

MOSQUITO STUDIES (Diptera, Culicidae)

XX. THE TERRENS GROUP OF AEDES (FINLAYA)¹

by

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INTRODUCTION

The Terrens Group of the subgenus *Finlaya* of *Aedes* is Neotropical in distribution and forms the dominant group of *Finlaya* of the region. Twenty-eight species are recognized in the present revision, as opposed to only 2, *terrens* and *argyrothorax*, in the world catalog (Stone, Knight and Starcke, 1959). The adults can usually be recognized by the characteristic silver banding of the tarsi, tarsi I-II,III showing basal and apical silver bands and tarsi 2-II,III only a basal silver band. The pupae do not show distinctive group characters and the larvae are distinguished only by a combination of several characters which are given in the description of the group. All the species are forest dwellers and utilize container habitats for breeding, primarily treeholes.

The present revision is based on a study of 3561 specimens, 946 ♀, 772 ♂, 945 pupae, 1097 larvae, with 542 individual rearings (329 larval, 178 pupal, 35 incomplete). Most of this material was collected for the project "Mosquitoes of Middle America" (Belkin, Schick et al, 1965) utilizing the techniques outlined by Belkin, Hogue et al (1965) and is deposited in the Department of Zoology, University of California, Los Angeles (UCLA). The remaining material was obtained from the U.S. National Museum (USNM) where the types of all the new species will be deposited. The methods of presentation in the present paper (format, synonymies, descriptions, distributional data and illustrations) are generally similar to those used by Berlin (1969:4-5). Modal ranges, that is 75% of the values about the median, are given for the various mensurations in addition to the absolute ranges, the absolute range being indicated parenthetically following the modal value. An effort was made to cite the elevation of all localities in the distributional data. When not specifically given in the collection data the elevations were determined mainly from contour maps and are enclosed by brackets. Usually only the range between contour lines could be obtained; these elevations were rounded to the nearest 100 feet.

The mesonotum of both sexes, male genitalia and immature stages are routinely illustrated for each species. These structures and stages are also illustrated for different geographical populations of a few possibly polytypic species. The illustrations of the mesonota show the pattern and different intensities of silver scalation diagrammatically by the use of screens of 3 different low densities; dark scaled or bare areas are represented by a very dense screen. All illustrations are based upon specimens from the type locality or from as near the type locality as possible. The pupal and larval drawings show a modal condition determined respectively from at least 5 and 3 specimens usually of the same collection. The modal number of branches and usual length of those hairs treated in the descriptions were based upon all available specimens or upon a representative sample from each collection.

Measurements were made with the aid of American Optical net reticule 1409A ruled into squares of 0.5 mm and were usually determined from all available specimens. Only reared specimens were utilized in those cases in which there was an abundance of material in a particular collection or from a particular geographic area.

The terminology in general follows Belkin (1962) except that a few special terms are introduced for the pattern of adult ornamentation, some of the structural specializations of the male genitalia and several indices and ratios. These are explained in the section on Taxonomic Characters.

I am indebted to John N. Belkin for providing descriptive notes on the type specimens in the British Museum (Nat. Hist.) and the U.S. National Museum of the following species: *braziliensis*, *heteropus*, *homoeopus*, *insolitus*, *metoecopus*, *podo-*

graphicus, *terrens* and *thorntoni*, and also for advice. I thank Thomas J. Zavortink and O.G.W. Berlin for their assistance; William A. Powder and Sandra J. Heinemann for the preparations of the immature stages and male genitalia; Rainer Beck, Sharon Burmeister, Sally Dieckmann, Nobuko Kitamura, Margaret Kowalczyk and Nancy Martsch for the preliminary and/or final illustrations; Sheila Bernstein for some of the preliminary drafts of the manuscript and Caryle Abrams for other preliminary drafts and the final copy for reproduction. I also thank T.H.G. Aitken, Pedro Galindo, Charles L. Hogue, Vernon Lee and Charles Serie, who made possible through their cooperation many of the collections on which this study is based; and Alan Stone for making available the material in the U.S. National Museum.

KOMP COLLECTION

The Komp collection, part of which is housed at the USNM and part at UCLA, requires some explanation in regard to the numbering system. Most of the specimens were collected by Komp himself, primarily in the Canal Zone in the years 1943 and 1945, and the remaining specimens were collected by other workers in Central America and northern South America. Collection data (when known) accompany all the specimens, both pinned and on slides. The adults and skins of the reared pupae and larvae were assigned numbers and these numbers and the collection data were typed on 3x5 index cards (usually in duplicate). Komp used 2 different numbering systems, 1 for the rearings and 1 for the adult specimens, reared or not. Unfortunately Komp did not give cross references on the specimens so that the cards are necessary to locate associated stages. The numbers for the rearings of the year 1943 are in chronological order; these numbers are noted in 3 different ways, e.g. for rearing 92, No. 92, No. 3-92 or No. 43-92. A capital letter A, P or L follows some of the numbers and apparently refers to the specific stage. The few rearings for the year 1944 have a "44" prefix and all the 1945 rearings a "5" prefix (e.g. No. 5-163). Unlike the 1943 system the 1945 rearing numbers are not arranged in any particular order, although some of the earlier rearings tend to have lower numbers. Most of the rearing numbers represent single individual rearings but some represent 2 or 3. In the latter cases, all the skins are mounted on the same slide; sometimes 1 or more of the pupal skins are absent and sometimes more than 1 species is represented.

All the adults of the *Terrens* Group were given "serial" number 207 and there are 5 sets of these numbers, 207A,B,C,D and E. A complete set basically comprised 45 adult numbers, 207A-1, 207A-2...207A-45; 207B-1-45 and so on. Adult numbers 207A and B represent collections made in 1943 and earlier, and includes most of Komp's 1943 collections and his 3 1944 collections; 207C represents collections made by Komp in 1945; and 207D and E collections made at various times and includes some of his 1943 and many of his 1945 collections. Komp, when assigning the adult numbers, selected the adults either at random or in some order not obvious to me. The adult numbers represent either reared or wild caught adults; in the latter case several adults may be represented by a single number. Only the adult numbers are used in the present revision in the distributional lists.

Although Komp's rearing numbers usually represent only a portion of a given collection several series of rearings can be assigned to a particular collection by using Komp's data. These data are the date of the collection and the specific treehole from which the specimen was collected (e.g. "treehole No. 1 SM [Snyder Molino]

trail" or "small treehole opp. WMW [William M. Wheeler trail] 14"). Thus, in the distribution sections of *thorntoni*, *zavortinki*, *alboapicus* and *galindoi* a single collection may be represented by several apparently unrelated adult numbers.

TAXONOMIC HISTORY

Aedes terrens was described by Walker in 1856 as a *Culex* but the true identity of the species was not known until 1921. The second species, *oswaldi*, was described by Lutz in 1904 as a *Gualteria*. With the exception of Dyar and Knab (1906a:166), who placed *oswaldi* in *Haemagogus*, *Gualteria* was retained until Howard, Dyar and Knab (1917:815) transferred *oswaldi* to *Aedes*. Coquillett in 1906 described *insolitus* and *laternaria* in the genus *Verrallina* but these species were placed in *Aedes* in the same year by Dyar (1906:16). All the other species of the group were originally described in *Aedes*. Dyar (1917:79), on the basis of the male genitalia, placed all the species of the Terrens Group known at that time in the subgenus *Gualteria* of *Aedes* (together with *A. triseriatus* and *A. mediovittatus*). These were subsequently transferred to the subgenus *Finlaya* by the same author in his Mosquitoes of the Americas (Dyar, 1928). Edwards (1932) placed the Terrens Group species into *Finlaya* Group B (*terrens-gubernatoris-group: Gualteria*). Knight and Marks (1952) revised and expanded this scheme. Group B was referred to as TERRENS-group: GUALTERIA and was subdivided into several subgroups of which A and B comprise the Terrens Group of the present revision. Vargas (1950) resurrected the subgenus *Gualteria* for the Terrens Group and other species, both of the New and Old World, based upon differences between these species and *poicilius* (Theobald, 1903), which he considered as the type species of *Finlaya*. This change has been accepted by a few South American workers but *Finlaya* remains the generally accepted subgeneric name for the group.

The taxonomy of the species, based principally upon the adults, has been in a state of confusion since the first general review in 1917 by Howard, Dyar and Knab. Five nominal species were known at that time: *oswaldi* Lutz, 1904; *insolitus* (Coquillett, 1906); *podographicus* Dyar & Knab, 1906; *laternarius* (Coquillett, 1906); and *thorntoni* Dyar & Knab, 1907. Three valid species were recognized by Howard, Dyar and Knab and were characterized principally upon the basis of the presence or absence of transverse silvering on the mesonotal disc: (1) *thorntoni*, mesonotal disc transversely silvered in both sexes, (2) *oswaldi*, disc transversely silvered only in the male and (3) *podographicus*, disc not transversely silvered in either sex. The Coquillett species were incorrectly synonymized with *oswaldi* and this laid the foundation for much of the confusion in subsequent works. The *oswaldi* of Howard, Dyar and Knab was essentially based upon *insolitus* and true *oswaldi* would key to *podographicus* in their work. The mesonotal disc in *oswaldi* is actually not transversely silvered in either sex while the disc in *insolitus* (= *laternarius*) is transversely silvered only in the male.

Dyar in 1921 published a 3 page revision of the group, the only one ever devoted solely to the Terrens Group. The 1921 revision differed from the one of 1917 in 2 respects: (1) two species were added, *heteropus*, a new species, showing the mesonotal scalation of the *podographicus* type (and correctly distinguished from that species by the broader median dark band of tarsus 1-II), and *argyrothorax* Bonne-Wepster & Bonne, 1919, known only by the male, showing a transversely silvered

disc and a characteristic claspette filament; and (2) the name *terrens* was used for *oswaldi*. The true identity of *Aedes terreus* had been discovered by Bonne-Wepster and Bonne (1921:23) and these authors considered *terrens* related to but distinct from *oswaldi*. Dyar correctly synonymized the 2, and *insolitus* and *laternarius* thus also became synonyms of *terrens*.

Three more species were described between 1921 and 1928, the date of the next revision, *terrens homoeopus* Dyar, 1922; *terrens* var. *braziliensis* Gordon & Evans, 1922; and *metoecopus* Dyar, 1925. The first 2 species were considered as forms of the *terrens* of Dyar since the mesonotal disc of the male was transversely silvered and the claspette filament was not of the *argyrothorax* type. *Aedes homoeopus* was distinguished from *terrens* on the basis of valid characters of the male genitalia and *braziliensis* on the basis of various characters of apparently no taxonomic value, although this species is actually distinct. *Aedes metoecopus* showed the mesonotal ornamentation of the *podographicus* and *heteropus* type and was distinguished from these species on the basis of valid characters of the male genitalia.

Dyar (1928:223-226) showed less insight into the group than in his previous publications. Only 4 valid species were recognized: *argyrothorax*, *thorntoni*, *terrens*, and *podographicus*. These were characterized as in the 1917 and 1921 publications. *Aedes homoeopus* and *braziliensis* were added to the list of *terrens* synonyms and *heteropus* and *metoecopus* were synonymized with *podographicus*. The reasons for these incorrect synonymies were not discussed. As in the case of the 1917 revision, true *terrens* keys to *podographicus* and this explains its identification as *podographicus* by Costa Lima (1930:257) and Lane (1936a:11; 1936b:131).

The treatment of the species by Edwards (1932) in the Genera Insectorum served only to confuse the picture further. Three valid species were recognized, *argyrothorax*, *thorntoni* and *terrens*. *Aedes terreus* comprised 3 varieties, *terrens*, *metoecopus* and *podographicus*; the variety *terrens* included *oswaldi* and *braziliensis*, and the variety *podographicus* included *insolitus*, *laternarius*, *heteropus* and *homoeopus*. I can see no justification in the changes made by Edwards and no justification was given. The variety *podographicus* in the sense of Edwards is quite heterogeneous compared to the other taxa recognized by him.

Lane (1939:105) and Kumm, Komp and Ruiz (1940:416) took the ultimate step in the trend of synonymizing valid species and lumped all the species, except *argyrothorax*, under *terrens*. The latter authors stated "we agree with Shannon and Edwards that *thorntoni*, *podographicus* and *terrens* [the latter 2 species apparently in the broad sense of Dyar (1928)] are but one polymorphic species, which shows variation in numbers of larval head-hairs and in mesonotal scaling, but no correlation between these larval characters and the adults." I cannot find such a statement by either Shannon or Edwards. The latter author may have altered his views subsequent to his 1932 treatise. The assertion that there is no correlation between the larval head hairs and the adult mesonotal scaling is incorrect, as shown in the present revision, although the mesonotal scaling is subject to a certain amount of variation in some species. Later Komp in unpublished notes, some of which at least were made in the year 1951 and which were based mainly upon his collections in the Panama Canal Zone in 1943-1945, identified specimens as *thorntoni* and *podographicus* and also recognized 3 new species, *alboapicus* MS (this name used in the present paper in the same sense), sp. A (= *galindoi* Schick) and sp. B (= *zavortinki* Schick).

Lane (1951:335; 1953:686-690), apparently after studying the type of *homoeopus* and perhaps 1 of the original males of *argyrothorax* at the USNM, took the very dubious step of synonymizing these 2 species. This resulted in the scheme gen-

erally accepted at the present: *argyrothorax* regarded as distinct, based upon its unique male genitalia and having 1 synonym, *homoeopus*, and all the other nominal species lumped under *terrens*.

Knight and Marks (1952) followed the interpretation of species of Edwards (1932) and did not make note of the changes proposed subsequent to that work. Forattini (1965) followed the Lane classification (1953) but suggested that some of the geographic forms might represent full species. Finally, Belkin (1968:4) resurrected *braziliensis* from synonymy.

TAXONOMIC CHARACTERS

The characters used in this revision are discussed here. Unless otherwise indicated, they do not show significant sexual dimorphism. They are arranged in the sequence followed in the descriptions.

ADULTS

VERTEX. The decumbent scales of the vertex are usually silver or iridescent purple (referred to here as "dark"), rarely pale white, and usually narrow curved or broad (flat), less frequently narrow spatulate. The broad scales are arranged in an imbricate pattern and are appressed against the integument; the narrow curved scales do not overlap, the underlying integument consequently visible between the scales, and are not appressed against the integument. The narrow spatulate scales are usually found in the median longitudinal line where they form a bilateral row of anterolaterally directed scales overlapping along their lateral margins.

A median longitudinal line of silver and usually narrow curved scales which differ in color and/or form from the more lateral scales is present in most species. The line may comprise a double or multiple row of scales. The scales laterad of the line in most species are dark in the female and silver in the male, but there is no dimorphism in the form of the scales; in a few species the more mesal scales are narrow curved and the more lateral scales broad.

OCCIPUT. The erect (forked) scales of the occiput may be pale, i.e. ivory colored to pale brown, or dark, i.e. dark brown to black. Usually all or most of the scales are pale in the female of most species but in some pale and dark scales may be present in about equal numbers. All or most of the scales are dark in only a few species. In *gabriel* the scalation varies from all pale through a mixture of pale and dark scales to all dark and in *buenaventura* and *aitkeni* the median scales are pale and the lateral scales are dark. The males of all the species except *buenaventura* and *metoecopus* have all scales pale. The scales of *buenaventura* are like those of the female described above and those of *metoecopus* are all dark.

PROBOSCIS. The length of the proboscis of the female is expressed relative to that of femur I. The proboscis was measured from the apex of the clypeus to the tip of the labellum and femur I from the basal articulation to the tip of the latero-apical scales at a magnification of 45 X. The 2 structures were treated as being subequal in length if they measured to within 0.04 mm of each other (i.e. to the nearest quarter square of the net reticule described in the Introduction). The proboscis showed 1 of 2 character states in most species, (1) shorter than or subequal in length to the femur, or (2) longer than the femur.

PALPUS. The female palpus was not studied carefully. It appears, however, from

the few slides made, that the relative and absolute lengths of the penultimate segment afford specific characters.

In the male palpus, the length is expressed as the difference in the number of labellum lengths by which the palpus terminates from the tip of the proboscis. Measurements were made primarily on those specimens in which the palpus was in the normal position, that is with its main axis diverging only slightly from that of the proboscis (fig. 8). The measurements were accurate to 0.5 labellum length. There was only a 1 labellum length variation in most species. The greatest variation, 3 labellum lengths, occurred in *argyrothorax*, a species in which the palpus is unusually short.

The ventrolateral apex of segment 3 of the male palpus is provided with hairs which vary in length and number. In some species only 1-3 hairs may be present (typical *thorntoni*, fig. 9) and in others several, these forming a more or less well-developed tuft (*terrens*, fig. 8). In those species with a tuft, the actual number of hairs present may be of taxonomic value but this was not determined. The length of the individual hairs or, when developed, of the tuft as a whole, may be divided into 2 taxonomic states, (1) shorter than or (2) at least as long as segments 4 and 5 combined. Segment 4 is provided with a ventrolateral and a mesal row of hairs but only the ventrolateral row is routinely treated in the descriptions since the development of the 2 rows is correlated. The ventrolateral row is described simply as comprising short or long, closely spaced or sparse hairs (see fig. 9, in which the hairs are short and sparse, and fig. 29, in which the hairs are long and closely spaced). The development of the hairs on segment 4 is more or less correlated with the development of those of segment 3.

MESONOTAL DISC. The mesonotal disc, which comprises the acrostichal and dorsocentral areas, is provided with narrow curved scales that are either dark brown with a coppery luster (referred to here as "dark") or silver. When silver scales are present they form more or less distinct markings that are not as intensely silvered as that of the fossal macula (see below). Four types of markings are of taxonomic value, a transverse marking, an anterolateral strip, an acrostichal line, and a posterior dorsocentral line.

A transverse marking is present in many species but is usually developed only in the male and in most of the species as an anterior band (fig. 17). The width of the anterior band is expressed in terms of the level of the fossa (to the nearest quarter or third) to which it is developed caudad along the dorsal midline. The band shows intraspecific variation in width. The greatest variation occurred in male *alboapiculus*, the band varying from 0.25 to 0.75 the length of the fossa, and in female *thorntoni*, being absent or present and varying from 0.33 to 0.75. The transverse silvering of male *insolitus*, *homoeopus* and *impostor* usually extends into the posterior half of the disc (figs. 29,31,33); the extent of this silvering along the longitudinal axis may be subject to great variation (see *homoeopus*).

An anterolateral strip of scales bordering the fossa is developed only in those species or individuals in which the fossal macula is coextensive with the fossa (see below) (fig. 9). The strip superficially appears to be the mesal portion of the macula but its scales lie on the dorsocentral area and are usually narrower than those of the macula and are not imbricate. The extent to which the strip is developed, or even its presence or absence, is subject to variation in some species while in others it is sometimes ill defined, being only represented by some scattered silver scales. The strip, as a character, usually only complements that of the development of the fossal macula, but shows a characteristic form in the male of *sumidero* (fig. 41).

An acrostichal line occurs in many species but may be present only in the male

of some. The line may be (1) complete, extending from the anterior promontory caudad to the prescutellar space (fig. 35), (2) incomplete, developed only at 1 end or broken up into more than 1 segment by large areas of dark scales (fig. 29), or (3) absent. In some species the complete line is further characterized as being weak when it is interrupted by a few dark scales.

A complete posterior dorsocentral line extends from the posterior tip of the fossal macula caudad to the posterior margin of the mesonotum (fig. 41) and may be weakly developed as in the case of the complete acrostichal line. The line is incomplete in many species, being developed only at the level of the prescutellar space (fig. 11).

ACROSTICHAL SETAE. These are the setae of the acrostichal line that occur caudad of those of the anterior promontory. The species generally fall into 3 classes in respect to the acrostichal setae, (1) setae absent, (2) seta(e) present, the most posterior occurring at about 0.25 to 0.5 from the anterior end of the acrostichal line or (3) setae present, the most posterior occurring at about 0.5 or in the posterior half of the line. In some of the species of the first class, 1 or more setae are occasionally present but these usually occur within the anterior half of the line, rarely as far caudad as 0.5. In some of the species of the second and third classes there is some variation in regard to the placement of the most posterior seta, whether it be in the anterior or posterior half of the line.

FOSSAL MACULA. The more or less well-defined anterolateral depression of the mesonotum is treated as the fossa in this paper (fig. 25). The depression is usually at least partially clothed with silver scales that are usually broad curved, imbricate and appressed against the integument. These scales form the fossal macula. The macula is coextensive with the fossa in many species, usually only in the male (fig. 17). When coextensive, the mesal margin of the macula is convex since the mesal margin of the fossa is also convex. In the remaining species the macula is variously reduced, usually only on the mesal margin which may be convex (fig. 25), essentially straight (fig. 52) or concave (fig. 37). The macula is greatly reduced in the females of a few species and may be represented by a sublateral stripe (fig. 7) or a diffusely silver scaled area or it may be complete suppressed (some *insolitus*).

The fossal depression is not distinct in some specimens. Whether or not the macula is coextensive with the fossa in these cases can usually be determined by the curvature of its mesal margin.

SUPRAALAR MACULA. The supraalar area is provided with a patch of appressed, broad curved silver scales which form the supraalar macula. The macula, when fully developed, is broadly joined to the fossal macula and caudally extends to the most posterior seta. In the female of many species the macula is reduced anteriorly so that it is disjunct from the fossal macula (fig. 52). In some of the species the macula may be reduced only anteromesally so that it is narrowly joined to the fossal macula (fig. 31). The posterior margin of the macula is characteristically truncate in a few species (fig. 9). The supraalar macula of all the males of the Terrens Group is broadly joined to the fossal macula.

PRESCUTELLAR SPACE. The females fall into 3 classes based upon the color of the prescutellar scales, (1) at least some silver scales present, (2) silver scales present or absent, (3) silver scales absent. The males usually have silver prescutellar scales, but these may be lacking in some species (*galindoi*, *campana*). The number of silver scales tends to be greater in some species than in others but this was not carefully studied.

SCUTELLUM. The presence or absence of silver scales on the scutellum is gen-

erally correlated with the condition on the prescutellar space. The presence or absence of silver scales on the lateral lobe may show considerable intraspecific variation; consequently only the scalation of the midlobe is treated in the descriptions.

PLEURON. The presence or absence of a patch of scales on the subspiracular area (*ssp*) is the only generally useful pleural scale character. This character is variable only in *vargasi* and in *podographicus*. The following 3 scale characters are of more limited taxonomic value: (1) scales of posterior pronotum (*ppn*) dark in *aitkeni*, pale in other species; (2) scale patches of upper sternopleuron (*stp*) and mesepimeron (*mep*) contiguous in *buenaventura* (fig. 25), not contiguous in other species; (3) *mep* patch usually relatively small in species of the Thorntoni Subgroup, relatively large in *diazi* and often divided into dorsal and ventral patches in *terrens*.

Many of the pleural hairs show considerable intraspecific variation in the intensity of their pigmentation. Those of the prealar area (*pra*), however, were found to be relatively constant in pigmentation and are useful for species discrimination. These hairs are described as being pale or dark. When the hairs are dark, the intensity of their pigmentation is compared to that of the hairs of the propleuron (*ppl*) and sometimes of the upper mesepimeron (*mep*). Dark *pra* hairs are present in many species, usually in both the sexes, but in some of the species the *pra* hairs of the male may be pale. The pigmentation of the female *pra* hairs is variable apparently only in *galindoi*.

LEG I. Femur I, and also femur II, are usually provided with a more or less well-developed ventral silver line and a posterior patch of silver scales in the basal half but only the posterior patch is of significant taxonomic value. The patch is described here as being absent, weakly developed, small or well developed. A weakly developed patch is one that comprises scattered silver scales; a small patch is more or less uniformly silvered but covers much less than one quarter of the area on the posterior surface of the segment; a well-developed patch, the most common condition, is one that is more or less uniformly silvered and covers at least one quarter of the area. The patches on femur I and II may be subequal or dissimilar in size. In the latter case the patch on femur II is usually larger than that of femur I.

A silver knee spot is present in only *amabilis*, the apical row of scales being silvered.

The remaining silver markings, except probably for the exceptionally broad apical silver band on tarsus 1-I in *diazi* (fig. 58), are too variable for taxonomic use.

LEG II. The silver ventral line of femur II is of some taxonomic value but since its development is more or less correlated with that of the posterior silver patch it is not treated in the descriptions. The posterior patch is discussed under Leg I.

The knee spot shows the following character states: absent, narrow, moderately broad and broad, the latter being the usual state. These designations are explained in the descriptions. The only marked intraspecific variation in the knee spot noted in this study occurred in *campana*; the knee spot was absent in 3 of the 4 specimens but was narrowly developed in the fourth.

The species generally fall into 3 classes in the development of a median dark band on tarsus 1-II, (1) band incomplete, that is, not completely ringing the segment, or complete and narrow, less than 0.33, (2) band complete and moderately broad, about 0.33-0.5 or slightly greater, and (3) band complete and broad, about 0.6-0.75.

The markings of tarsus 2-II have limited taxonomic value. Most species show a complete and broad apical dark band. In a few species the dark band is incomplete, being longitudinally dissected by a streak of silver scales, or absent, the entire seg-

ment being silver. The latter 2 states are usually developed only in those species in which the median dark band of tarsus 1-II is incomplete or complete and narrow. In *diazi*, however, the median dark band of tarsus 1-II is broad but tarsus 2-II is entirely silvered.

Tarsi 3,4-II always lack silver scales and tarsus 5-II is silvered only in *alboapicus* and occasionally in *insolitus*.

LEG III. The widths of the bands on femur III and tarsus 1-III were measured at a magnification of 45 X, and are expressed as the percentage of the total length of the respective segments. Only the basal and subapical dark bands of femur III and the basal and apical silver bands of tarsus 1-III of the females were treated. The width of the bands in the males are similar to those of the females. The femur was measured along its anterior surface from the basal articulation to the tip of the lateral apical scales; the basal dark band from the basal articulation to the apical notch of the band; and the subapical dark band from the basal notch of the dorsal apex of the band (fig. 7). Tarsus 1-III was measured from the base of the scaled area of the segment (represented usually by the base of the basal silver band) to the tip of the apical silver scales; the basal silver band (actually an incomplete ring) at its greatest width; and the apical silver band from its base to the tip of the apical scales.

The relative widths of the bands show characteristic ranges for the different species but there is considerable overlap between many of them. The basal dark band of femur III may be incomplete (the apical notch completely transecting the band) or complete and as broad as 0.25 (nearly a quarter of the length of the segment); the subapical dark band of femur III ranged from 0.11 to 0.49. The basal silver band of tarsus 1-III may be absent or present and as broad as 0.20; the apical silver band ranged from 0.07 to 0.38.

The width of the basal silver band of tarsus 2-III was not studied carefully but, except for *diazi* in which it is unusually broad, the width appears to be correlated with that of the apical silver band of tarsus 1-III.

Tarsi 3,4-III usually lack silver marking but in some species 3-III rarely shows a narrow basal and apical band and 4-III a narrow basal band. Tarsus 5-III is silvered in *alboapicus* and *diazi* but is dark in all the other species.

WING. Patches or lines of silver scales may be developed at the base of veins C, R and Cu. The extent of these markings is subject to sexual dimorphism in most species, the scalation being more extensively developed in the males. The scales on vein C sometimes can be seen only from an anterior view.

Five character states may be recognized for the silver scalation of veins C and R: (1) absent, (2) forming a small patch or short line, (3) a line reaching about 0.5 to crossvein *h* (or to the level of *h* in the case of vein R), (4) a line reaching or nearly reaching *h* (or the level of *h*), and (5) a line (vein R only) extending well beyond the level of *h*. The extent of the scalation of vein C shows some variation in the females of several species; some of the more extreme examples are found in *metoecopus* and *zavortinki* in which the states range from 1 to 3 and 2 to 4 respectively. Variation in the males is less common, only 3 species showing occasional deviations from the usual condition.

The silver scalation of vein R is of little taxonomic value in the females, states 1 or 2 being developed in most of the species. In the males, some species show only state 1 while in others in which this is the usual state, state 2 may be developed. Those typified by states 3 or 4 may show state 2 but not 1. The Maracay population of the *podographicus* complex shows an extreme range of variation, from states 1 through 4.

Vein Cu is silvered only in the males of the *Homoeopus* Subgroup.

ABDOMEN. The silver scalation of the abdomen is apparently of little taxonomic value. The width of some of the posterior silver sternal bands may be of some use but this was not studied carefully.

MALE GENITALIA

SIDEPIECE. The length of the sidepiece is routinely given in the descriptions principally to indicate the overall size of the genitalia. The sidepiece was measured at a magnification of 100 X from the sternomesal base, at the point of the union with the lateral lobe of the prosophallus, to the apex. There is considerable overlap in the range of variation among many of the species but the modal value is somewhat useful for their characterization. The length varied from 0.25 to 0.46 mm.

A dense basal tergomesal tuft of long setae is present in several species (fig. 48) and is a constant feature in these forms.

The median sternomesal area shows 3 specialized structures of taxonomic value, a convexity, a sclerite and a tuft. The median sternomesal convexity is a broadened region of the sternal flap and may be absent or weakly developed (fig. 52), moderately developed (fig. 44) or strongly developed (fig. 31). This structure is of limited taxonomic value serving chiefly to characterize *homoeopus* in which it is usually strongly developed.

The median sternomesal sclerite is a rounded and dorsal extension of the sternal flap and when present is developed at the apex of the median sternomesal convexity. The sclerite may be absent, weakly developed (fig. 52) or well developed (fig. 31).

The median sternomesal tuft originates on the median sternomesal sclerite and comprises fine setae (fig. 31). The tuft is present in all the species with a well-developed median sternomesal sclerite and in some of the species with a weakly developed sclerite. The tuft of *galindoi* and *campana* differs from the other species in that the setae are more numerous, more closely spaced and wavy (figs. 44,46).

In addition to the above features of the sidepiece, a rather inconspicuous but distinctive subapical tergomesal tuft of very fine setae is present in *argyrothorax* (fig. 13).

PROSOPHALLUS. Belkin (1968:9) proposed the term prosophallus for the sternal structure between the base of the sidepieces of the male genitalia of the Dixinae. He suggested that the prosophallus was homologous with the claspette of the Culicinae. The prosophallus is interpreted here as comprising the interbasal fold and claspette in the sense of Freeborn (1924:205) and subsequent authors.

The measurements of the prosophallus were made at a magnification of 210 X as shown in figure 9. The length, primarily a measure of the length of the stem, varied from 0.07 to 0.15 mm. The intraspecific ranges of variation overlap considerably but the length is still of use in the characterization of some species. The width is used in this paper only to distinguish *zavortinki* from other species of the *Terrens* Subgroup.

The interbasal fold shows 3 basal lobes and a pair of distal lobes, the latter termed mesal lobes (fig. 9). The basal lobes are of taxonomic value for the characterization of *galindoi*. In this species the median lobe projects farther cephalad than the lateral lobes (fig. 44). The median lobe in the other species projects cephalad to about the same level as the lateral lobes (fig. 46). The mesal lobe varies among the species in the inclination of its distal margin. The lateral portion of the mesal lobe may be declivous mesad (fig. 31), not appreciably inclined from the horizontal (fig. 17) or de-

clivous laterad (fig. 13). The latter condition occurs only in *argyrothorax*. The angle of inclination from the horizontal was measured in those species in which the lobe is declivous mesad. Measurement was made with the aid of an ocular net reticule (see Introduction) at a magnification of 860 X and is given in units of 15° in the descriptions. The angle ranged from 0 to 45°; the usual intraspecific variation was less than 15° but in many species there are occasional specimens which increase the variation to 15° and rarely 30°.

The stem is of particular importance in the characterization of the Podographicus Subgroup in which it is characteristically bowed (fig. 52). This type of stem is occasionally developed unilaterally and rarely bilaterally in the other species. The stems, in those species in which the central axis is not appreciably curved, may be divergent (fig. 27), parallel (fig. 17) or convergent (fig. 13). Two or 3 of these states may be shown by 1 species but usually only 1 is typical of that species.

The filament in all the species, except *argyrothorax* (fig. 13), is in the form of a stout seta whose apical portion is curved to form a hook (fig. 8). The length of the filament was determined at a magnification of 210 X on whole mounts of the genitalia. It was divided by the length of the prosophallus to determine the filament ratio which is given to the nearest 0.05 in the descriptions. The ratios ranged from 0.30 to 1.35 and the usual intraspecific variation was 0.25. The hook may be strongly angulate (fig. 31), weakly angulate (fig. 27) or evenly curved (fig. 29), the latter 2 conditions referred to simply as not strongly angulate in the descriptions. In most species the hook is either strongly angulate or not strongly angulate. A strongly angulate hook is occasionally developed in some of the species in which the hook is usually not strongly angulate; it seems that at least in some of these cases the strong angularity is the result of distortion produced in the preparation of the slide. *Aedes homoeopus*, on the other hand, seems to show actual intraspecific variation, the usually strongly angulate hook being weakly angulate in a few specimens.

AEDEAGUS. The aedeagus is of little taxonomic value. It is relatively narrow in *buenaventura* (fig. 25) and the lateral sclerotized portion in *argyrothorax* is narrower than in the other species. The absolute length is of limited use. Measured at a magnification of 210 X, the length varied from 0.10 to 0.16 mm. The intraspecific variation was usually 0.02, rarely as great as 0.03 mm.

OTHER STRUCTURES. The other parts of the male genitalia are apparently of limited taxonomic value. In *argyrothorax* (see) tergite IX, the clasper and paraproct show unique features and in *gabriel* the spiniform of the clasper appears to be relatively longer than in the other species.

PUPAE

ORNAMENTATION. The mesonotum and sometimes the legs cases and the middle portion of the wing case are more heavily pigmented than the remainder of the cephalothorax. A pale inverted V-shaped marking is formed in those specimens in which all 3 of these structures are heavily pigmented. This marking extends from the base of the mouthparts case caudolaterad through the base of the wing case (indicated in part in fig. 9) and may be weakly differentiated in those specimens in which the wing case pigmentation is weakly developed or does not extend across the entire width of the case.

CHAETOTAXY. Only 2 hairs were found to be of general taxonomic value. Hair 1-I varied in the predominant number of secondary branches per primary branch

and ranged from predominantly single to multiple. The range of variation is restricted in most species but in others the primary branches range from predominantly single to predominantly multiple.

Hair 2-II shows taxonomic value in its position relative to 3-II along the transverse line. The position can vary significantly among the species but in regard to the usual position most species show 1 of the following character states, (1) 2-II always laterad of 3-II, (2) 2-II laterad of 3-II or mesad of 3-II for less than 0.3 the distance from 1-II to 3-II, or (3) 2-II mesad of 3-II for 0.3 or more. A fourth character state, mesad for more than 0.3 may apply to 1 or 2 species but only a few specimens of these species were available. The distance of 2-II mesad of 3-II was determined to the nearest tenth with the aid of the ocular reticule at powers ranging from 100 X to 210 X.

PADDLE. Three paddle characters are of general taxonomic value, the shape of the apex, the general pigmentation and the pigmentation of the ventral midrib. The apex may be weakly emarginate (fig. 39), evenly rounded (fig. 9), or weakly to strongly produced (fig. 40). In many of the species the apex is not at all produced or at most only weakly produced. In other species the apex is usually produced but the degree of the production is variable. The extremes are illustrated in the pupal drawings of some of the species.

In several species the paddle is clear, lacking all apparent pigmentation. In the other species the paddle is pigmented to various intensities and the amount of pigmentation shows considerable intraspecific variation; the paddle of some specimens is very weakly pigmented but this condition can usually be differentiated from that of the clear paddle by the slightly darker overlapping portions.

The ventral midrib is pigmented only in species with a generally pigmented paddle. In most of these species the midrib is weakly pigmented along most of its length and does not contrast strongly with the rest of the paddle; the other species show a moderately to strongly pigmented midrib which contrasts rather strongly with the rest of the paddle. The apical portion of the midrib is more weakly pigmented than the remainder in most species but in some of the species with a moderately or strongly pigmented midrib the pigmentation may be as intense (fig. 31) or even more intense (fig. 15) in the apical portion.

LARVAE

CHAETOTAXY. The following hair characters were found to be of greatest taxonomic value: the relative lengths of 7,11,14-C, 11-P, 8-T, 5-I and 5-VII; the number of branches of 5,6,14-C, *bmh*, 1-A, 14-P, 3,4-M, 3,10-III, 3-VI, 4,10,12-VII and 2-VIII; and the position of 2-II and 5-VII.

The length of hair 8-T is given in terms of the length of the metathoracic pleural tubercle. Measurements were made at a magnification of 210 X and only in those specimens in which the tubercle was oriented in a reasonably horizontal manner. The tubercle was measured from its base to the apex of the longest distal spine. The lengths of the other hairs, also measured at a magnification of 210 X, are expressed relative to either the mental plate or to a particular hair.

The number of branches of hairs 7-C, 1,4,5,7-P are routinely given in the species descriptions as supportive data and to characterize different populations of particular species.

COMB SCALES. The species may be roughly divided into 3 classes in respect to the range of variation in the number of comb scales, which is rounded to the near-

est 10: (1) 20 to 40, (2) 30 to 50, (3) 50 to more than 100. Six species fall into the first 2 classes and the remaining into the third class.

The most useful comb scale character is the absolute length of the free portion of the midapical scale. This portion was measured from the most distal part of the sessile portion, appearing as a crescent in a slide mount, to the apex (excluding the fringe) at a magnification of 430 X. The midapical scale occasionally assumes an anomolous broad form that differs markedly from the adjacent scales; this type was not measured. The free portion ranged from 0.017 to 0.052 mm and usually showed an intraspecific variation of about 0.009 mm; in *insolitus* the variation was unusually great, 0.025 mm, due in part to geographic variation.

The length of the free portion of the most apical scale relative to that of the sessile portion provides a character supplementary to that of the absolute length of the free portion. The length is expressed simply as being shorter than, subequal in length to or longer than the sessile portion.

Two other characters of limited use are not treated routinely in the descriptions. One is the number of rows of comb scales, varying from 3 to 9 among the species. Since the usual range of intraspecific variation is 3 rows, this character has little general value. It is useful, however, in separating *galindoi* from *campana* and *tehuantepec* from *schroederi*. The second character is the shape of the free portion of the scales. In most species, except sometimes for the basal scales, the free portion is spatulate or pandurate. In some *daryi*, however, the comb comprises only ligulate or a mixture of ligulate and almost awllike scales (fig. 51).

SIPHON. Three siphon indices are routinely cited in the descriptions but have limited general diagnostic value since the intraspecific ranges of variation overlap to a considerable extent. The modal values, however, provide supportive characters. All measurements were made at a magnification of 100 X.

Relative siphon length (L/S). This is the length of the siphon (L) divided by the length of the saddle (S). The siphon was measured along its main axis from the dorsal base to the dorsal apex (fig. 10); the saddle was measured along its middorsal line. The L/S ratio was proposed by Colless (1957:87) as a means for deriving a satisfactory relative siphon length in specimens of all conditions, from "badly crushed skins to whole larvae," and is used here since so much of the material on hand consists of skins with the siphon crushed to various degrees. Colless (1962:364) presented data on *Culex (Lophoceraomyia)* comparing the L/S and classical siphon index; the L/S showed less intraspecific variability and a better discriminant function in interspecific analyses. The L/S in the Terrens Group showed a range of 1.82 to 2.86 and a usual intraspecific variation of 0.33 to 0.38.

Pecten row length index (P/L). This is the distance of the most apical pecten tooth from the dorsal base of the siphon (P), measured along the same line of projection as for the siphon length, divided by the siphon length (L) (fig. 10). The pecten was measured on both sides of the siphon and the average of the 2 was used for the index. The P/L showed a range of 0.44 to 0.64 and a usual intraspecific variation of 0.08.

Hair 1-S placement index (H/L). This is the distance of the alveolus of hair 1-S from the dorsal base of the siphon (H), measured along the same line of projection as for the siphon length, divided by the siphon length (L) (fig. 10). The position of the alveolus was measured on both sides of the siphon and the average of the 2 was used for the index. The H/L showed a range of 0.51 to 0.69 and a usual intraspecific variation of 0.06 to 0.08.

SADDLE. The saddle offers few characters of diagnostic value. In most of the

species the saddle extends at least halfway, or a somewhat greater distance, around the anal segment and the ventral margin usually shows a rounded notch of variable breadth or is irregularly undulate. Three species show deviations from this type of saddle. In *argyrothorax* the saddle extends less than halfway around the segment (fig. 14). In *tehuantepec* and *schroederi* (Tehuantepec Subgroup) the saddle extends much farther around the segment than in the other species (figs. 59, 60), although the exact extent is somewhat variable, and a narrow marginal or submarginal slit is developed at the ventral margin of the saddle. The slit is submarginal in those specimens in which the saddle is developed to a particularly great extent ventrad and marginal in those in which the saddle extends ventrad to a lesser extent. A few of the specimens with a submarginal slit show a variously developed strongly sclerotized band around the slit (fig. 60).

GILLS. The length of the gills, relative to that of the anal saddle measured along its dorsal midline, shows considerable intraspecific variation and is of little taxonomic value. The gills in a few species are short, less than the length of the saddle but even in these the gills may be much longer than the saddle. The length of the gills tends to be relatively stable, however, in a particular collection.

SYSTEMATICS AND EVOLUTION

The Terrens Group is most easily characterized by the leg banding of the adults. Typically, tarsi 1-II,III show a basal and apical silver band and tarsi 2-II,III only a basal silver band while the remaining segments are entirely dark; in 2 species, however, the fifth tarsal segment of at least leg III is silvered. *Aedes buenaventura* is unique in the group in the absence of the midtarsal and hindtarsal silver bands except for a very narrow one at the base of 1-II. The adults of this species can be readily separated from other New World *Finlaya* which lack prominent silver tarsal bands by the broad dark basal band of femur III, a character developed only in the Terrens Group; also the mesonotal disc of the male shows an anterior silver band and the hairs of the *pra* are dark, features of the Terrens Group that are not usually shown by other New World *Finlaya*.

The pupae are generally similar to other *Finlaya* of the region, but the trumpet is more darkly pigmented than in most of these other *Finlaya*.

The larvae of the Terrens Group can be distinguished from the other *Finlaya*, except *kompi* and *scutellalbum*, by an at least moderately large patch of usually spatulate or pandurate comb scales with an even fringe of fine spicules. *Aedes kompi* can be separated from the species of the Terrens Group in the larval stage by the usually stronger spine of the metathoracic pleural tubercle and by the usually abruptly tapered distal portion of the siphon, this portion of the siphon being more or less evenly tapered in the Terrens Group; and *scutellalbum* by the more spiculate anal saddle and the stouter hair 2-A.

The Terrens Group of the present revision corresponds to Group B (TERRENS-group: GUALTERIA), Subgroups I and II (*terrens* and *argyrothorax*) of Knight and Marks (1952:522-523). Subgroup I of these authors included *terrens* and most of the other nominal species of the group and Subgroup II only 1 species, *argyrothorax*. Four characters separated Subgroup II from I: (1) the broad scales of the vertex (presumably referring to those along the longitudinal midline), (2) the short male palpus, (3) the short, stiff hairs of segments 4 and 5 of the male palpus and (4) the broadly expanded claspette filament. *Aedes thorntoni*, not included in the scheme

since the authors had not seen the male, apparently is an annectant form. This species shows character states 1 and 3 of Subgroup II and a relatively long male palpus and simple claspette filament as in Subgroup I. *Aedes thorntoni* and *argyrothorax* actually show many characters that indicate that they are closely related and it seems best to treat them together as a single group (see Thorntoni Subgroup). Since state 3 of Subgroup II is shown by some of the new species of the present revision that would fall into Subgroup I, only the first character state of Knight and Marks would remain separating the 2 subgroups. Subgroups I and II do not appear to represent primary subdivisions of the Terrens Group and consequently are not recognized in the present revision. The subgroupings within the group is discussed below. Three of the new species of the present paper do not key to Group B of Knight and Marks. Based upon leg markings, *alboapicus* and *diazi* key to Group C (LONGIPALPIS-group) and *buenaventura* to Group H (GENICULATUS-group). The pattern of leg markings would seem to be a dubious group character.

Twenty-eight species are formally recognized in the present revision. Some of these are rather broadly interpreted and may actually represent species complexes. In addition, there are at least 7 more species which are not formally treated here either because of their representation by inadequate material or because they came to my attention when the manuscript was in its final stage of preparation. Two of these species (and probably more, as indicated under *terrens*) are from northeastern South America, 2 from the Andes in Ecuador and 3 from northwestern Argentina. The previous interpretation, that *terrens* itself was a highly variable and widespread species, is completely invalidated by an analysis of the morphology of the different stages and the distribution of the forms; also, there is correlation between adult, male genitalic, pupal and larval characters. Sympatry of species is common and in several cases 2 species have been collected in the same treehole.

The species in this revision are based primarily on adult scale patterns and other adult non-genitalic features but often the male genitalia and usually the larvae provide important supportive taxonomic data. The male genitalia of many of the species show only subtle differences which are of a statistical nature and consequently a key based on genitalia is not included here. The pupae offer the fewest characters of taxonomic value and in general are too similar and variable to be placed in a key; some of the species, however, have a distinctive chaetotaxy and the paddles often can be used for separating species or subgroups.

Fourteen primary subgroups are recognized in the Terrens Group in the present revision. They are characterized below in those stages that show unique or unusual features. For more complete characterizations see the individual subgroups in the taxonomic treatment.

Thorntoni Subgroup. Vertex of adults with decumbent scales along longitudinal midline broad. Larval hairs 7,11-C, 8-T and 5-I unusually short.

Bertrami Subgroup. Known only in the female. Mesonotal disc with broad anterior silver band.

Terrens Subgroup. A varied group showing no apparent unique features.

Alboapicus Subgroup. Tarsal segments 5-II,III of adults silvered. Pupal hairs 5-C, 1-P unusually long.

Buenaventura Subgroup. Adults with scale patches of upper *stp* and *mep* contiguous; mid- and hindtarsi with silver band only at base of 1-II. Sidepiece of male genitalia with specialized sternal subapical seta. Larva with hair 5-VII cephalad of 4-VII.

Metocopus Subgroup. Erect scales of vertex of male dark.

Insolitus Subgroup. Mesonotal disc of males usually largely silvered.

Aitkeni Subgroup. Known only in the female. Fossal macula with pale golden scales and *ppn* with dark scales.

Homoeopus Subgroup. Mesonotal disc of males usually largely silvered; veins R and Cu of males with unusually long basal line of silver scales.

Heteropus Subgroup. A varied group showing no apparent unique features.

Galindoi Subgroup. Larval hair 2-II situated relatively far laterad.

Podographicus Subgroup. Claspette stem of male genitalia characteristically bowed.

Tehuantepec Subgroup. Anal saddle of larvae relatively more complete than in other groups and with marginal or submarginal ventral slit.

Diazi Subgroup. Known only in the female. Mid- and hindtarsi shaggy and with silver bands of forelegs unusually broad.

I have not been able to assemble these primary units into larger groups characterized by correlated features in the adults and immature stages. Possibly the first 2 to 4 subgroups listed could be combined but this would result in a disproportionately large and varied group. Some of the difficulties involved in recognizing larger groups will become apparent in the discussion that follows on the evolution within the Terrens Group.

There are possibly 2 major phyletic lines in the Terrens Group and for the purpose of discussion these are termed the Terrens and Podographicus lines. The Terrens line comprises the following subgroups, Thorntoni, Bertrami, Terrens, Alboapicus, Buenaventura, Insolitus and possibly Metoecopus; and the Podographicus line, Homoeopus, Heteropus, Galindoi, Podographicus, Tehuantepec and possibly Diazi. The Aitkeni Subgroup cannot be satisfactorily referred to either line.

Fifteen characters are of use in distinguishing these lines. They are given below, the Terrens character first and the Podographicus character second; an asterisk after a character indicates that it is shown by all the members of the line. The Metoecopus Subgroup is not included in the characterization of the Terrens line since it shows very few of the Terrens characters.

Adults. (1) Mesonotal disc of males: anterior silver band present—anterior silver band absent; (2) fossal and supraalar maculae of females: broadly joined—not or narrowly joined; (3) *pra* hairs of females: dark—pale; (4) basal dark band of femur III: broad—incomplete or narrow; (5) silver scalation at base of vein C of males: line reaching crossvein *h**—small patch or line reaching at most 0.5 to *h**.

Pupae. Cephalothorax: pale inverted V-shaped marking present—V-shaped marking absent*.

Larvae. (1) Hair 3-M: branched—single; (2) 4-M: triple or multiple—single or double*; (3) 3-III: triple or multiple—single or double*; (4) 10-III: branched—single*; (5) 3-VI: branched—single*; (6) 4-VII: branched*—single*; (7) 10-VII: branched—single; (8) 12-VII: branched—single*; (9) 2-VIII: branched—single.

The subgroups and species of the Terrens line vary in the number of the Terrens line characters that they possess. In the Thorntoni Subgroup all 15 of the Terrens characters are shown by *thorntoni* and 14 of the 15 by *argyrothorax*; most are shown by the Terrens, Alboapicus and Insolitus Subgroups but only 6 by the Buenaventura and 3 by the Metoecopus Subgroups. On the other hand, all the species of the Podographicus line show either all or a majority of the Podographicus line characters. Each of the 15 character states for the Terrens line represents either a positive character state, that is, a more extensively silvered or more heavily pigmented condition, or a state of greater number of elements (hair branches) and those of the Podographicus line either a negative character state or a state of a lesser number

of elements.

It is suggested here that the Podographicus condition is the derived one. The presence of Podographicus character states in different combinations among species of the Terrens line seems to be most logically explained by a process of independent reductions of the Terrens states to those of Podographicus. One Podographicus character in particular, the narrowly joined or disjunct fossal and supraalar maculae of the females, is strongly suggestive of a derived state since the maculae are broadly joined in all the males of the Terrens Group. Two other characters suggestive of a derived state are the narrow or incomplete basal dark band of femur III and the short line or small patch of basal silver scales on vein C of the males; these markings are more extensively developed in the Terrens line and are variously and more poorly developed in most of the species of the Podographicus line.

Conversely, it seems less likely that the Podographicus condition is the more primitive since the presence of Podographicus character states among the species of the Terrens line would have to be explained either by (1) the acquisition of the positive Terrens states from the negative Podographicus states independently among the species or (2) the derivation of the Terrens condition from the Podographicus condition followed by independent reversions to the Podographicus states. Also, as indicated above, at least some of the Podographicus states appear to be derived.

Since, in the evolution of the Terrens line, there were apparently transformations of Terrens to Podographicus states independently among the species, it is possible that more than 1 phyletic line showing the Podographicus condition exists which cannot be detected because of the parallel evolution. One possibility is the existence of 2 major lines, 1 represented by the subgroups that show acrostichal setae (*Homoeopus*, *Heteropus* and *Galindoi*) and those in which these setae are absent (*Podographicus*, *Tehuantepec* and *Diazi*). The position of pupal hair 1-II in relation to 3-II supports this scheme to some degree but there are apparently no other characters to substantiate it.

The distribution of the subgroups provides the following data in relation to the phyletic lines. In the Terrens line, the *Thorntoni*, *Bertrami*, *Terrens* and *Alboapicus* Subgroups (the "core" of the Terrens line) occur primarily in the Atlantic lowlands of Central America and in the Atlantic drainages of South America; some of the species also cross over to the Pacific lowlands of eastern Panama at the Canal Zone; the *Insolitus* Subgroup occurs in the highlands of Central America and northern South America and the *Buenaventura* and *Meteocopus* Subgroups, which are the least Terrens-like of the line, are found in the Pacific lowlands of northern South America. The subgroups of the Podographicus line occur in the highlands and/or lowlands of Mexico and Central America; 1 form belonging to the Podographicus Subgroup, occurs disjunctly at moderately high elevations in northern Venezuela. In relation to the possible diphyletic composition of the Podographicus line discussed above, the Podographicus and *Tehuantepec* Subgroups (but not the *Diazi* Subgroup) are distributed primarily in the coastal lowlands of Central America while the remaining subgroups are found primarily at higher elevations.

In summary, the Terrens line appears to be the more primitive of 2 hypothetical major phyletic lines. This line is primarily Panamanian and South American in distribution. The *Thorntoni*, *Terrens* and *Alboapicus* Subgroups, and possibly *Bertrami*, form the "core" of the Terrens line and show a similar type of distribution. The *Insolitus* Subgroup is morphologically similar to these subgroups but shows a different type of distribution. The *Buenaventura* Subgroup and especially the *Meteocopus* Subgroup show a tenuous relationship with the preceding subgroups

and occur in a different geographic area. The remaining subgroups, except possibly for *Aitkeni*, comprise the *Podographicus* line which may actually be polyphyletic. This line is primarily Mexican and Central American in distribution.

The *Insolitus* Subgroup is possibly the most primitive subgroup of the *Terrens* Group. This is suggested by the following rather meager data and assumptions. (1) The *Insolitus* Subgroup is represented in the area which seems to be the most likely primary center of distribution of the *Terrens* Group, southeastern Central America (and possibly northeastern South America), by disjunct and distinctive montane populations. (2) The subgroup belongs to the apparently primitive *Terrens* phyletic line and also shows the following 2 characters that perhaps link it with the *Podographicus* line, the largely silvered mesonotal disc which is developed elsewhere only in the *Homoeopus* Subgroup and the relatively long hair 11-P of the larva which is long elsewhere only in *heteropus* and the *Galindoi* Subgroup. (3) If the largely silvered mesonotal disc of the *Insolitus* males is the primitive condition, then the anterior silver band of the disc of most of the remaining subgroups of the *Terrens* line could be the product of a caudal reduction (see *homoeopus*). I would suggest that a southern population of an ancestral *Insolitus* stock gave rise to the *Terrens* Subgroup. The latter may be the most primitive of the southern subgroups since some of the species (*zavortinki* and *apollo*) appear to be relatively nonspecialized and since, as treated here, it comprises a diverse array of species. The *Thorntoni* and *Alboapicus* Subgroups appear to have been derived from the *Terrens* Subgroup; they share with the latter many characters of subgroup significance but also show some apparently specialized features. The *Buenaventura* Subgroup and the apparently unrelated *Metocopus* Subgroup probably represent lines derived independently of the *Terrens* Subgroup since they occur in the Pacific rather than the Atlantic drainage of South America. I would also suggest that the northern highland *Aitkeni* Subgroup and subgroups of the *Podographicus* line which show acrostichal setae arose from 1 or more northern populations of the ancestral *Insolitus* stock; 1 species of these subgroups, *daryi*, is now represented by widely disjunct populations in Guatemala and southeastern Panama which suggests a differentiation in an area located between these ends of Central America. The *Podographicus* Subgroup, which lacks acrostichal setae, possibly differentiated in northeastern South America, perhaps from a species of *Insolitus* or from some member of the *Terrens* Subgroup; if the subgroup did evolve in this area it must have spread northward and crossed into the Pacific drainage. The Isthmus of Tehuantepec perhaps was the passageway to the Pacific since distinct populations of *podographicus* now occur to the north and to the south of the Isthmus on the Pacific side of Middle America. If on the other hand, the *Podographicus* Subgroup differentiated somewhere in its present lowland Central American range, its anomalous presence at moderately high elevations in Venezuela must be explained.

Although this phylogenetic scheme is only tentative it at least provides a working hypothesis. A less speculative phylogenetic scheme cannot be formulated until the fauna of the Atlantic lowlands of Central America and the montane faunas of southeastern Central America, northeastern South America and the Andes are better known.

DISTRIBUTION

The *Terrens* Group is distributed from the northernmost limits of the Neotropical

region (in the sense of Maldonado-Koerdell 1964:20, i.e. from the state of Nayarit in the West, across Mexico, including the Mesa Central, to the southern limits of the state of Tamaulipas in the East) southward into Ecuador, Peru, Bolivia, northern Argentina and southeastern Brazil and at elevations from sea level to at least 8,000 feet (fig. 1).

It is of interest that the Terrens Group is absent in the West Indies. Maldonado-Koerdell, in his treatment of the geohistory of Middle America (1964:15-18), indicated that northwestern Central America (southeastern Mexico to northern Nicaragua) and the West Indies (at least in part) formed a single land mass, Caribbean Land, from the early Tertiary through a major part of the Miocene. Southeastern Central America was broken up into several (or many) islands at this time. It is my premise that the Terrens Group originated on these islands; this is based upon the following tenuous data: (1) the greatest diversity of species occurs in this area, (2) several relict montane species or populations of widespread species occur here and (3) the area represents the center of the range of the group. Uplift of southeastern Central America occurred in Miocene-Pliocene times and the Terrens Group spread northward and southward. The absence of the group in the West Indies may be explained by the dispersal of at least the low elevations species into northwestern Central America after the subsidence of the transoceanic portion of Caribbean Land in the late Miocene.

The distributions of the subgroups are illustrated in figures 2-6. Half of the 14 subgroups are monotypic and show restricted geographic ranges. Four of the polytypic subgroups, *Homoeopus*, *Heteropus*, *Galindoi* and *Podographicus*, show striking discontinuities in their ranges. Two of the subgroups, *Thorntoni* and *Terrens*, are distributed primarily in the Atlantic lowlands of Central America and in the Atlantic drainages of South America, but some of the species cross over through the Canal Zone to the Pacific side of eastern Panama; these species have not been recorded west of the Canal Zone on the Pacific side. Of interest, *podographicus*, the common species of the Pacific lowlands to the northwest and north, apparently does not occur in southeastern Panama although it is recorded from the province of Panama west of the Canal Zone (see figs. 2,3,6).

BIONOMICS

The species of the Terrens Group are principally sylvan but some of the species occur in populated areas. Bonne and Bonne-Wepster (1925:424) took 1 of the original males of *argyrothorax* in a house in Paramaribo; Prosen, Carcavallo and Martinez (1964:103-104) reported "*terrens*" adults in rural areas of Bolivia; and *homoeopus* larvae were taken on the grounds of the University of Costa Rica and in Parque Bolivar in San Jose, Costa Rica (UCLA collections). On the other hand, Shannon (1931a:23) observed that *terrens* did not occur in the more or less natural areas of suburban Salvador, Brazil; *terrens* larvae were not taken in numerous treehole collections although *Culex conservator* larvae were abundantly represented.

The vertical distribution of *terrens* (sens. lat.) has been investigated by Galindo, Trapido and Carpenter (1950), Galindo, Carpenter and Trapido (1951) and Trapido, Galindo and Carpenter (1955a,b) in their studies on diurnal forest mosquitoes, carried out in different parts of Panama. The *terrens* of these authors almost certainly included *campana* and probably *thorntoni*, *zavortinki* and *podographicus*, and possibly *aitkeni* and other species. In the 1950 and 1955a studies, biting-landing collec-

tions were made on the ground and in the canopy; most specimens were taken on the ground, about 68% of the 25 specimens in the 1950 study and about 83% of the 1533 specimens in the 1955 study. Bamboo larval traps were used in the 1951 and 1955b studies and were placed near ground level, at 20-30 feet (low platform) and at 40-50 feet (upper platform); in the 1951 study it was noted simply that most larval collections occurred in the traps situated near the ground but that on several occasions larvae were found in the traps at the lower and upper platforms; and in the 1955b study 80% of the 252 larvae were taken near the ground, and the remainder in the canopy. The ground and canopy mosquitoes possibly represent different species.

All of the larval collections of the present project were made at heights from between ground level to 15 feet, presumably too small a range to indicate height specificity.

Flight range figures for *terrens* in the state of Minas Gerais, Brazil, were obtained by Causey, Kumm and Laemmer (1950). Adults were recaptured 4.3-4.4 km from a point of release after 1-2 days and 2.2-5.6 km after 1-17 days in 2 separate experiments.

Many of the species have been observed to be anthropophilic. Those definitely known to bite man are *insolitus* in Trinidad, *homoeopus* from Cordoba, Mexico and *idanus* (UCLA collection data) and what is probably *campana* (Galindo, personal communication). The following species have been taken in biting-landing collections but the data do not indicate whether they were actually biting: *amabilis*, *apollo*, *berlini*, *bertrami*, *metoecopus*, *sumidero*, *terrens* from Rochina, Brazil, *vargasi* (UCLA and other original collection data), *argyrothorax* in Brazil (Causey, Causey, et al, 1961:243), and what may be *braziliensis* (Kumm and Novis, 1938:502).

Davis and Shannon (1931:716) and Shannon, Whitman and Franca (1938:110) fed *terrens* from Brazil on monkeys and Kumm and Novis (1938:502) fed what may be *braziliensis* on *Cebus* monkeys and on agoutis.

All data on the activity of females indicate that it is diurnal. Fisher and Verity, however, observed *sumidero* flying in a shelter at night (MEX 115-2).

Egg deposition by "*terrens*" was observed by Galindo, Trapido and Carpenter (1951:121). The eggs were laid about 1 inch above the water level in a treehole. Galindo, Carpenter and Trapido (1955:162), using bamboo containers containing organic debris, showed that the hatching of the greatest number of eggs occurred after the first flooding. A substantial number hatched after the fourth and fifth flooding cycle and the last at a ninth cycle.

The larvae breed primarily in treeholes. Many species have also been found in cut or broken bamboo and in artificial containers and it seems likely that all or most species can utilize these habitats. Also, 1 collection of *gabriel* was made in a volcanic rockhole and 1 of *insolitus* in a coconut shell. The size of the treehole in general does not appear to be a critical factor in breeding site preference, most species being recorded from both "small" and "large" treeholes in our collections. However, *alboapicus* and *metoecopus* might show such a preference since only small treeholes or bamboo have yielded these species. Galindo, Carpenter and Trapido (1951:110,111) obtained "*terrens*" principally in their bamboo traps with large openings (apparently their open-top trap) and very few in their traps with a lid and a one-half inch opening.

DISEASE RELATIONS

Although probably most of the species are anthropophilic none has been implicated in disease transmission. Most experimental work has been carried out on *terrens* in Brazil. Davis and Shannon (1931:716) observed that Yellow Fever virus remained active in *terrens* from Salvador, Brazil, for at least 2 weeks and that a monkey was killed by the injection of a single specimen. However, since the mosquitoes were reluctant to feed for a second time in the laboratory and since they were not captured in the forest on either human or animal bait, the authors concluded that it was improbable that *terrens* was a factor in Yellow Fever transmission. Shannon, Whitman and Franca (1938:111) fed *terrens*, collected in the forest of the state of Rio de Janeiro where Yellow Fever had been reported, on infected monkeys. Only 58 of the 503 mosquitoes fed and none of these was positive for the virus.

TAXONOMIC TREATMENT

Terrens Group

ADULTS. *Head:* Vertex with decumbent scales silver or dark, broad, narrow curved or narrow spatulate; scales along median longitudinal line in most species silver, narrow curved and more lateral scales dark, broad; anterior patch of porrect scales absent; occiput with erect scales dark or silver, usually scales of 1 color predominating; palpus entirely dark scaled; torus without scales. *Thorax:* Integument dark brown to black; scales dark or silver, rarely a few golden scales present; mesonotal disc with narrow curved scales, usually not transversely silvered in females, often transversely silvered in males, the silvering usually an anterior band, less frequently most of or entire disc silvered; complete silver acrostichal and posterior dorsocentral lines present or absent, often present only in males; acrostichal setae present or absent; fossal and supraalar areas each with variably developed silver macula, the maculae in females joined or disjunct, in males always joined; prescutellar area with or without marginal silver scales, central portion without scales; lobes of scutellum with or without silver scales; *apn*, *ppn*, *ppl*, paratergite, *pra*, upper *stp*, posterior *stp* and *mep* with patch of scales, *ssp* with or without scales; all pleural scales silver (rarely dark on *ppn*); *apn*, *ppl*, posterior *ppn*, *psp*, *pra* and posterior *stp* and upper *mep* with setae. *Legs:* Midtarsi and hindtarsi usually with broader silver bands than foretarsi; femur I usually with ventral or posterior patch of silver scales and usually without knee spot, when present a single row of apical silver scales; tibia I usually entirely dark, rarely with posterior silver streak; tarsus 1-I with basal complete or incomplete silver band, with or without apical silvering, when present usually at most a narrow band; 2-I with or without basal silvering, when present usually at most a narrow band; 5-I rarely silvered; tarsus I otherwise dark; femur II usually with ventral or posterior silver line and knee spot; tibia II dark; tarsus 1-II usually with basal and apical silver band, sometimes entirely silvered, infrequently only narrow basal band present; 2-II usually with basal silver band, sometimes most or all of segment silvered; 5-II infrequently silvered; tarsus II otherwise dark; femur III usually with dark basal band or at least some dark basal scales, always with dark subapical band, remaining portion of segment silvered; tibia III dark; tarsus 1-III usually with basal and apical silver band; 2-III with basal silver band; 5-III infrequently silvered; tarsus III otherwise usually dark (in occasional specimens

apex of 2-III and base of 3-III with a few silver scales). *Wing*: Silver scales usually present at base of veins C and R and sometimes at base of Cu, often forming lines reaching crossvein *h* (or the level of *h* in case of vein R); wing scales otherwise dark. *Abdomen*: Laterotergite silver scaled; tergites II-VIII in females and III-VII in males with lateral patch of silver scales, VIII in males usually entirely silver scaled; sternites II-VII with basal silver band. *Female Genitalia*: Cercus short and broad; segment VIII only slightly retracted.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area with or without dense tuft of setae; median sternomesal area with or without sclerite produced into mesal membrane, sclerite sometimes with tuft of setae. *Prosophallus*: Filament typically stout, setalike and with terminal hook, usually without structural elaborations but in *argyrothorax* distally expanded into foliate structure. *Aedeagus*: Basal portion subequal in diameter to or broader than distal portion; truncate distally.

PUPAE. *Cephalothorax*: Trumpets much darker than integument of cephalothorax. *Abdomen*: Hairs 9-II-V and usually 9-VI caudad of 6-II-VI; hairs 10-VI much closer to 7-VI than to each other. *Paddle*: Apex produced, evenly rounded or weakly emarginate.

LARVAE. *Head*: Hair 4-C inconspicuous, multiple, usually caudad of 6-C, sometimes slightly cephalad of 6-C; hair 5-C well caudad of 7-C; 6-C slightly cephalad of 7-C; hair 5-C interdistance subequal to that of 6-C; hair 15-C subequal in length to mental plate; mental plate triangular in outline, the teeth more or less similar in shape but broader laterad. *Antenna*: Hair 1-A single to 4-branched. *Thorax*: Hairs 1-3-P on common tubercle; 5-7-P on separate tubercles, only tubercle of 7-P well developed; 6-P situated about midway between 5,7-P. *Abdomen*: Hair 12-I present. *Segment VIII*: Comb scales 19 to more than 100, in 2 or more rows; free portion with uniform fringe of very fine spicules at apex or along entire margin; apical scales with free portion usually spatulate to pandurate, rarely awl-shaped. *Siphon*: More or less evenly tapered; length 0.53-1.07 mm; classical index about 2.5-3.3; L/S 1.82-2.86; P/L 0.44-0.64; H/L 0.51-0.69; pecten teeth with basal denticles, distal teeth not detached. *Anal Segment*: Saddle finely spiculose, the posterior dorsal spicules longer but not developed as conspicuous spines; hair 1-X inserted on saddle; 3-X single; ventral brush without boss, with 10-16 hairs; 4a-X greater than half length of longest hair of brush.

DISCUSSION. The above descriptions include primarily features of the Terrens Group that separate it from other groups of the New World *Finlaya*. The systematics and evolution, the distribution, the bionomics and the disease relations of the group are discussed in the preceding chapters.

KEYS TO SPECIES

FEMALES

(5. *braziliensis* and 15. *impostor* unknown)

1. Supraalar macula broadly joined to fossal macula (fig. 17) except in some *insolitus* and *alboapicus*; femur III with basal dark band complete and broad, at least 0.09 or mesonotal disc transversely silvered; *pra* hairs often dark, more heavily pigmented than those of *ppl* and usually than those of upper *mep*; vein C often with basal line of silver scales (developed on anterior and/or dorsal surface) reaching crossvein *h* 2

- Supraalar macula usually not joined to fossal macula; femur III with basal dark band usually incomplete, if complete less than 0.09; mesonotal disc not transversely silvered; *pra* hairs pale (except in some *galindoi*); vein C without long basal line of silver scales as above, at most with line rarely reaching 0.5 to crossvein *h*). 13
- 2(1). *Ppn* with scales dark; fossal macula with some pale gold scales in addition to the silver (Aitkeni Subgroup) 13. **aitkeni**
Ppn with scales silver; fossal macula with all scales silver 3
- 3(2). Tarsi 1-II,III without apical silver band and tarsi 2-II,III without basal silver band; upper *stp* and *mep* scale patches contiguous (fig. 25) (Buena-ventura Subgroup) 10. **buenaventura**
Tarsi 1-II,III with apical silver band and tarsi 2-II,III with basal silver band; upper *stp* and *mep* scale patches not contiguous (fig. 7). . . . 4
- 4(3). Tarsus 5-III silver scaled; supraalar macula often not joined to fossal macula (Alboapicus Subgroup) 9. **alboapicus**
Tarsus 5-III dark scaled; supraalar macula broadly joined to fossal macula 5
- 5(4). Vertex with all decumbent scales broad (Thorntoni Subgroup) 6
Vertex with decumbent scales narrow curved at least along longitudinal midline. 7
- 6(5). Mesonotal disc with anterior silver band (fig. 9); vein R without silver scales 1. **thorntoni**
Mesonotal disc not transversely silvered (fig. 13); vein R with small basal patch of silver scales 2. **argyrothorax**
- 7(5). Mesonotal disc with broad anterior silver band (fig. 11); femur III with basal dark band incomplete (Bertrami Subgroup) 3. **bertrami**
Mesonotal disc not transversely silvered; femur III with basal dark band complete 8
- 8(7). Occiput with all erect scales dark; *ssp* scales absent; vertex with decumbent scales along median longitudinal line generally dark and with scales laterad of line narrow curved (Metoecopus Subgroup) 11. **metoecopus**
Occiput with all erect scales pale or with mixture of pale and dark scales; *ssp* scales usually present, when absent vertex with median longitudinal line of silver scales and with scales laterad of line broad (Terrens, Insolitus Subgroups) 9
- 9(8). *Ssp* scales absent 8. **berlini**
Ssp scales present 10
- 10(9). *Pra* hairs usually pale; fossal macula usually broadly reduced mesad and often reduced laterad (figs. 15,29); acrostichal setae present or absent 11

- Pra* hairs dark, more heavily pigmented than those of *ppl*; fossal macula narrowly reduced mesad and always reaching lateral margin of fossa (figs. 17,19); acrostichal setae absent 12
- 11(10). Fossal macula a well delineated marking, often in form of sublateral line, sometimes divided into anterior and posterior segments (figs. 7,15); *mep* with scale patch undivided or divided into dorsal and ventral portions. **4. terrens**
Fossal macula usually a poorly defined and irregularly reduced marking (fig. 29); *mep* with scale patch not divided **12. insolitus**
- 12(10). Upper *mep* hairs pale, less heavily pigmented than those of *pra*; vertex with decumbent scales laterad of median longitudinal line narrow curved **6. zavortinki**
Upper *mep* hairs dark, as heavily pigmented as those of *pra*; vertex with decumbent scales laterad of median longitudinal line broad **7. apollo**
- 13(1). Acrostichal setae absent; tarsus 1-II with median dark band usually incomplete or complete and narrow, at most about 0.33 14
Acrostichal setae present; tarsus 1-II with median dark band usually complete and broad, 0.33 or greater 17
- 14(13). Tarsus 5-III silver scaled; tarsus 1-I with broad apical silver band, about 0.4 (Diazi Subgroup) **28. diazi**
Tarsus 5-III dark scaled; tarsus 1-I at most with very narrow apical silver band. 15
- 15(14). Proboscis shorter than or subequal in length to femur I; femur II with knee spot moderately broad, the silver scales at most just reaching anterior subapical setae (Podographicus Subgroup) **25. podographicus**
Proboscis longer than femur I; femur II with knee spot broad, the silver scales extending basad of anterior subapical setae (Tehuantepec Subgroup) 16
- 16(15). Vertex with all decumbent scales silver **26. tehuantepec**
Vertex with silver and dark decumbent scales, latter forming submedian patch **27. schroederi**
- 17(13). Femur II with or without knee spot, when present, narrow, a single row of apical scales; *ssp* scales absent (Galindoi Subgroup) 18
Femur II with broad knee spot, the scales extending basad of anterior subapical setae; *ssp* scales present or absent (Homoeopus, Heteropus Subgroups) 19
- 18(17). Fossal macula reduced only mesally (figs. 48,50); supraalar macula joined to fossal macula; femora I,II with well developed posterior patch of silver scales **24. daryi**

- Fossal macula reduced anteriorly and mesally (fig. 44); supraalar macula disjunct from fossal macula; femora I,II without posterior patch of silver scales **22. galindoi**; **23. campana**
- 19(17). *Ssp* scale patch absent although 1 or 2 scales sometimes present **20. vargasi**
Ssp scale patch present 20
- 20(19). Proboscis shorter than or subequal in length to femur I; midlobe of scutellum with silver scales 21
 Proboscis usually longer than, sometimes subequal in length to femur I, when subequal midlobe of scutellum without silver scales 22
- 21(20). Acrostichal line absent or represented by scattered silver scales (fig. 39); midlobe of scutellum usually with a mixture of silver and dark scales, the dark scales usually predominating, infrequently all scales silver **19. sumidero**
 Acrostichal line present, complete (fig. 35); midlobe of scutellum with all scales silver **17. gabriel**
- 22(20). Femur I with narrow knee spot; complete and strong acrostichal and posterior dorsocentral lines present (fig. 37) **16. amabilis**
 Femur I without knee spot; complete and strong acrostichal and posterior dorsocentral lines usually absent, sometimes complete but weak 23
- 23(22). Vertex with decumbent scales laterad of median longitudinal line broad **18. idanus**
 Vertex with decumbent scales laterad of median longitudinal line narrow curved 24
- 24(23). Midlobe of scutellum without silver scales; proboscis subequal in length to or longer than femur I **12. heteropus**
 Midlobe of scutellum usually with silver scales; proboscis longer than femur I **14. homoeopus**

MALES

(**3. bertrami**, **8. berlini**, **12. aitkeni**, **16. amabilis**,
27. schroederi and **28. diazi** unknown)

1. Vein C with basal line of silver scales reaching crossvein *h*; mesonotal disc usually transversely silvered 2
 Vein C with small basal patch of silver scales or line reaching at most to about 0.5 to crossvein *h*; mesonotal disc not transversely silvered 12
- 2(1). Vein R with basal line of silver scales much longer than that of vein C (Homoeopus Subgroup) 3
 Vein R with basal line of silver scales much shorter than that of vein C 4

- 3(2). Median sternomesal area of sidepiece with well developed tuft and usually with well developed convexity and sclerite (fig. 31). **14. homoeopus**
 Median sternomesal area with these structures not strongly differentiated (fig. 33) **15. impostor**
- 4(2). *Ssp* scale patch absent 5
Ssp scale patch present. 6
- 5(4). Tarsi 1-II,III with apical silver band and 2-II,III with basal silver band; tarsus 5-III silvered; upper *stp* and *mep* scale patches not contiguous (fig. 7) (Alboapicus Subgroup). **9. alboapicus**
 Tarsi of legs II,III without above silver markings; upper *stp* and *mep* scale patches contiguous (fig. 25) (Buenaventura Subgroup) **10. buenaventura**
- 6(4). Vertex with scales along longitudinal midline broad (Thorntoni Subgroup) 7
 Vertex with scales along longitudinal midline narrow curved 8
- 7(6). Mesonotal disc with anterior silver band not emarginate posteriorly (fig. 9); palpus 1-2 labellum lengths shorter than proboscis. Claspette filament not expanded distally (figs. 9,11) **1. thorntoni**
 Mesonotal disc with anterior silver band emarginate posteriorly (fig. 13); palpus 4-7 labellum lengths shorter than proboscis. Claspette filament expanded distally (fig. 13) **2. argyrorhox**
- 8(6). Mesonotal disc transversely silvered for most its length (except in Trinidad where silvering sometimes restricted to anterior half of disc or transverse silvering not developed), silvered area not distinctly emarginate posteriorly (fig. 29); vertex with decumbent scales laterad of median longitudinal line silver, broad (Insolitus Subgroup) **12. insolitus**
 Mesonotal disc not transversely silvered or with transverse silvering developed as anterior silver band less than half length of disc and deeply emarginate posteriorly (fig. 17); vertex with decumbent scales laterad of median longitudinal line dark or silver, narrow or broad (Terrens Subgroup) 9
- 9(8). Mesonotal disc without or with very narrow and barely discernable anterior band (fig. 15); *pra* hairs pale; vertex with decumbent scales laterad of median longitudinal line narrow curved (Brazil) **4. terrens**
 Mesonotal disc with relatively broad anterior silver band (fig. 17); *pra* hairs dark, more heavily pigmented than those of *ppl*; vertex with decumbent scales laterad of median longitudinal line narrow curved or broad 10
- 10(9). Hairs of *pra* and upper *mep* about equally dark; vertex with decumbent scales laterad of median longitudinal line broad (Colombia). **7. apollo**
 Hairs of *pra* more heavily pigmented than those of upper *mep*; vertex with decumbent scales laterad of median longitudinal line narrow curved or broad 11

- 11(10). Vertex with decumbent scales laterad of median longitudinal line broad (French Guiana, Brazil) **5. braziliensis**
 Vertex with decumbent scales laterad of median longitudinal line narrow curved (Panama) **6. zavortinki**
- 12(1). Acrostichal setae absent 13
 Acrostichal setae present 15
- 13(12). Occiput with erect scales dark (Metoecopus Subgroup) . **11. metoecopus**
 Occiput with erect scales pale 14
- 14(13). Palpal segment 3 without prominent tuft of setae, the setae at ventrolateral apex shorter than segments 4 and 5 combined. Prosophallus with lateral portion of mesal lobe usually moderately inclined, between 15° and 30° from horizontal; stems usually bowed and convergent (figs. 52,54,56) (Podographicus Subgroup) **25. podographicus**
 Palpal segment 3 with prominent tuft of setae as long as segments 4 and 5 combined. Prosophallus with lateral portion of mesal lobe slightly inclined, about 15° or less from horizontal; stems not bowed, divergent or essentially parallel (fig. 58) (Tehuantepec Subgroup)
 **26. tehuantepec**
- 15(12). Femur II without or with narrow knee spot, the silver scales a single row at apex of segment; *ssp* scale patch absent (Galindoi Subgroup) . . 16
 Femur II with broad knee spot, the silver scales extending basad of anterior subapical setae; *ssp* scale patch present (Heteropus Subgroup) . 18
- 16(15). Femora I,II with well developed posterior patch of silver scales. Sidepiece with median sternomesal tuft poorly differentiated and the setae not wavy (figs. 48,50) **24. daryi**
 Femora I,II without posterior patch of silver scales. Sidepiece with median sternomesal tuft well differentiated and the setae wavy (figs. 44,46) 17
- 17(16). Prosophallus with median lobe projecting farther cephalad than lateral lobe (fig. 44) **22. galindoi**
 Prosophallus with median lobe projecting to about same level as lateral lobe (fig. 46) **23. campana**
- 18(15). Median sternomesal area of sidepiece with sclerite and tuft well developed; hook of filament strongly angulate (figs. 35,37) 19
 Median sternomesal area of sidepiece with sclerite and tuft absent or poorly developed; hook of filament not strongly angulate (figs. 39,40,42) 20
- 19(18). Palpus subequal in length to or slightly longer than proboscis. Basal tergomesal area of sidepiece without dense patch of long setae (fig. 35) **17. gabriel**
 Palpus about 2 labellum lengths shorter than proboscis. Basal tergomesal area of sidepiece with dense patch of long setae (fig. 37) . . **18. idanus**

- 20(18). *Ssp* scale patch absent; mesonotum without complete acrostichal or posterior dorsocentral lines (fig. 40); tarsus 1-II with median dark band incomplete 20. **vargasi**
Ssp scale patch present; mesonotum with complete acrostichal or posterior dorsocentral lines; tarsus 1-II with median dark band complete, about 0.33-0.4 21
- 21(20). Acrostichal line absent; posterior dorsocentral line complete (fig. 39); segment 3 of palpus with apical ventrolateral tuft not as long as segments 4 and 5 combined 19. **sumidero**
 Acrostichal line present, complete, sometimes weakly developed; posterior dorsocentral line incomplete (fig. 42); segment 3 of palpus with apical ventrolateral tuft as long as segments 4 and 5 combined 21. **heteropus**

LARVAE

(3. *bertrami*, 5. *braziliensis*, 16. *amabilis*,
and 19. *sumidero* unknown)

1. Hair 5-C usually with 4 or more branches (when fewer branches, only on 1 side) and/or 14-P branched 2
 Hair 5-C usually single or double, sometimes triple (when more branches, only on 1 side) and 14-P usually single (when rarely branched, only on 1 side) 8
- 2(1). Hair 5-VII cephalad of 4-VII 10. **buenaventura**
 Hair 5-VII caudad of 4-VII 3
- 3(2). Hairs 4-VII and 3-VI branched 9. **alboapicus**
 Hairs 4-VII single and 3-VI usually single (when rarely branched, only on 1 side) 4
- 4(3). Hair 2-II well mesad of 4-II (fig. 42); 14-P single 5
 Hair 2-II mesad of 4-II for about only 1 alveolus width, often laterad of 4-II (fig. 44); 14-P branched 6
- 5(4). Hair 11-P less than half length of 14-P; 1-VIII shorter than 2-VIII; 6-C single or double; *bmh* single 18. **idanus**
 Hair 11-P about half length of 14-P; 1-VIII usually at least subequal in length to 2-VIII; 6-C usually with more than 2 branches; *bmh* usually branched but often single 21. **heteropus**
- 6(4). Hair 14-C usually with 3 or more branches; 1-A usually branched but often single; free portion of apical scales ligulate, awl shaped or spatulate 24. **daryi**
 Hair 14-C usually with fewer than 3 branches; 1-A usually single (when branched, only on 1 side); free portion of apical scales spatulate 7
- 7(6). Comb scales 35-47, in 4 rows; free portion of midapical scale longer than sessile portion 22. **galindoi**

- Comb scales 23-32, in 3 rows; free portion of midapical scale shorter than or subequal in length to sessile portion. **23. campana**
- 8(1). Hair 7-C short, less than half length of 6-C; 11-C short, less than length of mentum 9
Hair 7-C more than half length of 6-C; 11-C longer than mentum . . . 10
- 9(8). Hair 8-S single; 2-A about 2.0 distal portion of 6-A; anal saddle extending less than halfway around segment (fig. 14) **2. argyrorhox**
Hair 8-S multiple; 2-A about 3.0 or more length of distal portion of 6-A; anal saddle extending more than halfway around segment (figs. 10,12) **1. thorntoni**
- 10(8). Hairs 14-C and *bmh* usually branched, rarely single; 11-P usually at least half length of 14-P; 6-C usually double or triple **12. insolitus**
Hairs 14-C and *bmh* usually single, rarely branched; 11-P less than half length of 14-P; 6-C usually single, sometimes double, rarely triple 11
- 11(10). Hair 4-VII at least double; 4-M and 3-III usually at least triple; 10,12-VII often branched. 12
Hair 4-VII usually single, rarely double; 4-M and 3-III with less than 3 branches; 10,12-VII single 15
- 12(11). Ventral brush with 11 or 12 hairs; 4a-X with 6 branches; 10,12-VII single **8. berlini**
Ventral brush with 13 or more hairs; 4a-X usually with 8 or more branches; 10,12-VII usually double but sometimes single 13
- 13(12). Hair 2-VIII usually branched; 6-C often branched but usually single **4. terreus**
Hairs 2-VIII and 6-C both single 14
- 14(13). Hair 7-C with 5-9 branches 5-C usually branched, sometimes single **6. zavortinki**
Hair 7-C triple; 5-C single **7. apollo**
- 15(11). Saddle extending around segment to at most moderate distance beyond horizontal midline, submarginal slit absent, ventral margin either with broad rounded incision or irregular in outline (fig. 52) **11. metoecopus; 14. homoeopus;**
. **16. impostor; 17. gabriel; 20. vargasi; 26. podographicus**
Saddle extending around segment far beyond horizontal midline, with ventral submarginal or marginal slit (figs. 59,60) 16
- 16(15). Comb scales 33-54, in 4 rows, narrow (fig. 59) **27. tehuantepec**
Comb scales 20-29, in 2-3 rows, stout (fig. 60) **28. schroederi**

Thorntoni Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline broad; occiput of both sexes with all erect scales pale; proboscis of females longer than femur I; palpal segment 3 of males usually with 1 or 2 short apical ventrolateral hairs; segment 4 with hairs of ventrolateral row usually short and sparse. *Thorax*: Mesonotal disc of females with or without narrow anterior silver band, of males with very broad anterior silver band; complete acrostichal or posterior dorso-central lines absent in females; acrostichal setae absent; fossal macula of both sexes coextensive with fossa; supraalar macula truncate posteriorly, in females broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales present; *pra* hairs of females dark; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with or without narrow apical silver band; femur II with knee spot broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band usually complete and moderately broad; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band complete, broad; tarsus 5-III without silver scales. *Wing*: Vein C of females with basal line of silver scales reaching about 0.5 to crossvein *h* or up to *h*, of males with line reaching *h*; vein R of males with basal line of silver scales reaching about 0.5 to level of *h*; vein Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area with or without dense patch of long setae; median sternomesal area without strongly developed sclerite; with or without tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral lobe variously inclined but always 15° or less from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPAE. *Cephalothorax*: With or without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly multiple; 2-II mesad of 3-II for at least 0.2, usually 0.3 or more the distance from 1-II to 3-II; 3-III usually branched. *Paddle*: Clear; apex not produced; hair 1-P shorter than paddle.

LARVAE. *Head*: Hairs 5,6-C single; 7-C less than half length of 6-C; 11-C shorter than mental plate; 14-C shorter than or subequal in length to mental plate, single; *bmh* single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P single; 3-M branched; 4-M double to multiple; 8-T less than half length of metathoracic pleural tubercle. *Abdomen*: Hair 5-I shorter than 4-I; 2-II well mesad of 4-II; 3-III double to multiple; 10-III, 3-VI and 4-VII branched; 5-VII caudad of 4-VII, less than half length of 3-VII; 10,12-VII branched. *Segment VIII*: Midapical comb scale with free portion shorter than or subequal in length to sessile portion; hair 2-VIII branched. *Anal Segment*: Saddle extending around segment for short to moderate distance, ventral margin without deep slit.

DISCUSSION. The Thorntoni Subgroup shows several characters which are unique in the Terrens Group. In the adults the decumbent scales along the longitudinal midline of the vertex are broad, in the pupae hair 3-III is usually branched, and in the larvae hairs 7,11-C, 8-T and 5-I are very short and hair 2-VIII is often triple to 4-branched (the latter hair being single or double in the other species). Other characters shown only infrequently among the other subgroups are the truncate posterior margin of the supraalar macula, the broad anterior silver band of the male mesonotum and the clear pupal paddle.

The subgroup shows all of the features that characterize the Terrens phyletic

line and is presumed to have been derived from the more generalized Terrens Subgroup (see chapter on Systematics and Evolution). It is distributed in the lowlands of Central America, principally on the Atlantic side, and in the Atlantic drainages of South America as far south as Rio de Janeiro.

The 2 species of the subgroup, *thorntoni* and *argyrothorax*, are evidently closely related since they share the singular subgroup characters mentioned above. The male genitalia of these species, however, are strikingly different, those of *argyrothorax* being unique in the Terrens Group. It would seem that *argyrothorax* has been derived from a *thorntoni*-like ancestor.

1. *Aedes* (Finlaya) *thorntoni* Dyar & Knab

Figs. 2,9-12

1907. *Aedes thorntoni* Dyar and Knab, 1907:10. TYPE: *Holotype* ♀, Bluefields, Nicaragua, W. F. Thornton [USNM, 10143]. Type data from Stone and Knight (1956:225).

Aedes (Finlaya) *thorntoni* of Dyar (1921:153; 1925b:147-148; 1928:225-226); Bonne-Wepster and Bonne (1925:361,365,419-420); Costa Lima (1930:257-258); Edwards (1932:150); Lane (1936a:11); Knight and Marks (1952:549); Horsfall (1955:462).

Aedes thorntoni of Theobald (1910:485); Howard, Dyar and Knab (1917:819-821); Dyar (1918:73,80).

Aedes (Finlaya) *terrens* in part of Arnett (1949:227); Lane (1939:105; 1953:686-687); Stone, Knight and Starcke (1959:171); Belkin, Schick and Heinemann (1965:395).

Aedes terrens in part of Kumm, Komp and Ruiz (1940:416,450).

Aedes insolitus in part of Busck (1908:64).

FEMALE. *Head*: Vertex with all decumbent scales broad, most or all dark. *Thorax* (fig. 9): Mesonotal disc typically with anterior silver band about 0.33-0.75 length of fossa; short silver acrostichal line often projecting caudad from anterior silver band; prescutellar space and scutellum without silver scales. *Legs*: Femur I with small posterior patch of silver scales in basal half; femur II without or with only a few posterior silver scales; tarsus I-II with median dark band about 0.33-0.67; femur III with basal dark band 0.13-0.19 (0.11-0.21), subapical dark band 0.18-0.23 (0.16-0.23); tarsus I-III with basal silver band 0.12-0.17 (0.09-0.19), apical silver band 0.17-0.21 (0.15-0.23). *Wing*: Vein C with basal line of silver scales reaching crossvein *h*; vein R without silver scales.

MALE. *Head*: Palpus usually about 2 labellum lengths shorter than proboscis, infrequently 1 labellum length; segment 3 usually with 1 or 2 short apical ventrolateral hairs and segment 4 with hairs of ventrolateral row usually short and sparse, but in Portobello area of Panama segment 3 with apical ventrolateral tuft of hairs as long as segments 4 and 5 combined and segment 4 with ventrolateral row of long, closely spaced hairs. *Thorax* (fig. 9): Mesonotal disc with about anterior 0.67 transversely silvered, posterior margin of silvered area usually an almost straight line; acrostichal and dorsocentral lines, often projecting caudad from transverse silvered area; *pra* hairs pale or dark. *Legs*: Tarsus I-II with median dark band complete, about 0.25-0.67.

MALE GENITALIA (figs. 9,11). *Sidepiece*: Length 0.25-0.30 mm; without specialized tufts of setae. *Prosophallus*: Length 0.07-0.10 mm; width 0.11-0.12 mm (0.10-0.12 mm); mesal lobe with lateral portion usually not appreciably inclined

or declivous mesad, usually inclined less than 15° (at about 15° in 1 specimen); stems parallel when short (fig. 11), divergent when long (fig. 9); filament not expanded distally, ratio 0.60-1.30. *Aedeagus*: Length 0.10-0.12 mm.

PUPA (figs. 9,11). *Abdomen*: Hair 2-II mesad of 3-II for 0.3 or more the distance from 1-II to 3-II, usually at least 0.4; 3-III usually branched [in most localities branched in both sexes; in Portobello area, Panama, single in male, branched in female].

LARVA (figs. 10,12). *Head*: Hair 7-C single to 6-branched [in most localities usually triple or 4-branched, in Portobello area usually double or triple]. *Antenna*: Hair 1-A reaching apex of antennal shaft; 2-A at least 3.0 length of distal portion of 6-A. *Thorax*: Hair 1-P usually double or triple (1-3); 4-P usually double or triple (2-4); 5, 7-P usually single or double (1-3); 3-M usually triple to 4-branched (2-4); 4-M usually 5-6 branched (4-6). *Abdomen*: Hair 3-III usually 5-6-branched (3-7); 10-III double to 4-branched; 3-VI double to triple (1-3); 4-VII usually triple to 4-branched (3-6); 10-VII double or triple; 12-VII usually triple or 4-branched (2-4). *Segment VIII*: Comb scales about 75 to more than 100; free portion of midapical scale shorter than or subequal in length to sessile portion, usually shorter, length 0.020-0.024 mm (0.018-0.027); hair 2-VIII usually triple to 4-branched (2-4). *Siphon*: Length 0.61-0.87 mm; L/S 2.63-2.78 (2.57-2.86); P/L 0.47-0.52 (0.46-0.54); H/L 0.55-0.59 (0.54-0.60); hair 8-S branched. *Anal Segment*: Saddle extending more than half-way around segment; ventral brush usually with 12 hairs (11-13); 4a-X usually 10-branched (9-14).

SYSTEMATICS. *Aedes thorntoni* can be differentiated from all the other species of the Terrens Group in the adults by the form of the silver markings of both sexes and in the larva by the often highly branched condition of hairs 3,4-M, 3,10-III, 4,10,12-VII and 2-VIII.

The population of the Portobello region of Panama differs from the others in 2 obvious respects, (1) the male palpus shows a denser and longer vestiture of hairs and (2) pupal hair 3-III is single in the male and branched in the female (6 specimens) whereas in the other populations the hair is branched in both sexes.

DISTRIBUTION (fig. 2). Atlantic lowlands, from Nicaragua to Panama; Canal Zone; Pacific lowlands of provinces of Panama and Darien, Panama. Material examined: 803 specimens; 240 ♂, 229 ♀, 185 pupae, 148 larvae; 103 individual rearings (75 larval, 25 pupal, 3 incomplete). For the Komp collections see the explanatory chapter.

✓ COSTA RICA. *Limon*: Chase [elev. 0-700 ft], 1 ♂ (221) [USNM].

✓ NICARAGUA. *Zelaya*: Bluefields, W. Thornton, 6 ♀ (10), type series [USNM].

PANAMA. *Bocas del Toro*: Bocas-Chiriqui road, nearest town Almirante (elev. near sea level), 6 May 1943, treehole, 1 p♂ (PA 328-103) [UCLA]. *Canal Zone*: Barro Colorado Island [elev. 100-500 ft], 24 July 1923, H. Dyar, R. Shannon, 1 ♀ (P29-II); 27 July 1923, H. Dyar, R. Shannon, 1 ♀ (P29-3); 28 July 1923, H. Dyar, R. Shannon, 1 p♂ (P29-1); 16 Aug 1923, H. Dyar, R. Shannon, 1 ♀ (P29-II); Jan 1935, 1 ♂ [USNM]; 26 July 1935, L. Rozeboom, 3 ♂ (PAR 81) [UCLA]; 15 Apr 1939, W. Komp, 1 ♀ (207E-3); 8 Jan 1943, treehole, 1 ♂ (207B-21); 7 May 1943, double treehole, W. Komp, 1 l♂ (207A-2) – treehole, 1 l♂ (207A-33) – 1 ♂ (207B-34) – treehole, 1 lp♂ (207B-38); 21 May 1943, treehole, G. Fairchild, 1 lp♂ (207A-19); 21 May 1943, hole in stilt palm, W. Komp, 2 l♂ (207A-25,27), 4 l♀ (207A-5,26,40; 207D-20), 2 ♂, 2 l (207D-9); 21 May 1943, treehole, 1 l♂ (207A-39), 1 lp♀ (207A-42) – small treehole, 1 l♂ (207D-15), 1 l♀ (207A-15) – 1 ♀, 21 (207A-21) – 2 l♀ (207A-35) – treehole, 3 ♀, 2 l (207A-38) – 3 ♀, 3 l (207A-41) – treehole, 1 ♂, 3 ♀ (207A-44) – deep double treehole, 2 ♂, 1 ♀, 4 l (207B-7) – large treehole, 1 l♀ (207B-11) – stilt roots, 1 ♂, 1 ♀ (207D-12); May 1943, treeholes, W. Komp, 2 ♂ (207A-32); 26 April 1945, treehole, W. Komp, 1 l♀ (207E-15); 15 May 1945, treehole, W. Komp, 1 lp♂ (207C-21; 207D-3), 4

1p♀ (207C-29; 207E-16,19,30), 4 ♂, 4 ♀ (207C-27), 1 ♂, 3 ♀ (207C-43), 2 ♀, 2 l (207D-30), 1 l (207C-15) – treehole, 2 lp♀ (207C-40; 207D-37) – treehole, 1 ♂, 1 P, 1 p, 2 l (207C-44), 1 ♂, 1 ♀, 2 p, 3 l (207D-24) – 1 lp♂ (207C-4) – treehole, 1 ♂ (207C-18) – 1 lp♂ (207C-31) – treehole, 1 lp♂ (207E-31) – 1 l♂ (207E-34); 22 May 1945, large treehole, W. Komp, 3 lp♀ (207C-30,36; 207D-44), 4 ♂ (207C-37), 1 ♂ (207C-32), 1 ♂ (207D-33), 2 ♂, 1 ♀ (207D-38), 1 ♀ (207E-23) – treehole, 1 ♀ (207D-35), 1 ♂, 1 p, 2 l (207E-25), 2 ♂, 5 ♀ (207D-34), 2 ♀, 2 l (207C-9) – 1 lp♀ (207C-16) – 1 ♂ (207C-39) – low stump, 1 lp♀ (207D-41); 23 May 1945, stilt palm, W. Komp, 1 lp♂ (207D-42), 1 l♂ (207E-17), 4 ♂, 2 ♀ (207D-29) – 1 ♀ (207D-25) – treehole, 1 ♂, 1 ♀, 2 l (207E-14); 1945, treehole, W. Komp, 1 ♂ (207D-23) [UCLA; USNM]. Camacho, 14 Jan 1922, J. Shropshire, 1 ♀; 17 Mar 1922, J. Shropshire, 2 ♀; 3 June 1922, J. Shropshire, 4 ♂, 1 ♀; 4 June 1922, J. Shropshire, 1 ♂; 8 Aug 1923, H. Dyar, R. Shannon, 1 ♀ (P64) [USNM]. Chiva Chiva, elev. 0-600 ft, Oct 1941, treehole, 1 ♂ (207B-42); 11 Nov 1965, treehole, height 2-4 ft, A. Quinonez (PA 768-700,772,773), 7 lp♂ (769-20,22-24,26; 773-21,23), 7 lp♀ (769-21,27-29; 770-11; 772-10; 773-22), 6 p♂ (769-25,100; 770-100; 773-100-102), 3 lP (770-10; 772-11; 773-20), 2 ♀, 5 p, 2 l (768-4), 6 p, 2 L (769-2), 2 ♂, 1 ♀, 1 P, 11 p, 2 l (770-1), 1 ♂, 5 ♀, 5 p, 1 L (772-1), 6 ♂, 7 ♀, 11 p (773-2) [UCLA]. Corozal [elev. 0-100 ft], 13 Jan 1943, “ant treehole”, 8 ♂, 16 ♀ (207B-22); 6 May 1943, 1 ♂, 2 ♀ (207B-36), 1 ♂ (207B-20); 12 Jan 1944, bamboo, W. Komp, 1 * (207D-17), 1 ♀, 2 l, 2 p (207D-14), 1 ♀ (207D-19); 3 May 1945, “square treehole”, W. Komp, 1 ♂ (207C-5) – treehole, 1 lp♂ (207C-17) – 1 ♂, 2 ♀ (207C-28); 4 May 1945, W. Komp, 1 l♂ (207C-12) – “square treehole”, 1 ♂, 1 ♀ (207C-22) – treehole, 1 l♂ (207C-33); date not specified, 1 ♂ (207B-25) [UCLA; USNM]. Corozal Damsite, 28 July 1943, bamboo, W. Komp, 1 ♂ (207A-36) – 1 ♂, 1 ♀ (207D-18); Aug 1943, bamboo, W. Komp, 1 ♂ (207A-12); 18 Sept 1943, bamboo, W. Komp, 2 lp♀ (207A-3,33), 1 ♂ (207A-30); 12 Jan 1944, W. Komp, 2 ♂, 1 ♀, 3 l, 3 p (207D-16); 3 May 1945, W. Komp, 1 ♂, 1 ♀, 2 l (207C-23) [UCLA; USNM]. Corozal Hospital grounds, 7 Sept 1943, treehole, H. Herman, 1 lp♀ (207A-16), 2 p♀ (207A-14,18) [UCLA; USNM]. Cruces Trail, Madden Forest, elev. 200-600 ft, 17 Sept 1964, large treehole, height 5 ft (PA 707), 1 lp♂ (707-31), 2 lp♀ (707-36, 38), 1 p♀ (707-100), 7 L (707-3) [UCLA]. Empire [elev. 200-300 ft], 7 Aug 1923, H. Dyar, R. Shannon, 1 ♂ (P56-1); 8 Aug 1923, H. Dyar, R. Shannon, 1 ♀ (P56-2) [USNM]; 7 Aug 1944, treehole, Wood, Adams (ASM 86,88,89), 1 ♂ (86-2), 1 ♂ (88-2), 3 ♂ (89-1) [UCLA]. Fort Randolph [elev. near sea level], 22 Apr 1922, J. Shropshire, 1 ♀ [USNM]. Fort San Lorenzo, 20 Aug 1923, H. Dyar, R. Shannon, 1 ♂, 1 ♀ (P95) [USNM]. Fort Sherman [elev. near sea level], 1916, L. Dunn, 1 ♂, 1 ♀ (C-53), 1 ♀ (C71=C53), 1 ♀ [USNM]; 26 Oct 1948, 1 ♀ (25); 5 May 1949, 4 ♂ (174); 6 May 1949, 1 ♂; 12 Aug 1949, 3 ♂; 19 Aug 1949, 1 ♂; 2 Sept 1949, 1 ♀; 9 Sept 1949, 2 ♂, 1 ♀ [UCLA]. France Field [elev. near sea level], 1 Jan 1925, J. Shropshire [USNM]; 26 Oct 1948, 1 ♂ (35) [UCLA]. Firjoles, elev. ca. 50 ft, 1 Dec 1965, large treehole, height 5 ft, R. Schick, A. Quinonez (PA 844), 1 lp♂ (844-10), 2 p♂ (844-101-102), 2 p♀ (844-100,103) [UCLA]. Gamboa [elev. 100-200 ft], 10 June 1943, Elton, 1 ♂, 1 ♀ (207D-21) [UCLA]. Gatun [elev. 100-200 ft], 8 Aug 1923, H. Dyar, R. Shannon, 1 ♂ (P61); 21 July 1926, D. Curry, 1 ♂, 1 ♀; 21 Aug 1926, D. Curry, 4 ♂, 3 ♀ [USNM]; 24 Sept 1964, treehole, height 15 ft (PA 712), 1 lp♂ (712-34), 9 lp♀ (712-30-33,35-39), 2 p♂ (712-104,111), 5 p♀ (712-101-103,112,114), 23 ♂, 13 ♀, 2 P, 54 p, 6 L, 8 l (712-3) [UCLA]. Gold Hill [elev. 0-700 ft], 9 Dec 1921, J. Shropshire, 1 ♂ [USNM]. Juan Mina [elev. 100 ft], 18 Jan 1963, treehole, height 1 ft, 1 lp♀ (PA 5-101) [UCLA]. Largo Remo [elev. near sea level], 27 July 1926, D. Curry, 3 ♂, 1 ♀, 11 Aug 1926, D. Curry, 3 ♂, 1 ♀ [USNM]. Majagual, 3 Dec 1921, J. Shropshire, 9 ♂, 3 ♀; 14 Jan 1922, J. Shropshire, 4 ♂, 3 ♀; 11 Feb 1922, J. Shropshire, 1 ♀; 22 Apr 1922, J. Shropshire, 2 ♂ [USNM]. Mandingo (? Mandinga), 13 Dec 1921, J. Shropshire, 4 ♂, 1 ♀; 14 Dec 1921, J. Shropshire, 1 ♂, 1 ♀ [USNM]. Margarita [elev. 0-100 ft], 21 Jan 1922, J. Shropshire, 3 ♂, 2 ♀; 12 Aug 1922, J. Shropshire, 2 ♀; 19 Aug 1922, J. Shropshire, 1 ♂, 3 ♀; 2 Dec 1922, J. Shropshire, 2 ♂, 1 ♀ [USNM]. Minda [elev. 0-100 ft], 28 July 1923, H. Dyar, R. Shannon, 1 ♂ (P40-II); 5 Aug 1923, H. Dyar, R. Shannon, 1 ♀ (P40-1) [USNM]. Quarry Heights, 14 Sept 1949, S. Carpenter, 2 ♀; 15 Nov 1949, S. Carpenter, 1 ♂ [UCLA]. Rio Chagres, upper, treehole, A. Busck, 2 ♀ (141) [USNM]. Rio Curundu, upper, 23 Aug 1923, treehole, H. Crowell, 1 l♂ (207A-13) [UCLA; USNM]. Sweetwater [elev. 0-100 ft], 1 Mar 1922, J. Shropshire, 3 ♂, 3 ♀ [USNM]. Summit [elev. 200-300 ft], 13 Apr 1939, W. Komp, 1 ♂ (207E-8); 13 Sept 1939, W. Komp, 2 ♀ (207E-2) – 1 ♀ (207E-6) – 1 ♀ (207E-9); 13 Dec 1939, treehole, W. Komp, 1 ♂ (207E-4); 17 Aug 1941, high treehole in Mango, 2 ♀ (207B-

17), 1 ♀ (207B-16) – *Ficus* treehole, 2 ♂ (207B-31), 1 ♂ (207B-35), 1 ♀ (207B-26) [UCLA]. Tabernilla [elev. 0-100 ft], 30 July 1908, A. Jennings, 2 ♂ (397,405), 1 ♀ (398.2); 14 Aug 1908, A. Jennings, 4 ♀ (418,423,423.1,423.2); 22 Dec 1908, A. Jennings, 1 ♂ (458.2) [USNM]. Toro Point [elev. near sea level], 28 Jan 1922, J. Shropshire, 1 ♂; 13 Apr 1922, J. Shropshire, 4 ♂; 19 Apr 1922, J. Shropshire, 1 ♂ [USNM]. Huile, near, elev. 100-300 ft, 7 Dec 1965, small treehole, height 4 ft, A. Quinonez (PA 875), 1 lp♀ (875-10), 1 L (875-1) [UCLA]. Locality not specified, 14 Feb 1924, C. Ludlow, 8 ♀; 25 Aug 1923, H. Dyar, R. Shannon, 1 ♂ (PII) [USNM]. *Colon*: Portobello, elev. near sea level, 5 Dec 1963, large treehole (PA 586), 1 lp♀ (586-102), 3 p♂ (586-101,103,105) [UCLA]. Rio Caldera, elev. near sea level, 6 Dec 1963, large treehole (PA 592), 3 lp♀ (592-101-102,104), 1 IP (592-105), 8 L (592-2) [UCLA]. *Darien*: Jaque [elev. near sea level], 3 July 1945, W. Komp, 1 l; 4 July 1945, W. Komp, 6 l [USNM]; July 1945, W. Komp, 1 ♂, 1 ♀ (207E-32), 1 ♂, 1 ♀ (207E-33), 1 ♂ (207E-35) [UCLA]. Santa Fe, elev. 200 ft, 22 Nov 1966, treehole, height 2-3 ft, O. Berlin (PA 944,945), 1 p♂ (945-100), 2 p♀ (944-100; 945-101); 9 Dec 1966, treehole, height 15 ft, O. Berlin, Lineres (PA 992), 1 lp♀ (992-10), 1 p♂ (992-101), 1 p♀ (992-100), 1 ♀ (992-100), 1 ♀ (992-1) [UCLA]. *Panama*: La Chorrera [elev. 0-300 ft], 17 Oct 1944, large treehole, Adams, 1 ♂, 1 ♀ (ASM 210-1) [UCLA]. Panama [elev. near sea level], 9 Sept 1926, D. Curry, 2 ♂ (26,26i), 1 ♀ (25a) [USNM].

2. *Aedes* (*Finlaya*) *argyrothorax* Bonne-Wepster & Bonne

Figs. 2,13,14

1920. *Aedes argyrothorax* Bonne-Wepster and Bonne, 1920:179. TYPE: *Holotype* ♂ (3925) with genitalia (BB 353, M52), Geiersvlijt, an estate near Paramaribo, Surinam, near a treehole [ITH]. Type data from Belkin (1968:4).

Aedes (*Finlaya*) *argyrothorax* of Dyar 1921:153; Bonne and Bonne-Wepster (1925:422,424); Dyar (1928:226); Shannon (1931a:8; 1931b:148); Edwards (1932:149); Chagas, Cunha et al (1937:388); Kumm and Novis (1938:502); Lane (1939:101-102; 1953:688-690); Floch and Abonnenc (1942a:5; 1942b:6; 1947:9-10,12); Cerqueira (1950:173-178); Del Ponte, Castro and Garcia (1951:239-240); Knight and Marks (1952:523,546); Horsfall (1955:457); Stone, Knight and Starcke (1959:159); Fauran (1961:28); Stone (1961:40); Belkin, Schick and Heinemann (1965:63); Forattini (1965:377,389-390); Belkin (1968:4).

Aedes (*Gualteria*) *argyrothorax* of Vargas (1950a:62).

Aedes oswaldi in part of Howard, Dyar and Knab (1917:819).

Gualteria oswaldi of Aiken (1909:12-13).

FEMALE. *Head*: Vertex with all decumbent scales broad, most or all dark. *Thorax* (fig. 13): Mesonotal disc not transversely silvered, with a few scattered silver scales along acrostichal line; prescutellar space with or without silver scales; scutellum without silver scales. *Legs*: Femur I with well-developed posterior patch of silver scales in basal half; femur II usually without posterior patch of silver scales or with patch represented by a few scattered scales, patch in Brazil sometimes well developed; tarsus I-II with median dark band about 0.5; femur III with basal dark band 0.18-0.20 (0.16-0.21), subapical dark band 0.12-0.16 (0.11-0.17); tarsus I-III with basal silver band 0.08-0.10 (0.06-0.11), apical silver band 0.20-0.24 (0.19-0.27). *Wing*: Vein C with line of silver scales extending about 0.5 to crossvein *h* or up to crossvein itself; vein R with basal silver scales usually forming small patch, sometimes a line extending about 0.5 to level of *h*.

MALE. *Head*: Palpus about 4-7 labellum lengths shorter than proboscis; segment 3 with 1 short apical ventrolateral hair; segment 4 with hairs of ventrolateral row

short and sparse. *Thorax* (fig. 13): Mesonotal disc with about anterior 0.5 transversely silvered, posterior border of silvered area shallowly emarginate; acrostichal and posterior dorsocentral lines absent; *pra* hairs as in female. *Legs*: Tarsus 1-II with median dark band usually complete, about 0.33-0.5, incomplete in some specimens from the Guianas.

MALE GENITALIA (fig. 13). *Sidepiece*: Length 0.29-0.33 mm; basal tergomesal area with dense tuft of fine setae; median sternomesal tuft present but not prominent. *Prosopallus*: Length 0.13-0.14 mm; width 0.14-0.15 mm; mesal lobe with lateral portion declivous laterad; stems convergent; filament foliaceous and striated (ratio not calculated because of unique structure). *Aedeagus*: Length 0.15 mm.

PUPA (fig. 13). *Abdomen*: Hair 2-II mesad of 3-II for 0.2 or more the distance from 1-II to 3-II, usually 0.3 or more; 3-III branched in both sexes.

LARVA (fig. 14). *Head*: Hair 7-C usually double or triple (2-4). *Antenna*: Hair 1-A not reaching apex of antennal shaft; 2-A about 2.0 length of distal portion of 6-A. *Thorax*: Hair 1-P usually single or double (1-3); 4-P single or double; 5,7-P single; 3,4-M double or triple. *Abdomen*: Hair 3-III usually double (2-3); 10-III usually double (1-2); 3-VI double; 4,10,12-VII double. *Segment VIII*: Comb scales 55 to about 70; free portion of midapical scale shorter than sessile portion, length 0.017-0.021 mm (0.019-0.021); hair 2-VIII usually double (2-3). *Siphon*: Length 0.61-0.75 mm; L/S 2.38-2.86 (2.13-2.86); P/L 0.48-0.52 (0.46-0.53); H/L 0.54-0.57 (0.54-0.58); hair 8-S single. *Anal Segment*: Saddle usually extending less than half-way around segment; ventral brush usually with 10 hairs (10-11); 4a-X usually 8-branched (7-9).

SYSTEMATICS. *Aedes argyrothorax* shows many unique features in the male genitalia. In addition to the foliaceous claspette filament and laterally declivous margin of the mesal lobe of the prosopallus, mentioned in the description, there are the following characters: (1) sidepiece with sternomesal convexity subapical in position, (2) clasper not markedly tapered distally, the axis distinctly curved, (3) median lobe of prosopallus virtually obsolete and mesal lobe greatly reduced laterally (consequently declivous laterad), and (4) paraproct with several small teeth at apex. The male is further distinguished by the very short palpus and the broad and only slightly emarginate anterior silver marking of the mesonotal disc. The larva is characterized by the hairs generally with few branches, hair 8-S, in particular, being single (multiple in the other species); also, the anal saddle is more widely incomplete than in the other species.

A series of females from Iquitos, Peru, are treated here as *argyrothorax*. Their identity, however, remains in doubt since the male is not represented and since all other records of this species are from coastal areas.

Cerqueira (1943:32), Martinez (1950:38) and Prosen, Carcavallo and Martinez (1964:102) have reported *argyrothorax* from the department of Santa Cruz in Bolivia, far south of the confirmed range of the species. These records probably represent a species of the Terrens Subgroup rather than *argyrothorax*.

DISTRIBUTION (fig. 2). Coastal lowlands from eastern Venezuela south to state of Rio de Janeiro, Brazil; Iquitos, Peru, based upon questionable determination. Material examined: 78 specimens; 11 ♂, 22 ♀, 18 pupae, 27 larvae; 8 individual rearings (6 larval, 1 pupal, 1 incomplete).

✓ **BRAZIL**. *Amapa*: Macapa [elev. near sea level], May 1948 (1587), 2 lp♀ (1587-5.9), 1 ♂ (1587-1), 1 lp (458, adult number unknown) [USNM]. *Ceara*: Serra da Pacoti (Cerqueira 1950:177). *Guaranabara*: Rio de Janeiro, Feb 1938, 1 ♂ [USNM]. *Para*: Cameta [elev. near sea level] (Cerqueira 1950:177). Curralinho [elev. near sea level], Feb 1936, 1 ♂ (1178) [USNM]. Igarape-Miri [elev. 0-

300 ft] and Nova Timboteua (Cerqueira 1950:177). *Pernambuco*: Recife [elev. near sea level] (Cerqueira 1950:177). *Rio de Janeiro*: Mangaratiba [elev. 0-300 ft], Dec. 1938, 2 ♂ [USNM].

FRENCH GUIANA. *Guyane*: Cabassou [elev. 0-100 ft], 31 Jan 1965, small treehole, height 1-3 ft, T. Aitken, R. Martinez, A. Guerra (FG 12,14), 1 lp♂ (12-11), 3 lp♀ (12-12,13; 14-12), 1 p♀ (14-11), 1 ♂, 3 p (12-10), 1 ♂, 4 p, 7 L (12-1), 13 L (14-1) [UCLA]. *Inini*: Langa Tabiki (Maroni River, ca 75 km S Saint Laurent) [elev. 0-300 ft], Oct 1947, 1 ♂ (FGA 46-1) [UCLA]. *Political subdivision not specified*: Maroni River, Oct 1947, 1 ♂, 6 ♀ (FGA 45-1) [UCLA]. *Locality not specified*: 1944, H. Floch, 1 ♀ [UCLA].

↓ GUYANA. *North West*: Mabaruma [elev. 0-300 ft], 22 Dec 1945, Anne Peberdy, 3 ♀ (207E-39) [UCLA].

↓ PERU. *Loreto*: Iquitos [elev. 300-700 ft], 5 ♀, R. Shannon [USNM].

↓ SURINAM. *Nickerie*: Corentyne River (Corantijn; probably vicinity of Oreala or Epira, Guyana) [elev. 0-300 ft], 1 July 1907, J. Aiken, 1 ♀ (DG-3) [USNM]. *Suriname*: Paramaribo [elev. near sea level], in house, 1 ♂ [USNM 22713]. Geiersvliet (near Paramaribo) [elev. near sea level] (holotype) [ITH].

↓ VENEZUELA. *Delta Amacuro*: Manoa [elev. near sea level], 10 Jan, F.L. de V., 2 ♀. Manoa Woods, 10 Jan, F.L. de V., 1 ♀ [USNM].

Bertrami Subgroup

ADULT (female only). *Head*: Vertex with decumbent scales along longitudinal midline narrow; occiput with erect scales pale; proboscis subequal in length to femur I. *Thorax*: Mesonotal disc with very broad anterior silver band; complete acrostichal or posterior dorsocentral lines absent; acrostichal setae absent; fossal macula coextensive with fossa; supraalar macula truncate posteriorly, broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales present; *pra* hairs predominantly pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with narrow apical silver band; femur II with knee spot broad, the silver scales extending basad of anterior subapical setae; tarsus 1-II with median dark band complete, narrow; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band incomplete; tarsus 5-III without silver scales. *Wing*: Vein C with small basal patch of silver scales.

PUPA, LARVA. Unknown.

DISCUSSION. The monobasic Bertrami Subgroup, known only by a single adult female, is distinguished from the other subgroups by the very broad anterior band of the mesonotum. The supraalar macula is posteriorly truncate as in the Thorntoni Subgroup.

The form of the supraalar macula suggests a phyletic relationship of the Bertrami and Thorntoni Subgroups. The transversely silvered mesonotal disc and the lowland distribution in British Honduras just to the north of the northern limits of *thorntoni* in the coastal lowlands of Central America (fig. 2) is further suggestive of a relationship with the Thorntoni Subgroup.

3. *Aedes* (*Finlaya*) *bertrami* Schick, n.sp.

Figs. 2,11

TYPE: *Holotype* ♀ (BH 395-2), new capital site, 0.6 mi above jct of Belize-Cayo Road and

Hummingbird hwy, Cayo, British Honduras [elev. 200 ft], 8 Aug 1967, biting-landing, 1800-1830 hrs, D.S. Bertram [USNM].

FEMALE. *Head:* Decumbent scales laterad of median longitudinal line broad, forming dark macula bounded by silver and clear scales. *Thorax* (fig. 11): Mesonotal disc with anterior silver band equal in length to fossa; acrostichal line absent; prescutellar space and scutellum with silver scales. *Legs:* Femora I and II with well-developed posterior patch of silver scales in basal half, subequal in size, median dark band of tarsus 1-II about 0.25; femur III with basal dark band incomplete, very poorly developed, subapical dark band 0.22; tarsus 1-III with basal silver band 0.09, apical silver band 0.26. *Wing:* Vein R without silver scales.

MALE, PUPA, LARVA. Unknown.

✓ **DISTRIBUTION** (fig. 2). Coastal lowlands of British Honduras. Known only by holotype female; no individual rearings.

Terrens Subgroup

ADULTS. *Head:* Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of females with all erect scales pale or with mixture of pale and dark scales, of males with all erect scales pale; palpal segment 3 of males with several long apical ventrolateral hairs forming tuft as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row long, closely spaced. *Thorax:* Mesonotal disc of females not transversely silvered, of males with narrow to moderately broad anterior silver band or not transversely silvered; complete acrostichal line rarely present and posterior dorsocentral line absent in females; acrostichal setae present or absent; fossal macula of females not coextensive with fossa, of males coextensive or not coextensive with fossa; supraalar macula not truncate posteriorly, in females broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales present or absent; *pra* hairs of females pale or dark; upper *stp* and *mep* scale patches not contiguous. *Legs:* Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with or without narrow apical silver band; femur II with knee spot broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band usually complete and moderately broad; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band complete, broad; tarsus 5-III without silver scales. *Wing:* Vein C of females with small basal patch of silver scales or line reaching crossvein *h*, of males with line reaching *h*; vein R of males with small basal patch of silver scales or line reaching level of *h*; vein Cu of males without silver scales.

MALE GENITALIA. *Sidepiece:* Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophallus:* Mesal lobe with lateral portion usually not inclined or inclined at 15° or less from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPAE. *Cephalothorax:* With or without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C usually single. *Abdomen:* Hair 1-I with primary branches predominantly multiple; 2-II usually not laterad of 3-II, usually mesad of 3-II for 0.3 or more the distance from 1-II to 3-II; 3-III usually single. *Paddle:* Pigmented; apex not or at most weakly produced; hair 1-P shorter than paddle.

LARVAE. *Head:* Hair 5-C usually single, at most triple; 6-C usually single, at most

double; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C about subequal in length to or longer than mental plate, single; *bmh* single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P usually single; 3-M usually single; 4-M double to multiple; 8-T shorter than but more than half length of metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double to multiple; 10-III usually single; 3-VI usually single; 4-VII branched; 5-VII caudad of 4-VII, usually less than half length of, or at most about equal to half length of 3-VII; 10,12-VII single or branched. *Segment VIII*: Midapical comb scale with free portion shorter than or subequal in length to sessile portion; hair 2-VIII single or branched. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. Five species are recognized in the Terrens Subgroup, *terrens*, *braziliensis*, *zavortinki*, *apollo* and *berlini*. The adults are difficult to characterize because of the great amount of variation and the few characters that are constant do not serve to separate the subgroup from some of the others. The adults can be recognized in general by the combination of the narrow curved scales along the longitudinal midline of the vertex, the anterior silver band on the mesonotal disc of the male, the broadly joined fossal and supraalar maculae, the complete and broad band of femur III and the tarsi which show the typical banding pattern of the group. However, only the characters of the vertex scales, joined maculae and tarsal banding pertain to all the species. The male genitalia and pupae do not show distinctive subgroup characters. The larvae are characterized by the combination of the single to triple hairs 5,6-C, the normal length of 7,11-C, 8-T and 5-I (as opposed to the short condition as in the Thorntoni Subgroup) and the branched 4-VII.

The Terrens Subgroup is the dominant subgroup on the Atlantic side of South America and is distributed from the Canal Zone southward into Bolivia, northern Argentina and southeastern Brazil. As suggested in the chapter on Systematics and Evolution, this subgroup is rather primitive and represents the ancestral stock of the southern subgroups of the Terrens phyletic line that occur in the Atlantic drainages of Panama and South America.

The treatment of the Terrens Subgroup must be considered as quite preliminary. The female of *braziliensis* and male of *berlini* are unknown and the identity of *braziliensis* is in doubt. More material is necessary to properly determine and characterize the species found in northeastern South America because of the complexity of the subgroup in the region. Many of the specimens cannot be satisfactorily placed with the known species and may represent variants of these species, hybrids or unrecognized species (see *terrens* and *apollo*). More material is also necessary to properly characterize *terrens* in Brazil because of the considerable variation of this species. Besides the possibility of more species existing in northeastern South America, 2 or 3 undescribed forms are present in northwestern Argentina and probably in Bolivia (see *argyrothorax* and *terrens*).

Aedes braziliensis, *zavortinki*, *apollo* and possibly *terrens* appear to form a species complex, *zavortinki* and *apollo* probably being the most closely related. *Aedes berlini* stands apart from the others because of the absence of *ssp* scales and the long hair 7-VII of the pupa. Perhaps this species should be set aside as a separate subgroup; the discovery of the male should help clarify its placement.

4. *Aedes* (Finlaya) *terrens* (Walker)

Figs. 3,7,8,15,16

1856. *Culex terreus* Walker, 1856:429. TYPE: *Holotype* ♂ with attached genitalia mount, South America [BM]. Type data from Belkin (1968:8).
1904. *Gualteria oswaldi* Lutz *In Bourroul*, 1904a:13; 1904b:4; Lutz, 1905:65-66. TYPE: Adults, states of Rio de Janeiro (? in part Guanabara) and Sao Paulo, Brazil, "sylvan, principally in the forests of the mountains" [translation mine] [BM, other material possibly in IOC or FMP]. Type data from Belkin (1968:6). Synonymy with *terrens* by Dyar 1921:152.
- Aedes* (Finlaya) *terrens* of Shannon (1931a:8,23); Duret and Barreto (1956:90); Belkin (1968:8).
Aedes terreus of Bonne-Wepster and Bonne (1921:23); Davis and Shannon (1931:716); Shannon, Whitman and Franca (1938:110-111); Antunes and Lane (1938:1036); Causey, Kumm and Laemmert (1950:302,304); Alvarado, Coll, et al (1959:194); Causey, Causey, et al (1961:235).
Aedes (Finlaya) *terrens* in part of Dyar (1921:152-153; 1928:224-225); Bonne-Wepster and Bonne (1925:424-428); Shannon (1931b:147-148); Edwards (1932:150); Lane (1939:104-105; 1953:686-687); Horsfall (1955:462); Stone, Knight and Starcke (1959:171); Forattini (1965:395-396).
Aedes (*Gualteria*) *terrens* of Vargas (1950a:62).
Stegomyia terreus of Theobald (1901:305-306; 1910:174); Giles (1902:378); Lutz (1905:66); Surcouf and Gonzales-Rincones (1911:135).
Culex terreus of Giles (1900:241); Theobald (1901:423; 1905:26).
Aedes (Finlaya) *oswaldi* of Belkin (1968:6).
Aedes oswaldi of Howard, Dyar and Knab (1917:815-819); Dyar (1918:73,80); Bonne-Wepster and Bonne (1920:23-24).
Haemagogus oswaldi of Dyar and Knab (1906a:166).
Gualteria oswaldi of Blanchard (1905:633); Theobald (1907:552-554); Peryassu (1908:45,64,177-179); Theobald (1910:606); Surcouf and Gonzales-Rincones (1911:149).
Aedes (Finlaya) *terrens* var. *podographicus* of Costa Lima (1930:257-258); Lane (1936a:11).
Aedes terreus var. *podographicus* of Lane (1936b:131).

FEMALE (figs. 7,15). *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, narrow curved; occiput with erect scales usually all pale. *Thorax* (fig. 15): Acrostichal line usually absent (complete line present in Teresopolis, Brazil); acrostichal setae usually absent, when present most posterior seta usually at about 0.25 from anterior end, rarely as far caudad as 0.5; fossal macula separated from lateral margin of fossa by a variably developed but usually prominent area of dark scales, infrequently by only a few dark scales, often divided into anterior and posterior portions; prescutellar space and scutellum with or without silver scales; *ssp* scales present; *pra* hairs usually pale (dark in 1 specimen from Londrina, Brazil). *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II often larger; tarsus I-II with median dark band complete, about 0.33-0.5; femur III with basal dark band 0.11-0.17, subapical dark band 0.24-0.33 (0.17-0.33); tarsus I-III with basal silver band 0.07-0.09 (0.04-0.10), apical silver band 0.19-0.25 (0.16-0.26). *Wing*: Vein C with silver scalation at base from small patch to line reaching crossvein *h*; vein R without silver scales or with a small basal patch.

MALE (figs. 8,15). *Head*: Vertex with decumbent scales laterad of median longitudinal line silver, generally narrow curved; palpus subequal in length to or 1 labellum length shorter than proboscis. *Thorax* (fig. 15): Mesonotal disc usually without anterior silver band, rarely with very narrow band a single row of scales in

width (Rio Cururipe, Brazil) and with or without strip of silver scales bordering fossal macula; fossal macula usually not reaching mesal margin of fossa, but in Salvador region of Brazil often coextensive with fossa (in latter case strip of silver scales bordering macula present); *pra* hairs as in female. *Legs*: Tarsus 1-II with median dark band variably developed [in Salvador region and occasionally farther south incomplete or narrow, less than 0.33; in southern Brazil usually complete, at least about 0.33]. *Wing*: Vein R with silver scalation at base forming small patch or interrupted line reaching level of crossvein *h*.

MALE GENITALIA (fig. 15). *Sidepiece*: Length 0.31-0.38 mm. *Prosopallus*: Length 0.09-0.13 mm; width 0.11-0.14 mm; mesal lobe with lateral portion in Salvador region of Brazil usually inclined less than 15° from horizontal, sometimes not appreciably inclined, and in only genitalia from other locality, Cambara, Brazil, between 15° and 30°; stems usually divergent, sometimes parallel, filament ratio 0.51-0.84 (0.42-1.07; 2 highest values, 1.00 and 1.07, possibly due to abnormal inclination of filament). *Aedeagus*: Length 0.13-0.14 mm.

PUPA (fig. 15). *Cephalothorax*: Without pale inverted V-shaped marking. *Abdomen*: Hair 2-II mesad of 3-II for 0.4 or more the distance from 1-II to 3-II; 3-III single; 7-VII not reaching caudolateral margin of sternite VIII. *Paddle*: Not tapered; apex not produced; ventral midrib weakly pigmented for most of the length, more strongly at apex.

LARVA (fig. 16). *Head*: Hair 5-C usually double or triple (1-4); 6-C usually single or double, infrequently triple; 7-C triple to 9-branched [in Novo Iguassu, Brazil, triple to 5-branched; in other localities 6-9 branched]; 14-C longer than mental plate, particularly long in Anapolis, Brazil. *Thorax*: Hair 1-P usually double or triple (2-4); 4-P usually double or triple (1-4); 5-P usually double (2-3); 7-P usually triple (2-4); 14-P single; 3-M usually single (1-2); 4-M double or triple. *Abdomen*: Hair 3-III double to 4-branched; 10-III single, infrequently double; 3-VI single or double; 4-VII double to 4-branched; 5-VII usually less than half length of 3-VII, somewhat longer than half length in Cha Pilar, Brazil; 10-VII usually double (1-2); 12-VII single to triple. *Segment VIII*: Comb scales 33-85; length of free portion of midapical scale 0.022-0.026 mm; hair 2-VIII usually double (1-2). *Siphon*: Length 0.75-1.02 mm; L/S 1.96-2.28; P/L 0.44-0.45; H/L 0.48-0.62. *Anal Segment*: Ventral brush usually with 14 hairs (13-15); 4a-X usually 8-branched (6-11).

SYSTEMATICS. Brazilian specimens of *terrens* show some marked variation in characters that are generally of a specific nature in the Terrens Group, in the female, the presence or absence of a complete acrostichal line and the development of either pale or dark *pra* hairs, and in the male the fossal macula coextensive or not coextensive with the fossa. The *mep* scale patch may be entire or transversely divided, the latter state being unique for the group.

There are populations of the Terrens Subgroup from northeastern South America whose identities are uncertain but which show some similarities to *terrens*. Among some females from the Maracay region of Venezuela, 2 are strikingly similar to those Brazilian specimens of *terrens* which show the characteristic sublateral fossal stripe (fig. 7); the *pra* hairs, however, are dark unlike those of typical *terrens*. The other females, perhaps conspecific with these 2, show a macula that is broadly developed up to the lateral margin of the fossa, a condition I have not encountered in Brazilian *terrens*. I hesitate to treat the 2 females as *terrens* since, among other possibilities, they may represent variants of a form found on the coast of Venezuela which is apparently related to *apollo* (see). More than 1 species may be represented in several collections from French Guiana (all probably from the Ile de Cayenne). The females

are similar to *terrens* except that the fossal macula is broadly developed up the lateral margin of the fossa. The mesonotum of the males is similar to that of the *terrens* from Rio Cururipe, Brazil (fig. 15), in that a narrow anterior mesonotal band is present and the fossal macula is coextensive with the fossa, but in some of the males the band is broader, about 0.25. The larva of 1 of these forms shows a triple hair 4-VII and double 2-VIII as in *terrens*. In northwestern Argentina *terrens* is apparently largely replaced by a form in which the fossal macula is absent, the basal band of femur III is incomplete and in which there are no silver scales at the base of wing vein C of the female. Specimens of this form came to my attention too late to be formally treated in the present revision.

DISTRIBUTION (fig. 3). Brazil, south of Amazon basin, Paraguay and northern Argentina, predominantly at elevations of 700-3300 ft. Material examined: 116 specimens; 29 ♂, 43 ♀, 13 pupae, 31 larvae; 12 individual rearings (4 larval, 4 pupal, 4 incomplete).

✓ ARGENTINA. *Misiones*: Iguazu [elev. 0-700 ft], 18 June 1927, R. Shannon, E. Del Ponte, 1 ♀ (217) [USNM]. *Tucuman*: Tafi Viejo [elev. 1600-3300 ft], 14 Mar 1927, R. Shannon, E. Del Ponte, 1 ♀ [USNM].

✓ BRAZIL. *Alagoas*: Cha Pilar [elev. 700-1600 ft], 1 L (2398) [USNM]. *Bahia*: Cururipe (? Coruripe in Alagoas), 28 Sept 1920, 1 ♂, 1 ♀ [USNM]. Piraja, 27 Dec 1928, treehole, N. Davis, R. Shannon, 1 p (27XII1), 1 l (27XII2); 7 Feb 1929, treehole, N. Davis, R. Shannon, 2 lp♂ (14II2, 15II1), 1 lp♀ (15II3), 2 ♂ (13II1, 14II3), 2 lp (13II1, 15II2), 1 l (14II1), 1 ♂, 1 ♀; 1 Mar 1929, treehole, N. Davis, R. Shannon, 1 lp (7III), 1 l (2III2); 13 Mar 1929, bamboo, N. Davis, R. Shannon, 1 lp (28-3-1); 10 Apr 1929, bamboo, R. Shannon, 1 ♂; 11 Apr 1929, treehole, R. Shannon, 1 ♂, 2 ♂ genitalia (28V6, 13); 16 July 1929, treehole, R. Shannon, 1 ♀ (24VII2), 10 l (19VIII, 2; 22VII1-6; 23VIII; 24VII1); Jan 1930, R. Shannon, 3 ♂; 1930, 1 ♀ [USNM]. Rio Cururipe (? Rio Coruripe in Alagoas), 13 Jan 1931, H. Kumm, 1 ♂ (BM 1933-503) [BM]. Locality not specified: 1930, 1 ♂, 1 ♀ [USNM]; H. Kumm, 1 ♂ (BM 1933-503) [BM]. *Goiás*: Anapolis [elev. 3300-6600 ft], Mar 1936, 1 ♀ (6989); date not specified, 5 ♂ (6600, 7131, 6844, 6989, 15389), 7 L (5557) [USNM]. *Guana-
bará*: Parque de Gavea (767), 1 ♂ (767-37), 2 ♀, 2 p, 2 l (767-56, 57) [USNM]. Rio de Janeiro, 21 Jan 1907, 1 ♀ (1034), Dec 1937, 4 ♀ [USNM]. *Mato Grosso*: Maracaju [elev. 1600-3300 ft], July 1937, 1 ♀; Nov 1937, 10 ♀; Dec 1937, 6 ♀; June 1938, 1 ♀; date not specified, 1 ♂, 2 ♀ [USNM]. *Minas Gerais*: Araxá [elev. ca 3300 ft], 2 L (26299) [USNM]. *Paraná*: Cambara [elev. 700-3300 ft], Sept 1936, 4 ♂ (11493); date not specified, 1 ♂ (11487) [USNM]. Londrina [elev. 700-1600 ft], Feb 1937, 1 ♀ (12458) [USNM]. *Rio de Janeiro*: Nova Iguaçu [elev. 0-300 ft], 3 L (3174) [USNM]. Teresopolis [elev. 1600-3300 ft], Nov 1942, 1 ♀ (12/28774); Dec 1942, 1 ♂ (1/29078) [UCLA]. *São Paulo*: Cantareira..., Jan 1944, treehole (1277), 1 p♂ (1277-31), 3 p♀ (1277-8, 12, 15) [USNM]. Rio Buri (533) [USNM]. Rocinha, 20 Feb 1937, human bait in forest, A. Ramo, 1 ♀ (744) [USNM].

✓ PARAGUAY. *Cordillera*: San Bernardino [elev. 700-1600 ft], Fiebrig, 1 ♀ [USNM].

5. *Aedes* (Finlaya) *braziliensis* Gordon & Evans

Figs. 3, 21

1922. *Aedes* (Finlaya) *oswaldi* var. *braziliensis* Gordon and Evans, 1922:329. TYPE: *Holotype* ♂ (10.1/463), Macapa (about 15 mi from Manaus), Amazonas, Brazil, 8 Dec 1921, reared from larva ex treehole, R.M. Gordon [BM]. Type data from Belkin (1968:4).

Aedes (Finlaya) *braziliensis* of Belkin (1968:4).

Aedes (Finlaya) *terrens* var. *braziliensis* of Bonne and Bonne-Wepster (1925:427).

Aedes (Finlaya) *terrens* in part of Dyar (1928:224); Edwards (1932:150); Lane (1939:104-105; 1953:686-687); Knight and Marks (1952:549); Stone, Knight and Starcke (1959:171); Forattini (1965:395).

FEMALE. Unknown.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad; palpus less than 1 labellum length shorter than proboscis. *Thorax* (fig. 21): Mesonotal disc with anterior silver band about 0.75 length of fossa, with strip of silver scales bordering fossal macula; acrostichal setae absent; fossal macula co-extensive with fossa; *ssp* scales present; *pra* hairs dark, more heavily pigmented than those of *ppl* or upper *mep*. *Legs*: Femur I without posterior patch of silver scales; femur II with posterior patch comprising only a few scattered scales; tarsus I-II with median dark band complete, about 0.33; femur III with basal dark band 0.20, sub-apical dark band 0.26; tarsus I-III with basal silver band 0.05, apical silver band 0.23. *Wing*: Vein R with basal line of silver scales reaching about 0.5 to level of *h*.

MALE GENITALIA (fig. 21). *Sidepiece*: Length 0.34 mm. *Prosophallus*: Length 0.10 mm; width 0.13 mm; mesal lobe with lateral portion inclined at about 15°, or somewhat less, from horizontal; stems divergent; filament ratio 1.05 (this high value possibly due to abnormal inclination of filament). *Aedeagus*: Length 0.12 mm.

PUPA, LARVA. Unknown.

SYSTEMATICS. As no topotypic material of *braziliensis* was available for this study the description of the *braziliensis* here is based upon one male specimen, "French Guiana" (671016-12). A second male (FG 14-13), from Cabassou, Ile de Cayenne, was in poor condition and not used in the description. There is some doubt about the identity of this material with topotypic *braziliensis*. In his study of the types of New World species in European museums, John N. Belkin examined the holotype male of *braziliensis*, the genitalia of which was missing. His unpublished sketch of the mesonotum matches that of the French Guianan specimens and is the basis of the present identification. Belkin's notes also indicate agreement in other minor respects. Discrepancies lie in the widths of the basal silver band of tarsi 2-II and 2-III, about 0.5 and 0.25 respectively in the type of *braziliensis* and about 0.33 for both segments in the French Guianan specimens. These discrepancies are probably not significant since the extent of the markings is subject to a similar range of variation in other species. The significance of the "capitate" clasper and the dorsally dark-scaled abdominal segment VIII that Gordon and Evans cite as separating *braziliensis* from *oswaldi (terrens)* is unknown.

Aedes zavortinki and *apollo* have mesonotal markings similar to those of the French Guianan specimens but it is less likely that these would be *braziliensis* since their ranges, admittedly very incompletely known, lie in or beyond the highlands of Colombia. The type locality of *braziliensis* is from near Manaus, Brazil.

Aedes braziliensis, as treated here, differs from the other species of the subgroup by a combination of the broad lateral decumbent scales of the vertex and the dark *pra* and upper *mep* hairs.

DISTRIBUTION (fig. 3). French Guiana and the state of Amazonas, Brazil. Material examined: 2 ♂; no individual rearings.

↓ BRAZIL. *Amazonas*: Macapa (nearest town Manaus) [elev. 0-300 ft], 8 Dec 1921, treehole, R. Gordon (type series).

FRENCH GUIANA. *Guyane*: Cabassou, elev. ca 100 ft, 31 Jan 1965, small treehole, height 2 ft, T. Aitken, R. Martinez, A. Guerra, 1 ♂ (FG 14-13) [UCLA]. *Locality not specified*: 1944, H. Floch, 1 ♂ [UCLA].

6. *Aedes* (Finlaya) *zavortinki* Schick, n.sp.

Figs. 3,17,18

TYPE: *Holotype* ♂ (207C-38) with associated larval skin (5-163), Barro Colorado Island [elev. 100-500 ft], Canal Zone, Panama, 22 May 1945, large treehole, W.H.W. Komp [USNM]. *Allotype* ♀ (207D-32) with associated larval and pupal skins (5-181), same data as holotype [USNM]. *Paratypes*: 1 ♂, 2 ♀, 3 p, 2 l (207D-43, 5-182), 7 ♂ (207C-10), 3 ♂ (207C-8,14,42), 2 ♂ (207C-45), 1 ♂ (207C-34), same data as holotype [BM; USNM; UCLA]. This species is dedicated to Thomas J. Zavortink.

Aedes thorntoni in part of Howard, Dyar and Knab (1917:819-821); Dyar (1918:225-226).

Aedes insolitus in part of Busck (1908:64).

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line generally dark, narrow curved; occiput with erect scales pale. *Thorax* (fig. 17): Acrostichal setae usually absent, when present most posterior seta at about 0.25 from anterior end; fossal macula fully developed up to lateral margin of fossa; prescutellar space and scutellum with or without silver scales; *ssp* scales present; *pra* hairs dark, more heavily pigmented than those of *ppl* or upper *mep*. *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II usually somewhat larger; tarsus I-II with median dark band complete, about 0.33-0.5; femur III with basal dark band 0.13-0.21, subapical dark band 0.26-0.33; tarsus I-III with basal silver band 0.11-0.12 (0.10-0.17), apical silver band 0.20-0.28 (0.19-0.31). *Wing*: Vein C with basal silver scales forming small patch or line reaching crossvein *h*; vein R without silver scales or with small basal patch.

MALE. *Head*: Vertex with decumbent scales silver, narrow curved; palpus about 1-2 labellum lengths shorter than proboscis. *Thorax* (fig. 17): Mesonotal disc with anterior silver band about 0.25-0.5 length of fossa and with strip of silver scales bordering fossal macula; fossal macula coextensive with fossa; *pra* hairs as in female. *Legs*: Tarsus I-II with median dark band complete, at least 0.33. *Wing*: Vein R with basal silver scalation forming small patch or interrupted line reaching level of crossvein *h*.

MALE GENITALIA (fig. 17). *Sidepiece*: Length 0.32-0.35 mm (0.27-0.42 mm). *Prosophallus*: Length 0.11-0.12 mm (0.10-0.14 mm); width 0.14-0.15 mm (0.13-0.15 mm); mesal lobe with lateral portion usually inclined at about 15° or less from horizontal (sometimes between 15° and 30°, infrequently not appreciably inclined or as great as 30°); stems usually convergent, sometimes parallel, infrequently divergent; filament ratio 0.51-0.66 (0.42-0.77). *Aedeagus*: Length 0.13-0.14 mm.

PUPA (fig. 17). *Cephalothorax*: Without pale inverted V-shaped marking. *Abdomen*: Hair 2-II rarely laterad of 3-II, usually mesad for 0.3 or more the distance from 1-II to 3-II; 3-III usually single, rarely branched; 7-VII not reaching caudolateral margin of sternite VIII. *Paddle*: Not tapered; apex not produced; ventral midrib weakly to moderately pigmented for most length, not more strongly at apex.

LARVA (fig. 18). *Head*: Hair 5-C usually double (1-3); 6-C single; 7-C usually 6-7 branched (5-9); 14-C slightly shorter than or subequal in length to mental plate. *Thorax*: Hairs 1,4,5-P double or triple; 7-P usually triple (2-4); 14-P single; 3-M single; 4-M triple. *Abdomen*: Hair 3-III triple; 10-III single; 3-VI single; 4-VII double; 5-VII less than half length of 3-VII; 10-VII single or double; 12-VII usually double, infrequently single. *Segment VIII*: Comb scales about 75; length of free portion of midapical scale 0.026-0.035 mm; hair 2-VIII single. *Siphon*: Length 0.80-0.97 mm;

L/S 2.08-2.44; P/L 0.45-0.50; H/L 0.51-0.57. *Anal Segment*: Ventral brush usually with 15 or 16 hairs (13-16); 4a-X usually 10-12 branched (9-12).

SYSTEMATICS. *Aedes zavortinki* is distinguished from the other members of the subgroup in the different stages only by combinations of characters, in the female by the narrow curved lateral decumbent scales of the vertex, the relatively broad fossal macula, the presence of *ssp* scales and the dark *pra* but pale upper *mep* hairs; in the male by the same vertex scale and pleural hair characters and by the anteriorly silvered mesonotal disc; and in the larva by the usually double hair 5-C, at least 5-branched 7-C, single 2-VIII, ventral brush of 15 or 16 hairs (usually the latter) and the 10-12 branched 4a-X.

DISTRIBUTION (fig. 3). Canal Zone and Pacific lowlands of eastern Panama. Material examined: 158 specimens; 57 ♂, 52 ♀, 22 pupae, 27 larvae; 16 individual rearings (15 larval, 1 pupal). For the Komp collections see the explanatory chapter.

PANAMA. *Canal Zone*: Barro Colorado Island [elev. 100-500 ft], 15 May 1945, treehole, W. Komp, 2 ♂ (207C-3), 1 l (207D-30) – 1 ♂, 1 ♀ (207C-11), 1 ♂ (207C-24) [UCLA; USNM]; 22 May 1945, large treehole, W. Komp, type series, 1 ♂ (207C-38), 1 lp♀ (207D-32), 1 ♂, 2 ♀, 3 p, 2 l (207D-43), 7 ♂ (207C-10), 3 ♂ (207C-8,14,42), 2 ♂ (207C-45), 1 ♂ (207C-34) [USNM; BM; UCLA] – treehole, 1 ♂ (207E-20), 2 lp♀ (207D-36; 207E-28) – 2 ♂ (207C-39) – treehole, 1 ♀, 1 p, 3 l (207D-28) – treehole, 1 lp♀ (207D-40) – treehole, 2 ♀, 2 l (207E-13) – treehole, 1 ♂ (207E-26) – deep treehole, 1 lp♀ (207E-29); 23 May 1945, treehole, W. Komp, 5 lp♀ (207D-16; 207E-18,21,22,27), 1 ♀ (207D-31), 2 ♀, 2 p, 2 l (207E-24) – treehole, 1 lp♀ (207D-27); 25 June 1945, W. Komp, 1 ♂, 2 ♀, 3 p, 3 l (207D-45) [UCLA; USNM]. Camacho, 14 Jan 1922, J. Shropshire, 2 ♀; 17 Mar 1922, J. Shropshire, 2 ♂, 3 ♀; 22 Apr 1922, J. Shropshire, 2 ♂, 2 ♀; 1 June 1922, J. Shropshire, 10 ♂, 4 ♀ [USNM]. Chiva Chiva, elev. 0-300 ft, 11 Nov 1965, treehole, height 4 ft, A. Quinonez, 2 ♂, 2 p (PA 773-3) [UCLA]. Corozal [elev. 0-100 ft], 13 Jan 1943, treehole, 1 ♂, 2 ♀ (207B-22) [UCLA]. Corozal Hospital grounds [elev. 0-100 ft], 7 Sept 1943, treehole, H. Herman, 1 ♀ (207B-8) [UCLA; USNM]. Empire [elev. 200-300 ft], Jan 1922, J. Shropshire, 1 ♀; 4 Apr 1922, J. Shropshire, 4 ♂; 10 May 1922, 3 ♂, 2 ♀; 21 Aug 1923, H. Dyar, R. Shannon, 1 ♀ (P56) [USNM]. Gamboa, S. trail, 9 June 1943, Elton, 2 ♂ (207B-2) [UCLA]. Gatun [elev. near sea level], 25 July 1928, D. Curry, 1 ♀ [USNM]. Largo Remo [elev. near sea level], 27 July 1926, D. Curry, 1 ♂; 11 Aug 1926, D. Curry, 1 ♂, 1 ♀ (15) [USNM]. Mandingo (? Mandinga), 13 Dec 1921, J. Shropshire, 1 ♂, 3 ♀; 14 Dec 1921, J. Shropshire, 1 ♂, 1 ♀ [USNM]. Paraiso [elev. 0-100 ft], 12 May 1918, treehole, J. Zetek, 1 ♂ (1638), 2 ♀ [USNM]. Rio Chagres, upper, treehole, A. Busck, 1 ♂ (102) [USNM]. Summit [elev. 200-300 ft], 13 Dec 1939, treehole, W. Komp, 1 ♂ (207E-4); 17 Aug 1941, treehole high in Mango tree, 1 ♀ (207B-13) [UCLA]. Locality not specified, 31 Dec 1921, J. Shropshire, 1 ♀ [USNM]. *Darien*: Morti, elev. 200 ft, 3 Dec 1966, large treehole, height 6-9 ft, O. Berlin, R. Hinds, 1 p♂ (PA 978-100) [UCLA]. *Panama*: Nuevo Emperador, near, on RT 7, elev. 100-300 ft, 23 Nov 1965, small treehole, height 4 ft, A. Quinonez, 1 ♀ (PA 825-2) [UCLA].

7. *Aedes (Finlaya) apollo* Schick, n.sp.

Figs. 3,19,20

TYPE: *Holotype* ♀ (COB 47-20) with associated pupal and larval skins, Finca Vanguardia (on Villavicencio-Restrepo road, closer to Villavicencio), elev. 1200 ft, 23 June 1965, small treehole, height 6 ft, E. Osorno-Mesa, Morales, et al [USNM]. *Allotype* ♂, Bosque Ocoa (near Villavicencio, elev. 1500 ft), 11 June 1964 [USNM]. *Paratype*: 1 lp♀ (47-21), same data as holotype [UCLA]. This species is named to commemorate the landing of Apollo 11 on the moon.

? *Aedes terrens* of Komp (1936:62); Antunes (1937:76).

? *Aedes podographicus* of Bugher, Boshell-Manrique, et al (1944:31).

FEMALE. *Head:* Vertex with decumbent scales laterad of median longitudinal line generally dark and narrow curved; occiput with mixture of pale and dark erect scales. *Thorax* (fig. 19): Acrostichal setae present or absent, when present most posterior seta at about 0.33 from anterior end; fossal macula fully developed up to lateral margin of fossa; prescutellar space with or without silver scales; scutellum without silver scales; *ssp* scales present; *pra* and upper *mep* with hairs dark and about equally heavily pigmented, more heavily so than those of *ppl*. *Legs:* Femur I with well-developed posterior patch of silver scales in basal half; femur II without posterior patch; tarsus I-II with median dark band complete, about 0.4-0.5; femur III with basal dark band 0.21, subapical dark band 0.19-0.25; tarsus I-III with basal silver band 0.09-0.11, apical silver band 0.15-0.17. *Wing:* Vein C with basal line of silver scales reaching about 0.5 to crossvein *h* or to crossvein itself; vein R without silver scales or with only a few at base.

MALE. *Head:* Vertex with decumbent scales laterad of median longitudinal line silver, broad; palpus about 0.5 labellum length shorter than proboscis. *Thorax:* Mesonotal disc with anterior silver band about 0.5-0.75 length of fossa and with strip of silver scales bordering fossal macula; fossal macula coextensive with fossa; *pra* hairs as in female. *Legs:* Tarsus I-II with median dark band complete, width unknown. *Wing:* Vein R with basal silver scalation very variable, when present, forming small patch to line nearly reaching level of crossvein *h*.

MALE GENITALIA (fig. 19). *Sidepiece:* Length 0.31-0.34 mm. *Prosopallus:* Length 0.11 mm; width 0.11-0.12 mm; mesal lobe with lateral portion not appreciably inclined or inclined at less than 15° from horizontal; stems divergent (based upon 1 specimen); filament ratio 0.47-0.60. *Aedeagus:* Length 0.12 mm.

PUPA (fig. 19). *Cephalothorax:* Without pale inverted V-shaped marking. *Abdomen:* Hair 2-II mesad of 3-II for 0.3 or more the distance from 1-II to 3-II; 3-III single; 7-VII not reaching caudolateral margin of sternite VIII. *Paddle:* Not tapered; apex not produced; ventral midrib weakly to moderately pigmented for most length, not more strongly at apex.

LARVA (fig. 20). *Head:* Hairs 5,6-C single; 7-C triple; 14-C slightly longer than mental plate. *Thorax:* Hair 1-P double to 4-branched; 4-P single to triple; 5-P single or double; 7-P double or triple; 14-P single; 3-M single or double; 4-M triple or 4-branched. *Abdomen:* Hair 3-III triple or 4-branched; 10-III single; 3-VI single, 4-VII double; 5-VII less than half length of 3-VII; 10,12-VII double. *Segment VIII:* Number of comb scales not determined, apparently similar to other species of subgroup; length of free portion of midapical comb scale 0.033 mm; hair 2-VIII single. *Siphon:* Length 0.86-0.92 mm; L/S 2.17-2.50; P/L 0.48-0.51; H/L 0.55-0.56. *Anal Segment:* Ventral brush with 15 or 16 hairs; 4a-X 9,10-branched.

SYSTEMATICS. *Aedes apollo* is very similar to *zavortinki* and may be distinguished from that species by the dark hairs of the *mep* in the adults and by the single hairs 5,6-C and triple 7-C in the larva.

Two undetermined males from Restrepo and Villavicencio, Colombia, also show dark hairs on the *mep* but differ from *apollo* in that the decumbent scales of the vertex laterad of the median longitudinal line are narrow curved and the anterior silver band of the mesonotal disc is narrower (about 0.25). A collection of a similar form from the coast of Venezuela near Ocumare de la Costa has just come to my attention. The males agree with the 2 undetermined males from Colombia except that the anterior silver band of the disc is even narrower (similar to the illustration of the male *terrens* from Rio Cururipe, fig. 15). Two of the 3 females show dark *mep* hairs, but those of the third female are pale; the fossal macula in all 3, un-

like that of *apollo*, is separated from the lateral margin of the fossa by a more or less well developed area of dark scales (see females from Maracay area of Venezuela mentioned under *terrens*). The pupa shows a distinct pale inverted V-shaped marking on the cephalothorax, unlike *apollo*, but the larva is quite similar to that of *apollo*. Whether these specimens represent variants of *apollo* or 1 or more distinct species cannot be determined until reared material from Colombia becomes available.

DISTRIBUTION (fig. 3). Department of Meta, Colombia, at elevations of 1200 to 1600 ft. Material examined: 11 specimens; 3 ♂, 4 ♀, 2 pupae, 2 larvae; 2 individual rearings (larval).

✓ **COLOMBIA. Meta:** Bosque Ocoa (near Villavicencio, elev. 1500 ft), 11 June 1944, 1 ♂, type series in part [USNM]. Finca Vanguardia (on Villavicencio-Restrepo road, closer to Villavicencio), elev. 1200 ft, 23 June 1965, small treehole, height 6 ft, E. Osorno-Mesa, Morales, et al, type series in part, 2 lp♀ (COB 47-20,21) [USNM; UCLA]. Villavicencio [elev. 1500 ft], 17 May 1939, 1 ♂ (3967); June 1942, W. Komp, 1 ♀ (207B-45) [USNM]; Jan 1942, W. Komp (H-9-10), 1 ♂, 1 ♀ [UCLA]. Villavicencio, river road to Bosque Ocoa [elev. 1500 ft], 1 June 1942, treehole, 1 ♂ (207B-10) [USNM].

8. *Aedes* (*Finlaya*) *berlini* Schick, n.sp.

Figs. 3,21,22

TYPE: *Holotype* ♀ (TOB 131-12), with associated pupal and larval skins, Parrott Hall, 15.5 mile post, elev. 300-400 ft, nearest town Parlatuvier, Tobago Island, 29 Nov 1965, treehole, R. Martinez and A. Guerra [USNM]. *Paratypes:* 2 L (131-1), same data as holotype. Orange Hill, Tobago Island, elev. 200-300 ft, 27 Nov 1965, biting-landing, 1500 hrs, R. Martinez, A. Guerra, 1 ♀ (TOB 125-1) [UCLA]. This species is dedicated to O.G.W. Berlin.

FEMALE. Head: Vertex with decumbent scales laterad of median longitudinal line dark, broad; occiput with mixture of pale and dark scales. **Thorax** (fig. 21): Acrostichal setae present or absent, most posterior seta at about 0.25 from anterior end; fossal macula fully developed up to lateral margin of fossa; prescutellar space and scutellum without silver scales; *ssp* scales absent; *pra* hairs dark, more heavily pigmented than those of *ppl* or upper *mep*. **Legs:** Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus I-II with median dark band complete, about 0.33-0.5; femur III with basal dark band 0.15, subapical dark band 0.18-0.21; tarsus I-III with basal silver band 0.08-0.11, apical silver band 0.20-0.26. **Wing:** Vein C with basal line of silver scales reaching about 0.5, or somewhat less, to crossvein *h*; vein R without silver scales.

MALE. Unknown.

PUPA (fig. 21). **Cephalothorax:** With poorly defined pale inverted V-shaped marking. **Abdomen:** Hair 2-II mesad of 3-II for 0.4 the distance from 1-II to 3-II; 3-III single; 7-VII long, reaching caudolateral margin of sternite VIII. **Paddle:** Tapered; apex weakly produced; ventral midrib moderately and uniformly pigmented in distal third.

LARVA (fig. 22). **Head:** Hair 5-C double; 6-C single or double; 7-C triple or 4-branched; 14-C longer than mental plate. **Thorax:** Hair 1-P triple; 4-P double or triple; 5-P double; 7-P double or triple; 14-P single or double; 3-M single; 4-M double or triple. **Abdomen:** Hair 3-III usually triple (2-3); 10-III usually single (1-2); 3-VI usually single (1-2); 4-VII double; 5-VII less than half length of 3-VII; 10,12-VII single.

Segment VIII: Comb scales 50-60; length of free portion of midapical scale 0.034 mm; hair 2-VIII usually single (1-2). *Siphon*: Length 0.84-0.94 mm; L/S 2.44-2.54; P/L 0.54-0.63; H/L 0.61-0.67. *Anal Segment*: Ventral brush with 11 or 12 hairs; 4a-X 6-branched.

SYSTEMATICS. *Aedes berlini* can be distinguished from the other species of the subgroup in the female by the absence of *ssp* scales (the male is unknown but undoubtedly also lacks these scales); in the pupa by the very long hair 7-VII (longer than in all the other species of the Terrens Group); and in the larva by the single hairs 10,12-VII vs. usually double in the other species, the smaller number of ventral brush hairs, 11 or 12 (vs. 13 or more), the usually smaller number of branches of 4a-X, usually 8-12, but as few as 6 (vs. 6), and the usually greater P/L and H/L ratios, 0.54-0.63 vs. 0.44-0.51 and 0.61-0.67 vs. 0.48-0.62.

DISTRIBUTION (fig. 3). Island of Tobago. Material examined: 6 specimens; 2 ♀, 1 pupa, 3 larvae; 1 individual rearing (larval).

TOBAGO. Orange Hill, elev. 200-300 ft, 27 Nov 1965, biting-landing, 1500 hrs, R. Martinez, A. Guerra, 1 ♀ (TOB 125-1, type series in part) [UCLA]. Parrott Hall, elev. 300-400 ft, 29 Nov 1965, large treehole, height 3 ft, R. Martinez, A. Guerra (TOB 131, type series in part), 1 lp♀ (131-12), 2 L (131-1) [USNM; UCLA].

Alboapicus Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of female with erect scales predominantly dark, of male with all erect scales pale; proboscis of female longer than femur I; palpal segment 3 of male with 1 or 2 usually short apical ventrolateral hairs; segment 4 with hairs of ventrolateral row long but sparse. *Thorax*: Mesonotal disc of female not transversely silvered, of male with anterior silver band; complete acrostichal or posterior dorso-central lines absent in female; acrostichal setae absent; fossal macula of female not coextensive with fossa, reduced mesally, of male coextensive with fossa; supra-alar macula not truncate posteriorly, in female disjunct from or broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales absent; *pra* hairs of female dark; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with or without narrow apical silver band; femur II with knee spot present, moderately broad, the scales just reaching anterior subapical setae; tarsus 1-II with median dark band complete, moderately to very broad; tarsus 2-II with complete apical dark band; tarsus 5-II at least partly silver scaled; femur III with basal dark band complete, usually broad; tarsus 5-III silver scaled. *Wing*: Vein C of female with small basal patch of silver scales or line reaching crossvein *h*, of male with line reaching *h*; vein R of male with small basal patch of silver scales; vein Cu of male without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophaallus*: Mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPA. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C long, more than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly at least double; 2-II laterad or mesad of 3-II, most often mesad for less than 0.3 the distance from 1-II to 3-II, not more than 0.3; 3-III usually single.

Paddle: Pigmented, sometimes very weakly; apex not produced; hair 1-P long, subequal in length to paddle.

LARVA. *Head*: Hairs 5,6-C multiple; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, single or branched; *bmh* branched. *Antenna*: Hair 1-A branched. *Thorax*: Hair 11-P less than half length of 14-P; 14-P usually branched; 3-M single; 4-M double to multiple; 8-T longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double or triple; 10-III single; 3-VI branched; 4-VII branched; 5-VII caudad of 4-VII, more than half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion shorter than or subequal in length to sessile portion; hair 2-VIII single or branched. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without slit.

DISCUSSION. The monotypic *Alboapicus* Subgroup is characterized in the adults by the silver scaled tarsi 5-II,III; in the pupa by the very long hairs 5-C and 1-P; and in the larva by a combination of the multiple hair 5-C and the branched 1-A, 3-VI and 4-VII. The male genitalia do not show distinctive subgroup characters.

This subgroup possibly represents an offshoot of the *Terrens* Subgroup (see Systematics and Evolution). It differs from the latter subgroup in the characters given above and also in the tendency of hair 2-II of the pupa to be situated farther laterad. The *Alboapicus* Subgroup occurs in the Canal Zone and in the lowlands of north-eastern Panama.

9. *Aedes* (*Finlaya*) *alboapicus* Schick, n.sp.

Figs. 3,23,24

TYPE: *Holotype* ♂ (206A-15) with associated pupal and larval skins (5-114) and genitalia slide (670912-1), Barro Colorado Island [elev. 100-500 ft], Canal Zone, Panama, 1 May 1945, W.H.W. Komp [USNM]. *Allotype* ♀ (207B-28) with associated pupal and larval skins (43-94), same data as holotype except collected 7 May 1943 [USNM]. *Paratypes*: 1 1p♀ (207B-14, 43-130), 2 1♀ (207A-11, 43-90; 207A-31, 43-91), 2 ♀ (207B-44), same data as allotype [BM; UCLA]. *Aedes alboapicus* was a manuscript name of W.H.W. Komp for this species and is used here in honor of Mr. Komp's discovery. The name obviously refers to the silvered fifth tarsal segments.

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad. *Thorax* (fig. 23): Prescutellar space and midlobe of scutellum without silver scales. *Legs*: Femur I and usually femur II without posterior patch of silver scales, femur II sometimes with sparse patch; tarsus 5-I sometimes sparsely silver scaled; tarsus 1-II with median dark band about 0.5-0.75; tarsus 5-II usually with at least some silver scales, sometimes entirely silvered; femur III with basal dark band 0.09-0.14 (0.08-0.15), subapical dark band 0.27-0.30 (0.20-0.33); tarsus 1-III with basal silver band 0.14-0.18 (0.13-0.20), apical silver band 0.15-0.19 (0.13-0.21). *Wing*: Vein C with silver scales at base from small patch to line reaching crossvein *h*, usually a short line; vein R without silver scales.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark or silver, broad; palpus about 2 labellum lengths shorter than proboscis. *Thorax* (fig. 23): Mesonotal disc with anterior silver band about 0.25-0.75 length of fossa and with strip of silver scales bordering fossal macula; *pra* hairs pale or dark. *Legs*: Tarsus 1-II with median dark band about 0.5.

MALE GENITALIA (fig. 23). *Sidepiece*: Length 0.32-0.33 mm (0.30-0.36 mm). *Prosopallus*: Length 0.09-0.10 mm (0.09-0.11 mm); width 0.11-0.12 mm; mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal, sometimes less than 15° or not appreciably inclined; stems usually divergent but sometimes convergent; filament ratio 0.70-0.75. *Aedeagus*: Length 0.11-0.12 mm.

PUPA (fig. 23). *Abdomen*: Hair 9-VII long, subequal in length to paddle. *Paddle*: Ventral midrib weakly pigmented throughout most length, not more strongly at apex.

LARVA (fig. 24). *Head*: Hair 5-C usually 5-8 branched (4-8); 6-C triple to 5-branched; 7-C usually 6,7-branched (5-8). *Thorax*: Hair 1-P usually triple to 5-branched (3-7); 4-P usually 4-branched (2-7); 5-P usually double (2-4); 7-P usually triple (2-4); 14-P usually double (1-3); 4-M usually double or triple (2-4). *Abdomen*: Hair 3-VI usually double (2-3). *Segment VIII*: Comb scales 28 to about 60, scales stout in 2 specimens with lowest number; length of free portion of midapical scale 0.024-0.028 mm; hair 2-VIII single or double. *Siphon*: Length 0.84-0.87 mm; L/S 2.48-2.86; P/L 0.49-0.53; H/L 0.58-0.59. *Anal Segment*: Ventral brush with 12 hairs (11-13); 4a-X usually 6,7-branched (5-7).

DISTRIBUTION (fig. 3). Canal Zone and Pacific lowlands of eastern Panama. Material examined: 72 specimens; 8 ♂, 16 ♀, 17 pupae, 31 larvae; 24 individual rearings (14 larval, 4 pupal, 1 incomplete). For the Komp collections see the explanatory chapter.

PANAMA. *Canal Zone*: Barro Colorado Island [elev. 100-500 ft], 7 May 1943, treehole, W. Komp, type series in part, 2 lp♀ (207B-14,18), 2 l♀ (207A-11,31), 2 ♀ (207B-44) [USNM; BM; UCLA] – treehole, 1 lp♂ (207B-27), 1 ♀ (207A-29), 2 l (43-115,117; adult numbers unknown), 2 p♀ (207A-16), 1 l (43-121, adult number unknown) – treehole, 1 p♀ (207A-20) – treehole, 1 ♂, 1 ♀ (207B-29) – treehole, 1 l (43-81, adult number unknown); 21 May 1943, very small treehole in thin tree, 1 lp♀ (207B-1), 1 p♀ (207B-23) – thin tree, 2 l♂ (207B-40,41), 1 l♀ (207A-9), 1 ♀, 1 p, 2 l (207A-34), 1 l (207D-2) – treehole, 1 l (207A-4), 2 l (43-221, adult number unknown) – small treehole, 1 lp♂ (207A-7) – treehole, 1 ♀ (207A-10), 1 l (43-160, adult number unknown) – 1 lp (207A-24); 21 May 1943, 1 ♀; 31 May 1943, 1 l♂ (207B-33); May 1943, treehole, W. Komp, 1 ♀ (207A-17) [UCLA; USNM]; 1 May 1945, W. Komp, 1 lp♂ (206A-15), type series in part [USNM]; 15 May 1945, small deep treehole, 1 p♀ (207C-13), 1 ♂ (207C-2), 1 ♀ (207C-7) – treehole, 2 l♀ (207C-1,25) – 1 lp♀ (207C-6) – small treehole in thin stump, 1 lp♀ (207C-35) [UCLA; USNM]. *Darien*: Morti, elev. 60 ft, 7 Dec 1966, treehole, height 1 ft, O. Berlin, R. Hinds, 1 lp♀ (PA 989-10) [UCLA].

Buenaventura Subgroup

ADULTS. *Head*: Vertex of female with decumbent scales along longitudinal midline apparently moderately broad, of male narrow or moderately broad; occiput of both sexes usually with median erect scales pale and lateral erect scales dark; proboscis of female longer than femur I; palpal segment 3 of male with 2 to several short hairs forming poorly developed tuft; segment 4 with hairs of ventrolateral row moderately long, sparse. *Thorax*: Mesonotal disc of female not transversely silvered, of male with anterior silver band; complete acrostichal or posterior dorsocentral lines absent in female; acrostichal setae present; fossa macula of female not coextensive with fossa, reduced mesally, of male coextensive with fossa; supraalar macula not truncate posteriorly, in female broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales absent; *pra* hairs of female dark; upper *stp* and *mep* scale patches contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi almost entirely dark scaled

(tarsus 1-II with inconspicuous narrow basal silver band); tarsus 1-I without apical silver band; femur II without knee spot; femur III with basal dark band complete, usually broad (incomplete in some males). *Wing*: Vein C of female with small basal patch of silver scales, of male a line reaching crossvein *h*; vein R of male without silver scales or with small basal patch; vein Cu of male without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area with small patch of long setae; median sternomesal area with strongly developed sclerite and with tuft; long subapical sternal seta with apical twist present. *Prosopallus*: Mesal lobe with lateral portion inclined at about 15° from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPA. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly double-triple to multiple; 2-II usually laterad of 3-II, when mesad, less than 0.3 the distance between 1-II and 3-II; 3-III single. *Paddle*: Clear or very weakly pigmented; apex not produced; hair 1-P shorter than paddle.

LARVA. *Head*: Hairs 5,6-C multiple; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, branched; *bmh* branched. *Antenna*: Hair 1-A single or branched. *Thorax*: Hair 11-P less than half length of 14-P; 14-P branched; 3-M single; 4-M double; 8-T more than half length of but shorter than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double; 10-III single; 3-VI single; 4-VII branched; 5-VII cephalad of 4-VII, more than half length of 3-VII; 10-VII usually single; 12-VII single. *Segment VIII*: Midapical comb scale with free portion longer than sessile portion; hair 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. The monotypic Buenaventura Subgroup shows several unique characters. In the adults tarsi 1-II,III lack an apical silver band, tarsi 2-II,III lack a basal silver band and the scale patches of the upper *stp* and *mep* are contiguous; in the male genitalia a specialized subapical seta is present on the sidepiece and the aedeagus is more elongate than in the other species; and in the larva hair 5-VII is situated cephalad of 4-VII. The pupa does not show distinctive subgroup characters.

Although possibly the most highly derived of the subgroups, Buenaventura shows definite affinities to the subgroups that form the "core" of the Terrens phyletic line (see Systematics and Evolution). As in the Alboapicus Subgroup of this phyletic line, the pupa differs from the Terrens Subgroup in the more lateral placement of hair 2-II, but this condition is more extreme in the Buenaventura Subgroup. Whether or not this is indicative of a common descent of the Alboapicus and Buenaventura Subgroups is not known but the more lateral position of the hair possibly represents the primitive condition.

The Buenaventura Subgroup occurs in the Pacific lowlands of Colombia.

10. *Aedes* (*Finlaya*) *buenaventura* Schick, n.sp.

Figs. 3,25,26

TYPE: *Holotype* ♂ (COL 56-102) with associated pupal skin and genitalia slide, Rio Raposo Virus Field Station, ca 4 km W, nearest town Buenaventura, elev. 100 ft, Valle, Colombia, 23 Feb 1965, decaying trunk of *Palma naidai*, V.H. Lee [USNM]. *Allotype* ♀ with associated larval and pupal skins (56-11), same data as holotype [USNM]. *Paratype*: 1 L (56-1), same data as holotype [UCLA].

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad. *Thorax* (fig. 25): Most posterior acrostichal seta at about 0.33 from anterior end; prescutellar space and midlobe of scutellum without silver scales. *Legs*: Femora I and II with posterior patch of silver scales in basal half well developed, about equally large; femur III with basal dark band 0.09-0.14, subapical dark band 0.28-0.29, latter band extending to apex of segment along dorsal surface. *Wing*: Vein R without silver scales.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line silver, broad; palpus about 1 labellum length shorter than proboscis. *Thorax* (fig. 25): Mesonotal disc with anterior silver band about 0.25-0.5 length of fossa; acrostichal line usually absent; fossal macula coextensive with fossa. *Legs*: Similar to those of female except that femur III with basal dark band sometimes incomplete and scales of median silver band sometimes completely transecting subapical dark band.

MALE GENITALIA (fig. 25). *Sidepiece*: Length 0.70 mm. *Prosophallus*: Length 0.11 mm; width 0.13 mm; stems convergent; filament ratio 0.70-0.75. *Aedeagus*: Length 0.12 mm.

PUPA (fig. 25). *Paddle*: Ventral midrib clear or weakly pigmented for most length.

LARVA (fig. 26). *Head*: Hair 5-C 5-7 branched; 6-C 6-9 branched; 7-C 7-9 branched. *Thorax*: Hair 1-P usually triple (2-4); 4-P usually triple (2-3); 5-P usually triple (2-4); 7-P double. *Abdomen*: Hair 10-VII usually single (1-2). *Segment VIII*: Comb scales more than 100; length of free portion of midapical scale 0.36-0.37 mm. *Siphon*: Length 0.53-0.56 mm; L/S 2.00-2.08; P/L 0.52-0.55; H/L 0.59-0.64. *Anal Segment*: Ventral brush with 12 hairs; 4a-X 11-branched.

DISTRIBUTION (fig. 3). Pacific lowlands of department of Valle, Colombia. Material examined: 27 specimens; 8 ♂, 3 ♀, 11 pupae, 5 larvae; 11 individual rearings (4 larval, 7 pupal).

COLOMBIA. *Valle*: Rio Raposo Virus Field Station, ca 4 km W, nearest town Buenaventura, elev. 100 ft, 23 Feb 1965, decaying trunk of *Palma naidai*, V. Lee (COL 56, type series), 1 lp♀ (56-11), 2 p♂ (56-100,102), 1 p♀ (56-101), 1 L (56-1) [USNM; UCLA]. Rio Raposo Virus Field Station, ca 4 km N, elev. 70 ft, 5 May 1965, *Palma naidai* stump, P. Barreto, V. Rivas (COL 110), 2 lp♂ (110-11,16), 1 lp♀ (110-17), 3 p♂ (100-12,100,108) [UCLA]. Rio Raposo Virus Field camp, W of, in Rio Raposo brackish water zone, nearest town Buenaventura, elev. near sea level, 17 Dec 1965, large treehole, height ca 35 ft, V. Lee, 1 p♂ (COL 144-100) [UCLA].

Metocopus Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of both sexes with all erect scales dark; proboscis of female longer than femur I; palpal segment 3 of male with long apical ventrolateral hairs forming a tuft as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row long, closely spaced. *Thorax*: Mesonotal disc of both sexes not transversely silvered; complete acrostichal or posterior dorsocentral lines absent in female; acrostichal setae absent; fossal macula of both sexes coextensive with fossa, reduced mesally; supraalar macula not truncate posteriorly, in female broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales absent; *pra* hairs of female dark; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with narrow apical silver band; femur II with knee spot present, narrow to moderately broad, the scales not,

or at most, just reaching anterior subapical setae; tarsus 1-II with median dark band complete, narrow to moderately broad; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band complete, broad; tarsus 5-III without silver scales. *Wing*: Vein C of both sexes usually with small basal patch of silver scales; vein R of males usually without silver scales; vein Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPA. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches usually predominantly single; 2-II mesad of 3-II for more than or less than 0.3 distance between 1-II and 3-II; 3-III single. *Paddle*: Pigmented; apex usually produced, often strongly; hair 1-P shorter than paddle.

LARVA. *Head*: Hair 5-C usually single or double; 6-C usually single; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, usually single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P single; 3-M single; 4-M double; 8-T about subequal in length to or longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double; 10-III single; 3-VI single; 4-VII single; 5-VII caudad of 4-VII, more than or less than half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion longer than sessile portion; hair 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. The monotypic *Metoecopus* Subgroup is characterized in the female by the combination of the narrow lateral scales of the vertex, the broadly joined fossal and supraalar maculae, the absence of *ssp* scales and the broad basal band of femur III; and in the male by the dark erect scales of the vertex. The larva can be distinguished from the previous subgroups by the single hair 4-VII but apparently cannot be separated from those of species of the *Homoeopus*, *Heteropus* and *Podographicus* Subgroups in which hairs 5,6-C are not multiple. The male genitalia and pupa do not show distinctive subgroup characters.

As indicated in the chapter on Systematics and Evolution, the *Metoecopus* Subgroup shows a tenuous relationship to the *Terrens* phyletic line, only 3 characters indicating an affinity. The subgroup has little similarity with the only other subgroup that occurs in the Pacific lowlands of Colombia, Buenaventura, aside from the few *Terrens* phyletic line characters.

The subgroup occurs in the coastal lowlands of Ecuador.

11. *Aedes* (*Finlaya*) *metoecopus* Dyar

Figs. 3,27,28

1925. *Aedes metoecopus* Dyar, 1925a:30. TYPE: *Lectotype* ♂ (2107/86) with genitalia slide (2107), Ecuador, F. Campos Ribadeneira [USNM; designation of Stone and Knight 1956: 222].

Aedes (Finlaya) *terrens metoecopus* of Horsfall (1955:699).

Aedes (Finlaya) *terrens* var. *metoecopus* of Edwards (1932:150); Knight and Marks (1952:549).

Aedes (Finlaya) *terrens* in part of Lane (1939:105; 1953:686-687); Stone, Knight and Starcke (1959:171); Belkin, Schick and Heinemann (1965:20); Forattini (1965:395).

Aedes (*Gualteria*) *terrens* in part of Levi-Castillo (1952a:555; 1952b:77).

Aedes (Finlaya) *podographicus* in part of Dyar (1928:223).

FEMALE. *Head*: Vertex with decumbent scales generally dark, narrow curved. *Thorax* (fig. 27): Prescutellar space with silver scales; midlobe of scutellum with or without silver scales. *Legs*: Femora I and II usually without posterior patch of silver scales or, with small patch in basal half, infrequently with large but diffusely scaled patch in basal half; tarsus 1-II with median dark band about 0.25-0.5; femur III with basal dark band 0.11-0.17 (0.04 in 1 specimen), subapical dark band 0.36-0.41; tarsus 1-III with basal silver band 0.04-0.12, apical silver band 0.24-0.31 (0.21 in 1 specimen). *Wing*: Vein C without silver scales or with basal silver scales forming small patch or line reaching about 0.5 to crossvein *h*; vein R without silver scales.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad; palpus about 3 labellum lengths shorter than proboscis. *Thorax* (fig. 27): Essentially as in female but fossal macula broader. *Legs*: Tarsus 1-II with median dark band about 0.25-0.5. *Wing*: Vein C usually with small basal patch of silver scales and vein R without silver scales (in ECU 114-99 vein C with line of silver scales reaching crossvein *h* and R with small basal patch of silver scales).

MALE GENITALIA (fig. 27). *Sidepiece*: Length 0.34-0.40 mm. *Prosophallus*: Length usually 0.10-0.12 mm (0.13 mm unilaterally in 1 specimen); width 0.13-0.15 mm; mesal lobe with lateral portion inclined usually between 15° and 30° from horizontal, sometimes at 15° or less; stems divergent; filament ratio 0.64-0.80. *Aedeagus*: Length 0.13-0.15 mm.

PUPA (fig. 27). *Abdomen*: Hair 1-I with primary branches usually predominantly single, sometimes single-double or double; 2-II mesad of 3-II for 0.1-0.5 the distance from 1-II to 3-II. *Paddle*: Ventral midrib strongly pigmented for entire length.

LARVA (fig. 28). *Head*: Hair 5-C usually single or double (1-3); 6-C usually single (1-2); 7-C usually triple or 4-branched (2-5); 14-C usually single, rarely double. *Thorax*: Hair 1-P usually triple (2-6); 4-P usually double to 4-branched (2-5); 5-P usually double (1-3); 7-P usually double or triple, rarely single. *Segment VIII*: Comb scales 82-93; length of free portion of midapical scale 0.033-0.037 mm. *Siphon*: Length 0.80-1.02 mm; L/S 2.12-2.33 (2.00-2.38); P/L 0.57-0.60 (0.54-0.64); H/L 0.62-0.68. *Anal Segment*: Ventral brush usually with 14 hairs (12-15); 4a-X usually 8-branched (6,8-10).

DISTRIBUTION (fig. 3). Lowlands of Guayas and Los Rios, Ecuador. Material examined: 114 specimens; 17 ♂, 34 ♀, 25 pupae, 38 larvae; 25 individual rearings (10 larval, 14 pupal, 1 incomplete).

ECUADOR. *Guayas*: Chongon (nearest town), Route 3, km 18-29, elev. 0-300 ft, 9 Feb 1966, small treehole, J. Belkin, E. Gerberg (ECU 134), 1 lp♂ (134-10), 2 p♀ (134-100,101), 2 L (134-1) [UCLA]. Empalme, 3 km S (ca 25 air miles NE Balzar), elev. 300-700 ft, 6 Feb 1966, biting-landing, J. Belkin, et al, 1 ♀ (ECU 120-1) [UCLA]. Guayaquil [elev. near sea level], Mar 1940, J. Murdock (H-9-34), 1 ♂, 4 ♀; Apr 1940, J. Murdock (207B-24), 1 ♂, 1 ♀; Aug 1940, W. Komp, 1 ♀; 1943, 3 ♀ (207B-19) [USNM]. Guayaquil, Country Club, J. Murdock (207A-45), 1 ♂, 1 ♀ [USNM]. Guayaquil (nearest town), Rt. 3, km 10, elev. 0-300 ft, 12 Feb 1966, cut or broken bamboo, J. Belkin, E. Gerberg, 1 L (ECU 161-3) [UCLA]. Pascuales, vicinity of, Rt. 2, km 9.5, elev. 0-300 ft, 5 Feb 1966, small treeholes, height 6 ft, J. Belkin, W. Hjort, et al (ECU 105-107), 1 lp♀ (107-10), 1 p♂ (105-100), 1 p♀ (107-100), 4 L (105-1), 2 L (106-2), 5 L (107-2) [UCLA]. *Los Ri-*

os: Hacienda Mora (near Montalvo), elev. 0-300 ft, 8 Feb 1966, cut bamboo, J. Belkin, E. Gerberg (ECU 125), 1 lp♂ (125-11), 2 lp♀ (125-12,14), 1 p♂ (125-111), 4 L (125-1) [UCLA]. Valencia, 4 km W, elev. 300-700 ft, 6 Feb 1966, fallen cacao pod, J. Belkin et al (ECU 114), 1 lp♂ (114-10), 4 lp♀ (114-11-14), 4 p♂ (114-72,93,99), 5 p♀ (114-73,85,102,110,113), 1 IP (114-5), 9 L (T14-4) [UCLA]. *Department not specified*: F. Campos R., 1 ♂ (139); 4 ♂; 1 ♀ (128); 1 ♀ (138); 1 ♀ (type series in part); 5 ♀ [USNM].

Insolitus Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of both sexes with all erect scales pale; proboscis of females longer than femur I; palpal segment 3 of males with several long apical ventrolateral hairs forming a tuft as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row long, closely spaced. *Thorax*: Mesonotal disc of females not transversely silvered, of males usually silvered for at least half length, sometimes not transversely silvered; complete acrostichal or posterior dorsocentral lines absent in females; acrostichal setae present or absent; fossal macula of females variable, coextensive with fossa, variously reduced or absent, of males coextensive with fossa; supraalar macula not truncate posteriorly, in females broadly joined to fossal macula (except when latter greatly reduced); *ppn* silver scaled; *ssp* scales present or absent; *pra* hairs of females pale or dark; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus I-I with or without narrow apical silver band; femur II with knee spot usually present, moderately broad to broad, the scales extending to level of or basad of anterior subapical setae; tarsus I-II with median dark band incomplete or complete, narrow or moderately broad; tarsus 2-II with incomplete or complete dark apical band or entirely silvered; tarsus 5-II usually without silver scales; femur III with basal dark band complete, usually broad; tarsus 5-III without silver scales. *Wing*: Vein C of females with basal line of silver scales usually reaching crossvein *h*, of males always reaching *h*; vein R of males with or without silver scales, when present, a small basal patch or a line reaching level of crossvein *h*; vein Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophaallus*: Mesal lobe with lateral portion usually not appreciably inclined; stem not bowed; filament with hook not strongly angulate.

PUPAE. *Cephalothorax*: With or without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly single to multiple; 2-II usually laterad of 3-II or mesad for less than 0.3 the distance from 1-II to 3-II; 3-III usually single. *Paddle*: Usually clear or very weakly pigmented; apex not produced; hair 1-P shorter than paddle.

LARVAE. *Head*: Hairs 5,6-C single to triple; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, usually branched; *bmh* usually branched. *Antenna*: Hair 1-A single. *Thorax*: 11-P greater or less than half length of 14-P; 14-P single; 3-M single; 4-M double or triple; 8-T shorter, but more than half length of, or longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double or triple; 10-III single or branched; 3-VI single or branched; 4-VII usually double; 5-VII caudad of 4-

VII, more than half length of 3-VII; 10-VII single or branched; 12-VII single. *Segment VIII*: Midapical comb scale with free portion subequal in length to or longer than sessile portion; hair 2-VIII single or branched. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. The *Insolitus* Subgroup is characterized primarily by the males. The mesonotal disc is usually largely silvered, as in the *Homoeopus* Subgroup, but unlike in the latter the basal dark band of femur III is complete and broad and vein R is not as extensively silvered. The females show a fossal macula that is variously reduced and sometimes absent but otherwise cannot be separated from those of the Terrens Subgroup. The larvae are characterized by a combination of the usually branched but non-multiple hairs 5,6-C, the branched 4-VII and the free portion of the midapical comb scale which is longer than or subequal in length to the sessile portion. The male genitalia and pupa do not show distinctive subgroup characters.

The *Insolitus* Subgroup, as suggested in the chapter on Systematics and Evolution, represents the most primitive of the subgroups of the Terrens Group and the stock ancestral to the other subgroups. It almost certainly belongs to the Terrens phyletic line but differs from the other subgroups of the line in the usually extensively silvered mesonotum of the males and its distribution.

The subgroup occurs in the highlands of Central America (Guatemala, Panama), on the Atlantic coast of Panama, in the highlands of Colombia and northern Venezuela and in Trinidad.

Only 1 species, *insolitus*, is included in the subgroup but a second species is now known from the Rancho Grande area of Venezuela (see *insolitus*). The subgroup description is based upon both species.

12. *Aedes* (Finlaya) *insolitus* (Coquillett)

Figs. 4,29,30

1906. *Verrallina insolita* Coquillett, 1906a:62. TYPE: *Holotype* ♀, Trinidad, F.W. Urich [USNM, 9142].

1906. *Verrallina laternaria* Coquillett, 1906b:184. TYPE: *Holotype* ♂, Montserrat, Caroni, Trinidad, June 1905, August Busck [USNM, 8290]. Type data from Belkin, Schick and Heinemann (1965:69). NEW SYNONYMY.

Aedes insolitus of Dyar (1906:16-17).

Verrallina insolita of Coquillett (1906c:17); Theobald (1910:496); Surcouf and Gonzales-Rincones (1911-226).

Aedes (Finlaya) *terrens* var. *podographicus* in part of Edwards (1932:150); Knight and Marks (1952:549).

?*Aedes podographicus* of Boshell-Manrique and Osorno-Mesa (1944:173).

Aedes (Finlaya) *terrens* in part of Dyar (1921:152); Bonne and Bonne-Wepster (1925:424); Dyar (1928:224); Lane (1939:105; 1953:686-687); Stone, Knight and Starcke (1959:171); Belkin, Schick and Heinemann (1965:69); Forattini (1965:395).

Aedes oswaldi in part of Urich (1913:528); Howard, Dyar and Knab (1917:815-819).

Aedes laternaria of Dyar (1906:17); Dyar and Knab (1906b:191,202).

Verrallina laternaria of Coquillett (1906c:17); Theobald (1910:496).

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line broad, usually all dark. *Thorax* (fig. 29): Mesonotal disc, in forms with rela-

tively well-developed fossal macula (see below) often with a short anterior silver acrostichal line, and in forms with reduced macula without line; acrostichal setae variously developed [always present in Trinidad, most posterior seta usually at about 0.33 from anterior end, sometimes as far caudad as about 0.5; usually absent in other populations, when present in these, most posterior seta at about 0.25]; fossal macula extremely variable in development, infrequently coextensive with fossa (fig. 29, TR 827-114), usually variously reduced mesally and centrally (e.g. fig. 29, TR 778-117) or rarely absent; prescutellar space usually without silver scales; midlobe of scutellum with silver scales; *ssp* scales present; *pra* hairs pale. *Legs*: Femur I with well-developed posterior patch of silver scales in basal half; femur II in Central American highlands and Trinidad with posterior patch usually larger than that of femur I but in coastal Central America patch smaller than that of femur I; femur II with knee spot usually present (absent in TR 680-105); tarsus 1-II with median dark band complete in Central America, about 0.33-0.5, in other localities usually incomplete and sometimes entirely obliterated by silver scales, when complete 0.25-0.33; tarsus 2-II in most localities with complete dark apical band, in Trinidad often entirely silver scaled or with at least some apical silver scales; tarsus 5-II usually dark scaled (silver scaled in 1 specimen of TR 620); femur III with basal dark band 0.06-0.15 [in San Felipe, Guatemala, 0.06; in Cerro Mali, Panama, 0.08-0.11; in other localities 0.11-0.14 (0.10-0.15)], subapical dark band 0.21-0.33 [in most localities 0.21-0.27 (0.20-0.28); in Colombia 0.27-0.33]; tarsus 1-III with basal silver band absent or 0.04-0.15 [in most localities 0.04-0.09 (absent-0.12); in coastal Central America 0.08-0.15], apical silver band 0.12-0.24 (0.12-0.30; entire range in Trinidad). *Wing*: Vein R usually without silver scales, sometimes with a few at base.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line silver, broad; palpus in most localities about 1-2 labellum lengths shorter than proboscis, in Isabi, Colombia, subequal in length to proboscis. *Thorax* (fig. 29): Mesonotal disc in most localities almost entirely silver scaled (fig. 29, TR 782-105), in Trinidad dorsocentral area silver or dark scaled, in latter case acrostichal line persisting as more or less prominent marking (fig. 29, TR 827-109); pleuron as in female. *Legs*: Essentially as in female. *Wing*: Vein R with basal silver marking variously developed [in Volcanes, Colombia, absent; in Trinidad usually absent, infrequently a small basal patch; in Capira, Panama, absent or a small basal patch (2 specimens); in Yepocapa, Guatemala and Isabi, Colombia, a small basal patch and also some silver scales disjunctly at level of crossvein *h*, in San Felipe, Guatemala, and in Quincha and Muzo, Colombia, a line reaching level of *h*].

MALE GENITALIA (fig. 29). *Sidepiece*: Length 0.54-0.70 mm. *Prosopallus*: Length 0.08-0.09 mm (0.07-0.10 mm); width 0.11-0.12 (0.11-0.13 mm); mesal lobe with lateral portion usually not appreciably inclined or inclined at less than 15° from horizontal, rarely as great as between 15° and 30°; stems divergent in most localities (convergent in Cerro Mali and Cerro Campana, Panama); filament ratio 0.85-1.20 (0.75-1.35). *Aedeagus*: Length 0.11-0.13 mm.

PUPA (fig. 29). *Cephalothorax*: Pale inverted V-shaped marking not developed or weakly differentiated. *Abdomen*: Hair 2-II laterad or mesad of 3-II [in Cerro Mali, Panama, laterad of 3-II to mesad for less than 0.3 the distance from 1-II to 3-II; in Trinidad infrequently laterad, usually mesad from less than 0.3 to more than 0.3; in other localities placement of 2-II intermediate between above conditions]; 3-III usually single, rarely branched. *Paddle*: Showing geographic dimorphism as follows, but intermediate types present in Trinidad. Central American type (fig. 29, PA

497): Clear or very weakly pigmented; not tapered; apex not produced, often emarginate; ventral midrib not or weakly pigmented. Trinidad type (fig. 29, TR 778): Pigmented; tapered; apex also not produced but not emarginate; ventral midrib moderately pigmented, not more strongly at apex.

LARVA (fig. 30). "Northern highlands" in this description refers to San Felipe, Guatemala (GUA 130) and Cerro Campana, Panama (PA 497). *Head*: Hair 4-C single to triple [in Northern highlands 1(1-2); in Trinidad 1,2(1-3); in Almirante, Panama, 2; in Cerro Mali, Panama, 2(1-3)]; 6-C single to triple [in Northern highlands 1(1-2); in Almirante 3; in Trinidad 3(1-3); in Cerro Mali 3(2-3, rarely 1)]; 7-C double to 7-branched [in Northern highlands 2,3(2-4); in Cerro Mali 3-5(2-7); in Trinidad 4,5(2-6); in Almirante 6,7]; 11-C in Cerro Campana about 1.5 length of mental plate, in other localities at least twice length of plate; 14-C in Northern highlands finer and tending to be shorter than in other localities, usually double (2-3, rarely 1); *bmh* usually double (2; rarely 1,3). *Thorax*: Hair 1-P single to 5-branched [in Northern highlands 2(1-2); in other localities 3,4(2-5)]; 4-P single to 4-branched [in Cerro Campana 1; in San Felipe 1-3; in Almirante 2; in Trinidad 2(2-3, rarely 1); in Cerro Mali 3(2-3, rarely 4)]; 7-P single to 4-branched [in Northern highlands 1; in Almirante 2; in Trinidad 2(1-3); in Cerro Mali 3(2-4)]; 11-P variable in length [less than half length of 14-P in Almirante and Cerro Campana, Panama; at least half length of 14-P in other localities]; 14-P single; 8-T shorter or longer than metathoracic pleural tubercle, particularly short in Cerro Campana. *Abdomen*: Hair 5-I usually subequal in length to or longer than 4-I, sometimes shorter than 4-I in Cerro Campana; 7-III sometimes long, subequal in length to 7-II; 3-III usually double (2-3); 10-III single or double; 3-VI single or double; 4-VII usually double (1-2); 10-VII usually single, sometimes double in Trinidad. *Segment VIII*: Comb scales 40 to more than 100; length of free portion of apical scale 0.027-0.052 mm [in San Felipe 0.027-0.033 mm; in Cerro Campana 0.033-0.035 mm; in Almirante 0.034-0.035 mm; in Trinidad 0.036-0.047 mm (0.035-0.048 mm, 0.027 mm in 1 specimen with atypical broad ligulate rather than pandurate scale)]. *Siphon*: Length 0.61-0.92 mm [in Northern highlands 0.61-0.72 mm; in Cerro Mali 0.77-0.82 (0.72-0.87 mm); in Trinidad 0.67-0.87 mm (0.61-0.92 mm); Almirante unknown]; L/S 2.12-2.45 [in most localities 2.22-2.38 (2.12-2.42); in Northern highlands 2.27-2.46]; P/L 0.49-0.58 [in Cerro Mali 0.49-0.52 (0.47-0.55); in Northern highlands 0.49-0.54; in Trinidad 0.51-0.55 (0.48-0.58)]; H/L 0.52-0.65 [in Cerro Mali 0.56-0.59 (0.52-0.59); in Northern highlands 0.54-0.61; in Trinidad 0.60-0.63 (0.57-0.65)]. *Anal Segment*: Ventral brush with 12 hairs, (11-13); 4a-X usually 7-branched (5-8).

SYSTEMATICS. *Aedes insolitus* is widely distributed and shows some marked geographical variation and perhaps actually represents a species complex. Some regional populations are briefly discussed below.

In San Felipe, Guatemala, and Cerro Campana, Panama ("Northern highlands"), certain of the larval hairs tend to have fewer branches than in other localities. Hair 6-C is single rather than usually triple, 1-P usually double rather than triple or multiple and 5,7-P is single rather than usually double or triple. Also, 14-C is finer and tends to be shorter than in other localities and the siphon is shorter than elsewhere, 0.61-0.72 mm vs. 0.77-0.92 mm.

The topotypic populations of Trinidad show variation in 2 characters that are not variable in other populations, (1) the dorsocentral area of mesonotal disc of the male is either largely silver scaled or dark scaled (fig. 29) and (2) the paddle of the pupa is either clear and broadly rounded (and sometimes emarginate at apex) or moderately well pigmented and somewhat tapered, with intermediate paddle

types often being developed. This first mentioned state of the above characters is the condition shown by the other populations (the immature stages of *insolitus* from Colombia are unknown) and the second mentioned alternative the condition shown only by the Trinidad populations. There is a strong correlation of the non-Trinidad vs. the Trinidad states and 1 or the other predominates or is exclusively represented in the various lots. Two further differences between non-Trinidad and Trinidad populations are (1) acrostichal setae are usually absent in the former and present in the latter and (2) hair 2-II of the pupa tends to be situated farther mesad in the latter.

The significance of the variation in Trinidad is unknown. Perhaps 2 species are involved or perhaps hybridization has occurred between an ancestral population showing the Trinidad character states and a species showing the non-Trinidad states. The male genitalia and larvae do not show corresponding variation.

Males from Isabi, Colombia, show an unusual character for the species, a very long palpus in the male.

A second species of the *Insolitus* Subgroup came to my attention too late to be formally included in the present revision. This species, from the Rancho Grande area of Venezuela, can be distinguished from *insolitus* by the absence of *ssp* scales and the dark *pra* hairs. The dorsocentral silvering of the males extends caudad into the posterior half of the disc.

DISTRIBUTION (fig. 4). Central America and Colombia at elevations of 2600-5000 ft; Atlantic lowlands of Costa Rica and Panama; Trinidad at elevations of 200-3000 ft. Material examined: 487 specimens; 58 ♂, 86 ♀, 106 pupae, 217 larvae; 89 individual rearings (58 larval, 23 pupal, 13 incomplete).

✓ **COLOMBIA.** *Boyaca*: Cuincha (near Muzo), [elev. 1600-3300 ft], 17 Mar 1943, E. Osorno-Mesa, 1 ♂ [UCLA]. Isabi (near Muzo), [elev. 3300-5000 ft], 18 Apr and 6 May 1942, E. Osorno-Mesa, 3 ♂ [UCLA]. Muzo [elev. 1600-3300 ft], 28 May 1963, E. Osorno-Mesa, 2 ♂ (161) [UCLA]. *Cundinamarca*: Volcanes, a patch of forest near Caparrapi, elev. 3300-5000 ft, 19 Sept 1943, H. Kumm, 1 ♂ (13), 1 ♀ (11); 1943, Kumm, 2 ♀ [UCLA].

✓ **COSTA RICA.** *Limon*: Suerre, 20 July 1923, A. Alfaro, 3 ♂, 5 ♀ [USNM].

GUATEMALA. *Chimaltenango*: Locality not specified, nearest town Yepocapa [elev. 4850 ft], 27 July 1950, treehole, P. Garcia, M. Xinic, 2 ♀ (GUA 140-1); 29 July 1950, treehole, H. Dalmat, 2 ♂ (GUA 141-1) [UCLA]. *Suchitepequez*: Cafetal Hamburgo (near San Felipe), elev. ca 2600 ft, 8 Sept 1964, cut or broken bamboo, Almengar and P. Cowsill (GUA 130), 2 lp♂ (130-11,14), 2 lp♀ (130-12,13), 3 p♂ (130-104-106), 1 p♀ (130-103) [UCLA]. Department not specified: 1 ♂ (GUA 151-36) [UCLA].

PANAMA. *Bocas del Toro*: Almirante, elev. ca 100 ft, 30 Apr 1963, treehole (PA 290), 2 p♂ (290-101,103), 1 p♀ (290-105), 1 p, 2 ♀ (290-1) [UCLA]. *Darien*: Cerro Mali, western slope, elev. 4650 ft, 28 May 1963, treehole in small tree, height 7 ft (PA 368), 3 lp♂ (368-103,128,140), 15 lp♀ (368-108,109,116-119,123,133-139,141), 6 p♂ (368-101,105,107,112,114,115), 5 p♀ (368-102,104,106,113,136), 9 IP (368-110,111,120,122,124,126,127,131,132), 4 P, 114 L, 1 ♀ (368-1) [UCLA]. Cerro Mali, auxiliary ridge W of, elev. 4900 ft, 22 May 1963, treehole, height 20 ft (PA 349), 1 lp♀ (349-103), 1 L (349-1) [UCLA]. *Panama*: Cerro Campana, elev. 3500 ft, 12 Aug 1963, treehole, height 3 ft (PA 497), 3 lp♂ (497-105-107), 1 lp♀ (497-101), 2 p♂ (497-102,103), 14 L (497-1) [UCLA].

TRINIDAD. *Mayaro*: Bush Bush Forest, 16 Oct 1964, biting, 900-1300 hrs, height 0-3 ft, Trul, 1 ♀ (TR 773-101) [UCLA]. *St. Andrew*: Cumaca, elev. 250-500 ft, 22 Oct 1964, large treehole, height 10 ft, A. Guerra (TR 778,779), 5 lp♂ (778-115,116,125; 799-122,130), 1 l♂ (779-110), 13 lp♀ (778-117-121,123,124,127; 779-118-121,135), 2 p♂ (779-115,116), 1 IP (779-137), 6 L (778-1), 2 ♂, 4 L (779-1) – large tub (TR 782), 1 lp♂ (782-111), 2 lp♀ (782-112,121), 1 p♂ (782-105), 1 lp (782-110), 1 L (782-5); 14 Jan 1965, large treehole, height 15 ft, A. Guerra (TR 932), 1 lp♂ (932-121), 1 lp♀ (932-122) – large tub, 1 lp♀ (TR 940-127); 18 Feb 1965, large tub, A. Guerra

(TR 1009), 2 lp♀ (1009-40,42), 1 L (1009-4) [UCLA]. Mt. Tamana, elev. 1000 ft, 23 Aug 1964, biting, 1100-1300 hrs, height 1-3 ft, R. Manuel and R. Martinez, 3 ♀ (TR 620) [UCLA]. *St. George*: El Tucuche [elev. 3000 ft], rain barrel, June 1942, 1 ♀; rain barrel, 2 ♂ (29VI42-2, 20VII-42-1) [USNM]. Las Lapas Trace, elev. 2000 ft, 3 Apr 1964, biting, 1000-1500 hrs, height 4 ft, A. Guerra (TR 281), 6 ♀ [UCLA]. Mt. Beck, elev. 800 ft, 29 Apr 1965, biting, 1400 hrs, height 3 ft, A. Guerra, 1 ♀ (TR 1143-2) [UCLA]. Verdant Vale, 4 mi on Blanchisseuse road, nearest town Arima, elev. 500 ft, 12 Nov 1964, large treehole, height 2 ft, A. Guerra (TR 827), 5 lp♂ (827-109-112,118), 3 lp♀ (827-113,114,117), 1 p♀ (827-117), 2 ♀, 2 p (827-1) – cut bamboo (TR 829), 1 lp♀ (829-115), 1 IP (829-119) – 1 lp♀ (TR 830-101) [UCLA]. Verdant Vale, elev. 1000 ft, large treehole, height 8 ft, A. Guerra (TR 680), 1 lp♀ (680-105), 1 IP (680-104), 1 L (680-1) [UCLA]. *Locality not specified*: F. Amandes, 14 Nov 1965, F. Urich, 1 ♀; 18 Nov 1905, F. Urich, 2 ♂, 1 ♀; June, A. Busck, 1 ♂ (34.2 ?d), 2 ♂, 4 ♀; F. Urich, 3 ♂ (27-7,8,10), 6 ♀ (27-9,11,12; B12-7, B-13-8,12) [USNM].

Aitkeni Subgroup

ADULT. (Female only.) *Head*: Vertex with decumbent scales along median longitudinal line narrow; occiput with median erect scales pale, lateral scales dark; proboscis longer than femur I. *Thorax*: Mesonotal disc with anterior silver band; complete acrostichal or posterior dorsocentral lines absent; acrostichal setae present; fossal macula not coextensive with fossa, reduced mesally; supraalar macula not truncate posteriorly, broadly joined to fossal macula; *ppn* dark scaled; *ssp* scales present; *pra* hairs pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I without apical silver band; femur II with knee spot broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band complete, broad; tarsus 2-II with complete apical dark band; femur III with basal dark band incomplete; tarsus 5-III without silver scales. *Wing*: Vein C without silver scales.

PUPA. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly single-double; 2-II laterad of 3-II; 3-III single. *Paddle*: Pigmented; apex not produced; hair 1-P shorter than paddle.

LARVA. Unknown.

DISCUSSION. The monotypic Aitkeni Subgroup is known only by the adult female and pupa. The female shows 2 unique characters for the Terrens Group, the presence of pale gold scales in the fossal macula and the presence of dark rather than silver scales on the *ppn*. The pupa does not show distinctive subgroup characters.

The subgroup occurs at high elevations in southern Central America. Its phyletic affinities are obscure but it possibly represents an early offshoot of the ancestral stock of the Terrens Group.

13. *Aedes* (Finlaya) *aitkeni* Schick, n.sp.

Figs. 4,39

TYPE: *Holotype* ♀ (CR 50-101) with associated pupal skin, La Sierra, 10 km SE on hwy 2, elev. 8000 ft, San Jose, Costa Rica, 24 Nov 1962, rotted depression in fallen tree, C.L. Hogue and W.A. Powder [USNM]. *Paratype*: 1 p (50-2), same data as holotype [UCLA]. This species is dedicated to T.H.G. Aitken.

FEMALE. *Head*: Vertex with broad median longitudinal line of narrow curved scales; decumbent scales laterad of line dark, narrow curved. *Thorax* (fig. 39): Mesonotal disc with narrow anterior band and a short silver acrostichal stripe extending caudad from band; most posterior acrostichal seta at about 0.5 from anterior end of acrostichal line; prescutellar space without silver scales; midlobe of scutellum with silver scales. *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; femur III with basal dark band incomplete, subapical dark band 0.33; tarsus 1-III with basal and apical dark bands each 0.08. *Wing*: Vein R without silver scales.

MALE. Unknown.

PUPA (fig. 39). *Paddle*: Weakly emarginate; ventral midrib moderately pigmented for most length, weakly at apex.

LARVA. Unknown.

SYSTEMATICS. Pedro Galindo saw the holotype specimen of *aitkeni* during a visit to the laboratory here at UCLA and believes it is the same form he has found at high elevation in the province of Chiriqui, Panama, that fiercely bites man. The Panamanian record cited for this species is based upon Galindo's identification.

DISTRIBUTION (fig. 4). Province of San Jose, Costa Rica, elevation 8000 ft; possibly in Chirique highlands of Panama (Galindo, personal communication). Material examined: 3 specimens; 1 ♀, 2 pupae; 1 individual rearing (pupal).

COSTA RICA. *San Jose*: La Sierra, 10 km SE on hwy 2, elev. 8000 ft, 24 Nov 1962, rotted depression in fallen tree, C. Hogue, W. Powder (CR 50, type series), 1 p♀ (50-101), 1 p (50-2) [UCLA].

Homoeopus Subgroup

ADULTS. (Female known for only 1 species.) *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of female with erect scales predominantly pale, of males all pale; proboscis of female longer than femur I; palpal segment 3 of males with several long apical ventrolateral hairs forming a tuft subequal in length to segments 4 and 5 combined; segment 4 with hairs of ventrolateral row long, somewhat sparse to closely spaced. *Thorax*: Mesonotal disc of female not transversely silvered, of males usually transversely silvered for nearly entire length; complete acrostichal or posterior dorsocentral stripes absent in female; acrostichal setae present; fossal macula of female not coextensive with fossa, reduced mesally, of males coextensive with fossa; supraalar macula not truncate posteriorly, in females not joined to or narrowly or broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales present; *pra* hairs of female pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver markings; tarsus 1-I with or without narrow apical silver band; femur II with knee spot present, broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band incomplete or complete and moderately broad; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band usually incomplete, narrow when complete; tarsus 5-III without silver scales. *Wing*: Vein C of female with small patch of silver scales or line not reaching 0.5 to crossvein *h*, of males reaching *h*; vein R of males with line of basal silver scales extending well beyond level of crossvein *h* (about twice length of line on C); vein Cu of males with basal silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long

setae; median sternomesal area with or without strongly developed sclerite, with or without tuft; specialized subapical sternal seta absent. *Prosophaallus*: Mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal; stem usually not bowed; filament with hook strongly or not strongly angulate.

PUPAE. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C usually double. *Abdomen*: Hair 1-I with primary branches usually predominantly single or single-double; 2-II usually laterad of 3-II or mesad for 0.3 or less the distance from 1-II to 3-II; 3-III single. *Paddle*: Pigmented; apex not or weakly produced; hair 1-P shorter than paddle.

LARVAE. *Head*: Hair 5-C single to triple; 6-C single to double; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, single; *bmh* single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P single; 3-M single; 4-M usually double; 8-T shorter, but more than half length of, or longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III usually double; 10-III single; 3-VI single; 4-VII usually single; 5-VII caudad of 4-VII, more than or less than half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion longer or shorter than sessile portion; hair 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance; ventral margin without deep slit.

DISCUSSION. The Homoeopus Subgroup is characterized primarily in the males; the mesonotal disc is usually largely silvered, vein R is very extensively silvered, the scales forming a basal line extending well beyond the level of crossvein *h*, and vein Cu is basally silvered. The female of only *homoeopus* is known and it does not differ from the females of the Heteropus Subgroup in any fundamental respects. In the larvae hairs 5,6-C are not multiple and 4-VII is single. I have been unable to separate these from the larvae of the species in the Metoecopus, Heteropus and Podographicus Subgroups that show non-multiple head hairs. The male genitalia and pupae do not show distinctive subgroup characters.

Two species, *homoeopus* and *impostor*, comprise the Homoeopus Subgroup. The former, although widely distributed, appears to be a relatively old form since it is represented in the state of Veracruz, Mexico, by a relict population in which the females show the primitive character of broadly joined fossal and supraalar maculae. *Aedes impostor* appears to be an offshoot of *homoeopus*, considering the apparent antiquity of *homoeopus* and that the genitalia of *impostor* possibly represent a simplification of the *homoeopus* type (the male genitalia of *homoeopus* shows variation in which the *impostor* condition is approached).

The subgroup occurs at moderately high elevations in the state of Veracruz, Mexico, and in Central America from Guatemala southward into Costa Rica.

14. *Aedes* (Finlaya) *homoeopus* Dyar

Figs. 4,31,32

1922. *Aedes terreus homoeopus*, Dyar 1922:92-93. TYPE: *Lectotype* ♂, Alajuela, Costa Rica, Oct 1921, A. Alfaro [USNM; designation of Stone and Knight 1956:219].

Aedes (Finlaya) *homoeopus* of Bonne and Bonne-Wepster (1925:424-428).

Aedes (Finlaya) *argyrothorax* in part of Lane (1951:335; 1953:688); Stone, Knight and Starcke (1959:159); Belkin, Schick and Heinemann (1965:12); Forattini (1965:389).

Aedes (Finlaya) terrens var. *podographicus* of Edwards (1932:150); Knight and Marks (1952:549).
Aedes (Finlaya) terrens in part of Dyar (1928:224); Lane (1939:105).
Aedes terrens in part of Kumm, Komp and Ruiz (1940:400,417); Kumm and Zuniga (1942:404);
 Vargas (1949a:221).
Aedes oswaldi in part of Howard, Dyar and Knab (1918:819).

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, narrow curved. *Thorax* (fig. 31): Acrostichal and posterior dorsocentral lines usually absent, sometimes weakly developed; fossal macula usually moderately well developed, rarely reduced forming narrow diffusely scaled stripe; supraalar macula in Central America usually narrowly joined to fossal macula but sometimes not joining macula, in Mexico broadly joined to macula; prescutellar space with silver scales; midlobe of scutellum usually with silver scales. *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur III larger; tarsus I-II with median dark band in most localities about 0.4-0.5, in Costa Rica about 0.33-0.5; femur III with basal dark band usually incomplete, when complete at most 0.07, subapical dark band 0.32-0.37 (0.29-0.39); tarsus I-III with basal silver band 0.12-0.16 (0.11-0.18), apical silver band 0.17-0.22 (0.15-0.26). *Wing*: Vein R without silver scales or with small basal patch, former condition common in Guatemala but infrequent elsewhere.

MALE. *Head*: Vertex with all decumbent scales silver, narrow curved; palpus about 0.5-2 labellum lengths shorter than proboscis, segment 4 with hairs of ventrolateral row somewhat sparse to closely spaced, latter condition most frequent in Mexico and Guatemala. *Thorax* (fig. 31): Mesonotal disc usually transversely silvered for at least half length, infrequently more narrowly, rarely with no transverse silvering (GUA 48-11; this specimen with poorly defined strip of silver scales bordering fossal macula and with complete acrostichal line). *Legs*: Tarsus I-II with median dark band variously developed [in El Salvador incomplete; in Mexico and Costa Rica complete, about 0.33-0.5; in Guatemala complete, about 0.5 or greater]. *Wing*: Vein Cu usually with at least some silver scales on stem, often forming long line.

MALE GENITALIA (fig. 31). *Sidepiece*: Length 0.34-0.41 mm [in Costa Rica 0.34-0.37 mm; in El Salvador 0.35-0.38 mm; in Guatemala 0.36-0.40 mm; in Mexico 0.40-0.41 mm]; median sternomesal area with convexity usually strongly developed, sometimes weakly or moderately so, sclerite typically well developed, tuft present. *Prosophaallus*: Length 0.11-0.14 mm [in El Salvador 0.11 mm; in Costa Rica 0.11-0.13 mm; in Guatemala 0.11-0.14 mm; in Mexico 0.13 mm]; mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal (at about 45° in 1 specimen); filament ratio 0.55-0.75 (0.40-0.85), hook usually strongly angulate (not strongly angulate in 2 specimens from Guatemala). *Aedeagus*: Length 0.13-0.14 mm (0.12-0.14 mm).

PUPA (fig. 31). *Cephalothorax*: Hair 9-C usually double, sometimes single. *Abdomen*: Hair 1-I with primary branches usually predominantly single or single-double, sometimes predominantly double or double-triple; 2-II laterad of 3-II to mesad for more than 0.3 the distance from 1-II to 3-II, usually in line with 3-II or mesad for 0.3 or less, rarely mesad for more than 0.3. *Paddle*: Ventral midrib with pigmentation moderate to strong and usually extending to apex.

LARVA (fig. 32). *Head*: Hair 5-C single to triple [in Amatitlan, Guatemala, single; in Costa Rica usually single (1-2, rarely 3); in Mexico triple]; 6-C single or double [in Amatitlan single; in Costa Rica usually single (1-2); in Mexico single or double];

7-C double to 4-branched; 14-C usually single, rarely double; *bmh* usually single, rarely double. *Thorax*: Hair 1-P double to 4-branched [in Amatitlan triple; in Costa Rica usually triple (2-4); in Mexico 4-branched (1 specimen)]; 4-P double to 6-branched [in Costa Rica usually triple (2-4); in Amatitlan 4-branched; in Mexico 3,4, 6-branched]; 5-P single to triple [in Amatitlan usually double (1-2); in Costa Rica usually double (2-3, rarely 1); in Mexico double or triple]; 7-P usually double, rarely single (1-3); 4-M usually double (1-3). *Abdomen*: Hairs 10,11-I subequal in length; 3-III usually double (1-2); 5-VII more than half length of 3-VII, often subequal to 3-VII. *Segment VIII*: Comb scales 56 to more than 100 (highest number in only Mexican specimen counted); length of free portion of midapical scale 0.027-0.035 mm (0.025-0.037 mm). *Siphon*: Length 0.72-0.90 mm (Mexican specimens not measured); L/S 2.04-2.22 (1.96-2.33); P/L 0.53-0.56 (0.51-0.58); H/L 0.59-0.63 (0.57-0.64). *Anal Segment*: Ventral brush usually with 14 hairs (12-15, rarely 16); 4a-X usually 6-branched (5-6, rarely 4 or 7); dorsal gill at least subequal in length to saddle.

SYSTEMATICS. *Aedes homoeopus* differs from *impostor*, the only other member of the subgroup, in the structure of the genitalia. In *homoeopus* the median sternomesal area usually shows a well-developed convexity, sclerite and tuft and the filament of the prosopallus is usually strongly angulate; in *impostor* the median sternomesal specializations are poorly differentiated and the filament is apparently only weakly angulate. The larvae of *homoeopus* and *impostor* are similar but show the following differences. In *homoeopus* hairs 10,11-I are subequal in length and 4a-X is usually 6-branched, rarely 7-branched; in *impostor* 10-I is at least 1.3 the length of 11-I and 4a-X is 8-branched (1 specimen).

The male of *homoeopus* shows some marked variation in diagnostic characters. The dorsocentral area at one extreme is silvered for nearly its entire length and at the other extreme the dorsocentral area is entirely devoid of silver scales (GUA 48-11); there are intermediate conditions in which the dorsocentral area is anteriorly silvered to various extents caudad. When it is not extensively silvered the acrostichal and usually the posterior dorsocentral stripes persist as prominent markings. The mesonotum of the GUA 48-11 male is strikingly similar to that of *heteropus* (figs. 31,42). The median sternomesal convexity and sclerite occasionally show marked reduction from the strongly developed condition typical of *homoeopus* and in 2 specimens from Guatemala, the hook of the claspette filament, typically strongly angulate, is apparently only weakly angulate. The median sternomesal structures of the latter 2 specimens are also reduced and only the presence of the median sternomesal tuft serves to distinguish these from *impostor* on the basis of the genitalia.

DISTRIBUTION (fig. 4). State of Veracruz, Mexico, at elevation of 3000 ft; Guatemala south to Costa Rica at elevations of 3100 to possibly 5000 ft. Material examined: 282 specimens; 82 ♂, 89 ♀, 52 pupae, 59 larvae; 49 individual rearings (36 larval, 10 pupal, 3 incomplete).

COSTA RICA. *Alajuela*: Alajuela [elev. 3100 ft], 26 May 1921, A. Alfaro, 1 ♀; June 1921, bamboo, A. Alfaro, 1 ♀; 1 July 1921, bamboo, A. Alfaro, 1 ♀; 4 July 1921, bamboo, A. Alfaro, 1 ♂; 30 July 1921, A. Alfaro, 2 ♀; Aug 1921, bamboo, A. Alfaro, 1 ♂, type series in part (1545, USNM 25253); 7 Oct 1921, A. Alfaro, 3 ♂, 3 ♀; 12 Oct 1921, A. Alfaro, 2 ♂; Oct 1921, A. Alfaro, 1 ♂, 2 ♀; Apr 1922, A. Alfaro, 2 ♀, type series in part (USNM 25253) [USNM]. Alajuela [elev. 3100 ft], 3 km S, 13 Nov 1962, bamboo stumps, C. Hogue, W. Powder (CR 18), 2 lp♂ (18-103, 105), 2 lp♀ (18-106,107), 1 L (18-2) [UCLA]. *San Jose*: Guadalupe [elev. 4000 ft], 27 June 1922, A. Alfaro, 1 ♀ [USNM]. San Jose, Parque Bolivar, elev. 3800 ft, 8 June 1963, small treehole, height 7 ft, C. Hogue (CR 88), 6 lp♀ (88-102,104,105,107,109,110), 2 p♂ (88-202,203), 2 lp♀ (88-

201), 4 ♂, 4 ♀, 24 L (88-1) [UCLA]. San Jose, University of Costa Rica, elev. 3800 ft, 8 Nov 1962, large treehole, J. Belkin, C. Hogue, W. Powder (CR 5), 1 lp♂ (5-111), 7 lp♀ (5-101-106,110), 1 lp (5-107), 1 L (5-1) – treehole, 1 lp♀ (CR 6-101); 13 Nov 1962, treehole, J. Belkin, C. Hogue, W. Powder, 1 lp♀ (CR 15-101); 16 Nov 1962, treehole (same as CR 5), C. Hogue, W. Powder, 1 lp♂ (CR 25-101) – large treehole (CR 44), 1 lp♂ (44-102-103), 1 lp♀ (44-101), 1 LP (44-104); 14 June 1964, large treehole, height 6 ft, C. Hogue (CR 175), 7 lp♀ (175-101,102,104-107,110), 5 p♀ (175-201-205), 1 ♂, 1 ♀, 2 p, 3 L (175-3) [UCLA]. *Province not specified*: Miravalles (? Guana-casta: Hacienda Miravalles, elev. 1700-3300 ft), 20 July 1922, A. Alfaro, 1 ♀ [USNM].

✓ EL SALVADOR. *Department not specified*: El Boqueron, 2 ♂ (716), 1 ♂ (717), 6 ♂, 8 ♀ [USNM].

GUATEMALA. *Chimaltenango*: Aldea "Pachup", nearest town Yepocapa [elev. 4850 ft], 28 Sept 1950, treehole, R. Rodriguez, P. Coc and J. Giron, 24 ♂, 1 ♀ (GUA 149-1) [UCLA]. Finca Santa Isabel, nearest town Yepocapa [elev. 4850 ft], 3 Aug 1950, treehole, V. and M. Xinic, 2 ♂, 3 ♀ (GUA 143-1) [UCLA]. Rio Queleya, nearest town Yepocapa [elev. 4850 ft], 22 Sept 1950, un pocito de agua estancada, J. and G. Giron, 1 ♂ (GUA 147-2) [UCLA]. *Locality not specified*, nearest town Yepocapa [elev. 4850 ft], 20 July 1950, treehole, P. Garcia, M. Xinic, 14 ♂, 7 ♀ (GUA 140-2); 29 July 1950, treehole, H. Dalmat, 4 ♂ (GUA 141-2); 3 Aug 1950, treehole, A. Castellanos, P. Garcia, 5 ♀ (GUA 142-1) [UCLA]. *Guatemala*: Amatitlan, elev. ca 3900 ft, 16 July 1964, small treehole, height 5 ft, P. Cowsill (GUA 48), 3 lp♂ (48-10,11,13), 1 LP (48-12), 1 ♀, 1 p, 1 L (48-1) [UCLA]. Guatemala, Villa de Guadalupe cemetery, elev. ca 5000 ft, 3 Sept 1964, small cement trough, W. Almengor, P. Cowsill (GUA 122), 1 p♀ (122-101), 1 ♀ (122-100) [UCLA].

MEXICO. *Veraacruz*: Cordoba [elev. 3000 ft], 7 Mar 1908, treehole, F. Knab (429), 2 lp♀ (429.11,.31), 2 ♂, type series in part (429.3, USNM 25253; 429.9, without USNM number), 2 ♂ (429.14), 5 ♂ (429p), 1 ♂ genitalia (1543, adult number unknown), 6 ♀ (429.4,.14,.20,.23,.59,.62), 2 ♀ (429p) [USNM]; 7 Aug 1905, biting-landing, 1500-1600 hrs, R. Schick, D. Schroeder, A. Lau, 1 ♀ (MEX 278-1) [UCLA].

15. *Aedes (Finlaya) impostor* Schick, n.sp.

Figs. 4,33,34

TYPE. *Holotype* ♂ (GUA 33-30) with associated pupal and larval skins and genitalia slide, Finca Trece Aguas, elev. 2800 ft, Alta Vera Paz, Guatemala, 7 July 1964, cut or broken bamboo, T. and J. Zavortink [USNM]. *Paratypes*: 5 L (33-3), same data as holotype [UCLA].

MALE. *Head*: Vertex with all decumbent scales silver, narrow curved; palpus about 2 labellum lengths shorter than proboscis, segment 4 with hairs of ventrolateral row closely spaced. *Thorax* (fig. 33): Mesonotal disc transversely silvered for more than half length. *Legs*: Tarsus I-II with median dark band about 0.5. *Wing*: Vein Cu with long line of silver scales on stem.

MALE GENITALIA (fig. 33). *Sidepiece*: Length 0.42 mm; median sternomesal area with convexity and sclerite weakly developed, tuft absent. *Prosopallus*: Length 0.14 mm; mesal lobe with lateral portion inclined at about 30° from horizontal; filament ratio 0.73, hook not strongly angulate. *Aedeagus*: Length 0.14 mm.

PUPA (fig. 33). *Cephalothorax*: Hair 9-C double. *Abdomen*: Hair 1-I with primary branches predominantly single; 2-II laterad of 3-II. *Paddle*: Ventral midrib weakly pigmented.

LARVA (fig. 34). *Head*: Hair 5-C usually single (1-2); 6-C single; 7-C usually triple or 4-branched (3-5). *Thorax*: Hair 1-P usually triple (2-4); 4-P usually double or triple (2-4); 5-P usually double (2-3); 7-P usually triple (2-3); 4-M double. *Abdomen*: Hair 10-I 1.3 or more length of 11-I; 3-III double; 5-VII usually less than half length

of 3-VII, at most slightly longer than half length. *Segment VIII*: Comb scales 50 to more than 100; length of free portion of midapical comb scale 0.027-0.030 mm. *Siphon*: Length 0.91-1.00 mm; L/S 2.37-2.44; P/L 0.56-0.59; H/L 0.63-0.66. *Anal Segment*: Ventral brush with 11-13 hairs; 4a-X 8-branched; dorsal gill absent in all specimens.

SYSTEMATICS. *Aedes impostor* is very similar to *homoeopus*. Their separation is discussed under the latter species.

DISTRIBUTION (fig. 4). Department of Alta Vera Paz, Guatemala. Material examined: 8 specimens; 1 ♂, 1 pupa, 6 larvae; 1 individual rearing (larval).

GUATEMALA. *Alta Vera Paz*: Finca Trece Aguas, elev. 2800 ft, 7 July 1964, cut or broken bamboo, T. and J. Zavortink (GUA 33, type series), 1 1p♂ (33-30), 5 L (33-3) [USNM; UCLA].

Heteropus Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of females with erect scales variable, from all pale to all dark, of males, all pale; proboscis of females shorter or longer than femur I; palpal segments 3 and 4 of males with ventrolateral hairs variously developed. *Thorax*: Mesonotal disc of both sexes not transversely silvered; complete acrostichal or posterior dorsocentral lines present or absent in females; acrostichal seta present; fossal macula of females not coextensive with fossa, reduced mesally, of males coextensive or not coextensive; supraalar macula not truncate posteriorly, in females usually not joined to fossal macula; *ppn* silver scaled; *ssp* scales present or absent; *pra* hairs of females pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver bands; tarsus 1-I with or without narrow apical band; femur II with knee spot broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band incomplete or complete and moderately broad; tarsus 2-II usually with complete dark apical band; tarsus 5-II without silver scales; femur III with basal dark band incomplete or complete and usually narrow; tarsus 5-III without silver scales. *Wing*: Vein C of female usually with small patch of silver scales or line not reaching 0.5 to cross-vein *h*, of males usually a small patch, sometimes an interrupted line reaching *h*; veins R and Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area with or without dense patch of long setae, median sternomesal area with or without strongly developed sclerite, with or without tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral portion inclined from less than 15° to about 45° from horizontal; stem not bowed; filament with hook strongly or not strongly angulate.

PUPAE. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C usually single. *Abdomen*: Hair 1-I with primary branches predominantly single to multiple; 2-II usually mesad of 3-II for 0.3 or less the distance from 1-II to 3-II; 3-III single. *Paddle*: Pigmented; apex usually produced, often strongly; hair 1-P shorter than paddle.

LARVAE. *Head*: Hairs 5,6-C single to multiple; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, single; *bmh* single or branched. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P greater or less than half length of 14-P; 14-P single; 3-M single; 4-M usually double; 8-T shorter, but more than half length of, or longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III single or double;

10-III single; 3-VI single; 4-VII usually single; 5-VII caudad of 4-VII, shorter or longer than half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion longer or shorter than sessile portion; 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. The Heteropus Subgroup is a rather large and diverse group but the species show no apparent fundamental differences that would justify the recognition of further subgroups. The subgroup is characterized in the adults by the combination of the absence of transverse silvering on the mesonotum of the males, the presence of acrostichal setae, the disjunct fossal and supraalar maculae of the females, the pale *pra* hairs, the incomplete or narrow dark basal band of femur III and the absence of extensive silver scaling at the base of the wing veins. The larva of some species shows nonmultiple hairs 5,6-C and cannot be readily distinguished from those of the *Metoecopus*, *Homoeopus* and *Podographicus* Subgroups; in the remaining species the larvae are distinguished by the combination of characters given in the key. The male genitalia and pupae do not show distinctive subgroup characters.

The subgroup occurs at moderately high to high elevations from Mexico to Costa Rica.

Three phyletic lines appear to be represented, one by *amabilis*, *gabriel*, *idanus* and *sumidero*, a second by *vargasi* and a third by *heteropus*. The species of the *amabilis* line seemingly are allied by the mesonotal markings of the females, complete acrostichal and/or posterior dorsocentral lines tending to be developed and the fossal maculae being strongly concave mesally.

16. *Aedes* (*Finlaya*) *amabilis* Schick, n.sp.

Figs. 5,37

TYPE: *Holotype* ♀ (MEX 381-3), Cueva del Nacimiento del Agua (cave of origin of Rio Atoyac), nearest town Penuela (elev. 3000 ft), Veracruz, Mexico, 13 July 1965, biting-landing, C.L. Hogue [USNM]. *Paratypes*: 3 ♀ (381-3), same data as holotype [BM; UCLA].

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line generally dark, narrow curved; occiput with erect scales dark; proboscis longer than femur I. *Thorax* (fig. 37): Complete acrostichal and posterior dorsocentral lines present; most posterior acrostichal seta at about 0.5 from anterior end or in posterior half; fossal macula with mesal margin concave; supraalar macula not joined to fossal macula; prescutellar space and midlobe of scutellum with silver scales; *ssp* scales present. *Legs*: Femur I with narrow knee spot; with poorly developed posterior patch of silver scales in basal half comprising scattered scales; posterior patch of femur II either similarly developed or with fewer scales or absent; tarsus 1-II with median dark band complete, about 0.5; femur III with basal dark band 0.07-0.11 (incomplete in 1 specimen), subapical dark band 0.36-0.42; tarsus 1-III with basal silver band 0.13-0.16, apical silver band 0.14-0.21. *Wing*: Vein C with small basal patch of silver scales or without silver scales.

MALE, PUPA, LARVA. Unknown.

SYSTEMATICS. *Aedes amabilis* is distinguished from the other members of the subgroup by the presence of both complete acrostichal and posterior dorsocentral

lines and by the presence of a narrow knee spot on femur I.

DISTRIBUTION (fig. 5). State of Veracruz, Mexico, at elevation of 3000 ft. Material examined: 6 ♀; no individual rearings.

MEXICO. Veracruz: Cueva del Nacimiento del Agua (cave of origin of Rio Atoyac), nearest town Penuela (elev. 3000 ft), 13 July 1965, biting-landing, C. Hogue, 4 ♀ (MEX 381-3, type series) [USNM; BM; UCLA]. Presidio, 0.5 mi S, elev. 2300-3300 ft, 14 July 1965, biting-landing, 1500 hrs, C. Hogue, 2 ♀ (MEX 386-3) [UCLA].

17. *Aedes* (Finlaya) *gabriel* Schick, n.sp.

Figs. 5,35,36

TYPE: *Holotype* ♂ (MEX 350-113) with associated pupal skin, Gabriel Mariaca, 0.5 mi E (2.7 mi W Tepotzlan), elev. 5200 ft, Morelos, Mexico, 7 Sept 1965, large treehole, D. Schroeder [USNM]. *Allotype* ♀ (350-20) with associated pupal and larval skins, same data as holotype [USNM]. *Paratypes*: 1 lp♂ (350-23), 12 lp♂ (350-10,18-22,26,28,29), 10 p♂ (350-92,95,100,101,103,104,108-110,114), 7 p♀ (350-90,91,94,102,105,107,111), 6 ♂, 4 ♀, 35 P, 9 p, 50 L (350-1), same data as holotype [BM; UCLA].

?*Aedes* (*Gualteria*) *terrens* in part of Vargas and Downs (1950:171).

FEMALE. Head: Vertex with decumbent scales laterad of median longitudinal line silver or dark, narrow curved; occiput with erect scales all pale or all dark or with a mixture of both; proboscis shorter than or subequal in length to femur I. **Thorax** (fig. 35): Complete acrostichal line present; complete posterior dorsocentral line absent; most posterior acrostichal seta usually at about 0.25 from anterior end, but sometimes in posterior half; fossal macula with mesal margin concave; supraalar macula not joined to fossal macula; prescutellar space and midlobe of scutellum with silver scales; *ssp* scales present. **Legs:** Femur I without knee spot; femora I and II with well-developed posterior patch of silver scales in basal half, about equal in size; tarsus I-II with median dark band complete, about 0.33-0.5; femur III with basal dark band 0.05-0.08, subapical dark band 0.35-0.49; tarsus I-III with basal silver band 0.07-0.11, apical silver band 0.14-0.21 (0.14-0.25). **Wing:** Vein C with small basal patch of silver scales; vein R without silver scales.

MALE. Head: Vertex with all decumbent scales silver, narrow curved; palpus subequal in length to proboscis or 0.5 labellum length longer; segment 3 with 3 or fewer rather short apical ventrolateral hairs; segment 4 with hairs of ventrolateral row short, sparse. **Thorax** (fig. 35): Mesonotal disc without strip of silver scales bordering fossa; complete acrostichal line usually present, middle portion sometimes weakly developed; complete posterior dorsocentral line absent; fossal macula not reaching mesal margin of fossa. **Legs:** Tarsus I-II with median dark band as in female. **Wing:** Vein C with small basal patch of silver scales.

MALE GENITALIA (fig. 35). *Sidepiece:* Length 0.43-0.45 mm; basal tergomesal area without dense patch of long setae; median sternomesal area with convexity usually weakly, sometimes moderately, developed, sclerite well developed, tuft present. *Prosopallus:* Length 0.15 mm; mesal lobe with lateral portion inclined from about 30° to 45° from horizontal; filament ratio 0.35-0.40; hook of filament not strongly angulate. *Aedeagus:* Length 0.15-0.16 mm.

PUPA (fig. 35). *Cephalothorax:* Hair 9-C single. *Abdomen:* Hair 1-I with primary branches predominantly single or single-double; 2-II laterad of 3-II to mesad for

more than 0.3 the distance from 1-II to 3-II, usually mesad for 0.3 or less. *Paddle*: Apex not or weakly to moderately produced; ventral midrib usually weakly pigmented, when infrequently moderately pigmented not more strongly at apex.

LARVA (fig. 36). *Head*: Hairs 5,6-C single; 7-C usually double to 4-branched (2-5); *bmh* single. *Thorax*: Hair 1-P usually double, rarely triple; 4-P single or double; 5-P usually double, rarely triple; 7-P usually double, rarely triple; 11-P less than half length of 14-P; 4-M double; 8-T usually shorter than metathoracic pleural tubercle (subequal in length in MEX 352). *Abdomen*: Hair 2-I usually single (1-2); 3-III usually single (1-2). *Segment VIII*: Comb scales 80 to more than 100, usually the latter; free portion of apical scale shorter or longer than sessile portion, length 0.015-0.030 mm (0.024-0.033 mm). *Siphon*: Length 0.70-0.80 mm; L/S 1.89-2.00 (1.82-2.08); P/L 0.57-0.61 (0.56-0.63); H/L 0.62-0.67 (0.61-0.68). *Anal Segment*: Ventral brush usually with 12 hairs (11-13); 4a-X usually 5-branched (4-6).

SYSTEMATICS. *Aedes gabriel* is distinguished from the other members of the subgroup in the adults by a combination of the presence of a complete acrostichal line and the absence of a complete posterior dorsocentral line; in the male genitalia by a combination of the absence of a dense patch of long basal tergomesal setae and the presence of a well-developed median sternomesal sclerite and tuft on the sidepiece; in the larva by a combination of the single hairs 5,6-C, the usually single 2-I and the ventral brush of usually 12 hairs.

The only larva of lot MEX 352 (352-12), differs markedly from the other *gabriel* larvae in characters that would otherwise be of some use in separating this species from the others in which hairs 5,6-C are not multiple and 4-VII is single. Typically, in *gabriel*, hair 8-T is shorter than the metathoracic pleural tubercle, 10-I is much longer than 11-I, hairs 1,13-III-VI are single and long and 5-VII is shorter than 3-VII. In MEX 352-13, however, hair 8-T is subequal in length to the tubercle, 10,11-I are subequal in length, 1,13-III-VI are multiple and relatively short and 5-VII is longer than 3-VII. The pupa of this rearing unfortunately died so that the adult is not available for confirmation of the identification.

DISTRIBUTION (fig. 5). State of Morelos, Mexico, at elevation of 5200 ft. Material examined: 234 specimens; 30 ♂, 30 ♀, 87 pupae, 87 larvae; 50 individual rearings (21 larval, 26 pupal, 3 incomplete).

MEXICO. *Morelos*: Gabriel Mariaca, 0.5 mi E (2.7 mi W Tepoztlán), elev. 5200 ft, 7 Sept 1965, volcanic rockhole, D. Schroeder, 1 p♂ (MEX 346-102) – small treehole (MEX 349), 4 lp♀ (349-13-15,17), 3 p♂ (349-102-104), 1 IP (349-12), 1 ♂, 2 L (349-1) [UCLA] – large treehole (MEX 350, type series), 1 lp♂ (350-23), 13 lp♀ (350-10,18-22,26,28,29), 11 p♂ (350-92,95,100,101,103,104,108-110,113,114), 7 p♀ (350-90,91,94,102,105,107,111), 6 ♂, 4 ♀, 35 P, 9 p, 50 L (350-1) [USNM; BM; UCLA] – small treehole (MEX 352), 1 p♂ (352-101), 1 p♀ (352-100), 1 IP (352-13), 1 L (352-2) – small volcanic rockhole (MEX 355), 1 lp♂ (355-10), 2 p♂ (355-100,102), 2 IP (355-11,12), 1 L (355-1) [UCLA].

18. *Aedes* (Finlaya) *idanus* Schick, n.sp.

Figs. 5,37,38

TYPE: *Holotype* ♂ (MEX 420-10), with associated larval and pupal skins and genitalia slide, Viejo de Agua de Obispo, nearest town Chilpancingo (elev. 2220 ft), Guerrero, Mexico, 8 Aug 1966, treehole, D. Schroeder [USNM]. *Allotype* ♀ (MEX 413-1), Agua de Obispo, elev. 2900 ft, 8 Aug 1966, biting, 0800-0830 hrs, D. Schroeder [USNM]. *Paratypes*: 3 L (420-1), same data as holotype; 1 ♀ (413-1), same data as allotype [UCLA].

FEMALE. *Head:* Vertex with decumbent scales of area just adjacent to median longitudinal line dark, narrow curved; scales laterad of these dark, broad; occiput with erect scales pale or dark; proboscis longer than femur I. *Thorax:* Complete acrostichal line absent although line of scattered silver scales present in specimens from Taxco; complete posterior dorsocentral line present; most posterior acrostichal seta about 0.4 from anterior end; fossal macula with mesal margin essentially straight; supraalar macula not joined to fossal macula; prescutellar space and mid-lobe of scutellum with silver scales; *ssp* scales present. *Legs:* Femur I without knee spot; femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus 1-II with median dark band complete, about 0.4-0.6; femur III with basal dark band incomplete, subapical dark band 0.31-0.34; tarsus 1-III with basal silver band 0.15, apical silver band 0.19. *Wing:* Vein C with small basal patch of silver scales; vein R without silver scales.

MALE. *Head:* Vertex with decumbent scales laterad of median longitudinal line dark, broad; palpus about 2 labellum lengths shorter than proboscis; segment 3 with 3 short apical ventrolateral hairs; segment 4 with hairs of ventrolateral row short and sparse. *Thorax* (mesonotal disc largely rubbed): Fossal macula not reaching mesal margin of fossa. *Legs* (in poor condition, measurement possibly inaccurate): Tarsus 1-II with median dark band complete, about 0.6. *Wing:* Vein C with small basal patch of silver scales.

MALE GENITALIA (fig. 37). *Sidepiece:* Length 0.38 mm; basal tergomesal area with dense patch of long setae; median sternomesal area with convexity moderately developed, sclerite well developed, tuft present. *Prosophallus:* Length 0.11 mm; mesal lobe with lateral portion inclined at about 30° from horizontal; stems essentially parallel; filament ratio 0.50-0.55; hook of filament strongly angulate. *Aedeagus:* Length 0.14 mm.

PUPA (fig. 37). *Cephalothorax:* Hair 9-C single. *Abdomen:* Hair 1-I with primary branches predominantly single; 2-II mesad of 3-II for less than 0.3 the distance from 1-II to 3-II. *Paddle:* Apex moderately produced; ventral midrib moderately pigmented, not more strongly at apex.

LARVA (fig. 38). *Head:* Hair 5-C 4-6 branched; 6-C single or double; 7-C 5-7 branched; *bmh* single. *Thorax:* Hair 1-P triple; 4-P double or triple; 5-P double; 7-P double; 11-P less than half length of 14-P; 4-M double; 8-T shorter than metathoracic pleural tubercle. *Abdomen:* Hair 2-I single to triple; 3-III single or double. *Segment VIII:* Comb scales about 42; length of free portion of midapical scale 0.033 mm (length relative to sessile portion not known). *Siphon:* Exact length not determined because of poor orientation on slide, at least 0.91 mm. *Anal Segment:* Ventral brush with 12 hairs; 4a-X 6-branched.

SYSTEMATICS. *Aedes idanus* is distinguished from the other members of the subgroup in the female by a combination of the long proboscis, the absence of a complete acrostichal line and the presence of a complete posterior dorsocentral line; in the male genitalia by the combination of a patch of long basal tergomesal setae and a well-developed median sternomesal sclerite and tuft of the sidepiece; and in the larva by the multiple hair 5-C and the short 11-P.

DISTRIBUTION (fig. 5). State of Guerrero, Mexico, at elevations of 2220 or 3000-5800 ft. Material examined: 10 specimens; 1 ♂, 4 ♀, 1 pupa, 4 larvae; 1 individual rearing (larval).

MEXICO. *Guerrero:* Agua de Obispo (21 mi S Chilpancingo), elev. 2900 ft [possibly 3000-4000 ft], 8 Aug 1966, biting, 0800-0830 hrs, D. Schroeder, 2 ♀ (MEX 413-1, type series in part) [USNM; UCLA]. Rancho Viejo de Agua de Obispo (24 mi S Chilpancingo), elev. 2200 ft [pos-

sibly 3000-4000 ft], 8 Aug 1966, large treehole in dead tree, height 10 ft, D. Schroeder (MEX 420, type series in part), 1 ♀ (420-10), 3 L (420-1) [USNM; UCLA]. Tazco (Taxco) [elev. 5800 ft], Aug 1955, N. Krauss, 2 ♀ [USNM].

19. *Aedes (Finlaya) sumidero* Schick, n.sp.

Figs. 5,39

TYPE: *Holotype* ♂ (MF 8-2), Sumidero (24 km N Tuxtla Gutierrez), elev. 3400 ft, Chiapas, Mexico, 16 Aug 1964, in shelter flying at night, E. Fisher [USNM]. *Allotype* ♀ (MF 8-2), same data as holotype [USNM]. *Paratypes*: 12 ♂, 4 ♀ (MF 8-2), same data as holotype [BM; UCLA].

FEMALE. *Head*: Vertex with decumbent scales of area just adjacent to median longitudinal line variable, usually dark, narrow curved; scales laterad of these silver, broad; occiput with erect scales all pale or with mixture of pale and dark scales; proboscis shorter than femur I. *Thorax* (fig. 39): Complete acrostichal line absent; complete posterior dorsocentral line absent or weakly developed; most posterior acrostichal seta at about 0.5 from anterior end; fossal macula with mesal margin concave; supraalar macula usually not joined to fossal macula (narrowly joined in 1 specimen); prescutellar space and midlobe of scutellum with silver scales; *ssp* scales present. *Legs*: Femur I without knee spot; femora I and II with well-developed posterior patch of silver scales in basal half; subequal in size; tarsus I-II with median dark band complete, usually about 0.5, sometimes about 0.4; femur III with basal dark band usually incomplete, when complete 0.05 or less, subapical dark band 0.33-0.36 (0.30-0.37); tarsus I-III with basal silver band 0.11-0.16 (0.10-0.19), apical silver band 0.17-0.22 (0.17-0.23). *Wing*: Vein C with small basal patch of silver scales; vein R without silver scales.

MALE. *Head*: Vertex with all decumbent scales silver, narrow curved; palpus usually about 0.5 labellum length shorter than proboscis, sometimes 1.5 less; segment 3 with several short to moderately long apical ventrolateral hairs shorter than segments 4 and 5 combined; segment 4 with hairs of ventrolateral row short to moderately long, somewhat sparse. *Thorax* (fig. 39): Mesonotal disc with strip of silver scales bordering fossal macula much broader posteriorly than anteriorly; complete acrostichal line usually absent, sometimes weakly developed; complete posterior dorsocentral line present; fossal macula coextensive with fossa. *Legs*: Tarsus I-II with median dark band complete, about 0.4. *Wing*: Vein C with basal silver scales variably developed, often forming incomplete line reaching crossvein *h*.

MALE GENITALIA (fig. 39). *Sidepiece*: Length 0.41-0.46 mm; basal tergomesal area without dense patch of long setae; median sternomesal area with convexity and sclerite weakly developed, tuft present but not prominently differentiated. *Proso-phallus*: Length 0.14-0.15 mm; mesal lobe with lateral portion usually inclined at 15° or less than 15° from horizontal (unilaterally between 15° and 30° in 1 specimen); stems essentially parallel; filament ratio 0.50-0.60; hook of filament not strongly angulate. *Aedeagus*: Length 0.14-0.15 mm.

PUPA, LARVA. Unknown.

SYSTEMATICS. *Aedes sumidero* is distinguished from the other members of the subgroup in the female by a combination of the short proboscis and the absence of a complete mesonotal line; and in the male by the form of the anterolateral silver strip of the mesonotal disc, which is unique for the Terrens Group. The male

genitalia serve to separate *sumidero* from *gabriel*, *idanus* and *heteropus* but not from *vargasi*; the sidepiece lacks a basal tergomesal tuft of long setae and prominent specialization of the median sternomesal area and the lateral portion of the mesal lobe of the prosophallus is only slightly inclined.

DISTRIBUTION (fig. 5). State of Chiapas, Mexico, at elevation of 3400 ft. Material examined: 45 specimens; 18 ♂, 27 ♀; no individual rearings.

MEXICO. Chiapas: Sumidero (24 km N Tuxtla Gutierrez), elev. 3400 ft, 23 July 1963, biting-landing, 0900 hrs, E. Fisher, 13 ♂, 5 ♀ (MF 8-2, type series) [USNM; BM; UCLA]; 15 Aug 1964, "in shelter flying at night", E. Fisher, 3 ♀ (MEX 115-2); 17 Aug 1964, biting-landing, 1100 hrs, E. Fisher, D. Verity (MEX 120-128), 1 ♀ (120-2), 4 ♀ (121-3), 6 ♀ (122-1; 123-1; 124-1; 125-1; 126-1; 127-1), 5 ♂, 7 ♀ (128-3) [UCLA].

20. *Aedes* (Finlaya) *vargasi* Schick, n.sp.

Figs. 5,40,41

TYPE: *Holotype* ♂ (MEX 247-10) with associated pupal and larval skins and genitalia slide, Cordoba, 5-15 mi S, elev. 3000-3500 ft, Veracruz, Mexico, 30 July 1965, treehole, D. Schroeder [USNM]. *Allotype* ♀ (MEX 246-10) with associated pupal and larval skins, same data as holotype [USNM]. *Paratypes:* 1 P, 22 L (247-1), same data as holotype [BM; UCLA]. This species is dedicated to Luis Vargas of the Instituto de Salubridad y Enfermedades Tropicales, Mexico.

FEMALE. Head: Vertex with decumbent scales laterad of median longitudinal line silver or dark, narrow curved; occiput with erect scales pale. **Thorax** (fig. 40): Complete acrostichal or posterior dorsocentral lines absent; most posterior acrostichal seta usually at about 0.25 from anterior end (in MEX 228-10 at posterior end); fossal macula with mesal margin essentially straight or slightly concave; supraalar macula not joined to fossal macula; prescutellar space and midlobe of scutellum with silver scales; *ssp* scales usually absent (MEX 226-10 with 2 scales). **Legs:** Femur I without knee spot; femora I and II with well-developed posterior patch of silver scales in basal half, about equal in size; tarsus I-II with median dark band usually complete, about 0.33 (incomplete in 1 specimen of MEX 18); femur III with basal dark band 0.07-0.13, subapical dark band 0.30-0.35; tarsus I-III with basal silver band usually present, 0.04-0.06 (absent in MEX 346-10), apical silver band 0.21-0.31. **Wing:** Vein C with basal silver scales forming small patch or line not reaching 0.5 to crossvein *h*; vein R with a few basal silver scales.

MALE. Head: Vertex with all decumbent scales silver, narrow curved; palpus about 1 labellum length shorter than proboscis; segment 3 with several long apical ventrolateral hairs forming tuft nearly as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row increasing in length basad, sparse. **Thorax** (fig. 40): Mesonotal disc without strip of silver scales bordering fossal macula; complete acrostichal or posterior dorsocentral lines absent; most posterior acrostichal seta about 0.25 from anterior end; fossal macula coextensive with fossa. **Legs:** Tarsus I-II with median dark band virtually obliterated by silver scales. **Wing:** Vein C with basal silver scales forming line reaching 0.5 to crossvein *h*.

MALE GENITALIA (fig. 40). **Sidepiece:** Length 0.30 mm; basal tergomesal area without dense patch of setae; median sternomesal area with convexity absent, sclerite weakly developed, tuft absent. **Prosophallus:** Length 0.11 mm; mesal lobe with lateral portion inclined at less than 15° from horizontal; stems slightly divergent; filament ratio 0.50-0.55; hook of filament not strongly angulate. **Aedeagus:** Length 0.12 mm.

PUPA (fig. 40). *Cephalothorax*: Hair 9-C usually single, infrequently double. *Abdomen*: Hair 1-I with primary branches predominantly double-triple to predominantly multiple, infrequently predominantly single (but with long barbs); 2-II mesad of 3-II for usually 0.3 or less the distance from 1-II to 3-II, sometimes more than 0.3. *Paddle*: Apex usually strongly produced; ventral midrib moderately pigmented for most length, weakly at apex.

LARVA (fig. 41). *Head*: Hair 5-C usually single (1-3); 6-C single; 7-C double to 5-branched; *bmh* single. *Thorax*: Hairs 1,4-P usually double or triple (2-4); 5-P single or double; 7-P usually double, infrequently triple; 11-P less than half length of 14-P; 8-T shorter than or subequal in length to metathoracic pleural tubercle. *Abdomen*: Hair 2-I usually triple (2-3); 3-III usually double (1-2). *Segment VIII*: Comb scales 40 to more than 100 [in Tamazunchale 40-60; in Cordoba 50 to more than 100]; free portion of midapical scale usually longer than sessile portion, length 0.027-0.033 mm (0.022-0.036 mm). *Siphon*: Length 0.80-0.97 mm; L/S 2.13-2.56 [in Cordoba 2.13-2.44; in Tamazunchale 2.27-2.56]; P/L 0.55-0.59 (0.54-0.60); H/S 0.61-0.65 (0.60-0.67). *Anal Segment*: Ventral brush usually with 14 hairs (13-15); 4a-X usually 6,7-branched (5-8).

SYSTEMATICS. *Aedes vargasi* is distinguished from the other members of the subgroup in the adults by the absence of complete acrostichal and posterior dorso-central lines in both sexes, the absence of a scale patch on the *ssp* and the usually narrower median dark band of tarsus 1-II; in the larva by a combination of the single hairs 5,6-C, the usually branched 2-I and the ventral brush of usually 14 hairs. The male genitalia are similar to those of *sumidero*.

DISTRIBUTION (fig. 5). Atlantic drainage of Sierra Madre Oriental, Mexico, at elevations of 400 to about 3000 ft. Material examined: 63 specimens; 1 ♂, 10 ♀, 9 pupae, 43 larvae; 9 individual rearings (6 larval, 2 pupal, 1 incomplete).

MEXICO. *San Luis Potosi*: Saketepan (near Tamazunchale), elev. 400 ft, 20 July 1965, small treehole, height 6 ft, R. Schick, D. Schroeder (MEX 213), 1 p♀ (213-100), 9 L (213-3) – biting-landing, 1100 hrs, 1 ♀ (MEX 220-7) – small treehole, height 10 ft, 11 L (MEX 227-1) – small treehole, height 3 ft, 1 lp♀ (MEX 228-10) – small treehole, height 4 ft (MEX 229), 2 lp♀ (229-10,11), 1 p♀ (229-100) [UCLA]. *Veracruz*: Cordoba, 1.5 mi E, elev. 3000 ft, 12 July 1964, biting-landing, 1900 hrs, at dusk, E. Fisher, D. Verity, 2 ♀ (MEX 18-1); 22 July 1964, large treehole, height 5 ft, E. Fisher, D. Verity, 1 lp♀ (MEX 71-5) [UCLA]. Cordoba, 5-15 mi S, elev. 3000-3500 ft, 30 July 1965, small treehole, height 5 ft, D. Schroeder (MEX 245), 1 IP (245-10), 1 L (245-1) [UCLA] – small treehole (MEX 246), 1 lp♀ (246-10), 3 L (246-1) [USNM; UCLA] – small treehole, height 5 ft (MEX 247, type series), 1 lp♂ (247-10), 1 P, 22 L (247-1) [USNM; BM; UCLA].

21. *Aedes (Finlaya) heteropus* Dyar

Figs. 5,42,43

1921. *Aedes (Finlaya) heteropus* Dyar 1921:152. TYPE: *Lectotype* ♂ with genitalia slide (1542), Alajuela, Costa Rica, 1 July 1921, bamboo, A. Alfaro [USNM, 24865; designation of Stone and Knight 1956:218].

Aedes (Finlaya) heteropus of Bonne and Bonne-Wepster (1925:422); Dyar (1925b:147).

Aedes (Finlaya) terrens in part of Lane (1939:105; 1953:686); Stone, Knight and Starcke (1959:171); Belkin, Schick and Heinemann (1965:12); Forattini (1965:395).

Aedes terrens in part of Kumm, Komp and Ruiz (1940:400,417).

Aedes (Finlaya) terrens var. *podographicus* of Edwards (1932:510); Knight and Marks (1952:549).

Aedes (Finlaya) podographicus in part of Dyar (1928:223).

FEMALE. *Head:* Vertex with decumbent scales laterad of median longitudinal line dark, narrow curved; occiput with erect scales pale; proboscis subequal in length to or longer than femur I. *Thorax* (fig. 42): Complete acrostichal and posterior dorsocentral lines absent; most posterior acrostichal seta at about 0.5 from anterior end or in posterior half; fossal macula with mesal margin essentially straight, supraalar macula not or narrowly joined to fossal macula; prescutellar space with silver scales; midlobe of scutellum without silver scales; *ssp* scales present. *Legs:* Femur I without knee spot; femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus 1-II with median dark band complete, about 0.5; femur III with basal dark band incomplete or complete, 0.03, subapical dark band 0.36-0.37 (0.32-0.37); tarsus 1-III with basal silver band 0.13-0.14, apical silver band 0.19-0.25. *Wing:* Vein C with only a few basal silver scales; vein R without silver scales.

MALE. *Head:* Vertex with all decumbent scales silver, narrow curved; palpus about 0.5-2 labellum lengths shorter than proboscis; segment 3 with several long apical ventrolateral setae forming tuft as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row usually long, somewhat sparse. *Thorax* (fig. 42): Mesonotal disc usually without strip of silver scales bordering fossal macula; complete acrostichal and posterior dorsocentral lines present; fossal macula coextensive with fossa. *Legs:* Tarsus 1-II with median dark band complete, about 0.33-0.5. *Wing:* Vein C with basal silver scales usually forming small patch but sometimes developed as interrupted line reaching crossvein *h*.

MALE GENITALIA (fig. 42). *Sidepiece:* Length 0.35 mm; basal tergomesal area without dense patch of long setae; median sternomesal area with convexity and sclerite weakly developed, tuft absent. *Prosophallus:* Length 0.11 mm (0.13 mm in 1 specimen); mesal lobe with lateral portion inclined from between 15° and 30° to about 30° from horizontal; stems essentially parallel or divergent; filament ratio 0.45-0.65; hook of filament not strongly angulate. *Aedeagus:* Length 0.12-0.13 mm.

PUPA (fig. 42). *Cephalothorax:* Hair 9-C single. *Abdomen:* Hair 1-I with primary branches predominantly double-triple to triple-multiple; 2-II laterad of 3-II or mesad for 0.3 or less the distance from 1-II to 3-II. *Paddle:* Apex not strongly produced; ventral midrib strongly pigmented for most length, weakly at apex.

LARVA (fig. 43). *Head:* Hair 5-C usually 5-branched (4-6); 6-C usually triple or 4-branched (2-5); 7-C usually 5,6-branched; *bmh* usually branched but often single. *Thorax:* Hair 1-P usually triple or 4-branched (3-5); 4-P usually triple (2-4); 5-P usually double or triple (2-4); 7-P usually double (1-3); 11-P about half length of 14-P; 8-T subequal in length to or longer than metathoracic pleural tubercle. *Abdomen:* Hair 2-I usually triple or 4-branched (2-4); 3-III double. *Segment VIII:* Comb scales 32-53; free portion of midapical scale usually shorter than sessile portion; length 0.027-0.030 mm (0.022-0.035 mm). *Siphon:* Length 0.70-0.86 mm; L/S 2.13-2.22 (2.13-2.33); P/L 0.53-0.56 (0.50-0.57); H/L 0.61-0.65 (0.59-0.68). *Anal Segment:* Ventral brush usually with 12 hairs (11-12); 4a-X usually 6-branched (4-6).

SYSTEMATICS. *Aedes heteropus* is distinguished from the other members of the subgroup in the adults by a combination of the absence of complete mesonotal lines in the female and the presence of a complete acrostichal line in the male; in the male genitalia by a combination of the absence of a median sternomesal sclerite and tuft on the sidepiece and the moderately steeply inclined mesal lobe of the prosophallus; and in the larva by a combination of the multiple hair 5-C and the long 11-P.

The females of *heteropus* and *homoeopus* are very similar. Their separation in

the key, by the presence of silver scales on the midlobe of the scutellum in *homoeopus* and the absence of the scales in *heteropus*, must be further verified. Probably more reliable separation can be made on the basis of the pigmentation of the midrib of the paddle if the pupa is available.

DISTRIBUTION (fig. 5). Costa Rica at elevations of 3100-3800 ft; 1 record, based upon questionable determination, from El Salvador at an elevation between 1700 and 3300 ft. Material examined: 72 specimens; 22 ♂, 8 ♀, 1 pupa, 41 larvae; 1 individual rearing (larval).

COSTA RICA. *Alajuela*: Alajuela [elev. 3100 ft], 20 May 1921, bamboo, A. Alfaro, 2 ♂ (1 ♂, type series in part); May 1921, bamboo, 1 ♂, type series in part; June 1921, bamboo, A. Alfaro, 3 ♂, 1 ♀; 1 July 1921, bamboo, A. Alfaro, 2 ♀, type series in part; 4 July 1921, bamboo, A. Alfaro, 3 ♂, 3 ♀ (1 ♂, type series in part); 30 July 1921, A. Alfaro, 1 ♂; 7 Oct 1921, A. Alfaro, 3 ♂; Oct 1921, A. Alfaro, 1 ♂ (1635), 4 ♂, 1 ♀; Apr 1922, A. Alfaro, 1 ♂, type series in part (USNM, 24865). *San Jose*: San Jose, Parque Bolivar, elev. 3800 ft, 8 June 1963, small treehole, height 7-8 ft, C. Hogue (CR 88), 1 lp♀ (88-101), 2 ♂, 38 L (88-3) — small treehole adjacent to CR 88, height 7 ft, C. Hogue, 1 L (89-1) [UCLA]. San Jose, University of Costa Rica, elev. 3800 ft, 8 Nov 1962, large treehole, J. Belkin, C. Hogue, W. Powder, 1 p♀ (CR 7-101).

EL SALVADOR. *Cuscatlan*: Cojutepeque [elev. 1700-3300 ft], 1 ♂ (626) [USNM].

Galindoi Subgroup

ADULTS. *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of both sexes with erect scales pale; proboscis of female longer than femur I; palpal segment 3 of males with 1 or 2 short to moderately long hairs; segment 4 with hairs of ventrolateral row short to moderately long, sparse. *Thorax*: Mesonotal disc of both sexes not transversely silvered; complete acrostichal or posterior dorsocentral lines absent in females; acrostichal setae present; fossal macula of females not coextensive with fossa, variously reduced; of males coextensive with fossa or reduced mesally; supraalar macula not truncate posteriorly, in females not joined to or narrowly to broadly joined to fossal macula; *ppn* silver scaled; *ssp* scales absent; *pra* hairs usually pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver bands; tarsus I-I with or without narrow apical silver band; femur II with knee spot absent or narrow, a single row at apex of segment; tarsus I-II with median dark band complete, usually very broad; tarsus 2-II with complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band incomplete or complete, narrow or broad; tarsus 5-III without silver scales. *Wing*: Vein C of both sexes with small basal patch of silver scales; veins R and Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area with dense patch of long setae; median sternomesal area with or without strongly developed sclerite, with tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral portion inclined from between 15° and 30° to 45° from the horizontal; stem usually not bowed; filament with hook strongly angulate.

PUPAE. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C usually single. *Abdomen*: Hair 1-I with primary branches predominantly double to multiple; 2-II usually laterad to just barely mesad of 3-II; 3-III single. *Paddle*: Pigmented; apex not or weakly produced; hair 1-P shorter than paddle.

LARVAE. *Head*: Hair 5-C usually multiple, sometimes triple; 6-C usually double to multiple; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C

longer than mental plate, usually branched; *bmh* usually branched. *Antenna*: Hair 1-A single to multiple. *Thorax*: Hair 11-P at least half length of 14-P; 14-P branched; 3-M single; 4-M single to multiple; 8-T shorter, but more than half length of, or longer than metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II slightly mesad of (about 1 alveolus width) to laterad of 4-II; 3-III single or double; 10-III single; 3-VI usually single; 4-VII single; 5-VII caudad of 4-VII, more than half length of 3-VII; 10-VII single to triple; 12-VII single. *Segment VIII*: Mid-apical comb scale with free portion subequal in length to or longer than sessile portion; 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without deep slit.

DISCUSSION. The Galindoi Subgroup is characterized in the adults by a combination of the absence of complete silver lines on the mesonotal disc of both sexes, the presence of acrostichal setae, the absence of a scale patch on the *ssp*, the absence usually of a knee spot on femur II and the very broad median dark band of tarsus 1-II; and in the larvae by the position of hair 2-II, which is situated farther laterad than in the other groups. At least 2 of the 3 species show hairy-nonhairy dimorphism in the larvae. The male genitalia and pupa do not show characters that would differentiate them from the other subgroups.

Three species comprise the subgroup, *galindoi*, *campana* and *daryi*. *Aedes galindoi* and *campana* are closely related; the former occurs in the Canal Zone and the latter in the highlands of central Panama. *Aedes daryi* is represented by 2 widely disjunct montane populations, 1 in eastern Panama and 1 near the Atlantic coast of Guatemala.

22. *Aedes* (Finlaya) *galindoi* Schick, n.sp.

Figs. 5,44,45

TYPE: *Holotype* ♂ (207C-20) with associated pupal and larval skins (5-147) and genitalia slide (672113-4), Barro Colorado Island [elev. 100-500 ft], Canal Zone, Panama, 15 May 1945, tree-hole, W.H.W. Komp [USNM]. *Allotype* ♀ (207C-26) with 2 sets of pupal and larval skins, 1 set representing actual associated stages (5-152), same data as holotype [USNM]. *Paratypes*: 2 1p♂ (207C-25, 5-139; 207C-41, 5-148), 1 1p♀ (207C-26, 5-152; see allotype), 1 1 (207C-1), 1 L, same data as holotype [BM; UCLA]. This species is dedicated to Pedro Galindo of the Gorgas Memorial Laboratory, Panama.

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad. *Thorax* (fig. 44): Most posterior acrostichal seta usually at about 0.5 from anterior end (between 0.33 and 0.5 in 1 specimen); fossal macula reduced anteriorly and mesally; supraalar macula reduced in size, disjunct from fossal macula; prescutellar space and midlobe of scutellum without silver scales; *pra* hairs pale or dark. *Legs*: Femora I and II without posterior patch of silver scales; femur II without knee spot; tarsus 1-II with median dark band from slightly greater than 0.5 to about 0.67; femur III with basal dark band 0.12-0.16 (0.07-0.16), subapical dark band 0.28-0.34; tarsus 1-III with basal silver band 0.10-0.14, apical silver band 0.09-0.16. *Wing*: Vein R without silver scales.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark or silver, broad; palpus about 1-2 labellum lengths shorter than proboscis; segment 3 with 1 or 2 short hairs at ventrolateral apex (hairs apparently absent in 1

specimen); segment 4 with hairs of ventrolateral row short, sparse. *Thorax* (fig. 44): Fossal macula not reaching mesal margin of fossa; *pra* hairs pale. *Legs*: Femur II without knee spot; tarsus 1-II with median dark band as in female.

MALE GENITALIA (fig. 44). *Sidepiece*: Length 0.36-0.39 mm; median sternomesal area with convexity weakly to moderately developed, sclerite well developed, tuft very dense, the setae wavy. *Prosopallus*: Length 0.11-0.12 mm; median lobe projecting cephalad of lateral lobe; mesal lobe with lateral portion inclined at about 45° from horizontal; stems usually divergent or essentially parallel (sometimes one stem bowed, converging towards the other); filament ratio 0.55-0.80. *Aedeagus*: Length 0.13 mm (0.12-0.13 mm).

PUPA (fig. 44). *Cephalothorax*: Hair 9-C usually single, infrequently double. *Abdomen*: Hair 1-I with primary branches usually predominantly double to triple, sometimes triple-multiple; 2-II laterad of 3-II or mesad for less than 0.3 the distance from 1-II to 3-II. *Paddle*: Ventral midrib usually weakly pigmented, sometimes moderately pigmented for most length, weakly at apex.

LARVA (fig. 45). *Head*: Hair 5-C usually 5-7 branched (3-7); 6-C most usually 4-branched (1-6); 7-C usually 5-7 branched (4-9); 14-C usually double, infrequently single or triple; *bmh* usually double, infrequently single. *Antenna*: Hair 1-A usually single, infrequently double. *Thorax*: Hair 1-P usually 4-branched (3-5); 4-P usually triple or 4-branched (2-4); 5-P usually double or triple (1-5); 7-P usually double to 4-branched (2-6); 4-M usually double, infrequently triple; 8-T longer than metathoracic pleural tubercle. *Abdomen*: Hair 3-III double; 3-VI single; 10-VII usually single (1-2). *Segment VIII*: Comb scales 35-47; free portion of midapical scale longer than sessile portion, length 0.034-0.040 mm. *Siphon*: Length 0.71-0.85 mm; L/S 2.18-2.27; P/L 0.57-0.59; H/L 0.63-0.67. *Anal Segment*: Ventral brush usually with 12 hairs (11-13); 4a-X usually 5,6-branched (5-7).

SYSTEMATICS. *Aedes galindoi* and *campana* are very closely related. The following similarities set them apart from the other species of the subgroup, *daryi*, fossal and supraalar maculae of females greatly reduced, posterior surface of femora 1-II without silver scales, median sternomesal tuft of the sidepiece very dense and unique in consisting of wavy hairs, and hair 1-A of the larvae usually single.

Aedes galindoi differs from *campana* in the usually shorter sidepiece, 0.36-0.39 mm vs. 0.39-0.41 mm, the more strongly produced median lobe of the prosopallus, the greater filament ratio, 0.55-0.80 vs. 0.45-0.55, the greater number of comb scales, 35-47 vs. 23-32, the scales arranged in 4 rows rather than 3, the relatively longer free portion of the apical scale and the greater L/S, 2.18-2.27 vs. 1.96-2.08. *Aedes galindoi* is found at low elevations (0-100 ft) and *campana* at high elevations (2800 ft).

The 2 larvae of PA 856 (Barro Colorado Island) differ from the others in the fewer number of branches of some of the hairs. Hair 5-C is single or double in these specimens but at least 5-branched in the other lots and 6,7-C, 7,8-P,T and 1-X show at least 2 fewer branches than in the other lots.

DISTRIBUTION (fig. 5). Canal Zone, Panama. Material examined: 52 specimens; 11 ♂, 8 ♀, 16 pupae, 17 larvae; 13 individual rearings (8 larval, 4 pupal, 1 incomplete). For the Komp collections see the explanatory chapter.

PANAMA. *Canal Zone*: Barro Colorado Island [elev. 100-500 ft], 15 May 1945, treehole, W. Komp (type series), 3 lp♂ (207C-20,25,41), 2 ♀, 2 p, 2 l (207C-26), 1 l (207C-1), 1 L [USNM; BM; UCLA] - 1 lp♂ (207C-19); 22 May 1945, deep treehole at ground level, W. Komp, 2 lp♀ (207A-16,17), 1 L, 1 l (5-256, adult number unknown); 26 June 1945, W. Komp (adult numbers unknown), 1 lp (5-146), 1 l (5-451) [UCLA; USNM]; 26 July 1935, L. Rozeboom, 1 ♂ (PAR 81-2)

[UCLA]; 3 Dec 1965, treehole, height 3 ft, A. Quinonez (PA 856), 2 lp♀ (856-12,13), 2 ♂, 1 p (856-4) [UCLA]. Fort Sherman [elev. 0-100 ft], 9 Sept 1949, 1 ♂ [UCLA]. Margarita [elev. 0-100 ft], 21 Jan 1922, J. Shropshire, 1 ♀ [USNM]. Mojinga Swamp [elev. near sea level], 13 Dec 1964, treehole (PA 721), 3 p♂ (721-13,102,103), 1 p♀ (721-12), 1 L (721-2) [UCLA].

23. *Aedes* (Finlaya) *campana* Schick, n.sp.

Figs. 5,46,47

TYPE: *Holotype* ♂ (PA 518-109) with associated pupal and larval skins, Cerro Campana [elev. 2800 ft], Panama, Panama, 16 Aug 1943, wood bowl [USNM]. *Allotype* ♀ in alcohol (PA 518-172) with associated pupal and larval skins, same data as holotype [USNM]. *Paratypes*: 1 lp♂ (518-121), 1 L (518-2), same data as holotype [UCLA].

?*Aedes* (Finlaya) *terrens* in part of Galindo, Carpenter and Trapido (1951:121; 1955:169); Trapido, Galindo and Carpenter (1955a:530).

FEMALE. Essentially as in *galindoi*, but most posterior acrostichal seta in posterior half in all specimens; *pra* hairs pale. *Legs*: Femur III with basal dark band 0.11, subapical band 0.28; tarsus 1-III with basal silver band 0.13, apical silver band 0.14.

MALE. Essentially as in *galindoi*, but femur II with narrow knee spot in 1 of 2 specimens.

MALE GENITALIA (fig. 46). *Sidepiece*: Length 0.39-0.41 mm; median sternomesal area with convexity moderately developed, sclerite well developed, tuft very dense, the setae wavy. *Prosophallus*: Length 0.11-0.12 mm; median lobe not projecting cephalad of lateral lobe; mesal lobe with lateral portion inclined at about 45° from horizontal; stems divergent; filament ratio 0.55-0.80. *Aedeagus*: Length 0.13 mm.

PUPA (fig. 46). *Cephalothorax*: Hair 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly multiple; 2-II laterad of or just barely mesad of 3-II. *Paddle*: Ventral midrib weakly pigmented.

LARVA (fig. 47). *Head*: Hair 5-C usually 5-branched (4-6); 6-C double or triple; 7-C 4-6 branched; 14-C double or triple; *bmh* double. *Antenna*: Hair 1-A single. *Thorax*: Hair 1-P triple or 4-branched; 4,5-P double or 4-branched; 7-P triple; 4-M double; 8-T longer than metathoracic pleural tubercle. *Abdomen*: Hair 3-III single or double; 3-VI single; 10-VII single. *Segment VIII*: Comb scales 23 (28 on other side of this specimen)-32; free portion of midapical scale subequal in length to or slightly shorter than sessile portion, length 0.035 mm. *Siphon*: Length 0.80-0.85 mm; L/S 1.96-2.08; P/L 0.55-0.58; H/L 0.64-0.66. *Anal Segment*: Ventral brush with 11 or 12 hairs; 4a-X 5-branched.

SYSTEMATICS. See *galindoi*.

DISTRIBUTION (fig. 5). Provinces of Coclé and Panama, Panama, at elevations between 1800 and 3300 ft. Material examined: 10 specimens; 2 ♂, 2 ♀, 3 pupae; 3 larvae; 3 individual rearings (larval).

PANAMA. *Coclé*: El Valle [elev. 1800-3300 ft], Nov 1946, N. Krauss, 1 ♀ [USNM]. *Panama*: Cerro Campana [elev. 2800 ft], 16 Aug 1953, wood bowl (PA 518, type series), 2 lp♂ (518-109, 121), 1 lp♀ (518-172), 1 L (518-2) [USNM; UCLA].

24. *Aedes* (*Finlaya*) *daryi* Schick, n.sp.

Figs. 5,48-51

TYPE: *Holotype* ♀ (GUA 33-31) with associated pupal and larval skins, Finca Trece Aguas, nearest town Senahu, elev. 2800 ft, Alta Vera Paz, Guatemala, 7 July 1964, cut or broken bamboo, T. and J. Zavortink [USNM]. *Allotype* ♂ (GUA 33-110) with associated pupal skin, same data as holotype [USNM]. *Paratypes*: 1 p♂ (33-44), 5 L (33-4), same data as holotype [UCLA]. This species is dedicated to Mario Dary R. of the Universidad de San Carlos, Guatemala.

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, broad. *Thorax* (figs. 48,50): Most posterior acrostichal seta usually at about 0.5 from anterior end or in posterior half of line; fossal macula not reduced anteriorly, broader in Trece Aguas, Guatemala, than in Cerro Mali, Panama (see figs. 48,50); supraalar macula usually broadly joined to fossal macula (narrowly joined in PA 381-102); prescutellar space and midlobe of scutellum with silver scales; *pra* hairs pale. *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus I-II with median dark band about 0.7; femur III with basal dark band incomplete, subapical dark band 0.23-0.33 (in Trece Aguas, 0.23; in Cerro Mali, 0.25-0.33); tarsus I-III with basal silver band 0.08-0.13 (in Trece Aguas, 0.08; in Cerro Mali, 0.10-0.13); apical silver band 0.07-0.12. *Wing*: Vein R without silver scales.

MALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line silver, broad; palpus about 3 labellum lengths shorter than proboscis; segment 3 with 1 or 2 moderately long apical ventrolateral hairs, not as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row short to moderately long, sparse. *Thorax* (figs. 48,50): Fossal macula coextensive with fossa; *pra* hairs pale. *Legs*: Femur II without knee spot; tarsus I-II with median dark band as in female.

MALE GENITALIA (figs. 48,50). *Sidepiece*: Length 0.35-0.42 mm; median sternomesal area with convexity absent or weakly developed, sclerite weakly developed, tuft present but not strongly differentiated, the setae not wavy. *Prosopallus*: Length 0.11-0.13 mm; median lobe not projecting cephalad of lateral lobe; mesal lobe with lateral portion inclined between 15° and 30° from horizontal; stems convergent; filament ratio 0.50-0.70. *Aedeagus*: Length 0.13-0.14 mm.

PUPA (figs. 48,50). *Cephalothorax*: Hair 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly double to multiple; 2-II always laterad of 3-II. *Paddle*: Ventral midrib weakly to moderately pigmented, not more strongly at apex.

LARVA (figs. 49,51). *Head*: Hair 5-C usually 6-8 branched (5-10); 6-C double to 10-branched; 7-C 6-11 branched; 14-C usually triple (2-5); *bmh* double to 4-branched. *Antenna*: Hair 1-A single to 4-branched. *Thorax*: Hair 1-P most usually 4-6 branched (2-6); 4-P double to 8-branched; 5-P usually 3-5 branched (2-6); 7-P usually triple (2-5); 8-T subequal in length to or longer than metathoracic pleural tubercle. *Abdomen*: Hair 3-III usually double (1-3); 3-VI usually single, infrequently double; 10-VII usually single or double (1-3). *Segment VIII*: Comb scales 18-38; free portion of midapical scale subequal in length to or longer than sessile portion, length 0.035-0.046 mm (0.033-0.047 mm). *Siphon*: Length 0.82-0.94 mm; L/S 2.27-2.70; P/L 0.51-0.58 [in Cerro Mali, Panama 0.51-0.57; in Trece Aguas, Guatemala 0.56-0.58]; H/L 0.57-0.67 [in Cerro Mali 0.57-0.63; in Trece Aguas 0.65-0.67]. *Anal Segment*: Ventral brush usually with 12 hairs (11-13); 4a-X usually 5-branched (4-6).

SYSTEMATICS. *Aedes daryi* differs from *galindoi* and *campana* in the more ex-

tensively developed fossal and supraalar maculae of the female, the presence of a patch of silver scales on the posterior surface of femora I and II, the more poorly developed sternomesal tuft of the sidepiece of the male genitalia, and the usually branched hair 1-A of the larva. The larval comb scales are exceptionally large for the Terrens Group.

Aedes daryi is known from 2 widely separated areas, Trece Aguas, Guatemala (GUA 33), and Cerro Mali in eastern Panama (PA 349,367,381). The only apparently significant difference I can find between the populations from these areas is the broader fossal macula of the females from Trece Aguas.

The larvae show dimorphism in hairiness. The larvae of the Guatemalan and PA 381 collections are hairy and those of PA 349 and PA 367 are nonhairy. The most striking difference between these 2 forms is in the number of branches of hair 1 of the abdominal segments. Of greater significance, however, is the larger number of branches in the hairy forms of some of the hairs whose branching provides important subgroup characters in the Terrens Group, hair 1-A is single to double in the nonhairy form vs. double to 4-branched in the hairy form; 4-M single or double vs. triple or 4-branched; and 10-VII single vs. single to triple. Also, hair 8-T is subequal in length to the metathoracic pleural tubercle in the nonhairy form vs. longer than the tubercle in the hairy form (see also *gabriel*).

DISTRIBUTION (fig. 5). Department of Alta Vera Paz, Guatemala, at elevation of 2800 ft; province of Darien, Panama, at elevations of 4500-4900 ft. Material examined: 30 specimens; 3 ♂, 5 ♀, 8 pupae, 14 larvae; 8 individual rearings (6 larval, 2 pupal).

GUATEMALA. Alta Vera Paz: Finca Trece Aguas, elev. 2800 ft, 7 July 1964, cut or broken bamboo, T. and J. Zavortink (GUA 33, type series), 1 lp♀ (33-31), 2 p♂ (33-110,44), 5 L (33-4) [USNM; UCLA].

PANAMA. Darien: Cerro Mali [8° 07' N - 77° 14' W], auxiliary ridge W of, elev. 4900 ft, 22 May 1963, treehole, height 20 ft (PA 349), 2 lp♀ (349-101,102), 1 L (349-2); western slopes, elev. 4700 ft, 28 May 1963, treehole, height 10 ft, 1 lp♂ (MEX 367-101); 4 mi W summit, elev. 4500 ft, 8 June 1963, treehole, height 12 ft (PA 381), 2 lp♀ (381-101,102), 2 L (381-1) [UCLA].

Podographicus Subgroup

ADULTS. Head: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of both sexes with erect scales pale; proboscis of female shorter than or subequal in length to femur I; palpal segment 3 of males with 1-3 apical ventrolateral hairs of moderate length, shorter than segments 4 and 5 combined; segment 4 with hairs of ventrolateral row of moderate length, sparse. **Thorax:** Mesonotal disc of both sexes not transversely silvered; complete acrostichal or posterior dorsocentral lines absent in female; acrostichal setae absent; fossal macula of both sexes not coextensive with fossa, reduced mesally; supraalar macula not truncate posteriorly, in females disjunct from fossal macula; *ppn* silver scaled; *ssp* scales present or absent; *pra* hairs of female pale; upper *stp* and *mep* scale patches not contiguous. **Legs:** Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver bands; tarsus 1-I with or without narrow apical silver band; femur II with knee spot moderately broad, the scales extending to about level of anterior subapical setae; tarsus 1-II with median dark band incomplete or complete, narrow; tarsus 2-II with incomplete or complete apical dark band; tarsus 5-II without silver scales; femur III with basal dark band incomplete or complete, narrow; tarsus 5-III

without silver scales. *Wing*: Vein C of females with small basal patch or line of silver scales reaching about 0.5 to crossvein *h*, of males usually with a line reaching about 0.5 to *h*; vein R of males without silver scales or with basal line of silver scales reaching level of crossvein *h*; vein Cu of males without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral portion usually inclined between 15° and 30° from horizontal; stems usually bilaterally bowed and convergent; filament with hook not strongly angulate.

PUPA. *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches predominantly single to multiple; 2-II mesad of 3-II usually for 0.3 or more the distance from 1-II to 3-II; 3-III single. *Paddle*: Pigmented; apex usually produced, sometimes strongly so; hair 1-P shorter than paddle.

LARVA. *Head*: Hairs 5,6-C usually single; 7-C more than half length of 6-C; 11-C longer than mental plate; 14-C longer than mental plate, usually single; *bmh* usually single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P usually single; 3-M single; 4-M double; 8-T more than half length of or subequal in length to metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III double; 10-III single; 3-VI single; 4-VII usually single; 5-VII caudad of 4-VII, usually less than half or about half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion shorter or longer than sessile portion; 2-VIII single. *Anal Segment*: Saddle extending around segment for moderate distance, ventral margin without slit.

DISCUSSION. The *Podographicus* Subgroup is characterized in the adults by a combination of the short proboscis of the female, the absence of silver markings on the mesonotal disc of both sexes, the absence of acrostichal setae, the disjunct fossal and supraalar maculae of the female and the incomplete or narrow basal dark band of femur III; and in the male genitalia by the inwardly bowed stems of the prosophallus. The larva shows nonmultiple hairs 5,6-C and cannot be readily separated from the larvae of the species of the *Metoecopus*, *Homoeopus*, and *Heteropus* Subgroups that show this combination of characters. The pupae do not show distinctive subgroup characters.

The subgroup is known from coastal Mexico and Central America and from the Maracay area of Venezuela.

Only 1 species, *podographicus*, is formally recognized here but there is a population from outside the range of typical *podographicus* which may represent a sibling species (see *podographicus*).

25. *Aedes* (*Finlaya*) *podographicus* Dyar & Knab

Figs. 6,52-57

1906. *Aedes podographicus* Dyar and Knab, 1906:165. TYPE: *Lectotype* ♀ (325j), Sonsonate, El Salvador [USNM, 10015; designation of Stone and Knight 1956:224].

Aedes (*Finlaya*) *podographicus* of Dyar (1921:151).

Aedes (*Finlaya*) *podographicus* in part of Dyar (1928:223-224); Martini (1935:56).

Aedes podographicus of Theobald (1910:484); Dyar (1918:73,80).

Aedes (*Finlaya*) *terrens podographicus* of Horsfall (1955:699).

Aedes (*Finlaya*) *terrens* var. *podographicus* in part of Edwards (1932:150); Knight and Marks (1952:549).

Aedes (*Finlaya*) *terrens* in part of Lane (1939:105; 1953:686-687); Trapido, Galindo and Carpenter (1955a:550); Stone, Knight and Starcke (1959:171); Belkin, Schick and Heinemann (1965:22); Forattini (1965:395).

?*Aedes* (*Gualteria*) *terrens* in part of Diaz Najera (1963:131; 1966:61).

Aedes *terrens* in part of Kumm, Komp and Ruiz (1940:400,416); Kumm and Zuniga (1942:407).

Aedes *insolitus* in part of Dyar and Knab (1906b:203).

FEMALE. *Head:* Vertex usually with decumbent scales of area just adjacent to median longitudinal line dark, narrow curved, and scales laterad of these dark, broad (in state of Campeche, Mexico, scales laterad of line generally dark, broad, some silver scales scattered among these). *Thorax* (fig. 52): Supraalar macula not or rarely narrowly joined to fossal macula; *ssp* scales variable in occurrence [in Panama present; in Costa Rica, and state of Campeche, Mexico, present or absent; in Nicaragua, El Salvador, Guatemala and San Blas, Mexico, usually absent]. *Legs:* Femora I and II with well-developed posterior patch of silver scales in basal half, subequal in size; median dark band of tarsus 1-II usually incomplete or complete and width less than 0.33, infrequently complete, as broad as about 0.33; tarsus 2-II usually with complete dark apical band but sometimes silvered along entire length on one side; femur III with basal dark band incomplete or complete, as broad as 0.05 (0.10), subapical dark band 0.33-0.45 [in San Blas 0.33-0.40; on Pacific side of Central America 0.37-0.42 (0.33-0.45); in state of Campeche 0.45]; tarsus 1-III with basal silver band when present as broad as 0.10 [in most localities when present as broad as 0.08 but usually less; in state of Campeche present, 0.10]; apical silver band 0.20-0.38 [in most localities 0.24-0.33 (0.20-0.35); in state of Campeche, 0.38]. *Wing:* Vein C with basal silver scales forming small patch or line reaching about 0.5 to crossvein *h*; vein R usually without or with only a few basal silver scales (in San Blas with basal patch of scales).

MALE. *Head:* Vertex with decumbent scales laterad of median longitudinal line dark or silver, otherwise as in female; palpus subequal in length to proboscis to about 1 labellum length shorter. *Thorax* (fig. 52). *Legs:* Tarsus 1-II with median dark band as in female except in state of Campeche, Mexico, where band complete, 0.6. *Wing:* Vein C with basal silver scales usually forming line reaching about 0.5 to crossvein *h*, occasionally with scales forming small patch; vein R with silver scalation variably developed [on Pacific side of Central America and in state of Campeche, Mexico, absent; in San Blas, Mexico, present, forming line reaching level of crossvein *h*].

MALE GENITALIA (figs. 52,54,56). *Sidepiece:* Length 0.35-0.39 mm (0.34-0.40 mm). *Prosopallus:* Length 0.12-0.14 mm (0.11-0.15 mm); mesal lobe with lateral portion usually moderately inclined, between 15° and 30° from the horizontal (infrequently somewhat less than 15° or as much as about 30°); filament ratio 0.40-0.50 (0.30-0.65). *Aedeagus:* Length 0.13-0.14 mm (0.13-0.15 mm).

PUPA (figs. 52,54,56). *Abdomen:* Hair 1-I with primary branches usually predominantly double-triple to multiple, infrequently predominantly single; 2-II in line with 3-II or mesad of 3-II for more than 0.3 distance from 1-II to 3-II [in Panama, San Blas, Mexico, and state of Campeche, Mexico, usually 0.3 or more mesad; in other localities 0.4 or more]. *Paddle:* Apex usually weakly produced in most localities, moderately to strongly produced in San Blas; ventral midrib weakly or moderately pigmented for most length, weakly at apex.

LARVA (figs. 53,55,57). *Head:* Hair 5-C usually single, rarely double; 6-C single;

7-C usually triple (2-4); 14-C, *bmh* usually single, very rarely double. *Thorax*: Hair 1-P usually double or triple (1-5); 4-P usually double (1-4); 5-P single or double; 7-P usually double (1-4). *Abdomen*: Hair 3-VI single, rarely double; 4-VII usually single, rarely double. *Segment VIII*: Comb scales 46 to more than 100; length of free portion of midapical comb scale 0.019-0.035 mm [in San Blas, Mexico, 0.019-0.025 mm; in state of Campeche, Mexico, 0.025-0.026 mm; on Pacific side of Central America, 0.026-0.032 mm (0.024-0.035 mm)]. *Siphon*: Length very variable, 0.71-1.05 mm, most lower values from Nicaragua; L/S 2.13-2.56; P/L 0.55-0.59 (0.50-0.62); H/L 0.60-0.69. *Anal Segment*: Ventral brush usually with 12 hairs, less usually 13, in San Blas 11 or 12 (11-14); 4a-X usually with 7 or 8 branches, in state of Campeche, 6,7-branched (6-11).

SYSTEMATICS. Typical *podographicus* occurs in the Pacific lowlands of Central America from Tehuantepec, Mexico, south into Panama. There are collections at hand from 3 coastal lowland areas beyond this range, San Blas in the state of Nayarit, Mexico; near Champoton in the state of Campeche, Mexico; and in British Honduras. The Mexican specimens deviate from typical *podographicus* as follows. Those from San Blas show a more extensive silver scalation at the base of wing R, a pupal paddle which is more strongly produced apically and a shorter free portion of the apical comb scale of the larva; those from the state of Campeche show a broader median dark band of tarsus I-II in the male and broader silver bands of tarsus I-III in the female (the length of the free portion of the apical comb scale falls into the upper end of the range of the San Blas specimens and the lower end of the range of typical *podographicus*). The specimens from British Honduras are females taken in light traps and are in too poor a condition to be treated in any detail; the legs bands of tarsus I-III, however, are not broad as in the females from the nearby state of Campeche, the widths falling into the range of typical *podographicus*.

In the Maracay area of Venezuela, which is of moderately high elevation, there is another *podographicus*-like form known only by the adults. This population is indistinguishable from the typical *podographicus* of Central America and shows the same morphological variation except that the silver scalation at the base of vein R is more variable and may be developed to the same extreme as in the San Blas population.

I am not describing at least the San Blas and Campeche populations as distinct species because of (1) the few differences between these and the typical populations of *podographicus*, (2) the uncertainty regarding the taxonomic significance of 3 of the 4 characters involved, the silver scalation at the base of vein R which is so variable in the Maracay area, the produced apex of the paddle which may be very variable in other species (e.g. *vargasi*), and the broad tarsal bands which are not unusually broad in the specimens of the opposite sex from the area in question, and (3) the lack of sufficient material from the coastal areas beyond the range of typical *podographicus* to ascertain the variability of the characters and whether clinal variations are involved. I think that these 2 populations will be shown to represent at best "forms" of *podographicus* (or subspecies, depending upon the taxonomist's philosophy) when the fauna of the area becomes more adequately known. Consequently, I am treating these as populations of *podographicus* here. The population from Maracay area can only be treated as "*podographicus* complex" until the immature stages can be studied.

Aedes podographicus of the Pacific coast shows marked variation in the development of the *ssp* scales, the branching of some larval hairs and in some of the siphon indices. The development of a *ssp* scale patch shows a clinal variation, being present

in all specimens in the southern part of the range and usually absent in those in the northern part of the range (see description). Clinal variations in the branching of hairs 1,4,5-P (see description) and 1-II-VII and 6-III-VI are not apparent. Hairs 1-II-VII are often single in El Salvador and Panama; usually double or triple in Nicaragua and San Blas; and usually triple or multiple in Guatemala. Hairs 6-III-VI are usually single in El Salvador; single or double in Panama; and usually double in other localities. The L/S and H/S siphon indices also show geographical variations of a nonclinal nature (see description).

DISTRIBUTION (fig. 6). Coastal lowlands of Mexico and Central America. Material examined: 635 specimens; 96 ♂, 130 ♀, 157 pupae, 252 larvae; 106 individual rearings (49 larval, 52 pupal, 5 incomplete).

COSTA RICA. *Alajuela*: San Mateo [elev. 800 ft], 1 ♂ (583) [USNM]. *Guanacaste*: Samara, Nicoya Peninsula, elev. near sea level, 23 Aug 1964, small treehole, C. Hogue, Miranda (CR 196, 197), 8 L (196-2), 1 L (197-2) [UCLA]. *Puntarenas*: El Roble (near Puntarenas), [elev. 0-300 ft], 16 June 1963, T. Aitken, 1 ♂ (207B-12) [UCLA]. Esparta [elev. 700 ft], 7 June 1943, T. Aitken, 5 ♂, 4 ♀; 1943, T. Aitken, 1 ♂, 1 ♀ [USNM]. Macacóna [elev. 300-1700 ft], 28 May 1943, treehole, T. Aitken, 4 ♀ (207B-6); 1 June 1943, treeholes, T. Aitken, 2 ♂, 6 ♀ (207B-4) [UCLA]. Rio Aranjuez, ? 9 Sept 1905, F. Knab (340), 2 ♂ (340a), 1 ♂, 1 ♀ (340b), 1 ♀ (340c) [USNM].

EL SALVADOR. *San Miguel*: San Miguel [elev. 300-700 ft], ? May 1931, 9 ♂, 3 ♀ (207B-43), 1 ♀ (531-D) [USNM]. *Sonsonate*: Canton El Castano, nearest town Sonsonate (elev. 730 ft), 1 Aug 1964, large treehole, height 12 ft, A. Quinonez (SAL 1), 4 lp♀ (1-11,13,18,19), 2 p♂ (1-101, ft (SAL 2), 1 lp♀ (2-12), 1 P, 12 L (2-1) [UCLA]. Finca San Dionisio, nearest town San Antonio, 4 Aug 1964, large treehole, height 6 ft, A. Quinonez (SAL 8), 1 p♀ (8-100), 1 P, 25 L (8-2) — cut or broken bamboo (SAL 10), 1 lp♂ (10-21), 4 P, 2 L (10-2) [UCLA]. Sonsonate [elev. 700-1600 ft], 18 Aug 1905, treehole, F. Knab (325, lectotype collection), 4 ♂ (325c,e,f,h), 5 ♂ (325j) [USNM]. *Usulután*: San Juan del Gozo (Peninsula de) [elev. 0-300 ft], H. Kumm, 2 ♂ (207A-28) [UCLA].

GUATEMALA. *Escuintla*: Escuintla, vicinity (63.8 km S Guatemala), elev. ca 660 ft, 10 July 1964, large treehole, height 10 ft, J. and T. Zavortink (GUA 39), 1 lp♂ (39-33), 7 lp♀ (39-30-32,34-36,38), 1 p♂ (39-104), 1 IP (39-33), 14 ♂, 14 ♀, 3 P, 35 p, 20 L, 3 I (39-3). Escuintla, vicinity (52.5 km S Guatemala), elev. 660-730 ft, 10 July 1964, large treehole, height 6 ft, T. and J. Zavortink (GUA 40), 1 lp♂ (40-11), 3 lp♀ (40-10,12,13), 5 p♂ (40-100-102,104,105), 1 p♀ (40-103), 1 L (40-1); 10 July 1964, large treehole, height 6 ft, P. Cowsill (GUA 41), 3 lp♀ (41-10-13), 5 p♂ (41-100-104), 1 p♀ (41-105), 3 P, 25 L (41-1) [UCLA]. San Jose, N of (87.5 km from Guatemala on hwy CA 9), elev. near sea level, 10 July 1964, small treehole, height 6 ft, T. and J. Zavortink (GUA 38), 1 lp♂ (38-11), 2 lp♀ (38-10,12), 1 p♀ (38-100), 5 L (38-1) [UCLA]. San Jose de Guatemala [probably Department of Escuintla and elev. near sea level], 15 July 1943, treehole, D. Hall, 1 ♂, 3 ♀ (207A-37); 15 July 1943, D. Hall, 2 ♀, 2 p (207A-43); 20 July 1943, D. Hall, 2 ♀, 2 p, 1 I (207D-10); July 1943, D. Hall, 1 ♀, 1 I (207D-11) [USNM; UCLA]. *Retalhuleu*: Near San Sebastian, 50 yds E Rio Mulua bridge, elev. 990 ft, 2 July 1964, cut or broken bamboo, P. Cowsill, T. Zavortink (GUA 29), 1 lp♂ (29-11), 4 lp♀ (29-13,17,19,21), 5 p♂ (29-100,101, 105,106,108), 1 P, 2 p, 5 L (29-1) [UCLA].

✓ **HONDURAS.** *Choluteca*: Choluteca [elev. 0-300 ft], Dec 1945, B. Avila, 2 ♀ (H-9-21) [USNM]; Dec 1945, treehole, B. Avila, 2 ♂ (207E-40), 13 ♀ (207E-36) [UCLA]. *Valle*: Nacaome [elev. 0-300 ft], 20 July 1945, treehole, W. Komp, 2 ♀ (207E-5) [UCLA].

MEXICO. *Campeche*: Champoton, 10 km SW on hwy 180, elev. near sea level, 18 Aug 1966, small treehole, height 4 ft, D. Schroeder (MEX 438), 1 lp♂ (438-10), 2 lp♀ (438-11,12), 1 p♀ (438-100), 1 IP (438-13), 1 ♀, 1 p, 6 L (438-1) [UCLA]. *Nayarit*: San Blas, elev. near sea level, 27 June 1956, treehole, W. McDonald (UCLA 203), 3 lp♀ (203-113-115), 1 p♂ (203-109,110), 6 L (203-1) [UCLA]. *Oaxaca*: Almoloya [elev. 800 ft], F. Knab, 22 July 1905, 1 ♂ (313a) [USNM].

NICARAGUA. *Chinandega*: Corinto [elev. near sea level], Dec 1942, P. Woke, 1 ♂, 1 ♀ (207B-18); 29 May 1945, well, H. Crowell, 1 ♂, 4 ♀ (H-9-24); 24 Oct 1944, steel drum, H. Crowell, 2 ♂, 4 ♀ (207B-30); 1 ♀, K. Maxwell [USNM]; 19 Aug 1944, steel drum, H. Crowell, 4 ♂, 1 ♀ (207D-1) [UCLA]. *Leon*: Puerto Somoza [elev. near sea level], 13 June 1964, treehole, height 4-8 ft, A. Quinonez (NI 4), 1 lp♂ (4-113), 1 lp♀ (4-106), 1 p♂ (4-109) [UCLA]. Simonillo, nearest town

Nagarote, elev. 0-300 ft, 15 June 1964, treehole, height 5 ft, A. Quinonez (NI 11), 3 p♂ (11-101, 102,105), 2 p♀ (11-103-104); 16 June 1964, treehole, height 4 ft, A. Quinonez, 1 p♀ (NI 12-101) [UCLA]. *Rivas*: Rivas [elev. 0-700 ft], 17 Sept 1943, treehole, P. Woke, 1 ♂, 2 ♀ (207A-22) [USNM].

PANAMA. *Panama*: Bejuco, elev. 90 ft, 3 Aug 1963, old tire, height 8 ft (sic) (PA 459), 1 ♀ (459-101), 1 p♂ (459-106), 2 p♀ (459-107,108); 25 Aug 1963, treehole, height 8 ft (PA 534), 2 lp♂ (534-109-111), 7 lp♀ (534-102,104,115-119), 1 p♂ (534-108), 2 p♀ (534-105,118), 1 lp (534-112), 1 p, 2 L, 1 I (534-1) [UCLA]. Nueva Gorgona, elev. 60 ft, 13 Dec 1966, large treehole, height 2 ft, O. Berlin (PA 1003), 2 p♂ (1003-101,104), 7 p♀ (1003-100,102,103,105,110-112), 1 ♂, 3 P, 1 p, 2 I (1003-1) [UCLA].

Tehuantepec Subgroup

ADULTS. (Male known for only *tehauntepec*.) *Head*: Vertex of both sexes with decumbent scales along longitudinal midline narrow; occiput of both sexes with erect scales pale; proboscis of females longer than femur I; palpal segment 3 of male with several long apical ventrolateral hairs forming a tuft as long as segments 4 and 5 combined; segment 4 with hairs of ventrolateral row long, closely spaced. *Thorax*: Mesonotal disc of both sexes not transversely silvered; complete acrostichal and posterior dorsocentral lines absent in females; acrostichal setae absent; fossal macula of both sexes not coextensive with fossa, reduced mesally; supraalar macula not truncate posteriorly, in females disjunct from fossal macula; *ppn* silver scaled; *ssp* scales absent; *pra* hairs of females pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs not shaggy; mid- and hindtarsi with conspicuous silver band; tarsus 1-I with or without narrow apical silver band; femur II with knee spot broad, the silver scales extending basad of anterior subapical setae; tarsus 1-II with median dark band incomplete or complete and narrow; tarsus 2-II with complete apical dark band or entirely silvered; tarsus 5-II without silver scales; femur III with basal dark band complete, narrow; tarsus 5-III without silver scales. *Wing*: Vein C of females with small basal patch of silver scales, of male usually with short line not reaching 0.5 to crossvein *h*; vein R and Cu of male without silver scales.

MALE GENITALIA. *Sidepiece*: Basal tergomesal area without dense patch of long setae; median sternomesal area without strongly developed sclerite and without tuft; specialized subapical sternal seta absent. *Prosophallus*: Mesal lobe with lateral portion inclined from less than 15° to about 15° from horizontal; stem not bowed; filament with hook not strongly angulate.

PUPA. (Known only for *schroederi*.) *Cephalothorax*: Without pale inverted V-shaped marking; hair 5-C less than twice length of 4-C; 9-C single. *Abdomen*: Hair 1-I with primary branches multiple; 2-II mesad of 3-II for 0.3 distance from 1-II to 3-II; 3-III single. *Paddle*: Pigmented; apex not produced; hair 1-P shorter than paddle.

LARVAE. *Head*: Hairs 5,6-C single; 7-C more than half length of 6-C; 14-C longer than mental plate, single; *bmh* single. *Antenna*: Hair 1-A single. *Thorax*: Hair 11-P less than half length of 14-P; 14-P single; 3-M single; 4-M single or double; 8-T more than half length of or subequal in length to metathoracic pleural tubercle. *Abdomen*: Hair 5-I at least subequal in length to 4-I; 2-II well mesad of 4-II; 3-III single or double; 10-III single; 3-VI single; 4-VII single; 5-VII caudad of 4-VII, more than half length of 3-VII; 10,12-VII single. *Segment VIII*: Midapical comb scale with free portion shorter or longer than sessile portion; hair 2-VIII single. *Anal Segment*: Saddle extending around segment to nearly ventral midline, with deep ventral marginal or

submarginal slit.

DISCUSSION. The adults of the Tehuantepec Subgroup are very similar to those of the Podographic Subgroup and are distinguished from the latter in the female by the longer proboscis and broader knee spot of femur II; and in the male by the hairier palpus and the less steeply inclined mesal lobe of the prosophaallus. The larvae are distinguished from the others of the Terrens Group by the more extensively developed anal saddle and by the presence of a ventral marginal or submarginal slit. The male genitalia and pupae do not show distinctive subgroup characters. The male genitalia surprisingly are very similar to those of the Terrens Subgroup.

Two closely related species, *tehauntepec* and *schroederi*, comprise the subgroup. These species are sympatric and occur on the Pacific side of the Isthmus of Tehuantepec.

26. *Aedes* (Finlaya) *tehuantepec* Schick, n.sp.

Figs. 6,58,59

TYPE: *Holotype* ♂ (291g), with associated pupal and larval skins and genitalia slide (671016-60), Tehuantepec, elev. near sea level, Oaxaca, Mexico, 1 July 1905, treehole or cemented tank in shaded part of garden at public bath house, F. Knab [USNM]. *Allotype* ♀ (291i) with associated pupal and larval skins, same data as holotype [USNM]. *Paratypes*: 5 ♂ (291c-f; 294j), 1 ♀ (291h), same data as holotype [USNM].

Aedes (Finlaya) *podographicus* in part of Martini (1935:56).

Aedes podographicus in part of Howard, Dyar and Knab (1917:812-815).

Aedes insolitus in part of Dyar and Knab (1906b:189,203).

FEMALE. *Head*: Vertex with decumbent scales silver, narrow curved. *Thorax*: (fig. 58). *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus 1-II with median dark band usually complete and narrow, at most about 0.33 (incomplete in 307i); tarsus 2-II usually with apical dark band (entirely silvered in 307i); femur III with basal dark band 0.01, sub-apical dark band 0.33 (1 specimen); tarsus 1-III with basal silver band 0.05-0.06, apical silver band 0.25-0.27 (0.38 in 307i). *Wing*: Vein R usually without silver scales, sometimes with a few at base.

MALE. *Head*: Vertex with decumbent scales as in female; palpus about 2 labelum lengths shorter than proboscis. *Thorax* (fig. 58): Complete silver acrostichal line present or absent. *Legs*: Tarsus 1-II with median dark band usually incomplete, when complete at most about 0.25.

MALE GENITALIA (fig. 58). *Sidepiece*: Length 0.34-0.37 mm. *Prosophaallus*: Length 0.12-0.14 mm (0.11-0.14 mm); stems essentially parallel or divergent, but distal 0.33 in 1 specimen curved mesad (see figure); filament ratio 0.45-0.65 (0.40-0.65). *Aedeagus*: Length 0.15 mm.

PUPA. Unknown.

LARVA (fig. 59). *Head*: Hair 7-C triple to 5-branched. *Thorax*: Hair 1-P double or triple; 4,5-P double; 7-P usually triple (2-3); 4-M usually double (1-2). *Abdomen*: Hair 3-III single or double. *Segment VIII*: Comb scales 33-54, in 4 rows, usually narrow spatulate, sometimes narrow ligulate; length of free portion of apical scale 0.025-0.029 mm. *Siphon*: Length 0.78-0.97 mm; L/S 2.38-2.63; P/L 0.49-0.59; H/L 0.55-0.67. *Anal Segment*: Ventral brush usually with 16 hairs (14-17); 4a-X usually

6-branched (5-7).

SYSTEMATICS. *Aedes tehuantepec* is distinguished from the other species of the Tehuantepec Subgroup, *schroederi*, by the more numerous and more slender comb scales of the larva which are arranged in 4 rows (usually 2 rows in *schroederi*). The decumbent scales of the vertex of the female *tehuantepec* are all silver, while in the *schroederi* female a submedian macula of dark scales is developed amidst the silver scales. The constancy of this character in *schroederi* is open to question since only a single female is known. The male of *schroederi* is unknown.

DISTRIBUTION (fig. 6). Coastal lowlands of state of Oaxaca, Mexico. Material examined: 38 specimens; 10 ♂, 4 ♀, 2 pupae, 22 larvae; 2 individual rearings (larval).

MEXICO. *Oaxaca*: Almoloya [elev. 800 ft], 22 July 1905, treehole, F. Knab (308,313), 3 ♂ (308b), 1 ♂ (308d), 1 ♀ (313b) [USNM]. Salina Cruz [elev. near sea level], 15 July 1905, treehole, F. Knab, 1 ♀ (307i) [USNM]. Tehuantepec, elev. near sea level, 1 July 1905, treehole and cemented tank in shaded part of garden at public bath house, F. Knab (291, type series; 294), 1 lp♂ (291g), 1 lp♀ (291i), 5 ♂ (291c-f; 294j), 1 ♀ (291h) [USNM]; 1 Sept 1965, large treehole, height 5 ft, D. Schroeder, 6 L (MEX 333-3) — large treehole, height 8 ft, 13 L, 1 l (MEX 334-2) [UCLA].

27. *Aedes* (Finlaya) *schroederi* Schick, n.sp.

Figs. 6,58,60

TYPE: *Holotype* ♀ (MEX 332-10), with associated pupal and larval skins, Tehuantepec, elev. near sea level, Oaxaca, Mexico, 1 Sept 1965, treehole, D. Schroeder [USNM].

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line narrow curved, dark, forming submedian macula, or silver. *Thorax* (fig. 58). *Legs*: Femora I and II with well-developed posterior patch of silver scales in basal half, that of femur II larger; tarsus I-II with median dark band complete, less than 0.33; tarsus 2-II with incomplete apical dark band; femur III with basal dark band 0.05, subapical dark band 0.32; tarsus 1-III with basal silver band 0.02, apical silver band 0.27. *Wing*: Vein R without silver scales.

MALE. Unknown.

PUPA (fig. 58). *Paddle*: Ventral midrib moderately pigmented, weakly at apex.

LARVA (fig. 60). *Head*: Hair 7-C double to 4-branched. *Thorax*: Hairs 1,4-P double or triple; 5-P usually double (1-2); 7-P usually double (2-3); 4-M double. *Abdomen*: Hair 3-III usually single (1-2). *Segment VIII*: Comb scales 20-29, usually in 2 rows (2-3), stout, awl-shaped or ligulate; length of free portion of apical scale 0.024-0.032 mm. *Siphon*: Length 0.87-1.07 mm; L/S 2.27-2.63; P/L 0.49-0.59; H/L 0.53-0.63. *Anal Segment*: Ventral brush usually with 14 or 16 hairs (16-18); 4a-X 4-6 branched.

SYSTEMATICS. See *tehuantepec*.

DISTRIBUTION (fig. 6). Coastal lowlands of state of Oaxaca, Mexico. Material examined: 8 specimens; 1 ♀, 1 pupa, 6 larvae; 1 individual rearing (larval).

MEXICO. *Oaxaca*: Tehuantepec, elev. near sea level, 1 Sept 1965, large treehole, height 0.5 ft, D. Schroeder, 1 lp♀ (MEX 332-10, holotype) [USNM] — large treehole, height 5 ft, D. Schroeder, 5 L (MEX 333-4) [UCLA].

Diazi Subgroup

ADULT. (Female only.) *Head*: Vertex with decumbent scales along longitudinal midline narrow; occiput with erect scales pale; proboscis subequal in length to femur I. *Thorax*: Mesonotal disc not transversely silvered; complete acrostichal or posterior dorsocentral lines absent; acrostichal setae absent; fossal macula not coextensive with fossa, reduced mesally; supraalar macula not truncate posteriorly, disjunct from fossal macula; *ppn* silver scaled; *ssp* scales present; *pra* hairs pale; upper *stp* and *mep* scale patches not contiguous. *Legs*: Mid- and hindlegs shaggy; mid- and hindtarsi with conspicuous silver bands; tarsus 1-I with broad apical silver band, about 0.4; femur II with knee spot broad, the scales extending basad of anterior subapical setae; tarsus 1-II with median dark band complete, moderately broad; tarsus 2-II entirely silver scaled; tarsus 5-II without silver scales; femur III with basal dark band complete, narrow; tarsus 5-III silver scaled. *Wing*: Vein C with short basal silver line, not reaching 0.5 to crossvein *h*.

PUPA, LARVA. Unknown.

DISCUSSION. The Diazi Subgroup is characterized by unique leg characters, the shaggy mid- and hindlegs, the broad apical silver band of tarsus 1-I, the entirely silvered tarsus 2-II, the unusually broad basal silver band of tarsus 2-III and the silvered tarsus 5-III. Only the adult female is known.

The subgroup is monotypic and is known only from 1 locality in the state of Veracruz, Mexico.

28. *Aedes* (Finlaya) *diazi* Schick, n.sp.

Figs. 6,56

TYPE: *Holotype* ♀ (381-4), Cueva del Nacimiento del Agua (cave of origin of Rio Atoyac), nearest town Penuela (elev. 3000 ft), Veracruz, Mexico, 13 July 1965, biting-landing, C.L. Hogue [USNM]. This species is dedicated to Alfonso Diaz Najera of the Instituto de Salubridad y Enfermedades Tropicales, Mexico.

FEMALE. *Head*: Vertex with decumbent scales laterad of median longitudinal line dark, narrow curved. *Thorax* (fig. 56): *Mep* more extensively scaled than in other species of group. *Legs*: Femur I with posterior patch of silver scales poorly developed, comprising scattered scales, that of femur II well developed; tarsus 1-II with median dark band about 0.5; femur III with basal dark band 0.07, subapical dark band 0.37; tarsus 1-III without basal silver band, apical silver band 0.19; tarsus 2-III with basal silver band unusually well developed, about 0.67. *Wing*: Vein R without silver scales.

MALE, PUPA, LARVA. Unknown.

DISTRIBUTION (fig. 6). State of Veracruz, Mexico, at elevation of 3000 ft. Known only by holotype female; no individual rearings.

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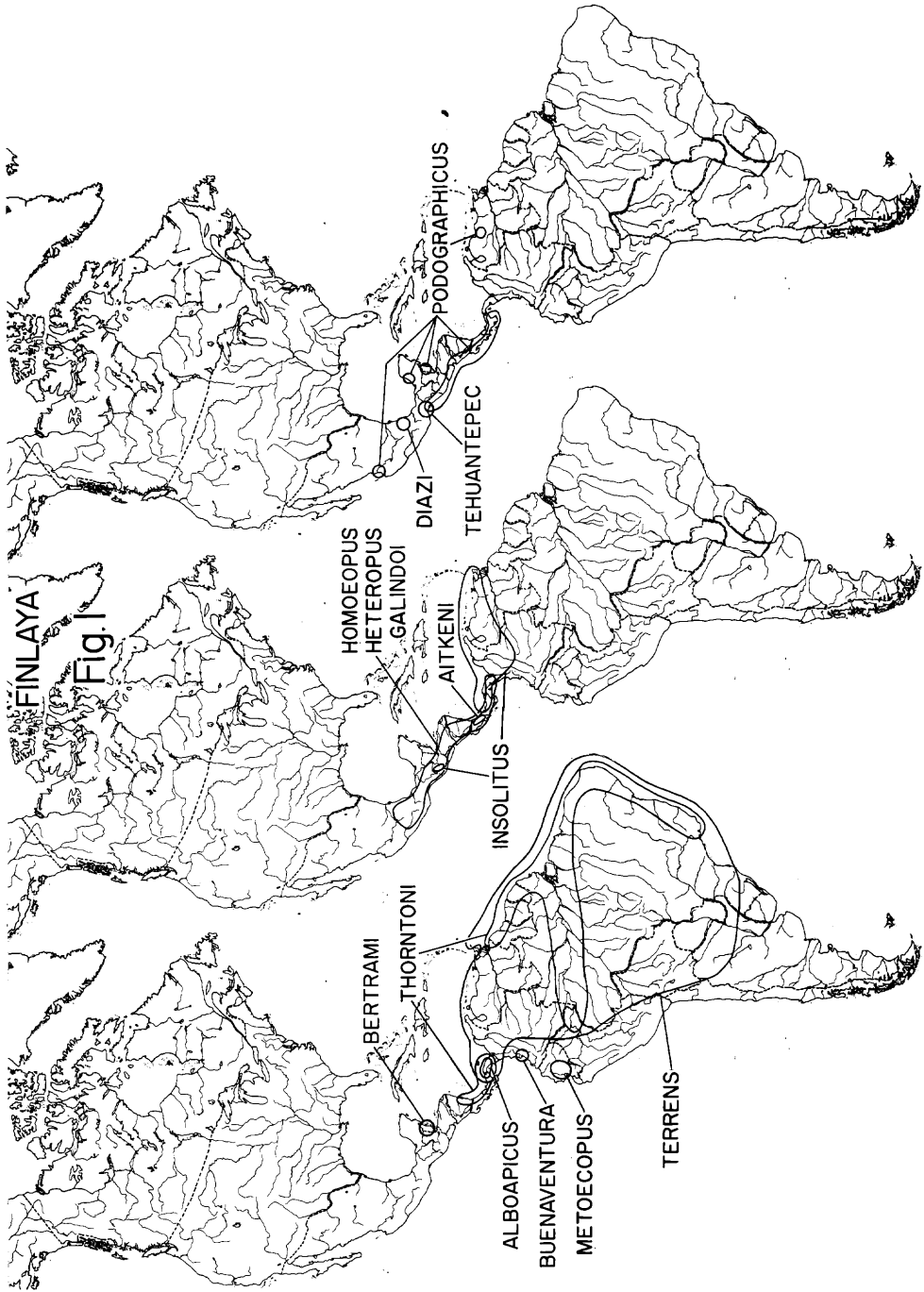
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FIGURES

1. Distribution of the subgroups of the Terrens Group
2. Distribution of the species of the Thorntoni and Bertrami Subgroups
3. Distribution of the species of the Terrens, Alboapicus, Buenaventura and Metoecopus Subgroups
4. Distribution of the species of the Insolitus, Aitkeni and Homoeopus Subgroups
5. Distribution of the species of the Heteropus and Galindoi Subgroups
6. Distribution of the species of the Podographicus, Tehuantepec and Diazi Subgroups
7. *Aedes (F.) terrens*; female
8. *Aedes (F.) terrens*; male
9. *Aedes (F.) thorntoni*; female and male mesonotum, male palpus, male genitalia and pupa
10. *Aedes (F.) thorntoni*; larva
11. *Aedes (F.) thorntoni*; male genitalia and pupa. *Aedes (F.) bertrami*; female mesonotum
12. *Aedes (F.) thorntoni*; larva
13. *Aedes (F.) argyrothorax*; female and male mesonotum, male genitalia and pupa
14. *Aedes (F.) argyrothorax*; larva
15. *Aedes (F.) terrens*; female and male mesonotum, male genitalia and pupa
16. *Aedes (F.) terrens*; larva
17. *Aedes (F.) zavortinki*; female and male mesonotum, male genitalia and pupa
18. *Aedes (F.) zavortinki*; larva
19. *Aedes (F.) apollo*; female mesonotum, male genitalia and pupa
20. *Aedes (F.) apollo*; larva
21. *Aedes (F.) berlini*; female mesonotum and pupa. *Aedes (F.) braziliensis*; male mesonotum and male genitalia
22. *Aedes (F.) berlini*; larva
23. *Aedes (F.) alboapicus*; female and male mesonotum, male genitalia and pupa
24. *Aedes (F.) alboapicus*; larva
25. *Aedes (F.) buenaventura*; female and male mesonotum, female pleuron, male genitalia and pupa
26. *Aedes (F.) buenaventura*; larva
27. *Aedes (F.) metoecopus*; female and male mesonotum, male genitalia and pupa
28. *Aedes (F.) metoecopus*; larva
29. *Aedes (F.) insolitus*; female and male mesonotum, male genitalia and pupa
30. *Aedes (F.) insolitus*; larva
31. *Aedes (F.) homoeopus*; female and male mesonotum, male genitalia and pupa
32. *Aedes (F.) homoeopus*; larva
33. *Aedes (F.) impostor*; male mesonotum, male genitalia and pupa
34. *Aedes (F.) impostor*; larva
35. *Aedes (F.) gabriel*; female and male mesonotum, male genitalia and pupa
36. *Aedes (F.) gabriel*; larva
37. *Aedes (F.) idanus*; female mesonotum, male genitalia and pupa. *Aedes (F.) amabilis*; female mesonotum
38. *Aedes (F.) idanus*; larva
39. *Aedes (F.) aitkeni*; female mesonotum and pupa. *Aedes (F.) sumidero*; female and male mesonotum and male genitalia
40. *Aedes (F.) vargasi*; female and male mesonotum, male genitalia and pupa

41. *Aedes (F.) vargasi*; larva
42. *Aedes (F.) heteropus*; female and male mesonotum, male genitalia and pupa
43. *Aedes (F.) heteropus*; larva
44. *Aedes (F.) galindoi*; female and male mesonotum, male genitalia and pupa
45. *Aedes (F.) galindoi*; larva
46. *Aedes (F.) campana*; male genitalia and pupa
47. *Aedes (F.) campana*; larva
48. *Aedes (F.) daryi*; female and male mesonotum, male genitalia and pupa
49. *Aedes (F.) daryi*; larva
50. *Aedes (F.) daryi*; female and male mesonotum, male genitalia and pupa
51. *Aedes (F.) daryi*; larva
52. *Aedes (F.) podographicus*; female and male mesonotum, male genitalia and pupa
53. *Aedes (F.) podographicus*; larva
54. *Aedes (F.) podographicus*; male genitalia and pupa
55. *Aedes (F.) podographicus*; larva
56. *Aedes (F.) podographicus*; male genitalia and pupa. *Aedes (F.) diazi*; female mesonotum, tarsi 1,2-I-III
57. *Aedes (F.) podographicus*; larva
58. *Aedes (F.) tehuantepec*; female and male mesonotum and male genitalia. *Aedes (F.) schroederi*; female mesonotum and pupa
59. *Aedes (F.) tehuantepec*; larva
60. *Aedes (F.) schroederi*; larva



FINLAYA

Fig. I

HOMOEOPUS
HETEROPUS

GALINDOI

AITKENI

INSOLITUS

BERTRAMI

THORNTONI

ALBOAPICUS

BUENAVENTURA

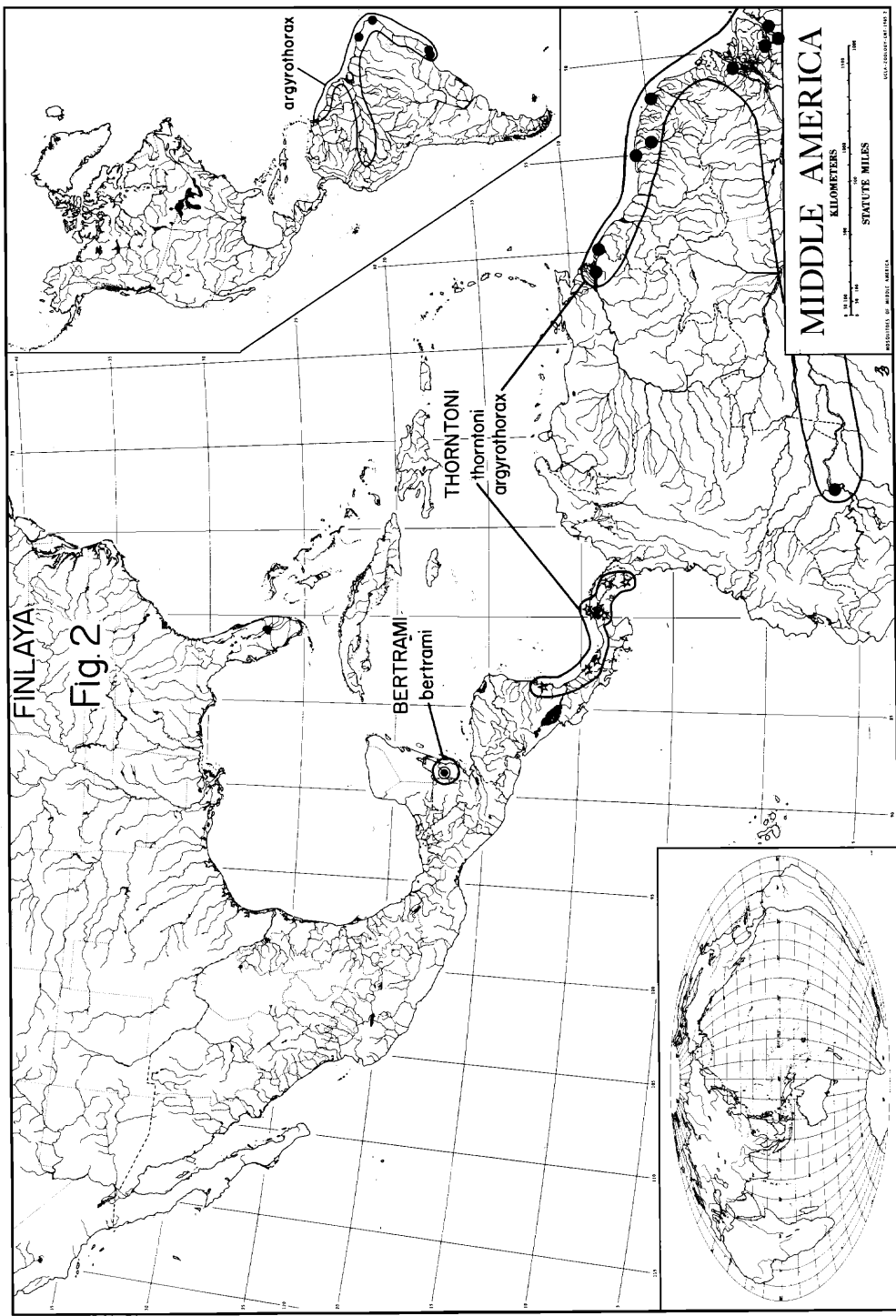
METOECOPUS

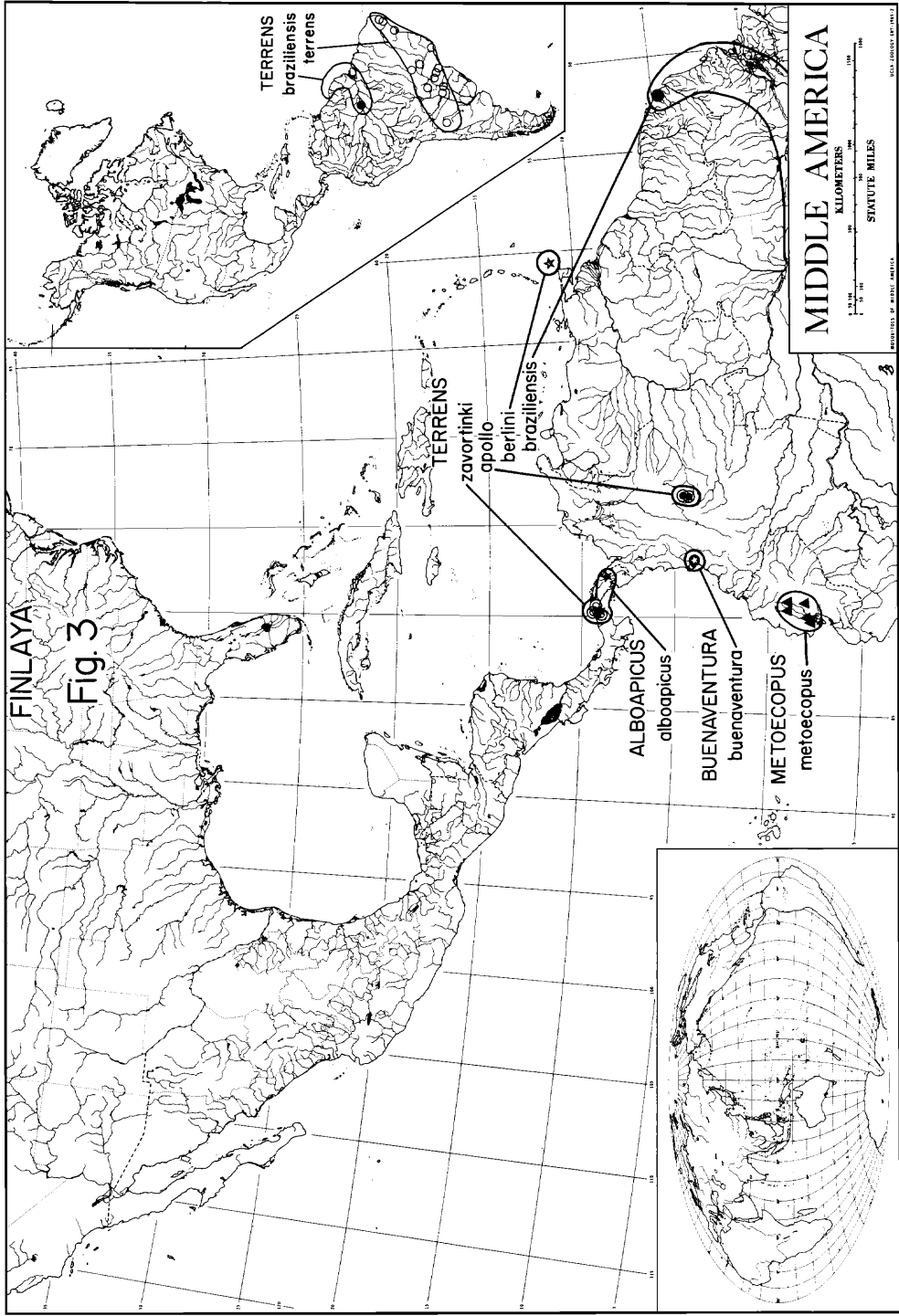
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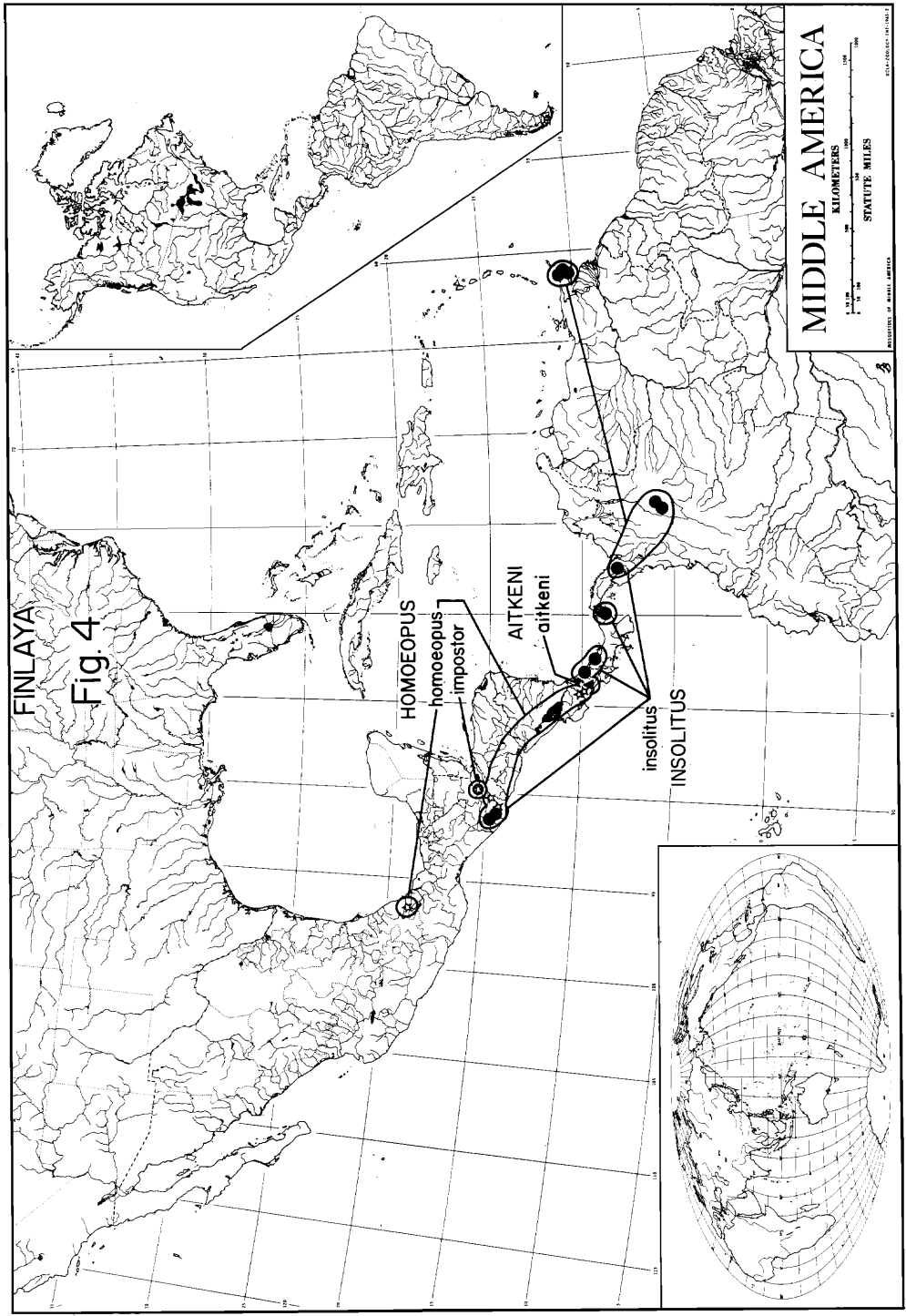
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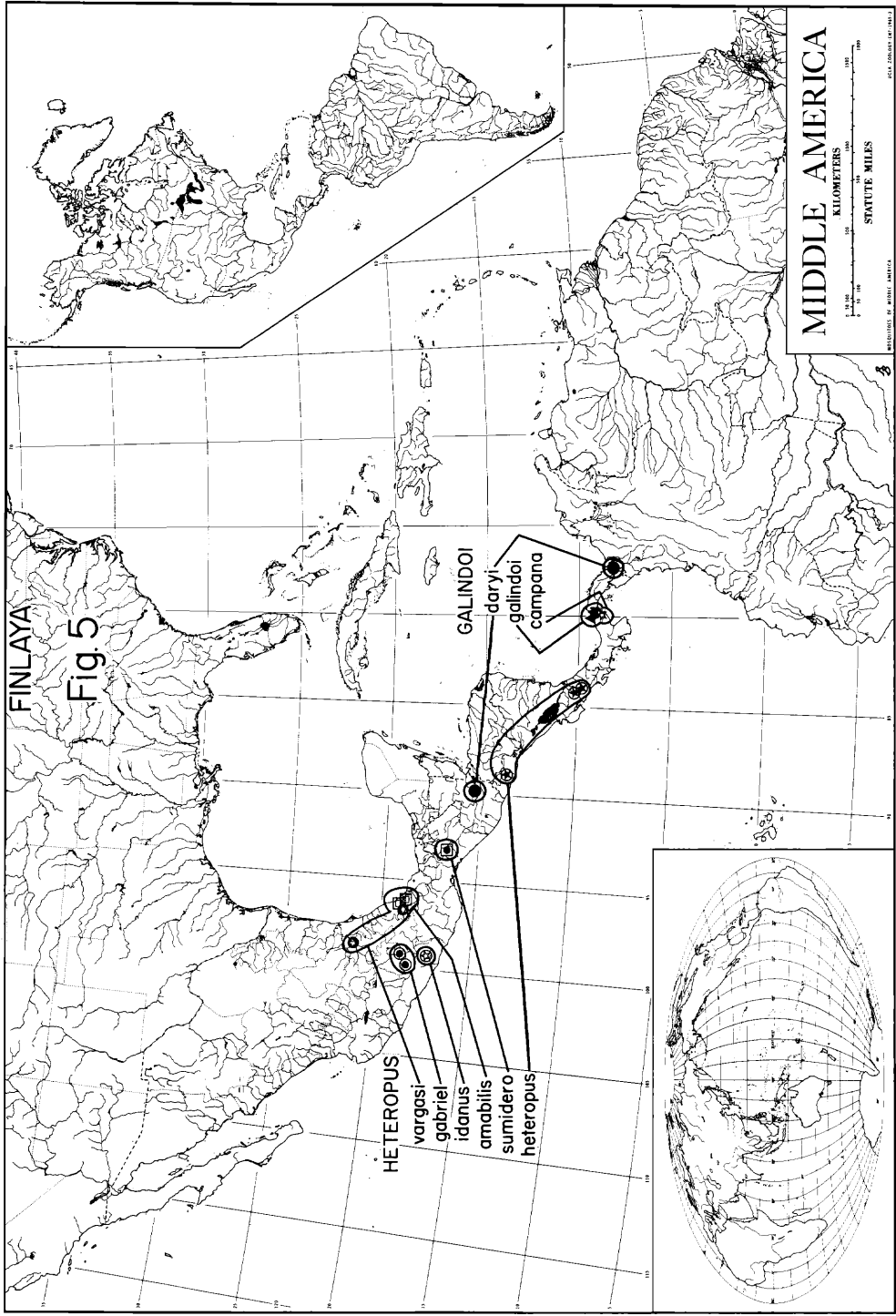
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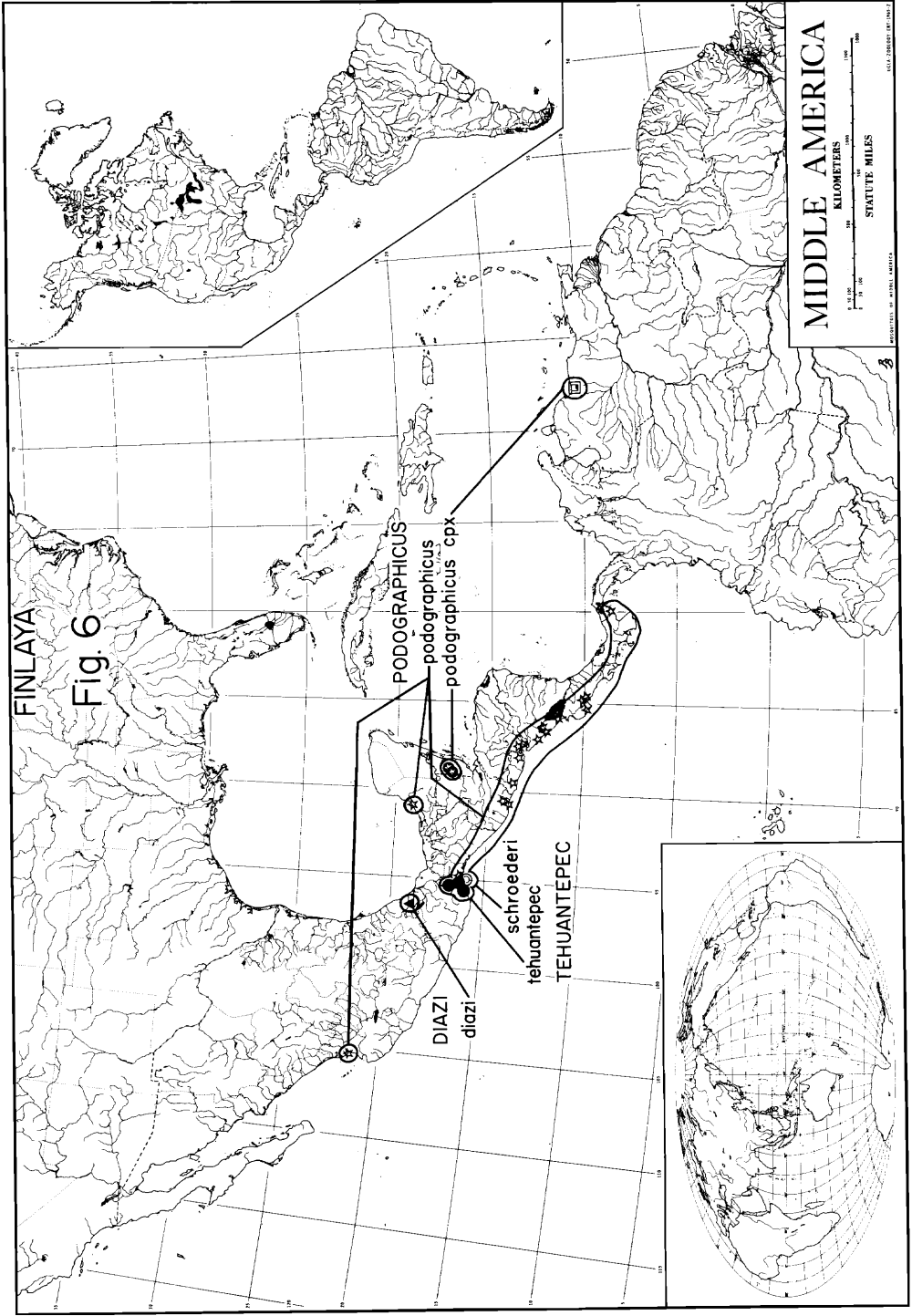
TEHUANTEPEC











FINLAYA

Fig. 7

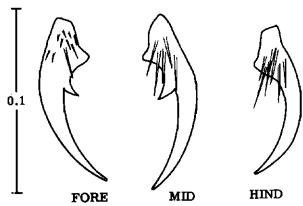
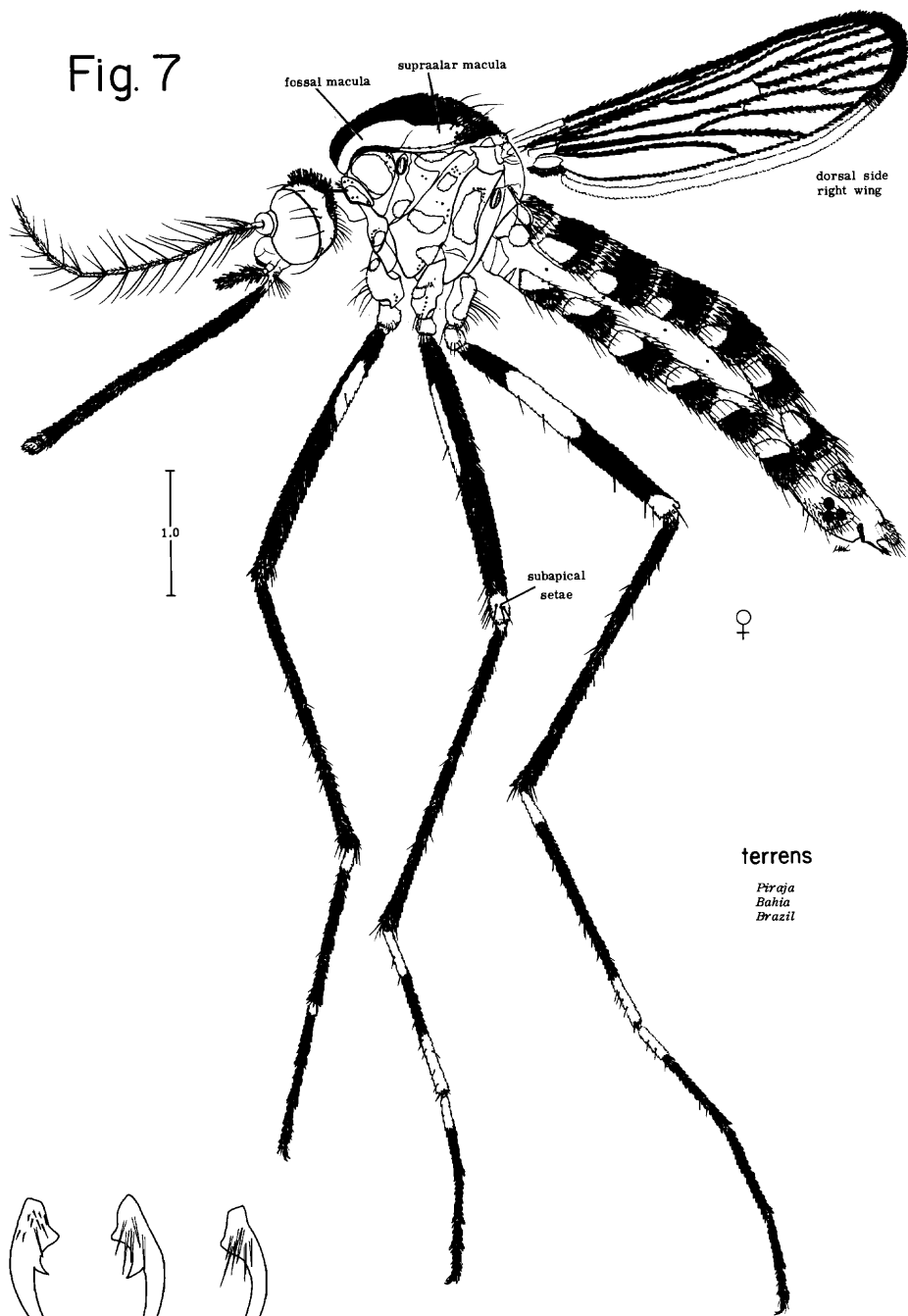
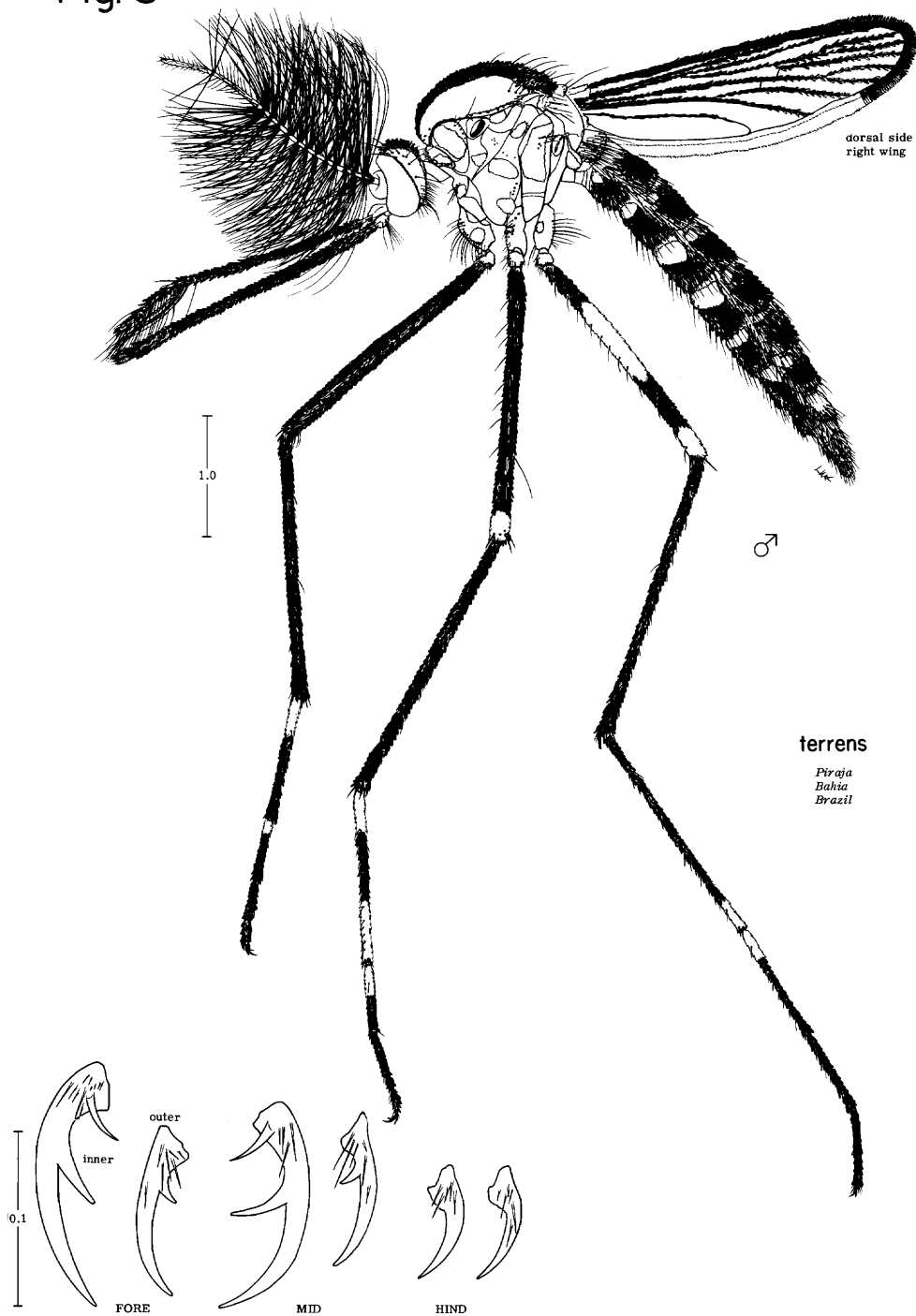
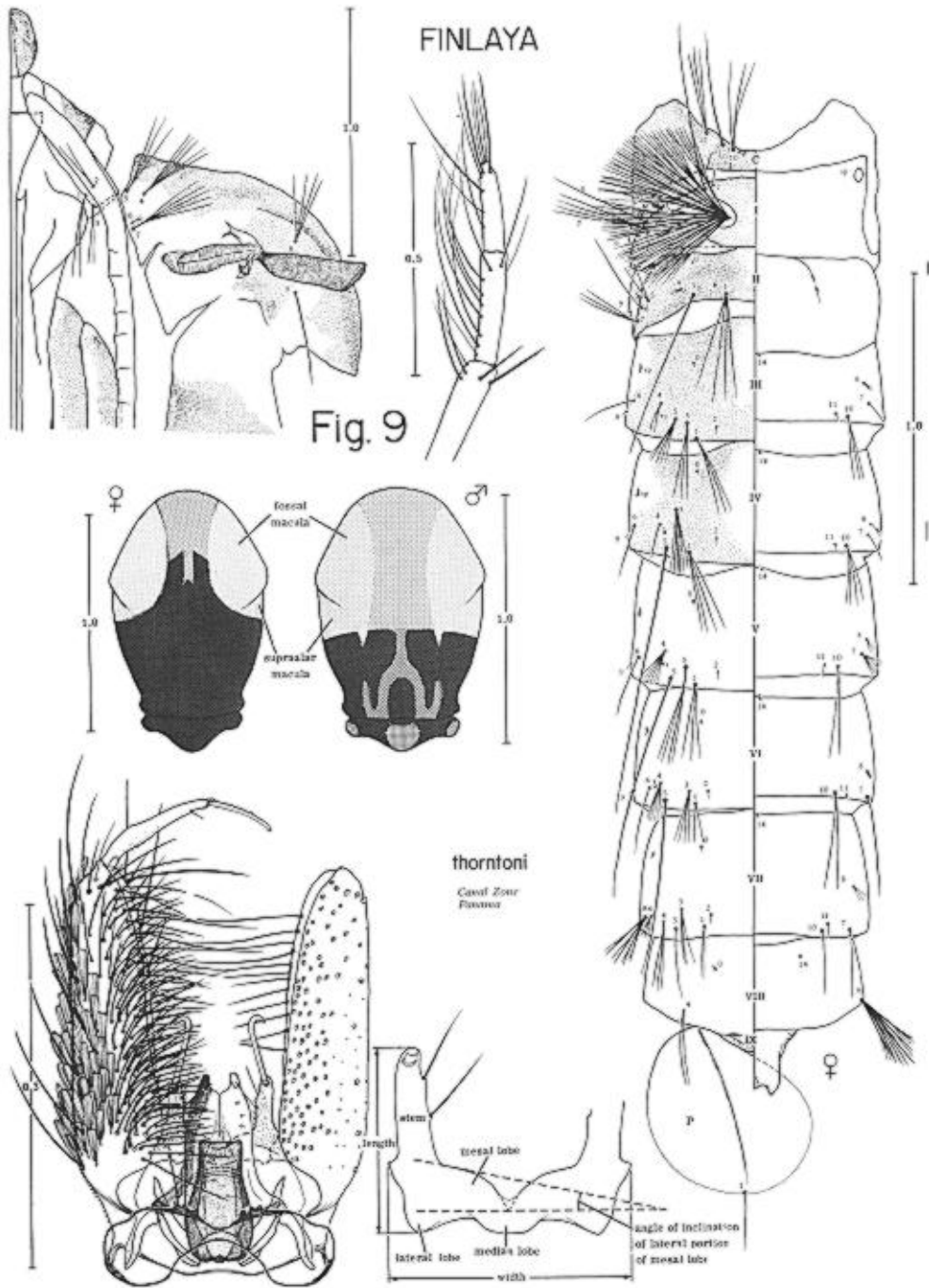


Fig. 8

FINLAYA





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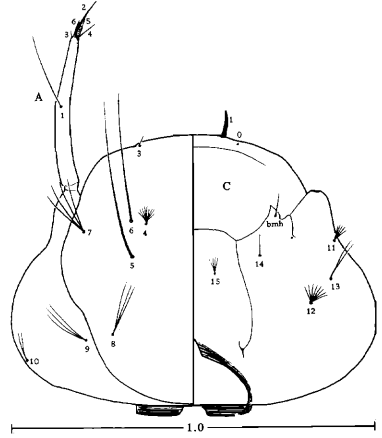
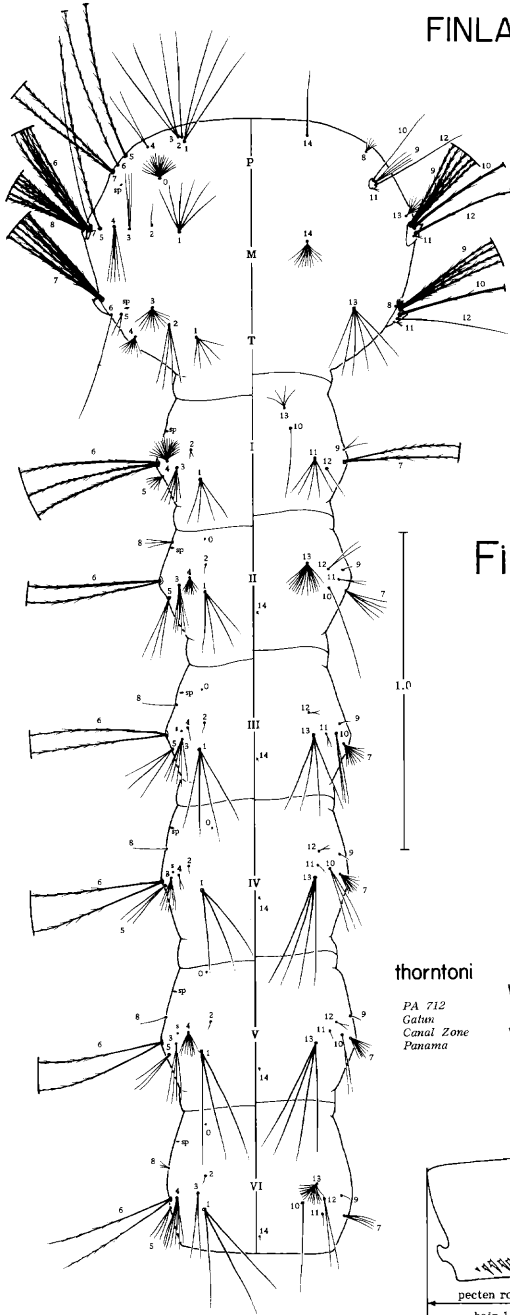
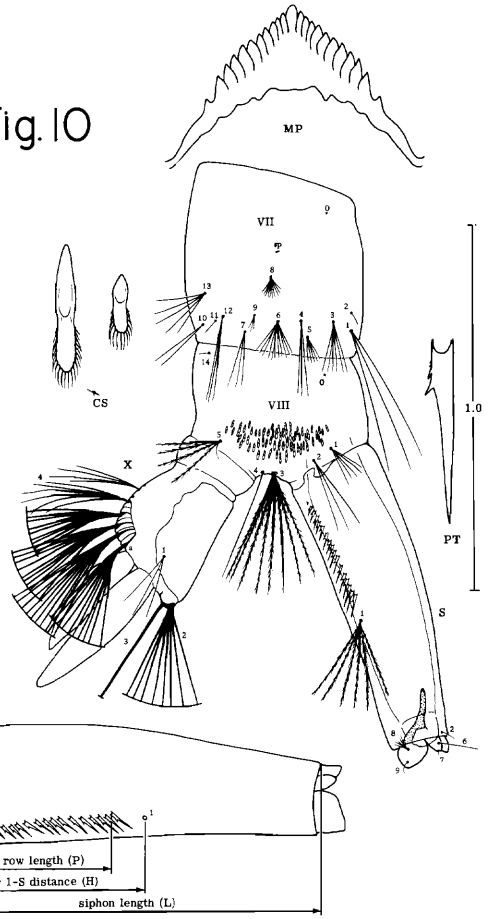


Fig. 10

thorntoni

PA 712
Gatun Canal Zone
Panama



FINLAYA

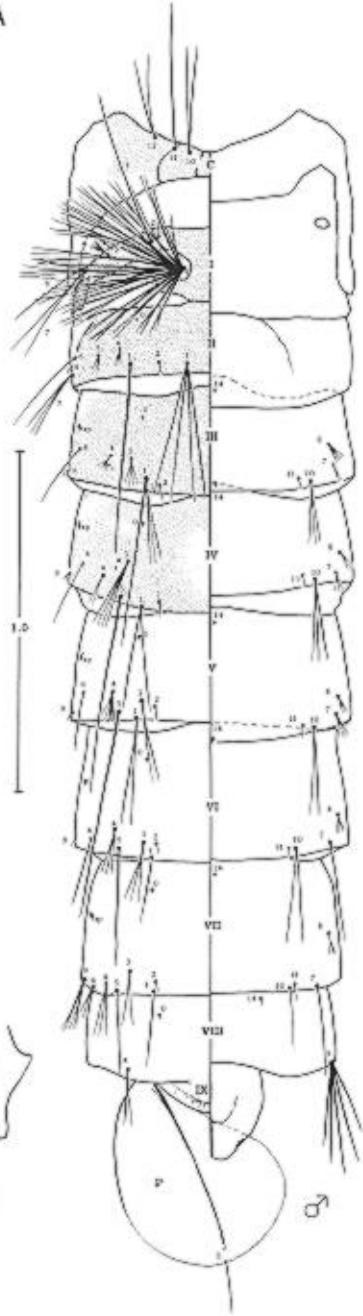
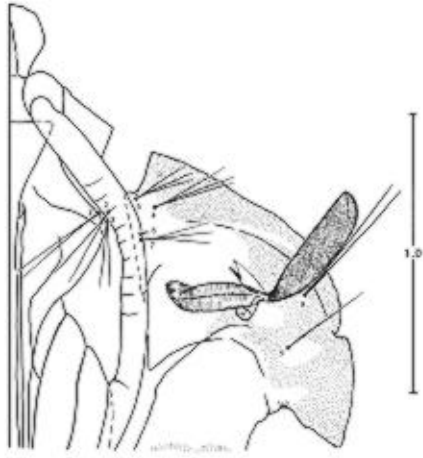
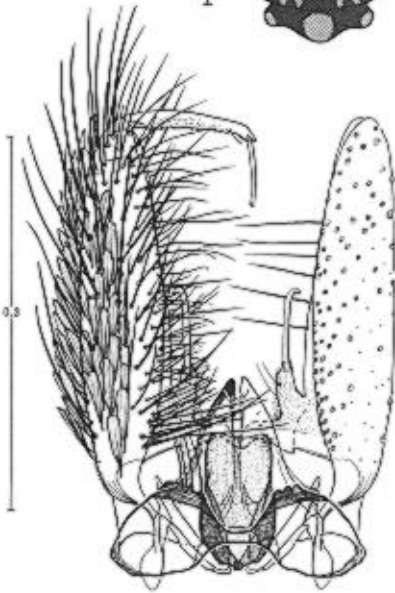


Fig. II

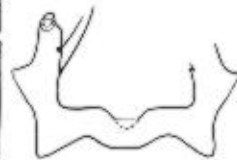
bertrami

BM 395
District of Caco
British Honduras



thorntoni

PA 547
Ferdinello
Colón
Panama



FINLAYA

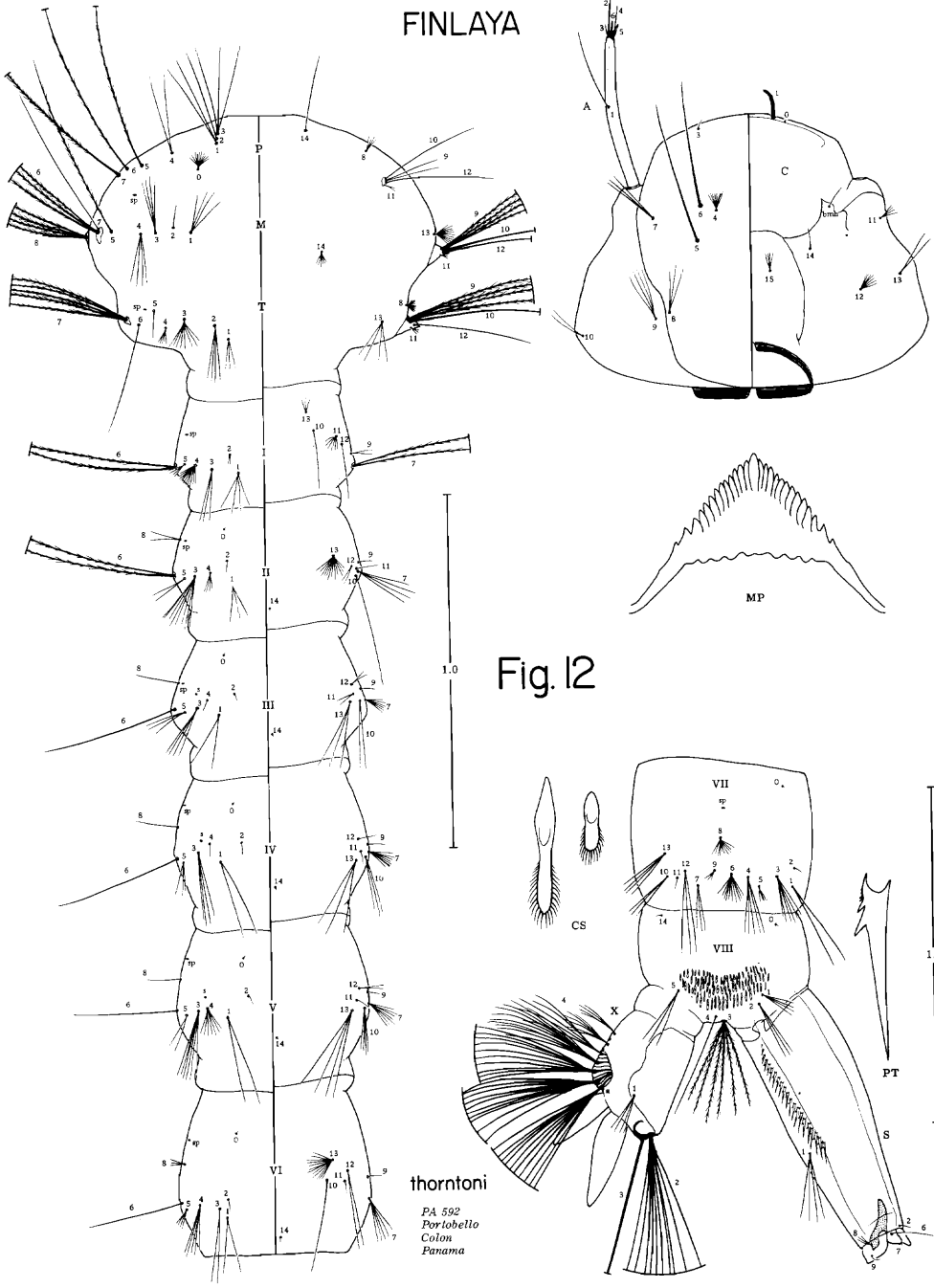


Fig. 12

thorntoni
FA 592
Portobello
Colon
Panama

FINLAYA

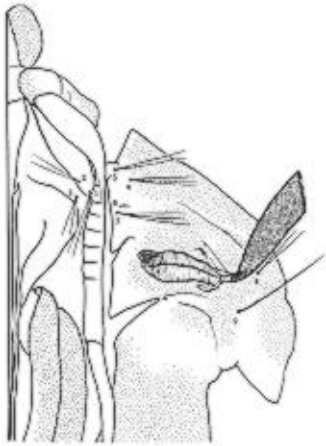
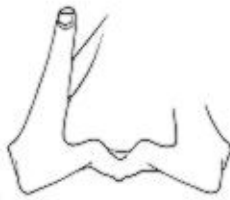
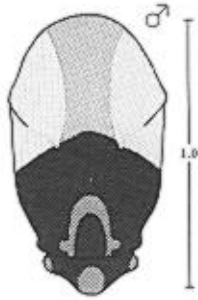
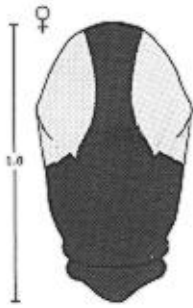
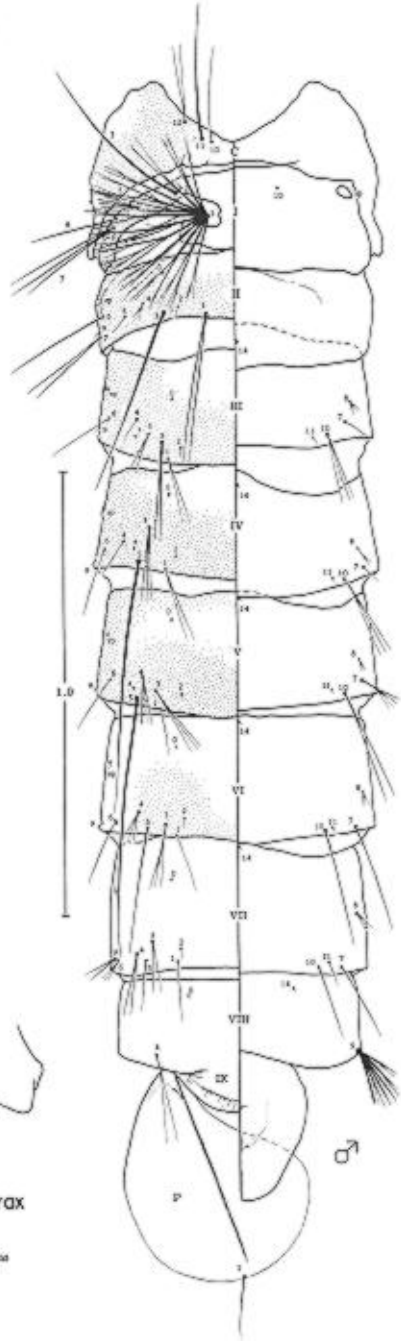
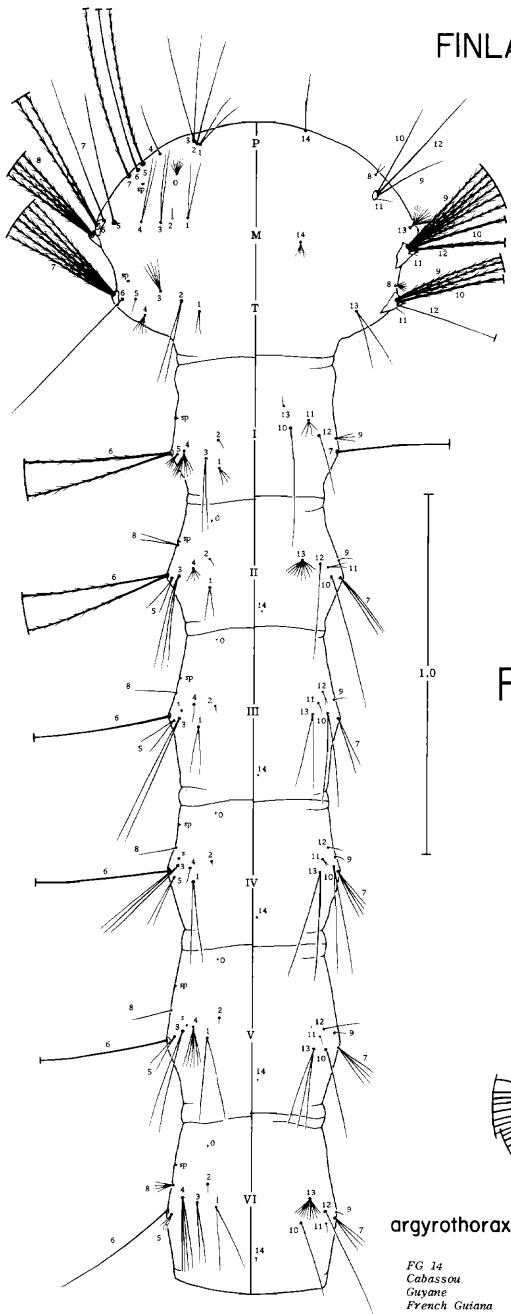


Fig. 13



argyrothorax
Colosse
Guane
French Guiana



FINLAYA

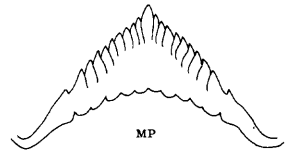
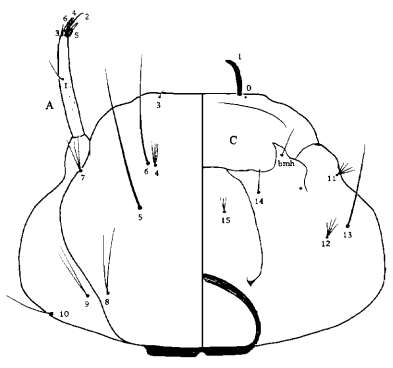
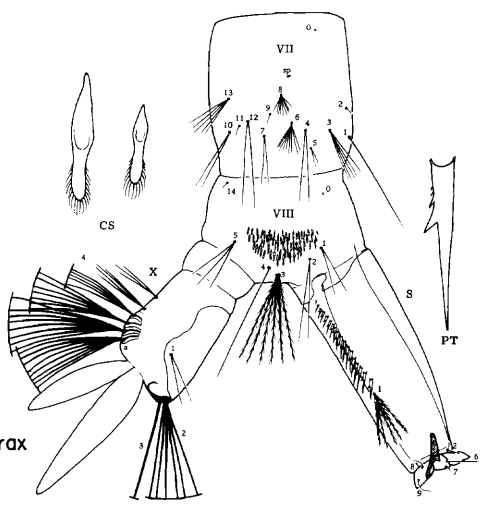


Fig. 14



argyrothorax

FG 14
Cabassou
Guyane
French Guiana

FINLAYA

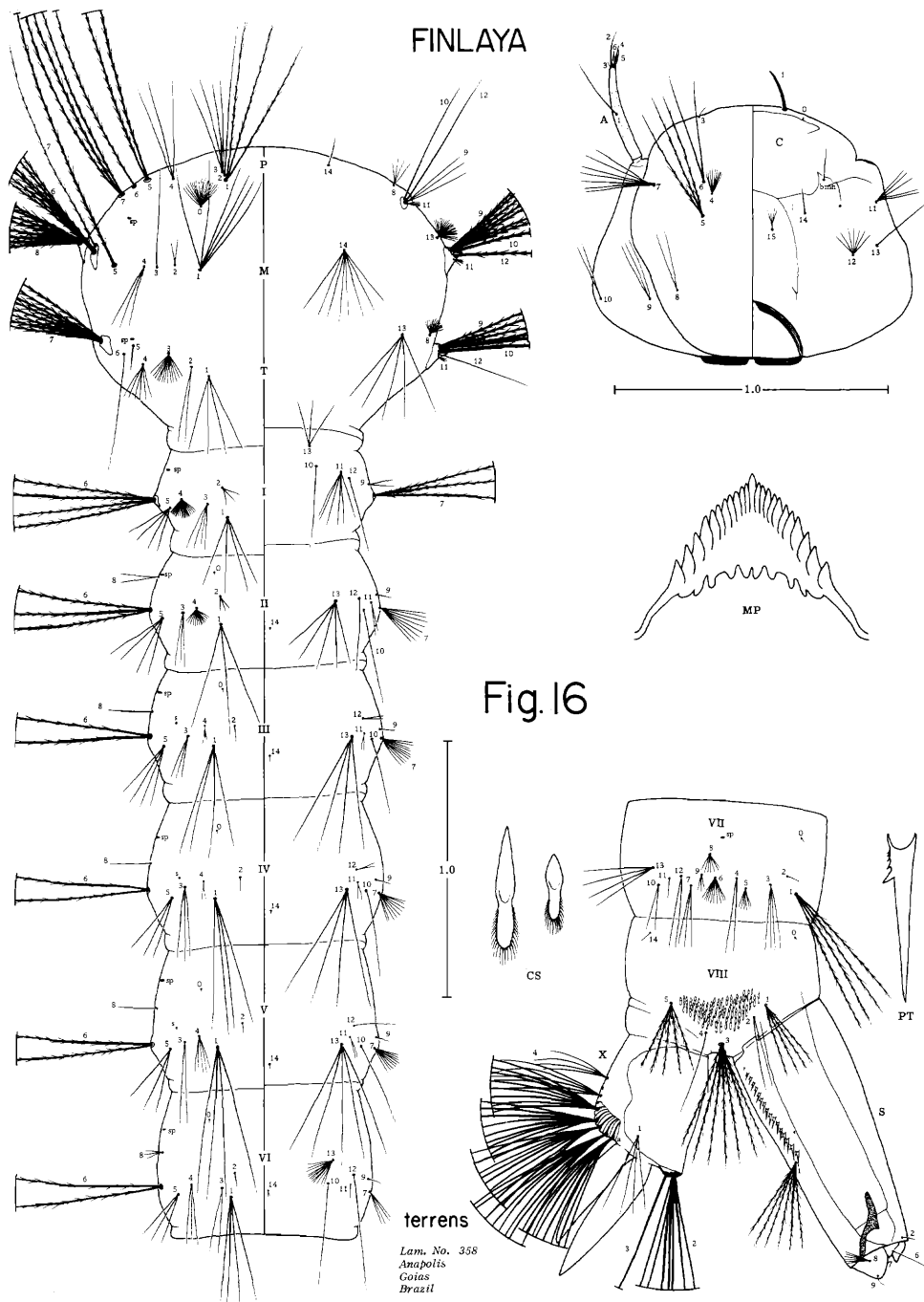


Fig. 16

terrens

Lam. No. 358
Anapoís
Goias
Brazil

FINLAYA

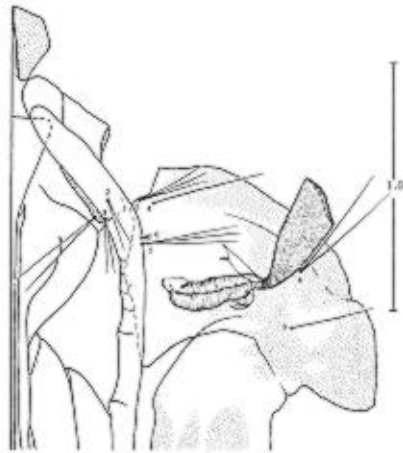
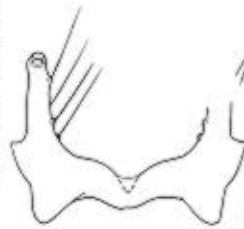
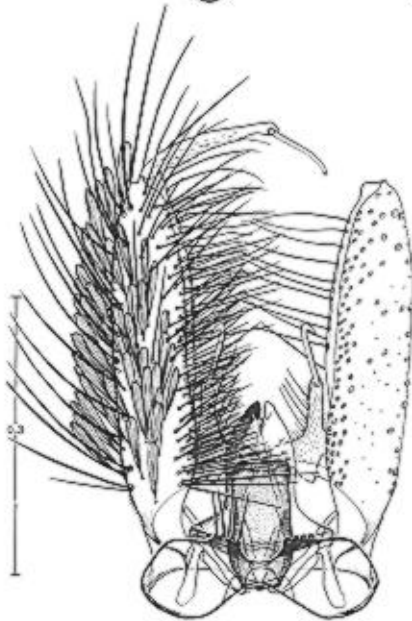
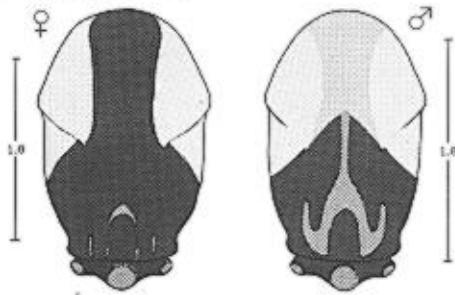
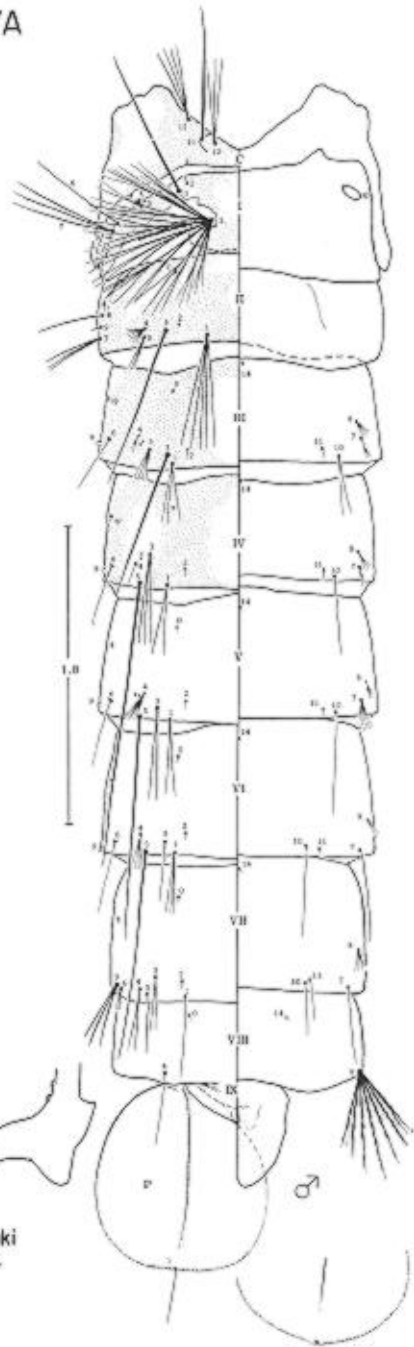


Fig. 17



zavorotinki
Cosol. Zavorotinki
Passera

FINLAYA

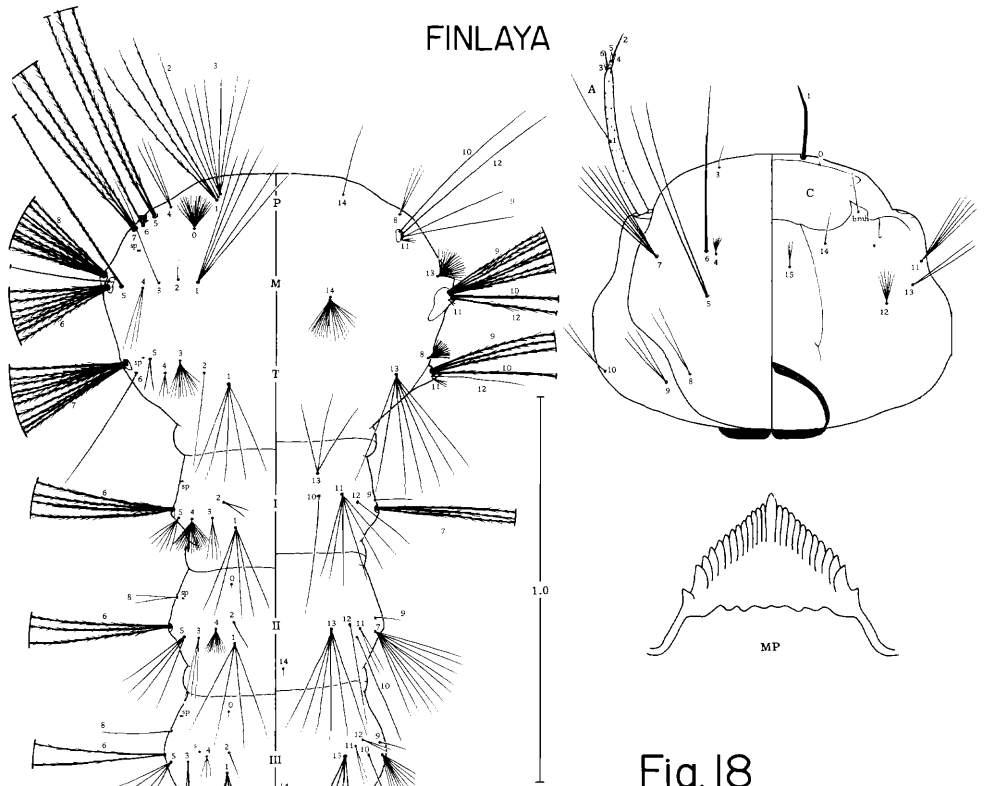
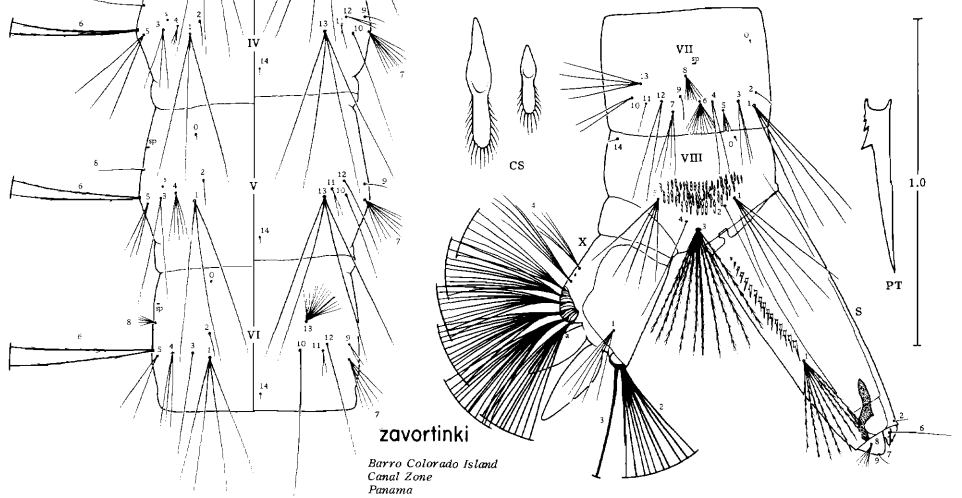


Fig. 18



zavortinki

*Barro Colorado Island
Canal Zone
Panama*

FINLAYA

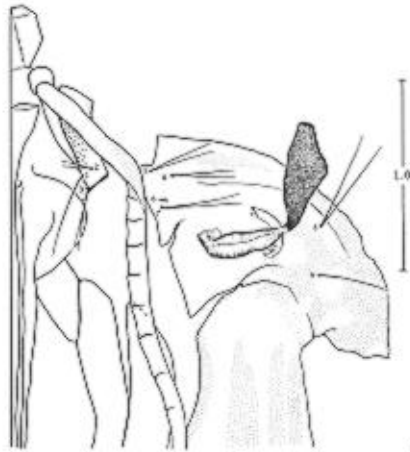
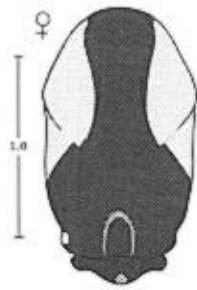
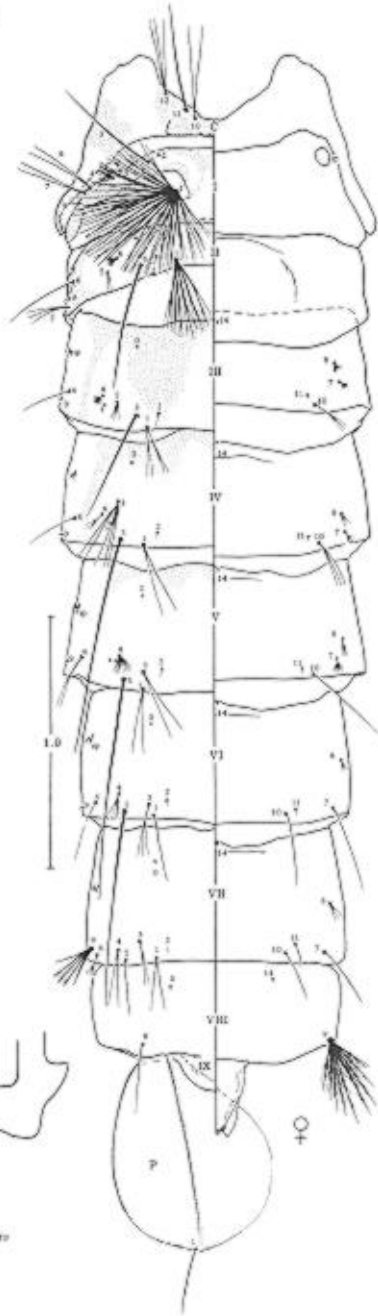


Fig. 19



apollo

near Villavieja
Meta
Colombia



FINLAYA

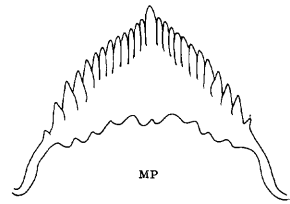
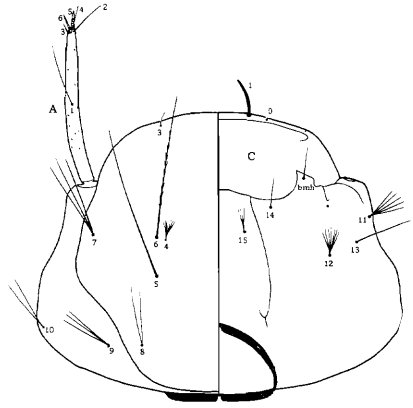
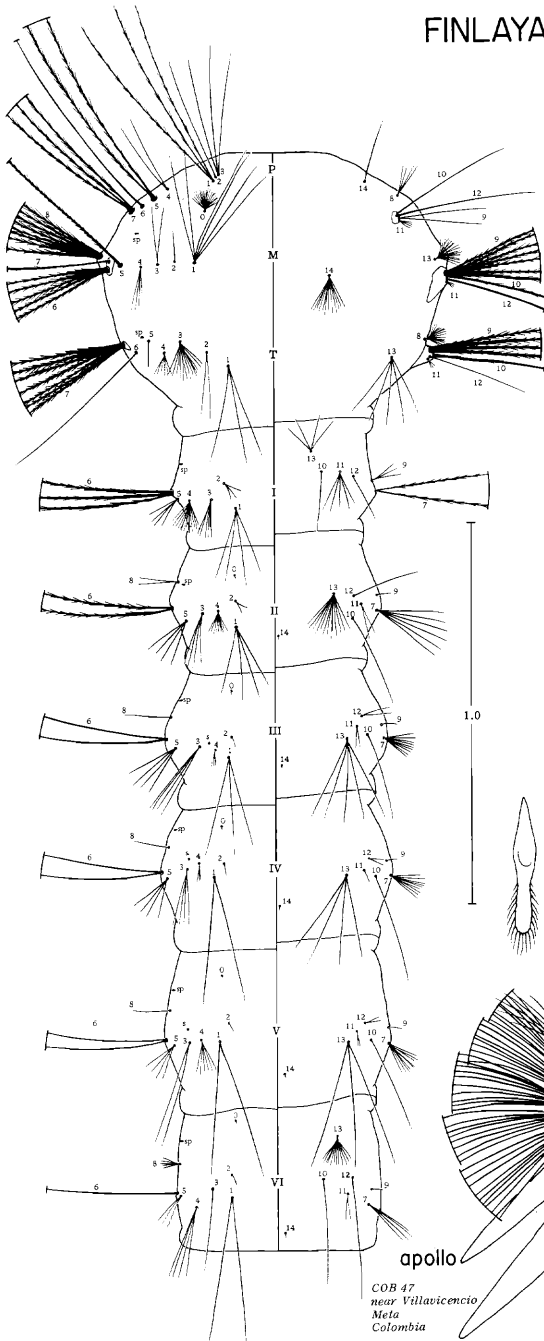
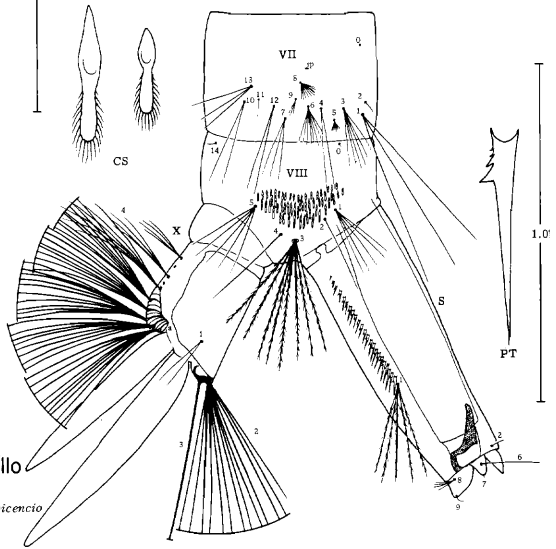


Fig. 20



apollo

COB 47
near Villavicencio
Meta
Colombia

FINLAYA

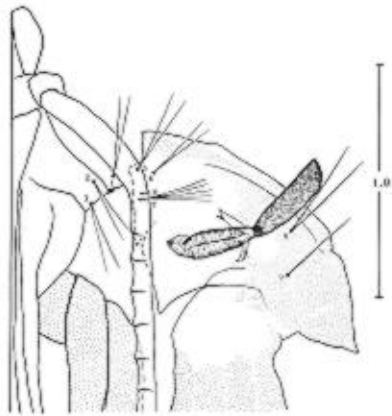
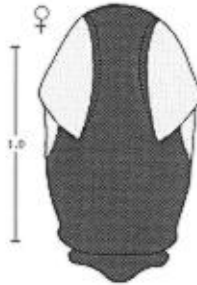
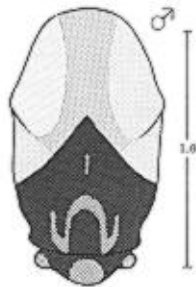


Fig. 21

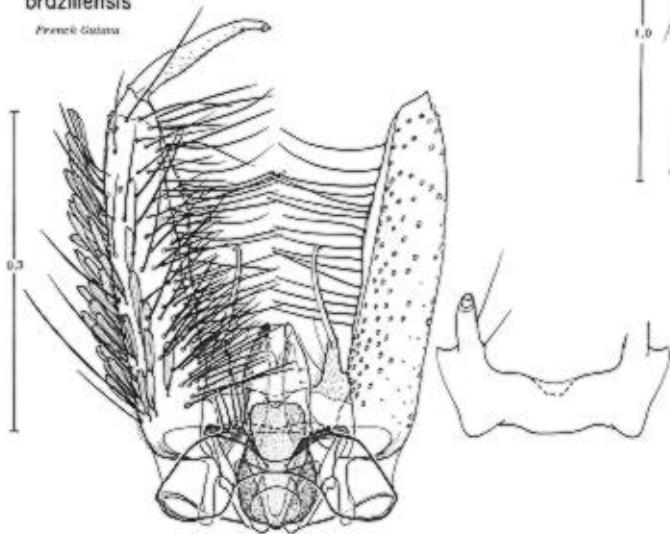
berlini

7109 133
Island of Tobago



braziliensis

French Guiana



FINLAYA

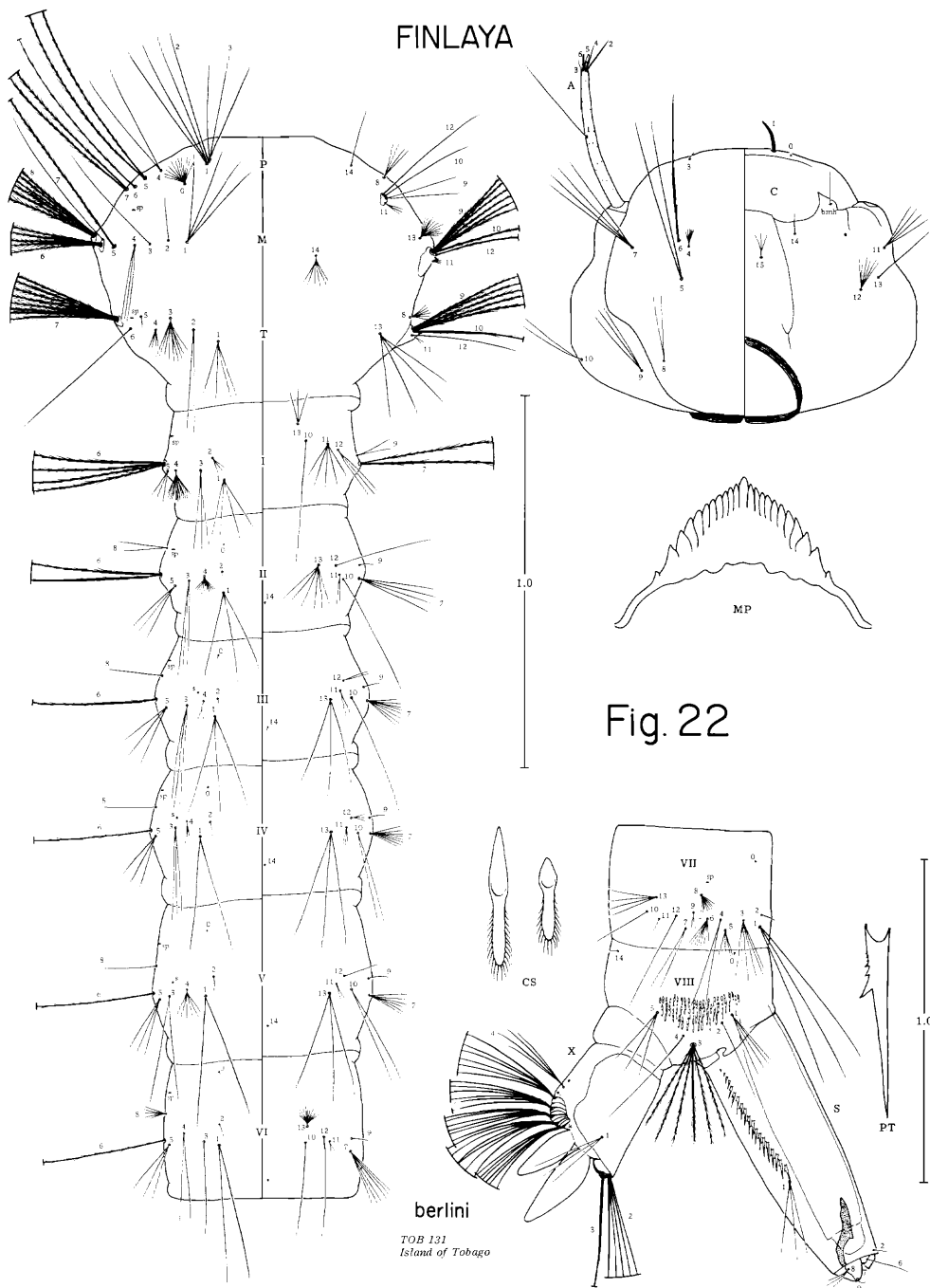


Fig. 22

berlina
TOB 131
Island of Tobago

FINLAYA

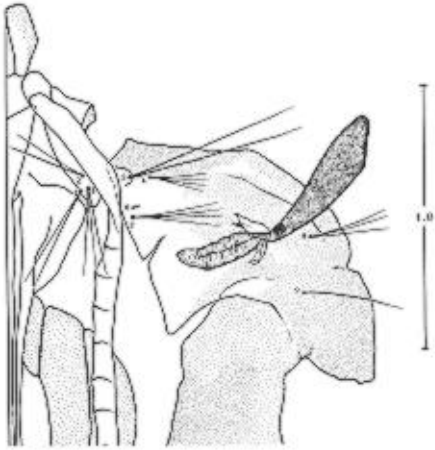
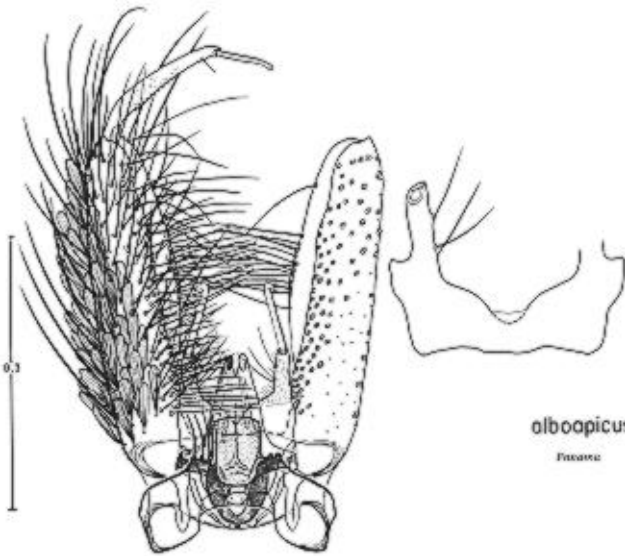
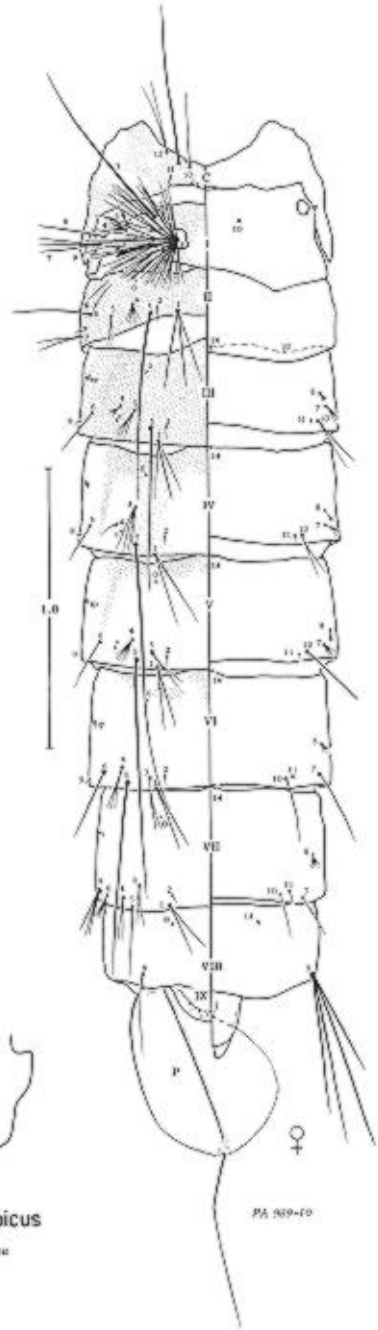
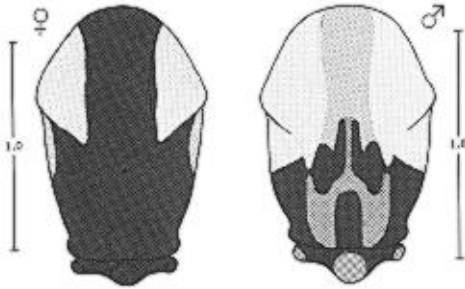


Fig. 23



alboopicus
Finlaya

PA 289-60

FINLAYA

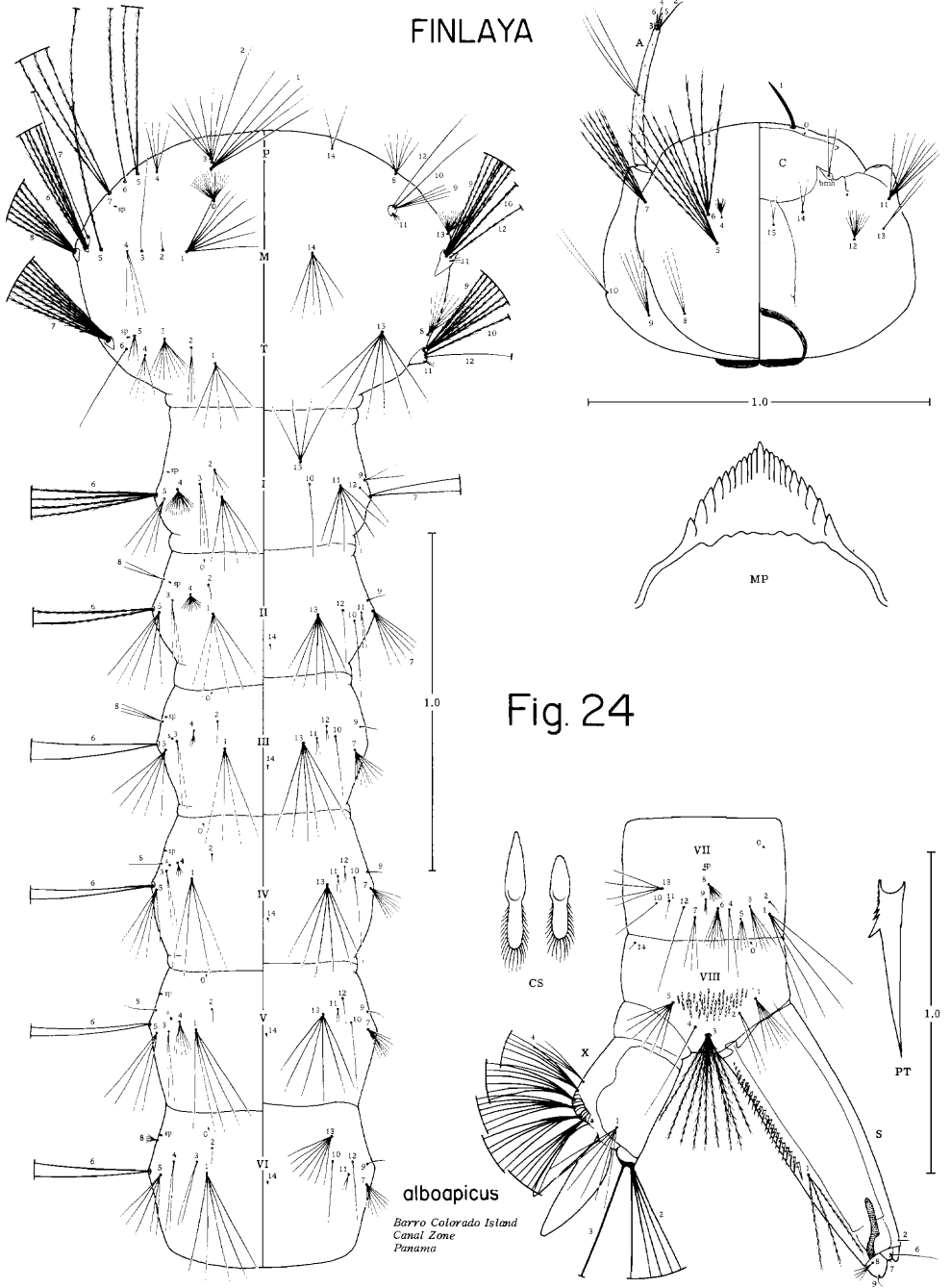


Fig. 24

alboapicus

Barro Colorado Island
Canal Zone
Panama

FINLAYA

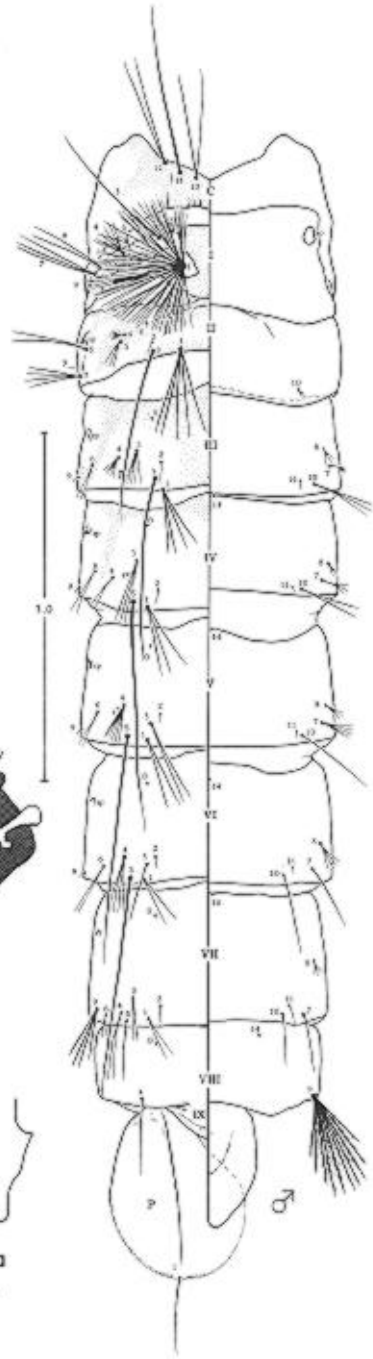
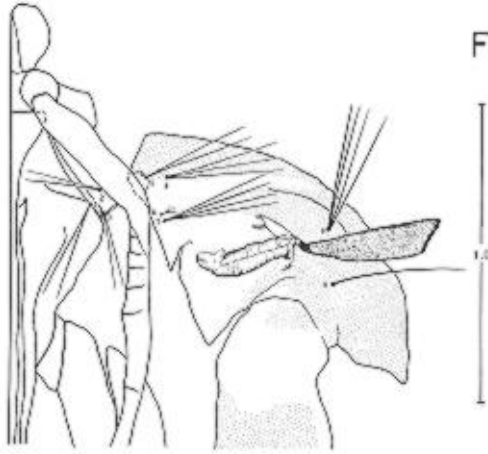
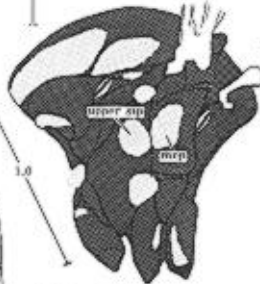
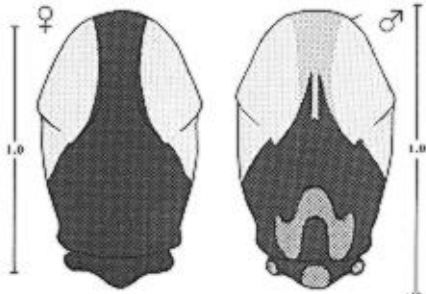


Fig. 25



buenaventura

near Buenaventura
Valle
Colombia

FINLAYA

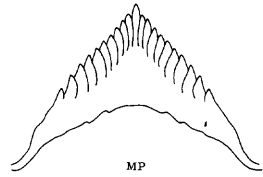
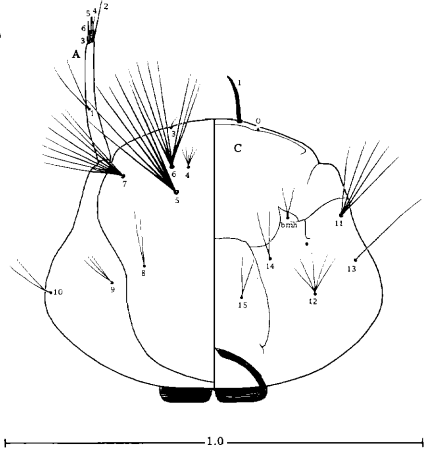
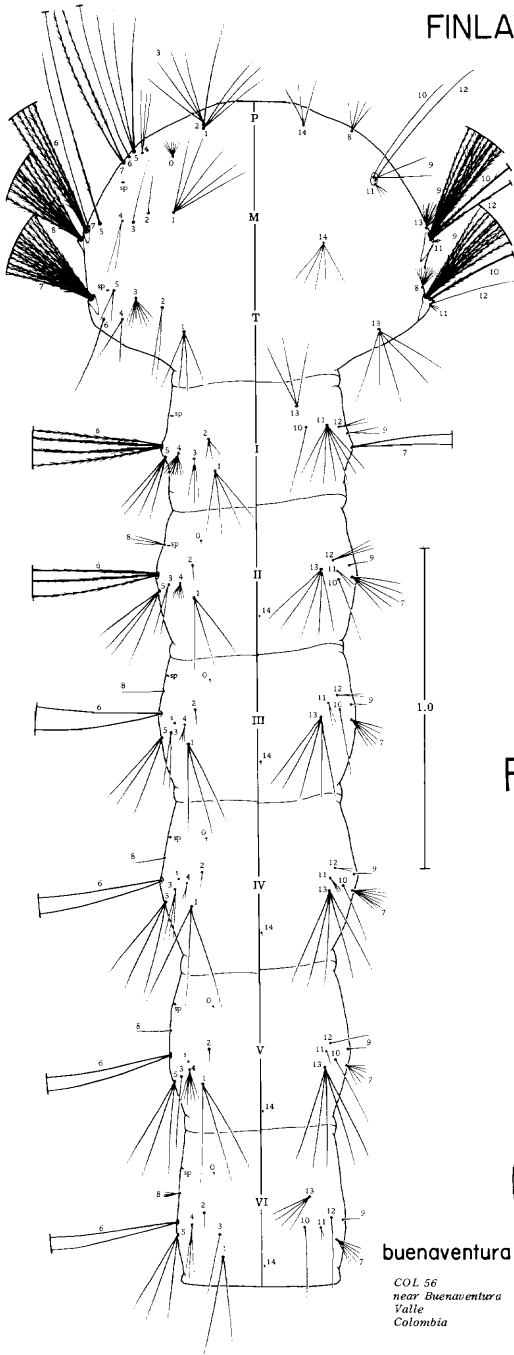
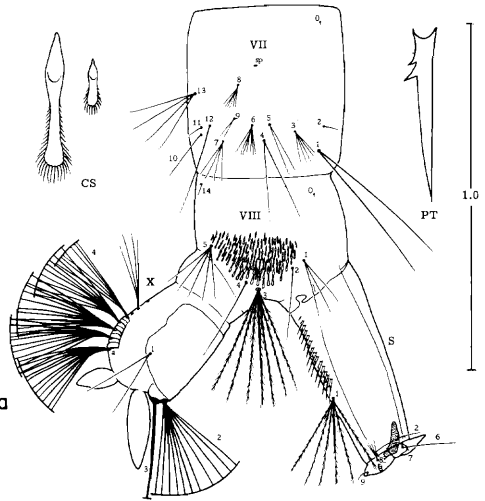


Fig. 26

buenaventura

COL 56
near Buenaventura
Valle
Colombia



FINLAYA

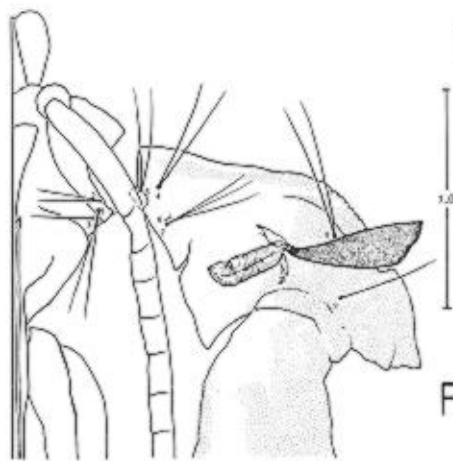
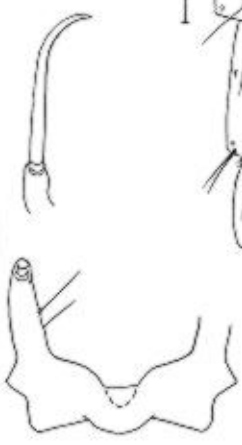
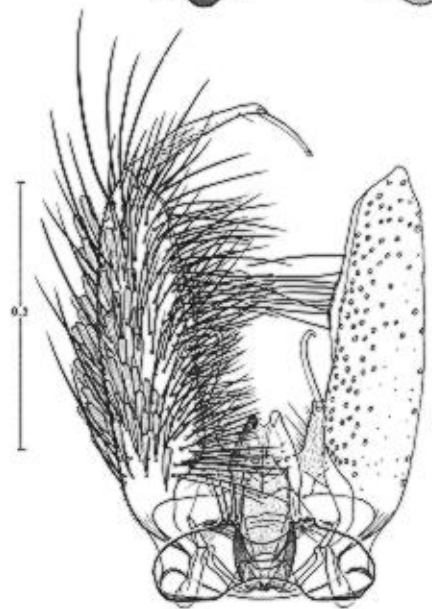
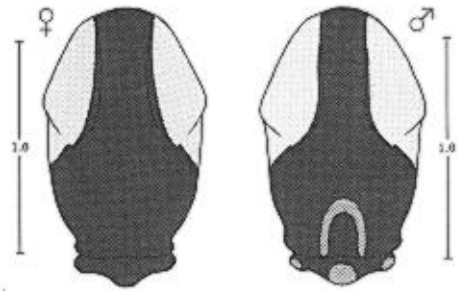
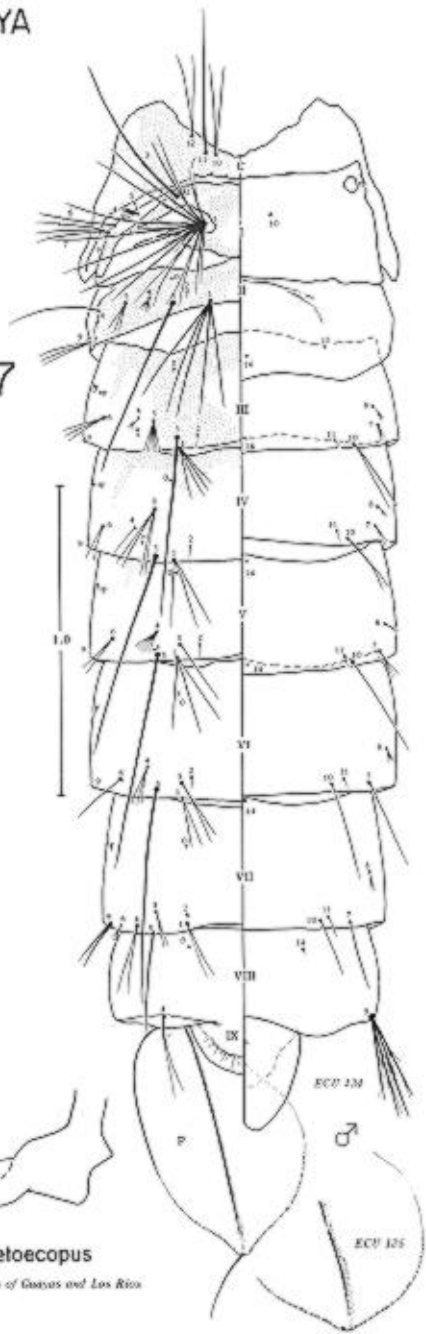


Fig. 27



metoecopus

Departments of Guayas and Los Rios Ecuador

FINLAYA

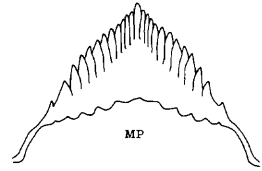
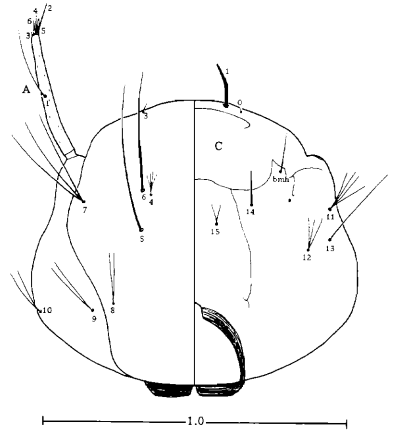
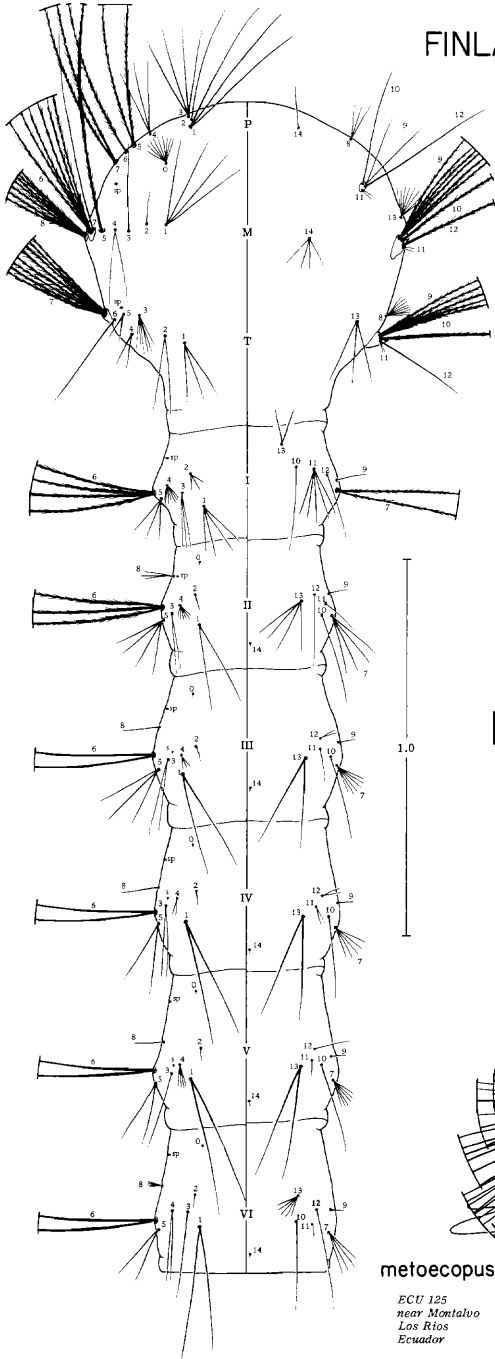
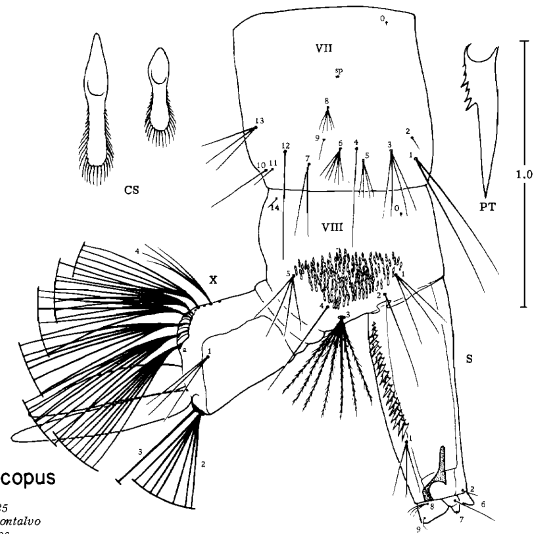


Fig. 28

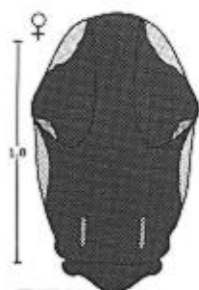
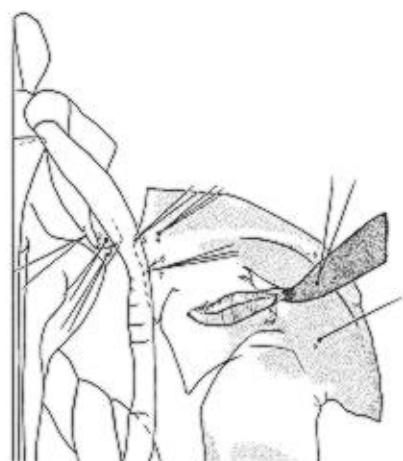


metoecopus

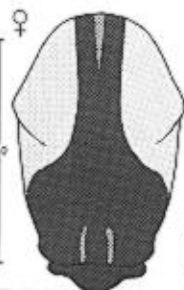
ECU 125
near Montalvo
Los Rios
Ecuador

FINLAYA

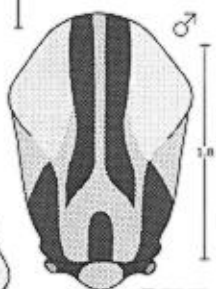
Fig. 29



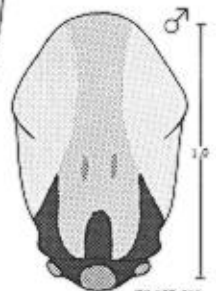
TR 627-127



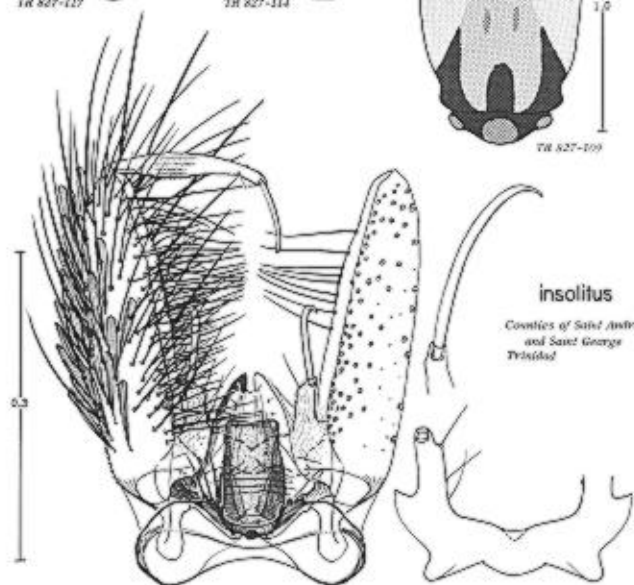
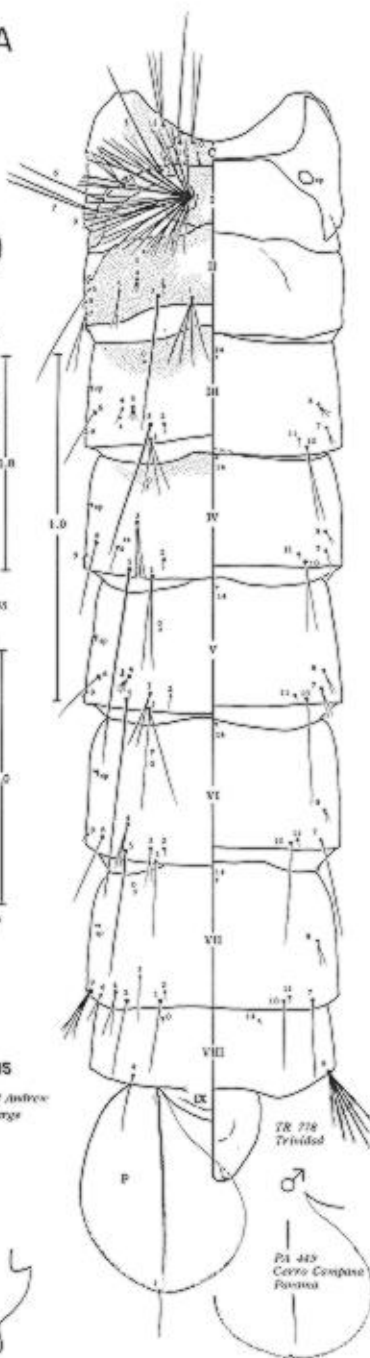
TR 627-134



TR 752-105



TR 627-109



insolitus

Counties of Saint Andrew
and Saint George
Trinidad

TR 718
Trivittid

P1 445
Cerro Comana
Panama

FINLAYA

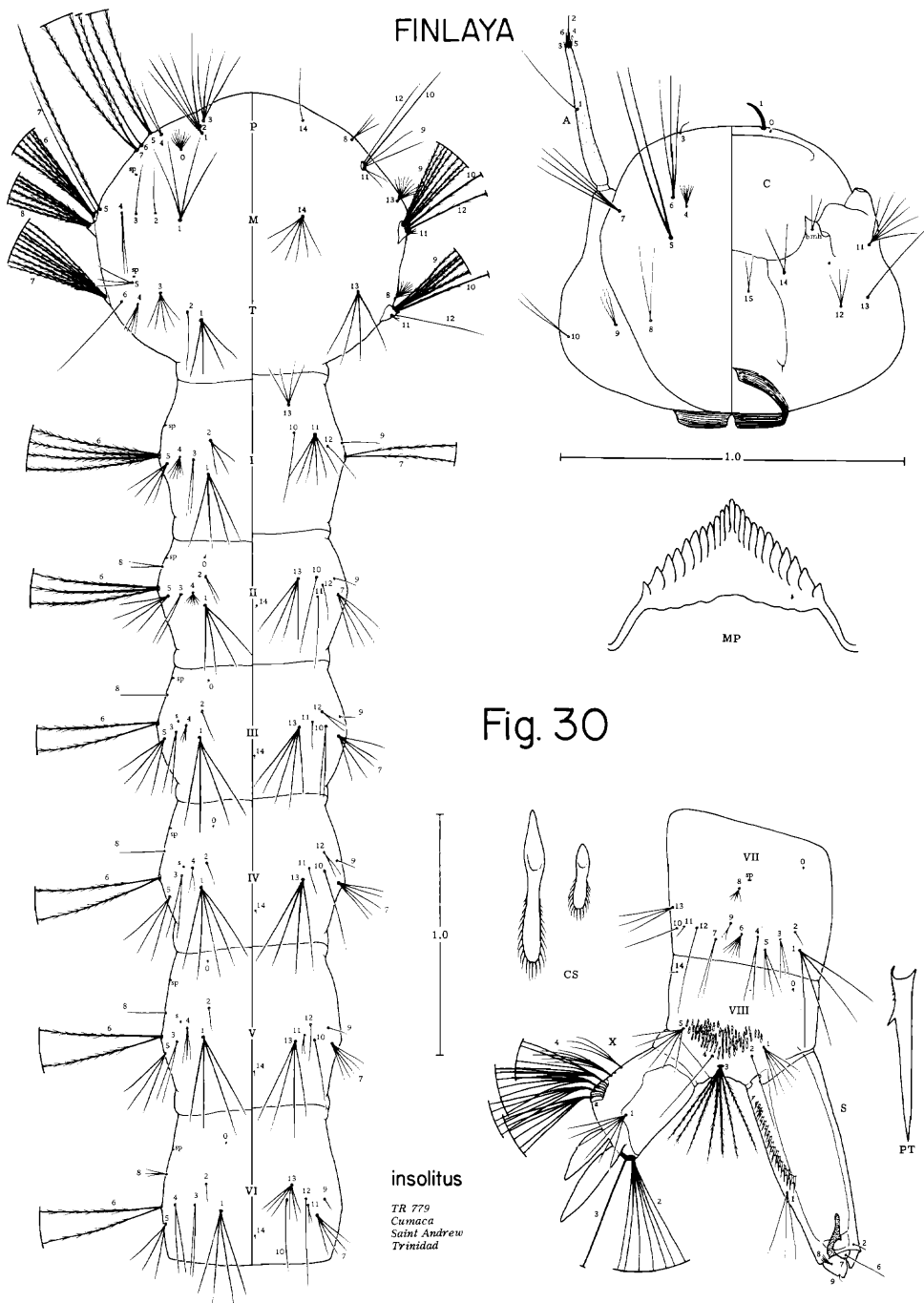


Fig. 30

insolitus
 TR 779
 Cumaca
 Saint Andrew
 Trinidad

FINLAYA

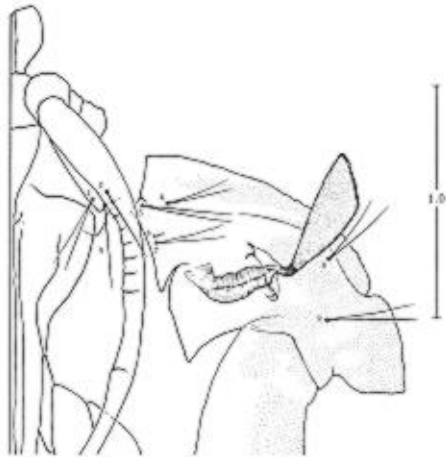
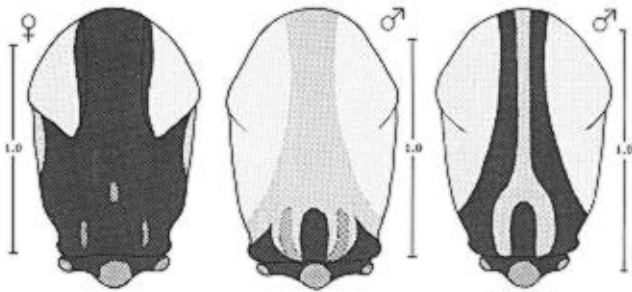
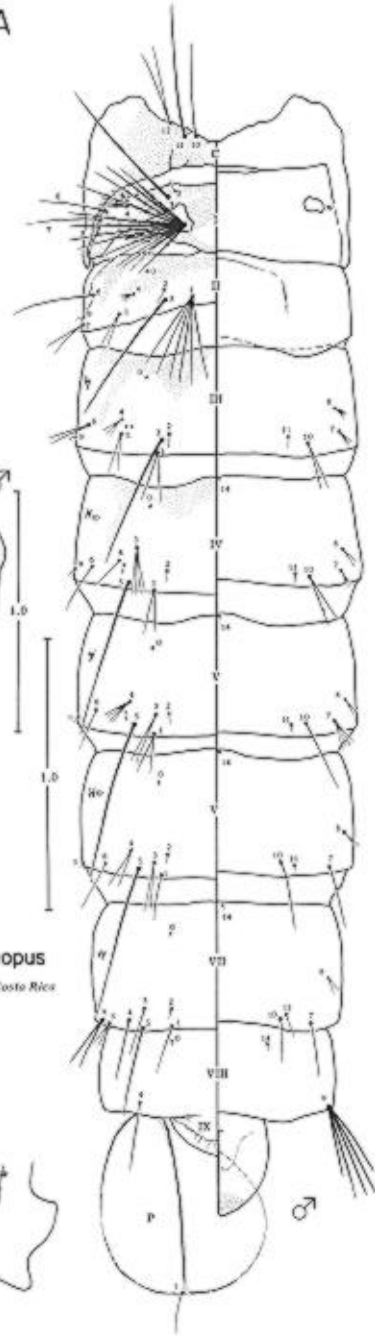
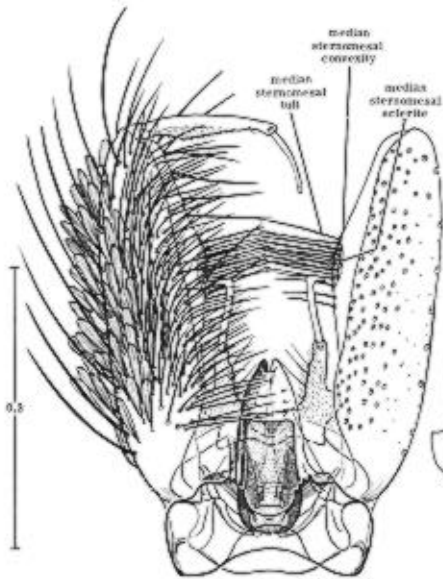


Fig. 31



GUA 48-53
Awailon, Guatemala



homoeopus
San Jose, Costa Rica



FINLAYA

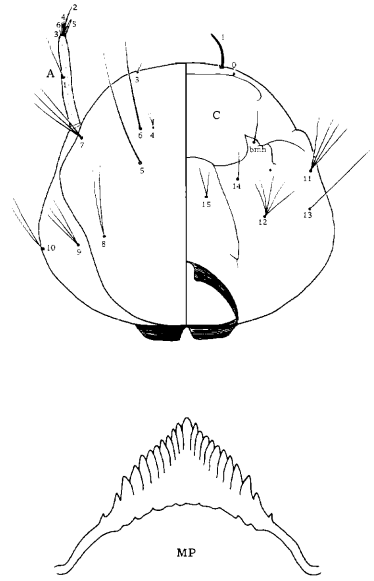
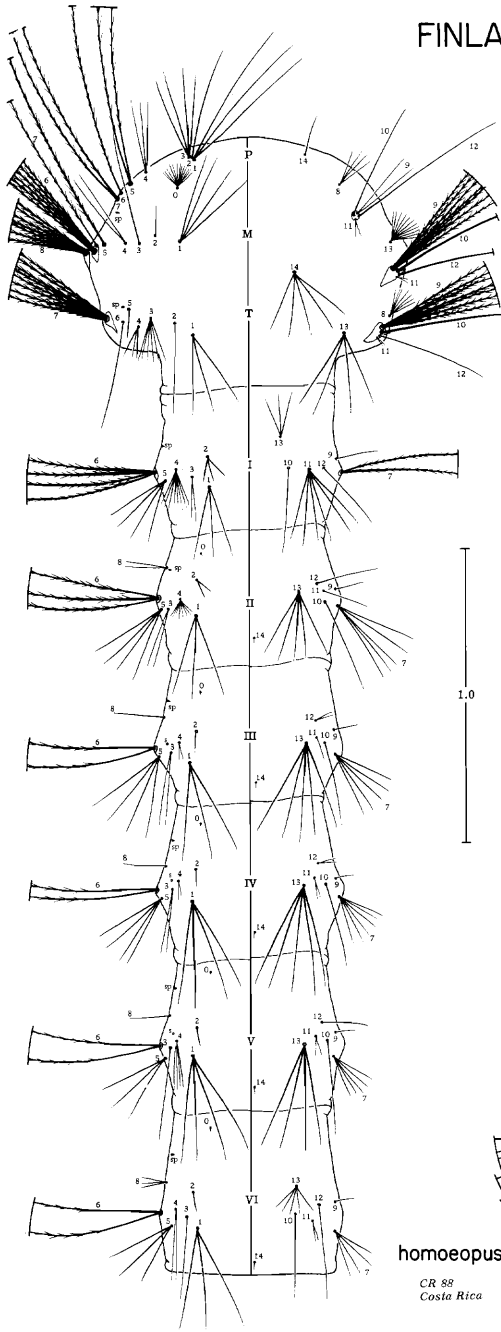
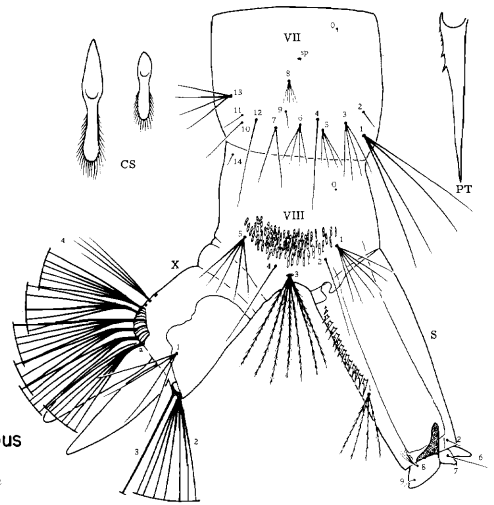


Fig. 32



homoeopus

CR 88
Costa Rica

FINLAYA

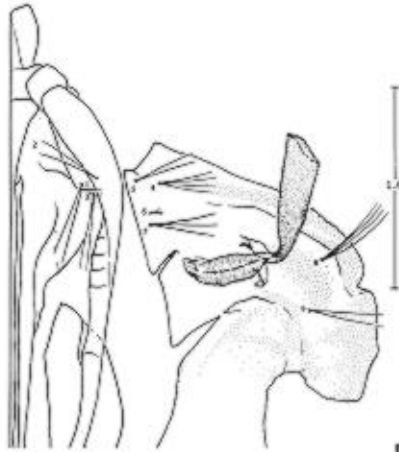
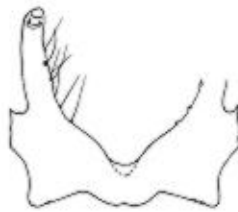
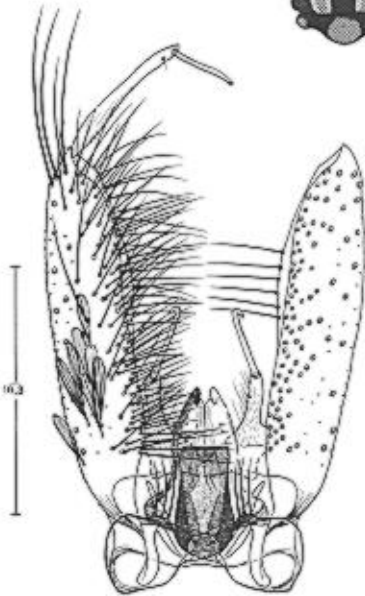
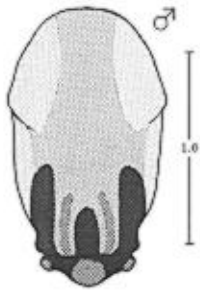
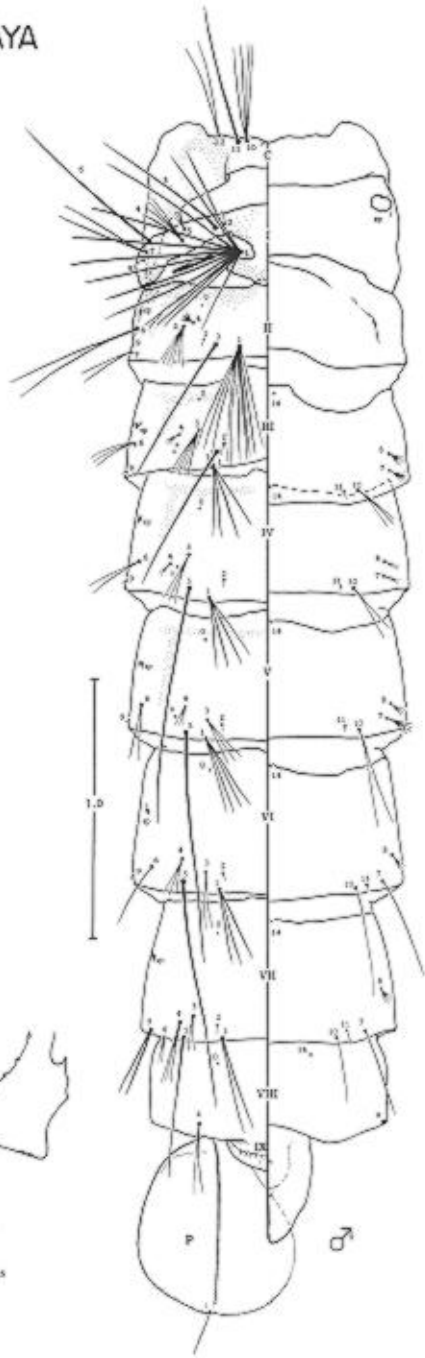


Fig. 33



impostar

GS# 33-30
Finca Trece Años
Alta Verapaz
Guatemala



FINLAYA

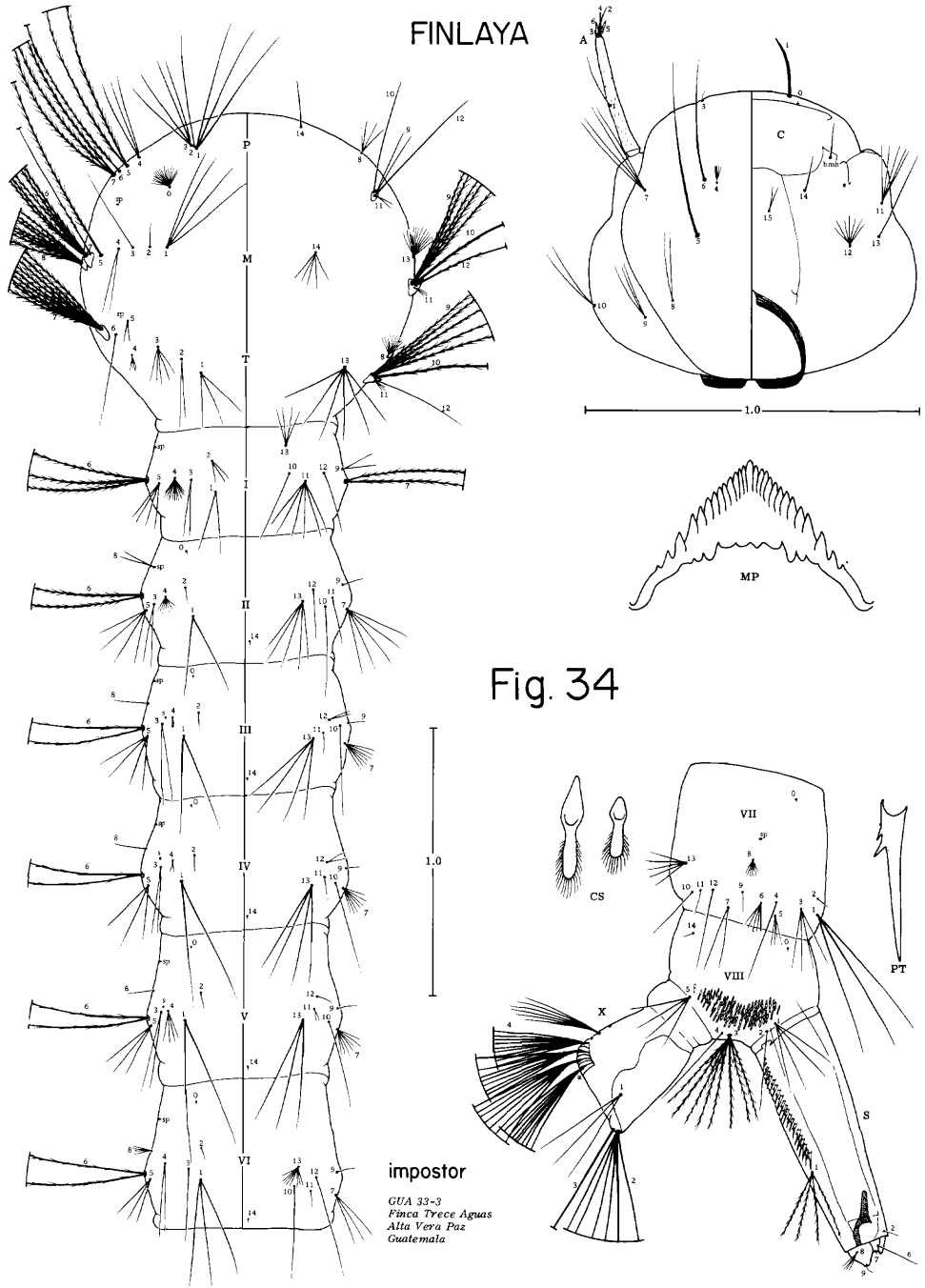


Fig. 34

impostor
 GUA 33-3
 Finca Trece Aguas
 Alta Verapaz
 Guatemala

FINLAYA

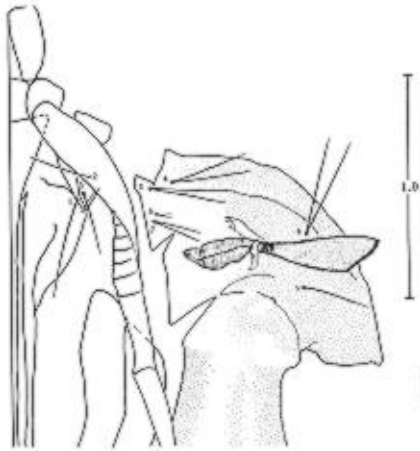
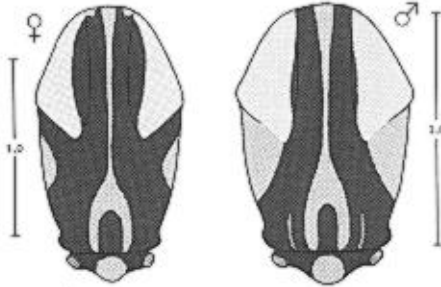
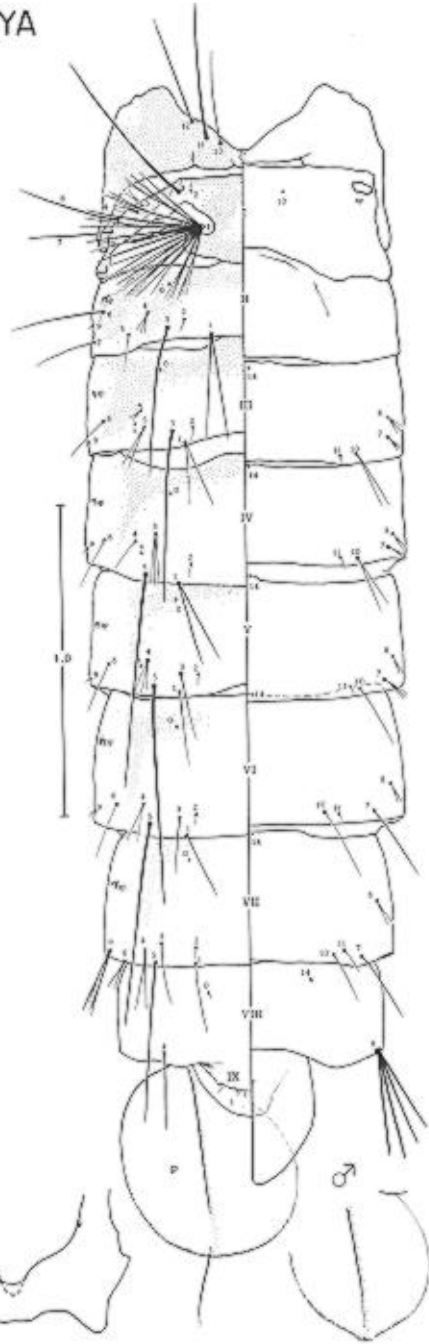
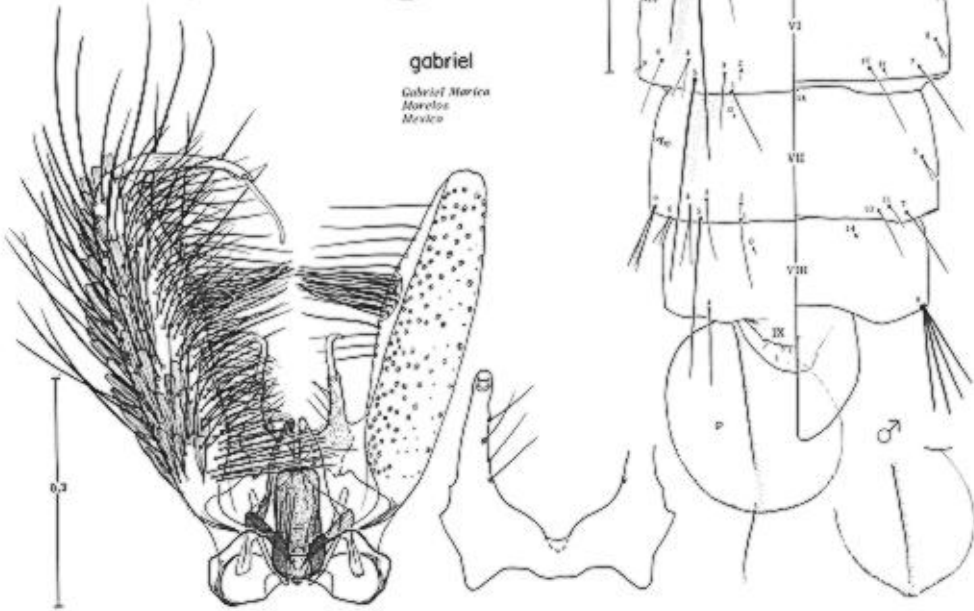


Fig. 35



gabriel

Gabriel Mexico
Morelos
Mexico



FINLAYA

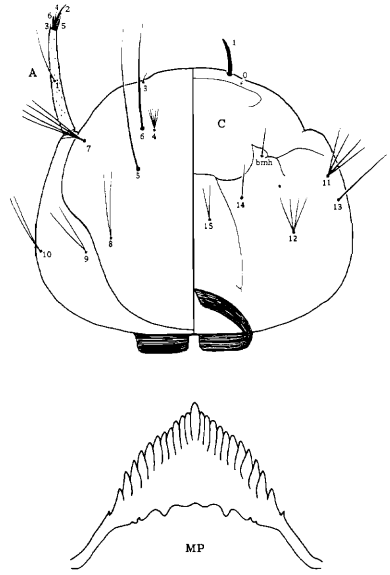
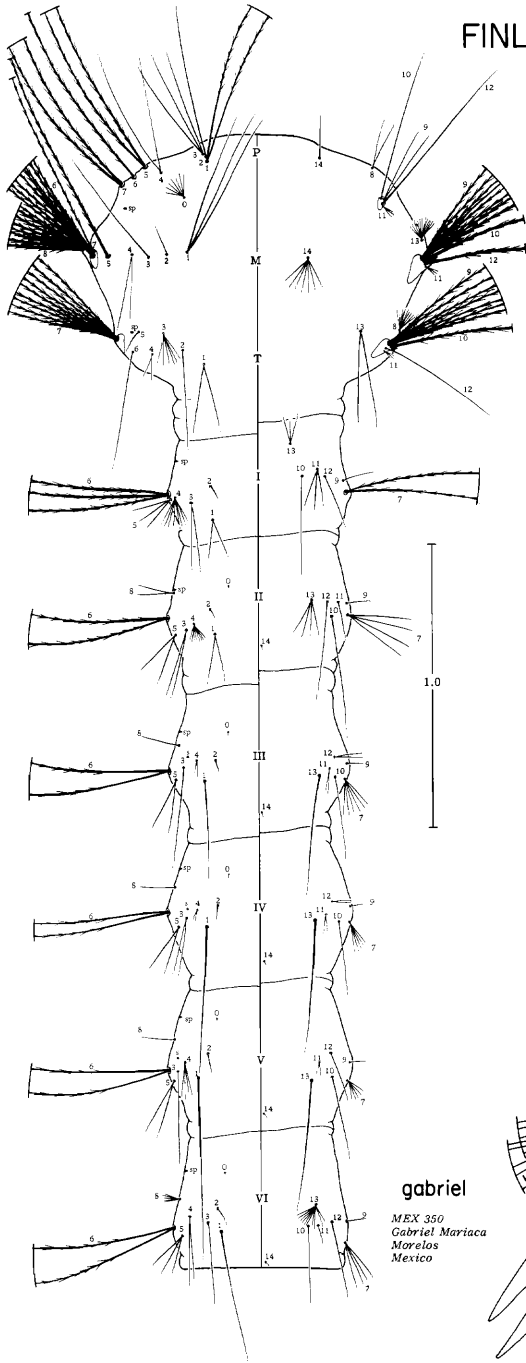
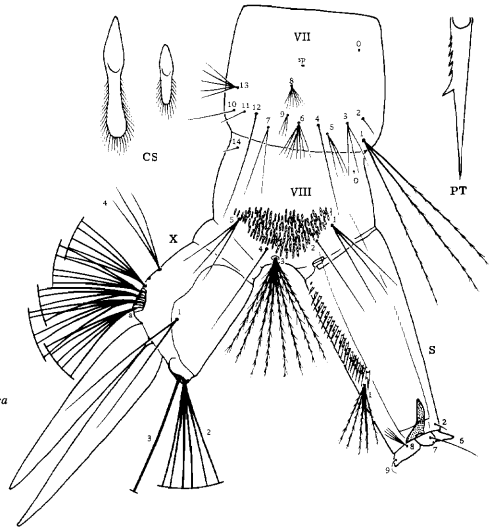


Fig. 36

gabriel

MEX 350
Gabriel Mariaca
 Morelos
 Mexico



FINLAYA

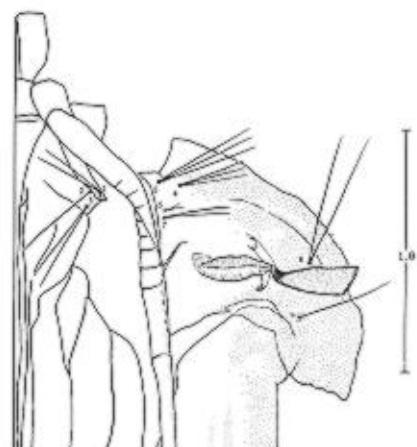
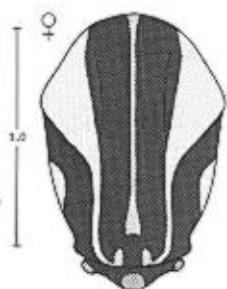


Fig. 37

amabilis

MEX 384
Cueva de Nicholes
de Agua
Veracruz
Mexico

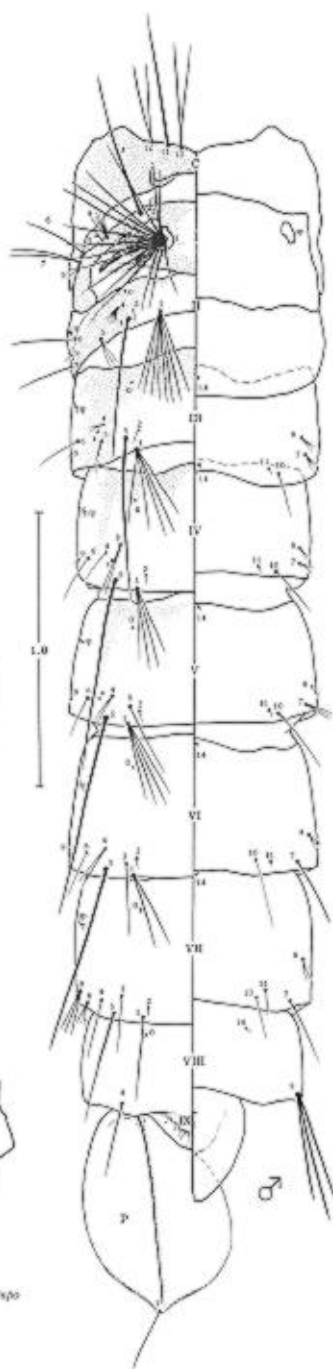
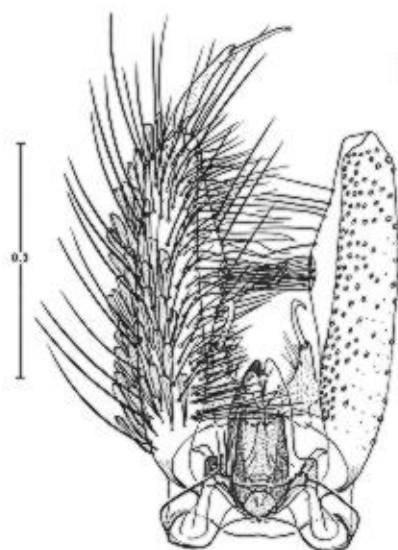


idanus

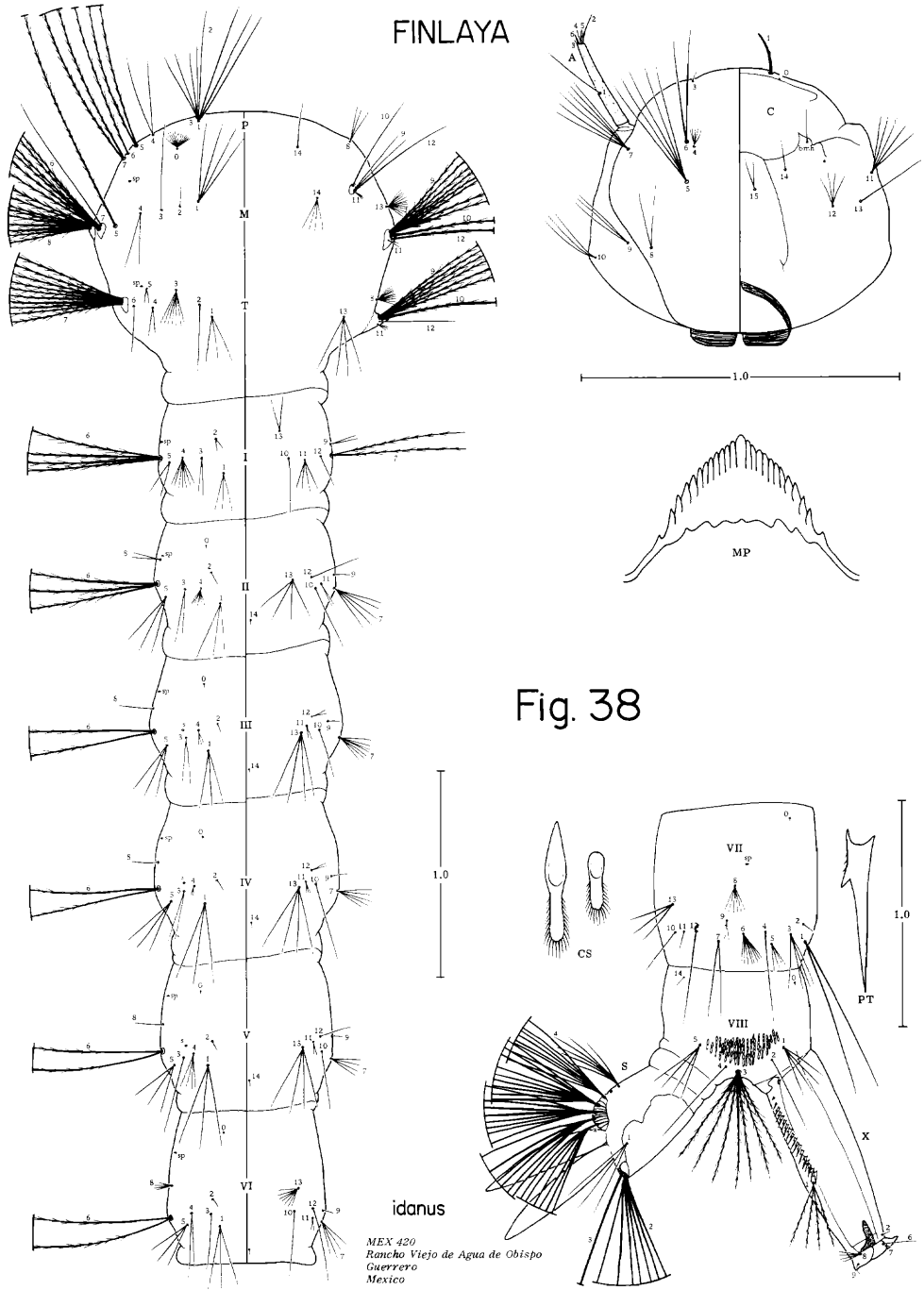


idanus

MEX 420
Rancho Vieja de Agua de Obispo
Guerrero
Mexico



FINLAYA





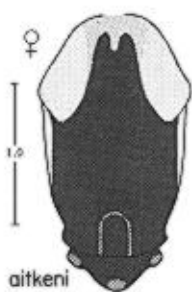
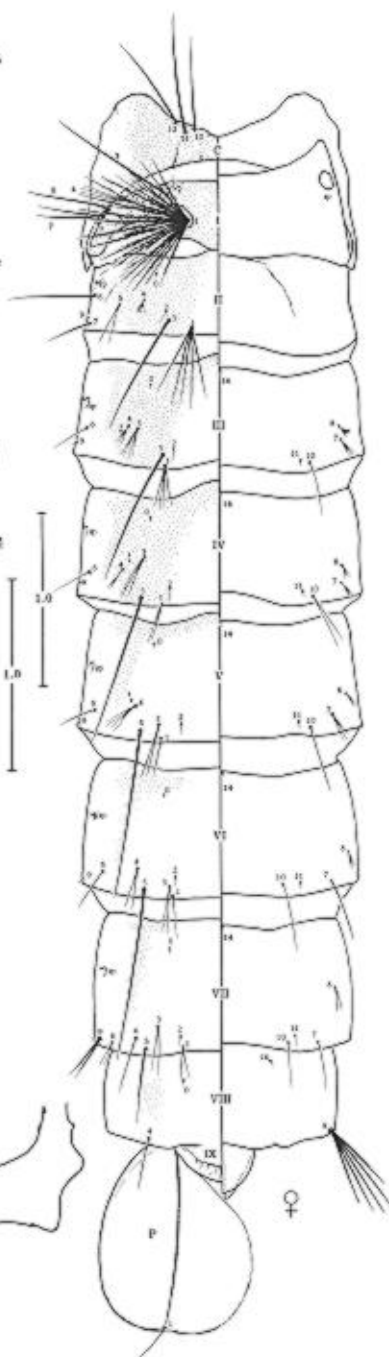
FINLAYA

aitkeni

CW 50-363
20 Km SE La Sierra
San José
Costa Rica

1.0

Fig. 39



1.0

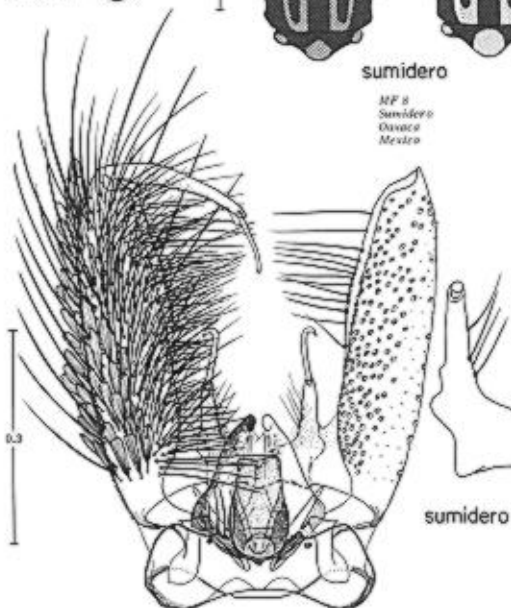


1.0



1.0

1.0



sumidero

MP 8
Sumidero
Oaxaca
Mexico

sumidero

0.5

FINLAYA

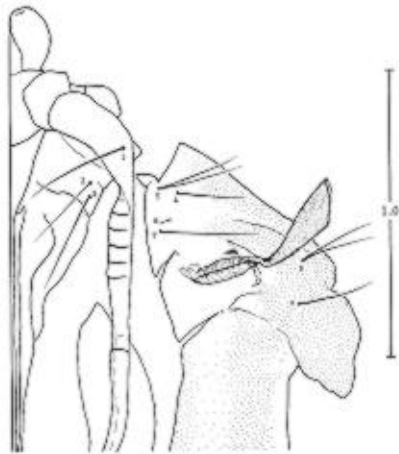
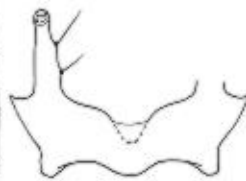
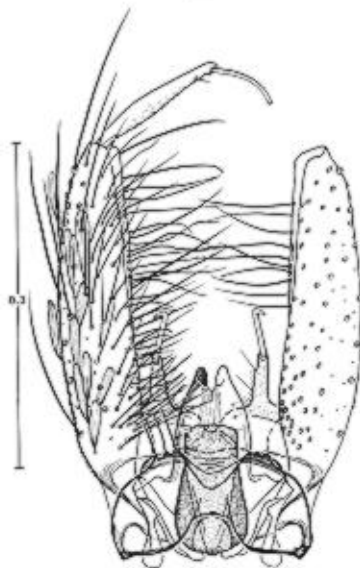
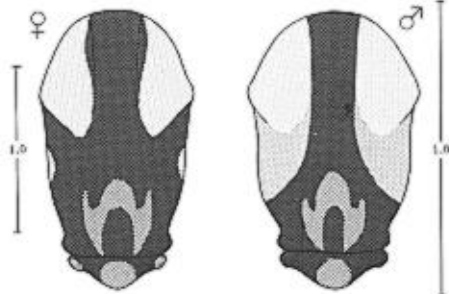
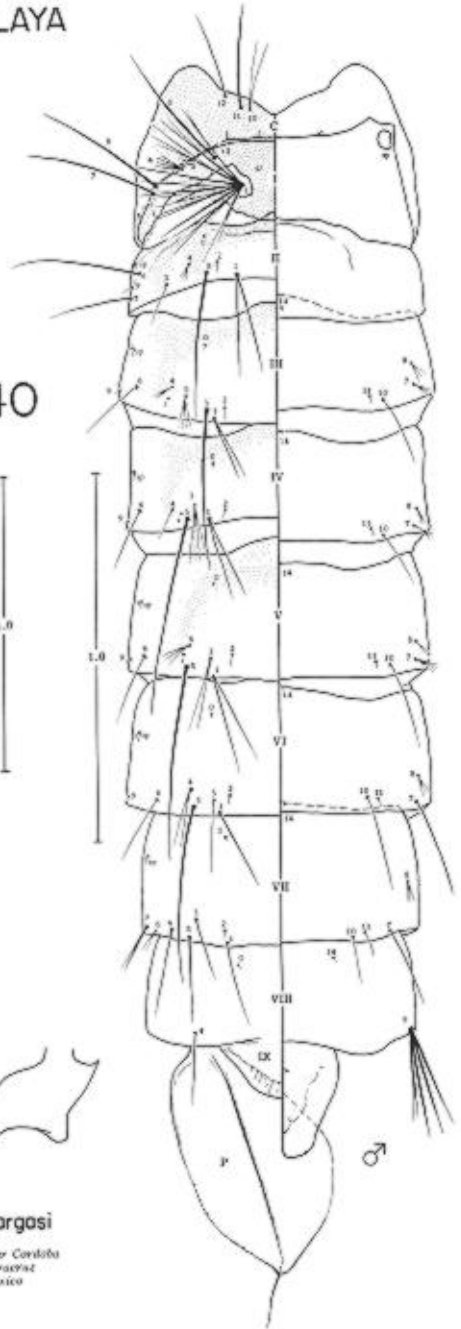


Fig. 40



vargasi

near Cordoba
Tlaxcala
Mexico



FINLAYA

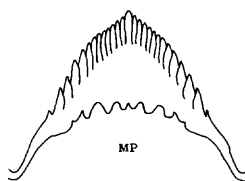
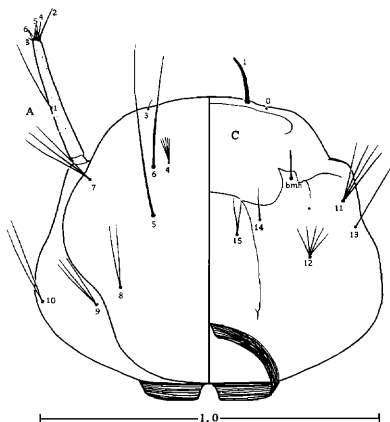
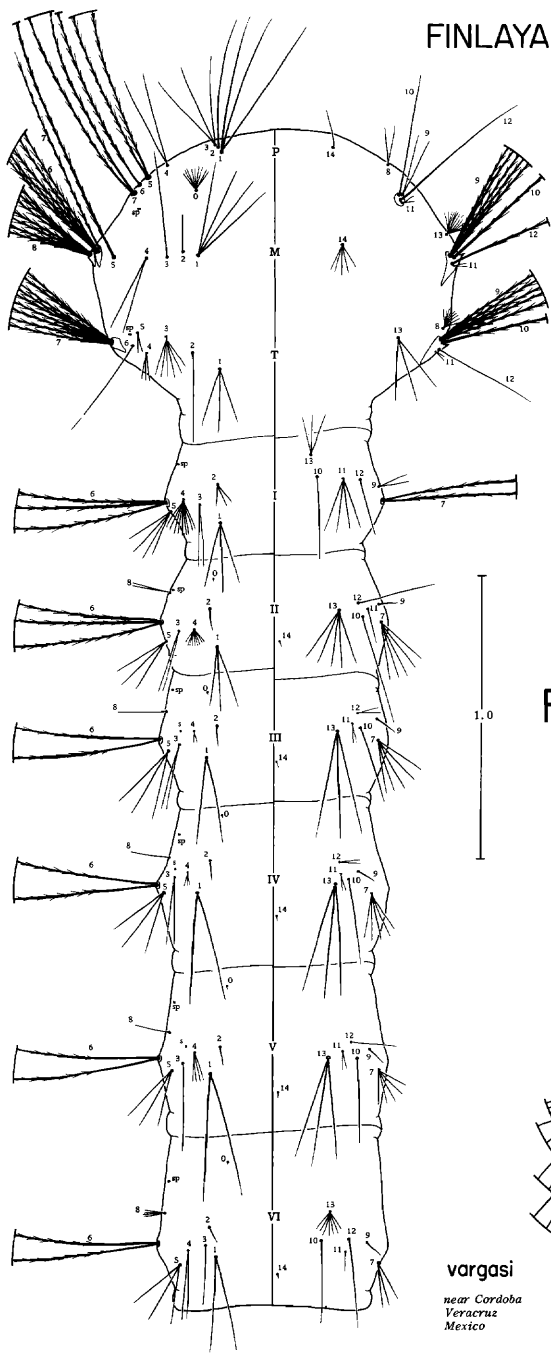
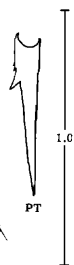
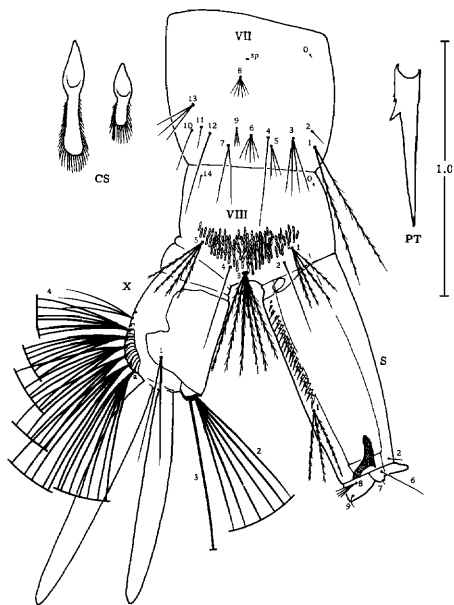


Fig. 41

vargasi
near Cordoba
Veracruz
Mexico



FINLAYA

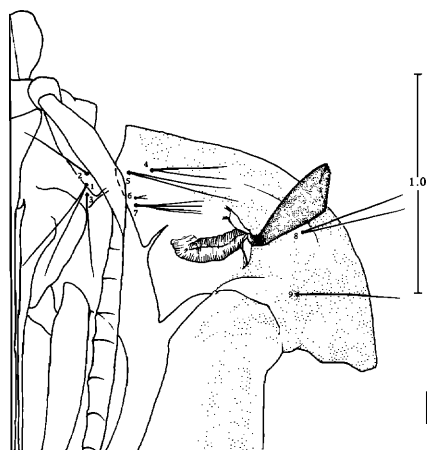
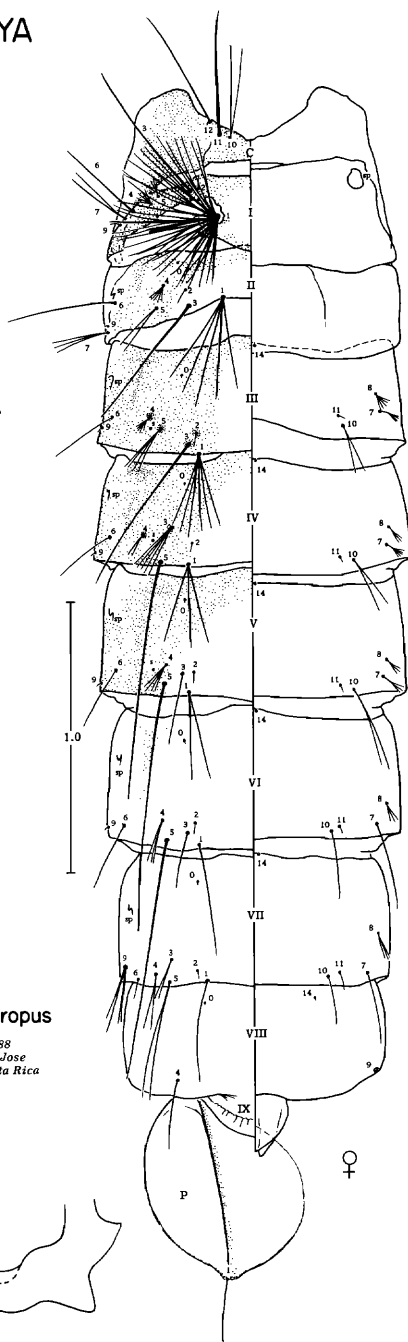
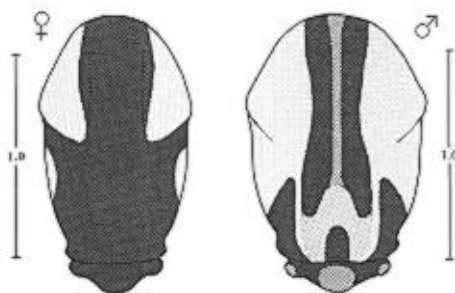
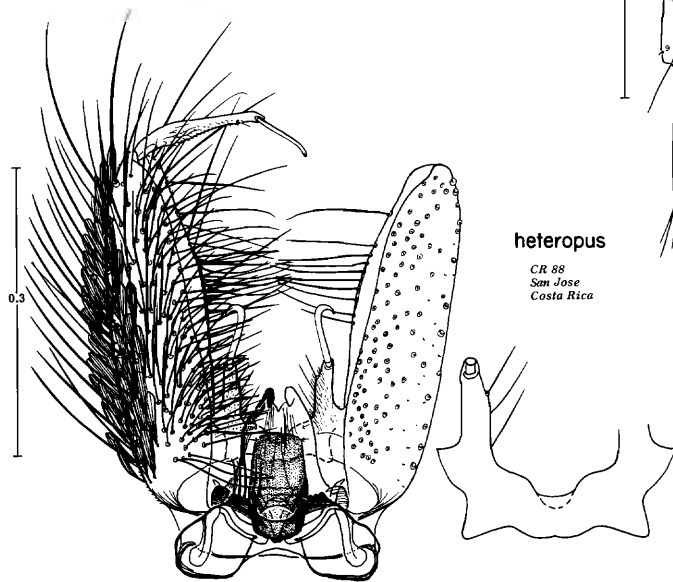


Fig. 42



heteropus

CR 88
San José
Costa Rica



FINLAYA

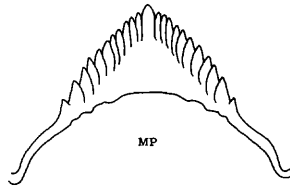
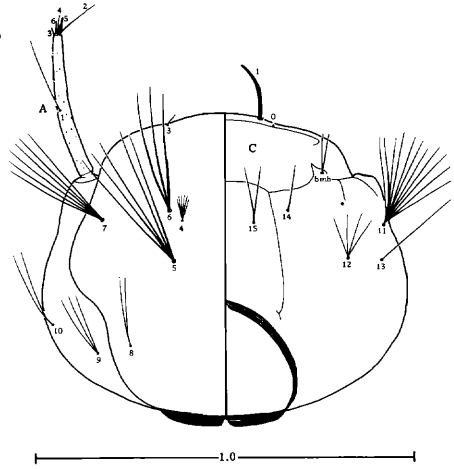
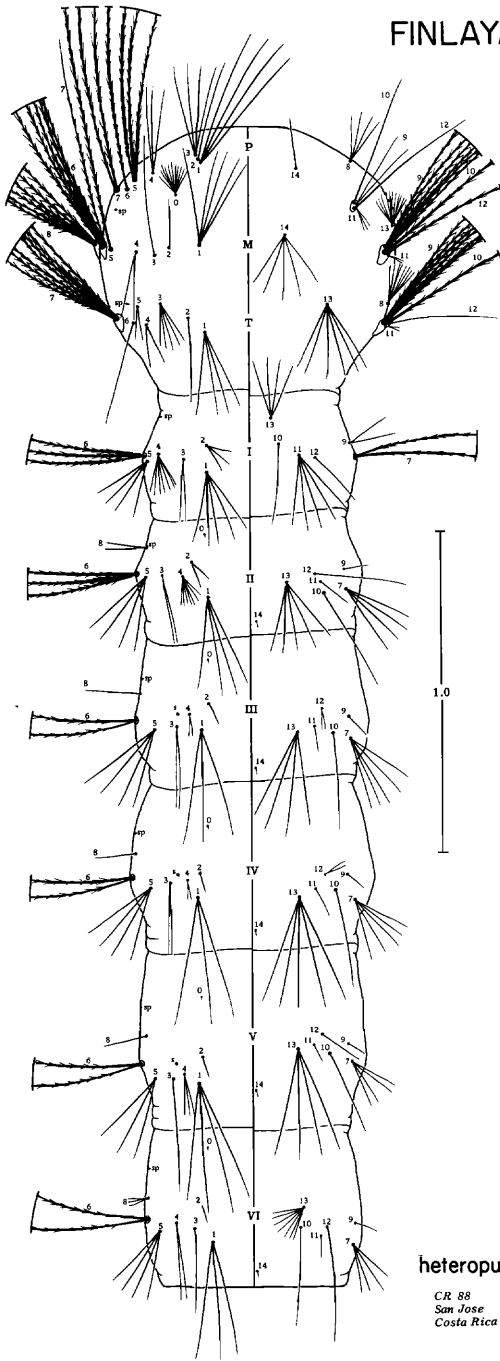
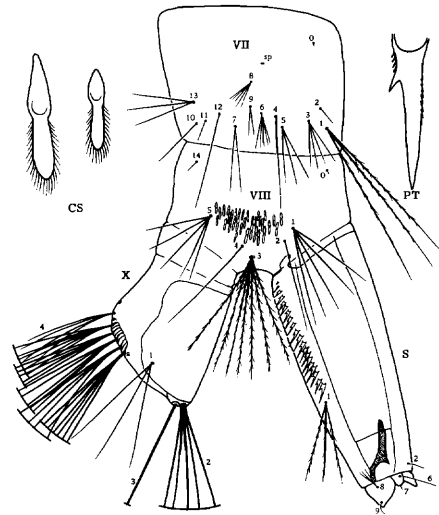


Fig.43



heteropus

CR 88
San Jose
Costa Rica

FINLAYA

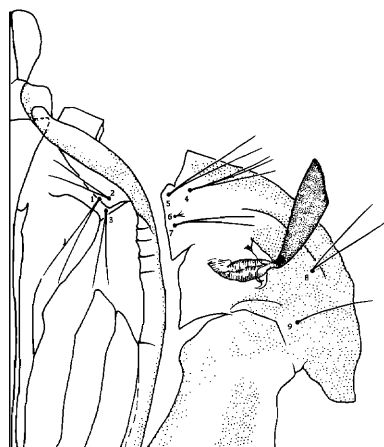
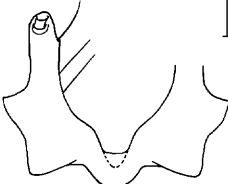
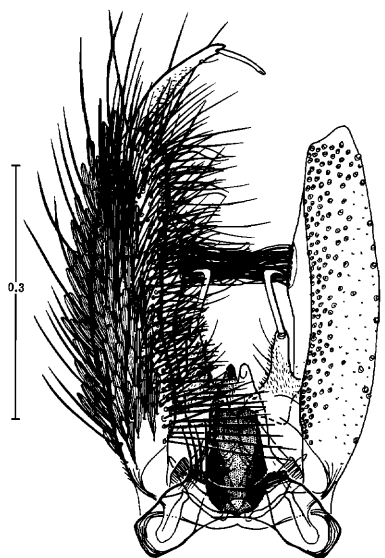
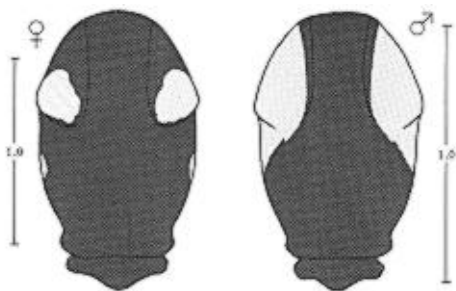
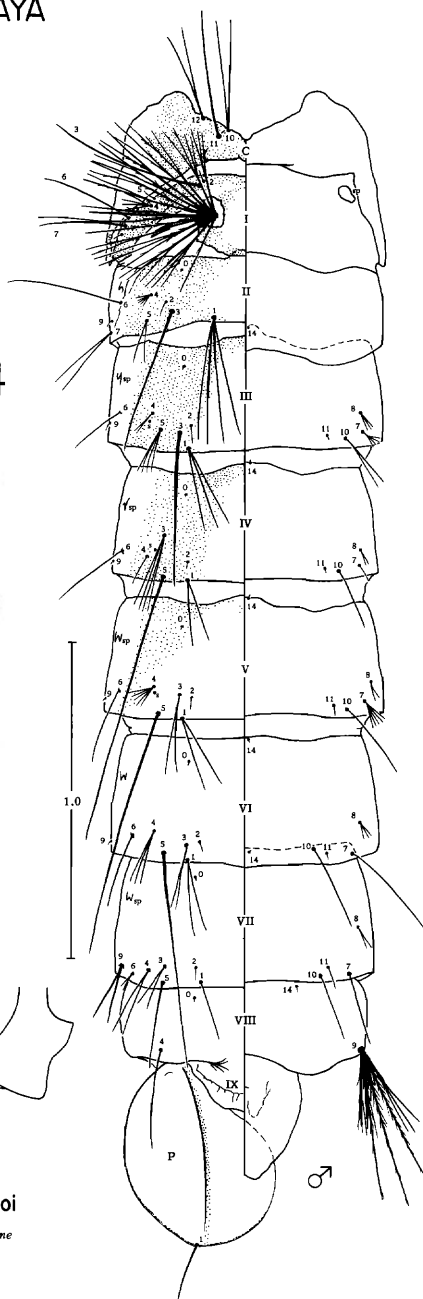


Fig. 44



galindoi

Canal Zone
Panama



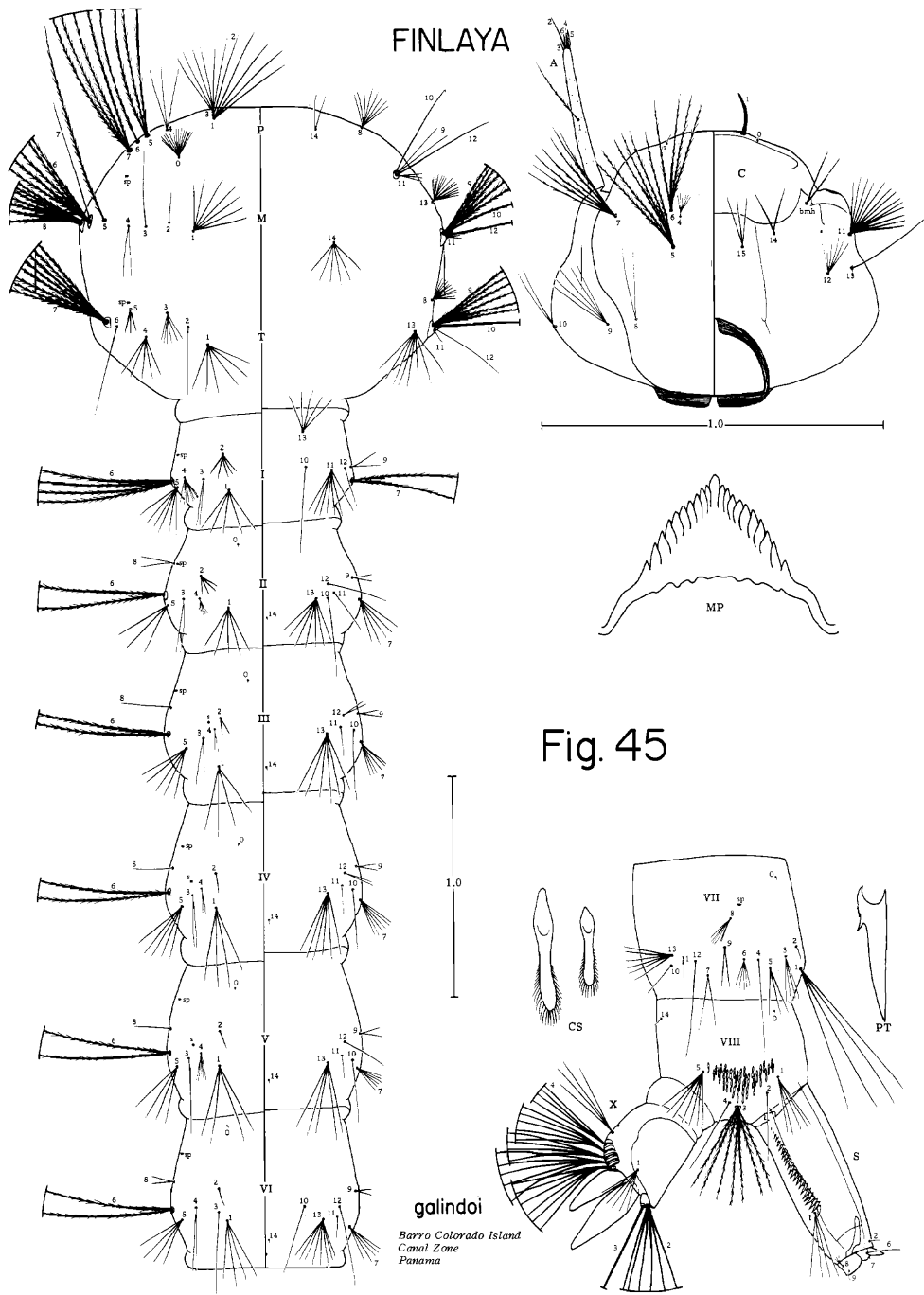


Fig. 45

FINLAYA

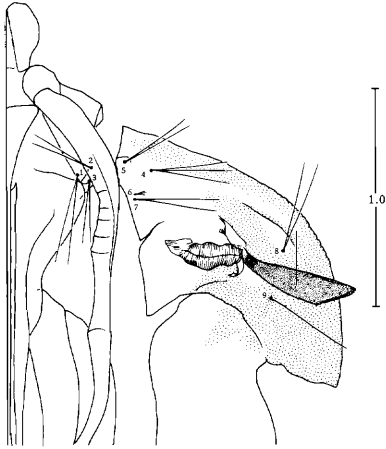
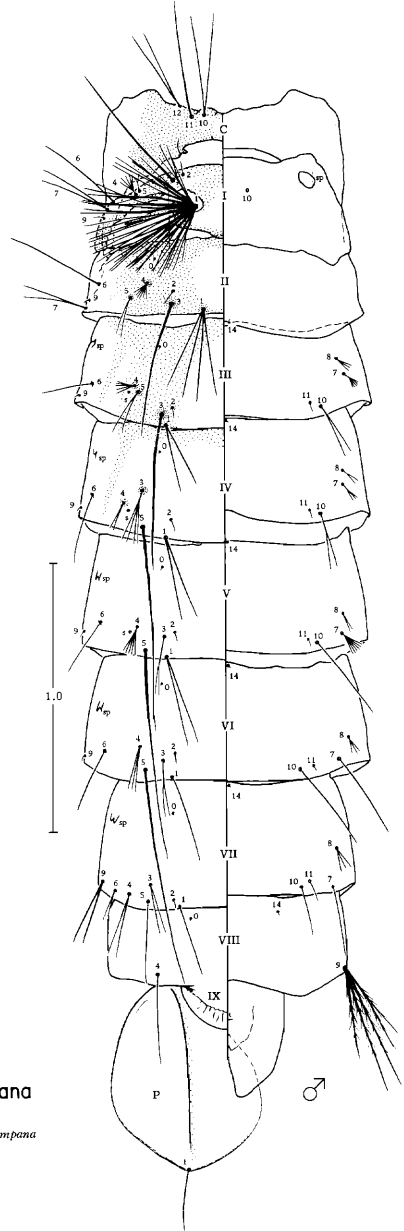
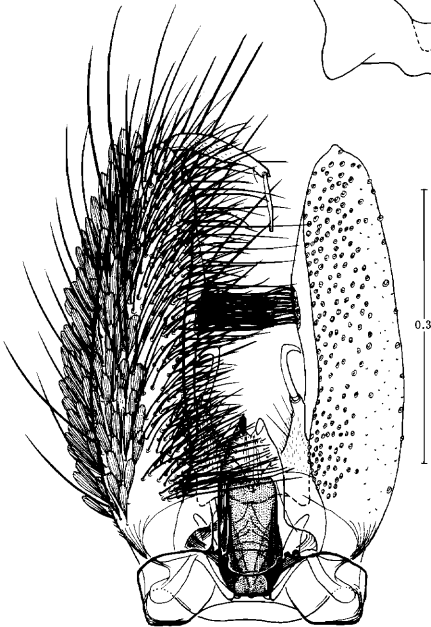
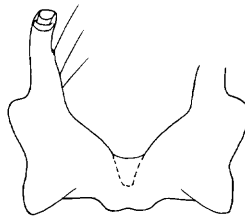


Fig. 46



campana

PA 518
Cerro Campana
Panama
Panama

FINLAYA

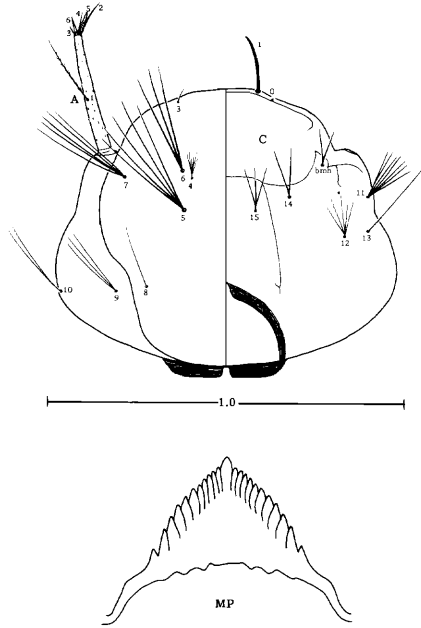
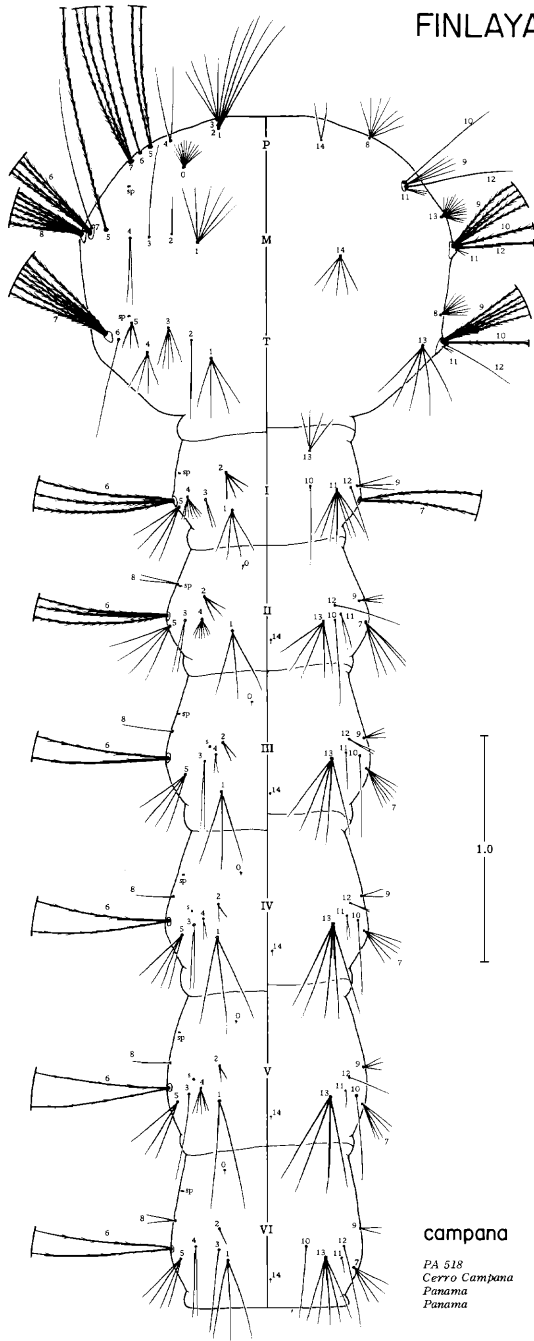
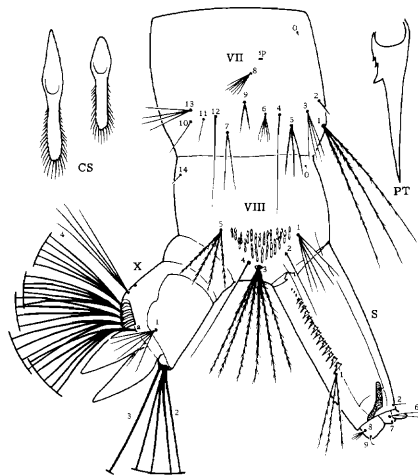


Fig. 47

campana
 PA 518
 Cerro Campana
 Panama
 Panama



FINLAYA

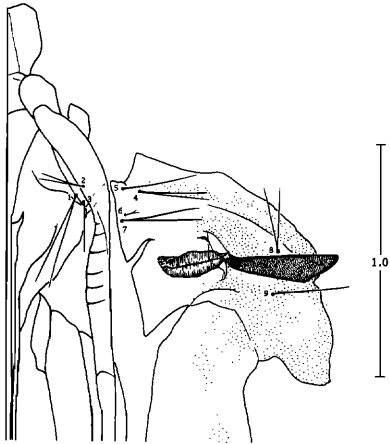
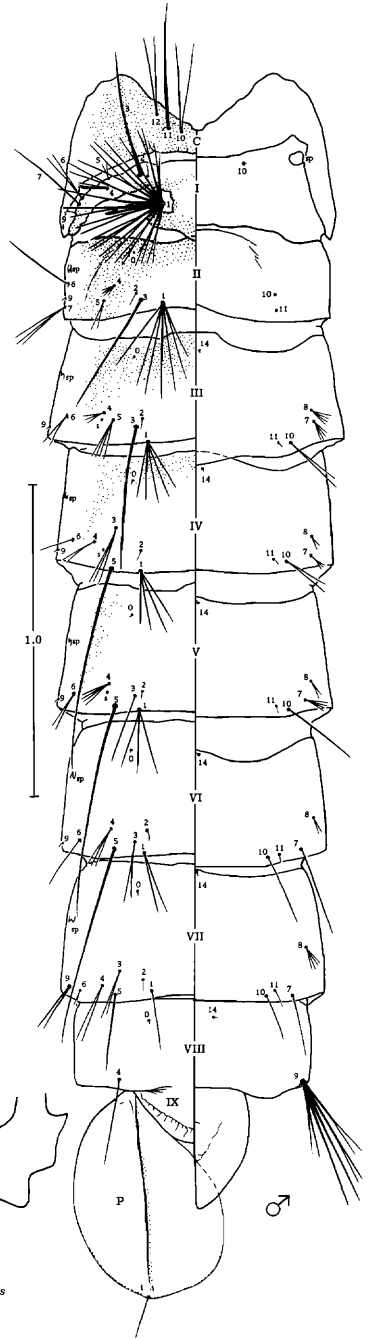
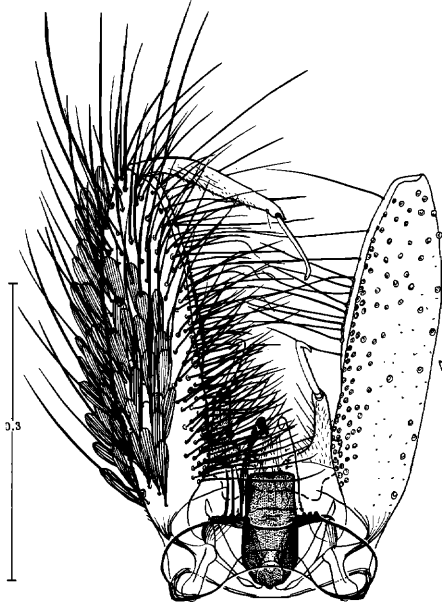
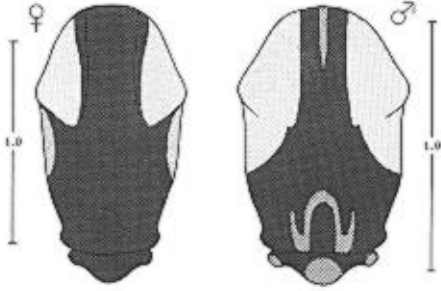


Fig. 48



daryi

GUA 33
Finca Trece Aguas
Alta Vera Paz
Guatemala

FINLAYA

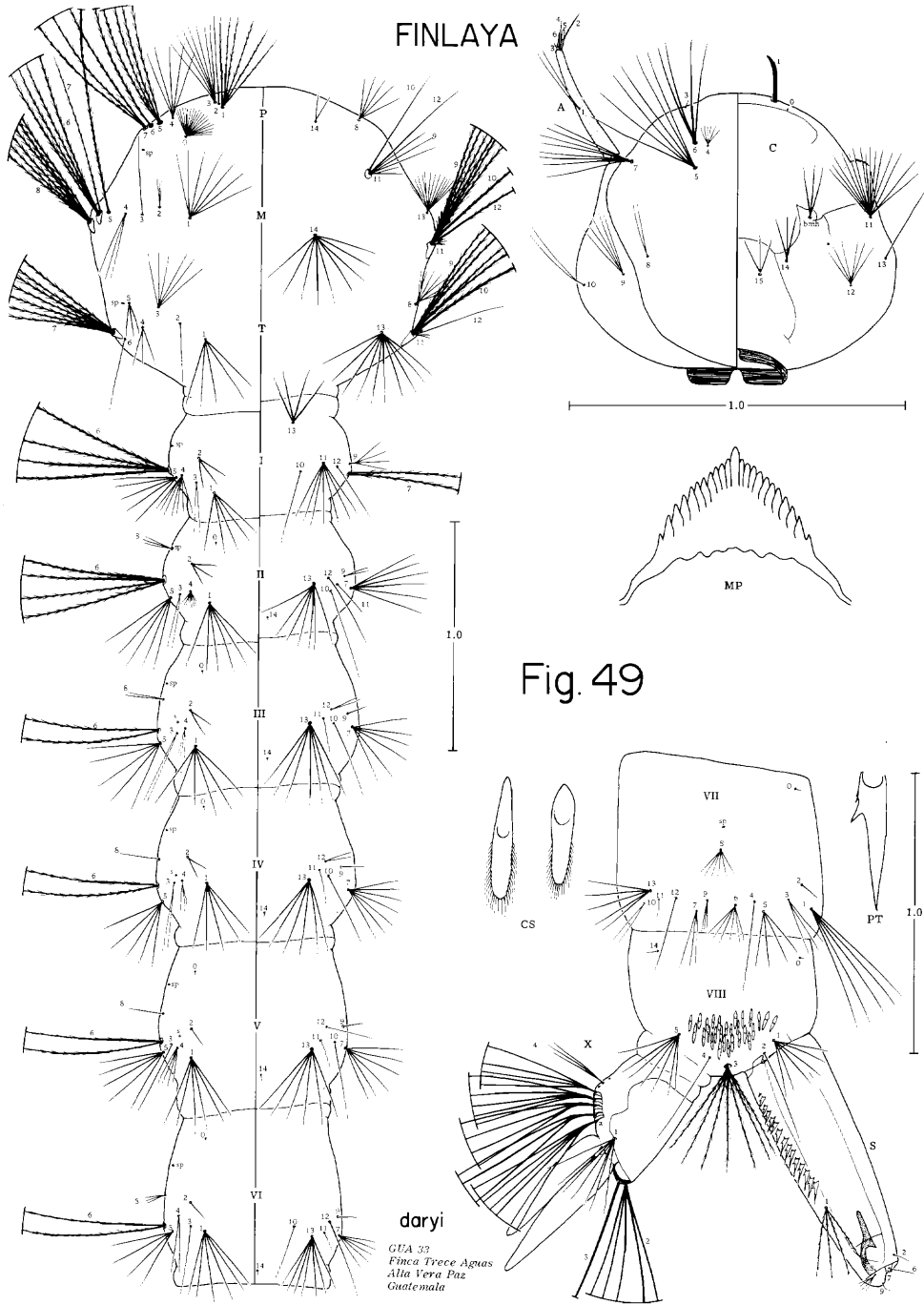
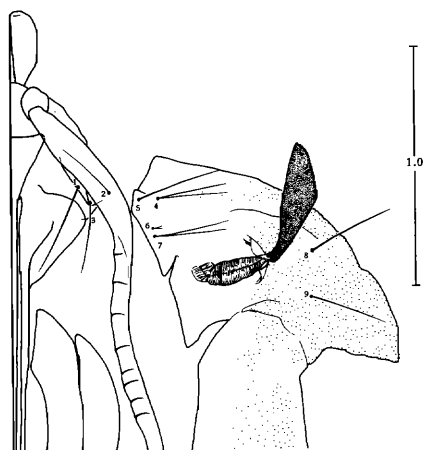


Fig. 49

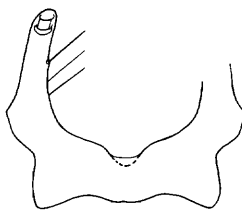
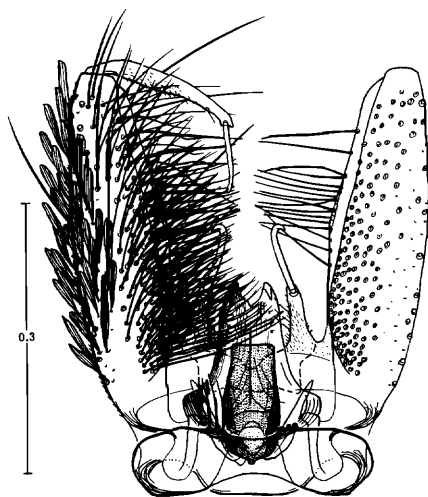
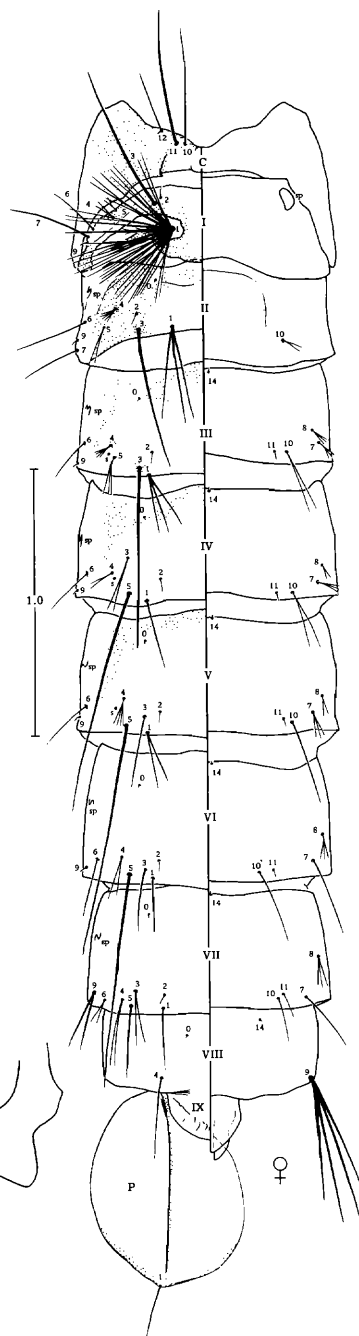
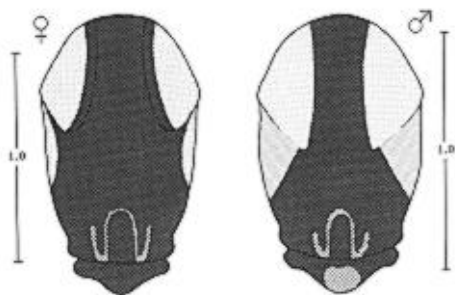
daryi

GUA 22
 Finca Trece Aguas
 Alta Vera Paz
 Guatemala



FINLAYA

Fig. 50



daryi

Cerro Mali
Darien
Panama

FINLAYA

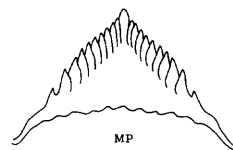
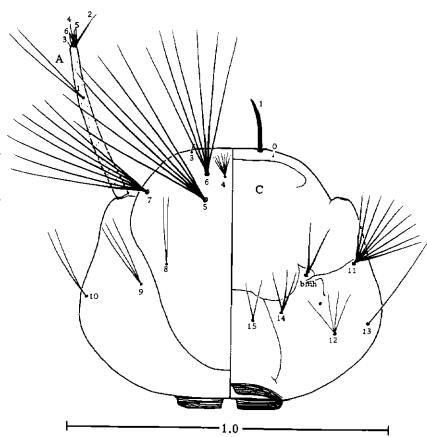
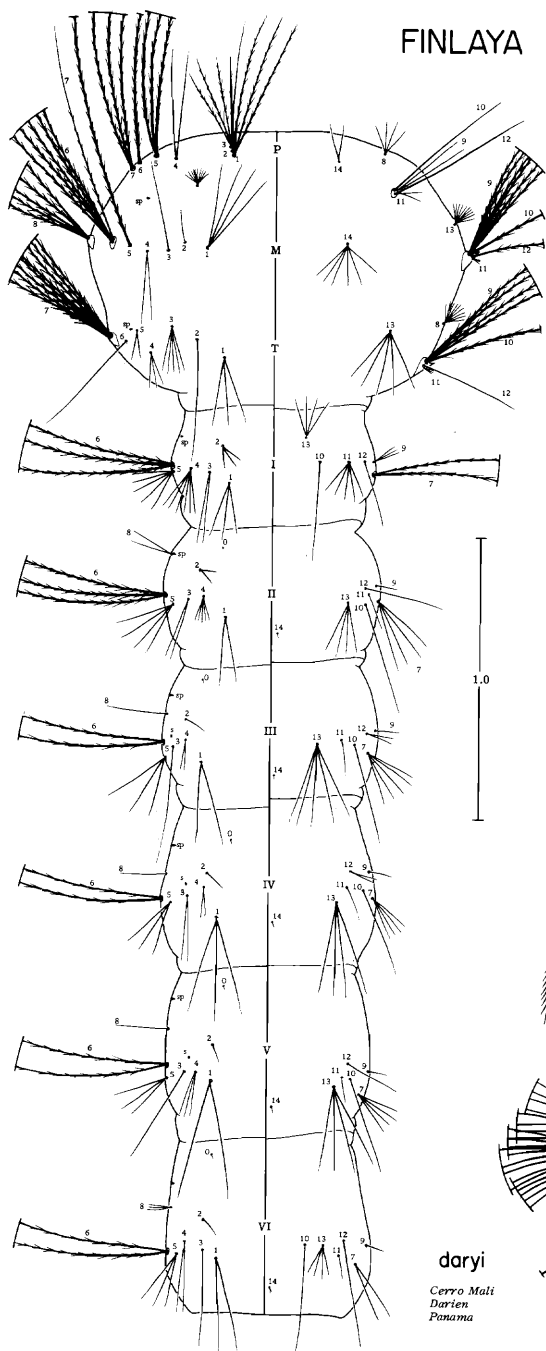
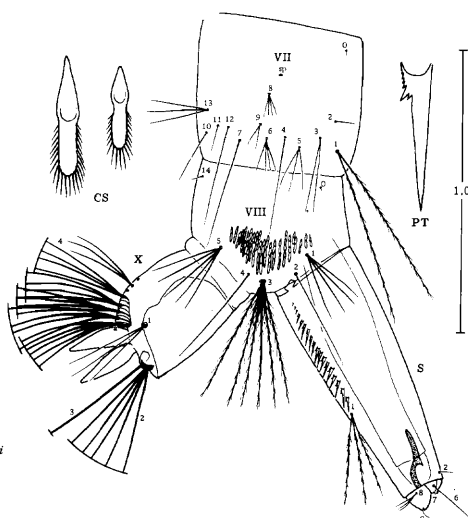
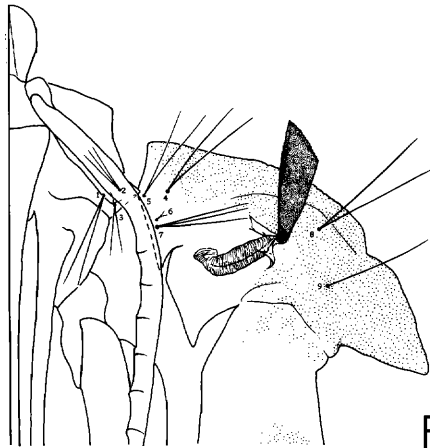


Fig. 51



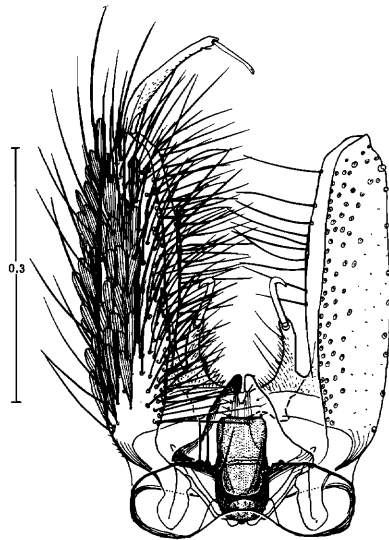
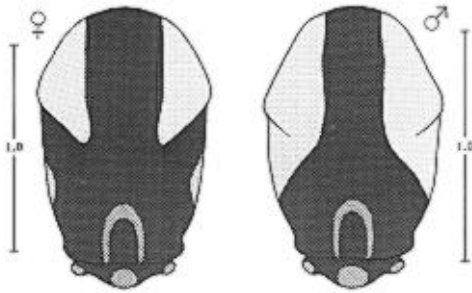
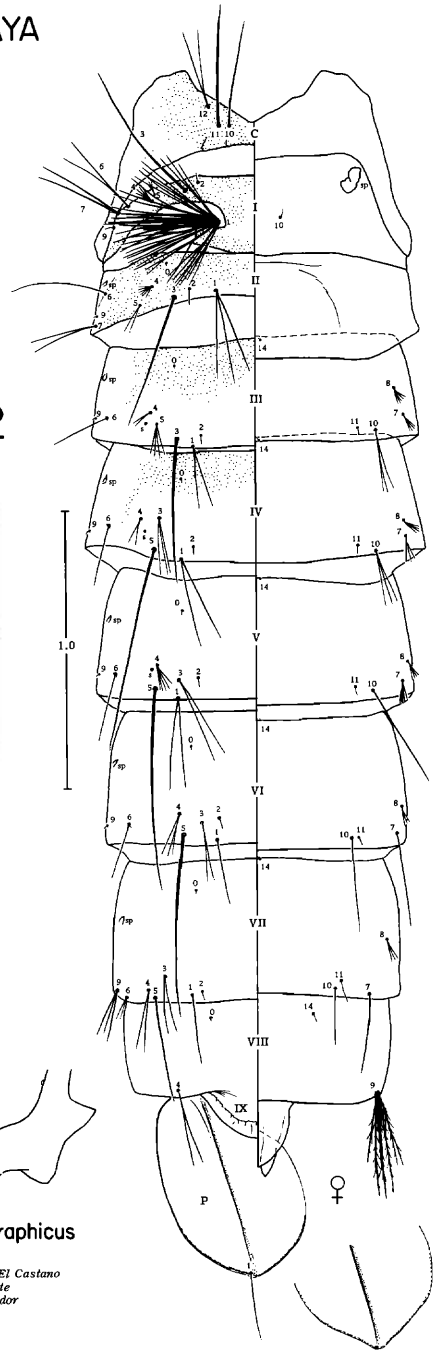
daryi

Cerro Mali
Darlen
Panama



FINLAYA

Fig. 52



podographicus

SAL 1
Canton El Castano
Sonsonate
El Salvador

FINLAYA

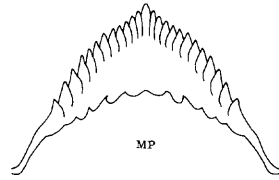
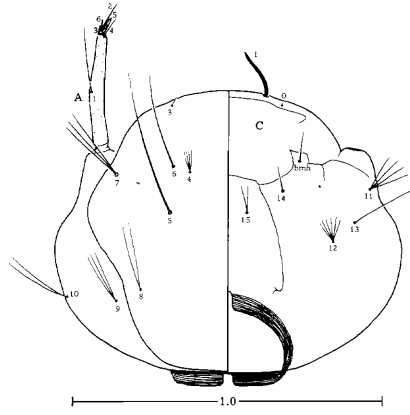
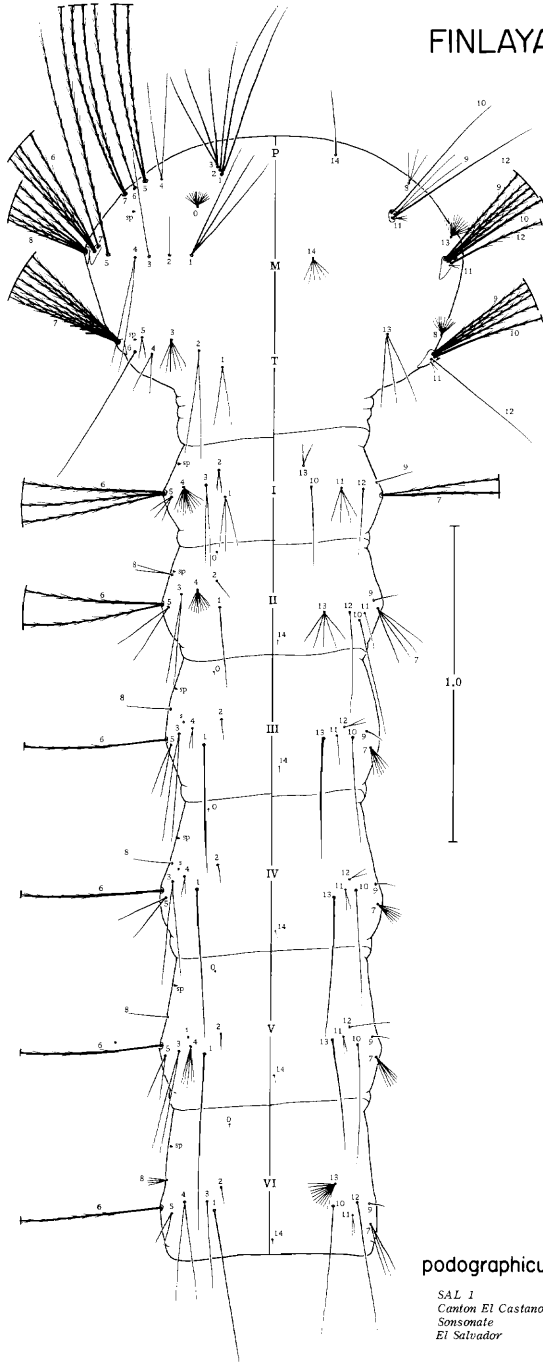
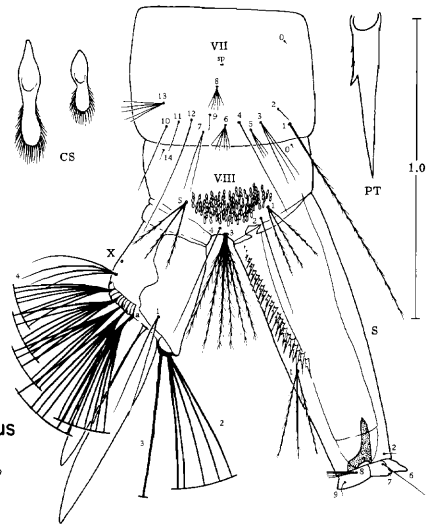
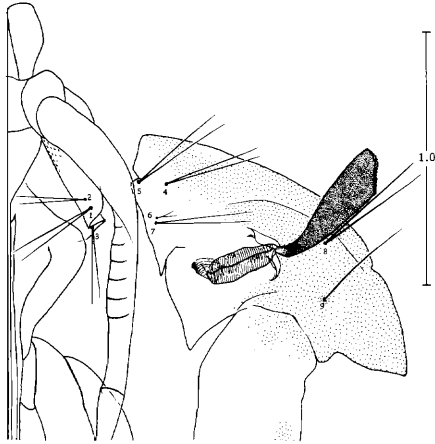


Fig. 53



podographicus

SAL 1
Canton El Castano
Sonsonate
El Salvador



FINLAYA

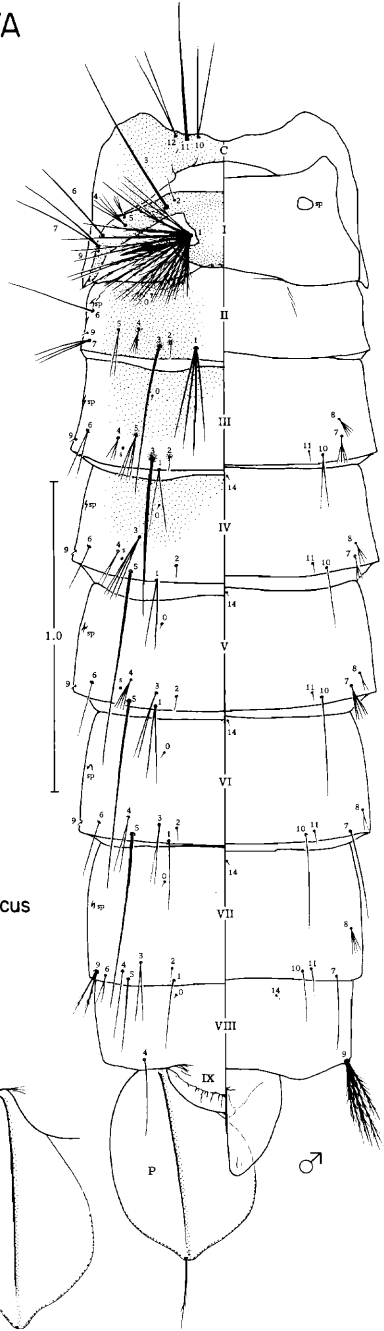
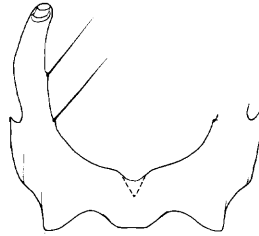
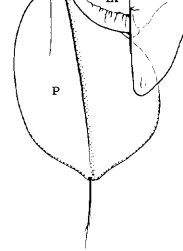
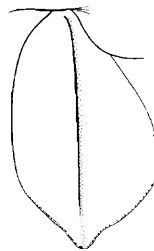
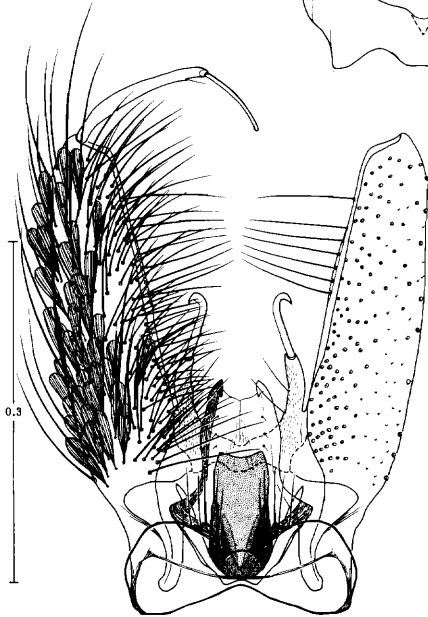


Fig. 54



podographicus

UCLA 203
San Blas
Nayarit
MEXICO



♂

FINLAYA

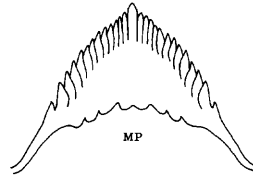
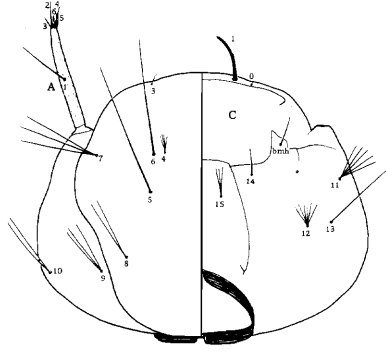
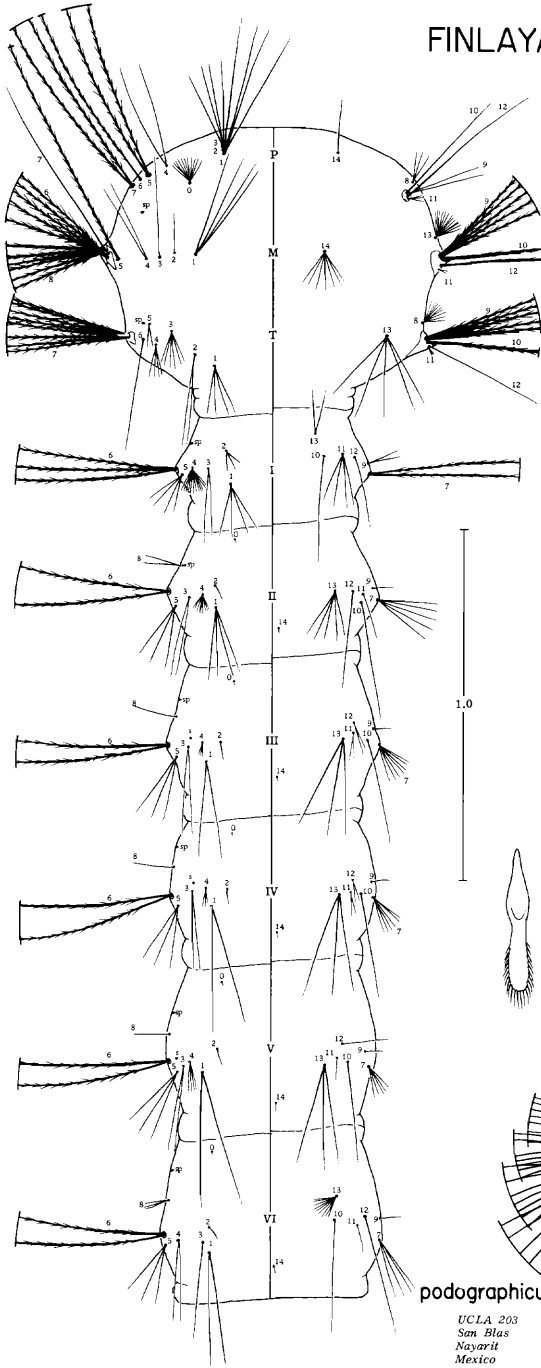
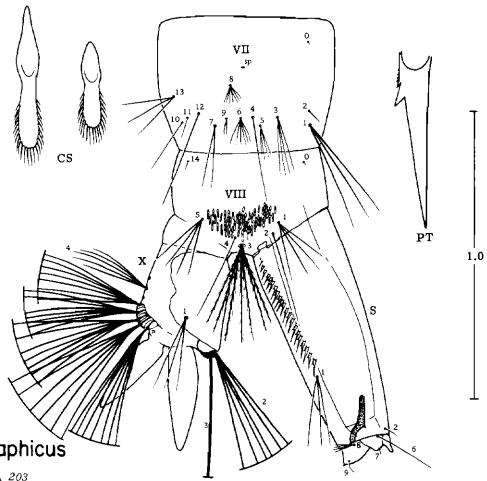


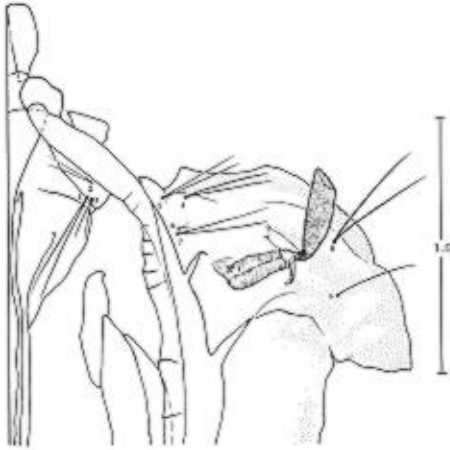
Fig. 55



podographicus

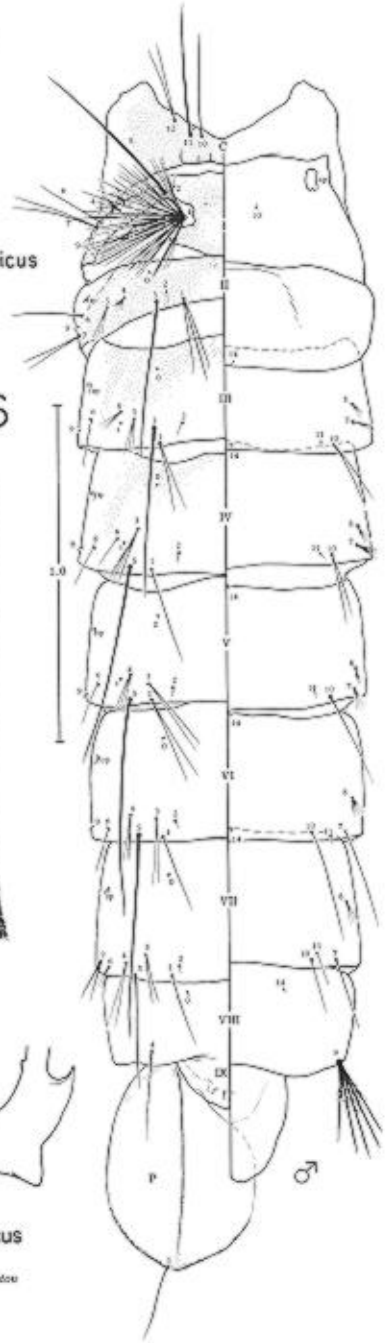
UCLA 203
San Blas
Nayarit
Mexico

FINLAYA



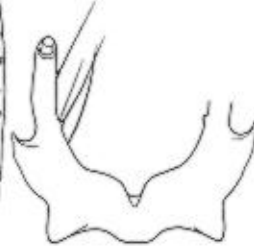
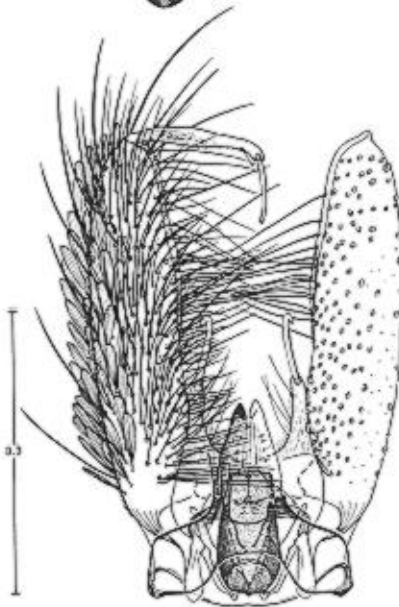
podographicus

Fig. 56



diazi

MEX 202
Cueva del Nacimiento del Agua
Veracruz
Mexico



podographicus

MEX 438
10 Km SW Champetón
Coahuila
Mexico

FINLAYA

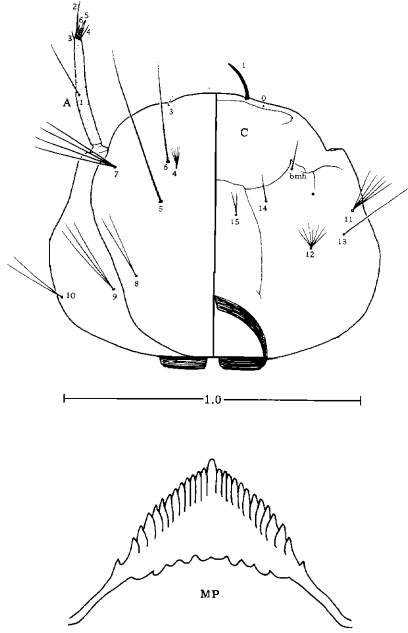
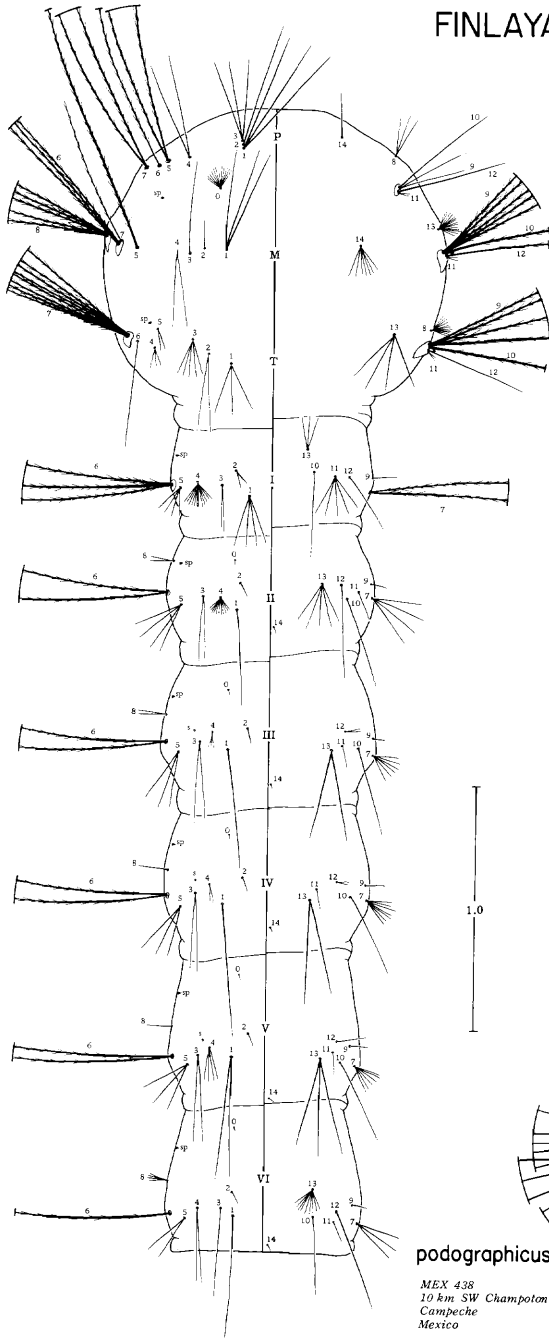
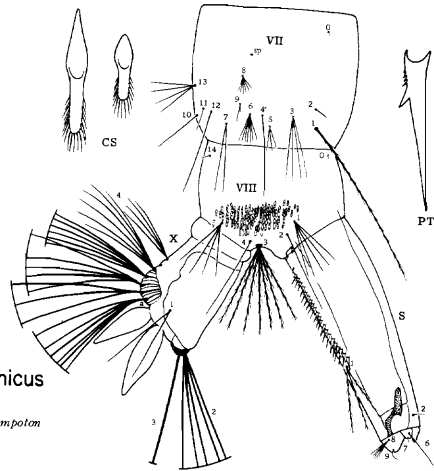


Fig. 57



podographicus

MEX 438
10 km SW Champoton
Campeche
Mexico

FINLAYA

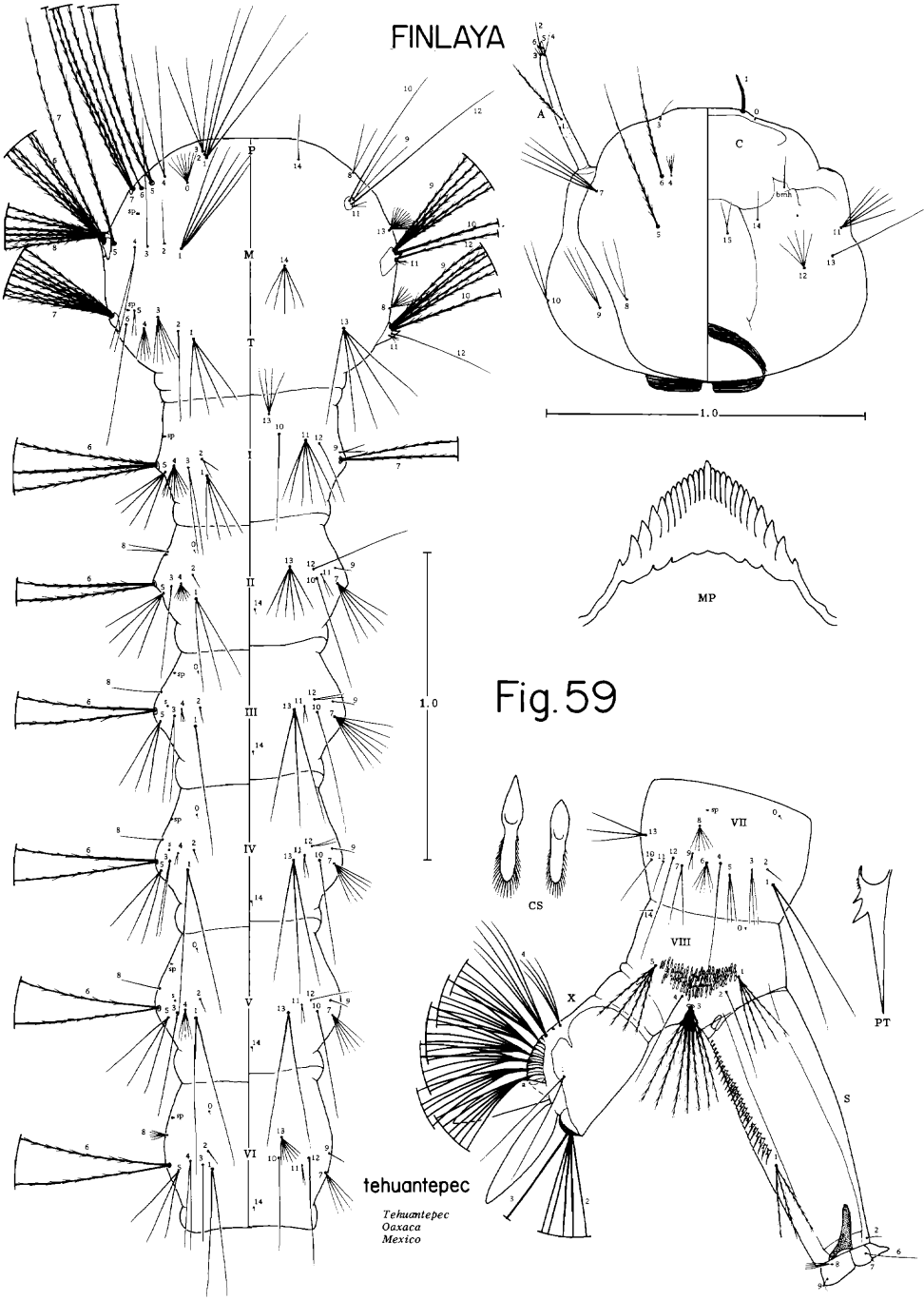
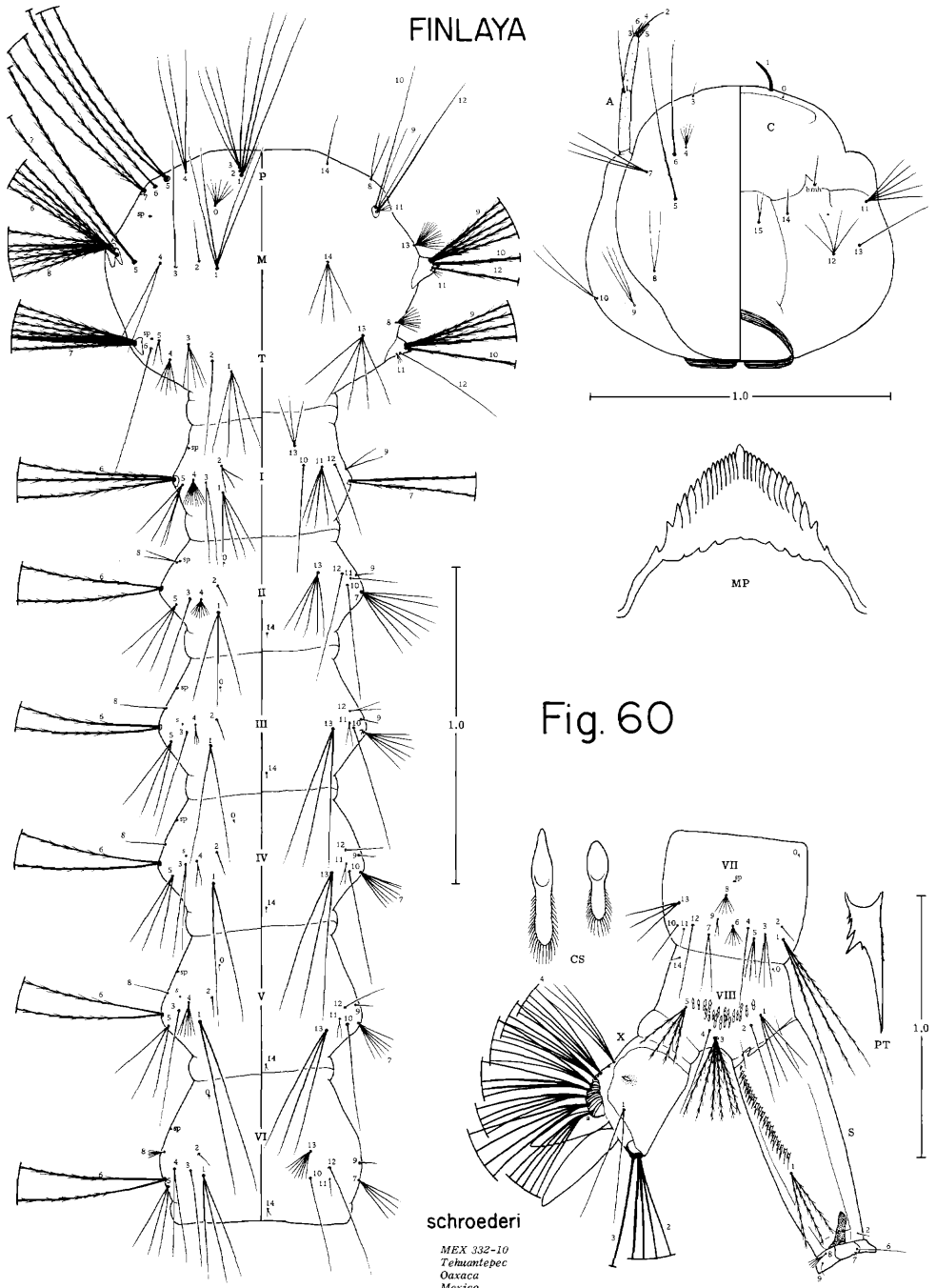


Fig. 59



FINLAYA

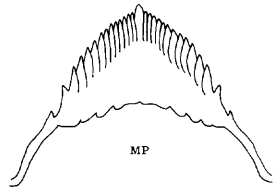
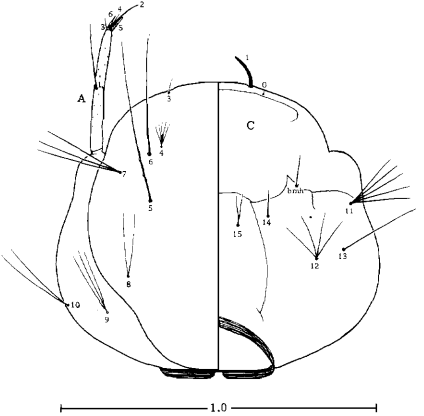
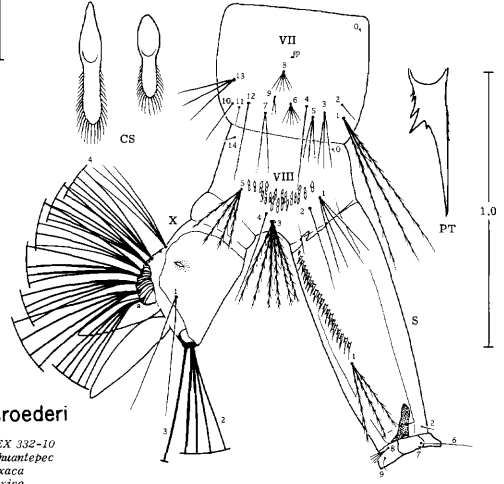


Fig. 60

schroederi

MEX 332-10
 Tehuantepec
 Oaxaca
 Mexico



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