fossate	3	—	—	3	—	sensory pit	3
2	2	2-VIII	2. "	2	—	—	4	—	" "	4
3	3	3-VIII	3. "	1	—	—	5	—	" "	5
5	5	5-VIII	5.base lateral papilla	5	—	—	6	—	basal papillary	6
4	4	4-VIII	4.tip lateral papilla	4	—	—	7	—	apical papillary	7
f	f	8-IX	8.	f	—	—	8	—	—	8
e	e	6-IX	6.	e	—	—	9	—	—	9
a	a	1-IX	1.scoop	a	—	—	10	—	—	10
b	b	2-IX	2. "	b	—	—	11	—	—	11
c	c	3-IX	3. "	c	—	—	12	—	—	12
d	d	4-IX	4. "	d	—	—	13	—	—	13

*The pecten plate of anophelines.

**Cited as *An. bifurcatus*.

***The word "hair" follows each name in this table.

†Terminology used herein.

Table 15. Comparison of Terminology for Setae on Abdominal Segment X of Culicid Larvae.

Martini 1923 p. 519	Root 1924 p. 710	Puri 1931 p. 20	Christophers 1933 p. 37	Hurlbut 1938a p. 151	Marshall 1938 p. 40	Baisas and Pagayon 1949 p. 57	Belkin 1950 p. 678	Foote 1952 p. 456	Christophers 1960 p. 211	Belkin 1962 † p. 555
<i>Anopheles claviger</i> (Meigen)*	<i>Anopheles quadrimaculatus</i> Say	<i>Anopheles</i>	<i>Anopheles</i>	<i>Anopheles walkeri</i> Theobald	anopheline and culicine	<i>Tripteroides</i> spp.	anopheline and culicine	<i>Culex</i> (<i>Melanoconion</i>)	<i>Aedes aegypti</i> (Linnaeus)	anopheline and culicine
Sattelborste	lateral hair	S.H.saddle**	S. lateral	lateral	—	1h	1	saddle	saddle	1
Schwanzborste	dorsal hair	I.S.C.H.	ISC.inner submedian caudal	inner dorsal	—	isc	2	inner dorsal tuft	inner caudal	2
Schwanzborste	dorsal hair	O.S.C.H.	OSC.outer submedian caudal	outer dorsal	—	osc	3	outer dorsal tuft	outer caudal	3
Ruder	ventral hair	V.C.H. ventral	VC.ventral caudal	ventral brush	ventral brush	—	4	ventral brush	ventral fan	4

*Cited as *An. bifurcatus*.

**The word "hair" follows each name in this table unless otherwise indicated.

†Terminology used herein.

PUPA

A

ABDOMEN (Figs.76-78) — The third, posterior division (tagma) of the insect body. In mosquito pupae, consisting of ten apparent segments. (Syn.: tail, Theobald 1901b,50)

ABDOMINAL LENGTH — The length of the abdomen measured along the dorsal midline from the anterior margin of tergum I to a transverse line connecting the most posterior points of tergum VIII. (Syn.: abdomen length, Belkin 1962,558)

ABDOMINAL PUNCTURE (p-III,p-IV,p-V) (Figs.75,77,78) — The puncture which occurs medially on the dorsolateral area of the tergum of abdominal segments III to V (occurring anomalously on II); associated with setae 4-, 5- and 6-III-V; also present in mosquito larvae. (Syn.: dorsal sensillum, Belkin 1953,321; dorsal hairless setal ring, Belkin 1954a,227; setal ring, Belkin 1954a,227; sensillum, Christophers 1960,356; hairless ring, Christophers 1960,356; also see Tables 19,20)

ABDOMINAL SEGMENT (I,II,etc.) (Figs.76-78) — One of the annular subdivisions of the insect abdomen. Ten are apparent in mosquito pupae.

ABDOMINAL SEGMENT IX (IX) [Knight 1971a,42] — The ninth annular subdivision of the insect abdomen. In mosquito pupae, represented dorsally chiefly by the median caudal lobe; sternum IX may be present but is usually reduced and indistinct.

ANTENNA (A) (Figs.73,74,76) [Hurst 1890a,51] — One of the paired anterior appendicular organs of the insect head. In mosquito pupae, curved upward and backward over the side of the thorax beneath the lower edge of the wing. (Syn.: antennal case, Smith 1904,22; antenna case, Mitchell 1907,19; Antennenscheide, Zavřel 1907,250; Fühlerscheide, Martini 1923a,531; antennal sheath, Knight 1971a,43) Concerning synonyms with the words "case" and "sheath," see **PUPA** for discussion.

ANTERIOR TENTORIAL PIT (ATP) (Fig.73) [Knight 1971a,43] — An external depression in the head at the base of each anterior tentorial arm (see this term in the adult and larva sections). In mosquito pupae, indistinctly evident anteriorly just below the base of the antenna. (Syn.: anterior opening of tentorium, Christophers 1960,356; anterior opening of the tentorium, Christophers 1960,359)

ATRIAL WALL (AW) (Fig.75) — The wall of the spiracular atrium (Snodgrass 1935,439) (the spiracular chamber of Keilin 1944,5); clothed in a network of specialized spicules, the filter apparatus. (Syn.: inner wall, Edwards 1941,355; inner trumpet wall, Reid 1963,33)

B

BUTTRESS (Bu) (Figs.75,77,78) [Ingram and Macfie 1917a,88] — The thickened, sclerotized, basolateral part of the paddle. (Syn.: external buttress, Ingram and Macfie 1917a,88; external thickening, Ingram and Macfie 1917a,82; nervure, Senevet 1930,306)

C

CEPHALOTHORAX (CT) (Figs.73,74,76) [cephalo-thorax, Mitchell 1907,19] — The combined head and thorax. This term is entirely descriptive and is not meant to indicate that the head and thorax are united as in crustaceans, arachnids or coccids.

CERCUS (Ce) (Figs.73,75,77) [Christophers 1960,358] — One of the pair of appendages of abdominal segment XI; often articulating with a more anterior segment, particularly when the posterior segments are reduced. In female mosquito pupae, one of the more or less distinct lateral lobes of the proctiger; sometimes bearing a seta, seta I-XI. (Syn.: cercal lobe, Belkin 1962,558)

CLYPEUS (Cip) (Figs.73,74) [Darsie 1951,4] — The median facial area usually bounded above by the epistomal suture and below by the clypeolabral suture. In mosquito pupae, the usually poorly delimited, conspicuously bulged area between the anterior margins of the lateralialia. (Syn.: labrum,

Hurst 1890a, including the labrum, 50; upper lip, Hurst 1890a, including the labrum, 50; clypeal plate, Crawford 1938,8; clypeal sheath, Foote 1953,95) Compare **CLYPEUS** in the adult section. Concerning synonyms with the words "plate" and "sheath," see **PUPA** for discussion.

COMPOUND EYE (CE) (Figs.73,76) [Hurst 1890a,57] — A light-perceptive organ consisting of an aggregation of optic elements (ommatidia) generally located on each side of the head. In mosquito pupae, present in a developing state; perhaps functional. (Syn.: eye, Howard 1900b,40; Hauptauge, Zavřel 1907,249; Komplexauge, Constantineanu 1930,323; zusammengesetztes Auge, Constantineanu 1930,324; imaginal eye, Baisas and Pagayon 1949,47)

D

DORSAL APOTOME (Dap) (Figs.73,74,76) — In many immature insects, the cranial area bounded laterally by the frontal ecdysial lines and apically by an imaginary line between the most apical parts of the frontal ecdysial lines; there is no necessary homology between the cranial area included in the dorsal apotome of different insects. In mosquito pupae, perhaps homologous with the dorsal apotome of mosquito larvae. (Syn.: vertical plate, Crawford 1938,8; head-shield, Edwards 1941,354; head shield, Belkin *et al.* 1945,245; vertex plate, Reid 1968,19) Concerning synonyms with the words "plate" and "shield," see **PUPA** for discussion.

DORSAL ECDYSIAL LINE (DEL) (Fig.74) — In arthropods, any dorsal preformed line of weakness along which the cuticle splits (usually) or bends during ecdysis. In mosquito pupae, located on the midline of the median keel. (Syn.: ecdysial line, Belkin 1962,557) See **ECDYSIAL LINE** in the larva section.

F

FILTER APPARATUS (FA) (Fig.75) — The network of specialized spicules which covers the atrial wall; sometimes forming a perforated plate. (Syn.: fine setae, Hurst 1890a,51; fine hairs, Reid 1963,35; microtrichia, Reid 1963,35; ental spicules, Belkin 1962,87)

FRONTAL ECDYSIAL LINE (FEL) (Fig.74) — In many immature arthropods, one of the arms of the epicranial ecdysial line; course varying widely among insects; often not homologous between different insects. In mosquito pupae, lying on each side of the dorsal apotome and apparently ending dorsally near the base of the antenna. See **ECDYSIAL LINE** and **EPICRANIAL ECDYSIAL LINE** in the larva section.

G

GENITAL LOBE (GL) (Figs.73,75-78) [Belkin *et al.* 1945,249] — The rounded projection lying ventral to the proctiger; in females, usually small, inconspicuous and spiculate; in males, large and partially bilobed, representing fused gonocoxopodites (see **GONOCOXOPODITE** in the adult section). (Syn.: outgrowth of ninth segment, Hurst 1890a, in Explanation of Letters Used on the Plates; gonapophyses, Thompson 1905,179; genital pouch, Crawford 1938,14; median caudal lobe of the eighth sternite, Penn 1949,6; tenth segment, Penn 1949,6; segment X, Foote 1953,93; phallic organ, Snodgrass 1959, in ♂, 41; phallus, Snodgrass 1959, in ♂, 41; gonocoxite, Christophers 1960, in ♂, 362)

H

HEAD (Fig.74) [Hurst 1890a,50] — The anterior section (tagma) of the insect body bearing the compound eyes, antennae and mouthparts; separated from the thorax by the cervix. In mosquito pupae, the cervix is reduced and the head abuts the thorax, the combined head and thorax being referred to as the cephalothorax. (Syn.: Kopfstück, Martini 1923a,531; head capsule, Belkin 1962,119)

hypopygium [Christophers 1960,358] — The combined tergum IX and genital lobe; including the cerci in females.

I

INTERSEGMENTAL MEMBRANE (IM) (Figs.75-78) [Penn 1949,6] — The membrane connecting the segments of the body and of the appendages.

L

LABIUM (Lb) [Hurst 1890a,50] — The fused third or posterior pair of gnathal appendages. In

mosquito pupae, soft and slender and occurring on the posterior (upper) side of the proboscis; with the hypopharynx fused to its anterior surface. (Syn.: lower lip, Hurst 1890a,50; labial sheath, Crawford 1938,11) Concerning synonyms with the word "sheath," see **PUPA** for discussion.

LABRUM (Lr) (Fig.74) [Hurst 1890a, including the clypeus, 50] — The median preoral appendage articulated with the clypeus by the clypeolabral suture. In mosquito pupae, long and slender and continuous with the clypeus. (Syn.: upper lip, Hurst 1890a, including the clypeus, 50; sheath of labrum, Crawford 1938,10; labrum sheath, Crawford 1938,11; labral sheath, Darsie 1951,4) Concerning synonyms with the word "sheath," see **PUPA** for discussion.

LATERALIA (Lat) (Figs.73,74,76) — In most immature insects, the lateral and ventral areas of the cranium lateral to the epicranial ecdysial lines, excluding any ventral apotomes and the submentum or labiogula if either can be distinguished from the adjacent cranial parts. (Syn. in part: ocular plate, Crawford 1938,8; supra-ocular plate, Crawford 1938,8; ocular lobe, Belkin 1952,119; genal plate, Christophers 1960,359) Concerning synonyms with the word "plate," see **PUPA** for discussion.

LEG (Figs.73,74,76) [Hurst 1890a,51] — In animals, one of the paired appendages ordinarily used in locomotion and support. In insects, applied only to the three pairs of thoracic legs; in most insects, composed of the coxa, trochanter, femur, tibia, tarsus and posttarsus. In mosquito pupae, non-functional and folded in loops against the sides of the thorax; comprised of the usual parts. (Syn.: leg case, Theobald 1901b,51; leg sheath, Crawford 1938,13; leg-sheath, Marshall 1938,55; pupal leg, Snodgrass 1959,40) Concerning synonyms with the words "case" and "sheath," see **PUPA** for discussion.

M

MANDIBLE (Mn) (Fig.74) [Hurst 1890a,50] — One of the first pair of gnathal appendages. In mosquito pupae, long and slender and flanking the labrum. (Syn.: mandibular sheath, Thompson 1905,182; sheath of mandible, Crawford 1938,10) Concerning synonyms with the word "sheath," see **PUPA** for discussion.

MAXILLA (Mx) (Fig.74) [Hurst 1890a,50] — One of the second pair of gnathal appendages. In mosquito pupae, consisting of a long slender part, lacinia, which borders the mandible, and a broad basal part, the maxillary palpus. (Syn.: sheath of maxilla, Crawford 1938,10; maxillary sheath, Crawford 1938,11) Concerning synonyms with the word "sheath," see **PUPA** for discussion.

MAXILLARY PALPUS (MPIp) (Figs.73,74,76) [Snodgrass 1959,40] — The teleopodite of the maxilla. In mosquito pupae, arising immediately below the clypeus and folded along the side of the proboscis. (Syn.: maxillary palp, Hurst 1890a,50; palp, Hurst 1890a, in *Explanation of Letters Used on the Plates*; palp sheath, Crawford 1938,9; palpal case, Belkin *et al.* 1945,245; sheath of maxillary palpus, Darsie 1951,4; sheath of maxillary palp, Foote 1953,95; palpus, Snodgrass 1959,40; palpal sheath, Snodgrass 1959,44) Concerning synonyms with the words "case" or "sheath," see **PUPA** for discussion.

MEATAL CLEFT (MC) (Fig.76) [Reid and Knight 1961,474] — In some mosquito pupae, a more or less distinct slit or line extending into the meatus from the spiracular opening; allowing the spiracular opening to enlarge at the surface of the water. (Syn.: basal notch, Baisas 1935,292; slit of meatus, Belkin 1962,557)

MEATUS (Mea) (Figs.75,76) [Ingram and Macfie 1919,59] — The part of the trumpet from the base to an imaginary line drawn more or less perpendicular to the longitudinal axis at the most proximal margin of the spiracular opening; extent expressed as a fraction of the trumpet length.

MEDIAN CAUDAL LOBE (MCL) (Figs.73,75-78) [Belkin 1962,557] — The transverse lobe borne caudal to tergum VIII and dorsal to the proctiger; representing the dorsum of abdominal segment IX and at least a small part of abdominal segment VIII. (Syn.: ninth segment, Giles 1900,62; median caudal projection of the eighth tergite, Penn 1949,6; anal flap, Darsie 1951,4; tergite IX, Belkin 1952,127; segment IX, Foote 1953,93; posterior median evagination, Foote 1953,93; dorsal flap, Foote 1953,93; tergum of the ninth segment, Snodgrass 1959,45; median lobe of ninth tergite, Christophers 1960,218; ninth tergite, Christophers 1960,358; IX, Belkin 1962,557; abdominal segment IX, Belkin 1962,557; ninth tergum, Knight 1971a,44)

MEDIAN KEEL (MK) (Figs.73,74,76) [Edwards 1941,356] — The crestlike median longitudinal ridge of the scutum; bearing the dorsal ecdysial line along its midline. (Syn.: median dorsal keel, Edwards 1926,124; median ridge of dorsal plate, Crawford 1938,10; median crest, Christophers 1960,360; middorsal ridge, Belkin 1962,557; median dorsal ridge, Reid 1963,36)

MESONOTUM (Mn) — The notum (tergum) of the mesothorax. In mosquito pupae, comprised of the scutum and a postscutal area, the latter consisting of the usually ill-defined scutellum and mesopostnotum. (Syn.: dorsal plate, Crawford 1938,7; mesonotal plate, Belkin 1952,120) Concerning synonyms with the word "plate," see **PUPA** for discussion.

MESOTHORACIC WING (MW) (Figs.73,74,76) [Snodgrass 1959,41] — In adult pterygotous insects, the paired organ of flight of the mesothorax; in Diptera, called simply a wing because the metathoracic wings are represented by the halteres (see **WING** in the adult section); present but non-functional in the pupal stage of these insects. In mosquito pupae, extended downward on the sides of the thorax; with little or no indication of venation. (Syn.: wing, Hurst 1890a,51; wing-case, Theobald 1901b,51; wing-pad, Smith 1904,22; wing case, Smith 1904,22; wing shield, Roseboom and Knight 1946,99; wing pad, Penn 1949,6; wing sheath, Knight 1971a,49) Concerning synonyms with the words "case," "sheath" and "shield," see **PUPA** for discussion.

METANOTUM (Mtn) (Figs.73,74,77,78) [Eysell 1911,321] — The notum (tergum) of the metathorax. In mosquito pupae, a small sclerite appearing as part of the abdomen; bearing the metathoracic wings laterally. (Syn.: metathorax, Senevet 1930, including the metathoracic wings, 302; metathoracic plate, Crawford 1938, including the metathoracic wings, 8; metanotum, Belkin *et al.* 1945, including the metathoracic wings, 248; metanotal bar, Belkin *et al.* 1945,245; median bar, Belkin *et al.* 1945,248; bar, Roseboom and Knight 1946,115; metanotal plate, Belkin 1952, probably including the metathoracic wings, 120; metanotal plate, Knight 1971a,44) Concerning synonyms with the word "plate," see **PUPA** for discussion.

METATHORACIC WING (Mw) (Figs.73,74,76-78) [Snodgrass 1959,41] — In adult insects, the paired organ of flight of the metathorax; represented by the halter in Diptera (see **HALTER** and **WING** in the adult section); present but non-functional in the pupal stage of these insects. In mosquito pupae, lying behind the mesothoracic wing with the apex directed posteriorly along the side of abdominal segment I. (Syn.: halter, Hurst 1890a, in Explanation of Letters Used on the Plates; balancer, Hurst 1890a, in Explanation of Letters Used on the Plates; metathorax, Senevet 1930, including the metanotum, 302; metathoracic plate, including the metanotum, 8; metanotum, Belkin *et al.* 1945, including the metanotum, 248; metanotal plate, Belkin 1952, including the metanotum, 120; metathoracic wing pad, Snodgrass 1959,41; hind wing, Snodgrass 1959,44; pupal halter, Christophers 356; haltere case, Belkin 1962,558; halter sheath, Knight 1971a,43) Concerning synonyms with the words "case," "plate" and "sheath," see **PUPA** for discussion.

MIDRIB (Mr) (Figs.75-78) [mid-rib, Hurst 1890a,51] — The thickened median veinlike supporting structure of the paddle. (Syn.: longitudinal rib, Johannsen 1903,414; vein, Banks 1908,239; central rib, Wesché 1910,16; rib, Wesché 1910,28; thickening, Wesché 1910,28; nervure, Senevet 1930,306)

mouthpart case [Belkin 1962,557] — A general term applied to any of the pupal oral appendages, i.e., the labrum, mandibles, maxillae, labium and hypopharynx. (Syn.: proboscis sheath, Crawford 1938,11)

O

outer trumpet wall [Reid 1963,33] — The wall of the trumpet comprised of the pinna and meatus; its inner surface opposes the atrial wall and its outer surface sometimes has tracheoid and reticulate areas or is entirely reticulate. (Syn.: outer wall, Edwards 1941,355; external surface, Reid 1963,33)

P

PADDLE (Pa) (Figs.75-78) [Smith 1904,22] — The movable or immovable paired appendage of abdominal segment IX; appearing to arise from the caudolateral part of abdominal segment VIII. (Syn.: nageoire, de Réaumur 1738,607; tail-fin, Hurst 1890a,51; fin, Hurst 1890a,51; flap, Miall 1895,104; caudal fin, Giles 1900, legend to Plate IV; swimming paddle, Johannsen 1903,391; gill, Smith 1904,21; pinnura, Banks 1908,239; anal plate, Wesche 1910,16; Ruderplatte, Eysell 1911,323; natatory paddle, Penn 1949,5)

The paddle has inner and outer parts and margins which are defined below:

Inner margin [Macfie and Ingram 1923,416] — The margin from the apex of the midrib, or its projection, to the base along the inner or mesal part of the paddle. (Syn.: lateral margin, Banks 1908,242)

Inner part [Belkin 1962,558] — The part of the paddle mesad of the midrib.

Outer margin [Banks 1908,239] — The margin from the apex of the midrib, or its projection, to the base along the outer or lateral part of the paddle. (Syn.: lateral margin, Banks 1908,242; external border, Ingram and Macfie 1919,60; external margin, Macfie and Ingram 1923,416)

Outer part [Johannsen 1934,45] — The part of the paddle laterad of the midrib.

- PADDLE FRINGE (PF)** [Knight 1971a,44] — The serrations, aciculae and/or filaments occurring along the inner and outer margins of the paddle. (Syn.: fringe, Banks 1908,239; ciliation, Wesché 1910, in Explanation of Plate III; marginal fringe, Ingram and Macfie 1917a,75; fringe of the paddle, Carpenter and LaCasse 1955,15)
- PADDLE INDEX** [Darsie 1949,18] — The ratio of the paddle length to the paddle width.
- PADDLE LENGTH** [Macfie and Ingram 1920,106] — The maximum length of the paddle from the basal articulation to the most distal point measured along the midrib or its projection.
- PADDLE MARGINAL SERRATIONS (Se)** (Fig.77) [Knight 1971a,44] — The serrations of the paddle fringe, usually confined to the outer margin. (Syn.: external fringe, Ingram and Macfie 1917a,76; denticles, Macfie and Ingram 1923,416; denticulation, Macfie and Ingram 1923,426; éspines, Senevet 1930,306; dents, Senevet 1930,312; teeth, Christophers 1933,34; spines, Evans 1938,19; spinous part of fringe, Gillies and De Meillon 1968,13; fringe teeth, Reid 1968,25; marginal serrations, Belkin 1962,558)
- PADDLE MARGINAL SPICULES (Sp)** (Figs.75,77,78) [Knight 1971a,44] — The aciculae or filaments of the paddle fringe, usually confined to the outer margin. (Syn.: cilia, Johannsen 1903,391; hairs, Johannsen 1903,391; fimbria, Macfie and Ingram 1923,416; marginal spicules, Belkin 1962,558; hairy part of fringe, Gillies and De Meillon 1968,13; fringe of hairs, Reid 1968,24; fringe hairs, Reid 1968,25)
- PADDLE WIDTH** [Belkin 1962,558] — The maximum width of the paddle measured along a line perpendicular to the midrib. (Syn.: paddle breadth, Macfie and Ingram 1920,106)
- PINNA (PI)** (Figs.75,76) [Ingram and Macfie 1919,59] — The part of the trumpet from the apex to an imaginary line drawn more or less perpendicular to the longitudinal axis at the most proximal margin of the spiracular opening, the part distal to the meatus; extent expressed as a fraction of the trumpet length.
- POSTSCUTAL AREA (PsA)** (Figs.73,74,76) — The part of the mesonotum behind the scutum; composed of a more or less smooth anterior area, scutellum, and a smaller, sometimes striated posterior area, mesopostnotum, which bears a variously developed median longitudinal ridge; the scutellum and mesopostnotum are usually poorly delimited or otherwise difficult to distinguish from one another. (Syn.: postscutellar area, Christophers 1960, at least in part, 356 (see his page 360); postscutal plate, Knight 1971a,45) Concerning synonyms with the word "plate," see **PUPA** for discussion.
- PROBOSCIS (P)** (Figs.73,76) [Rozeboom and Knight 1946,99] — The greatly elongate bundle of closely adherent oral appendages curled beneath the cephalothorax; the appendages include the labrum, mandibles, maxillae and the united labium and hypopharynx. (Syn.: Stiletbündel, Eysell 1911,324; Rüsselscheide, Eysell 1911,325; proboscis sheath, Knight 1971a,45) Compare **PROBOSCIS** in the adult section. Concerning synonyms with the word "sheath," see **PUPA** for discussion.
- PROCTIGER (Pr)** (Figs.73,75) [Belkin 1952,127] — In insects with poorly defined segmentation behind abdominal segment IX, the complex formed of abdominal segments X and XI, with its cerci, and the telson. (Syn.: anal lobe, Belkin 1952,127; tenth abdominal segment, Carpenter and LaCasse 1955,16; genital pouch, Carpenter and LaCasse 1955,16; tenth segment, Snodgrass 1959,45; anal segment, Belkin 1962,552; X, Belkin 1962,552; ninth sternite, Christophers 1960,358; abdominal segment X, Knight 1971a, in part, 42) Compare **PROTIGER** in the adult section.
- PRONOTUM (PrN)** (Fig.74) — The tergum of the prothorax. In Diptera, generally narrowed or seemingly absent medially but well developed laterally. In mosquito pupae, bearing setae 4- to 7-CT. (Syn.: Seitenfeld, Eysell 1911,325; pronotal process, Crawford 1938,7; pronotal plate, Crawford 1938,8; prothoracic plate, Knight 1971a,45) Concerning synonyms with the word "plate," see **PUPA** for discussion.
- PUPA** — The third of penultimate stage in the life cycle of a holometabolous insect. (Syn.: nymphe, de Réaumur 1738,606; nymph, Stephens and Christophers 1903,88)
- In mosquitoes, the pupal-adult apolysis occurs shortly after the larval-pupal ecdysis. Hence, there is a very short exposed pupal period, perhaps one to four hours, followed by a very long pharate adult phase, perhaps about 44-47 hours of the two days that so many species are conventionally said to be in the "pupal stage." So most of the conventional "pupal stage" is an adult, not a pupa, enclosed by the remains of the pupal cuticle. For this reason, most recent authors have adopted terms for parts of the pupal "skin" which include the words "sheath," "case" or "plate" because the parts cover or enclose the corresponding structure in the developing adult, e.g.,

scutal plate, which was recommended for use by Knight (1971a,45), overlies the adult scutum. There are, however, particular objections to using "plate" with terms for cuticular structures which are sclerites since sclerite and plate are so often used interchangeably. And of course, the scutum is a sclerite, so it is ambiguous to say "scutal sclerite" or "scutal plate." Then too, the pupa has a scutum which lies over the area in which the adult scutum will develop, but the adult scutum does not do any developing (being a sclerite and thus part of the cuticle) at all until after the apolysis marking the end of the pupal stage. Of course, when there is no longer a pupa as such, there is still the pupal "pelt" around the adult stage, and then the pupal scutum overlies the developing adult scutum. Would the pupal scutum be called the scutum before apolysis and the "scutal plate" after apolysis? Of course not, and for this reason terms which have included the words sheath, shield, case, plate, pouch or sac have not been recommended for use herein. If such terms had been adopted, then logically the conventional pupal abdomen would have had to be dubbed the abdominal case, the genital lobe dubbed the genital case, etc.

R

ratio (width: length) [Theodor 1924,345] — Theodor (1924,344) suggested that the "proportion of the total length (= 1) to the width [of the trumpet] at the end of the meatus, measured vertically to the longer side. . ." be used instead of the meatus/total length ratio first employed by Ingram and Macfie (1919,59) as a "trumpet index" (Buxton 1924,312). See **TRUMPET INDEX**.

REFRACTILE BORDER (RB) [Reid 1968,25] — The part of the outer margin of the paddle bearing the paddle marginal serrations; refractile to light. (Syn.: refractile part of lateral border, Reid 1968, 24)

REFRACTILE INDEX [Reid 1968,25] — The ratio of the paddle length to the length of the refractile border.

RETICULATE AREA (RA) (Fig.76) [Knight 1971a,45] — The part of the trumpet meatus where the surface has an interconnected system of shallow grooves which separate raised areas of the cuticula. (Syn.: reticulate, Edwards 1941,355; reticulated, Christophers 1960,360)

RUDIMENTARY SPIRACLE (rs) (Figs.75-78) — A closed, non-functional spiracle. In mosquito pupae, rudimentary spiracles are usually present on abdominal segments I-VII; borne ventrally near the anterolateral margins of abdominal segment I (stated to be functional by Christophers 1960,361) and dorsally near the anterolateral margins of abdominal segments II-VII. (Syn.: stigma, Hurst 1890a,51; abdominal stigma, Macfie and Ingram 1923,413; spiracle, Christophers 1960, on abdominal segment I, 356; mark of functionless spiracle, Christophers 1960, on abdominal segments II-VII, 356; abdominal spiracle, Christophers 1960,361; spiracular sensillum, Belkin 1962,558)

S

SCUTUM (Scu) (Figs.73,74,76) [Martini 1923a,531] — The principal dorsal area of the thorax belonging to the mesonotum; used here for the combined prescutum and scutum because these areas are not separated in mosquito pupae. (Syn.: Dorsalfeld, Eysell 1911,325; scutal plate, Knight 1971a,45) Concerning synonyms with the word "plate," see **PUPA** for discussion.

SECONDARY CLEFT (SeC) (Fig.76) [Reid and Knight 1961,476] — In many mosquito pupae with a laticorn trumpet, a small slit extending into the pinna from the margin of the spiracular opening opposite the meatal cleft. (Syn.: apical notch, Baisas 1935,292; secondary split, Reid 1963,32)

SETA, pupal — An understanding of the pupal chaetotaxy has been developing for the past 60 years. Progress has been slow because only in relatively recent years have the pupae of sufficient numbers of species been collected, identified and described to assure that the chaetotaxy is of monophyletic origin and that its components are homologous phylogenetically as well as ontogenetically and in part serially. The discovery (Belkin 1960;1962,555) that the developing pupal setae are connected by sensory neurons to their homologs in the fourth stage larva established beyond doubt the ontogenetic homology of the setae.

In the period since names were first applied to most of the pupal setae (Macfie 1920), numerous naming systems and modifications 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 Tables 16-23. In these tables, each setal name in the various previously proposed nomenclatural systems 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 such setal relationships expressed there differ in a number of ways from the interpretations commonly accepted today.

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

Because it is convenient to think of the abdominal setae in groups, Figure 78b was prepared as a composite. It shows the area on each abdominal segment occupied by each setal group for all the species and genera illustrated by Belkin (1962). Additionally, many drawings of pupae published since 1962 were checked against the figure. Setal arrangements not covered in Figure 78b are still being discovered, but the figure is probably representative of the greater proportion of species.

SETA, cephalothoracic — Thirteen pairs of setae occur on the cephalothorax, three on the lateralia of the head, four on the prothorax, two on the mesothorax and usually three, sometimes four, on the metathorax. The setae of this area were formerly designated with a number connected by a hyphen to the suffix "C." Since this suffix was also being employed for the setae of the larval cranium, Knight (1971a, 57) instituted the practice of using the suffix "CT" for the cephalothoracic setae.

SETA 1-CT (Figs. 73, 76) — The dorsal of the three head setae, borne on the lateralia of the head; homologous with larval seta 10-C; in slide-mounted exuviae, the lateralia fold in such a manner that this seta becomes the most mesal and caudal while seta 3-CT becomes the most lateral and anterior (Belkin 1952, 119). (Syn.: See Table 16)

SETA 2-CT (Figs. 73, 76) — The median of the three head setae, borne on the lateralia of the head; homologous with larval seta 12-C (Belkin 1952, 120). (Syn.: See Table 16)

SETA 3-CT (Figs. 73, 76) — The ventral of the three head setae, borne on the lateralia of the head; homologous with larval seta 13-C (Belkin 1952, 120). (Syn.: See Table 16)

SETA 4-CT (Figs. 73, 76) — A prothoracic seta, associated with seta 5-CT to form the more anterior setal group of the pronotum; 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-P, 1- and 3-P, or 2- and 3-P respectively (Belkin 1952, 120). (Syn.: See Table 16)

SETA 5-CT (Figs. 73, 76) — A prothoracic seta, associated with seta 4-CT to form the more anterior setal group of the pronotum; usually interpreted as being the more lateral and/or anterior of the two; with seta 4-CT, probably homologous with either larval setae 1- and 2-P, 1- and 3-P, or 2- and 3-P respectively (Belkin 1952, 120). (Syn.: See Table 16)

SETA 6-CT (Figs. 73, 76) — A prothoracic seta, associated with seta 7-CT to form the more posterior setal group of the pronotum; usually interpreted as being the more anterior and/or lateral of the two; with seta 7-CT, probably homologous with either larval setae 3- and 4-P, 4- and 0-P, or 4- and 5-P respectively (Belkin 1952, 120). (Syn.: See Table 16)

SETA 7-CT (Figs. 73, 76) — A prothoracic seta, associated with seta 6-CT to form the more posterior setal group of the pronotum; usually interpreted as being the more posterior and/or mesal of the two; with seta 6-CT, probably homologous with either larval setae 3- and 4-P, 4- and 0-P, or 4- and 5-P respectively (Belkin 1952, 120). (Syn.: See Table 16)

SETA 8-CT (Figs. 73, 76) — A mesothoracic seta, associated with seta 9-CT to form a group close to the dorsal midline and 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 (Belkin 1952, 120). (Syn.: See Table 16)

SETA 9-CT (Figs. 73, 76) — A mesothoracic seta, associated with seta 8-CT to form a group close to the dorsal midline and mesal to the trumpet; interpreted as being either the more posterior and/or lateral of the two; homology not clear, possibly either homologous with larval seta 4-M or seta 5-M (Belkin 1952, 120). (Syn.: See Table 16)

SETA 10-CT (Figs. 73, 76-78) — A metathoracic seta, associated with setae 11- and 12-CT to form a group lateroanteriorly on the metanotum; interpreted as being the most mesal of the group; homologous with larval seta 1-T (Belkin 1952, 121). (Syn.: See Table 16)

SETA 11-CT (Figs. 73, 76-78) — A metathoracic seta, associated with setae 10- and 12-CT to form a group lateroanteriorly on the metanotum; interpreted as being the intermediate seta of the group

homologous with larval seta 2-T (Belkin 1952,121). (Syn.: See Table 16)

SETA 12-CT (Figs.73,76-78) — A metathoracic seta, associated with setae 10- and 11-CT to form a group lateroanteriorly on the metanotum; interpreted as being the most lateral of the group; homologous with larval seta 3-T (Belkin 1952,121). (Syn.: See Table 16)

SETA 13-CT — An evanescent metanotal seta reported in *Uranotaenia* by Belkin (1952,128), who stated that it bears the same relationship to seta 12-CT that larval seta 4-T bears to 3-T. Peyton (1973) found this seta or its alveolus in most *Uranotaenia* pupae in a position slightly caudolaterad of seta 12-CT and designated it 13-CT without attempting homologies. Marks (1976) described the presence of 13-CT in *Bironella*.

SETA, abdominal — The numbers applied to the pupal abdominal setae indicate homologies with larval abdominal setae as established by Belkin (1952) unless otherwise stated.

SETA 0-II to SETA 0-VIII (Figs.76-78) — The most anterior of the dorsal setae on abdominal segments II to VIII; minute except in some Anophelinae. Seta 0 is absent from abdominal segment I. (Syn.: See Tables 18-23)

SETA 1-I (Figs.73,76-78) — The dorsal seta nearest both the posterior margin and the longitudinal midline of abdominal segment I; usually inserted mesad of a large membranous area; typically a large multi-branched dendritic seta; in species having non-surface resting pupae, simple or sparsely branched, e.g., in some Mansoniini pupae. (Syn.: See Table 17)

SETA 1-II to SETA 1-VII (Figs.76-78) — The mesodorsal seta nearest the posterior margin of abdominal segments II to VII; if seta 2 is equally near or nearer, it is also usually nearer the longitudinal midline and typically shorter than seta 1; if seta 3 is equally near or nearer, it is also nearer the lateral margin, mesad of seta 1 in *Anopheles*, however. (Syn.: See Tables 18-23)

SETA 1-IX (Figs.77,78) — A seta sometimes present dorsally near the lateral margin of the median caudal lobe; arbitrarily named (Belkin 1952,127). (Syn.: See Table 23; also, caudal hair, Belkin 1962,558)

SETA 1-XI (Fig.77) — A lateral seta of the cercus; observed only in *Toxorhynchites*. (Syn.: See Table 23; also, cercal hair, Belkin 1962,558; seta 1-X, Knight 1971a,47)

SETA 2-I (Figs.73,76-78) — One of the two (usually noticeably paired with seta 3-I) dorsal setae occurring nearest both the anterior margin and the longitudinal midline of abdominal segment I; the shorter of the two except in Anophelinae, Aedeomyiini, some Mansoniini and *Uranotaenia* (*Uranotaenia*) pupae. (Syn.: See Table 17)

SETA 2-II to SETA 2-VII (Figs.76-78) — The mesodorsal seta on abdominal segments II to VII associated with setae 1 and 3 and 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; nearly always the shortest of the three mesodorsal setae. Seta 2 is absent from abdominal segment VIII. (Syn.: See Tables 18-22)

SETA 3-I (Figs.73,76-78) — One of the two (usually noticeably paired with seta 2-I) dorsal setae occurring nearest both the anterior margin and the longitudinal midline of abdominal segment I; in most genera, interpreted as being the more posterior and/or lateral of the two; usually also the longer. (Syn.: See Table 17)

SETA 3-II to SETA 3-VII (Figs.76-78) — A mesodorsal seta variously associated either with setae 1 and 2 or 4 and 5 or standing alone on abdominal segments II to VII; sometimes exhibiting sufficient lack of serial resemblance in form and position on one or more segments as to be difficult to name; usually determinable by process of elimination; at least on abdominal segments IV and V, believed to be a homolog of larval seta 4 (Barr and Myers 1962,95; Belkin 1962, Fig.409). Seta 3 is absent from abdominal segment VIII. (Syn.: See Tables 18-22)

SETA 4-I (Figs.73,76-78) — A dorsoanterior seta grouped with seta 5 on abdominal segment I; usually posterior to 5 but if at the same level it is regarded as being the mesal one of the pair. (Syn.: See Table 17)

SETA 4-II to SETA 4-VIII (Figs.76-78) — A dorsoposterior seta which along with seta 5 arises mesal to setal groups 1-2-3 and 6-9 on abdominal segments II-VII; in some cases, seta 4 and/or 5 are distinguishably grouped with one or more of the 1-2-3 group; seta 4 is usually shorter than 5; on segment II, 4 is relatively stable in position with 5 occurring on any side of it; on segments III-V, 4 is generally nearer the puncture than 5; on III, 4 is usually anterior and lateral to 5; on IV-VI, 4 is anterior to 5; on VII, 4 is nearly always more anterior and lateral than 5; on VIII, arbitrarily applied

to the inner posterior seta. (Syn.: See Tables 18-23)

Regarding seta 4-VIII, both Barr and Myers (1962) and Boreham (1970) have determined by tracing connecting nerves between larval and prepupal setae that it is homologous with larval seta 2-VIII. Since serial homologies between the larval setae of abdominal segment VIII (reduced to five pairs) and more anterior segments possessing full complements of setae have not been determined, the numbering for this seta is left as established by Belkin (1952). At least on segments IV and V, seta 4 is believed to be a homolog of larval seta 3 (Barr and Myers 1962).

SETA 5-I (Figs.73,76-78) — A dorsoanterior seta grouped with seta 4 on abdominal segment I; usually anterior to seta 4 but if at the same level it is regarded as being the lateral one of the pair. (Syn.: See Table 17)

SETA 5-II to SETA 5-VII (Figs.76-78) — See definition for **SETA 4-II to SETA 4-VIII**. Seta 5 is interpreted as being absent from abdominal segment VIII. (Syn.: See Tables 18-22)

SETA 6-I (Figs.73,76-78) — The seta interpreted as being the most anterior (and often the most mesal) in the laterodorsal setal group 6-7-9 on abdominal segment I. (Syn.: See Table 17)

SETA 6-II to SETA 6-VII (Figs.76-78) — A dorsoposterior seta generally inserted lateral to setae 4 and 5 and mesal to seta 9 on abdominal segments II to VII. Seta 6 is absent from abdominal segment VIII. (Syn.: See Tables 18-22)

SETA 7-I (Figs.73,76-78) — The seta closely associated with setae 6 and 9 on abdominal segment I; posterior to seta 6. (Syn.: See Table 17)

SETA 7-II (Figs.73,76-78) — The seta usually dorsally associated with setae 6 and 9 on abdominal segment II; identifiable by comparison with seta 7 on abdominal segment I. (Syn.: See Table 18)

SETA 7-III to SETA 7-VII (Figs.76-78) — The seta lateroventrally associated with seta 8 on abdominal segments III to VII; interpreted as being the more posterior of the two. Seta 7 is absent from abdominal segment VIII. (Syn.: See Tables 19-22)

SETA 8-II to SETA 8-VII (Figs.76-78) — The ventral seta nearest both the lateral and the anterior margins of abdominal segments II to VII; associated with seta 7; often absent on segment II. Seta 8 is absent from abdominal segments I and VIII. (Syn.: See Tables 18-22)

SETA 9-I (Figs.73,76-78) — A lateral seta closely associated with setae 6 and 7 on abdominal segment I; the shortest (except in some Anophelinae) and generally the most posterior of the three. (Syn.: See Table 17)

SETA 9-II to SETA 9-VIII (Figs.76-78) — In flattened exuviae, the seta inserted on or near the lateral margin of abdominal segments II to VIII, generally lateral to seta 6; in most taxa, small to minute on segments II-VI and elongate on VII and VIII. (Syn.: See Tables 18-23)

SETA 10-I (Figs.77,78) — A small ventral seta present on abdominal segment I; when seta 11 is also present, seta 10 is interpreted as being the one nearer both the longitudinal midline and the posterior margin of the segment.

The ease with which this seta and seta 11 can be overlooked may account for the frequency with which one or both are missing on published drawings. When only one ventral seta occurs on abdominal segment II, the decision as to whether it is 10 or 11 is largely arbitrary.

SETA 10-II to SETA 10-VIII (Figs.76-78) — A ventroposterior seta associated with seta 11 in a position mesal to setal group 7-8 on abdominal segments II to VII; usually longer than seta 11. Seta 10 occurs on abdominal segment VIII in *Aedes futunae* Belkin (Belkin 1962, Fig.327). (Syn.: See Tables 18-22)

SETA 11-I (Figs.77,78) — A small ventral seta on abdominal segment I. See **SETA 10-I**.

SETA 11-II to SETA 11-VII (Figs.76-78) — A ventroposterior seta associated with seta 10 in a position mesal to setal group 7-8 on abdominal segments II to VII; usually shorter than seta 10; occurring in any relationship to 10 except immediately posterior. Seta 11 is absent from abdominal segment VIII. (Syn.: See Tables 18-22)

SETA 12-V and SETA 12-VI (Fig.78) — A transitory ventral seta of abdominal segments V and VI reported from *Anopheles freeborni* Aitken by Belkin (1953; labelled "hair 9"); regarded by Belkin (in correspondence) as being homologous with larval seta 12. Also, see Belkin 1962, Fig.387. (Syn.: See Table 21)

SETA 13-II to SETA 13-VII (Fig.78) — In the pupae of some sabethine genera, a ventral puncture present approximately midway between the longitudinal midline and lateral margin and between

the anterior and posterior margins of abdominal segments II to VII; sometimes with a minute seta as an anomaly; possibly the seta illustrated in *Tripteroides bambusa* (Yamada) by Nakagawa and Asanuma (1954,93).

SETA 14-III to SETA 14-VIII (Figs.76-78) — A minute ventral seta near the anterior margin at the longitudinal midline of abdominal segments III to VIII. (Syn.: See Tables 19-23)

SETA 1-P (Figs.76-78) — The terminal or outer seta of the paddle; arbitrarily named (Belkin 1952,127). (Syn.: See Table 23; also, urochaeta, Banks 1908,239)

SETA 2-P (Figs.77,78) — The subterminal or inner seta of the paddle; often absent; arbitrarily named (Belkin 1952,127). (Syn.: See Table 23; also urochaeta, Banks 1908,239)

STEMMA (St) (Fig.73) — In the pupae of certain insects, any one of one to several paired lateral ocelluslike light-perceptive organs of the lateralia; composed of a few large optic elements unlike the ommatidia of compound eyes. In mosquito pupae, one consisting of five elements occurs caudal to the compound eye; occurring in the larva and persisting into the adult. (Syn.: ocellus, Hurst 1890a,57; Nebenaugue, Zavfel 1907,249; pupal eye, Patton and Evans 1929,247; simple eye, Patton and Evans 1929,249)

STERNUM (S) [Giles 1900,62] — The ventral sclerotization of a body segment, primary sternum. (Syn.: sternite, Kirkpatrick 1925,34; sternal plate, Crawford 1938,13)

STERNUM IX (IX-S) (Fig.75) — The sternum of abdominal segment IX. In mosquito pupae, may be present as a reduced and indistinct transverse sclerite at the base of the genital lobe. (Syn.: ninth sternite, Christophers 1960,362)

T

tentorial bar [Christophers 1960,359] — The right or left half of the tentorium comprised mainly of the united anterior and posterior tentorial arms (see these terms in the adult and larva sections). (Syn.: Chitinhebel, Eysell 1911,325; bone-like tapering rod, Crawford 1938,11; sclerotized rod, Crawford 1938,12; internal rod, Edwards 1941,354; tentorial rod, Edwards 1941,354)

TENTORIUM (Tn) [Knight 1971a,48] — The pair of endoskeletal struts of the cranium formed chiefly of the fused anterior and posterior tentorial arms (see these terms in the adult and larva sections). In mosquito pupae, the right and left halves of the tentorium are not connected, each extends through the head from the anterior tentorial pit to the soft membrane forming the back of the head. See **tentorial bar**.

TERGUM (Te) [Giles 1900,62] — The dorsal sclerotization of a body segment; called notum in the thorax. (Syn.: tergite, Kirkpatrick 1925,34; tergal plate, Crawford 1938,14)

THORAX (Fig.74) [Hurst 1890a,50] — The second or intermediate division (tagma) of the insect body; bearing the true legs and wings; comprised of the pro-, meso- and metathoracic segments. In mosquito pupae, the head abuts the thorax, the combined head and thorax being referred to as the cephalothorax. (Syn.: Brustkorb, Martini 1923a,531)

TRACHEOID AREA (TA) (Fig.76) [Knight 1971a,49] — The proximal part of the trumpet meatus when it shows more or less distinct transverse striations on the external surface; extent expressed as a fraction of its greatest length to the trumpet length. (Syn.: transverse folds, Theodor 1924,342; tracheoid, Edwards 1941,355)

TRAGUS (Tg) (Fig.76) [Reid and Knight 1961,476] — A more or less elaborate lobe sometimes occurring on the rim of the pinna of a laticorn trumpet. (Syn.: flap, Baisas 1935,292; lobe, Reid and Knight 1961,476; process, Reid and Knight 1961,476)

TRUMPET (T) (Figs.73-76) [trompette, Meinert 1886,490] — The paired, usually movable, dorsolateral appendage of the cephalothorax containing the mesothoracic spiracle; apex cut off obliquely to form the pinna, the remainder being the meatus; the surface sometimes with a proximal tracheoid and a distal reticulate area or entirely reticulate. The two types of trumpets occurring in mosquito pupae are defined below. (Syn.: cornet, de Réaumur 1738,607; horn, Hurst 1890a,50; air-tube, Hurst 1890a,50; respiratory siphon, Hurst 1890a, in Explanation of Letters Used on the Plates; respiratory tube, Hurst 1890a,51; prothoracic siphon, Hurst 1890b,172; pupal siphon, Hurst 1890b,176; respiratory trumpet, Miall 1895,103; respiratory syphon, Giles 1900, legend to Plate IV; pupal syphon, Giles 1900,59; syphon, Giles 1900,61; breathing trumpet, Nuttall and Shipley 1901b,271; siphon, Theobald 1901b,52; Athemhorn, de Meijere 1902,637; breathing tube, Johannsen 1903,390; air trumpet, Johannsen 1903,415; syphon tube, Stephens and Christophers

1903,91; spiracle, James and Liston 1904,13; air pipe, Mitchell 1907,19; tube, Wesché 1910,28; Atmungshorn, Eysell 1911,320; pupal trumpet, Ingram and Macfie 1917a,73; prothoracic spiracle, Keilin 1944,58; respiratory horn, Matheson 1944,26)

Angusticorn (**AT**) (Fig.76) [Reid and Knight 1961,475] — A trumpet having the longest axis vertical more or less in line with the stem; narrowly funnel-shaped when closed; with a split (meatal cleft) down one side which allows it to open widely at the surface of the water.

Laticorn (**LT**) (Fig.76) [Reid and Knight 1961,475] — A trumpet having the longest axis transverse to the stem; often with a secondary cleft in the pinna opposite the meatal cleft; sometimes less wide-mouthed but with a more or less elaborate lobe, the tragus, on the rim of the pinna.

trumpet index [Buxton 1924,312] — Buxton used this term for the ratio of meatus length to trumpet length first employed by Ingram and Macfie (1919,59). See **TRUMPET INDEX**.

TRUMPET INDEX [Belkin 1962,557] — The ratio of the trumpet length to the trumpet width.

TRUMPET LENGTH [Belkin 1962,557] — The maximum length of the trumpet measured along a straight line from the point of articulation at the base to the extreme apex.

TRUMPET WIDTH [Belkin 1962,558] — The width of the trumpet measured at one-half the trumpet length; measured along a line perpendicular to the line of projection for the trumpet length.

FIGURE 73

- a,b. Pupa of *Aedes (Stegomyia) aegypti* (Linnaeus). Redrawn from Christophers (1960,357).
- a. Anterior aspect of cephalothorax of female.
 - b. Dorsal aspect of cephalothorax and abdominal segments I and II.
- c. Dorsal and ventral aspects of terminal abdominal segments of male pupa (diagramatic). Redrawn from Belkin (1962, Fig.410).
- d. Dorsal and ventral aspects of terminal abdominal segments of female pupa (diagramatic). Redrawn from Belkin (1962, Fig.410).
- e. Anophelinae. External aspect of part of cephalothorax of pupal exuviae.
- f. Toxorhynchitinae. External aspect of part of cephalothorax of pupal exuviae.

Abbreviations

A	- antenna
ATP	- anterior tentorial pit
Ce	- cercus
CE	- compound eye
Clp	- clypeus
CT	- cephalothorax
DAP	- dorsal apotome
GL	- genital lobe
Lat	- lateralia
MCL	- median caudal lobe
MK	- median keel
MPIp	- maxillary palpus
Mtn	- metanotum
MtW	- metathoracic wing
MW	- mesothoracic wing
P	- proboscis
Pr	- proctiger
PsA	- postscutal area
Scu	- scutum
St	- stemma
T	- trumpet
I, III	- abdominal segments

Fig. 73

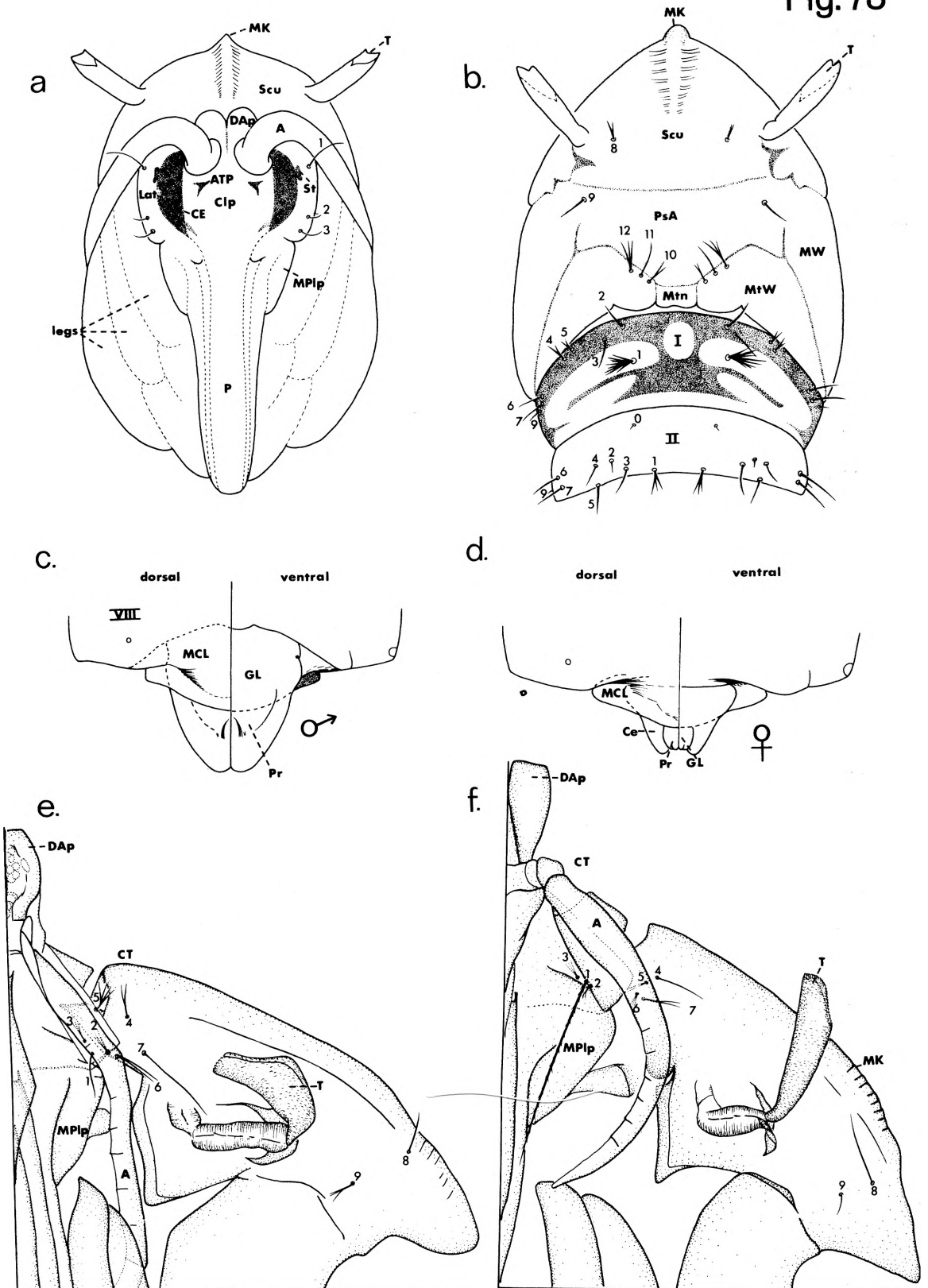


FIGURE 74

- a. Pupa of *Toxorhynchites (Toxorhynchites) brevivalpis* Theobald. Anterior aspect of head.
- b. Pupa of *Culiseta (Culiseta) inornata* (Williston). Dorsal aspect of head and anterior part of thorax.
- c,d. Pupa of *Anopheles (Nyssorhynchus) albimanus* Wiedemann.
 - c. Dorsal aspect of head and thorax.
 - d. Dorsal aspect of thorax and abdominal segment I.

Abbreviations

A	- antenna
Clp	- clypeus
CT	- cephalothorax
DAP	- dorsal apotome
DEL	- dorsal ecdysial line
FEL	- frontal ecdysial line
Lat	- lateralia
Lr	- labrum
MK	- median keel
Mn	- mandible
MPlp	- maxillary palpus
Mtn	- metanotum
MtW	- metathoracic wing
MW	- mesothoracic wing
Mx	- maxilla
PrN	- pronotum
PsA	- postscutal area
Scu	- scutum
T	- trumpet

Fig. 74

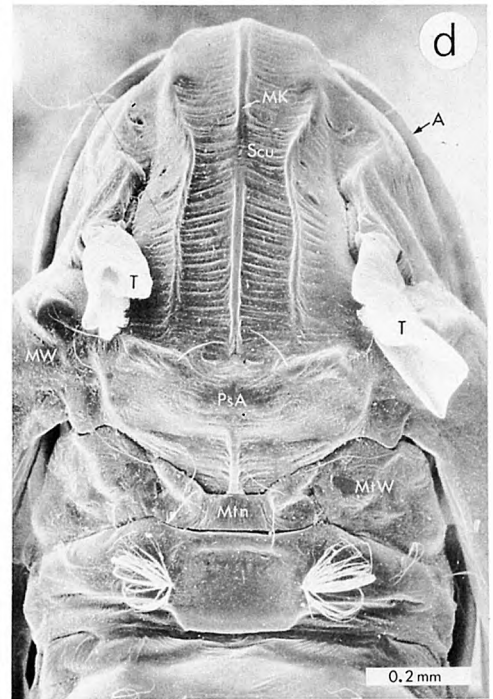
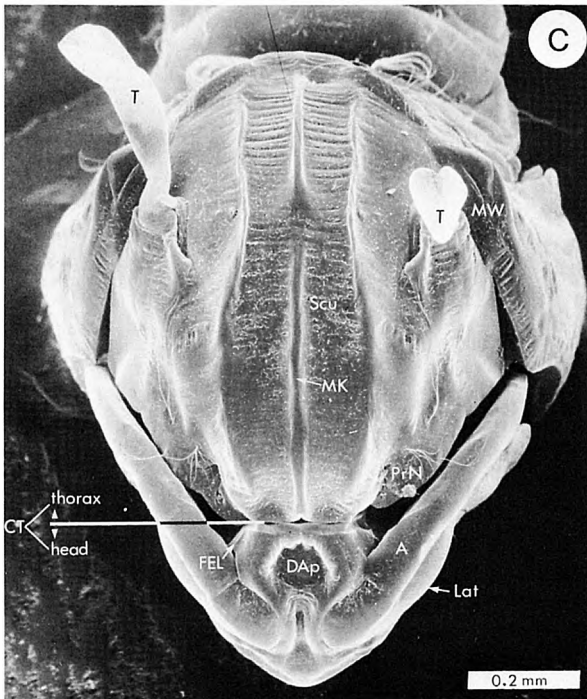
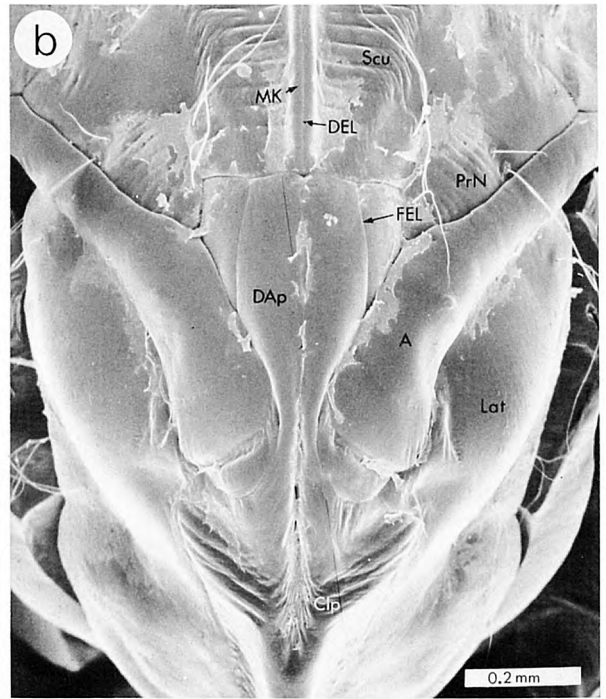
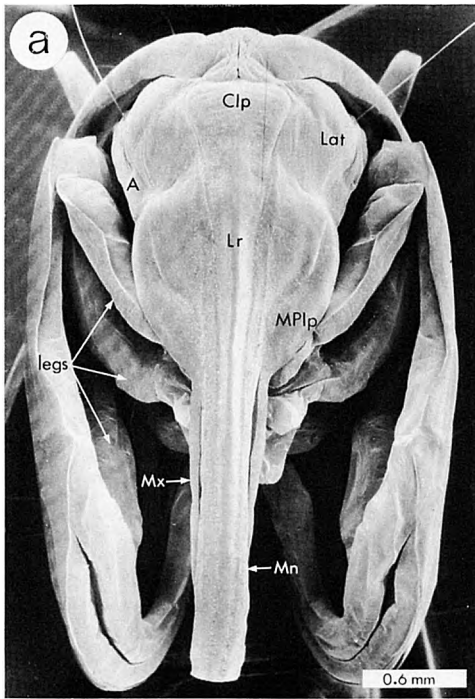


FIGURE 75

Pupa of (*Culiseta inornata* (Williston).

- a. Mesoposterior aspect of left trumpet.
- b. Ventral aspect of terminal abdominal structures of male.
- c. Lateral (left) aspect of terminal abdominal structures of female.
- d. Right side of dorsum of abdominal segment IV. Insert — puncture of abdominal segment V.

Abbreviations

AW	- atrial wall
Bu	- buttress
Ce	- cercus
FA	- filter apparatus
GL	- genital lobe
IM	- intersegmental membrane
MCL	- median caudal lobe
Mea	- meatus
Mr	- midrib
p	- abdominal puncture
Pa	- paddle
Pi	- pinna
Pr	- proctiger
rs	- rudimentary spiracle
Sp	- paddle marginal spicules
O-6	- setae 0- to 6-IV
IV-Te	- tergum IV
VIII-S	- sternum VIII
VIII-Te	- tergum VIII
IX-S	- sternum IX

Fig. 75

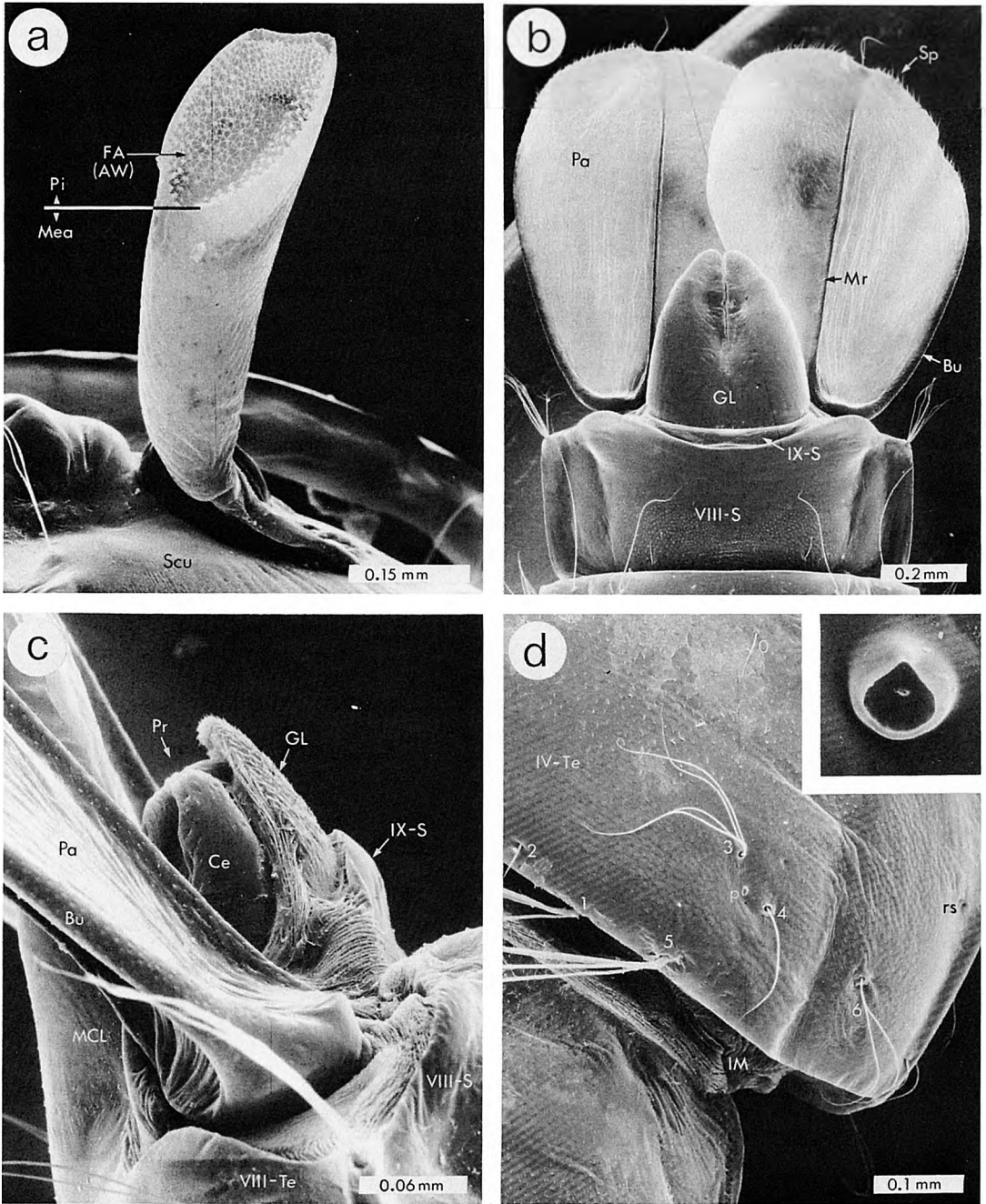


FIGURE 76

- a. Male pupa of *Aedes (Ochlerotatus) canadensis* (Theobald). Lateral (left) aspect illustrating structure and chaetotaxy.
- b. Pupal trumpet (diagramatic). Redrawn from Penn (1949,5).
- c. Laticorn trumpet of pupa of *Anopheles (Anopheles) barbirostris* van der Wulp. Left trumpet. Redrawn from Reid (1968,20).
- d. Angusticorn trumpet of pupa of *Anopheles (Cellia) maculatus* Theobald. Left trumpet. Redrawn from Reid (1968,20).
- e. Culicinae. External aspect of part of cephalothorax of pupal exuviae.
- f. Left trumpet of pupa of *Anopheles (Anopheles) letifer* Sandosham. Redrawn from Reid (1968,176).

Abbreviations

A	- antenna
AT	- angusticorn trumpet
CE	- compound eye
CT	- cephalothorax
DAP	- dorsal apotome
GL	- genital lobe
IM	- intersegmental membrane
Lat	- lateralia
LT	- laticorn trumpet
MC	- meatal cleft
MCL	- median caudal lobe
Mea	- meatus
MK	- median keel
MPip	- maxillary palpus
Mr	- midrib
MtW	- metathoracic wing
MW	- mesothoracic wing
P	- proboscis
Pa	- paddle
Pi	- pinna
PsA	- postscutal area
RA	- reticulate area
rs	- rudimentary spiracle
Scu	- scutum
SeC	- secondary cleft
T	- trumpet
TA	- tracheoid area
Tg	- tragus
I-VIII	- abdominal segments

Fig. 76

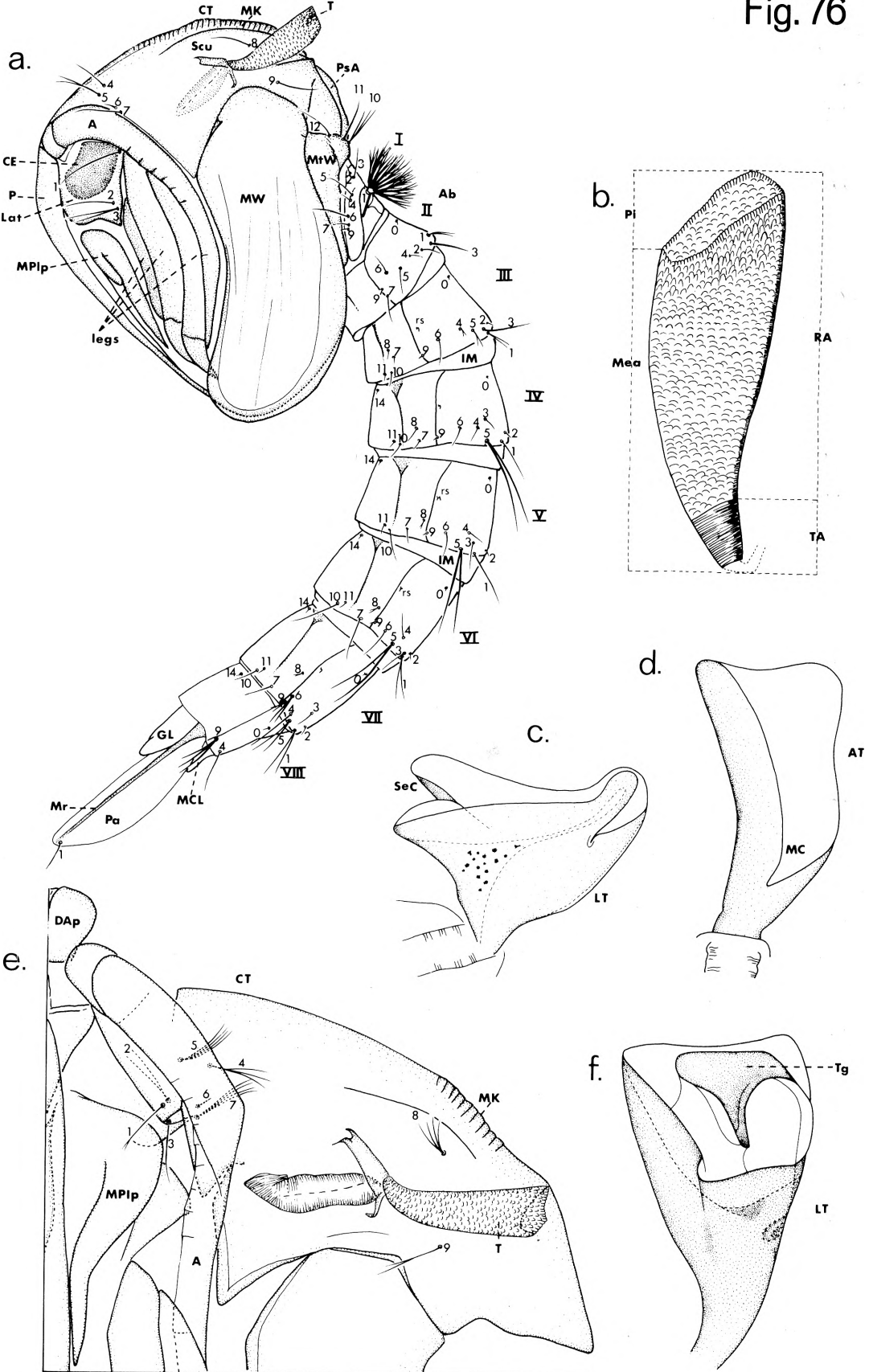


FIGURE 77

Dorsal and ventral aspects of metathorax and abdomen of pupal exuviae.

- a. Chaetotaxy of Anophelinae (composite).
- b. Chaetotaxy of Toxorhynchitinae (composite).

Abbreviations

Bu	-	buttress
Ce	-	cercus
GL	-	genital lobe
IM	-	intersegmental membrane
MCL	-	median caudal lobe
Mr	-	midrib
Mtn	-	metanotum
MtW	-	metathoracic wing
p	-	abdominal puncture
Pa	-	paddle
rs	-	rudimentary spiracle
Se	-	paddle marginal serrations
Sp	-	paddle marginal spicules
I-VIII	-	abdominal segments

Fig. 77

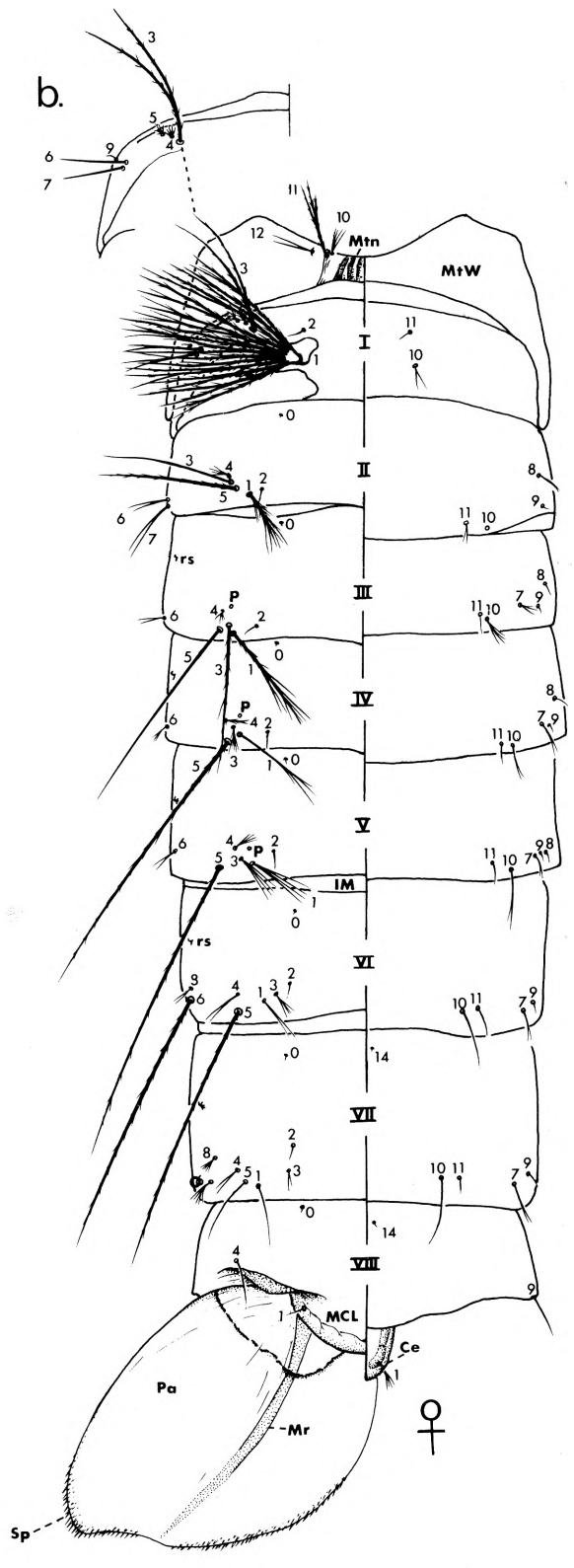
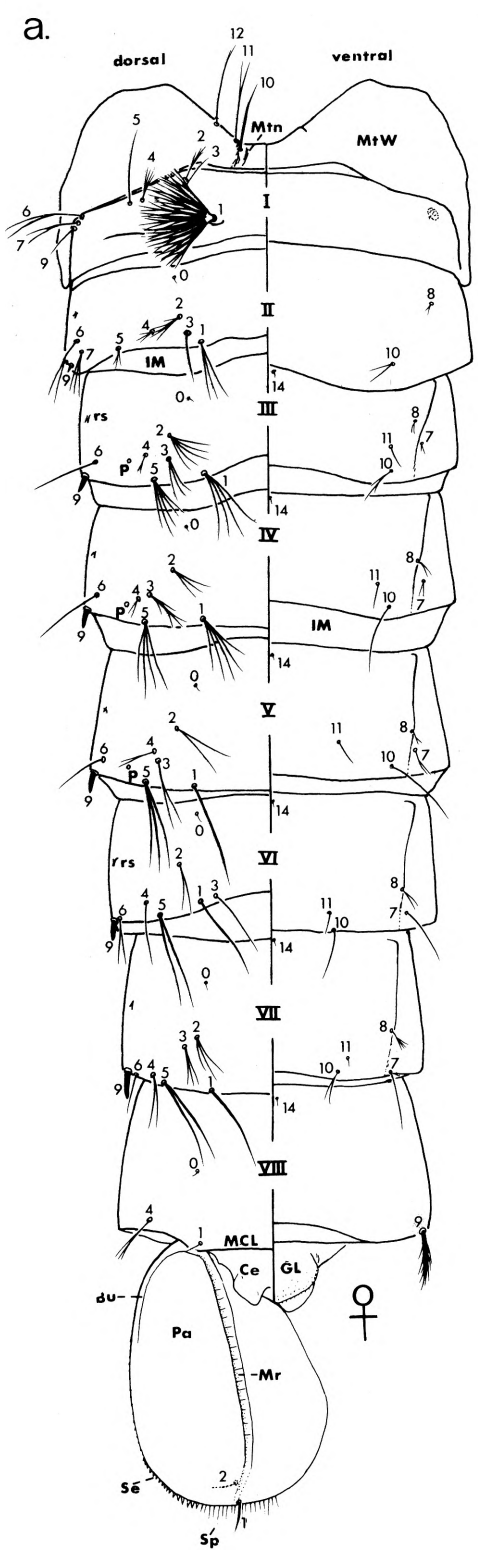


FIGURE 78

- a. Chaetotaxy of Culicinae (composite). Dorsal and ventral aspects of metathorax and abdomen of pupal exuviae.
- b. Culicidae. Dorsal and ventral aspects of metathorax and abdomen of pupa. Composite drawing illustrating area occupied by each seta (when present) on metanotum and abdominal segments I-VIII.

Abbreviations

Bu	-	buttress
GL	-	genital lobe
IM	-	intersegmental membrane
MCL	-	median caudal lobe
Mr	-	midrib
Mtn	-	metanotum
MtW	-	metathoracic wing
p	-	abdominal puncture
Pa	-	paddle
rs	-	rudimentary spiracle
Sp	-	paddle marginal spicules
I-VIII	-	abdominal segments

Fig. 78

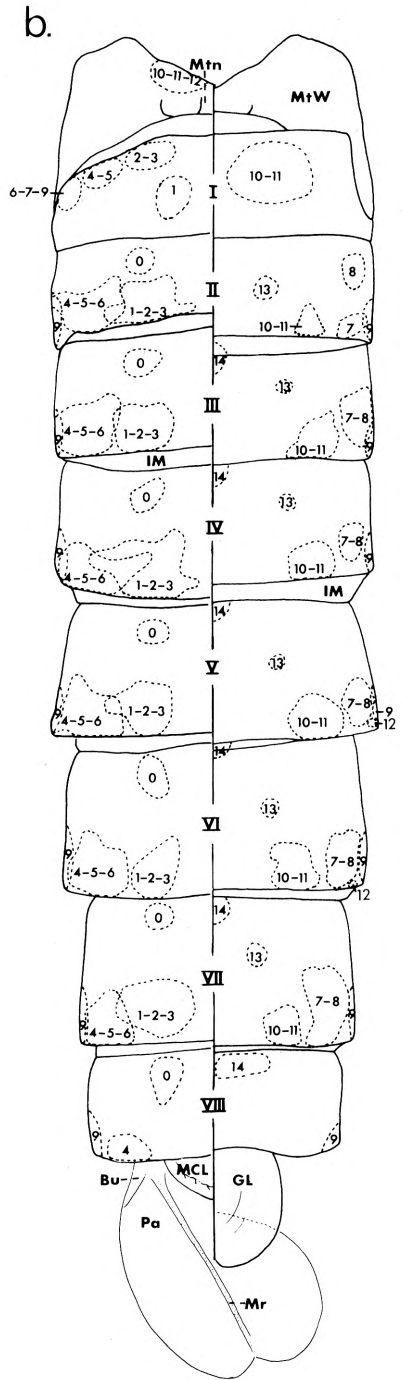
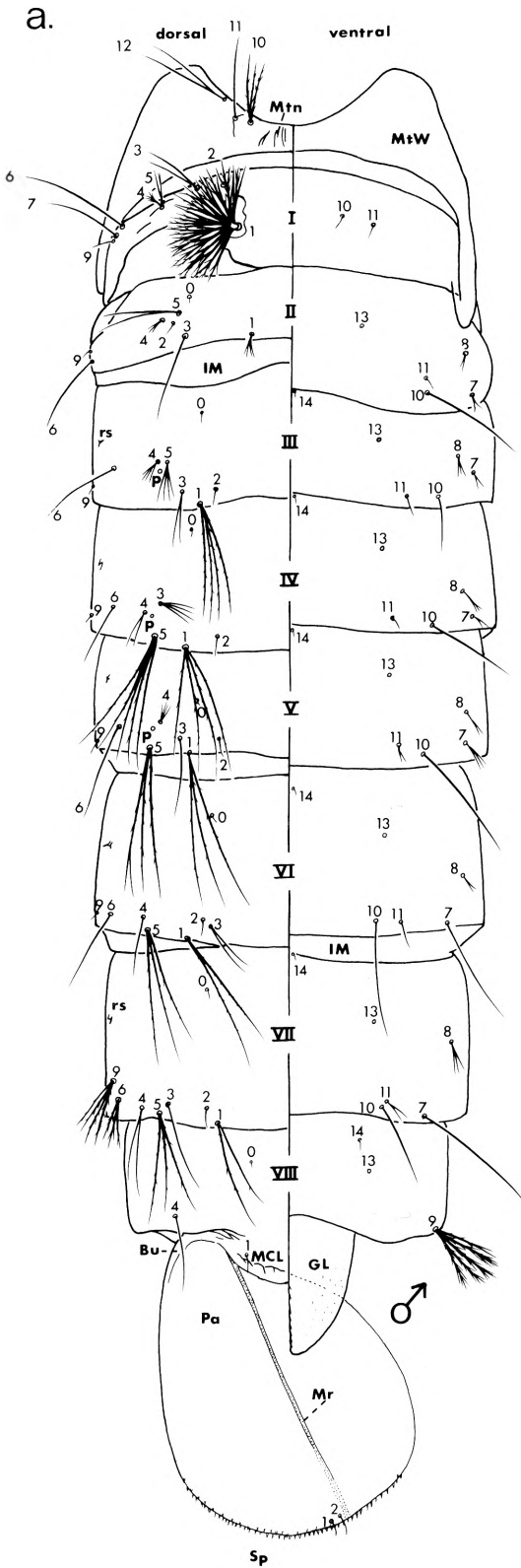




Table 16. Comparison of Terminology for Setae on Cephalothorax of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles gigas formosus</i> Ludlow	<i>Culex vishnui</i> Theobald*	<i>Anopheles barbistrostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles farauti</i> Laveran	<i>Anopheles farauti</i> Laveran	<i>Tripteroides dyari</i> Bohart and Farnier	Generalized anopheline	<i>Tripteroides mathesoni</i> Belkin	<i>Anopheles freeborni</i> Aitken	<i>Culiseta inornata</i> (Williston)	<i>Anopheles farauti</i> Laveran
1.superior post-ocular***	—	—	—	—	superior ocular****	1	3	1	14	1	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

*Cited as *adetae* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Macfie's names are followed by the word "seta."

****Crawford's names are followed by the word "hair."

†Terminology used herein.

Table 17. Comparison of Terminology for Setae on Abdominal Segment I of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles gigas formosus</i> Ludlow	<i>Culex vishnui</i> Theobald*	<i>Anopheles barbirostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles farauti</i> Laveran	<i>Anopheles farauti</i> Laveran	<i>Tripterooides dyari</i> Bohart and Farner	Generalized anopheline	<i>Tripterooides mathesoni</i> Belkin	<i>Anopheles freeborni</i> Aitken	<i>Culiseta inornata</i> (Williston)	<i>Anopheles farauti</i> Laveran
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

*Cited as *adelaë* Baisas.***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Macfie's names are followed by the word "seta."

†Terminology used herein.

Table 18. Comparison of Terminology for Setae of Abdominal Segment II of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12,15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles gigas formosus</i> Ludlow	<i>Culex vishnui</i> Theobald*	<i>Anopheles barbifrostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles faraui</i> Laveran	<i>Anopheles faraui</i> Laveran	<i>Tripteroides dyari</i> Bohart and Farner	Generalized anopheline	<i>Tripteroides mathesoni</i> Belkin	<i>Anopheles freeborni</i> Aitken	<i>Culiseta inornata</i> (Williston)	<i>Anopheles faraui</i> Laveran
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 hair	--	--	9	--	--	8	8	--	8
A	--	--	A	--	A	A	1	8	6	A	7	7	9	9
--	--	--	--	--	postero-medial ventral hair	--	--	--	--	--	--	12	--	10
inner ventral seta	--	--	--	--	--	--	--	--	13	--	13	11	--	11
--	--	--	--	--	--	--	--	--	--	--	--	13	--	13

*Cited as *adelsae* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

†Terminology used herein.

Table 19. Comparison of Terminology for Setae on Abdominal Segment III of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12,15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles gigas formosus</i> Ludlow	<i>Culex vishnui</i> Theobald*	<i>Anopheles barbirostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles farauti</i> Laveran	<i>Anopheles farauti</i> Laveran	<i>Tripteroides dyari</i> Bohart and Farnier	Generalized anopheline	<i>Tripteroides mathesoni</i> Belkin	<i>Anopheles freeborni</i> Aitken	<i>Culiseta inornata</i> (Williston)	<i>Anopheles farauti</i> Laveran
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

*Cited as *adelaë* Baisas.

** *Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

*** Macfie's names are followed by the word "seta."

****Crawford's names are followed by the word "hair."

+ s = dorsal sensillum. Termed an abdominal puncture herein.

†Terminology used herein.

Table 20. Comparison of Terminology for Setae on Abdominal Segments IV and V of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles</i> <i>gigas formosus</i> Ludlow	<i>Culex</i> <i>vishnui</i> Theobald*	<i>Anopheles</i> <i>barbirostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Tripteroides</i> <i>dyari</i> Bohart and Farner	Generalized anopheline	<i>Tripteroides</i> <i>mathesoni</i> Belkin	<i>Anopheles</i> <i>freeborni</i> Aitken	<i>Culiseta</i> <i>inornata</i> (Williston)	<i>Anopheles</i> <i>farauti</i> Laveran
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 ventral-central	—	—	—	9	small anterior	—	18	13	—	—	14	14	14	14
—	—	—	—	3?	—	3?	3	—	10	3	—	s ⁺	s	s(IV)
—	—	—	—	—	—	3?	3	—	10	3	—	s	s	s(V)
D(on V?)												9(V) ⁺⁺		

*Cited as *adelaë* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Macfie's names are followed by the word "seta."

****Crawford's names are followed by the word "hair."

†s = dorsal sensillum. Termed an abdominal puncture herein.

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

†Terminology used herein.

Table 21. Comparison of Terminology for Setae on Abdominal Segment VI of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles</i> <i>gigas formosus</i> Ludlow	<i>Culex</i> <i>vishnui</i> Theobald*	<i>Anopheles</i> <i>barbirostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Tripteroides</i> <i>dyari</i> Bohart and Farner	Generalized anopheline	<i>Tripteroides</i> <i>mathesoni</i> Belkin	<i>Anopheles</i> <i>freeborni</i> Aitken	<i>Culiseta</i> <i>inornata</i> (Williston)	<i>Anopheles</i> <i>farauti</i> Laveran
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(?)												

*Cited as *adelae* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Macfie's names are followed by the word "seta."

****Crawford's names are followed by the word "hair."

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

†Terminology used herein.

Table 22. Comparison of Terminology for Setae on Abdominal Segment VII of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles</i> <i>gigès formosus</i> Ludlow	<i>Culex</i> <i>vishnui</i> Theobald*	<i>Anopheles</i> <i>barbirostris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Tripteroides</i> <i>dyari</i> Bohart and Farnier	Generalized anopheline	<i>Tripteroides</i> <i>mathesoni</i> Belkin	<i>Anopheles</i> <i>freeborni</i> Aitken	<i>Culiseta</i> <i>inornata</i> (Williston)	<i>Anopheles</i> <i>farauti</i> Laveran
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
B''	III	3	—	4	iii	4	5	4	3	4	3	3	3	3
B'	II	2	—	2	ii	2	4	6	4	2	5	4	4	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	—	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
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	13	—	13
anterior ventro-central	—	—	—	9	small anterior	—	18	13	—	—	14	14	14	14
	D(?)	D(?)												

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*Cited as *adelaë* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Macfie's names are followed by the word "seta."

****Crawford's names are followed by the word "hair."

†Terminology used herein.

Table 23. Comparison of Terminology for Setae on Abdominal Segments VIII and IX, the Cercus and Paddle of Culicid Pupae.

Macfie 1920 p. 163	Senevet 1930 p. 301	Christophers 1933 p. 32	Baisas 1936 p. 84	Baisas 1938 p. 179	Crawford 1938 pp. 12;15	Edwards 1941 p. 354	Rozeboom and Knight 1946 p. 128	Knight and Chamberlain 1948 p. 3	Baisas and Pagayon 1949 p. 43	Penn 1949 p. 3	Belkin 1952 p. 115	Belkin 1953 p. 321	Barr and Myers 1962 p. 96	Belkin 1962 † Fig. 44
<i>Aedes aegypti</i> (Linnaeus)	Generalized <i>Anopheles</i>	Generalized <i>Anopheles</i>	<i>Anopheles</i> <i>gigas formosus</i> Ludlow	<i>Culex</i> <i>vishnui</i> Theobald*	<i>Anopheles</i> <i>barbistrotris</i> van der Wulp	<i>Aedes</i> (2 spp.)**	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Anopheles</i> <i>farauti</i> Laveran	<i>Tripteroides</i> <i>dyari</i> Bohart and Farner	Generalized anopheline	<i>Tripteroides</i> <i>mathesoni</i> Belkin	<i>Anopheles</i> <i>freeborni</i> Aitken	<i>Culiseta</i> <i>inornata</i> (Williston)	<i>Anopheles</i> <i>farauti</i> Laveran
<u>Abdominal Segment VIII</u>														
D	8	5	5	5	v	5	7	1	2	5	0	0	0	0
P	7	A'	A'	A'	accessory	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 seta	—	—	—	9	small anterior hair	—	18	13	13	—	14	14	14	14
<u>Abdominal Segment X</u>														
—	—	—	—	—	—	—	—	1***	—	V	1***	1	—	1
<u>Cercus (Abdominal Segment XI)</u>														
—	—	—	—	—	—	—	—	8***	—	W	1***/+	—	—	1†
<u>Paddle</u>														
P	4	paddle hair	paddle hair	—	terminal paddle hair	paddle hair	12	8	—	X	1***	1	—	1
—	5	accessory paddle hair	accessory paddle hair	—	accessory paddle hair	accessory paddle hair	13	7	—	Z	2***	2	—	2

*Cited as *adela* Baisas.

***Aedes aegypti* (Linnaeus) and *Ae. albolineatus* (Theobald).

***Labelled from other genera.

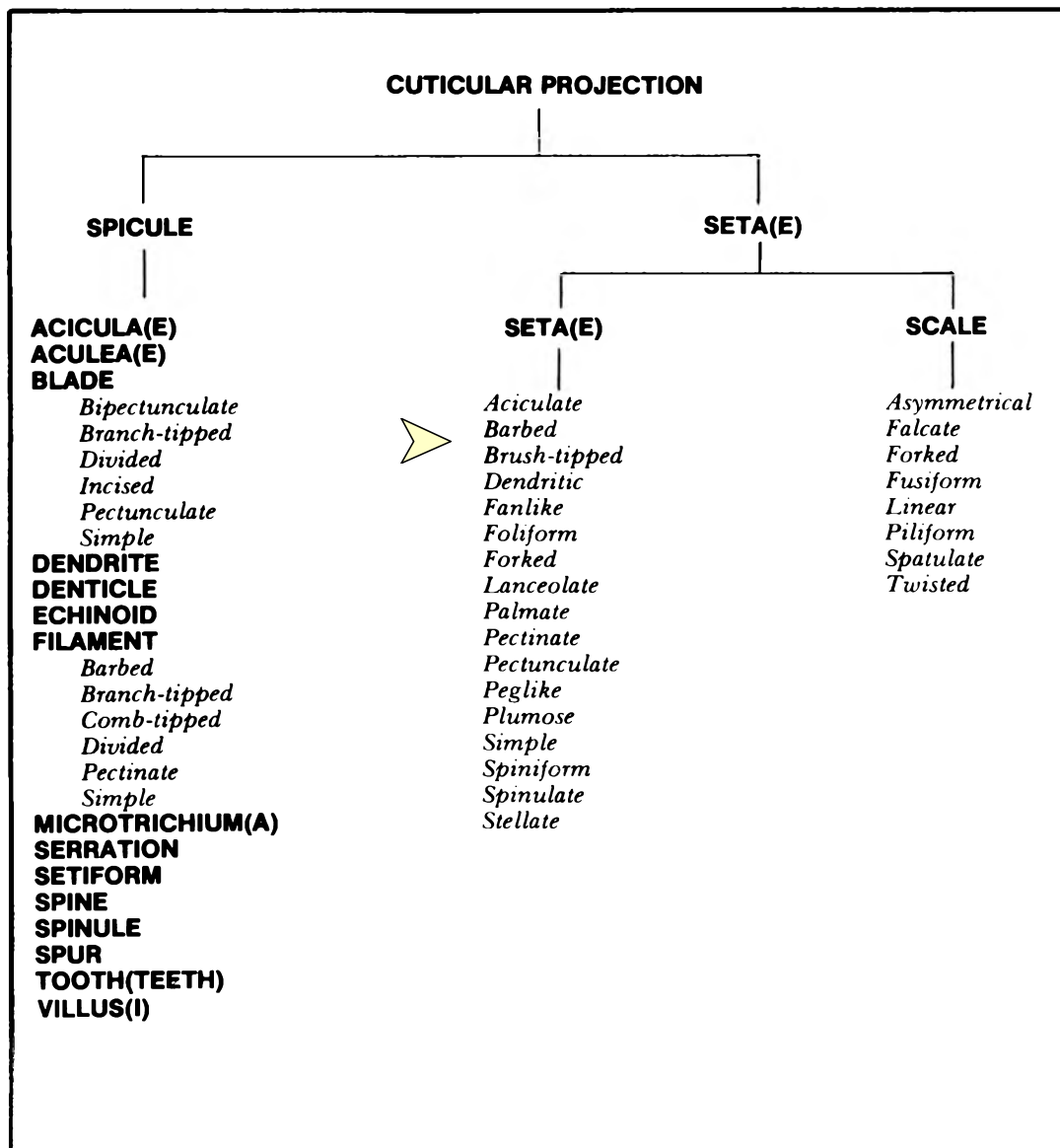
†Seta 1-X. Termed seta 1-XI herein.

†Terminology used herein.

VESTITURE

The hierarchical organization for the terminology applicable to the vestiture of mosquitoes as conceptualized by Harbach and Knight (1978c) is reproduced here. Use of this section of the glossary should begin with an examination of Chart 1 below.

CHART 1



A

- ACICULA** (Fig.83) [Harbach and Knight 1978c,542] — A small, slender, rigid, needle- or thornlike spicule.
- ACULEA** (Fig.82) [Harbach and Knight 1978c,542] — One of the microtrichiumlike spicules comprising the tomentum which covers the cuticula (except the wing membrane); aculeae usually form a dense covering in adults but are normally sparse or absent in immatures.
- ALVEOLUS (a)** (Fig.82) — A cuplike depression (socket) bearing a seta or scale; its floor is formed by the membrane which supports the seta or scale; its wall is formed by a ringlike swelling of the cuticula (collar). An alveoluslike structure not bearing a seta or scale is termed a puncture (see).

B

- barb** [Gardner *et al.* 1973,169] — One of the minute, pointed processes occurring on some of the maxillary brush filaments of *Aedes communis* De Geer. See **Barbed FILAMENT**.
- BLADE** [Harbach and Knight 1978c,542] — An elongate, flattened, usually stiff spicule; may lie in a single plane or be wavy, curved and/or twisted; sometimes movable. The more common types of blades occurring in mosquitoes are named by the adjectives listed below.
- Bipectunculate* (Fig.83) [Harbach and Knight 1978c,542] — With two rows of acicula- or small toothlike processes.
- Branch-tipped* [Harbach and Knight 1978c,542] — With a few short branches arising apically or subapically. (Syn.: branched hair, Gardner *et al.* 1973,168)
- Divided* (Fig.81) [Harbach and Knight 1978c,542] — With long branches of relatively equal diameter arising below the distal third.
- Incised* (Figs.81,83) [Gardner *et al.* 1973,168] — With apical or subapical notches; the notches are usually rounded as are the toothlike processes between them. (Syn.: incised hair, Gardner *et al.* 1973,169)
- Pectunculate* (Figs.81,83) [Harbach and Knight 1978c,542] — With a row of acicula- or toothlike processes arising along one side. (Syn.: pectinate spine, Shalaby 1957a,157; pectinate hair, Shalaby 1957b,278)
- Simple* (Fig.83) [Pao and Knight 1970,128] — Without lateral or apical processes. (Syn.: simple spine, Pao and Knight 1970,128; xiphoid hair, Gardner *et al.* 1973,168)

C

- CUTICULAR PROJECTION** [Belkin 1962,554] — Any elongate process jutting from the outer surface of the cuticula. There are two basic types of cuticular projections: (1) **SETAE** (see), which are articulated processes arising from a basal alveolus, and (2) **SPICULES** (see), which are non-articulated, continuous processes of the cuticula.

D

- DENDRITE** (Fig.81) [Harbach and Knight 1978c,542] — A spicule branched to resemble a tree in form; having a basal stem bearing irregular or dichotomous branches which may be repeatedly branched in turn. (Syn.: dendritic hair, Gardner *et al.* 1973,168)
- DENTICLE** (Fig.83) [Belkin 1962,555] — A small toothlike spicule.

E

- ECHINOID** (Fig.81) [Harbach and Knight 1978c,543] — A spicule consisting of numerous spinelike rays projecting at various angles from a tuberclelike base. (Syn.: echinate tubercle, Harbach and Knight 1977a,31)

F

- FILAMENT** [Harbach and Knight 1978c,543] -- A long, slender, flexible spicule which gradually tapers to a point or is of equal or near equal diameter throughout. The more common types of

filaments occurring in mosquitoes are named by the adjectives listed below. (Syn.: filamentous spicule, Belkin 1962,555)

Barbed (Fig.81) [Gardner *et al.* 1973,169] — With minute, short, pointed processes projecting obliquely from the surface. (Syn.: spinulated hair, Shalaby 1957a,157; barbed hair, Gardner *et al.* 1973,169)

Branch-tipped (Fig.81) [Harbach and Knight 1978c,543] — With a few subdivisions arising apically; the subdivisions may be short and thick or long and slender. (Syn.: branched-tipped simple hair, Pao and Knight 1970,128; branched spine, Pao and Knight 1970,128; brush-tipped hair, Gardner *et al.* 1973,169)

Comb-tipped (Fig.81) [Harbach and Knight 1978c,543] — With a short row of small rigid processes located at the side near the apex. (Syn.: comb-toothed hair, Marshall 1938,37; pectinate hair, Shalaby 1957a,148)

Divided (Fig.83) [Harbach and Knight 1978c,543] — With long branches of equal diameter usually arising within the basal two-thirds. (Syn.: plumose hair, Pao and Knight 1970,128)

Pectinate (Fig.81) [Harbach and Knight 1978c,543] — With long or short branches arising at regular intervals along one side. (Syn.: basal pectinate hair, Pao and Knight 1970,128)

Simple (Fig.81) [Shalaby 1957a,157] — Without lateral or distal processes, usually sharply pointed. (Syn.: simple hair, Shalaby 1957a,157; pointed-tipped simple hair, Pao and Knight 1970,128)

H

hair [Belkin 1962,555] — In addition to being applied to a seta in a broad sense, Belkin (1962,555) used the term "hair" for a specific type of seta, "a seta with long, slender stem and attenuate apex." Note that a seta with these characteristics is by definition a simple single seta. It may be described as a long slender simple single seta with an attenuate apex.

M

MICROTRICHIMUM (Fig.82) — One of the minute, slender, tapered, flexible spicules closely covering the wing membrane; characteristically bent so that they extend more or less parallel to the longitudinal veins with their apices pointed toward the wing margin.

P

PEDICEL (**p**) (Fig.82) [pédicule, de Réaumur 1738,579] — The slender basal stalk of a scale which supports the squame; with or without longitudinal ridges.

PUNCTURE (**P**) (Fig.83) — An alveoluslike depression not bearing a seta or scale. See **ALVEOLUS**.

S

SCALE — A modified seta comprised of a slender basal stalk, pedicel, and an expanded and/or flattened distal part, squame; all scales have longitudinal ridges and arise from alveoli which are usually minute. (Syn.: squama)

Two main types of scales are recognized in mosquitoes by cross section of the squame. If the squame is round or elliptical, the scale is *piliform*; if it is thin and flat, the scale is *lamellar*. Many forms of lamellar scales exist but only one type of piliform scale. The piliform and the more common types of lamellar scales which occur in mosquitoes are defined below. It should be noted that piliform scales tend to grade into the lamellar form and that the types of lamellar scales grade into one another. For this reason, mosquito scales are divided into a number of extreme types with broad definitions in order that the transitional forms may be classified more easily.

Asymmetrical (Fig.82) [Harbach and Knight 1978c,544] — A lamellar scale which is obviously unevenly developed on opposite sides of a plane which is parallel to the plane of the squame. (Syn.: asymmetrically broadened scale, Theobald 1901a,231; broad asymmetrical winged scale, Theobald 1901a,235; broad wing scale, Theobald 1901b,9; broad Aedeomyia scale, Theobald 1905,2; broad Mansonia scale, Theobald 1905,2; Taeniorhynchus-like scale, Theobald 1905,3; schiefe Schuppe, Martini 1923b,26; fahnenförmige Schuppe, Martini 1923b,26)

Falcate (Fig.82) [Harbach and Knight 1978c,544] — A sickle-shaped lamellar scale; the squame narrow and curved with a sharp or narrowly rounded apex. (Syn.: narrow curved scale, Theobald 1901a,231; Sichelschuppe, Martini 1923b,26; haarförmige Schuppe, Swellengrebel and Rodenwaldt 1932,12)

Forked (Fig.82) [Theobald 1901a,231] — A lamellar scale which is cuneate or gently flared distally; with a long thick pedicel which gradually merges into the squame; distal margin of squame cut off squarely or notched. (Syn.: trumpet scale, Hogg 1871,192; trumpet-shaped scale, Hogg 1871,193; upright forked scale, Theobald 1901a,231; fork scale, Theobald 1901b,414; Gabelschuppe, Martini 1923b,26; erect scale, Bonne and Bonne-Wepster 1925,14; upright scale, Evans 1938,6; erect forked scale, Sasa *et al.* 1971,138)

Fusiform (Fig.82) [Harbach and Knight 1978c,544] — Widest at the middle and tapered toward the ends; apex sharply pointed or narrowly rounded; ranging from short and broad to long slender. (Syn.: pointed scale, Hogg 1871,192; spindle shaped curved scale, Theobald 1901a,231; lanceolate scale, Theobald 1901a,231; spindle shaped scale, Theobald 1901a,235; small spindle-shaped scale, Theobald 1901a,235; flat spindle-shaped scale, Theobald 1901b,9; spindle-shaped scale, Theobald 1901b,11; small spindle shaped scale, Theobald 1905,3; lancettförmige Schuppe, Martini 1923b,26; spitze linealische Schuppe, Martini 1923b,26)

Linear (Fig.82) [Theobald 1901a,235] — A straplike lamellar scale; much longer than broad with parallel sides; always truncate. (Syn.: linear and narrow scale, Theobald 1901a,231; ligulate scale, Howard *et al.* 1912,72; stumpfe linealische Schuppe, Martini 1923b,26)

Piliform (Fig.82) [Harbach and Knight 1978c,544] — Any scale of which the squame is circular or elliptical in cross section; normally narrow, curved and pointed; setalike. (Syn.: narrow hair-like curved scale, Theobald 1901a,231; curved hair-like scale, Theobald 1901a,235; Härchenschuppe, Martini 1923b,26; narrow curved scale, Patton and Evans 1929,38; haarförmige Schuppe, Swellengrebel and Rodenwaldt 1932,12)

Spatulate (Fig.82) [Theobald 1905,2] — A lamellar scale which is very broad distally, attenuate at base; top rounded or truncate, rarely emarginate (heart-shaped); the squame may be parallel-sided, obovate or accrescent. (Syn.: battledore scale, Hogg 1871,192; flattened out scale, Hogg 1871,192; spade-shaped scale, Theobald 1901a,231; broad flat scale, Theobald 1901a,231; pyriform scale, Theobald 1901a,231; elongated oval scale, Theobald 1901a,231; inflated parti-coloured scale, Theobald 1901a,235; flat scale, Theobald 1901b,9; inflated scale, Theobald 1905,3; parti-coloured scale, Theobald 1905,3; Melanoconion scale, Theobald 1905,3; Cyclolepteron scale, Theobald 1905,3; heart shaped scale, Theobald 1905,3; breite flache Schuppe, Martini 1923b,26; erweiterte Schuppe, Martini 1923b,26; elliptical scale, Bonne and Bonne-Wepster 1925,14; ovate scale, Bonne and Bonne-Wepster 1925,14; broad appressed scale, LaCasse and Yamaguti 1948,3; leaf-like scale, Sasa *et al.* 1971,138)

Twisted (Fig.82) [Harbach and Knight 1978c,545] — A curled lamellar scale with a spiral or winding form; the squame is usually accrescent. (Syn.: long twisted scale; Theobald 1901a,231; upright twisted scale, Theobald 1901a,235; twisted upright scale, Theobald 1901b,9; Lockenschuppe, Martini 1923b,26)

SERRATION (Fig.83) [Belkin 1962,555] — A recurved denticlelike process; a series of such processes is termed serrations.

SETA — A cuticular projection which arises from a basal alveolus. Flattened setae with longitudinal ridges are known as **SCALES** (see) and are so modified as to be worthy of separate consideration. Other setae fall under two groups: *single* (unbranched) and *branched*. Single setae (Marshall 1938,36) may be simple or bear short lateral processes that are not to be considered as branches. Single setae may have longitudinal ridges but unlike scales they are broadest at the base and taper distally. Branched setae have branches radiating from the base, originating as divisions of the main stem or arising along the length of the main stem. The descriptors used to name single setae include aciculate, barbed, brush-tipped, foliform, lanceolate, pectunculate, pedlike, simple, spiniform and spinulate; those used to name branched setae include dendritic, fanlike, forked, palmate, pectinate, plumose and stellate. The single setal names are used to describe the branches of branched setae. The types of setae are listed and defined below. (Common syn. include: bristle, chaeta, hair, macrotrichium and spine)

Aciculate (Fig.80) [Harbach and Knight 1978c,545] — Furnished with slender needlelike processes along the stem; the processes are somewhat flexible but often appear to be rigid. (Syn.: branched hair, Nuttall and Shipley 1901a,53; plumose hair, Wesché 1910,9; laterally

branched hair, Evans 1938,25; spiculate seta, Belkin 1962,555)

Barbed (Fig.81) [Marshall 1938,37] — With minute, short, heavy, pointed processes projecting obliquely from the surface. (Syn.: subplumose hair, Wesché 1910,9; gewimperte Borste, Martini 1923b,11; frayed hair, Evans 1938,25; barbed hair, Marshall 1938,37)

Brush-tipped (Fig.80) [Harbach and Knight 1978c,546] — With numerous moderately long, slender processes arising apically. (Syn.: frayed hair, Nuttall and Shipley 1901a,53; brush tip seta, Belkin 1962,555)

Dendritic (Fig.80) [Belkin 1962,555] — Branched to resemble a tree in form; having a stemlike part bearing irregular or dichotomous branches which may be repeatedly forked or branched in turn. (Syn.: besenförmige Borste, Martini 1923b,11; dendroid hair, Evans 1938,25; broom-like hair, Marshall 1938,37)

Fanlike (Figs.79,80) [Harbach and Knight 1978c,546] — With branches spreading out in a single plane from a short stem; in the case of some ventral brush setae the branches successively arise on one side of the stem (see Fig.80g); branches may be simple, barbed, aciculate or dendritic. (Syn.: branched hair, Wesché 1910,9; tufted hair, Lang 1920,20; geteilte Borste, Martini 1923b,11; furcate hair, Marshall 1938,36; hair-tuft, Marshall 1938,36; bifid hair, Marshall 1938,37; dendroid hair, Marshall 1938,37; bifurcated hair, Marshall 1938,37)

Foliform (Figs.80,83) [Belkin 1962,553] — Flattened and leaflike; similar to some scales but lacking longitudinal ridges. (Syn.: leaf-like scale, Dyar 1905a,45; leaf, Dyar 1918b,93; einfache blätchenförmige Borste, Martini 1923b,11; bladlike spine, Ross 1947,21; spatulate spine, Ross 1947,21; leaflet, Ross 1947,44)

Forked (Fig.80) [Belkin 1962,555] — With a few branches arising beyond the basal third of the main stem. (Syn.: split hair, Evans 1938,25; furcate hair, Marshall 1938,36)

Lanceolate (Fig.81) [Belkin 1962,553] — Oblong or spear-shaped; tapering distally to a point.

Palmate (Fig.79) [Nuttall and Shipley 1901a,61] — With flattened, movable, usually horizontal branches radiating from a common point on a short stem. (Syn.: palmate hair, Nuttall and Shipley 1901a,61; Strahlenborste, Tsuzuki 1907,530; Quirlhaar, Tänzer 1921,142; Palmhaar, Martini 1931,12; palmate tuft, Lee and Woodhill 1944,30; float hair, Marshall 1938,36)

Pectinate (Fig.80) [Belkin 1962,555] — With long branches arising at regular intervals from one side of the main stem; a few small, sparsely-arranged branches may arise from the opposite side. (Syn.: pinnate hair, Evans 1938,25; feathered hair, Evans 1938,25; unequally-feathered hair, Evans 1938,37)

Pectunculate (Fig.80) [Harbach and Knight 1978c,546] — With a row of short rigid processes resembling the teeth of a comb.

Peglike (Fig.83) [Harbach and Knight 1978c,546] — A small cylindrical, usually blunt-tipped simple seta. (Common syn. include: papilla and sensorium)

Plumose (Fig.79) [Evans 1938,25] — With numerous usually regularly-arranged branches arising on either side of the main stem; the branches on either side may be directly opposite one another or alternate. (Syn.: feathered hair, Nuttall and Shipley 1901a,53; gefiederte Borste, Martini 1931,11; kurze dickschaftige Feder, Martini 1931,11; pinnate hair, Evans 1938,25; plumose hair, Evans 1938,25)

Simple (Fig.81) [Nuttall and Shipley 1901a,53] — Without lateral or apical processes. (Syn.: simple pointed hair, Nuttall and Shipley 1901a,53; simple hair, Wesché 1910,10; einfaches Haar, Martini 1923b,11)

Spiniform (Fig.80) [Belkin 1962,555] — Thick, spinelike, and usually not markedly attenuate or sharply pointed. (Syn.: spike, Belkin 1962,555)

Spinulate (Fig.81) [Harbach and Knight 1978c,547] — Beset with small spinelike processes. (Syn.: spike, Belkin 1962,555)

Stellate (Figs.79,80) [Wesché 1910,10] — Tufted; with numerous stiff branches projecting at various angles from a single base; branches may be simple, barbed or aciculate. (Syn.: tuft, Wesché 1910,10; stellate hair, Wesché 1910,10; plume, Wesché 1910,10; tufted hair, Lang 1920,20; furcate hair, Marshall 1938,36; hair-tuft, Marshall 1938,36; stellate tuft, Marshall 1938,37)

It should be noted that the term “stellate” refers to a condition where the rays (branches)

project in all directions from a single point in the same plane. A better term would be multiradiate but owing to the long use of the term "stellate" in mosquito taxonomy it is recommended for continued use.

SETIFORM (Fig.83) [Belkin 1962,555] — A spicule which resembles a single seta; usually stiff with a diameter greater than a filament; may be simple or bear short lateral or apical processes. (Syn.: hairlike seta, Belkin 1962,555)

SPICULE [Belkin 1962,555] — A non-articulated cuticular projection, directly continuous with the cuticula. Spicules are named by nouns. The common types which occur in mosquitoes include (see): **ACICULAE**, **ACULEAE**, **BLADES**, **DENDRITES**, **DENTICLES**, **ECHINOIDS**, **FILAMENTS**, **MICROTRICHIA**, **SERRATIONS**, **SETIFORMS**, **SPINES**, **SPINULES**, **SPURS**, **TEETH** and **VILLI**. Spurs and some filaments and blades are movable, i.e., they have a ring of unsclerotized cuticle at the base. (Common syn. include: hair, seta and spine)

SPINE (Fig.83) [Belkin 1962,555] — A very large, sturdy, immovable spicule; with a sharp or narrowly rounded tip.

SPINULE (Fig.83) [Frohne 1955,295] — A minute spinelike spicule; always stiff; commonly occurring in short rows on the saddle and siphon as well as in the pharynx of toxorhynchitine larvae. (Syn.: spine, Frohne 1955,295; microspine, Dahl 1978,211)

SPUR — A movable spinelike spicule; with a ring of unsclerotized cuticle at the base.

SQUAME (♂) (Fig.82) [Christophers 1960,401] — The expanded and/or flattened distal part of a scale supported by the pedicel; invariably with longitudinal ridges. (Syn.: palette, de Réaumur 1738,578)

T

TOMENTUM (Fig.82) — In Diptera, a covering of aculeae on the body and its appendages, except the wings.

TOOTH (Fig.83) [Belkin 1962,555] — A very stout heavy spicule with a blunt apex.

V

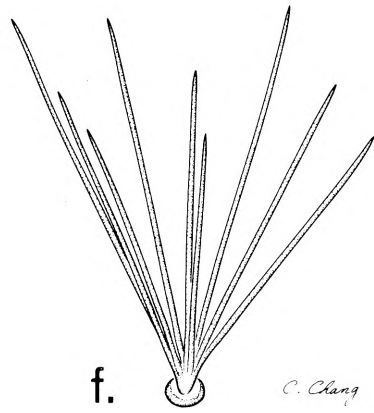
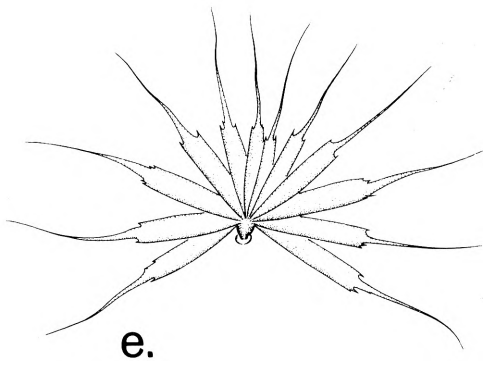
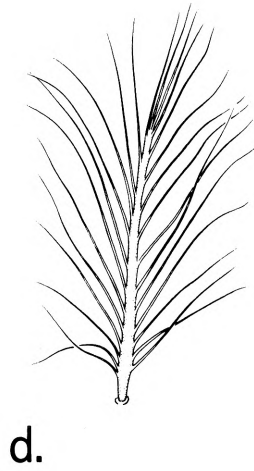
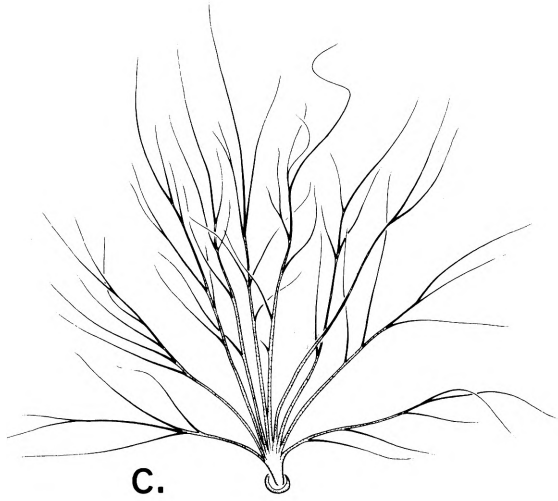
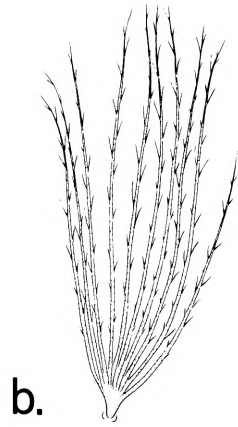
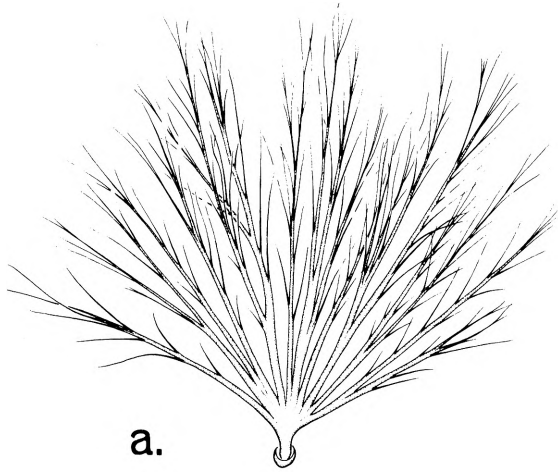
velum [Gardner *et al.* 1973,165] — A translucent flattened lateral expansion of the basal part of a seta or spicule, especially on the ventral margin of the basal part of some mandibular comb spicules.

VESTITURE — The general surface covering of insects comprised of cuticular projections, i.e., setae, scales and spicules.

VILLUS (Fig.83) [Harbach and Knight 1978c,547] — A minute, slender, flexible, filamentlike spicule; usually with a blunt tip.

FIGURE 79

- a. Fanlike seta with aciculate dendritic branches. Seta 1-I of larva of *Aedes (Finlaya) novoniveus* Barraud.
- b. Fanlike seta with aciculate branches. Unidentified seta from larva of *Aedes (Skusea) pambaensis* Theobald.
- c. Fanlike seta with dendritic branches. Seta 4-C of larva of *Aedes (Finlaya) albolateralis* (Theobald).
- d. Plumose seta. Seta 1-M of larva of *Anopheles (Cellia) stephensi* Liston.
- e. Palmate seta. Seta 1-IV of larva of *Anopheles (Cellia) sundaicus* (Rodenwaldt).
- f. Stellate seta with simple branches. Seta 4-P of larva of *Topomyia* sp.



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FIGURE 80

- a. Stellate seta with aciculate branches. Unidentified seta from larva of *Sabethes (Sabethinus) undosus* (Coquillett).
- b. Forked seta. Seta 4-Mx of larva of *Malaya* sp.
- c. Forked seta. Seta 12-VII of larva of *Anopheles (Anopheles) crucians* Wiedemann.
- d. Pectinate seta. Seta 12-CT of pupa of *Aedes (Finlaya) niveus* (Ludlow).
- e. Dendritic seta with aciculate branches. Seta 1-II of larva of *Aedes (Finlaya) pexus* Colless.
- f. Foliform seta (seta g) from subapical lobe of male genitalia of *Culex (Culex) antennatus* (Becker).
- g. Fanlike seta with simple branches successively arising on one side of main stem. Ventral brush seta (seta 4-X) of larva of *Aedes (Finlaya) novoniveus* Barraud.
- h. Pectunculate seta. Seta 2-S of larva of *Mansonia (Mansonioides) uniformis* (Theobald).
- i. Spiniform seta. Seta 9-V of pupa of *Anopheles (Anopheles) punctipennis* (Say).
- j. Aciculate seta. Seta 5-IV of pupa of *Aedes (Finlaya) pseudoniveus* (Theobald).
- k. Brush-tipped seta. Seta 4-Mx of larva of *Phoniomyia splendida* (Bonne-Wepster and Bonne).

Fig.80

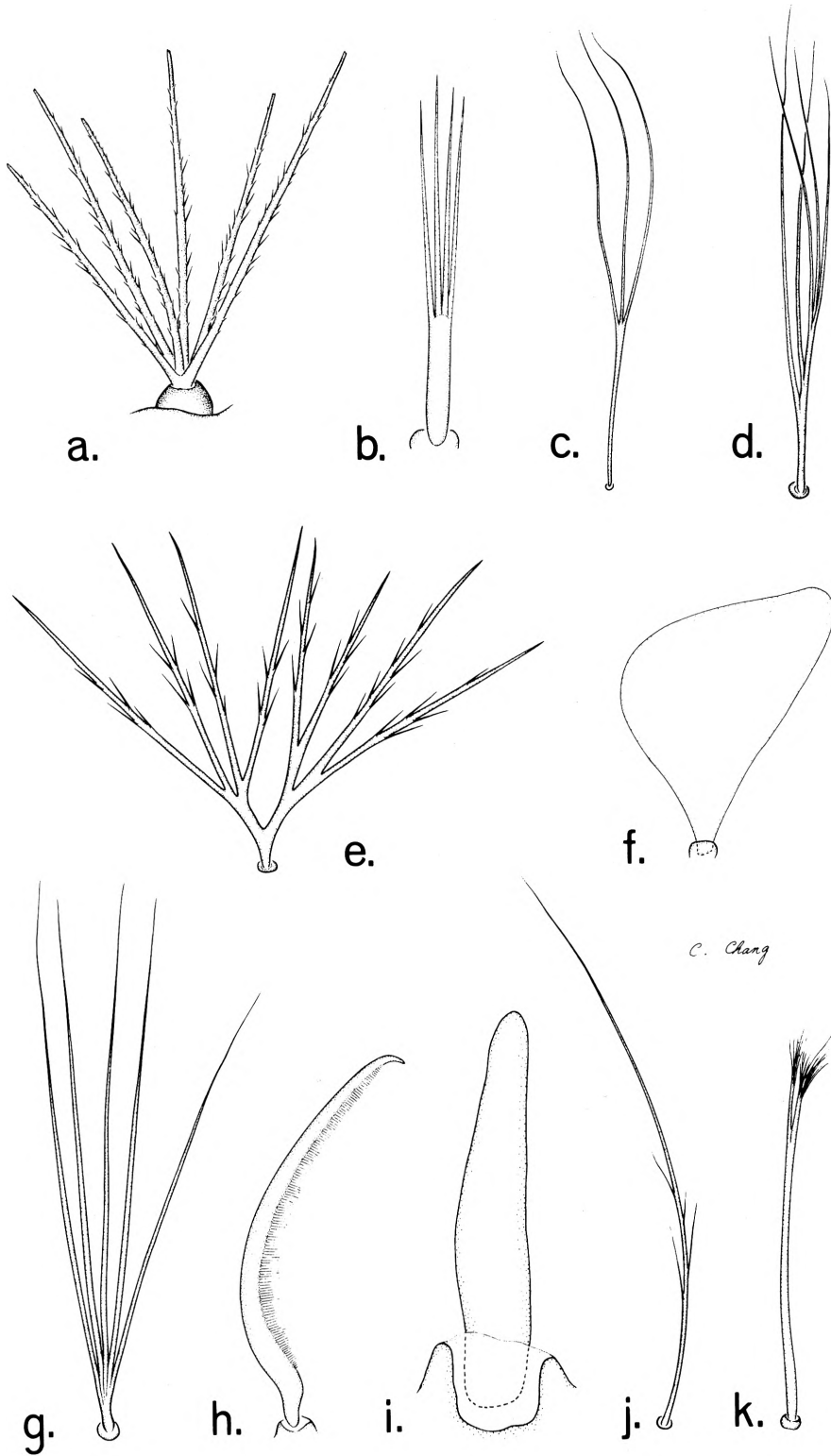


FIGURE 81

- a. Simple seta. Seta 9-III of larva of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
- b. Simple seta. Seta 4-Mx of larva of *Hodgesia solomonis* Belkin.
- c. Barbed seta. Seta 6-II of larva of *Eretmapodites chrysogaster* Graham.
- d. Spinulate seta. Seta 9-M of larva of *Toxorhynchites (Lynchiella) rutilus* (Coquillett).
- e. Lanceolate seta from gonocoxite of male genitalia of *Haemagogus (Haemagogus) argyromeris* Dyar and Ludlow.
- f. Lanceolate seta from gonocoxite of male genitalia of *Aedes (Finlaya) melanopterus* (Giles).
- g. Simple filament from maxillary brush of larva of *Malaya genurostris* Leicester.
- h. Barbed filament from mandibular sweeper of larva of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
- i. Branch-tipped filament from maxillary brush of larva of *Haemagogus (Haemagogus) panarchys* Dyar.
- j. Comb-tipped filament from lateral palatal brush of larva of *Zeugomyia* sp.
- k. Pectinate filament from maxillary brush of larva of *Hodgesia solomonis* Belkin.
- l. Divided blade from mandibular comb of larva of *Limatus durhamii* Theobald.
- m. Dendrite from mandibular comb of larva of *Culex (Culex) pipiens quinquefasciatus* Say.
- n. Echinoid from mandibular comb of larva of *Culex (Culex) pipiens quinquefasciatus* Say.
- o. Pectunculate blade from laciniarastrum 1 of maxilla of larva of *Psorophora (Janthinosoma) mathesoni* Belkin.
- p. Incised blade from laciniarastrum 1 of maxilla of larva of *Eretmapodites chrysogaster* Graham.
- q. Pectunculate blade. Mandibular rake blade 1 of larva of *Sabethes (Sabethinus) undosus* (Coquillett).

Fig. 81

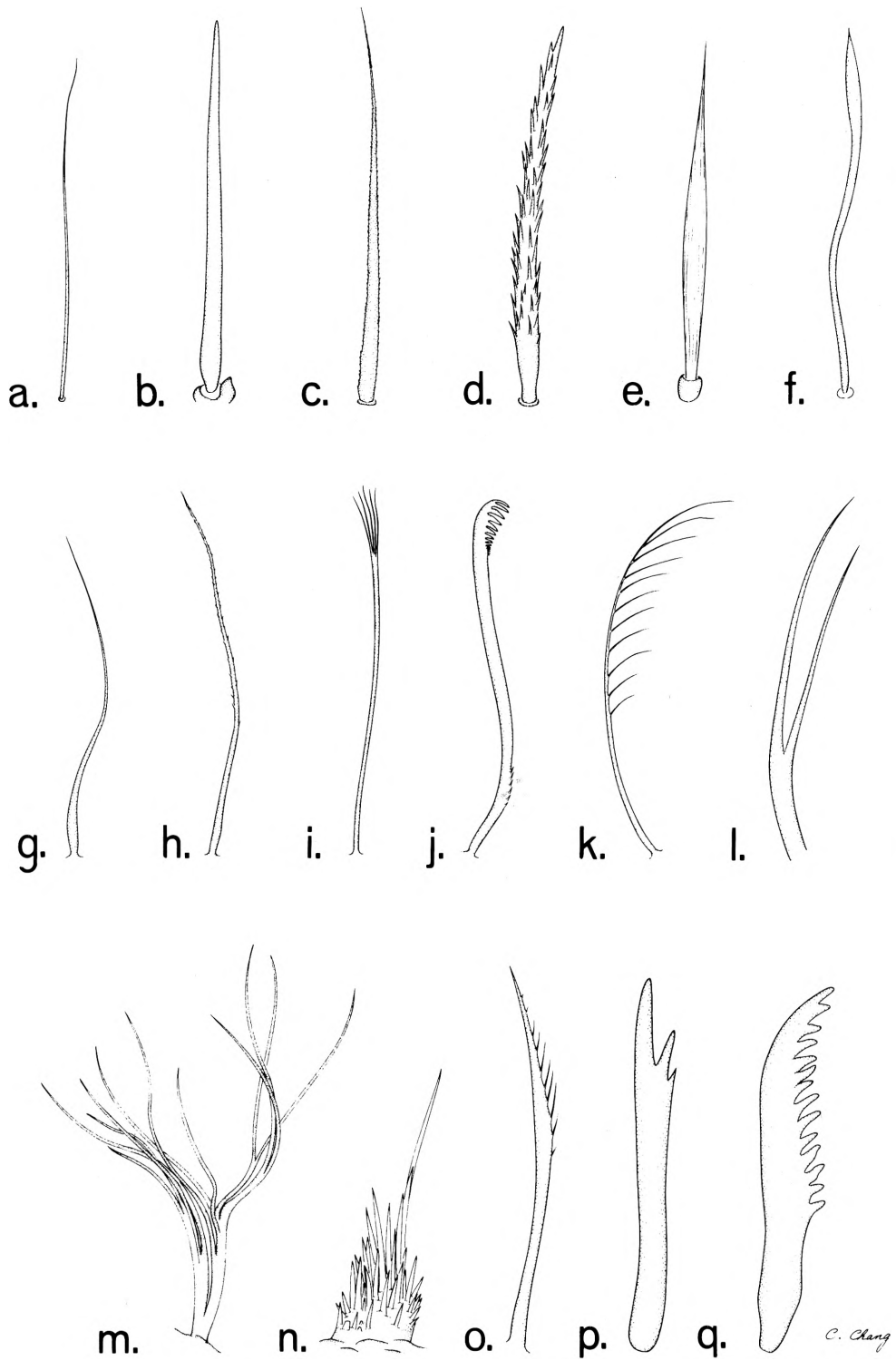


FIGURE 82

- a. Asymmetrical scale from wing of *Mansonia (Mansonioides) uniformis* (Theobald). Note microtrichia on wing membrane.
- b. Falcate scales from vertex of *Mansonia (Mansonioides) uniformis* (Theobald).
- c. Twisted scales on meskatepisternum of *Aedes (Mucidus) scatophagoides* (Theobald).
- d-e. Fusiform scales on scutum of *Psorophora (Psorophora) ciliata* (Fabricius). Note covering of aculeae.
- f. Fusiform scales on wing of *Anopheles (Anopheles) quadrimaculatus* Say. Note microtrichia on wing membrane.
- g. Forked scales on vertex of *Aedes (Mucidus) scatophagoides* (Theobald). Note covering of aculeae.
- h. Linear scales on wing of *Culex (Neoculex) deserticola* Kirkpatrick. Note microtrichia on wing membrane.
- i. Spatulate scales on wing of *Orthopodomyia signifera* (Coquillett). Note microtrichia on wing membrane.
- j. Spatulate scale on wing of *Aedes (Mucidus) scatophagoides* (Theobald). Note microtrichia on wing membrane.
- k. Spatulate scales on wing of *Anopheles (Cellia) cinereus* Theobald. Note microtrichia on wing membrane.
- l. Spatulate scales on wing of *Orthopodomyia signifera* (Coquillett).
- m. Spatulate scale on scutum of *Toxorhynchites (Lynchiella) rutilus septentrionalis* (Dyar and Knab). Note covering of aculeae.
- n. Piliform scales on scutum of *Aedes (Finlaya) banksi* Edwards. Note covering of aculeae.

Abbreviations

- a** - alveolus (with seta removed)
- p** - pedicel
- s** - squame

Fig. 82

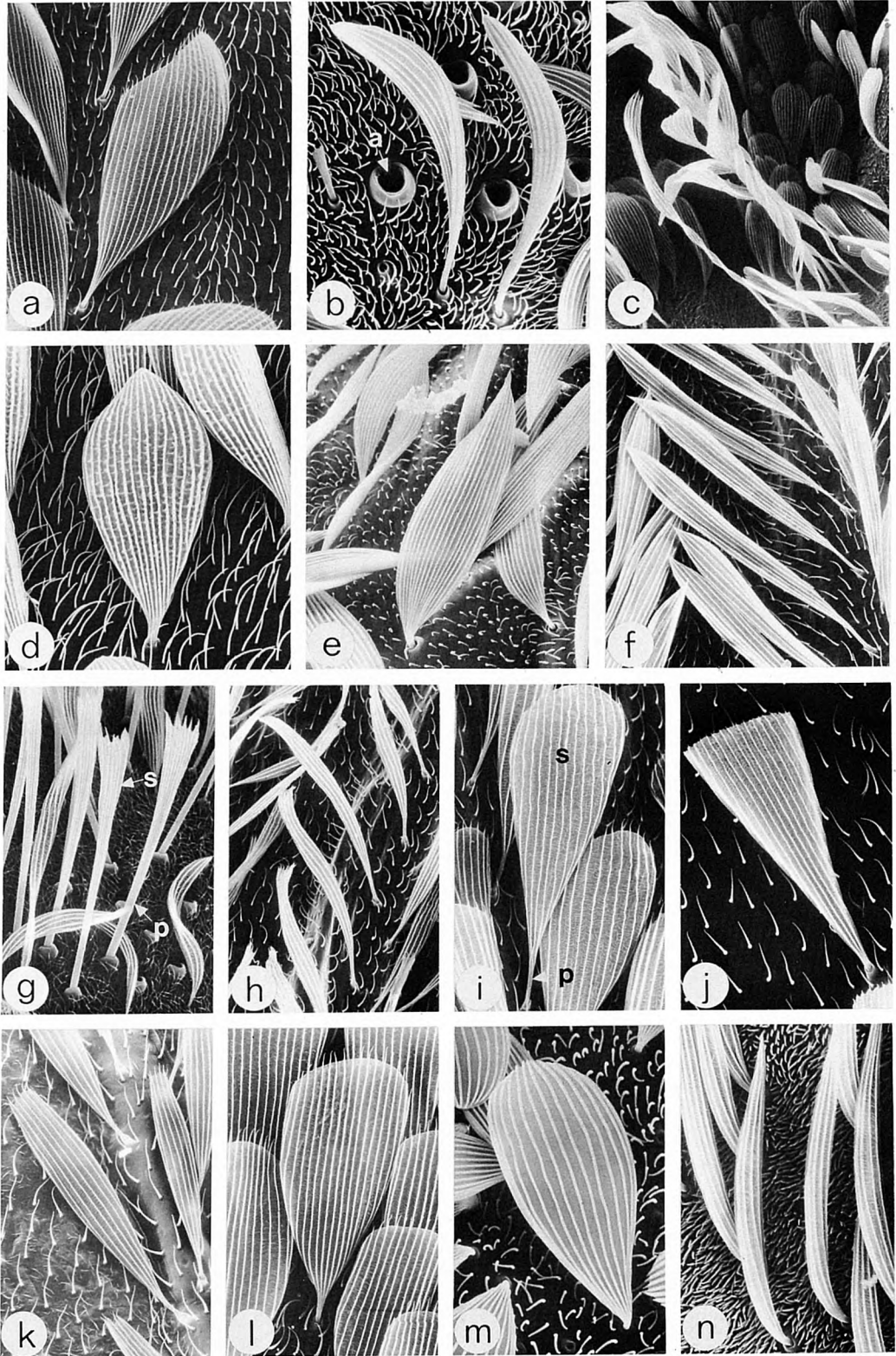
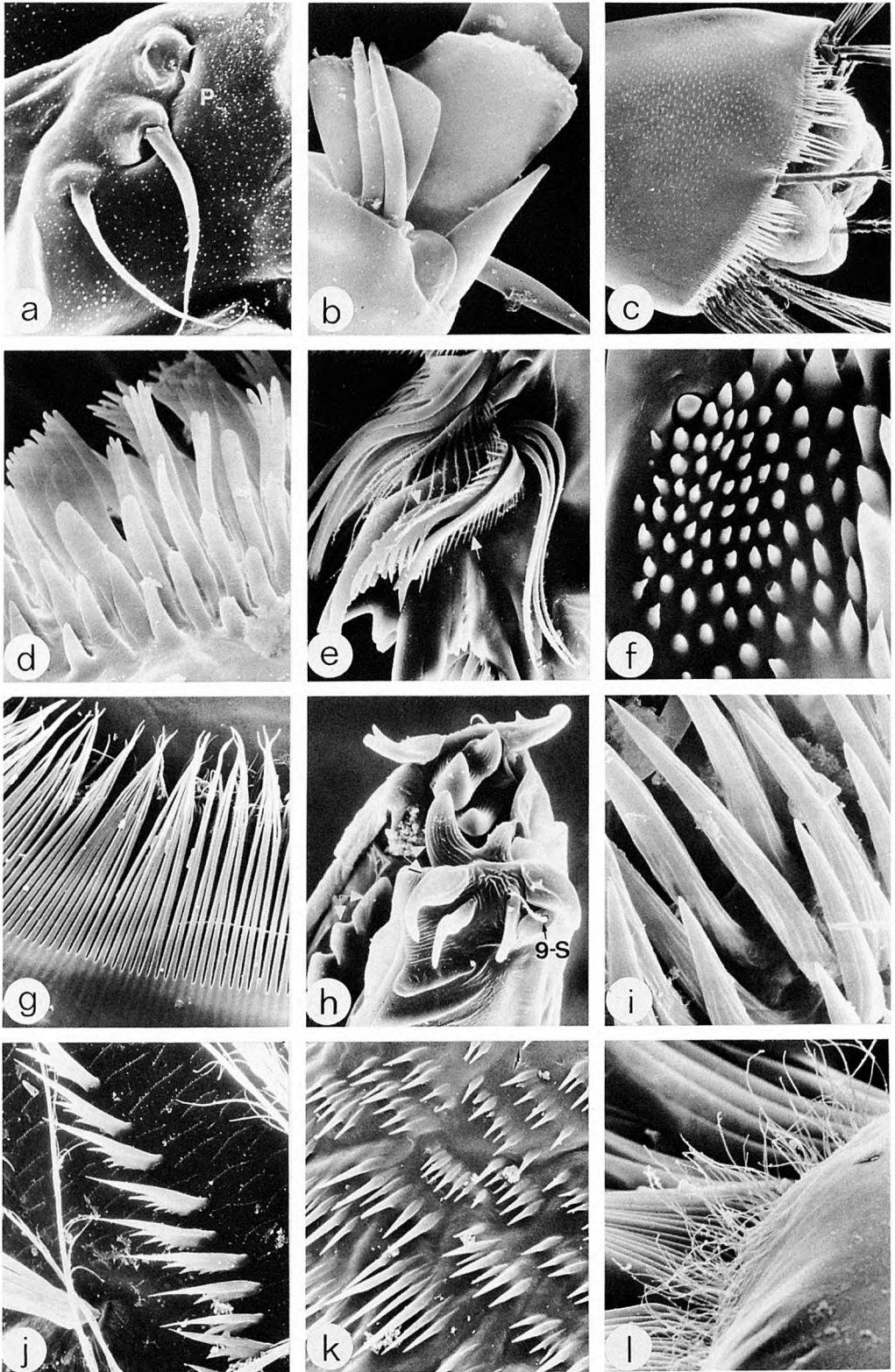


FIGURE 83

- a. Puncture (P) (seta 3-S) on anterior spiracular lobe of larva of *Anopheles (Anopheles) crucians* Wiedemann.
- b. Apex of maxillary palpus of larva of *Anopheles (Anopheles) crucians* Wiedemann showing four peglike and three foliiform setae.
- c. Saddle of larva of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald with row of aciculae (collectively, saddle marginal spicules).
- d. Laciniarastrum 1 on maxilla of larva of *Armigeres (Armigeres) subalbatus* (Coquillett) comprised of simple (front rows) and incised blades (back rows).
- e. Mandibular rake of larva of *Anopheles (Anopheles) crucians* Wiedemann with pectunculate (lower arrow) and bipectunculate blades (upper arrow).
- f. Denticles of premental mala on labiohypopharynx of larva of *Anopheles (Nyssorhynchus) albimanus* Wiedemann.
- g. Divided filaments from primary dorsal fringe in pharynx of larva of *Anopheles (Nyssorhynchus) albimanus* Wiedemann.
- h. Apex of spiracular apparatus of larva of *Mansonia (Mansonioides) uniformis* (Theobald). Teeth (inner and outer spiracular teeth) (upper arrows) and serrations (lower arrows) comprising the saw. Note seta 9-S.
- i. Setiforms comprising laciniarastrum 1 on maxilla of larva of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
- j. Spines of pecten of larva of *Culiseta (Culiseta) inornata* (Williston).
- k. Spinules (oral spicules) on ventral wall of pharynx of larva of *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald.
- l. Villi comprising the mandibular pilose area of larva of *Culex (Culex) pipiens quinquefasciatus* Say.

Fig. 83



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About this book a message from the publisher

We at Plexus Publishing are indeed honored to have been chosen as publisher of this fine book, *Taxonomists' Glossary of Mosquito Anatomy*. The authors have been working on the book for over ten years, while we have been privileged to know it for only about ten months. During this time, however, the authors' thoroughness, scholarship, and dogged attention to detail have impressed us over and over again.

In the production of this book, we have taken every possible step to insure that the high standards of quality which were set by the authors were not thwarted in the process of turning a manuscript into "ink on paper." Nevertheless, it is inevitable in a book of this magnitude that certain errors will occur. Should the reader discover any of these, we encourage their communication to the authors or to us at Plexus Publishing, Inc., Box 550, Marlton, NJ 08053. Future editions of this work will be enhanced thereby.

This book was typeset entirely in-house by Carol H. Reilly. Her patience and dedication are greatly appreciated by all concerned.

Thomas H. Hogan
President,
Plexus Publishing, Inc.
September, 1980.

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Research activities are centered in several collaborative facilities, particularly those provided by Insect Control and Research, Inc., Baltimore, MD, where an extensive research library in medical entomology and insect taxonomy is maintained.

Corrections and Additions to *Taxonomists' Glossary
of Mosquito Anatomy*¹

Ralph E. Harbach² and Kenneth L. Knight³

Abstract. Corrections and additions are provided for *Taxonomists' Glossary of Mosquito Anatomy* by Harbach and Knight (1980).

INTRODUCTION

Since *Taxonomists' Glossary of Mosquito Anatomy* (Harbach and Knight 1980) was published, certain errors have been discovered that went undetected during the final preparation of the volume. Through the exhortations of John F. Reinert and Ronald A. Ward, and the encouragement of Richard H. Foote, this supplement was prepared to point out and correct the noted errors. Additionally, this communication includes several newly recommended terms, many new synonymous terms and a number of previously uncited references to anatomical works.

The format employed in the glossary has been utilized throughout (see p. xi of the glossary). New terms recommended for general use are marked by the symbol +. Underscoring is used to indicate non-entry words describing the action to be taken with each entry. Entries *per se* are not underscored. Corrections and additions to the index are listed separately. It would be of value to everyone working with mosquitoes to transfer the corrections and additions directly to the appropriate places in the glossary.

The following individuals graciously called our attention to errors in the glossary: Jack Colvard Jones, Kenneth J. Linthicum, John F. Reinert and George C. Steyskal. Thomas H. Hogan, President, Plexus Publishing, Inc. kindly endorsed the preparation of this publication. Sincere thanks are due Michael E. Faran, E.L. Peyton and Ronald A. Ward for their suggestions and criticisms. Appreciation is also expressed to Gale Munro for typing the manuscript.

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²Department of Entomology, Walter Reed Army Institute of Research, Washington, DC, with mailing address: U.S. Army Biosystematics Unit, c/o Medical Entomology Project, NHB-165, Smithsonian Institution, Washington, DC 20560.

³Emeritus Professor, Department of Entomology, North Carolina State University, Raleigh, NC 27650.

TAXONOMISTS' GLOSSARY OF MOSQUITO ANATOMY

Gloss. p.

FOREWORD

- v. In paragraph 3, line 13 correct Jung to Tung.

ADULT

1. + **ACROSTERNITE (As)** [Owen 1980,157] -- The part of a sternum anterior to the antecostal suture; absent from the thoracic sterna. Acrosternites have not been studied or recognized in the abdominal sterna of most mosquitoes and are known only in *Culiseta inornata* (Williston).

ACROTERGITE. Add to definition Acrotergites have not been studied or recognized in the abdominal terga of most mosquitoes and are known only in *Culiseta inornata* (Williston) (Owen 1980,157). Change Syn. (line 4) to Syn. for acrotergite of mesonotum

AEDEAGAL SCLERITE. Add to syn. sclerotized plate of mesosome, Rees and Onishi 1951,246

2. **ANEPISTERNAL CLEFT.** Correct meskatepisternum (line 3) to mesokatepisternum

- + **ANTECOSTA (An)** [Owen 1980,157] -- The anterior, internal transverse ridge of a tergum or sternum marked externally by the antecostal suture, serving for the attachment of longitudinal muscles; bearing the phragmata of the meso- and metanota (see **FIRST PHRAGMA** and **SECOND PHRAGMA**). Antecostae have not been studied or recognized in the abdominal segments of most mosquitoes; the antecosta is well differentiated on both the tergum and sternum of abdominal segment II of *Culiseta inornata* (Williston), and is present as a light band in the remaining abdominal segments of this species (Owen 1980, 157).

ANTECOSTAL SUTURE. Correct definition to The external groove of the antecosta. That of the antecosta bearing the first phragma is not readily visible in mosquitoes. Antecostal sutures have not been studied or recognized in the abdominal segments of most mosquitoes but are known to occur on the terga and sterna of abdominal segments II and III in *Culiseta inornata* (Williston) (Owen 1980,157).

- + **ANTENNAL PULSATING ORGAN (APO)** (Figs.2,7) [Clements 1956,429] -- In various insects, a pulsatile structure that drives blood into the antennae. In certain Diptera, comprised of a pair of vesicles situated between the bases of the antennae, each giving off a vessel to the antenna of its side and each connected by a muscle to the aorta. In mosquitoes, each vesicle is marked externally by a depression located on either side of the interantennal groove be-

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tween the antennal sockets and postfrontal sutures. (Syn: ocellus, Thompson 1905,192; Stirnauge, Martini 1923b,19; lateral ocellus, Patton and Evans 1929,54; tambour organ, Day 1955,331; dorsal ocellus, Christophers 1960,420)

3. **ANTEPRONOTUM.** Add to syn. anteprenotal lobe, Stone 1981,334
- ANTERIOR MESANEPISTERNUM.** Correct meskatepisternum (line 3) to mesokatepisternum
5. **BASAL PIECE.** Add to syn. (page 6) apodemous inflection, Zaka-Ur-Rab 1980,10; basal inflection of the outer paramere, Zaka-Ur-Rab 1980,10; internal inflection of outer paramere, Zaka-Ur-Rab 1980,13; gonocoxital apodeme, Owen 1980,155
6. **CELL M.** Add to syn. cell bm [basal medial], Stone 1981,341
7. **CELL R.** Add to syn. cell br [basal radial], Stone, 1981,341
- CERCAL SCLERITE.** Add to syn. tergum 10, Owen, 1980,167
8. **CIBARIAL ARMATURE.** Add to syn. ventral pharyngeal valve, Uchida 1979,159
- CIBARIAL DOME.** Add to syn. dorsal pharyngeal valve, Uchida 1979,159
- CIBARIAL RIDGE.** Add to syn. finger-like projection, Uchida 1979,159
11. **DORSAL POSTGENITAL LOBE INDEX.** Correct definition to In female mosquitoes, the dorsal postgenital lobe length divided by the dorsal postgenital lobe width.
12. **DORSAL SETA.** Add to syn. campaniform sensillum, Uchida 1979, in part, 159
13. **FIRST PHRAGMA.** Replace A transverse apodeme (line 1) with The platelike (usually) apodemal arms of the antecosta located...
14. **FURCASTERNUM.** Correct of the mosquito, (line 5) to of mosquitoes,
16. **GONOCOPODITE.** Add to syn. Cercus, Ehlert 1979,197; outer paramere, Zaka-Ur-Rab 1980,10
- GONOPORE.** Add to syn. for ♂ phallotreme, Zaka-Ur-Rab 1980,13
- GONOSTYLUS** Add to syn. stylus, Matsuda 1976,345
17. **HALTER.** Add to syn. Schwingkölbchen, Ehlert 1979,196

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- HUMERAL PLATE.** Correct in the mosquito. (line 2) to in mosquitoes.
20. **LABIAL BASAL SETA.** Correct (Figs.1-3) to (Figs.2,3)
- LABIUM.** Add to syn. 2. Maxillen, Ehlert 1979,192; Stechborstenscheide, Ehlert 1979,193
22. **LOWER MESKATEPISTERNAL SCALE.** Correct to LOWER MESOKATEPISTERNAL SCALE. Correct meskatepisternal (line 2) to mesokatepisternal
- LOWER MESKATEPISTERNAL SETA.** Correct to LOWER MESOKATEPISTERNAL SETA. Correct meskatepisternum (line 2) to mesokatepisternum and meskatepisternal (line 3) to mesokatepisternal
23. **MANDIBLE.** Add to syn. 1. Maxillen, Ehlert 1979,192
- MAXILLARY PALPUS.** Following the syn. Maxillartaster (page 24) delete Vogel 1921,276 and cite Lindner 1919,20 for the first use of the term.
25. **MESANAPLEURAL SUTURE.** Correct meskatepisternum (lines 2 and 3) to mesokatepisternum
- MESANEPIMERON.** Correct meskatepimeron (line 3) to mesokatepimeron
- MESANEPISTERNUM.** Correct meskatepisternum (line 2) to mesokatepisternum
- MESEPIMERON.** Correct meskatepimeron (lines 3 and 5) to mesokatepimeron
- MESEPISTERNUM.** Correct meskatepisternum (lines 2 and 5, page 26) to mesokatepisternum
26. **MESKATEPIMERON.** Correct to MESOKATEPIMERON and place this and the next four entries alphabetically after MESOFURCASTERNUM.
- MESKATEPISTERNAL BRIDGE.** Correct to MESOKATEPISTERNAL BRIDGE. Correct meskatepisterna (line 2) to mesokatepisterna
- MESKATEPISTERNAL SCALE.** Correct to MESOKATEPISTERNAL SCALE. Correct meskatepisternum (line 1) to mesokatepisternum and meskatepisternal (line 2) to mesokatepisternal
- MESKATEPISTERNAL SETA.** Correct to MESOKATEPISTERNAL SETA. Correct meskatepisternum (line 1) to mesokatepisternum and meskatepisternal (line 2) to mesokatepisternal
- MESKATEPISTERNUM.** Correct to MESOKATEPISTERNUM. Insert meskatepisternum, before Patton and Evans (line 1) and add mesokatepi-

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sternum, before Wood *et al.* (line 2).

27. **MESOPLEUROSTERNAL SUTURE.** Correct meskatepisternum (line 2) to mesokatepisternum
- MESOPOSTNOTAL SETA.** Add to syn. postnotal setula, Mattingly 1971[f], Figs. 3c-d, Pl. 1
28. **MESOTROCHANTIN.** Correct meskatepisternum (line 2) to mesokatepisternum
30. **OCELLUS.** Delete entire entry. [See **ANTENNAL PULSATING ORGAN** (page 2)]
31. **PARACOXAL SUTURE.** Correct meskatepisternum (line 2) to mesokatepisternum
- PARAMERE.** Add to syn. (page 32) parameral apodeme, Matsuda 1976,345; basal sclerite, Zaka-Ur-Rab 1980,10; basal sclerotic plate, Zaka-Ur-Rab 1980,13
32. **PARAPROCT.** Add to syn. for ♂ paramere, Matsuda 1976,345; inner paramere, Zaka-Ur-Rab 1980, including tergum X, 10; apical portion of the inner paramere, Zaka-Ur-Rab 1980,10; apical portion of inner paramere, Zaka-Ur-Rab 1980,13; sternum 10, Owen 1980,166; ventral arm of sternum 10, Owen 1980, in part, 166; sternite 10, Stone 1981,346
33. + **pharyngeal valve** [Uchida 1979,162] -- The combined cibarial dome and cibarial armature.
34. **POSTERIOR MESANEPISTERNUM.** Correct meskatepisternum (line 3) to mesokatepisternum
35. **POSTGENITAL LOBE.** Add to syn. eleventh sternite, Christophers 1951,374; post-genital plate, Christophers 1951,376
36. **POSTPROCOXAL MEMBRANE.** Correct meskatepisternum (line 2) to mesokatepisternum
43. **SECOND PHRAGMA.** Correct definition to The oval flaplike apodemal lobes of the antecosta of the mesopostnotum; bearing the attachment of some longitudinal flight muscles.
48. **TERGUM IX.** Add to syn. for ♂ sclerotic bar, Zaka-Ur-Rab 1980, in part, 9; sclerotic bar of ninth sternum, Zaka-Ur-Rab 1980, in part, 13; tergum 9, Owen 1980,165
- TERGUM X.** Add to syn. for ♂ interbasal plate, Rees and Onishi 1951, in part, 237; inner paramere, Zaka-Ur-Rab 1980, including the

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paraproct, 10; basal portion of the inner paramere, Zaka-Ur-Rab 1980,10; basal portion of inner paramere, Zaka-Ur-Rab 1980,13; dorsal arm of sternum 10, Owen 1980,166

49. **UPPER MESKATEPISTERNAL SCALE.** Correct to UPPER MESOKATEPISTERNAL SCALE. Correct meskatepisternal (line 2) to mesokatepisternal
50. **UPPER MESKATEPISTERNAL SETA.** Correct to UPPER MESOKATEPISTERNAL SETA. Correct meskatepisternum (line 2) to mesokatepisternum
- UPPER VAGINAL SCLERITE.** Add to definition apparently homologous with sternum IX of generalized insects but so modified as to be worthy of separate consideration. Add to syn. vaginal apodeme, Christophers 1951,374; sternum 9, Owen 1980,158; apodeme of sternum 9, Owen 1980, in part, 155
51. **VENTRAL POSTGENITAL LOBE INDEX.** Correct definition to In female mosquitoes, the ventral postgenital lobe length divided by the dorsal postgenital lobe width.
56. **Abbreviations.** Delete LBS - labial basal seta and add Mts - metepisternum
57. **Fig. 1.** Correct Mn to Mm. Replace Mtpn with Mts and label narrow sclerite to right of this Mtpn
58. **Abbreviations.** Add APO - antennal pulsating organ and delete Oc - ocellus
59. **Fig. 2a.** Replace Oc with APO
60. **Abbreviations.** Add OSI - ocular sclerite
63. **Fig. 4e.** Correct PAP to PTP
68. **Abbreviations.** Add APO - antennal pulsating organ and delete Oc - ocellus
69. **Fig. 7a.** Replace Oc with APO
78. **Abbreviations.** Correct meskatepimeron to mesokatepimeron; meskatepisternum to mesokatepisternum; lower meskatepisternal seta to lower mesokatepisternal seta; and upper meskatepisternal seta to upper mesokatepisternal seta
80. **Abbreviations.** Correct meskatepimeron to mesokatepimeron; meskatepisternum to mesokatepisternum; lower meskatepisternal seta to lower mesokatepisternal seta; upper meskatepisternal seta to upper mesokatepisternal seta; lower meskatepisternal scale to lower mesokatepisternal scale; and upper meskatepisternal scale to upper mesokatepisternal scale

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mesokatepisternal scale

81. **Fig. 13a.** Correct PESU to PeSU
- Fig. 13b.** Correct the lower MtS to Mts
82. **Abbreviations.** Correct meskatepimeron to mesokatepimeron; meskat-episternum to mesokatepisternum; meskatepisternal bridge to mesokatepisternal bridge; lower meskatepisternal seta to lower mesokatepisternal seta; and upper meskatepisternal seta to upper mesokatepisternal seta.
84. **Abbreviations.** Add Mfs - mesofurcasternum, MksB - mesokatepisternal bridge and Sct -- sternacosta
85. **Fig. 15d.** Label the curved inflection at the upper left Mef
86. **Abbreviations.** Correct lower meskatepisternal seta to lower mesokatepisternal seta; upper meskatepisternal seta to upper mesokatepisternal seta; lower meskatepisternal scale to lower mesokatepisternal scale; and upper meskatepisternal scale to upper mesokatepisternal scale
94. **Abbreviations.** Add ADL - apicodorsal lobe
97. **Fig. 21a.** Correct GS to Gs
100. **Abbreviations.** Add PH - phallosome
101. **Fig. 23c.** Correct Pha to PH
103. **Fig. 24f.** Correct GS to Gs

LARVA

131. **ANTENNAL PROMINENCE.** Add to syn. lobe, Stone 1981,347
132. **ANTERIOR TENTORIAL ARM.** Add to syn. bras antérieur du tentorium, Chaudonneret 1952,401
- ANTEROMEDIAN PALATAL FILAMENT.** Add to syn. central preapotal bristle, Colless 1979[b],21; palatal seta, Mattingly 1981,68
135. **COLLAR.** Replace Snodgrass 1959,4 (line 6) with Chaudonneret 1952,401
136. **COMPOUND EYE.** Add to syn. oeil imaginal, Chaudonneret 1952,401
138. **EGG-BUSTER.** Correct to EGG-BURSTER and correct egg buster (line 5) to egg burster

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- epipharynx.** Add Chaudonneret 1952,401 to the list of authors who have followed the third usage of this term (page 139, line 4).
139. **EPISTOMAL RIDGE.** Add to syn. phragme antennaire, Chaudonneret 1952,401
145. **LATERAL PALATAL BRUSH FILAMENT.** Add to syn. soie prémandibulaire, Chaudonneret 1952,401; lateral palatal bristle, Colless 1979[b],21
161. **RUDIMENTARY SPIRACLE.** Correct I-VII. (line 5) to II-VII.
171. **SETA 1-S.** Add to syn. subventral hair, Belkin 1962,179; subventral seta, Stone 1981,347; siphonal seta, Stone 1981,347
172. **SETA 1-X.** Add to syn. lateral seta, Stone 1981,347
- SETA 4-X.** Add to syn. ventrolateral seta, Stone 1981,347
174. **SPIRACULAR APPARATUS.** Add to syn. spiracular disc, Stone 1981,348
- STEMMA.** Add to syn. oeil larvaire, Chaudonneret 1952,401; (page 175) Punktauge, Ehlert 1979,192
176. **TORMA.** Add to syn. premandibule, Goetghebuer 1925,153
182. **Abbreviations.** Add HEL - hypocranial ecdysial line
189. **Fig. 36a.** Replace MdAP with MAdA
- Fig. 36d.** Correct area of L to area of LG
191. **Fig. 37a.** Delete Sca
206. **Abbreviations.** Add AS - antennal socket and DPhS - dorsal pharyngeal sclerite
209. **Fig. 46a.** Correct MnC to MnCS
- Fig. 46b.** Correct MnCE to MnCS
216. **Abbreviations.** Correct Pdt to PDT
221. **Fig. 52a.** Correct HSc to Cd
225. **Fig. 54c.** Correct 3 to 2
- Fig. 54e.** Correct 3 to 2
231. **Fig. 57a.** Correct PcP to PCP

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238. **Abbreviations.** Delete MSP - marginal spicules and add SMS - saddle marginal spicules

PUPA

283. **SETA 13-CT.** Add Reinert (1981) recounted the presence of this seta in the Culicidae and reported on its occurrence in *Aedes aurotaeniatu*s Edwards.
292. **Abbreviations.** Add Scu - scutum

VESTITURE

308. **Chart 1.** Add *Bifurcated* under SETA
311. **SETA.** Add bifurcated to the list of names of branched setae (line 9). Add to syn. setula
312. + *Bifurcated* [Marshall 1938,37] -- With two branches of equal or nearly equal length arising together, usually below the distal third, commonly at the base. (Syn.: bifid hair, Marshall 1938,37)
- Fanlike.* Delete bifid hair, Marshall 1938,37 (line 5) and bifurcated hair, Marshall 1938,37 (line 6).

LITERATURE CITED

326. Carpenter, S.J. and W.J. LaCasse. 1955. Correct 353 pp. to vi + 360 pp.
327. Christophers, S.R. 1960. Correct Oxford. ix to Cambridge. xii

INDEX**Corrections**

349. accessory plate of mesoepimerum (**MESKATEPIMERON**). Correct recommended term to MESOKATEPIMERON
356. bifid hair (*Fanlike* SETA). Substitute *Bifurcated* for *Fanlike*
bifurcated hair (*Fanlike* SETA), V312. Delete and substitute *Bifurcated* SETA, V312
364. egg-breaker (**EGG-BUSTER**). Correct recommended term to EGG-BURSTER
egg breaker (**EGG-BUSTER**). Correct recommended term to EGG-BURSTER

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- egg-breaker spine (**EGG-BUSTER**). Correct recommended term to EGG-BURSTER
- EGG-BUSTER**. Correct to EGG-BURSTER
- egg buster (**EGG-BUSTER**). Correct to egg burster (EGG-BURSTER)
- egg-tooth (**EGG-BUSTER**). Correct recommended term to EGG-BURSTER
365. episternal plate (**MESKATEPISTERNUM**). Correct recommended term to MESOKATEPISTERNUM
370. hatching spine (**EGG-BUSTER**). Correct recommended term to EGG-BURSTER
373. katepisternum (**MESKATEPISTERNUM**). Correct recommended term to MESOKATEPISTERNUM
375. lateral ocellus. Delete (OCELLUS), A30 and add (ANTENNAL PULSATING ORGAN), A2
377. lower episternal chaeta (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA (page 378).
378. lower katepisternal seta (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA
- lower mes-episternal bristle (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA
- lower mesepisternal seta (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA
- LOWER MESKATEPISTERNAL SCALE**. Correct to LOWER MESOKATEPISTERNAL SCALE
- LOWER MESKATEPISTERNAL SETA**. Correct to LOWER MESOKATEPISTERNAL SETA
- lower sternopleural bristle (**MESKATEPISTERNAL SETA**). Correct recommended term to MESOKATEPISTERNAL SETA
- lower sternopleural group (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA
- lower sternopleural scale patch (**LOWER MESKATEPISTERNAL SCALE**). Correct recommended term to LOWER MESOKATEPISTERNAL SCALE
- lower sternopleural seta (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to LOWER MESOKATEPISTERNAL SETA

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382. mesepisternal bridge (**MESKATEPISTERNAL BRIDGE**). Correct recommended term to **MESOKATEPISTERNAL BRIDGE**
- mes-episternal bristle (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- mesepisternalen Schuppenfleck (**MESKATEPISTERNAL SCALE**). Correct recommended term to **MESOKATEPISTERNAL SCALE**
- mesepisternal seta (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- MESKATEPIMERON**. Correct to **MESOKATEPIMERON** and place this entry alphabetically after mesofurcum
- MESKATEPISTERNAL BRIDGE**. Correct to **MESOKATEPISTERNAL BRIDGE** and place this and the next three entries alphabetically after **MESOKATEPIMERON**
- MESKATEPISTERNAL SCALE**. Correct to **MESOKATEPISTERNAL SCALE**
- MESKATEPISTERNAL SETA**. Correct to **MESOKATEPISTERNAL SETA**
- MESKATEPISTERNUM**. Correct to **MESOKATEPISTERNUM**
383. meso-sternum (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
384. Middenbeugel (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
- Mittelbügel (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
- Mittelhaar (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
385. obere Mesepisternal-Borste (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- obere Sternopleuralborste (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- OCELLUS**, A30. Delete and substitute ocellus (**ANTENNAL PULSATING ORGAN**), A2
391. posterior sternopleural bristle (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to **LOWER MESOKATEPISTERNAL SETA**

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393. preepisternal bridge (**MESKATEPISTERNAL BRIDGE**). Correct recommended term to **MESOKATEPISTERNAL BRIDGE**
- preepisternum 2 (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
402. soie sternopleurales (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
403. sternopleural bridge (**MESKATEPISTERNAL BRIDGE**). Correct recommended term to **MESOKATEPISTERNAL BRIDGE**
- sternopleural bristle (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- sternopleural chaeta (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- sterno-pleural group (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- sternopleural scale (**MESKATEPISTERNAL SCALE**). Correct recommended term to **MESOKATEPISTERNAL SCALE**
- sternopleural scale-patch (**MESKATEPISTERNAL SCALE**). Correct recommended term to **MESOKATEPISTERNAL SCALE**
- sternopleural seta (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- sternopleurite (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
- sternopleuron (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
- sternum (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**
404. Stirnauge. Delete (**OCELLUS**, A30) and add (**ANTENNAL PULSATING ORGAN**), A2
409. untere mesepisternale Borste (**MESKATEPISTERNAL SETA**). Correct recommended term to **MESOKATEPISTERNAL SETA**
- untere Sternopleuralborste (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to **LOWER MESOKATEPISTERNAL SETA**
- Unterhaar (**LOWER MESKATEPISTERNAL SETA**). Correct recommended term to **LOWER MESOKATEPISTERNAL SETA**

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- upper episternal chaeta (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- upper katepisternal seta (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- upper mes-episternal bristle (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- upper mesepisternal seta (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
- UPPER MESKATEPISTERNAL SCALE**. Correct to **UPPER MESOKATEPISTERNAL SCALE**
- UPPER MESKATEPISTERNAL SETA**. Correct to **UPPER MESOKATEPISTERNAL SETA**
- upper sternopleural group (**UPPER MESKATEPISTERNAL SETA**). Correct recommended term to **UPPER MESOKATEPISTERNAL SETA**
410. upper sternopleural scale patch (**UPPER MESKATEPISTERNAL SCALE**). Correct recommended term to **UPPER MESOKATEPISTERNAL SCALE**
- ventrales Mesepisternum (**MESKATEPISTERNUM**). Correct recommended term to **MESOKATEPISTERNUM**

Additions

349. **ACROSTERNITE**, A1
350. **ANTECOSTA**, A2
351. **ANTENNAL PULSATING ORGAN**, A2
- antepronotal lobe (**ANTEPRONOTUM**), A3
353. apical portion of inner paramere (**PARAPROCT**), A32
- apical portion of the inner paramere (**PARAPROCT**), A32
- apodeme of sternum 9 (**UPPER VAGINAL SCLERITE**), A50
- apodemous inflection (**BASAL PIECE**), A6
355. basal inflection of the outer paramere (**BASAL PIECE**), A6
- basal portion of inner paramere (**TERGUM X**), A48

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- basal portion of the inner paramere (**TERGUM X**), A48
- basal sclerite (**PARAMERE**), A32
- basal sclerotic plate (**PARAMERE**), A32
356. bras antérieur du tentorium (**ANTERIOR TENTORIAL ARM**), L132
357. campaniform sensillum (**DORSAL SETA**), A12
- cell bm [basal median] (**CELL M**), A6
- cell br [basal radial] (**CELL R**), A7
358. central preapotomal bristle (**ANTEROMEDIAN PALATAL FILAMENT**), L132
- Cercus (**GONOCOPODITE**), A16
362. dorsal arm of sternum 10 (**TERGUM X**), A48
363. dorsal ocellus (**ANTENNAL PULSATING ORGAN**), A2
- dorsal pharyngeal valve (**CIBARIAL DOME**), A8
364. eleventh sternite (**POSTGENITAL LOBE**), A35
366. finger-like projection (**CIBARIAL RIDGE**), A8
369. gonocoxital apodeme (**BASAL PIECE**), A6
372. inner paramere (**PARAPROCT**), A32
- inner paramere (**TERGUM X**), A48
- interbasal plate (**TERGUM X**), A48
373. internal inflection of outer paramere (**BASAL PIECE**), A6
375. lateral palatal bristle (**LATERAL PALATAL BRUSH FILAMENT**), L145
376. lateral seta (**SETA 1-X**), L172
377. lobe (**ANTENNAL PROMINENCE**), L131
382. meskatepisternum (**MESOKATEPISTERNUM**), A26
385. oeil imaginal (**COMPOUND EYE**), L136
- oeil larvaire (**STEMMA**), L174

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palatal seta (**ANTEROMEDIAN PALATAL FILAMENT**), L132
387. paramere apodeme (**PARAMERE**), A32
paramere (**PARAPROCT**), A32
388. phallotreme (**GONOPORE**), A16
pharyngeal valve, A33
phragme antennaire (**EPISTOMAL RIDGE**), L139
391. post-genital plate (**POSTGENITAL LOBE**), A35
392. postnotal setula (**MESOPSTNOTAL SETA**), A27
393. premandibule (**TORMA**), L176
395. Punktauge (**STEMMA**), L175
397. sclerotic bar (**TERGUM IX**), A48
sclerotic bar of ninth sternum (**TERGUM IX**), A48
sclerotized plate of mesosome (**AEDEAGAL SCLERITE**), A1
Schwingkölbchen (**HALTER**), A17
401. setula (**SETA**), V311
siphonal seta (**SETA 1-X**), L171
402. soie prémandibulaire (**LATERAL PALATAL BRUSH FILAMENT**), L145
403. spiracular disc (**SPIRACULAR APPARATUS**), L174
Stechborstenscheide (**LABIUM**), A20
sternite 10 (**PARAPROCT**), A32
sternum 9 (**UPPER VAGINAL SCLERITE**), A50
sternum 10 (**PARAPROCT**), A32
404. stylus (**GONOSTYLUS**), A16
405. subventral hair (**SETA 1-S**), L171

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- subventral seta (**SETA 1-X**), L171
406. tambour organ (**ANTENNAL PULSATING ORGAN**), A2
- tergum 9 (**TERGUM IX**), A48
- tergum 10 (**CERCAL SCLERITE**), A7
410. vaginal apodeme (**UPPER VAGINAL SCLERITE**), A51
- ventral arm of sternum 10 (**PARAPROCT**), A32
411. ventral pharyngeal valve (**CIBARIAL ARMATURE**), A8
- ventrolateral seta (**SETA 4-X**), L172
413. 1. Maxillen (**MANDIBLE**), A23
2. Maxillen (**LABIUM**), A20

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