A Mosquito Taxonomic Glossary

X. The Larval Mandible*

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For a full explanation of this project see Part I (Knight 1970). As before, terms recommended for standardized use are given fully capitalized. Synonyms or terms used in error are in lower case and underlined. Standardized abbreviations are also suggested. An appendix presenting supplementary information is included.

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

Part IX of this series dealt with the larval cranium (Laffoon and Knight 1973). The present part is the first of a sequence dealing with the larval mouthparts. The illustrations, as previously, were drawn from specimens observed with the light microscope. Included, however, are blown-up areas showing finer detail which were drawn with the aid of scanning electron micrographs.

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accessory denticles. -- See ACCESSORY TEETH.

ACCESSORY SELLAR SETA (ASeS). -- In culicid larvae, one of a varying number of fine setae arising mesal to the bases of the much larger sellar setae 1-3 in the sella of the mandible. (Syn.: mandibular spur 2, Knight 1971, 196; sellar hairs 1, Gardner *et al.* 1973, 164.)

accessory spines. -- See ACCESSORY TEETH.

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ACCESSORY TEETH (AcT). -- In anopheline larvae, a group of peg-like cuticular structures 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 (Foote 1952, 449), a smaller group of similar structures also closely associated with the posterior dorsal tooth. (Syn.: chitinous pad covered with spines, LaCasse and Yamaguti 1948, 13; molar part, Schremmer 1949, 192; accessory spines, Foote 1952, 449; small teeth, Shalaby 1959, 208; molar region, Clements 1963, 35; mesal pecten, Knight 1971, 196; accessory denticles, Gardner *et al.* 1973, 165.) The "cluster of finger-shaped processes" (24) and the "subterminal teeth" (25) of Puri (1931) together represents the accessory teeth. See appendix.

acinaciform outgrowths. -- See MANDIBULAR RAKE.

adductor tendon of mandible. -- See MANDIBULAR ADDUCTOR APODEME.

adorning comb. -- See MANDIBULAR BRUSH.

anterior articulation of the mandible. -- See PREARTIS.

ANTERIOR DORSAL TOOTH (ADT). -- In most culicid larvae (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). -- See Part IX (Laffoon and Knight 1973, 33). (Syn.: in addition to those listed in Part IX; dorsal mandibular joint, Crawford 1933, 27; dorsal mandibular articulation, Schremmer 1949, 190; articulation of the maxilla with the zygous trabecula, Becker 1938, 750; inner mandibular articulation, Schremmer 1949, 190.)

anterior spine. -- See VENTRAL TOOTH-4.

anvil-shaped projection. -- See MANDIBULAR LOBE.

apodeme. -- See MANDIBULAR ABDUCTOR APODEME.

arcuate suture. -- See ARCUATE THICKENING.

ARCUATE THICKENING (ArT). -- In culicid larvae, as seen in the light microscope, a partial or complete loop-like band of cuticle extending anteriorly from the dorsal part of the U-shaped rod; representing the rim of a depression in which is borne mandibular sweeper 2. (Syn.: arcuate suture, Knight, 1971, 204.) See appendix.

articulate serrate spine. -- See MANDIBULAR RAKE BLADE 1.

articulation of the maxilla with the zygous trabecula. -- See ANTERIOR MANDIBULAR ARTICULATION.

articulatory process. -- See POSTARTIS.

AUXILIARY VENTRAL TOOTH (AVT). -- In some culicid larvae, a small projection located posterior to and in line with the ventral teeth of the mandible; usually bearing two or three cusps. See appendix.

BASAL BAND (BB). -- In many culicid larvae (Pao and Knight 1970, 124), a semi-circular or linear band of cuticle which represents the rim of the depression in which is borne the mandibular rake.

biting part. -- See MANDIBULAR TEETH.

border of brushes. -- See MANDIBULAR COMB and MANDIBULAR BRUSH.

bowed setae. -- See MANDIBULAR BRUSH.

brushes of hairs. -- See MANDIBULAR BRUSH.

bunch of hairs which line the mouth. -- See MANDIBULAR SWEEPER.

bunch of long stout setae. -- See MANDIBULAR SWEEPER.

caudal subgroup of the dorsal dentes. -- See POSTERIOR DORSAL TOOTH.

cephalic subgroup of the dorsal dentes. -- See ANTERIOR DORSAL TOOTH.

chewing segment. -- See MANDIBULAR TEETH.

chewing teeth. -- See VENTRAL TEETH, DORSAL TEETH, and MANDIBULAR TEETH.

chitinized teeth. -- See MANDIBULAR TEETH.

chitinous apodeme. -- See POSTARTIS.

chitinous growth. -- See MANDIBULAR LOBE.

chitinous pad covered with spines. -- See ACCESSORY TEETH.

chitinous process. -- See POSTARTIS and MANDIBULAR LOBE.

chitinous projection. -- See MANDIBULAR LOBE.

cluster of finger-shaped processes. -- See ACCESSORY TEETH.

combing apparatus. -- See MANDIBULAR COMB.

comblike fringe. -- See MANDIBULAR BRUSH.

comb-like fringe. -- See MANDIBULAR BRUSH and MANDIBULAR COMB.

composite teeth. -- See MANDIBULAR TEETH.

corner spines. -- See SELLAR SETA.

cramming comb. -- See MANDIBULAR SWEEPER.

curved spines. -- See SELLAR SETA.

CUSP (c). -- In culicid larvae, 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.

cutting organ. -- See MANDIBULAR TEETH.

cutting organ of mandible. -- See MANDIBULAR TEETH.

cycle-shaped hairs. -- See SELLAR SETA.

dentes-bearing area. -- See MANDIBULAR TEETH.

distal fang. -- See DORSAL TEETH.

dorsal bristles. -- See MANDIBULAR SPINOSE AREA.

dorsal cleaning comb of the mandible. -- See MANDIBULAR BRUSH.

dorsal falciform hair of the mandible. -- See SELLAR SETA.

dorsal group of dentes. -- See DORSAL TEETH.

dorsal mandibular articulation. -- See ANTERIOR MANDIBULAR ARTICULATION.

dorsal mandibular joint. -- See ANTERIOR MANDIBULAR ARTICULATION.

DORSAL MANDIBULAR SETA (DMS). -- In many culicine larvae, a long curved spur-like 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.) See appendix.

DORSAL MANDIBULAR SPINE (DMSp). -- In many culicine larvae, a small straight spine-like cuticular structure 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 saw. -- See DORSAL TEETH.

dorsal spines. -- See SELLAR SETA, DORSAL MANDIBULAR SETA, and DORSAL MANDIBULAR SPINE.

dorsal spine 1. -- See DORSAL MANDIBULAR SETA.

dorsal spine 2. -- See DORSAL MANDIBULAR SPINE.

DORSAL TEETH (DT). -- In most culicid larvae (Foote 1952, 449), two usually broadened smaller 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, Becker 1938, 751; dorsal tooth, LaCasse and Yamaguti 1948, 8; dorsal saw, LaCasse and Yamaguti 1948, 8; dorsal group of

dentes, Shalaby 1956, 150.) Schremmer (1949, 192) used the terms "incisers" and "chewing teeth" interchangably to include both the dorsal and ventral mandibular teeth.

dorsal tooth. -- See DORSAL TEETH.

falciform outgrowths. -- See SELLAR SETA.

fine setae. -- See MANDIBULAR LOBE SETA.

finger-like process. -- See MANDIBULAR LOBE.

first denticle. -- See VENTRAL TOOTH 1.

flabelliform plastins [plates]. -- See MANDIBULAR BRUSH.

fork-like lobe. -- See MANDIBULAR LOBE.

fringe of long hairs. -- See MANDIBULAR BRUSH.

fringe of long soft hairs. -- See MANDIBULAR BRUSH.

gorging hairs of the mandible. -- See MANDIBULAR SWEEPER.

group A hairs. -- See MANDIBULAR SWEEPER 1.

group B hairs. -- See MANDIBULAR SWEEPER 2.

group C hairs. -- See MANDIBULAR SPINOSE AREA.

hairs projecting inward to mouth. -- See MANDIBULAR SWEEPER.

incisor region. -- See VENTRAL TEETH.

incisors. -- See VENTRAL TEETH and DORSAL TEETH.

inner mandibular articulation. -- See ANTERIOR MANDIBULAR ARTICULATION.

intermediate group of hairs. -- See MANDIBULAR LOBE SETAE 2.

LABULA (L). -- In larval culicids (Gardner *et al.* 1973, 166), the dorsoposterior part or lip of the mandibular lobe.

LABULAR SPINE (LSp). -- In larvae of the *Aedes varipalpus* complex (Gardner *et al.* 1973, 166), a spine on the posterior border of the labula (of the mandibular lobe).

large apodeme. -- See MANDIBULAR ADDUCTOR APODEME.

lateral bristles. -- See SELLAR SETA.

lateral comb. -- See MANDIBULAR BRUSH.

lateral dorsal cluster of hairs. -- See MANDIBULAR LOBE SETAE 5.

lateral dorsal dentes. -- See POSTERIOR DORSAL TOOTH.

lateral dorsal spine. -- See DORSAL MANDIBULAR SPINE.

lateral group of hairs. -- See MANDIBULAR LOBE SETAE 4.

lateral subgroup of mandibular hairs. -- See MANDIBULAR SWEEPER 1.

lateral tooth. -- See MANDIBULAR RAKE BLADE 1.

long bent hairs. -- See MANDIBULAR BRUSH.

long bristlelike comb. -- See MANDIBULAR SWEEPER.

long spines. -- See SELLAR SETA and MANDIBULAR SWEEPER.

lower teeth. -- See DORSAL TEETH.

main tooth. -- See VENTRAL TOOTH 0.

MANDIBLE (Mn). -- In mandibulate arthropods, one of the first pair of gnathal appendages of the head. In culicid 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 lateralia to the cibarial bar; typically flattened lobes with their mesal ends produced into strongly sclerotized toothed processes and a seta-bearing lobe, the tips of opposing mandibles coming to rest against the labiohypopharynx when closed (larvae of predaceous species may be exceptions to this). (Syn. for culicid larvae: maxilla, Becker 1938, 750.)

MANDIBULAR ABDUCTOR APODEME (MAbA). -- In culicid larvae (Knight 1971, 190), an apodeme attached under the V-shaped ridge or to the lateroventral end of the U-shaped rod when the V-shaped ridge is absent; providing attachment for an abductor muscle. Farnsworth (1947, 142) referred to this structure as simply an "apodeme."

MANDIBULAR ADDUCTOR APODEME (MAdA). -- In culicid larvae (Knight 1971, 190), an apodeme attached to the mesal end or to a posterior projection of the mesal end of the ventral arm of the U-shaped rod; providing attachment for an adductor muscle. (Syn.: adductor tendon of mandible, Christophers 1960, 206; mandibular apodeme, Pao and Knight 1970, 126.) The "large apodeme" referred to by Farnsworth (1947, 143) may include the mesoventral projection of the U-shaped rod which is large in *Anopheles* species. Knight (1971) labelled the mesoventral projection of the rod as part of the apodeme in a number of his drawings.

mandibular apodeme. -- See MANDIBULAR ADDUCTOR APODEME.

mandibular arm. -- See POSTARTIS.

mandibular bristles. -- See SELLAR SETA.

mandibular brush. -- See MANDIBULAR SWEEPER.

MANDIBULAR BRUSH (MnB). -- In larval culicids (Shalaby 1956, 152), a group of prominent, curved, acute setae linearly arranged and varying in position from the dorsoanterior (in most species) to the dorsomesal margin (in predaceous species) of the mandible; number of setae greatly reduced in predaceous species; the most lateral setae may be flattened plumose structures in anophelines. (Syn.: brushes of hairs, Nuttall and Shipley 1901, 55; lateral comb, Mitchell 1906, 12; fringe of long hairs, Howard *et al.* 1912, 86; fringe of long soft hairs, Wesenberg-Lund 1921, 18; row of long, curved, finely branched hairs, Puri 1931, 27; flabelliform plastins [plates], Becker 1938, 752; long bent hairs, Foote 1952, 449; row of stout bristles, Salem 1931, 402; dorsal cleaning comb of the mandible, Chaudonneret 1962, 475; mandibulary fan, Dodge 1966, 339.) The "adorning comb" (196), also termed a "setal comb" and a "mandibular comb" (194), and "bowed setae" (194) of Schremmer (1949) represent the mandibular brush as defined here. Snodgrass (1959, 16) used the term "comblike fringe" which may have included the mandibular comb since he later referred to "setal combs" (17). Christophers (1960, 206) used the term "comb-like fringe" for both the mandibular brush and the mandibular comb. Meinert's (1886, 377) "border of brushes" included elements of the comb and brush. Knight (1971) incorrectly labelled the lateral plumose elements of the mandibular brush in his drawings of anopheline mandibles as the "mandibular comb." See appendix.

MANDIBULAR BRUSH SETA (MnBS). -- In culicid larvae, any setal element of the mandibular brush; commonly bearing villiform processes in filter-feeders and serrations in predators; the most lateral setae may be flattened plumose structures in anophelines.

mandibular comb. -- See MANDIBULAR BRUSH.

MANDIBULAR COMB (MnC). -- In culicine larvae (Shalaby 1957a, 155), a linearly-arranged group of setae or echinate tubercles 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 seta closely associate with the lateralmost setae of the mandibular brush. (Syn.: marginal comb, Mitchell 1906, 13; seta-bearing tubercles, Howard *et al.* 1912, 86; tubercles carrying thorns, Wesenberg-Lund 1921, 18; combing apparatus, Wesenberg-Lund 1921, 18; serrated processes, Shalaby 1957b, 278.) Christophers (1960, 206) used the term "comb-like fringe" for both the mandibular comb and the mandibular brush. Meinert's (1886, 377) "border of brushes" included the comb and brush elements. See appendix.

MANDIBULAR COMB ELEMENT (MnCE). -- In culicine larvae, one of the setae or echinate tubercles of the mandibular comb. The setae often bear small slender branches near their base.

mandibular cutting organ. -- See MANDIBULAR TEETH.

mandibular dorsal artis. -- See PREARTIS.

mandibular hairs. -- See MANDIBULAR SWEEPER.

MANDIBULAR LOBE (MnL). -- In larval culicids, 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 setae, mandibular lobe setae 1-5; highly reduced or absent in predaceous species. (Syn.: chitinous growth, Raschke 1887, 9; chitinous process, Raschke 1887, 29; 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; ventral lobe of the mandible, Chaudonneret 1962, 476; piliferous process, Gardner *et al.* 1973, 166.) See appendix.

MANDIBULAR LOBE SETA (MLS). -- In larval culicids, one of the uninnervated setae of the mandibular lobe; in as many as five groups, mandibular lobe setae 1-5. (Syn.: fine setae, Puri 1931, 27; piliferous process hairs, Gardner *et al.* 1973, 166.) See appendix.

MANDIBULAR LOBE SETAE 1 (MLS_1). -- In culicid larvae, a cluster of setae borne apically on the labula of the mandibular lobe; usually spine-like structures. (Syn.: mesal group of hairs, Shalaby 1957a, 154; MP_1 group of hairs, Knight 1971, 196; piliferous process hairs 1, Gardner *et al.* 1973, 166.)

MANDIBULAR LOBE SETAE 2 (MLS_2). -- In culicid larvae, a cluster of small setae borne apically on the anterior lip of the mandibular lobe; often spine-like structures. (Syn.: intermediate group of hairs, Shalaby 1957a, 153; MP_2 group of hairs, Knight 1971, 196; piliferous process hairs 2, Gardner *et al.* 1973, 166.)

MANDIBULAR LOBE SETAE 3 (MLS_3). -- In culicid larvae, a cluster of setae situated on the anterodorsal margin of the labula of the mandibular lobe; often spine- or hair-like structures. (Syn.: mesal dorsal cluster of hairs, Shalaby 1957b, 277; MP_3 group of hairs, Knight 1971, 196; piliferous process hairs 3, Gardner *et al.* 1973, 166.) The sclerotized spine which occurs on the mandibular lobe of *Anopheles quadrimaculatus* (Shalaby 1956, 150) is probably homologous with this group of setae.

MANDIBULAR LOBE SETAE 4 (MLS_4). -- In culicid larvae, an often linearly-arranged group of setae situated lateral of mandibular lobe setae 2 on the anterior or anteroventral surface of the mandibular lobe; usually hair-like structures. (Syn.: lateral group of hairs, Shalaby 1957a, 153; MP_4 group of hairs, Knight 1971, 196; piliferous process hairs 4, Gardner *et al.* 1973, 166.)

MANDIBULAR LOBE SETAE 5 (MLS_5). -- In culicid larvae, a linearly-arranged group of setae 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 flattened hair-like structures. (Syn.: lateral dorsal cluster of hairs, Shalaby 1957b, 277; MP_5 group of hairs, Knight 1971, 196; piliferous process hairs 5, Gardner *et al.* 1973, 166.)

MANDIBULAR LOBE SPINE (MLSp). -- In some culicid larvae, one of several minute tubercles or spine-like projections located posteriorly at the base of the mandibular lobe. (Syn.: piliferous process spines, Gardner *et al.* 1973, 166.)

mandibular molar area. -- See MANDIBULAR TEETH.

mandibular palp. -- See MANDIBULAR LOBE.

MANDIBULAR PEG ORGAN (MPgO). -- Known only in a few culicines, a small conical sensillum located dorsally at the base of the mandibular lobe. See appendix.

MANDIBULAR PILOSE AREA (MnPA). -- In many culicid larvae, a group or covering of fine hair-like cuticular filaments located anterodorsally on the mandible; extending from the rim of the sella along the base of the mandibular brush. In anophelines, the pile at the rim of the sella is sometimes long and easily confused with the accessory sellar setae. (Syn.: mandibular spur 2, Knight 1971, in part in some species, e. g., *Anopheles,* 196.) See appendix.

MANDIBULAR PIT ORGAN (MPO). -- In most culicid larvae, a small innervated pit occurring lateroposteriorly on the dorsal surface of the mandible near the preartis; bearing a small dome-shaped projection or conical peg; resembling a small cuticular ring under the light microscope. (Syn.: mandibular ring. Knight 1971, 204.) See appendix.

MANDIBULAR RAKE (MnR). -- In most culicid larvae, a serried rank of variably shaped, uninnervated setal elements arising ventral and posterior to the ventral teeth. The anterior elements, the mandibular rake blades, are typically flattened and elongate; the posterior elements, the mandibular rake setae, are usually plumose, pectinate, or serrate structures. (Syn.: acinaciform outgrowths, Becker 1938, 752.) See appendix.

MANDIBULAR RAKE BLADE (MRB). -- In most culicid larvae, one of the flattened, elongate anterior setal elements of the mandibular rake. Usually one to three in number (mandibular rake blades 1, 2, and 3), they are extremely variable in size and form; often bearing spines or pectinations. (Syn.: sabre-shaped spines on the mandibles, Puri 1931, 24; toothed rods, Schremmer 1949, 194; transparent arms, Foote 1952, 450; serrated group of dentes, Shalaby 1956, 148; serrated teeth, Clements 1963, 35.) See appendix.

MANDIBULAR RAKE BLADE 1 (MRB_1). -- In most culicid larvae, the most anterior and largest of the mandibular rake setal elements; 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; ventral falciform hair of the mandible, Chaudonneret 1962, 475; ventral blade 1, Gardner *et al.* 1973,165.)

MANDIBULAR RAKE BLADE 2 (MRB_2). -- In many culicid larvae, a reduced blade-like setal element located immediately posterior to mandibular rake blade 1. (Syn.: medial tooth, Shalaby 1956, 150; ventral blade 2, Gardner *et al.* 1973, 165.)

MANDIBULAR RAKE BLADE 3 (MRB_3). -- In many culicid larvae, 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 SETA (MRS). -- In most larval culicids, one of the posterior setal elements of the mandibular rake; varying in size and form, they may be plumose, pectinate, serrate, branched, or hairlike. (Syn.: pectinate hairs, Shalaby 1957a, 153; plumose hairs, Shalaby 1957b, 277; pectinate brushes, Pao and Knight 1970, 124; pectinate brush, Knight 1971, 196.) See appendix.

mandibular ring. -- See MANDIBULAR PIT ORGAN.

MANDIBULAR SPINOSE AREA (MSA). -- In culicid larvae, a grouping of cuticular structures having the form of spicules, small spines, hairs, and/or nodules located laterodorsally on the mandible; sometimes extending onto the ventral surface. The area commonly bears a row of uninnervated setae, termed the mandibular spinose area brush, in anophelines. (Syn.: group C hairs, Mitchell 1906, 14; minute sensory hairs, Puri 1931, 24; dorsal bristles, Becker 1938, 753; microspines, Shalaby 1957a, 155; spinose area, Knight 1971, 190.)

MANDIBULAR SPINOSE AREA BRUSH (MSAB). -- In anopheline larvae, a linearly-arranged group of branched setae occurring dorsally within the mandibular spinose area. (Syn.: patch of long usually branched setae, Puri 1931, 27.) See appendix.

mandibular spur 1. -- See SELLAR SETA 1.

mandibular spur 2. -- See ACCESSORY SELLAR SETA and MANDIBULAR PILOSE AREA.

mandibular spur 3. -- See SELLAR SETA 2 and SELLAR SETA 3.

mandibular spur 4. -- See SELLAR SETA 4.

mandibular spurs. -- See SELLAR SETA.

MANDIBULAR SWEEPER (MnS). -- In culicid larvae, a linear group of long flexible, uninnervated setae arising along the dorsal basal margin of the mandible. When the setae are divided into two groups, the more lateral group is termed mandibular sweeper 1 and the mesal group mandibular sweeper 2. In many species, mandibular sweeper 2 is borne within the arcuate thickening. (Syn.: bunch of hairs which line the mouth, Nuttall and Shipley 1901, 55; hairs projecting inward to mouth, Nuttall and Shipley 1901, 74; bunch of long stout setae, Puri 1931, 27; spines of the maxilla, Becker 1938,750 cramming comb, Schremmer 1949, 194; long bristlelike comb, Schremmer 1949, 194; setae extending mesad, Shalaby, 1956, 150; gorging hairs of the mandible, Chaudonneret 1962, 479; mandibular brush, Clements 1963, 34; long spines, Pucat 1965, 55; mandibular hairs, Pao and Knight 1970, 126.) See appendix.

MANDIBULAR SWEEPER 1 (MnS_1). -- In larval culicids, a group of long flexible setae situated on the dorsal basal margin of the mandible and arising along the U-shaped rod; located lateral to mandibular sweeper 2 when sweeper 2 is present. (Syn.: group A hairs, Mitchell 1906, 14; MdH_1 group, Knight 1971, 204; lateral subgroup of mandibular hairs, Pao and Knight 1970, 128.)

MANDIBULAR SWEEPER 2 (MnS_2). -- In many culicid larvae, a linear group of long flexible setae 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; MdH_2 group, Knight 1971, 204; mesal subgroup of mandibular hairs, Pao and Knight 1970, 128.)

MANDIBULAR SWEEPER SETA (MnSS). -- In culicid larvae, any setal element of the mandibular sweeper; often a finely branched or barbed structure.

MANDIBULAR TEETH (MnT). -- In culicid larvae (Marshall 1938, 44), a cluster of heavily sclerotized projections occurring on the mesodistal margin of the mandible; including dorsal teeth, ventral teeth, accessory teeth, and an auxiliary ventral tooth. The auxiliary ventral tooth and accessory teeth are often absent. (Syn.: teeth, Meinert 1886, 377; chewing teeth, Nuttall and Shipley 1901, 55; biting part, Mitchell 1906, 12; chitinized teeth, Wesché 1910, 12; projecting irregular teeth, Howard *et al.* 1912, 86; composite teeth, Salem 1931, 402; the Terminal teeth, Puri 1931, 25; teeth of the mandible, Crawford 1933, 27; radula, Becker 1938, 751; cutting organ of mandible, LaCasse and Yamaguti 1948, 8; mandibular cutting organ, LaCasse and Yamaguti 1948, 18; chewing segment, Schremmer 1949, in part, 192; dentes-bearing area, Shalaby 1956, in part, 148; mandibular molar area, Menees 1958, 35; toothed process, Snodgrass 1959, 16; molar process, Surtees 1959, 10.) The "cutting organ" of LaCasse and Yamaguti (1949) and later authors included the dorsal teeth, ventral teeth, dorsal mandibular spine, mandibular rake, and the basal band. See appendix.

mandibular ventral artis. -- See POSTARTIS.

mandibulary fan. -- See MANDIBULAR BRUSH.

marginal comb. -- See MANDIBULAR COMB.

maxilla. -- See MANDIBLE.

MdH_1 group. -- See MANDIBULAR SWEEPER 1.

MdH_2 group. -- See MANDIBULAR SWEEPER 2.

medial tooth. -- See MANDIBULAR RAKE BLADE 2.

membranous process. -- See MANDIBULAR LOBE.

mesal dorsal cluster of hairs. -- See MANDIBULAR LOBE SETAE 3.

mesal dorsal dentes. -- See ANTERIOR DORSAL TOOTH.

mesal dorsal spine. -- See VENTRAL TOOTH-4.

mesal group of hairs. -- See MANDIBULAR LOBE SETAE 1.

mesal pecten. -- See ACCESSORY TEETH.

mesal subgroup of mandibular hairs. -- See MANDIBULAR SWEEPER 2.

mesal tooth. -- See MANDIBULAR RAKE BLADE 3.

microspines. -- See MANDIBULAR SPINOSE AREA.

minute sensory hairs. -- See MANDIBULAR SPINOSE AREA.

molar lobe. -- See MANDIBULAR LOBE.

molar part. -- See ACCESSORY TEETH.

molar process. -- See MANDIBULAR TEETH.

molar process of mandible. -- See MANDIBULAR LOBE.

molar region. -- See ACCESSORY TEETH.

movable dentated tooth. -- See MANDIBULAR RAKE BLADE 1.

movable spines. -- See SELLAR SETA and MANDIBULAR RAKE BLADE 1.

MP_1 group of hairs. -- See MANDIBULAR LOBE SETAE 1.

MP_2 group of hairs. -- See MANDIBULAR LOBE SETAE 2.

MP_3 group of hairs. -- See MANDIBULAR LOBE SETAE 3.

MP_4 group of hairs. -- See MANDIBULAR LOBE SETAE 4.

MP_5 group of hairs. -- See MANDIBULAR LOBE SETAE 5.

outer mandibular articulation. -- See POSTERIOR MANDIBULAR ARTICULATION.

patch of long usually branched setae. -- See MANDIBULAR SPINOSE AREA BRUSH.

pectinate brush. -- See MANDIBULAR RAKE SETA.

pectinate brushes. -- See MANDIBULAR RAKE SETA.

pectinate hairs. -- See MANDIBULAR RAKE SETA.

pectinate spines. -- See SELLAR SETA.

piliferous process. -- See MANDIBULAR LOBE.

piliferous process hairs 1. -- See MANDIBULAR LOBE SETAE 1.

piliferous process hairs 2. -- See MANDIBULAR LOBE SETAE 2.

piliferous process hairs 3. -- See MANDIBULAR LOBE SETAE 3.

piliferous process hairs 4. -- See MANDIBULAR LOBE SETAE 4.

piliferous process hairs 5. -- See MANDIBULAR LOBE SETAE 5.

piliferous process spines. -- See MANDIBULAR LOBE SPINE.

pivot. -- See POSTARTIS.

plumose hairs. -- See MANDIBULAR RAKE SETA.

POSTARTIS (Poa). -- In most insects, the part of the mandible articulating with the postcoila (a cranial structure); often forming a condyle. In culicid larvae (Shalaby 1956, 150), 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.: pivot, Raschke 1887, 9; chitinous apodeme, Salem 1931, 402; chitinous process, Puri 1931, 27; ventral mandibular process, Crawford 1933, 27; mandibular arm, Farnsworth 1947, 142; articulatory process, Schremmer 1949, 190; posterior basal articular point, Snodgrass 1959, 16; mandibular ventral artis, Pao and Knight 1970, 126.) See appendix.

POSTCOILA (Pot). -- See Part IX (Laffoon and Knight 1973, 52).

posterior basal articular point. -- See POSTARTIS.

POSTERIOR DORSAL TOOTH (PDT). -- In most culicid larvae (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). -- See Part IX (Laffoon and Knight 1973, 52). (Syn.: in addition to those listed in Part IX; ventral mandibular joint, Crawford 1933, 27; outer mandibular articulation, Schremmer 1949, 190; ventral mandibular articulation, Schremmer 1949, 190.)

PREARTIS (Pra). -- In most insects, the part of the mandible articulating with the precoila (a cranial structure); often forming a condyle. In culicid larvae (Shalaby 1956, 150), a small posterodorsal process borne at the lateral third of the U-shaped rod of the mandible. (Syn.: anterior articulation of the mandibel, Chaudonneret 1962, 447; mandibular dorsal artis, Pao and Knight 1970, 126.) See appendix.

PRECOILA (Pc). -- See Part IX (Laffoon and Knight 1973, 54).

principal tooth. -- See VENTRAL TOOTH 0.

projection below last tooth. -- See MANDIBULAR LOBE.

projecting irregular teeth. -- See MANDIBULAR TEETH.

radula. -- See MANDIBULAR TEETH.

ring-based seta (0-MP). -- See SETA 0-MP.

row of long, curved, finely branched hairs. -- See MANDIBULAR BRUSH.

row of stout bristles. -- See MANDIBULAR BRUSH.

sabre-shaped spines on the mandibles. -- See MANDIBULAR RAKE BLADE.

sclerotized socket. -- See SELLA.

second denticle. -- See VENTRAL TOOTH 2.

SELLA (Se). -- In culicid larvae (Gardner *et al.* 1973, 164), a saddle-shaped indentation (? alveolus) in the laterodistal margin of the mandible; bearing the sellar setae. (Syn.: sclerotized socket, Shalaby 1956, 152.) See Appendix.

sellar hairs 1. -- See ACCESSORY SELLAR SETA.

sellar hairs 2. -- See appendix.

SELLAR SETA (SeS). -- In culicid larvae (Gardner *et al.* 1973, 164), one of four innervated and prominent setae borne by the sella of the mandible. Proceeding anteroposteriorly they are designated as sellar seta 1, 2, 3, and 4; one or more may be absent in varying combinations. (Syn.: cycle-shaped hairs, Nuttall and Shipley 1901, 55; simple articulate spines, Mitchell 1906, 13; dorsal spines, Smith 1908, 24; stiff bristles, Wesché 1910, 12; long spines, Howard *et al.* 1912, 86; movable spines, Wesenberg-Lund 1921, 18; upper bristles, Salem 1931, 402; group of sickle-shaped hairs, Puri 1931, 24; falciform outgrowths, Becker 1938, 752; pectinate spines, LaCasse and Yamaguti 1948, 13; corner spines, LaCasse and Yamaguti 1948, 18; sickle setae, Schremmer 1949, 194; curved spines, Foote 1952, 449; dorsal falciform hair of the mandible, Chaudonneret 1962, 475; lateral bristles, Clements 1963, 34; mandibular bristles, Pucat 1965, 55; mandibular spurs, Pao and Knight 1970, 126.) See appendix.

SELLAR SETA 1 (SeS_1). -- In culicid larvae (Gardner *et al.* 1973, 164), the most dorsal seta borne by the sella of the mandible; usually the longest of the sellar setae. (Syn.: mandibular spur 1, Knight 1971, 190.)

SELLAR SETA 2 (SeS_2). -- In culicid larvae (Gardner *et al.* 1973, 164), a large seta borne by the sella of the mandible; located immediately adjacent to sellar seta 1. (Syn.: mandibular spur 3, Knight 1971, in part, 196.)

SELLAR SETA 3 (SeS_3). -- In culicid larvae (Gardner *et al.* 1973, 164), a large seta borne by the sella of the mandible; located immediately adjacent to sellar seta 4. (Syn.: mandibular spur 3, Knight 1971, in part, 196.)

SELLAR SETA 4 (SeS_4). -- In culicid larvae (Gardner *et al.* 1973, 164), the most ventral seta borne by the sella of the mandible; often reduced to a short, transparent, saw-shaped structure. (Syn.: mandibular spur 4, Knight 1971, 196.)

serrated group of dentes. -- See MANDIBULAR RAKE BLADE.

serrated processes. -- See MANDIBULAR COMB.

serrated teeth. -- See MANDIBULAR RAKE BLADE.

seta-bearing lobe. -- See MANDIBULAR LOBE.

seta-bearing tubercles. -- See MANDIBULAR COMB.

SETA O-MP (O-MP). -- See Part VIII (Knight and Laffoon 1971, 164). (Syn.: ring-based seta (O-MP), Knight 1971, 190.) See appendix.

setae extending mesad. -- See MANDIBULAR SWEEPER.

setal comb. -- See MANDIBULAR BRUSH.

sickle setae. -- See SELLAR SETA.

simple articulate spines. -- See SELLAR SETA.

small protuberance. -- See MANDIBULAR LOBE.

small teeth. -- See ACCESSORY TEETH.

spines of the maxilla. -- See MANDIBULAR SWEEPER.

spinose area. -- See MANDIBULAR SPINOSE AREA.

stiff bristles. -- See SELLAR SETA.

SUBDENTAL TUBERCLES (ST). -- In culicid larvae (Gardner *et al.* 1973, 165), one of the small tuberculiform or nodule-like projections sometimes occurring on the sides or at the bases of ventral teeth 1, 2, and 3. See appendix.

subterminal teeth. -- See ACCESSORY TEETH.

teeth. -- See MANDIBULAR TEETH.

teeth of the mandible. -- See MANDIBULAR TEETH.

tendon plate of the mandibular adductor. -- See U-SHAPED ROD.

the Terminal teeth. -- See MANDIBULAR TEETH.

thickened rim. -- See U-SHAPED ROD.

third denticle. -- See VENTRAL TOOTH 3.

toothed process. -- See MANDIBULAR TEETH.

toothed rods. -- See MANDIBULAR RAKE BLADE.

transparent arms. -- See MANDIBULAR RAKE BLADE.

tubercles carrying thorns. -- See MANDIBULAR COMB.

U-osselet. -- See U-SHAPED ROD.

upper bristles. -- See SELLAR SETA.

upper teeth. -- See VENTRAL TEETH.

U-SHAPED ROD (UR). -- In culicid larvae (Pao and Knight 1970, 126), the U-shaped apodematous ridge (thickened rim) of the posterior or attachment surface of the mandible; appearing as a rod-like structure in the light microscope with the base of the U being lateral and its arms extending mesally; the arms sometimes meet or are fused mesally to give the rod the appearance of being a narrow ellipse; the pre- and postartises are projections of this thickening. (Syn.: thickened rim, Puri 1931, 27; U-osselet, Crawford 1933, 27.) Schremmer (1949, 191) referred to the posteriorly protruding projection of the mesal end of the ventral arm of the U-shaped rod, which is extremely long in some anophelines, as the "tendon plate of the mandibular adductor."

velum. -- See appendix.

ventral blade. -- See MANDIBULAR RAKE BLADE 1.

ventral blade 1. -- See MANDIBULAR RAKE BLADE 1.

ventral blade 2. -- See MANDIBULAR RAKE BLADE 2.

ventral falciform hair of the mandible. -- See MANDIBULAR RAKE BLADE 1.

ventral fang of the radula. -- See VENTRAL TEETH.

ventral group of dentes. -- See VENTRAL TEETH.

ventral lobe of the mandible. -- See MANDIBULAR LOBE.

ventral mandibular articulation. -- See POSTERIOR MANDIBULAR ARTICULATION.

ventral mandibular joint. -- See POSTERIOR MANDIBULAR ARTICULATION.

ventral mandibular process. -- See POSTARTIS.

ventral saw. -- See VENTRAL TEETH.

ventral spine. -- See VENTRAL TOOTH-4.

VENTRAL TEETH (VT). -- In larval culicids (Foote 1952, 449), a complex of closely associated teeth situated along a row which is located ventrally on the mesodistal margin of the mandible; consisting of a principal tooth, ventral tooth 0, with three teeth (ventral teeth 1 to 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, Becker 1938, 751; ventral saw, LaCasse and Yamaguti 1948, 8; ventral group of dentes, Shalaby 1956, 148; ventral tooth, Pao and Knight 1970, 124.) Schremmer (1949, 192) used two terms, "chewing teeth" and "incisors," each of which collectively represented the ventral and dorsal mandibular teeth. The "incisor region" of Clements (1963, 35) also probably included both sets of teeth.

ventral tooth. -- See VENTRAL TEETH.

VENTRAL TOOTH 0 (VT_0). -- In culicid larvae (Gardner *et al.* 1973, 165), the principal tooth of the ventral teeth complex of the mandible; the largest and most prominent of the ventral teeth. (Syn.: main tooth, Pao and Knight 1970, 124; principal tooth, Knight 1971, 196.)

VENTRAL TOOTH 1 (VT_1). -- In culicid larvae (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; VT_1, Knight 1971, 196.)

VENTRAL TOOTH 2(VT_2). -- In culicid larvae (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; VT_2, Knight 1971, 196.)

VENTRAL TOOTH 3 (VT_3). -- In culicid larvae (Gardner *et al.* 1973, 165), the posteriormost tooth of the ventral teeth of the mandible; usually smaller than ventral tooth 2 and occasionally bearing subdental tubercles. (Syn.: third denticle, Pao and Knight 1970, 124; VT_3, Knight 1971, 196.)

VENTRAL TOOTH-1 (VT_{-1}). -- In some culicine larvae (Gardner *et al.* 1973, 165), a small projection immediately anterior to the base of ventral tooth 0 of the mandible.

VENTRAL TOOTH-2 (VT_{-2}). -- In some aedine larvae (Gardner *et al.* 1973, 165), a small curved projection at the base of ventral tooth-4 of the mandible.

VENTRAL TOOTH-3 (VT_{-3}). -- Known only in some larvae of the Atra section of the genus *Uranotaenia* (Gardner *et al.* 1973, 165), a small projection located between ventral tooth-2 and ventral tooth-4 of the mandible.

VENTRAL TOOTH-4 (VT_{-4}). -- In many culicid larvae (Gardner *et al.* 1973, 165), the most anterior of the ventral teeth of the mandible; characteristically spine-like 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 1971, 196.)

V-SHAPED RIDGE (VR). -- In many culicid larvae, a ridge of thickened cuticle extending anteriorly outward from the U-shaped rod near the postartis of the mandible; the mandibular abductor apodeme is attached under the ridge external to the U-shaped rod. (Syn.: V-shaped suture, Pao and Knight 1970, 126.)

V-shaped suture. -- See V-SHAPED RIDGE.

VT_1. -- See VENTRAL TOOTH 1.

VT_2. -- See VENTRAL TOOTH 2.

VT_3. -- See VENTRAL TOOTH 3.

VT_{-1}. -- See VENTRAL TOOTH-4.

Fig. 54. *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

ASeS -- accessory sellar setae

L -- labula

MAbA -- mandibular abductor apodeme

MAdA -- mandibular adductor apodeme

MLS_1 -- mandibular lobe setae 1

MLS_2 -- mandibular lobe setae 2

MLS_3 -- mandibular lobe setae 3

MLS_4 -- mandibular lobe setae 4

MLS_5 -- mandibular lobe setae 5

MnB -- mandibular brush

MnBS -- mandibular brush setae (showing villiform processes)

MnC -- mandibular comb (echinate tubercle type)

MnCE -- mandibular comb element

MnL -- mandibular lobe

MnPA -- mandibular pilose area

MnR -- mandibular rake

MnS_1 -- mandibular sweeper 1

MnS_2 -- mandibular sweeper 2

MnT -- mandibular teeth

MPgO -- mandibular peg organ

MPO -- mandibular pit organ

MRB_1 -- mandibular rake blade 1

MRS -- mandibular rake seta

MSA -- mandibular spinose area

Poa -- postartis

Pra -- preartis

Se -- sella

SeS_1 -- sellar seta 1

SeS_2 -- sellar seta 2

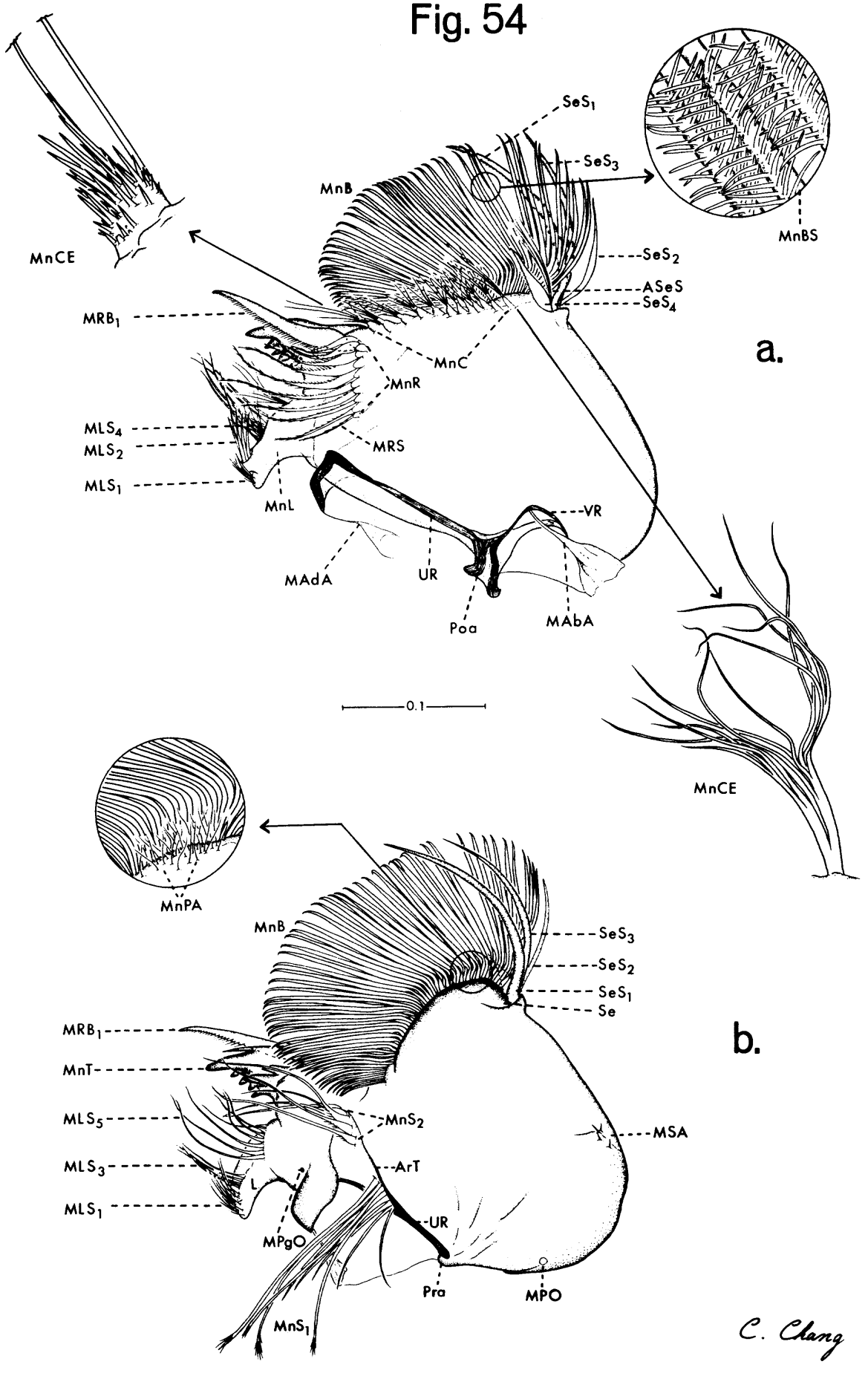
SeS_3 -- sellar seta 3

SeS_4 -- sellar seta 4

UR -- U-shaped rod

VR -- V-shaped ridge

Fig. 54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SeS1
SeS3
MnB
MnBS
SeS2
ASeS
SeS4
MRB1
MnC
MnR
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MRS
MLS1
MnL
VR
MAdA
UR
Poa
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a.
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MnCE
MnPA
MnB
SeS3
SeS2
SeS1
Se
MRB1
MnT
MLS5
MnS2
MSA
MLS3
ArT
MLS1
UR
MPgO
Pra
MPO
MnS1
b.
C. Chang

Fig. 55. *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

MLS_2 -- mandibular lobe setae 2

MnB -- mandibular brush

MnCE -- mandibular comb element

MnL -- mandibular lobe

MnPA -- mandibular pilose area

MnS -- mandibular sweeper

O-MP -- seta O-MP

MPO -- mandibular pit organ

MRB_1 -- mandibular rake blade 1

MRB_2 -- mandibular rake blade 2

MRB_3 -- mandibular rake blade 3

MRS -- mandibular rake seta

MSA -- mandibular spinose area

MSAB -- mandibular spinose area brush

Poa -- postartis

Pra -- preartis

Se -- sella

SeS_1 -- sellar seta 1

SeS_2 -- sellar seta 2

SeS_3 -- sellar seta 3

SeS_4 -- sellar seta 4

UR -- U-shaped rod

VT -- ventral teeth

VT_{-4} -- ventral tooth-4

Fig. 55

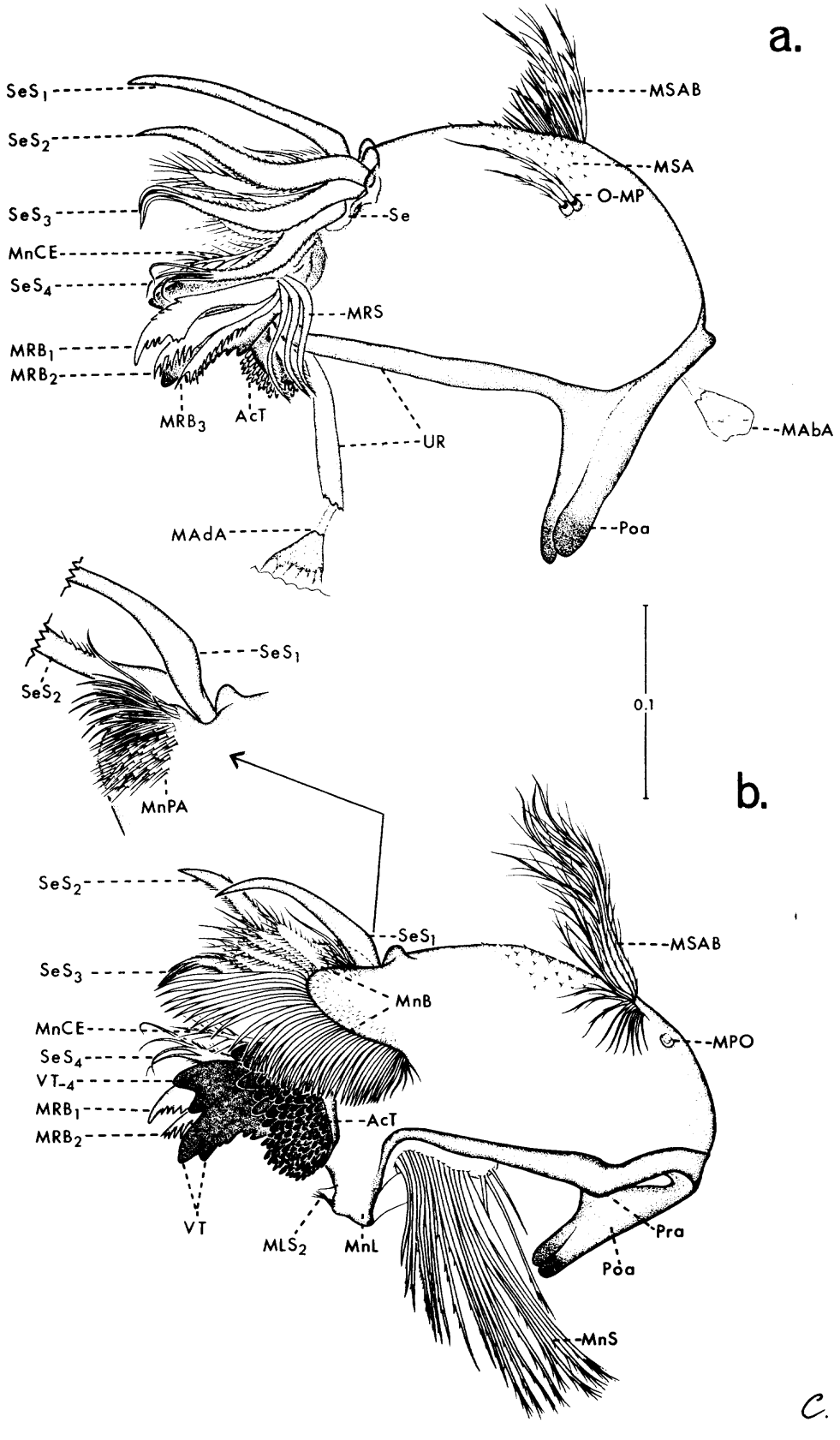

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Fig. 56. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Mandible of fourth stage larva.

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

MnBS -- mandibular brush seta (showing serrations)

MnL -- mandibular lobe

MnS -- mandibular sweeper

MPO -- mandibular pit organ

MSA -- mandibular spinose area (small spicules are seen in SEM)

Poa -- postartis

Pra -- preartis

SeS -- sellar setae (homologies uncertain)

UR -- U-shaped rod

VT -- ventral teeth

Fig. 56

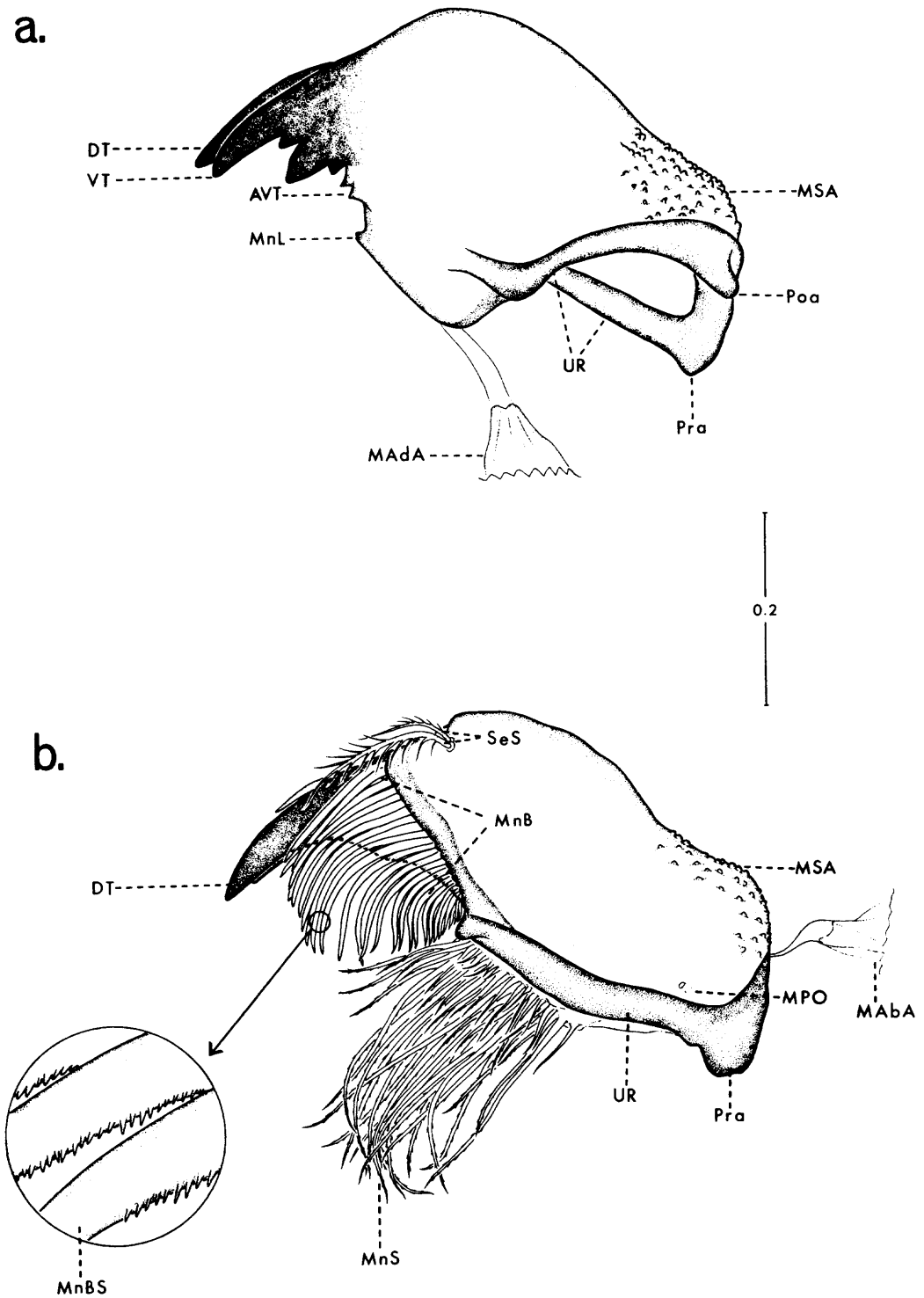

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Fig. 57. *Culex (Culex) pipiens quinquefasciatus* Say. Mandibular teeth of fourth stage larva.

a. Ventral aspect

b. Dorsal aspect.

Fig. 58. *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann). Mandibular teeth of fourth stage larva.

a. Ventral aspect.

b. Dorsal aspect.

Fig. 59. *Toxorhynchites (Toxorhynchites) brevipalpis* Theobald. Anteroventral aspect of the mandibular teeth of fourth stage larva.

Fig. 60 *Anopheles (Anopheles) crucians* Wiedemann. Mandibular teeth of fourth stage larva.

a. Ventral aspect.

b. Dorsal aspect.

ABBREVIATIONS

AcT -- accessory teeth

ADT -- anterior dorsal tooth

AVT -- auxiliary ventral tooth

BB -- basal band (mandibular rake omitted)

DMS -- dorsal mandibular seta

DMSp -- dorsal mandibular spine

DT -- dorsal tooth

PDT -- posterior dorsal tooth

ST -- subdental tubercles

VT_0 -- ventral tooth 0

VT_1 -- ventral tooth 1

VT_2 -- ventral tooth 2 (bicuspid in *A. crucians*)

VT_3 -- ventral tooth 3

VT_{-1} -- ventral tooth-1

VT_{-2} -- ventral tooth-2

VT_{-4} -- ventral tooth-4

Fig. 57

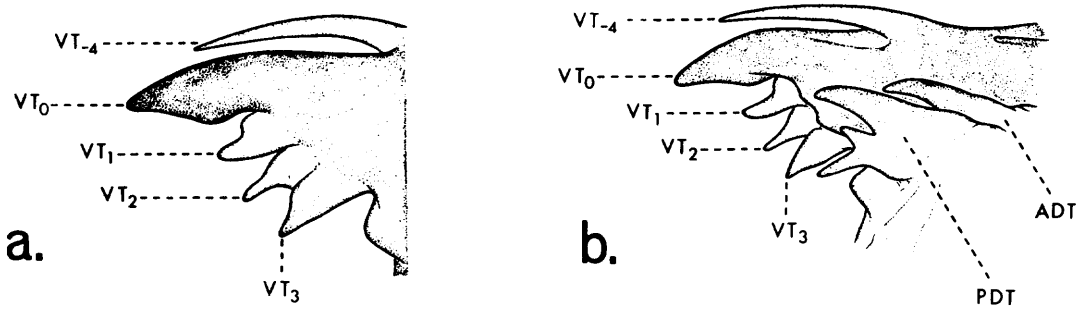


Fig. 58

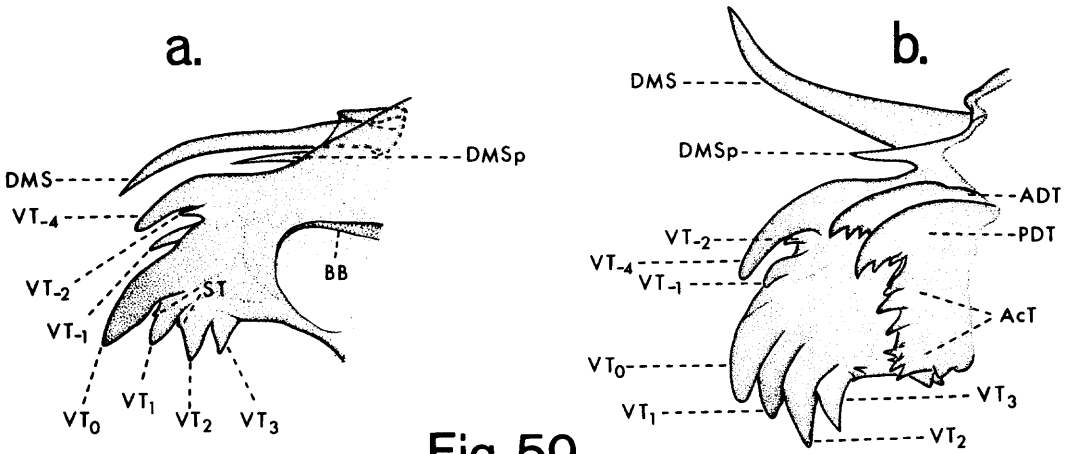


Fig. 59

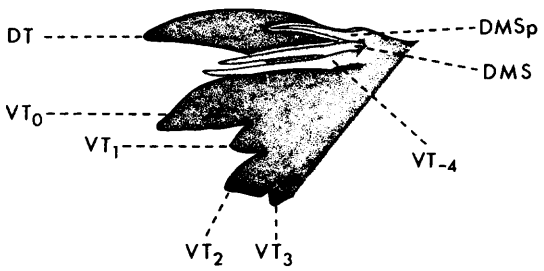
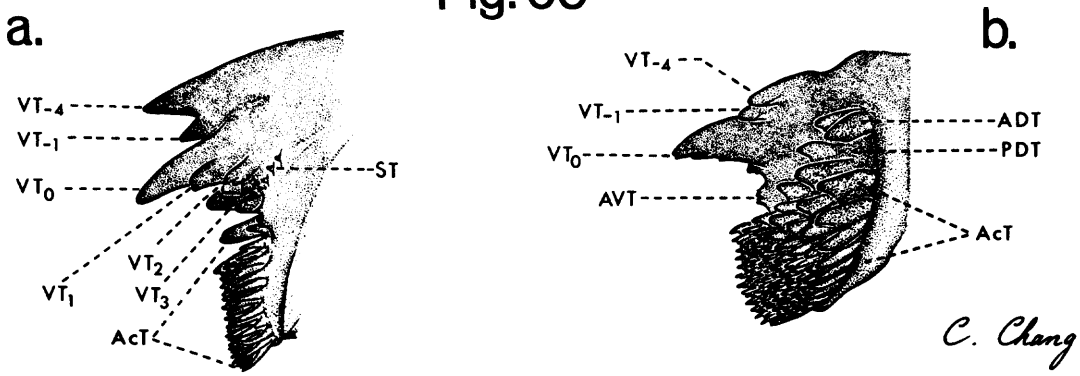


Fig. 60



APPENDIX

This part is appended for the purpose of explaining: 1) the introduction of new terms, 2) the recommendation of terms currently not widely accepted for use in the Culicidae, and 3) the derivation of terms where appropriate.

ACCESSORY SELLAR SETA. -- This term is proposed as a replacement for "sellar hairs" (Gardner *et al.* 1973, 164). We feel that the term "hair," although widely used by entomologists, is a misapplied and unsatisfactory synonym for "seta." A "seta" was defined by Snodgrass (1935, 69) as "a hairlike unicellular external process of the body wall or any derivative of the latter." MacGillivray (1923, 13) stated that "each of the hair-like appendages borne on the surface of the cuticle is known as a seta." Neither of these authors listed a definition for a "hair." In keeping with these definitions, we have used the term "seta" rather than "hair" for all of the external, apparently unicellular, hair-like projections of the mandible whether an alveolus is evident or not. Here, the term "accessory sellar setae" is adopted so that these structures are not confused with the more prominent "sellar setae."

ACCESSORY TEETH. -- Foote (1952, 449) introduced this term for a group of three or four spine-like processes located immediately posterior to the posterior dorsal tooth in *Culex* species of the subgenus *Melanoconion*. These appear to be homologous with the larger group of similar structures in anophelines.

ARCUATE THICKENING. -- This term replaces the "arcuate suture" of Knight (1971, 204). Scanning electron microscope investigations have shown that this structure, which appears to be suturelike in the light microscope, corresponds to a rim of thickened cuticle around the edge of the shallow depression which bears mandibular sweeper 2.

AUXILIARY VENTRAL TOOTH. -- Applied here to a previously undescribed small tooth-like projection located immediately posterior to the ventral teeth.

DORSAL MANDIBULAR SETA. -- Since this structure, previously termed "dorsal spine 1" (Gardner *et al.* 1973, 165), is clearly socketed and appears to be a unicellular process, it is referred to here as a "seta" (see above).

MANDIBULAR BRUSH. -- Apparently first used for culicid larvae by Shalaby (1956, 152) and currently accepted by culicidologists. We prefer this term to its many synonyms for a number of reasons, but primarily because it indicates the location of the structure. The term is somewhat objectionable to us because of the function it alludes to. While it correctly conveys the function of the structure in filter-feeding and browsing species (i.e., to clean or brush food particles from the lateral palatal brushes), it incorrectly implies the same function for the homologous structure in predaceous species. In predators the structure probably serves, along with the mandibular teeth, to hold the prey.

Since it seems impractical to assign a new term to this structure in predators, we endorse the use of the term for all culicid larvae. In simuliid larvae, the "first" and "second external brushes" of Chance (1970, 255) and the "line of simple bristles" of Davies (1965, 172) may be homologous with the mandibular brush.

MANDIBULAR COMB. -- This term was first introduced by Shalaby (1957a, 155). It is applied here to a row of setae or echinate tubercles known only in culicine larvae. Scanning electron microscope studies have shown that Knight (1971) incorrectly labelled the lateral plumose elements of the mandibular brush in his drawings of anopheline mandibles as the "mandibular comb." A branched seta closely associated with the lateral elements of the mandibular brush of some anophelines, however, is believed to be homologous with a single mandibular comb element.

We prefer this term to the rejected synonyms because it indicates the location and functional nature of the culicine structure. A similarly located (? homologous) structure, the "covering brush" (Chance 1970, 255), occurs on the mandibles of simuliid larvae.

MANDIBULAR LOBE. -- We introduce this new term in place of many unsatisfactory synonyms. Most of the rejected terms do not indicate the location of the structure. Those incorporating the word "process" imply that the structure is a prolongation of the surface rather than a rounded protuberance. A similarly located (? homologous) structure on the mandibles of a number of nematocerous larvae has been variously termed "hooked projection" (Anthon 1943, 61), "ventral or median teeth" (Keilin 1940, 62), and "marginal teeth" (Chance 1970, 255).

MANDIBULAR LOBE SETA. -- Formerly referred to as a "hair" (Knight 1971, 196; Gardner *et al.* 1973, 166), a term with which we take exception (see above). Each seta on the mandibular lobe appears to be a unicellular structure. Puri (1931, 27) first referred to these as "fine setae." Yin (1970) found no evidence that the setae are innervated.

MANDIBULAR PEG ORGAN. -- This term is proposed for a previously undescribed structure which has the appearance of a sensillum basiconicum. In *Culex pipiens quinquefasciatus* it is often absent; it varies slightly in position when present.

MANDIBULAR PILOSE AREA. -- We propose this new term for a previously undescribed grouping or covering of hair-like structures. The term clearly indicates the position and nature of this surface feature.

MANDIBULAR PIT ORGAN. -- Yin (1970) first referred to this structure as a "pit organ" and demonstrated that it is a sensory organ, perhaps a stress receptor. Our term indicates the location as well as the appearance of this sensillum.

MANDIBULAR RAKE. -- Schremmer (1949) showed that the anterior elements of this group of setae function to remove entangled food particles from the setal field on the inner surface of the maxilla in filter-feeding culicids. Since it is likely that the posterior elements have the same function, we have introduced

this new term to include all of the setae in this group. The term implies the function and location of the setae and distinguishes them from the mandibular comb and brush. Yin (1970) found no evidence that the setae are innervated. See MANDIBULAR RAKE BLADE which follows.

MANDIBULAR RAKE BLADE. -- Among other unsuitable synonyms, the most anterior of these flattened setae was first termed a "tooth," a "movable dentated tooth," by Wesenberg-Lund (1921, 18). Since these structure are movable, usually absent or weakly developed in predaceous species where they might be expected to be prominent structures if they functioned as "teeth," and function in cleaning the maxilla in filter-feeders (see above), we have rejected the synonyms which include the words "tooth," "teeth," or "dentes." Because these setae are blade-like, we have elected to call each of them a "blade," a word first adopted by LaCasse and Yamaguti (1948, 8), in order to distinguish them from the other mandibular rake setae. See MANDIBULAR RAKE SETA which follows.

MANDIBULAR RAKE SETA. -- Although each of the elements of the mandibular rake is a seta, we specifically apply this term to each of the posterior elements and the term "manidublar rake blade" to each of the dissimilar anterior elements (see above). The structures have been referred to as a "pectinate brush" (Knight 1971, 196) or "pectinate brushes" (Pao and Knight 1970, 124), but these terms seem inappropriate because the elements are often not pectinate and the whole group of rake elements functions as a "brush."

MANDIBULAR SPINOSE AREA BRUSH. -- Proposed as a replacement for the longer "patch of long usually branched setae" employed by Puri (1931, 27). The term describes the location and nature of the structure.

MANDIBULAR SWEEPER. -- We propose this new term because its many synonyms are objectionable to us. Many are erroneous because they include the words "hairs" or "spines." Others are misleading or confusing because they incorporate the words "comb" or "brush." Since this structure serves to sweep food into the pharynx of filter-feeders (Schremmer 1949), and is likely to have a similar function in browsers and predators, we feel that our new term merits standardization.

Three groups of setae referred to as "brushes" on the mandibles of simuliid larvae (Chance 1970, 255) may be homologous with the mandibular sweeper. Specifically, the "middle brush" may represent mandibular sweeper 2 and the "large" and "small basal brushes" may correspond to mandibular sweeper 1.

MANDIBULAR TEETH. -- We prefer Marshall's term to the rejected synonyms because it indicates the location of the structures. We have not, however, added the modifier "mandibular" to the names of the individual teeth. This would have increased the length of the names unnecessarily and made them cumbersome to use.

POSTARTIS. -- Yuasa (1920, 259) introduced this term in a study on orthopteroids; MacGillivray (1923, 89) applied it to several orders of insects; and Shalaby (1956, 150) first used it for culicid larvae. We endorse the term for standard use.

PREARTIS. -- Introduced by Yuasa (1920, 261) for orthopteroids and used by MacGillivray (1923, 89) for a number of insects from different orders, it was first employed by Shalaby (1956, 150) for larval culicids. We recommend it for standard use.

SELLA. -- This invented term, apparently derived from the word "sellate" meaning "saddle-shaped," (Torre-Bueno 1937, 262) was introduced for use in culicids by Gardner *et al.* (1973, 164). We accept it because we do not know of a more accurate or descriptive term that could be applied to the alveolus-like depression which bears a number of setae.

sellar hairs 2. -- Introduced by Gardner *et al.* (1973, 164) who applied it to a group of fine hair-like structures situated mesal to the accessory sellar setae in *Uranotaenia sapphirina*. Although we have not studied this species, our observations have shown that structures located mesal to the accessory sellar setae are actually situated outside of the sella. Clark Gardner (pers. corres.) now believes that these structures are part of the mandibular comb.

SELLAR SETA. -- Yin (1970) demonstrated that the dendrite of a single neuron inserts at the base of each sellar seta in several culicine species.

SETA 0-MP. -- This seta was defined in Part VIII by Knight and Laffoon (1971, 164). It belongs to a class of taxonomically important setae which are easily recognized by the presence of their well-defined alveoli. Pao and Knight (1970) and Knight (1971) employed the adjective "ring-based" in order to distinguish such setae from those which lack or have less apparent alveoli. We prefer to distinguish these setae by simply referring to each as a "SETA" and giving it a number followed by a hyphen and a capital letter or a Roman numeral indicating the body area on which it is located. Seta 0-MP is mouthpart (MP) seta number zero.

SUBDENTAL TUBERCLE. -- Gardner *et al.* (1973, 165) first applied this term to the small tuberculiform projections occurring on the posterior surface of ventral teeth 1 and 2 in *Aedes communis*. They named these structures according to the tooth on which they occurred, e.g., subdental tubercle 2 is located on ventral tooth 2. Scanning electron microscope studies have shown that similar projections are also common on the anterior, dorsal, and ventral surfaces of ventral teeth 1, 2, and 3 as well as at or near their bases. We prefer to call each of these structures a subdental tubercle. If it is important to refer to specific tubercles by name, we suggest that the name include the surface on which or near which the tubercle occurs, e. g., posterior subdental tubercle 2.

velum. -- Introduced by Gardner *et al.* (1973, 165) as a term for a translucent flattened lateral expansion of the basal part of a seta, especially on the ventral margin of the basal part of some mandibular comb setae. This structure will be defined and illustrated in a later part which will deal with the vestiture.

V-SHAPED RIDGE. -- This new term replaces the "V-shaped suture" of Pao and Knight (1970, 126). Since the structure is actually an extension of the basal apodematous ridge of the mandible rather than a true "suture," we feel that

our term more accurately describes the structure. It is to be noted that the mandacoria (MacGillivray 1923, 89) is attached to the anterior edge of the ridge; the mandibular adductor apodeme arises from its basal surface lateral to the U-shaped rod.

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