

Studies of Gymnomyzinae
(Diptera: Ephydriidae),
II: A Revision of the Shore Fly
Subgenus *Pseudohecamele* Hendel
of the Genus *Allotrichoma* Becker

WAYNE N. MATHIS

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ABSTRACT

Mathis, Wayne N. Studies of Gymnomyzinae (Diptera: Ephydriidae), II: A Revision of the Shore Fly Subgenus *Pseudohecamede* Hendel of the Genus *Allotrichoma* Becker. *Smithsonian Contributions to Zoology*, number 522, 28 pages, 27 figures, 1991.—Species of *Pseudohecamede* are revised and are treated as a subgenus of the genus *Allotrichoma*. Other subgenera of *Allotrichoma* are diagnosed and keyed, and genera related to *Allotrichoma* are keyed and placed in Hecamedini, new tribe, which is diagnosed. Nine species are now known in *Pseudohecamede*, five of which are new (in alphabetical order): *A. adustum* (Belize, Stann Creek District, Twin Cays), *A. baja* (Mexico, Baja California, Todos Santos), *A. ecuadorensis* (Ecuador, Manabi Province, Bahia), *A. jamaicense* (Jamaica, Wag Water), and *A. steineri* (Costa Rica, Guanacaste Province, Playa Tamarindo). Species of *Pseudohecamede* occur only in the New World, particularly in subtropical and tropical zones, where they apparently occupy microhabitats similar to those of the nearctic *Allotrichoma*, sensu stricto. Descriptions of species are accompanied by distributional maps and illustrations of male terminalia. For some species, diagnostic characters of the head and thorax are also provided. A key to the species is included.

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Studies of Gymnomyzinae (Diptera: Ephydriidae), II: A Revision of the Shore Fly Subgenus *Pseudohecamede* Hendel of the Genus *Allotrichoma* Becker

Wayne N. Mathis

Introduction

The research for this paper was begun as part of an ongoing project on the shore flies of the Middle East, specifically my attempts to identify the species related to *Elephantinosoma perspiciendum* Becker. Determining the identity of these species eventually led to an analysis of the tribe Atissini Cresson (1936), its recharacterization, and an assessment of the phylogenetic relationships between the included lineages. This paper reports the results of these studies as they pertain to the subgenus *Pseudohecamede* Hendel (genus *Allotrichoma* Becker).

Previously, Collin (1949) had tentatively treated these species in the genus *Allotrichoma* but had also suggested the possibility of a relationship with the genus *Pseudohecamede*. Not having specimens of *Pseudohecamede* available to him, Collin was unable to investigate his suggestion further. Some years later, Giordani Soika (1956) described the subgenus *Eremotrichoma* within the genus *Allotrichoma* for these species, but he did not consider Collin's earlier suggestion of a possible relationship with *Pseudohecamede*.

Runyan and Deonier (1979) published a study on the relationships of certain taxa within *Allotrichoma* and *Pseudohecamede* and concluded that *Pseudohecamede* was probably the sister group of "the yosemite species group" within the genus *Allotrichoma* and provided character evidence to support

their hypothesis. They did not consider species of the subgenus *Eremotrichoma* in their analysis.

In an attempt to further resolve these questions, as well as others that surfaced as the work progressed, a study of the appropriate taxa was initiated and has resulted in a revision of *Eremotrichoma* (Mathis, 1986a), *Elephantinosoma* Becker (Mathis and Deeming, 1987), *Diphua* Cresson (Mathis, 1990), and this revision of *Pseudohecamede*.

As with many acalyptrate Diptera that are inconspicuous and not of any direct economic importance, the species of *Pseudohecamede* have received little and sporadic attention, and it follows that the taxonomic history of the group is brief and relatively uncomplicated. Hendel (1936) proposed *Pseudohecamede* for three species, *P. nasalis* (designated as the type species), *P. facialis*, and *P. abdominalis* (Williston); the first two of which he described. *Pseudohecamede abdominalis* was originally described in the genus *Hecamede* Haliday, and between Hendel's treatment of *abdominalis* in *Pseudohecamede* and its original description in *Hecamede*, Williston (1897) had transferred it to *Allotrichoma*. The other species subsequently included in *Pseudohecamede*, *salubre* Cresson, *slossonae* Cresson, and *longirostre* Hendel, were transferred there from *Allotrichoma* (Cresson, 1946; Wirth, 1965, 1968). In 1946, Cresson reviewed the genus in his synopsis of the subfamily Psilopinae from the neotropics.

So far as is known, *Pseudohecamede* occurs strictly in the New World with greatest species diversity in the subtropics and tropics. Most species are found in the littoral zone, especially where organic debris has accumulated. Only the immature stages of *P. abdominalis* have been described.

METHODS.—The terminology and methods used generally in this study were explained previously (Mathis, 1982, 1983,

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1985, 1986a, 1986b). Because of the small size of specimens, study and illustration of the male terminalia required the use of a compound microscope. To assure better and more effective communication about structures of the male terminalia, I have adopted the terminology of other workers in Ephydriidae (see references in Mathis, 1986b). Usage of these terms, however, should not be taken as an endorsement of them from a theoretical or morphological view over alternatives that have been proposed (Griffiths, 1972; McAlpine, 1981). Rather, I am deferring to tradition until the morphological issues are better resolved.

Two venational ratios are used commonly in the descriptions and are defined here for the convenience of the user (ratios are averages of three specimens, the largest specimen, the smallest, and one other).

1. Costal vein ratio: the straight line distance between the apices of R_{2+3} and R_{4+5} / distance between the apices of R_1 and R_{2+3} .

2. M vein ratio: the straight line distance along M between crossveins (dm-cu and r-m) / distance apicad of crossvein dm-cu.

The phylogenetic analysis was performed with the assistance of Hennig86 (copyrighted), a computerized algorithm, which produces parsimonious cladograms. Before performing the analysis, the character data were arranged in transformation series, which were then polarized using the outgroup method.

ACKNOWLEDGMENTS.—Although this study was based primarily on specimens in the National Museum of Natural History, numerous others were borrowed, particularly type specimens of species described previously. To my colleagues and their institutions, listed below, who lent specimens, I express my sincere thanks. Without their cooperation this study could not have been completed.

AMNH	American Museum of Natural History, New York, New York (R.T. Schuh and D.A. Grimaldi)
ANSP	Academy of Natural Sciences of Philadelphia, Pennsylvania (D. Otte and D. Azuma)
BMNH	The Natural History Museum, London (formerly British Museum (Natural History)), London, England (A.C. Pont and B.H. Cogan)
CAS	California Academy of Sciences, San Francisco, California (P.H. Arnaud, Jr.)
CNC	Canadian National Collection, Ottawa, Canada (J.R. Vockeroth)
MCV	Museo civico di Storia naturale di Venezia, Italy (S. Canzoneri)
NMW	Naturhistorisches Museum, Vienna, Austria (Ruth Contreras-Lichtenberg)
SMN	Staatliches Museum für Naturkunde, Stuttgart, West Germany (H.P. Tschorsnig)
USNM	former United States National Museum, collections in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Hollis B. Williams prepared the distribution maps, and most of the illustrations were carefully rendered by Elaine R.S. Hodges; George L. Venable prepared Figure 1. For reviewing a draft of this paper I thank D.L. Deonier and T. Pape. I am also grateful to David Challinor, former Assistant Secretary for Research, Smithsonian Institution, for financial support to conduct field work through grants from the Research Opportunity Fund. Field work in Belize was facilitated through grants from the Caribbean Coral Reef Ecosystems program, Klaus Rützler, administrator. Field work in Belize was greatly expedited by many station managers, the able and pleasant assistance of I.C. Feller, H.B. Williams, and N.D. Mathis, and by Regina Lewis, matriarch of Carrie Bow Cay. Finally, I am grateful and offer thanks for the generous hospitality and guidance extended by Joaquin Bueno S. and his wife Silvia, Messers Hector Velasco M., and Francisco Arias V., Universidad Nacional Autónoma de México, while conducting field work in México.

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Systematics

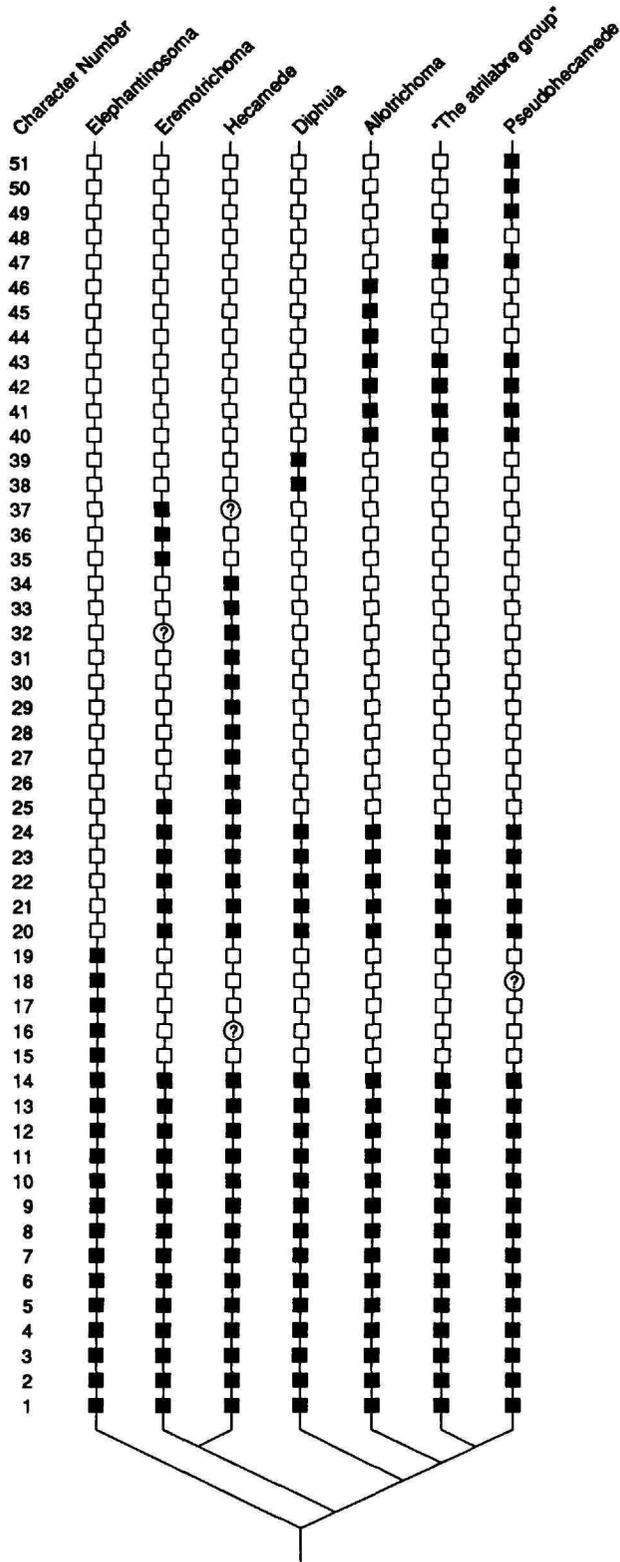
The taxa that have been included in what has been called the tribe Atissini (including genera of Lipochaetini, which is an older family-group name) can be divided into various monophyletic lineages (Mathis, in prep.). One such lineage (Figure 1) comprises taxa that are related to the genus *Hecamede* Haliday and includes the following: *Allotrichoma* Becker, *Diphua* Cresson, *Elephantinosoma* Becker, *Eremotrichoma* Soika, *Hecamede* Haliday, *Pseudohecamede* Hendel, and "The *atrilabrae* Group" (= *yosemite* group) of *Allotrichoma*. This group is recognized here as a tribe in the subfamily Gymnomyzinae and is described below.

HECAMEDINI, new tribe

Type genus: *Hecamede* Haliday, 1837.

DIAGNOSIS.—The tribe Hecamedini is characterized by several synapomorphies that clearly establish its monophyly. These characters are (the number for a character corresponds with that on Figure 1): arista with 3–5 branching rays, longer 2–3 rays subequal, inserted toward arista base (SYNAPOMORPHY 1); compound eye bare of microsetulae or the latter very sparse (SYNAPOMORPHY 2); usually with a gray to silvery stripe on thorax from postpronotum through ventral portion of notopleuron (SYNAPOMORPHY 3); anterior supra-alar seta

FIGURE 1.—Hypothetical phylogeny for the tribe Hecamedini. Filled in squares = synapomorphies; open squares = plesiomorphies; and circles with a "?" denote possible convergences. Numbers for characters correspond with those in the text (page 5). The most parsimonious tree required 47 steps, has a consistency index of 0.82 and a retention index of 0.85.



lacking (SYNAPOMORPHY 4); posterior notopleural seta inserted at distinctly elevated position, especially as compared to anterior seta (SYNAPOMORPHY 5); anepisternum usually two toned, dorsal portion concolorous with mesonotum, ventral portion gray (SYNAPOMORPHY 6); anepisternum with 2, subequal setae inserted along posterior margin (SYNAPOMORPHY 7); venation of wing generally pale colored (SYNAPOMORPHY 8); vein R_{2+3} elongate, section III much smaller than

section II (SYNAPOMORPHY 9); apical section of vein M longer than section between crossveins r-m and dm-cu (SYNAPOMORPHY 10); alula wide, width subequal to that of costal cell (SYNAPOMORPHY 11); pregonite either lacking or fused indistinguishably with postgonite (SYNAPOMORPHY 12); subepandrial sclerite lacking (SYNAPOMORPHY 13); and postgonite generally elongate and bearing few setulae, usually only 2 are conspicuous (SYNAPOMORPHY 14).

Key to Genera of Hecamedini

1. Oral opening large, gaping; only reclinate fronto-orbital seta present; anteroventral margin of face essentially flat, at same level with rest of oral margin; clypeus broad; katepisternal seta lacking *Elephantinosoma* Becker
- Oral opening narrow; usually both a reclinate and proclinate fronto-orbital seta present; anteroventral margin of face emarginate with narrow clypeus exposed within facial emargination; katepisternal seta usually present 2
2. Scutellum bearing 3 marginal setae; postgenal margin sharp; gena high, over $1/2$ eye height (Genus *Hecamede* Haliday) 3
- Scutellum bearing 2 marginal setae; postgenal margin rounded; gena short, less than $1/2$ eye height 4
3. Facial prominence bare at anterior apex, shiny; proclinate fronto-orbital seta present, well developed; intrafrontal seta present. Acrostichal setulae in about 6 irregular rows; katepisternal seta well developed, conspicuous
- Subgenus *Hecamede* Haliday
- Facial prominence microtomentose; proclinate fronto-orbital seta either weakly developed or lacking; intrafrontal setae lacking. Acrostichal setulae in 4, more or less regular rows; katepisternal seta lacking
- Subgenus *Soikia* Canzoneri and Meneghini
4. Palpus yellowish; prescutellar acrostichal setae greatly reduced or absent; 1 katepisternal seta; face with 1 large lateral seta *Eremotrichoma* Soika
- Palpus blackish; 1 pair of prescutellar acrostichal setae, well developed; 2 katepisternal setae, the 2nd seta smaller and inserted below larger seta; face with 2 or more large lateral setae 5
5. Color generally black; microtomentum sparse, subshiny to shiny
- *Diphuia* Cresson
- Color generally gray to brown; microtomentum dense, generally appearing dull (Genus *Allotrichoma* Becker) 6
6. Median facial carina above facial prominence distinct, high, acute; presutural seta lacking (except in *A. slossonae*); proboscis geniculate, labella lanceolate, elongate, nearly equal to length of mediproboscis; face carinate above medial prominence
- Subgenus *Pseudohecamede* Hendel
- Median facial carina above facial prominence shallow; presutural seta present; labella broad, fleshy, shorter than mediproboscis 7
7. Clypeus microtomentose, usually gray; 5th tergum of male long and tubular; cerci of male terminalia elongate and with irregular, species-specific shape
- Subgenus *Allotrichoma* Becker
- Clypeus bare, black; 5th tergum of male short, $1/2$ length of 4th tergum; cerci normally developed, oval to lenticular "The *atrilabrae* Group"

DISCUSSION

This discussion is intended to complement the hypothesized phylogeny (Figure 1) for the taxa being treated and provides

documentation and an explanation of the character evidence to support the cladogram. *Elephantinosoma* serves as the outgroup for purposes of polarizing the characters used in the cladistic analysis of the remaining lineages of Hecamedini.

Synapomorphies for the cladogram are indicated by numbers in parentheses. The numbers correspond with those in the discussion.

The first or basal lineage of this group, and the sister group of the remaining lineages (Figure 1), gives rise to *Elephantinosoma* and its included species (See Mathis and Deeming, 1987, for a revision and further discussion of *Elephantinosoma*). The monophyly of *Elephantinosoma* is indicated by the following synapomorphies: reclinate fronto-orbital seta 1 (SYNAPOMORPHY 15) (By convergence, a reduction in the number of reclinate setae occurs elsewhere in Atissini.); katapisternal seta lacking (SYNAPOMORPHY 16) (The loss of this seta also occurs in *Soikia*, a subgenus of *Hecamede*.); facial setae weakly developed, usually only one seta, inserted near parafacial (SYNAPOMORPHY 17); presutural seta reduced or lacking (SYNAPOMORPHY 18) (This seta is also reduced or lost by convergence in *Pseudohecamede*.); mesonotal setae reduced in size and number (SYNAPOMORPHY 19).

The remaining assemblage, the sister group of *Elephantinosoma*, comprises a lineage that is divided into two groups, which are likewise sister groups. These two groups include taxa that are closely related to *Hecamede* and, secondly, those related to *Allotrichoma*. The stem for these two sister groups is characterized and its monophyly established by the following synapomorphies: Fourth segment of male abdomen elongate, 5th segment usually not visible, retracted within 4th (SYNAPOMORPHY 20); oral margin narrow (SYNAPOMORPHY 21); clypeus narrow (SYNAPOMORPHY 22); ventral margin of face concave (SYNAPOMORPHY 23); middle of face with slight to pronounced conical or carinate prominence (The degree of prominence is quite variable.) (SYNAPOMORPHY 24).

The group comprising *Hecamede* and closely related taxa includes the genus *Eremotrichoma* (Figure 1) in addition to *Hecamede*. The monophyly of this group, however, is based on weak evidence: palpus pale (SYNAPOMORPHY 25). The monophyly of *Hecamede* is confirmed by the following synapomorphies: fore femur swollen, especially when compared with femora of the middle and hind legs (SYNAPOMORPHY 26); scutellum with 3 pairs of marginal setae (SYNAPOMORPHY 27); postgenal margin sharp (SYNAPOMORPHY 28) (This character apparently has developed independently in other lineages.); gena high, over 1/2 height of eye (SYNAPOMORPHY 29); katapisternum with 1 large seta and numerous smaller setae anterior of larger seta (SYNAPOMORPHY 30); scutellar disc with numerous, scattered setae (SYNAPOMORPHY 31); tibiae pale (SYNAPOMORPHY 32) (This may be a synapomorphy, linking *Hecamede* with *Eremotrichoma*.); wing membrane lacteous (SYNAPOMORPHY 33); and acrostichal setulae in 3 or more rows (SYNAPOMORPHY 34). *Hecamede*, which includes approximately 10 species, is now being revised on a worldwide basis (Mathis, in prep.).

The sister group of *Hecamede* is *Eremotrichoma*. The monophyly of the latter is confirmed by the following synapomorphies: facial setae fewer in number, usually 1 pair (SYNAPOMORPHY 35); prescutellar acrostichal setae either

greatly reduced or absent (SYNAPOMORPHY 36); tibiae pale colored (SYNAPOMORPHY 37) (see character number 32 for *Hecamede*). *Eremotrichoma*, which is accorded generic status, was recently revised as a subgenus of *Allotrichoma* (Mathis, 1986a) and now includes four species.

The sister group to the *Hecamede/Eremotrichoma* lineage (Figure 1), comprises taxa that are closely related to *Allotrichoma* and includes the following genus-group taxa: *Diphua*, *Allotrichoma*, and *Pseudohecamede*. *Diphua* is an anomalous genus of four species (Mathis, 1990), which are unusual among atissines by being mostly black, somewhat shiny, and comparatively bare of microtomentum (SYNAPOMORPHY 38) (microtomentum is mostly on the mesonotum). In addition, the face has silvery markings (SYNAPOMORPHY 39), which are similar to markings found in genera of Gymnomyzini and Discocerini. The sister group of *Diphua* is the lineage comprising *Pseudohecamede*, "The *atrilabrae* Group," and *Allotrichoma*, *sensu stricto*. The monophyly of the latter group is confirmed by the following synapomorphies: facial coloration sexually dimorphic—the face of females is two toned, dark above (brown to golden brown), light colored below; male faces are generally uniformly dark colored (SYNAPOMORPHY 40); palpus blackish brown (SYNAPOMORPHY 41); katapisternal setae 2, the 2nd seta smaller, sometimes greatly so, and is inserted below the larger seta (SYNAPOMORPHY 42); surstyli of the male terminalia vestigial, reduced, a small process near the ventral margin of the cercus (SYNAPOMORPHY 43).

The sister group of the combined *Pseudohecamede*/"The *atrilabrae* Group" lineage is *Allotrichoma*, *sensu stricto*, and the monophyly of the latter is established by the following synapomorphies: fifth tergum of male elongate, tubular in shape, well sclerotized and with 2 spiracles (SYNAPOMORPHY 44); fifth sternum of male modified, reduced or truncate medially and bearing lateral lobes or processes (SYNAPOMORPHY 45); cercus of male elongate and with more complicated shape than the typical oval to lenticular shape of the cercus (SYNAPOMORPHY 46).

The monophyly of the lineage giving rise to *Pseudohecamede* plus "The *atrilabrae* Group" is established by one apomorphy: slightly ventrad to the ventral margin of the male cercus is a small projection, which I interpret to be the only remaining vestige of the surstylus (SYNAPOMORPHY 47). This process occurs in both *Pseudohecamede* and species of "The *atrilabrae* Group."

The monophyly of "The *atrilabrae* Group" is confirmed by the following synapomorphy: clypeus bare, entirely black (SYNAPOMORPHY 48).

The monophyly of the subgenus *Pseudohecamede* is confirmed by the following synapomorphies: proboscis geniculate (SYNAPOMORPHY 49); face with dorsal two-thirds between antennal grooves distinctly carinate, carina high and acutely rounded, becoming more prominent below antennal grooves (SYNAPOMORPHY 50); presutural seta lacking (except in *A. slossonae*) (SYNAPOMORPHY 51).

Genus *Allotrichoma* Becker

Allotrichoma Becker, 1896:121 [type species: *Hecamede lateralis* Loew, by original designation].—Mathis, 1986a:129–130 [description].

DESCRIPTION.—Small to moderately small shore flies, length 1.15 to 2.95 mm.

Head: Wider than high; frons wider than long, entirely and mostly densely microtomentose, with vestiture of mesofrons undifferentiated except by color; ocellar seta well developed, inserted in front of anterior ocellus; pseudopostocellar setae usually well developed; a reclinate and a proclinate fronto-orbital seta present, reclinate seta inserted slightly anteromedial of proclinate seta; both inner and outer vertical setae present; ocelli arranged to form isosceles triangle, with distance between posterior pair slightly larger than between anterior ocellus and either posterior ocellus. Antenna exerted; arisal length subequal to antennal length and bearing 4–6 dorsal rays, with basal 3–4 rays longer than apical 1–2, the latter subequal. Eye apparently bare of microsetulae (using a stereomicroscope). Face shallowly carinate between antennal bases; ventral margin of face curved inward laterally making oral margin narrow, width subequal to narrowest distance between eyes, anterior margin shallowly emarginate; bearing 2 facial setae, the dorsal one very slightly larger, both inserted near parafacials; facial coloration sexually dimorphic, face of female two toned, dark above, brown to golden brown, light colored below, male generally uniformly dark colored; labella broad, fleshy, shorter than mediproboscis; palpus blackish brown.

Thorax: Dorsal portion of anepisternum darker colored than medial portion, frequently concolorous with dorsum of scutum, these areas separated by lighter colored stripe through

postpronotal and notopleural areas; chaetotaxy conspicuous, setae dark colored, arranged in well-defined setal tracks as follows: acrostichal setulae in 4 rows, 2 median rows better developed, 2 lateral rows attenuated anteriorly; dorsocentral track terminated posteriorly with larger seta; intra-alar setulae irregularly seriated; postpronotal seta 1; postalar seta 1; scutellar setae 2 and with sparse, scattered setulae on scutellar disc; notopleural setae 2, insertion of posterior seta elevated dorsally above anterior one; anepisternal setae 2, length of both subequal, inserted along posterior margin; katepisternal setae 2, the 2nd seta smaller, sometimes greatly so, inserted below larger seta. Wing with vein R_{2+3} extended beyond level of crossvein dm-cu, 2nd costal section at least $1\frac{1}{2}$ times longer than 3rd section.

Abdomen: Fifth segment of male not visible from a dorsal view, retracted within 4th segment. Male terminalia with surstyli vestigial, reduced.

NATURAL HISTORY.—Adults generally feed on nectar from various flowering-plant species, and females oviposit upon decomposing plants and excrement (Deonier, in litt.).

DISCUSSION.—The enlarged concept of *Allotrichoma* presented above partially follows that of a previous paper (Mathis, 1986a), but here it also includes *Pseudohecamede* as a subgenus, and *Eremotrichoma* is accorded generic status (see p. 5). The inclusion of *Pseudohecamede* within *Allotrichoma* was first suggested by Runyan and Deonier (1979) in their cladistic analysis of these taxa. Their analysis, which I accept, has been reconfirmed by the research for this paper.

For purposes of agreement between species-group names and genus-group names, the generic name *Allotrichoma* is neuter, not feminine.

Key to Subgenera of *Allotrichoma*

- Median facial carina above mid facial prominence shallow; presutural seta present, well developed, subequal to posterior notopleural seta; labella broad, fleshy, shorter than mediproboscis Subgenus *Allotrichoma* Becker
- Median facial carina above mid facial prominence distinct, high, acute; presutural seta either undifferentiated, similar to surrounding setulae, or lacking (except in *A. slossonae*); labella lanceolate, elongate, nearly equal to length of mediproboscis Subgenus *Pseudohecamede* Hendel

Subgenus *Allotrichoma* Becker

Allotrichoma Becker, 1896:121 [type species: *Hecamede lateralis* Loew, by original designation].

Epiphasis Becker, 1907:301 [type species: *Epiphasis clypeata* Becker, 1907, monotypy].—Also see generic synonymy.

DESCRIPTION.—Small to moderately small shore flies, length 1.15 to 2.10 mm.

Head: Frontal coloration mostly unicolorous, at most with narrow, anterior fronto-orbits slightly lighter in color, lacking distinctively colored ocellar triangle; pseudopostocellar setae subequal in length to ocellar setae. Pedicel with well-developed, proclinate, dorsal seta. Facial coloration sexually dimorphic, males unicolorous and darker; face with dorsal $\frac{2}{3}$

between antennal grooves shallowly carinate, becoming more prominent ventrad of facial grooves, slightly tuberculate; clypeus usually mostly microtomentose, dull colored.

Thorax: Mesonotum generally medium brown; chaetotaxy generally well developed; prescutellar acrostichal setae much larger than other acrostichal setulae and more widely set apart; presutural seta well developed, length subequal to notopleural setae; katepisternal seta well developed, conspicuous, also bearing at least 1 other seta, usually smaller and inserted ventral to the larger seta. Wing membrane mostly milky white; veins behind costa usually brownish; alular marginal setulae short, less than $\frac{1}{2}$ alular height. Legs with tibiae dark, concolorous with femora.

Abdomen: Fifth tergum elongate, tubular in shape, well

sclerotized, including the 2 anterodorsal apodemes; 5th sternum as a ventrally projected process; cerci elongate and usually ornate, providing good characters for recognition of species (see Runyan and Deonier, 1979, for discussion and illustrations).

DISTRIBUTION.—Except for polar regions and South America, the subgenus *Allotrichoma* occurs worldwide, although it has greater diversity in temperate zones.

DISCUSSION.—The nearctic species of this subgenus are currently being revised by Dr. D.L. Deonier (Miami University, Oxford, Ohio) and myself.

The monophyly of this subgenus is well established, although mostly by sexually dimorphic characters of the male. For example, most of the characters of the abdomen that were noted in the subgeneric diagnoses are unique and are synapomorphies for this subgenus.

Subgenus *Pseudohecamede* Hendel, new status

Pseudohecamede Hendel, 1936:104 [type species: *Pseudohecamede nasalis* Hendel (= *Allotrichoma salubre* Cresson, 1930), by original designation].—Cresson, 1946:137–138 [revision].—Wirth, 1965:736–737 [nearctic catalog]; 1968:5 [neotropical catalog].

DESCRIPTION.—Small to moderately small shore flies, length 1.45 to 2.95 mm.

Head: Frontal coloration mostly unicolorous, at most with narrow, anterior fronto-orbits slightly lighter in color, lacking distinctively colored ocellar triangle; pseudopostocellar setae, if present (lacking in *A. salubre*) subequal in length to ocellar setae. Pedicel with well-developed, proclinate, dorsal seta. Facial coloration sexually dimorphic, males unicolorous and slightly darker, light golden brown; face with dorsal 2/3 between antennal grooves distinctly carinate, carina high and acutely rounded, becoming more prominent ventrad of antennal grooves; clypeus usually mostly microtomentose, dull colored, concolorous with ventral facial coloration.

Thorax: Mesonotum generally brown; chaetotaxy moderately well developed; prescutellar acrostichal setae much larger than other acrostichal setulae and more widely set apart; presutural seta usually lacking (present in *A. slossonae*); kaicpisternal seta well developed, conspicuous. Wing membrane mostly milky white; veins behind costa usually light yellow to white, except in *A. salubre*; alular marginal setulae

short, less than 1/2 alular height. Legs with tibiae dark, concolorous with femora.

Abdomen: Fifth tergum of male only slightly longer than 3rd and lacking long, robust, anteriorly projected apodemes. Male terminalia as follows: cerci with 2–3 longer setae at ventral end; surstylus vestigial, a small process at anteroventral margin of cercus, bearing 2–3 setulae; epandrium a narrow band, sometimes weakened dorsally; gonite sheathing base of aedeagus, posteroventral angle frequently acutely developed; aedeagus digitiform, simple; aedeagal apodeme usually higher than wide in lateral view (see Runyan and Deonier, 1979, for additional discussion and illustrations).

DISTRIBUTION.—New World between 40° north latitude and 42° south latitude. Although widespread, including temperate zones, this subgenus has greater species diversity in semitropical and tropical regions.

DISCUSSION.—Facial coloration in most species of *Pseudohecamede* is sexually dimorphic. Frequently the coloration of the female’s face is bicolored, darker above, usually lightly brownish to golden brown, and lighter below, usually grayish white to silvery gray. The male’s face tends to be unicolorous, with the coloration usually darker.

Except for species closely related to *Allotrichoma abdominale* (*A. ecuadorensis* and *A. baja*), the external differences between the species are quite distinct, which facilitates identification of these species. For the species related to *A. abdominale*, reference to characters of the male genitalia will be necessary for accurate species determinations. The structures of the male terminalia are quite similar throughout the subgenus, and there is little doubt as to the homologous structures between the species.

Runyan and Deonier (1979) suggested previously that *Pseudohecamede* and the “*atrilabrae* species group” are sister groups. The character evidence they cited to establish this relationship, and with which I concur, comes mostly from characters of the male terminalia, especially the reduced surstylus. The vestigial surstylar process is apparently unique to these two groups, and I interpret it to be an autapomorphy, which establishes the monophyly of the lineage (see “Discussion” after “Key to Genera of Hecamedini,” p. 4, for further details concerning the phylogenetic relationships of taxa related to *Pseudohecamede*).

Key to Species of the Subgenus *Pseudohecamede* Hendel

1. Proclinate fronto-orbital seta absent; pseudopostocellar setae lacking; oral margin, in front, distinctly emarginate with clypeus in emargination . . . *A. salubre* Cresson
 Proclinate fronto-orbital seta present; pseudopostocellar setae present; oral margin at most shallowly emarginate 2
2. Abdominal terga subshiny to shiny, especially laterally, brown, at most very thinly microtomentose *A. jamaicensis*, new species
 Fourth abdominal tergum and usually 3rd densely microtomentose, silvery gray 3

3. Presutural seta present and conspicuous, subequal to postpronotal seta in length *A. slossonae* (Cresson)
Presutural seta absent or greatly reduced and inconspicuous 4
4. Mesonotum and dorsal half of anepisternum mostly unicolorous, lacking distinctive silvery gray colored, horizontal stripe through postpronotum and ventral half of notopleuron 5
Silvery gray horizontal stripe through postpronotum and ventral half of notopleuron distinct, contrasted with golden to dark brown coloration above and below 7
5. Thorax grayish tan *A. steineri*, new species
Thorax chestnut brown 6
6. Abdominal terga mostly silvery gray, basal 2 sometimes lightly brownish colored *A. adustum*, new species
Abdominal terga light brown *A. faciale* (Hendel)
7. Surstylus only slightly longer than wide, greatest width preapical, posterior margin convex, anterior margin shallowly concave *A. ecuadorensis*, new species
Surstylus either parallel sided or much longer than wide, not as above 8
8. Gonite of male terminalia with posterior $\frac{1}{3}$ distinctly narrowed and projected, falcate *A. baja*, new species
Gonite of male terminalia at most with posteroventral corner projected and pointed *A. abdominale* (Williston)

Allotrichoma (Pseudohecamede) abdominale (Williston)

FIGURES 2-10

Hecamede abdominalis Williston, 1896:398.

Allotrichoma abdominale.—Williston, 1897:4 [generic combination, Brazil].—Coquillett, 1900:260 [Puerto Rico].—Cresson, 1918:54 [Costa Rica, figure of head]; 1942:109 [list].—Hendel, 1930:135 [Bolivia].

Pseudohecamede abdominalis.—Hendel, 1936:106 [generic combination, Paraguay].—Wirth and Stone, 1956:467 [list, California].—Wirth, 1965:737 [nearctic catalog]; 1968:5 [neotropical catalog].—Runyan and Deonier, 1979:123-137 [figures of male terminalia, puparium, egg, discussion].

Allotrichoma longirostre Hendel, 1930:135 [Bolivia].—Wirth, 1968:5 [synonymy].

DESCRIPTION.—Small to moderately small shore flies, length 1.45 to 2.45 mm.

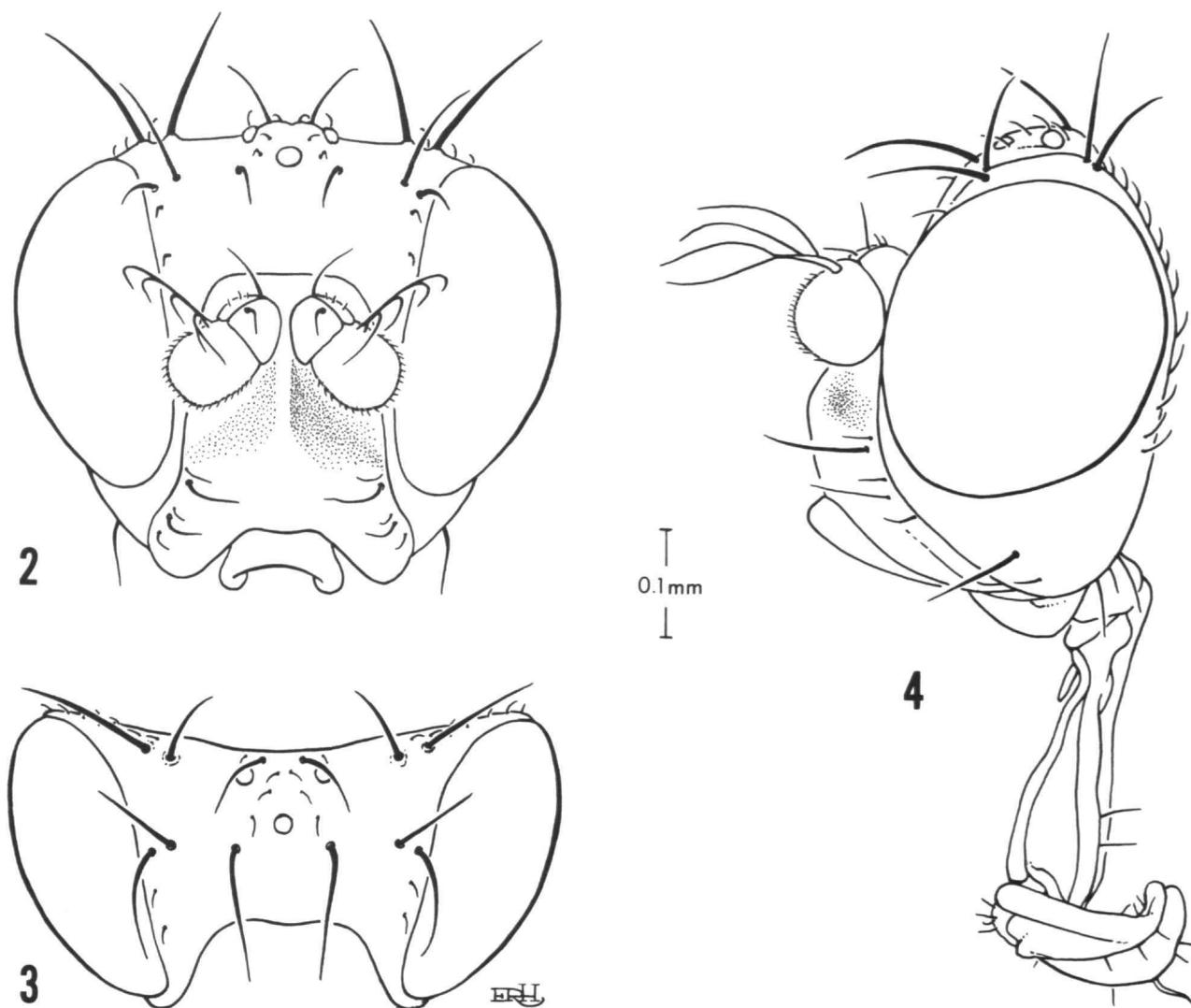
Head (Figures 2-4): Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion short, about $\frac{1}{3}$ of total arista length; arista bearing 4-5 dorsal rays, basal 3 subequal in length. Face of female bicolorous, silvery colored on ventral half, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4-6 rows anteriorly, lateral rows with fewer setulae; mesonotum and dorsal portion of anepisternum brown, coloration more or less uniform, some specimens with slightly darker coloration through setal tracks; a distinct, horizontal, silver-colored stripe from postpronotum through ventral portion of notopleuron; a second horizontal stripe through proepisternum and ventral $\frac{1}{3}$ of anepisternum and anepimeron, silvery colored but not as

pronounced as dorsal stripe, quite faded in some specimens; ventral margin of anepisternum brown; katepisternum silvery colored. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.52; M vein ratio 0.38. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: First and 2nd terga brown, 3rd and 4th silvery gray. Male terminalia (Figures 5-8) as follows: Epandrium in lateral view a narrow band, ventral margin slightly produced anteroventrally; cercus moderately narrow in lateral view, not more than twice width of epandrium; surstylus slightly to moderately produced; aedeagal apodeme with basal portion more or less rectangular, with a short posterior projection, which attaches to the hypandrium, and a much larger, tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, gradually enlarged toward apex, apex broadly rounded; gonite irregularly rectangular, posteroventral angle distinctly produced into a narrow, short projection; hypandrium in lateral view angulate, with ventral arm longer and more robust.

TYPE MATERIAL.—Two female syntypes of *Hecamede abdominalis* Williston were examined as part of this study. The first is labeled "Co-type [disk with yellow margin]/St. Vincent. W.I. H. H. Smith./W. Indies. 1907-66./+ [handwritten on a nearly square label/May/Hecamede abdominalis Will [handwritten, red sub-border]." The second female syntype is labeled "Co-type [disk with yellow margin]/Windward side St. Vincent. W.I. H. H. Smith./W. Indies. 1907-66./Hecamede abdominalis Will [handwritten, red sub-border]." Each of the two syntypes is double mounted (minute nadel in a small rectangular card on its edge), is in poor condition (the head is missing on both), and is deposited in British Museum (Natural



FIGURES 2-4.—*Allotrichoma abdominale*: 2, head, anterior aspect; 3, head, lateral aspect; 4, head, dorsal aspect.

History). Because the syntypes are in poor condition, and critical characters for identification (structures of the male terminalia) are not found in females, I have not elected to designate a lectotype for this species. I have collected and studied several males from St. Vincent, the type locality, and these are conspecific.

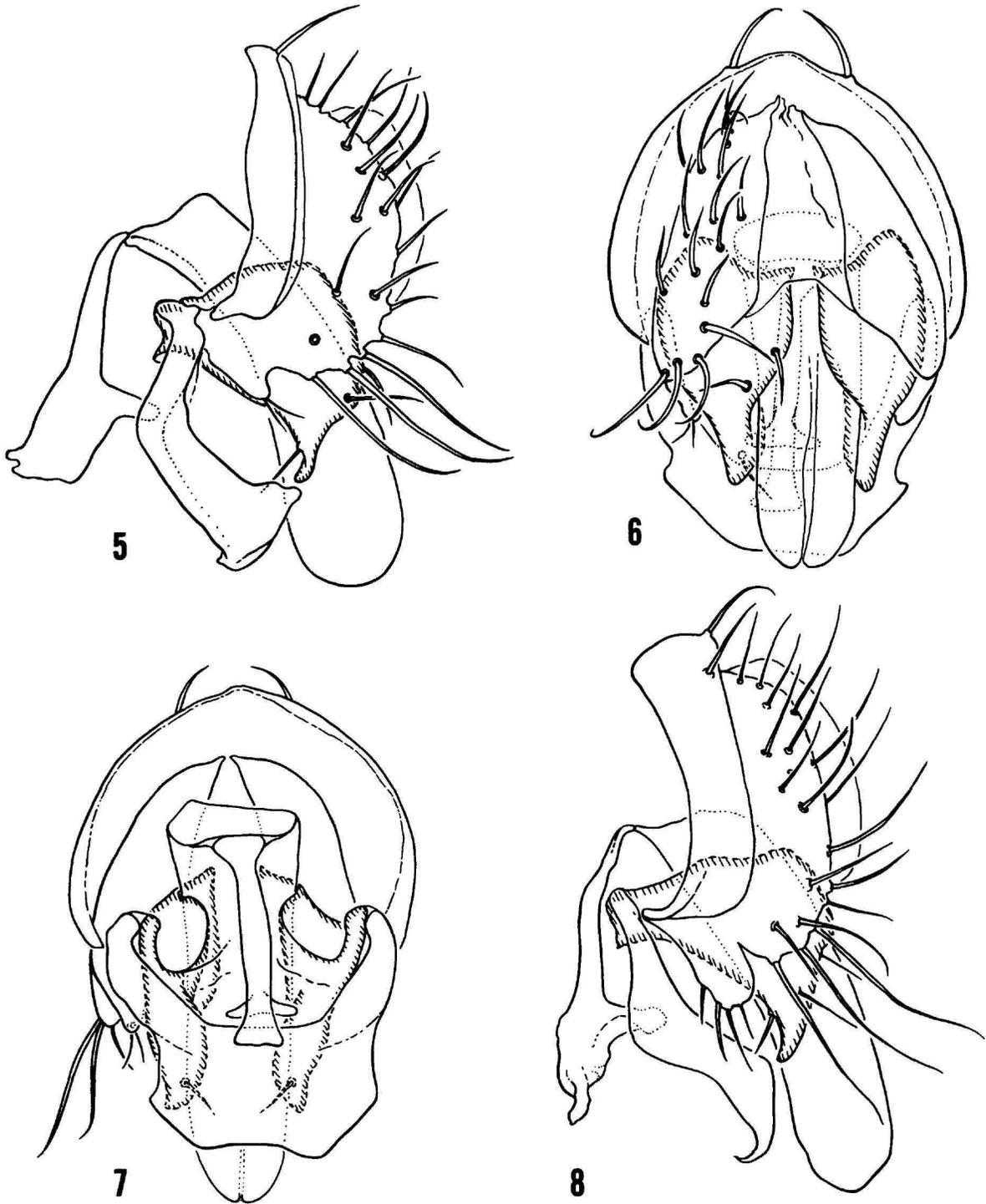
The lectotype male of *Allotrichoma longirostre* Hendel, here designated, is labeled "Fortin Esteros[,] Bolivia, III.26[26 Mar][,] D.Chaco-Exped [a black margin]/*Allotrichoma abdominale* Will. ♂ [handwritten]." The lectotype is appropriately labeled with a lectotype label, is double mounted (minute nadel in a rectangular card), is in fair condition, and is

deposited in the Staatliches Museum für Naturkunde, Stuttgart, Germany. A second specimen, a female, bears identical locality label data and is designated as a paralectotype.

OTHER SPECIMENS EXAMINED.—ARGENTINA. Formosa, Ing. Guarez, 2-7 Jan 1949, R. Golbach (1♂; USNM).

BAHAMAS. Cat Island, McQueen, 23 Jan 1953, E.B. Hayden (4♀; USNM); San Salvador Island, near Cockburn Town, 18 Mar 1953, L. Giovannoli, G.B. Rabb (1♂, 3♀, 1?; BMNH).

BELIZE. *Stann Creek District*: Bread and Butter Cay, 25 Mar 1988, W.N. Mathis (3♂, 5♀; USNM); Carrie Bow Cay, 15 Jan-2 Jun 1984, 1985, 1987, C. Feller, W.N. Mathis (38♂,



FIGURES 5-8.—*Allotrichoma abdominale*: 5, male terminalia (West Indies: Dominica), lateral aspect; 6, male terminalia, posterior aspect; 7, male terminalia, anterior aspect; 8, male terminalia (West Indies: Dominica), lateral aspect.

31♀; USNM); Coco Plum Cay, 23 Mar–31 Jul 1988, 1989, W.N. Mathis (7♂, 7♀; USNM); Glover's Reef (Long Cay, Middle Cay, Northeast Cay, Southwest Cay), 26–28 Jul 1989, W.N. Mathis, H. Williams (13♂, 17♀; USNM); Man of War Cay, 2 Jun 8–15 1985, 1987, 1989, W.N. Mathis (34♂, 22♀; USNM); Round Cay, 23 Mar 1988, W.N. Mathis (2♂, 2♀; USNM); Saddle Cay, 25 Mar 1988, W.N. Mathis (2♂; USNM); Stewart Cay, 24 Mar 1988, W.N. Mathis (5♂, 1♀; USNM); Tobacco Range, 30 Jul 1989, W.N. Mathis (3♂, 9♀; USNM); Twin Cays (Dock area, E shore of East Island, S end of East Island, S end of West Island, West Bay), 17–27 Jan–4 Mar 1984, 1987, C. Feller, W.N. Mathis (79♂, 75♀; USNM); Wee Wee Cay, 21 Jul–9 Nov 1987, 1989, D. Mathis, W.N. Mathis (5♂, 7♀; USNM).

BOLIVIA. Piedra Blanca, Apr (2♀; USNM); Rogagua, Rosario Lake, 28 Oct–9 Nov 1921, W.M. Mann (1♀; USNM).

BRAZIL. *Mato Grosso*: Capitaio Vasconcelos, on Rio Tuatuari, upper Xingu Basin, 31 Jul 1957, B. Malkin (4♂, 2♀; CAS). *Paraná*: Foz do Iguacu, N.L.H. Krauss, Jul 1961 (1♂; USNM). *Santa Catarina*: Nova Teutonia (300–500 m), Oct 1958, F. Plaumann (1♀; CNC).

COSTA RICA. Santa Cruz, 30 Jan 1910, P.P. Calvert (3♂, 1♀; ANSP); Puntarenas, Playa Manuel Antonio (6 km SE Puerto Quepos, sandy mud flats near mangrove inlet), 30 Mar 1988, J.M. Hill, J.M. Mitchell, J.M. Swearingen, W.E. Steiner (4♀; USNM).

ECUADOR. *Manabi Province*: Bahia, 10 Jan 1978, W.N. Mathis (1♂; USNM).

EL SALVADOR. Acajutla, Dec 1953, W.B. Heed (1♀; USNM).

MEXICO. *Chiapas*: Boca de Cielo (17 km S Puerto Arista), 18 May 1985, A. Freidberg, W.N. Mathis (11♂, 29♀; USNM). *Guerrero*: Acapulco, 16–30 Aug 1938, L.J. Lipovsky (32♂, 37♀; KU). *Michoacan*: Morelia, Jun 1965, N.L.H. Krauss (1♀; USNM). *Nayarit*: Tepic (24 mi SE), 16 Aug 1960, P.H. Arnaud, Jr., D.C. Rentz, E.S. Ross (3♀; CAS). *Nuevo Leon*: Linares (20 mi W), 8 Nov 1946, F.E. Skinner (1♂; CAS). *Sinaloa*: Elota (13 mi N), 14 Aug 1980, P.H. Arnaud, Jr., D.C. Rentz, E.S. Ross (1♂; CAS); Mazatlan, 16 Aug 1954, light trap, Rykman, Christenson, and Spencer (1♀; USNM); Pericos (26 mi N), 13 Aug 1960, P.H. Arnaud, Jr., D.C. Rentz, E.S. Ross (1♀; CAS). *Sonora*: Alamos, 5 Jan 1971, P.H. and M. Arnaud (1♀; CAS); Guaymas (10 mi SE), 13 Aug 1959, R.H. and E.M. Painter (1♂; USNM); Kino (38 mi E, 400 ft), 12 Aug 1959, R.H. and E.M. Painter (1♀; USNM). *Vera Cruz*: Minatitlan, 1 Feb 1892, H. Osborn (1♀; USNM); Tecolutla (1.6 mi S), 26 Jun 1953 (1♀; KU); Esperanza, Nov (1♀; USNM).

PANAMA. *Cocle*: Agua Dulce, 25 Sep–21 Nov 1951, 1952, F.S. Blanton (3♂, 2♀; USNM). *Colon*: Galeta Point, 26 Aug 1952, F.S. Blanton (1♀; USNM). *Darien*: Garachine, Feb 1953, F.S. Blanton (1♂, 3♀; USNM). *Panama*: Ponto Chorrera, 9 Sep 1952, F.S. Blanton (2♀; USNM); Tocumen, 6–13 Feb 1953, F.S. Blanton (6♂, 2♀; USNM); Balboa (tidal margin), Sep 1942, P.A. Woke (1♀; USNM). Fort Clayton, 23 Apr 1923,

R.C. Shannon (1♂; USNM). Nata, 20 Nov 1952, F.S. Blanton (1♀; USNM). Rio Trinidad, 8 Jun 1912, A. Busck (1♂; USNM).

PARAGUAY. Fiebrig, Chaco (1♂, 1♀; ANSP, NMW); Fiebrig, S. Bernardino (1♂; NMW).

PERU. *Junín*: Colonia Perene, Rio Perene (18 mi NE La Merced), 3 Jan 1955, E.S. Ross, E.I. Schlinger (1♂; CAS). *Callao*: Callao, 17 Nov 1950, A.E. Michelbacher, E.S. Ross (1♂, 1♀; CAS). Matucana, 1 Jul 1913, C.T. Brues (1♂; ANSP).

TRINIDAD. LaBrea (on vegetation on surface of pitch lake), 18 Oct 1918, H. Morrison (1♂; USNM).

UNITED STATES. *Alabama*: Lee Co., Auburn, D. Cunningham (1♀; USNM). Mobile Co., Coden, 9 Oct 1922, A.H. Sturtevant (2♀; USNM); Kushla (Mobile), 22 Jun 1952, A.H. Sturtevant (1♂; USNM); Whistler (Pritchard), 20 Oct 1924, A.H. Sturtevant (1♀; USNM). *Arizona*: Pima Co., Baboquivari, 27 Apr 1947, A.L. Melander (1♂; ANSP); Organ Pipe Park, Rincon Spring, 18 Apr 1947, A.L. Melander (1♀; ANSP). *Arkansas*: Carroll Co., Berryville, 20 May 1954, A.H. Sturtevant (1♂; USNM). *California*: Riverside Co., Salton Sea, Desert Beach, P.H. Arnaud, Jr. (1♀; USNM). Imperial Co., Brawley, 8 Aug 1914, J.C. Bradley (1♀; ANSP). San Bernardino Co., 29 Palms, 28 Aug 1934, P.H. Timberlake (1♀; ANSP). *Florida*: Collier Co., Ochopee (W of), 9 Sep 1938, P.W. Oman (1♀; USNM). Dade Co., Everglades National Park, 9 Mar 1955, H.A. Denmark (1♀; USNM); Miami (1♀; USNM); Royal Palm Park, 26 Jan–22 Jul 1932, 1948, R.H. Beamer, A.L. Melander (4♂, 10♀; ANSP, USNM). Highlands Co., Archbold Biological Station, 13–19 Apr 1970, W.W. Wirth (3♀; USNM); Venus, 8 Oct 1964, L.J. Brass (1♀; CAS). Leon Co., Tallahassee, 25 Jun 1952, A.H. Sturtevant (2♀; USNM). Marion Co., Silver Springs, 3 Feb 1932, A.L. Melander (1♀; USNM); Salt Springs, 14 Apr 1989, D. Mathis, W.N. Mathis (5♂, 7♀; USNM); Salt Springs (8 km N), 14 Apr 1989, D. Mathis, W.N. Mathis (2♂, 1♀; USNM). Monroe Co., Everglades National Park, 8–10 Apr 1970, malaise trap, W.W. Wirth (4♀; USNM); Flamingo, Everglades National Park, 1–5 Dec 1961, J. Chillcott, G. Holland, E. Munroe (1♀; CNC). Palm Beach Co., Lake Worth (bay shore), 8 Aug 1951, W.W. Wirth (1♂, 9♀; USNM). Seminole Co., Oviedo (3 mi SW, fish baited trap), 3 Oct 1955, E.G. Jay (5♀; USNM). Volusia Co., Daytona, 12 Aug 1932, C.T. Brues (1♂, 2♀; USNM). Matecumbe, 1 Feb 1936, A.L. Melander (2♀; ANSP). Silver Beach, 24 Jun 1952, A.H. Sturtevant (3♀; USNM). *Georgia*: Tift Co., Tifton, 8 Jun–4 Sep 1896 (7♀; USNM). Okefenokee Swamp, Honey Island, 1 Jun 1912 (1♀; ANSP); Billy's Island, Jun 1912 (1♀; ANSP). *Maryland*: Anne Arundel Co., Chesapeake Beach, 8 Sep 1920, J.M. Aldrich (1♀; USNM). *Ohio*: Portage Co., Kent (3 mi E), 10 Sep 1975, reared from muskrat dung, B.A. Foote (1♀; USNM). *Texas*: Kleberg Co., Kingsville, 8–9 Jun 1936, R.H. Painter (1♀; ANSP). *Virginia*: Falls Church, light trap, 18 Aug 1958, W.W. Wirth (1♀; USNM). *Washington*: Klickitat Co., Husum, 28 Jun 1917, A.L. Melander (1♀; ANSP).

VENEZUELA. *Barinas*: Santa Rosa, P. Anduze (1♂, 2♀; USNM). *Miranda*: Tacarigua, 1 Mar 1949, M. Villegas (1♂, 3♀; USNM). *Zulia*: Carrasquero (17 km NE), 15 Jun 1976, A.S. Menke, D. Vincent (1♀; USNM).

WEST INDIES. DOMINICA. Cabrit Swamp, 23 Feb-22-25 Mar 1965, 1989, W.N. Mathis, W.W. Wirth (10♂, 5♀; BMNH, USNM); Clarke Hall, 21-28 Feb-15 Aug 1964, 1965, 1966, light trap, O.S. Flint, T.J. Spilman, W.W. Wirth (5♂, 2♀; USNM); Clarke Hall (♂ from *Cassia* sp.), 5-6 Jun 1966, G.C. Steyskal (1♂, 1♀; USNM); Coulibistri, 21 Mar 1989, W.N. Mathis (1♀; USNM); Dublanc, 21 Mar 1989, W.N. Mathis (1♀; USNM); Grande Savane (pond margin), 20 Mar 1965, W.W. Wirth (9♂, 2♀; USNM); Layou River mouth, 9 Jan-24 Mar 1965, W.W. Wirth (6♂, 2♀; BMNH, USNM); Macoucheri (seashore), 1 Feb 1965, W.W. Wirth (1♀; USNM); Soufrière Bay, 24 Mar 1989, A. Freidberg, W.N. Mathis (2♂; USNM). GUADELOUPE. Grande Anse (beach), 11-22 Jul 1986, E. Ratti (5♂, 2♀; MCV). JAMAICA. Annotto Bay (marsh), 25 Feb 1969,

W.W. Wirth (1♀; USNM); Falmouth (bay shore), 1 Mar 1960, W.W. Wirth (3♂; USNM); Kingston, Fresh River, 24 Feb 1969, W.W. Wirth (1♂, 1♀; USNM); Milk River, Bath, 11 Mar 1970, W.W. Wirth, T. Farr (2♂, 4♀; USNM); Negril Beach (rocky shore), 12 Mar 1970, W.W. Wirth (5♂, 8♀; USNM); Negril Beach (5 km E, rocky shore), 13 Mar 1970, W.W. Wirth (2♂; USNM); Runaway Bay, 16-28 Feb 1969, W.W. Wirth (1♂, 1♀; USNM); Savanna La Mar (stream margin), 13 Mar 1970, W.W. Wirth (2♂, 4♀; USNM). ST. VINCENT. Buccament Bay, 25-28 Mar 1989, W.N. Mathis (2♂, 6♀; USNM); Cumberland Bay, 28 Mar 1989, A. Freidberg, W.N. Mathis (1♂, 1♀; USNM); Kingstown, Botanical Garden, W.N. Mathis (6♂, 2♀; USNM); Richmond Beach, 28 Mar 1989, W.N. Mathis (2♂; USNM); Wallilabou (beach), 27 Mar 1989, W.N. Mathis (3♂, 1♀; USNM); Yambou Head, 27 Mar 1989, W.N. Mathis (1♂, 2♀; USNM).

DISTRIBUTION (Figures 9, 10).—New World between 40° north latitude and 40° south latitude. United States (Washing-

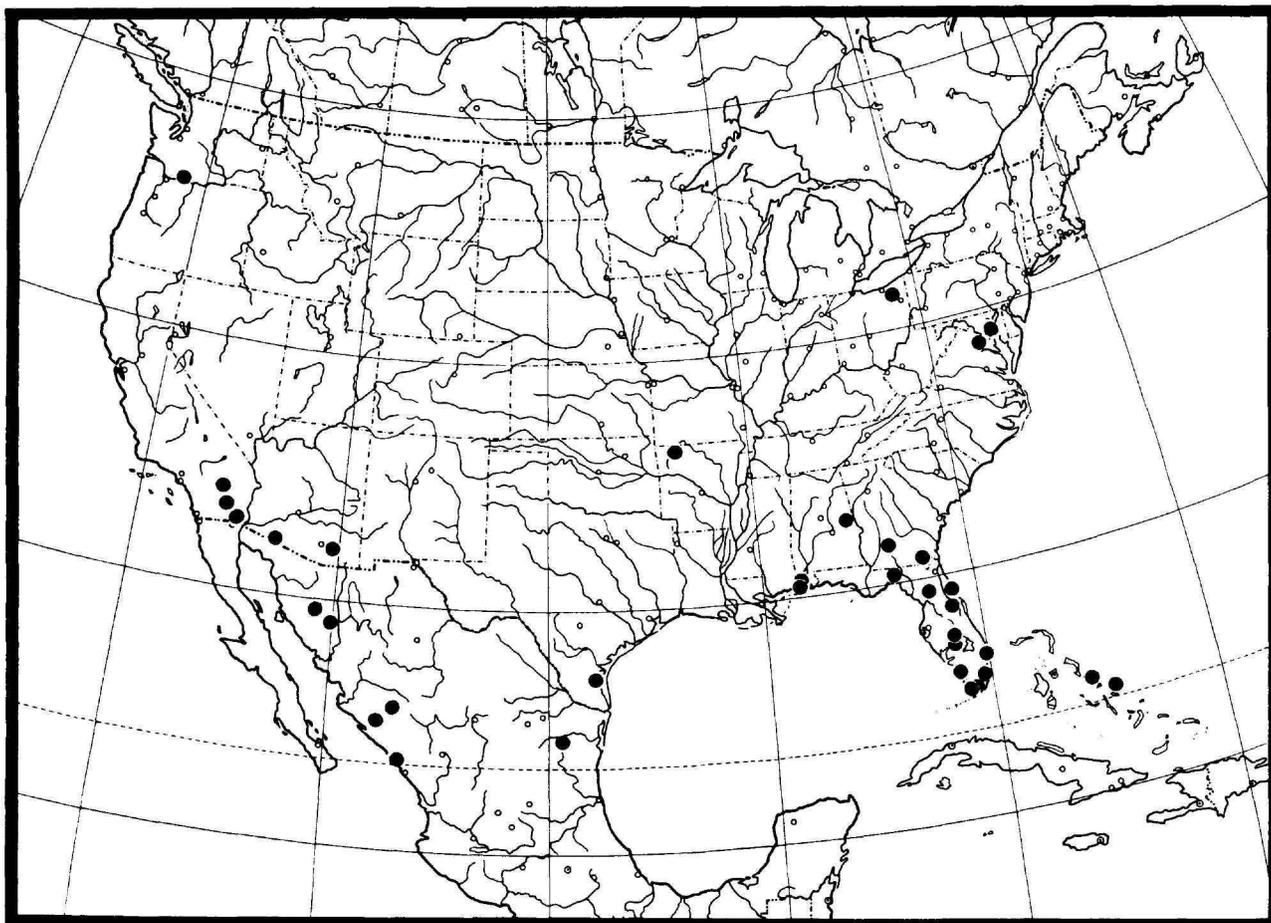


FIGURE 9.—Distribution map of *Allotrichoma abdominale* with localities north of the Tropic of Cancer.



FIGURE 10.—Distribution map of *Allotrichoma abdominale* with localities south of the Tropic of Cancer.

ton east to Ohio and Maryland, south to California, Texas, and Florida), Bahamas, and West Indies (Dominica, Guadeloupe, Jamaica, and St. Vincent) to Mexico, south through Central America to Argentina, Paraguay, and Bolivia. This is the most widespread species of the subgenus.

NATURAL HISTORY.—This species occurs inland as well as in the littoral zone of marine environments. The specimens I collected occurred mostly in the littoral zone, especially where organic debris had accumulated. On Man of War Cay, off the coast of Belize, numerous specimens were swept from a partially decayed carcass of a Brown Booby (*Sula leucogaster* (Boddaert)).

REMARKS.—Considerable clinal variation in color is evident among the specimens I examined. In the northern reaches of its distribution, the brown coloration appears darker, with even darker coloration along the setal tracks on the mesonotum. Toward the south, the coloration tends to be paler, with stripes along the setal tracks less distinctive or lacking.

Some variation is also evident in the shape of the male terminalia (Figures 5, 8), especially the degree of sclerotization and subtle size differences in the surstylus. The extent of the variation is slight, however, and appears to be overlapping. The variation found in insular populations, such as those on St. Vincent (West Indies), is as great as found throughout the entire range of the species and with the same degree of overlap. Because discrete and independent populations are not apparent in either allopatric or sympatric situations, I regard the variation to be intraspecific.

The distinctive, silvery gray, horizontal stripe, which extends from the postpronotum through the ventral portion of the notopleuron, and the bicolored anepisternum usually distinguish this species from congeners. To distinguish this species from *A. baja* or *A. ecuadorensis*, with which it is very similar, characters of the male terminalia will need to be examined. For additional distinguishing characters from other congeners, see "Key to the Species of the Subgenus *Pseudohecamede* Hendel" and the species diagnosis above.

Hendel (1930) had tentatively identified three specimens from Bolivia as *A. abdominale*, but commented further that should true specimens of *A. abdominale* have a short proboscis, then his three specimens were a new species and should be named *A. longirostre*. This practice of making a name conditionally available was acceptable before 1960. Hendel did not then realize that an elongate proboscis is a synapomorphy that characterizes all species of the subgenus *Pseudohecamede* (see "Discussion" on p. 5). Although based on negative evidence, Hendel's conditional description meets the requirements of availability. The lectotype, however, is conspecific with *A. abdominale*, and thus the two names are synonyms.

Allotrichoma (Pseudohecamede) baja, new species

FIGURES 11, 12

DESCRIPTION.—Small shore flies, length 1.90 to 1.95 mm. *Head:* Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$

length of ocellar setae. Arista with basal thickened portion short, about $\frac{1}{3}$ total arista length; arista bearing 4–5 dorsal rays, basal 3 subequal in length. Face of female bicolored, silvery gray colored on ventral half, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4–6 rows anteriorly, lateral rows with fewer setulae; mesonotum and dorsal portion of anepisternum brown, coloration more or less uniform, some specimens with slightly darker coloration through setal tracks; a distinct, horizontal, silver-colored stripe from postpronotum through ventral portion of notopleuron; a second horizontal stripe through proepisternum and ventral $\frac{1}{3}$ of anepisternum and anepimeron, silvery colored but not as pronounced as dorsal stripe, quite faded in some specimens; ventral margin of anepisternum brown; katepisternum silvery colored. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.46; M vein ratio 0.35. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: First and 2nd terga brown, 3rd and 4th silvery gray. Male terminalia (Figure 11) as follows: Epandrium in lateral view a narrow, vertical band, becoming gradually narrower ventrally, ventral margin slightly produced anteroventrally; cercus moderately narrow in lateral view, not

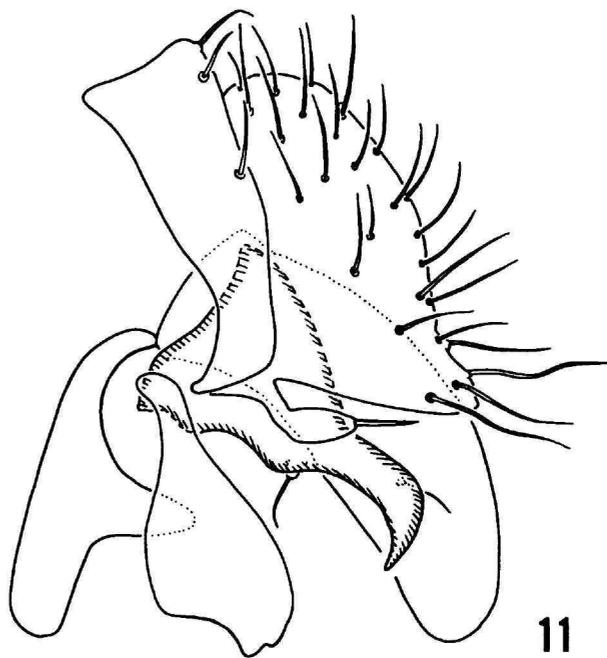


FIGURE 11.—*Allotrichoma baja*: male terminalia, lateral aspect.

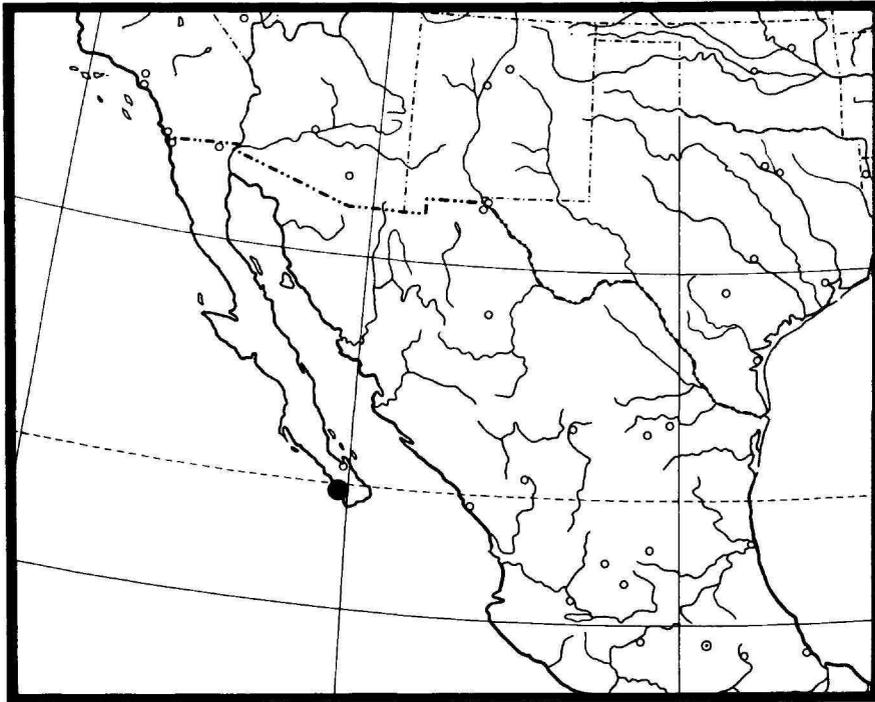


FIGURE 12.—Distribution map of *Allotrichoma baja*.

more than twice width of epandrium; surstylus distinct, with gap between cercus and process deeply incised; aedeagal apodeme with basal portion more or less narrowly rectangular, with a short posterior projection, which attaches to the hypandrium, and a much larger, tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, gradually becoming narrower toward apex, apex moderately rounded; gonite irregularly triangular, posteroventral angle distinctly produced into a moderately narrow, long, falcate projection; hypandrium in lateral view angulate, with ventral arm longer and more robust.

TYPE MATERIAL.—The holotype male is labeled "Todos Santos Baja Calif[ornia], Mex[ico]. X-19-45 [19 Oct 1945, handwritten]/M.Correa, coll./# 246 [handwritten]." Two male paratypes bear the same label data as the holotype. The holotype is point mounted, is in poor condition, and is deposited in the Smithsonian Institution (USNM).

DISTRIBUTION (Figure 12).—This species is known only from the type locality in Baja California Sur (Mexico).

ETYMOLOGY.—The species epithet, *baja*, is treated as a noun in apposition.

REMARKS.—This species is very similar to *A. abdominale* and is distinguished from the latter by the falcate shape of the gonite and the shape of the surstylus.

Allotrichoma (Pseudohecamede) ecuadorensis, new species

FIGURES 13, 15

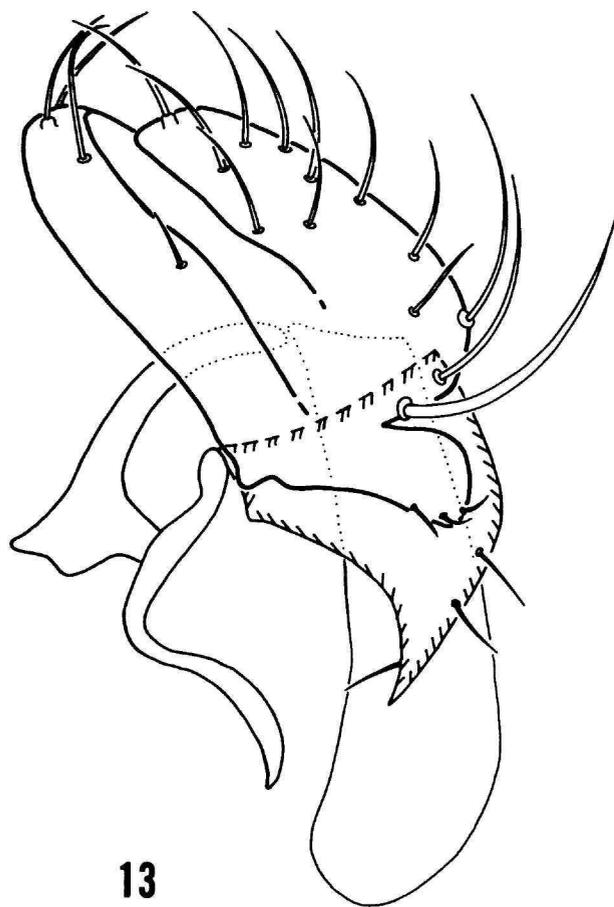
DESCRIPTION.—Small to moderately small shore flies, length 1.70 to 2.10 mm.

Head: Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion short, about $\frac{1}{3}$ total aristal length; arista bearing 4 dorsal rays, basal 3 subequal in length. Face of female bicolorous, silvery gray colored on ventral half, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4 rows, lateral rows with fewer setulae and poorly developed anteriorly; mesonotum brown, coloration more or less uniform; a distinct, horizontal, silver-colored stripe from postpronotum through ventral portion of notopleuron; a second horizontal stripe from proepisternum through ventral $\frac{1}{3}$ of anepisternum; anepimeron and katepisternum mostly grayish, concolorous. Wing lightly milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.47; M vein

ratio 0.43. Legs, except for tarsi, grayish brown to brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: First, 2nd, and in some specimens anterior $\frac{1}{2}$ of 3rd terga brown to grayish brown; ventral portion of 3rd and 4th terga silvery gray. Male terminalia (Figure 13) as follows: Epandrium in lateral view a narrow band, ventral margin slightly produced anteroventrally; cercus moderately narrow in lateral view, width little more than that of epandrium; surstylus moderately well produced comparatively, length subequal to width of cercus, posterior margin conspicuously convex, anterior margin shallowly concave, greatest width preapical; aedeagal apodeme with basal portion irregularly shaped, with a short posterior projection, which attaches to the hypandrium, and a much larger, tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, more or less parallel sided, apex broadly rounded; gonite irregularly trapezoidal, posteroventral angle slightly projected, acutely pointed; hypan-



13

FIGURE 13.—*Allotrichoma ecuadorensis*: male terminalia, lateral aspect.

drium in lateral view angulate, ventral arm longer and more robust.

TYPE MATERIAL.—The holotype male is labeled "ECUADOR: Manabi Pr[ovince]. Bahia[de Caráquez,] 10 Jan 1978[,] Wayne N. Mathis." The allotype female bears the same label as the holotype. The holotype is point mounted, is in good condition, and is deposited in the Smithsonian Institution (USNM).

DISTRIBUTION (Figure 15).—This species is known only from the type locality in Ecuador.

ETYMOLOGY.—The species epithet, *ecuadorensis*, alludes to the country where the type series was collected.

REMARKS.—This species is similar to *A. abdominale* in having the distinctive, silvery gray, horizontal stripe from the postpronotum through the ventral portion of the notopleuron. The ventral half of the anepisternum and katepisternum are brown, mostly unicolorous in this species, whereas in *A. abdominale* there is a second stripe across the ventral portion of the anepisternum or the ventral half of the anepisternum is entirely silvery gray, concolorous with the katepisternum. Other distinguishing characters are as noted in "Key to the Species of the Subgenus *Pseudohecamede* Hendel" and the species diagnosis.

Allotrichoma (Pseudohecamede) faciale (Hendel),
new combination

FIGURES 14, 15

Pseudohecamede facialis Hendel, 1936:105 [Brazil].—Cresson, 1946:138 [revision].—Wirth, 1965:737 [nearctic catalog]; 1968:5 [neotropical catalog].

DESCRIPTION.—Small shore flies, length 1.45 to 1.95 mm. **Head:** Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion nearly $\frac{1}{2}$ total arisal length; arista bearing 4–6 dorsal rays, basal 3 subequal in length. Face of female bicolored, silvery colored on ventral $\frac{2}{3}$, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 2 rows anteriorly, 4 from about sutural level, these rows with fewer setulae; mesonotum, anepisternum, and anepimeron brown, pleural areas only slightly lighter in coloration ventrally and lacking horizontal stripes; katepisternum silvery colored. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.46; M vein ratio 0.32. **Legs,** except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: All terga brownish colored; 4th sternum narrow, slightly wider posteriorly than anteriorly. Male terminalia

(Figure 14) as follows: Epandrium in lateral view a narrow band, ventral margin slightly produced anteroventrally; cercus moderately narrow in lateral view, width little more than that of epandrium; surstylus moderately well produced comparatively, apex bluntly rounded, length subequal to width of cercus; aedeagal apodeme with basal portion irregularly shaped, with a moderately long posterior projection, which attaches to the hypandrium, and a longer, tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, very slightly tapered toward base, apex broadly rounded; gonite as an irregular pentagon, with posteroventral angle slightly produced; hypandrium in lateral view angulate, with each arm of about equal length.

TYPE MATERIAL.—The male lectotype, here designated, is labeled "Unt. Amazonas Santarem 18.VIII 27. [18 Aug 1927; day and month handwritten] Zerny/Pseudohecam[ede] facialis H. [species name handwritten] F. Hendel det./Coll Hendel." The lectotype is double mounted (minute nadel in rectangular foam block), is in fair condition (the abdomen has been removed and dissected, the parts are in an attached microvial), and is in Vienna (NMW). The second specimen is a female, although reported to be a male, and bears the same locality and determination labels as the lectotype but there is also a red "Type" label. This specimen is designated as a paralectotype.

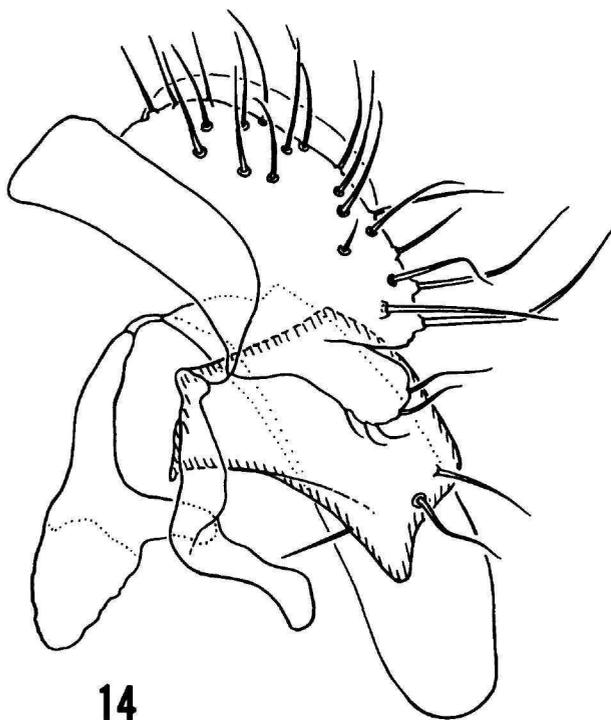


FIGURE 14.—*Allotrichoma faciale*: male terminalia, lateral aspect.

There is also a third specimen, a female that was misidentified as *A. abdominale*, which is also from the type locality.

OTHER SPECIMENS EXAMINED.—BRAZIL. *Amazonas*: Santarém (1♂; NMW). *Rio de Janeiro*: Jacarepagua, 5 Nov 1939, S. Lopes (1♂; USNM). ECUADOR. *Loja*: Catamayo, Dec 1955, J.R. Levi-Castillo (1♂, 1♀; USNM). *Guayas*: Rio Bobo, Aug 1955, J.R. Levi-Castillo (1♂; USNM); Tenguel, Dec 1955, J.R. Levi-Castillo (2♀; USNM). *Manabi*: Bandurria, Aug 1955 (1♀; USNM).

DISTRIBUTION (Figure 15).—Brazil and Ecuador.

REMARKS.—This species is similar to *A. adustum* in having the mesonotum and dorsal portion of the anepisternum unicolorous, lacking a distinctive stripe along the postpronotum and notopleuron. Specimens of *A. adustum*, however, have the abdominal terga mostly silvery gray, whereas the terga in specimens of *A. faciale* are light brown in coloration. Other distinguishing characters for this species are as noted in "Key to the Species of the Subgenus *Pseudohecamede* Hendel" and the diagnosis above.

Allotrichoma (Pseudohecamede) adustum, new species

FIGURES 16, 17

Pseudohecamede facialis, in part, of author's (misidentification): Wirth, 1965:737 [nearctic catalog]; 1968:5 [neotropical catalog].

DESCRIPTION.—Small to moderately small shore flies, length 1.65 to 2.20 mm.

Head: Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion about $\frac{1}{3}$ total arista length; arista bearing 4–6 dorsal rays, basal 3 subequal in length. Face of female bicolored, silvery colored on ventral $\frac{2}{3}$, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4 rows although lateral rows with sparse to lacking setulae anteriorly; mesonotum, anepisternum, and anepimeron brown to dark brown, pleural areas only slightly lighter in coloration ventrally and lacking horizontal stripes; katepisternum silvery colored. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.45; M vein ratio 0.44. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: Terga mostly silvery gray, some specimens with basal 2 terga very lightly brownish. Male terminalia (Figure 16) as follows: Epandrium in lateral view a narrow band, ventral margin not produced anteroventrally; cercus moderately narrow in lateral view, although obviously wider than width of epandrium; surstylus comparatively well developed, length longer than width of epandrium, apex slightly but irregularly



FIGURE 15.—Distribution map of *Allotrichoma ecuadorensis* (filled diamond) and *Allotrichoma faciale* (filled circles).

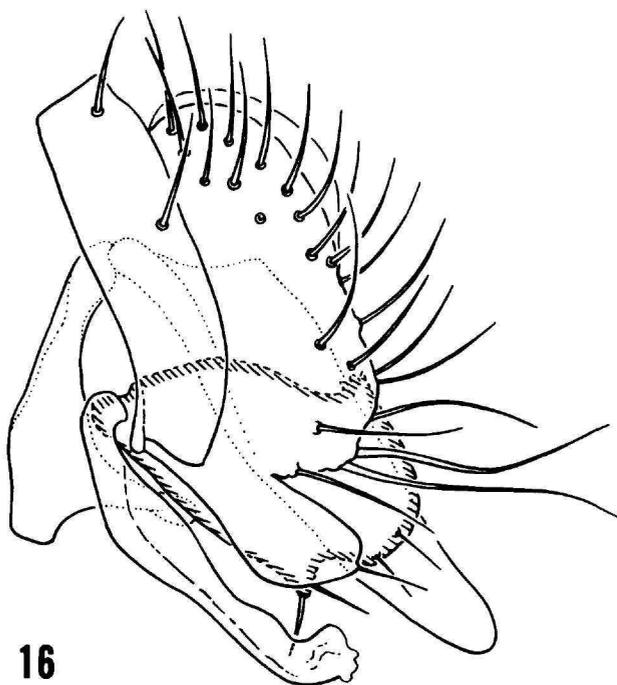


FIGURE 16.—*Allotrichoma adustum*: male terminalia, lateral aspect.

angulate; aedeagal apodeme with basal portion small, irregularly shaped, with a moderately long posterior projection, which attaches to the hypandrium, and a longer, slightly tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, distinctly tapered toward apex, apex narrowly rounded; gonite as an irregular rectangle, posteroventral angle only slightly produced, anterodorsal surface sinuate; hypandrium in lateral view nearly flat, with no evident development of separate arms.

TYPE MATERIAL.—The male holotype is labeled "BELIZE. Stann Crk. Dist. Twin Cays (Aanderaa Flats) 17–21 March 1988 Wayne N. Mathis." The allotype female and one other female bear the same label data as the holotype. The holotype is double mounted (minute nadel in plastic elastomere block), is in excellent condition, and is deposited in the Smithsonian Institution (USNM). Other paratypes are as follows: BAHAMAS. Exuma Cays: Warderick Wells Cay, 10 Jan 1953, L. Giovannoli (1♀; USNM). Fortune Island (or Long Cay), near Albert Town, 7 Mar 1953, E.B. Hayden, L. Giovannoli (1♂; USNM).

BELIZE. *Stann Creek District*: Coco Plum Cay, 31 Jul 1989, W.N. Mathis (1♂; USNM); Tobacco Range, 30 Jul 1989, W.N. Mathis (1♂, 2♀; USNM); Twin Cays, Aanderaa Flats, 23–25 Jul 1989, 7–19 Nov 1987, D. Mathis, W.N. Mathis (3♂; USNM); Twin Cays, south end of East Island, 25 Jul

1989, W.N. Mathis (1♀; USNM).

ECUADOR. Guayas Gala (night), Dec 1955, J.R. Levi-Castillo (1♂, 1♀; USNM). Los Rio Vinces, Oct 1954, J.R. Levi-Castillo (1♀; USNM).

UNITED STATES. *Florida*: Dade Co., Everglades National Park, 10 Mar 1955, H.A. Denmark (1♀; USNM). Big Pine Key, 30 Dec 1954, H.V. Weems (1♀; USNM). Monroe Co., Bahia Honda Key (seashore), 11 Apr 1970, W.W. Wirth (1♂; USNM).

WEST INDIES. JAMAICA. Milk River Bath (mangrove), 11 Mar 1970, T. Farr, W.W. Wirth (2♀; USNM). Negril Beach (rocky shore), 12 Mar 1970, W.W. Wirth (1♂; USNM).

DISTRIBUTION (Figure 17).—Western Hemisphere from 30° north latitude to 3° south latitude, primarily in countries around or within the Caribbean and Gulf of Mexico but also Ecuador.

ETYMOLOGY.—The species epithet, *adustum*, is a Latin adjective for the color brown, in allusion to the brown, mostly concolorous anepisternum and anepimeron.

REMARKS.—This species is similar to *A. faciale* in having the mesonotum and dorsal portion of the anepisternum unicolorous, without a distinctive, silvery gray stripe, and the thoracic coloration is dark brown. Specimens of *A. adustum*, however, have the abdominal terga mostly silvery gray, whereas the terga in specimens of *A. faciale* are light brown in coloration. Other distinguishing characters for this species are as noted in "Key to the Species of the Subgenus *Pseudohecamede* Hendel" and the diagnosis above.

Allotrichoma (Pseudohecamede) steineri, new species

FIGURES 18, 19

DESCRIPTION.—Moderately small shore flies, length 2.25 to 2.80 mm.

Head: Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, $\frac{1}{2}$ to $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion about $\frac{1}{3}$ total arista length; arista bearing 4 dorsal rays, basal 3 subequal in length. Face of female bicolored, silvery colored on ventral $\frac{2}{3}$, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4 rows although lateral rows with sparse to lacking setulae anteriorly; mesonotum, anepisternum, and anepimeron grayish tan, pleural areas only slightly lighter in coloration ventrally and lacking horizontal stripes; katepisternum more grayish. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.46; M vein ratio 0.43. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish ventrally, apical 2 tarsomeres grayish brown.

Abdomen: Terga mostly silvery gray, some specimens with basal 2 terga very lightly brownish. Male terminalia (Figure 18)



FIGURE 17.—Distribution map of *Allotrichoma adustum*.

as follows: Epandrium in lateral view a narrow band, ventral margin slightly produced anteroventrally; cercus moderately narrow in lateral view, width little more than that of epandrium; surstylus moderately well produced comparatively, length subequal to width of cercus; aedeagal apodeme with basal portion irregularly shaped, with a short posterior projection, which attaches to the hypandrium, and a much larger, tapered, dorsal projection, which attaches to the base of the aedeagus;

aedeagus simple, more or less parallel sided, apex broadly rounded; gonite irregularly trapezoidal, posteroventral angle slightly projected, acutely pointed; hypandrium in lateral view angulate, ventral arm longer and more robust.

TYPE MATERIAL.—The male holotype is labeled "COSTA RICA Guanacaste Prov. Playa Tamarindo 28 March 1987 W. E. Steiner/Swept from sandy mud flats around brackish lagoon." The allotype female and 62 paratypes (12♂, 49♀;

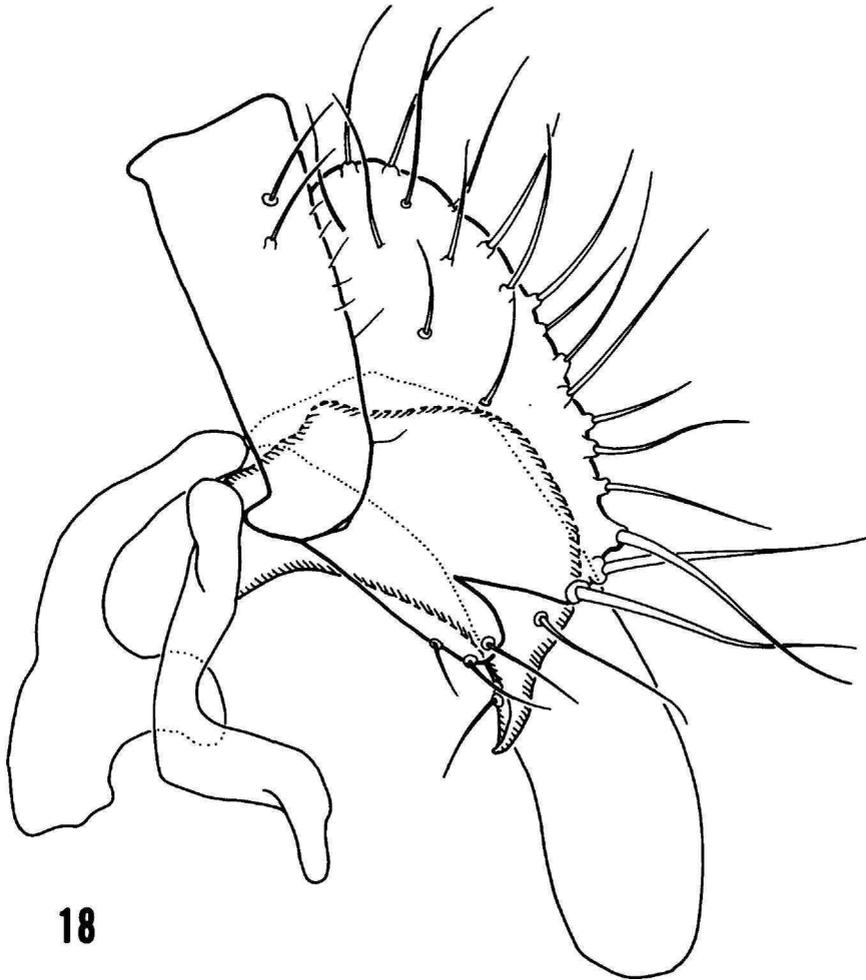


FIGURE 18.—*Allotrichoma steineri*: male terminalia, lateral aspect.

USNM) bear the same label data as the holotype. Other paratypes are as follows: PERU. *Cuzco*: Paucartambo, Atalaya (Rio Alto Madre de Dios, 600 m) 4 Sep 1988, W.N. Mathis (3♂; USNM). *Madre de Dios*: Diamante (12°25'S, 70°57'W, Rio Alto Madre de Dios, 400m), 7 Sep 1988, W.N. Mathis (1♀; USNM); Erika (near Salvacion, 550 m), 5–6 Sep 1988, W.N. Mathis (3♀; USNM); Manu (Rio Manu), near Pakitza (12°1'S, 70°57'W, 250m), 9–23 Sep 1988, W.N. Mathis (1♂, 2♀; USNM); Romero (Rio Manu), 8 Sep 1988, W.N. Mathis (3♀; USNM). The holotype is point mounted, is in excellent condition and is deposited in the Smithsonian Institution (USNM).

DISTRIBUTION (Figure 19).—This species is presently known only from the type locality in Costa Rica and the few

sites in Peru.

ETYMOLOGY.—The species epithet, *steineri*, is a Latinized patronym to recognize Warren E. Steiner, especially his interest and efforts to collect shore flies.

REMARKS.—This species is similar to *A. faciale* and *A. adustum* in having the mesonotum and dorsal portion of the anepisternum unicolorous, without a distinctive, silvery gray stripe; the coloration, however, is much lighter, being yellowish to tan. Like specimens of *A. adustum*, the abdominal terga are mostly silvery gray, whereas the terga in specimens of *A. faciale* are light brown in coloration. Other distinguishing characters for this species are as noted in "Key to the Species of the Subgenus *Pseudohecamele* Hendel" and the diagnosis above.



FIGURE 19.—Distribution map of *Allotrichoma steineri*.

Allotrichoma (Pseudohecamede) salubre Cresson

FIGURES 20–24

Allotrichoma salubris Cresson, 1930:78 [Brazil].

Pseudohecamede nasalis Hendel, 1936:104 [Paraguay].—Cresson, 1946:138 [synonymy].

Pseudohecamede salubris.—Cresson, 1946:138 [generic combination].—Wirth, 1968:5 [neotropical catalog].

DESCRIPTION.—Small to moderately small shore flies, length 1.55 to 2.35 mm.

Head (Figures 20–22): Proclinate fronto-orbital seta absent; pseudopostocellar setae absent. Arista with thickened basal portion long, about $\frac{1}{2}$ total aristal length; arista bearing 4 dorsal rays, basal 3 subequal in length. Face of male and female bicolored, silvery colored on ventral $\frac{1}{2}$, concolorous with gena, brown dorsally, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 2 rows anteriorly, 4 posteriorly, although both lateral rows with sparse

setulae; mesonotum brownish, multicolored, dark brown along setal tracks and more generally posteriorly, otherwise lighter in coloration, olivaceous to grayish brown, lacking lateral stripes; pleural areas including postpronotum and ventral $\frac{1}{3}$ of notopleuron silvery gray. Wing hyaline anteriorly, becoming milky white on posterior $\frac{1}{3}$; costal vein brownish, those behind lighter, yellowish brown to yellowish; costal vein ratio 0.33; M vein ratio 0.44. Legs grayish black to black; tarsomeres entirely dark colored, grayish black.

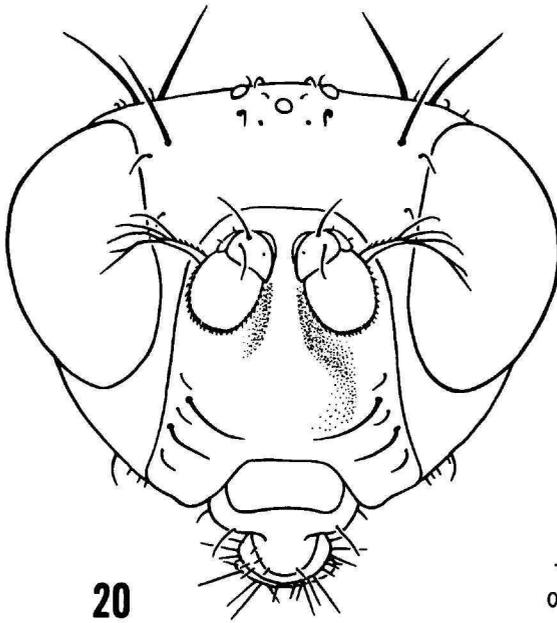
Abdomen: Terga 1 and 2 brownish, others silvery gray. Male terminalia (Figure 23) as follows: Epandrium in lateral view a very narrow, arched band, with ventral half conspicuously tapered, posteroventral angle narrowly produced; cercus distinctly narrow in lateral view, width no more than that of epandrium; surstylus very poorly developed, development a slightly produced, rounded projection; aedeagal apodeme with basal portion large, irregularly shaped, with a short posterior projection, which attaches to the hypandrium, and a longer, slightly tapered, dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, parallel sided, apex bluntly rounded; gonite more or less rectangular, posteroventral angle only slightly produced, anterodorsal surface evenly and shallowly concave; hypandrium in lateral view angulate, ventral arm longer but no more robust than dorsal arm.

TYPE MATERIAL.—The male holotype of *A. salubre* is labeled “♂ [square label]/[a yellow disk with a pencil drawing on the dorsal surface]/211 [handwritten on a square, light orange label]/TYPE No. 6368 *Allotrichoma SALUBRIS* E T Cresson, Jr. [red label, number and species name handwritten]/ANSP [yellow].” The holotype bears no locality label, although Cresson wrote that the specimen was from Brazil and that H.H. Smith was the collector. The holotype is double mounted (minute nadel in cork block), is in good condition (the minuten protrudes from the left side), and is in the Academy of Natural Sciences (ANSP 6368).

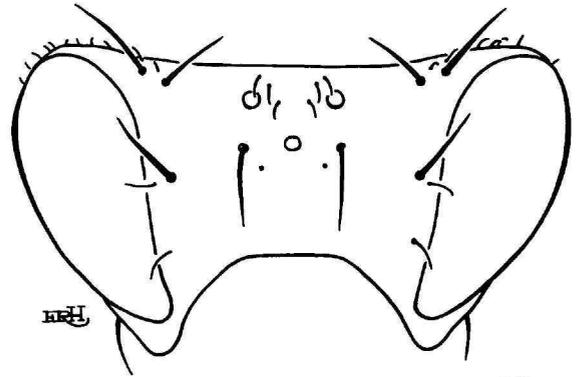
Seven syntype females of the junior synonym, *A. nasale* Hendel, are labeled “Fiebrig Paraguay Chaco/Type [red].” Hendel reported the syntypes to be males, but all are females. In addition to the syntypes there are 81 female specimens bearing the same label data as the syntypes. All specimens are double mounted, usually two to a rectangular foam block, are in poor condition (they appear shriveled, either from being teneral or from being mounted from alcohol), and are in the Naturhistorisches Museum, Wien (NMW) and the Academy of Natural Sciences of Philadelphia (ANSP).

OTHER SPECIMENS EXAMINED.—ARGENTINA. *Mendoza:* Uspallata, 24 Jan 1954, M.L. Aczel (1♀; USNM). *Tucumán:* Tacanas, 20–28 Nov 1947, R. Golbach (1♂; USNM); Laca Vera [? could not find], 23–28 Nov 1961, M.L. Aczel, R. Golbach (1♀; USNM).

CHILE. *Bio Bio:* Santa Barbara (1 km S, 290 m), 25 Jan 1978, W.N. Mathis (1♂; USNM). *Cautin:* Temuco (20 km E), 7 Jan 1951, E.S. Ross, A.E. Michelbacher (48♂, 25♀; CAS, USNM); Villarrica (30 km NW), 25 Jan 1978, W.N. Mathis

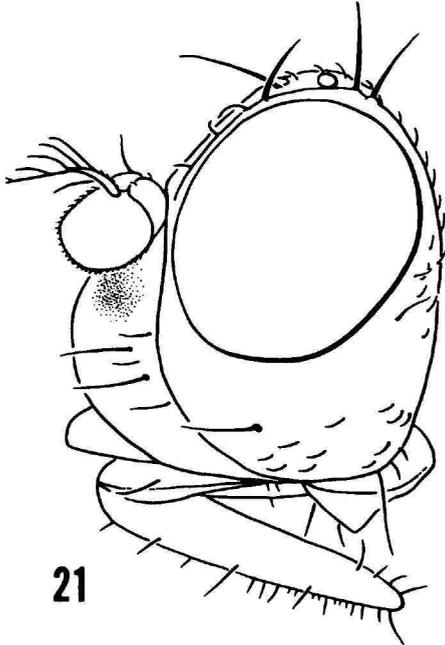


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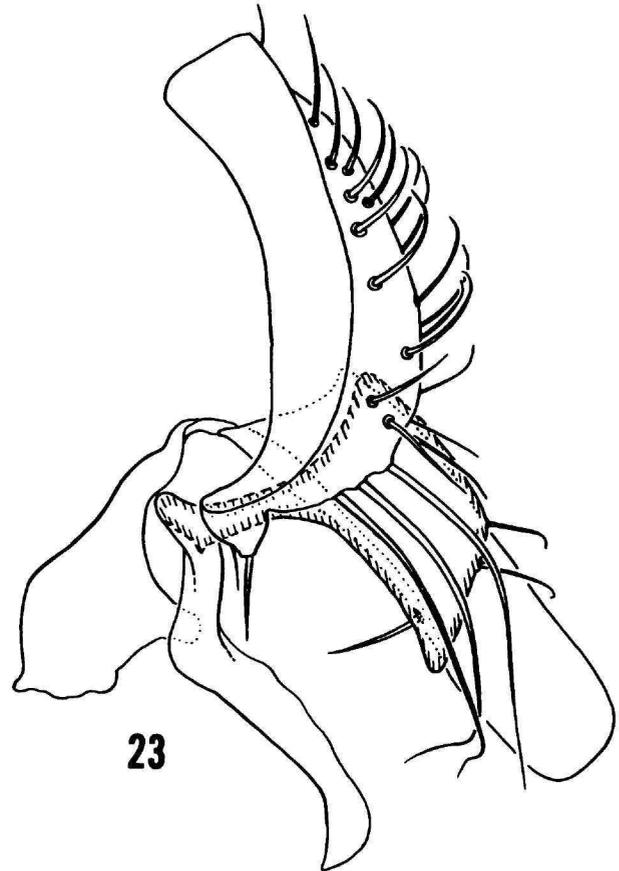


22

↑
0.1mm
↓



21



23

FIGURES 20-23.—*Allotrichoma salubre*: 20, head, anterior aspect; 21, head, lateral aspect; 22, head, dorsal aspect; 23, male terminalia, lateral aspect.

(8♂, 8♀; USNM). *Coquimbo*: Hidalgo [? Hacienda] Illapel, 21-24 Nov 1959, L.E. Peña (1♂; CNC); Incahuasi, 30 Sep

1952, P.G. Kuschel (2♀; USNM); Laguna Dam (3.5 km N, between Juntas and Paso del Agua Negra, 8000 ft), 6 Dec 1950,

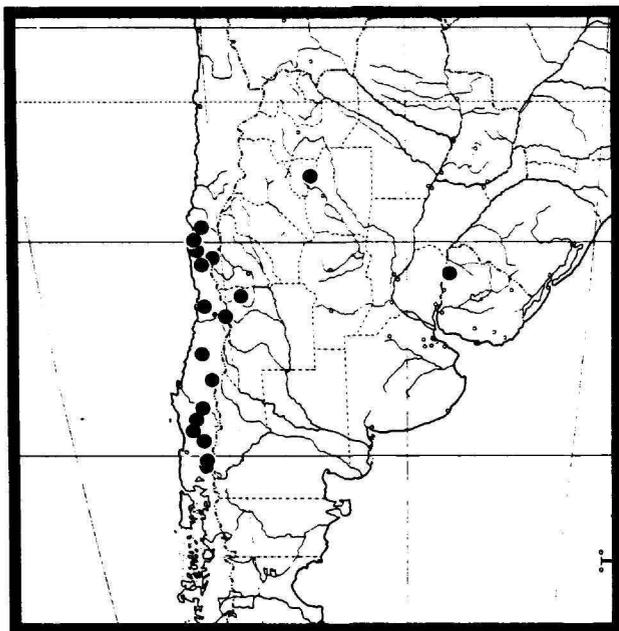


FIGURE 24.—Distribution map of *Allotrichoma salubre*.

E.S. Ross, A.E. Michelbacher (1♀; CAS); La Serena (20 mi E), 3 Dec 1950, E.S. Ross, A.E. Michelbacher (1♀; CAS); Manquehua, Combarbala (Maj. Blanca), 2–8 Aug 1960, L.E. Peña (1♀; CNC); Ovalle (20 mi SW), 12 Dec 1950, E.S. Ross, A.E. Michelbacher (1♀; CAS). *Malleco*: Angol, 1 Jan 1951, E.S. Ross, A.E. Michelbacher (1♂, 1♀; CAS, USNM); Liucura (1000 m), 6–10 Jan 1959, L.E. Peña (3♀; CNC); Victoria (11 km N, 300 m), 25 Jan 1978, W.N. Mathis (3♂, 2♀; USNM). *Nuble*: Perquilauquen (12 km S Parral, 160 m), 24 Jan 1978, W.N. Mathis (12♂, 4♀; USNM); San Carlos (50 km E), 26 Dec 1950, E.S. Ross, A.E. Michelbacher (2♂; CAS, USNM); San Carlos (40 km E), 23 Dec 1950, E.S. Ross, A.E. Michelbacher (1♂, 1♀; CAS, USNM); San Carlos (18 km E), 24 Dec 1950, E.S. Ross, A.E. Michelbacher (1♂, 3♀; CAS, USNM); San Carlos (15 km E), 23 Dec 1950, E.S. Ross, A.E. Michelbacher (2♀; CAS). *O'Higgins*: Rio Claro (5 km N Rengo, 300 m), 23 Jan 1978, W.N. Mathis (4♂, 2♀; USNM). *Osorno*: Aguas Calientes (1 km SE, 530 m), 7–8 Feb 1978, W.N. Mathis (2♀; USNM); Anticura (1 km W, 430 m), 5 Feb 1978, W.N. Mathis (1♂, 1♀; USNM); Anticura (4 km W, 400 m), 3 Feb 1978, W.N. Mathis (5♂, 11♀; USNM); Lago Puyehue (SE shore), 6–10 Feb 1978, W.N. Mathis (2♂, 3♀; USNM); Lago Puyehue (W shore), Entre Lagos, 14 Feb 1978, W.N. Mathis (2♀; USNM); Lago Rupanco (El Encanto), 6 Feb 1978, W.N. Mathis (4♂, 2♀; USNM); Laguna El Pato (1100 m), 13 Feb 1978, W.N. Mathis (5♂, 4♀; USNM); Pucatrihue, 27–30 Jan 1978, W.N. Mathis (5♀; USNM); Rio Bueno (N Osorno), 14

Jan 1951, E.S. Ross, A.E. Michelbacher (1♂; CAS); Rio Golgol (300 m), 13–19 Mar, 1955, L.E. Peña (1♀; CNC). *Santiago*: El Alfalfal (1320 m), 22 Jan 1978, W.N. Mathis (2♂, 2♀; USNM); Quebrada de la Plata, Rinconada, Maipo (550 m), 27 Mar 1966, M.E. Irwin (1♂, 3♀; CAS); Rio Clarillo, 27 Oct 1954, P.G. Kuschel (1♂; USNM); Rio Maipo (7 km E, 1065 m), 22 Jan 1978, W.N. Mathis (4♂; USNM). *Talca*: Rio Lircay (11 km N Talca, 85 m), 23 Jan 1978, W.N. Mathis (8♂, 14♀; USNM). *Valparaiso*: Rio [Estero] Marga Marga, Los Perales, 13 Oct 1966, M. Irwin, E.I. Schlinger (8♂, 10♀; CAS, USNM).

URUGUAY. Montevideo to Salto and Concordia, at light, 6–14 Mar 1940, H.L. Parker (1♀; ANSP).

DISTRIBUTION (Figure 24).—Southern South America between 27° and 42° south latitude (Argentina, Chile, Paraguay, and Uruguay).

REMARKS.—This is the most distinctive species of the subgenus and is easily distinguished from congeners (see characters already noted in the “Key to the Species of the Subgenus *Pseudohecamede* Hendel.”)

I have accepted the synonymy of *A. nasale* with *A. salubre*, but with some reservation. The problem, which remains unresolved, is the poor condition of the syntypes of *A. nasale*, making identification of the specimens difficult to impossible. For the present, I accept the synonymy proposed by Cresson (1946) and Wirth (1968).

Allotrichoma (Pseudohecamede) slossonae (Cresson)

FIGURES 25, 26

Allotrichoma slossonae Cresson, 1942:108 [Florida].

Pseudohecamede slossonae.—Wirth, 1965:737 [generic combination].

DESCRIPTION.—Moderately small shore flies, length 2.30 to 2.95 mm. *Head*: Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion short, about $\frac{1}{3}$ total aristal length; arista bearing 4–5 dorsal rays, basal 3 subequal in length. Face of female bicolored, silvery colored on ventral $\frac{1}{2}$, concolorous with gena, brown dorsally, concolorous with frons; face of male more unicolorous, brown, concolorous with frons; lower facial margin shallowly emarginate.

Thorax: Presutural seta present, subequal to larger postpronotal seta; acrostichal setulae in 4–6 rows anteriorly, lateral rows with fewer setulae; mesonotum and dorsal portion of anepisternum brown, coloration more or less uniform, some specimens with slightly darker coloration through setal tracks; a horizontal, light silvery gray stripe from postpronotum through ventral portion of notopleuron; dorsal $\frac{1}{3}$ of anepisternum light brown, otherwise pleural areas silvery gray. Wing milky white; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.43; M vein ratio 0.46. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 1–2

tarsomeres yellowish, apical 1–2 grayish brown.

Abdomen: Second tergum very lightly grayish brown; other terga silvery gray. Male terminalia (Figure 25) as follows: Epandrium in lateral view well developed dorsally, distinctly tapered ventrally, and posteroventral angle little produced; cercus well developed, width obviously greater than that of epandrium; surstylus moderately well developed comparatively, length less than width of cercus, apex pointed; aedeagal apodeme with basal portion large, irregularly shaped, with a short posterior projection, which attaches to the hypandrium, and a short dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, dorsal surface slightly sinuate, and with preapical enlargement, apex narrowly rounded; gonite as an irregular triangle, posteroventral angle well developed, robust, anterodorsal surface shallowly concave; hypandrium in lateral view angulate, ventral arm longer but no more robust than dorsal arm.

TYPE MATERIAL.—The holotype female is labeled "BISC[ayne] BAY, FL[orida]A./Mrs. [A.T.]Slosson Collector/Type No. 56367 U.S.N.M. [red]/Pseudohecamede slossonae Cress. [red, handwritten]/Published as *Allotrichoma slossonae* Cresson [white, handwritten]." The holotype is point mounted, is in fair condition (much of the left side of the thorax is obscured by the glue and tip of the paper point), and is in the Smithsonian Institution, National Museum of Natural History (USNM).



FIGURE 25.—*Allotrichoma slossonae*: male terminalia, lateral aspect.

OTHER SPECIMENS EXAMINED.—CHILE. *Antofagasta*: San Pedro Atacama (2280 m), 1–5 May 1964, L.E. Peña (1♂; CNC).

ECUADOR. *Manabi*: Bahia, 10 Jan 1978, W.N. Mathis (16♂, 10♀; USNM).

MEXICO. *Chiapas*: Boca de Cielo (17 km S Puerto Arista), 18 May 1985, W.N. Mathis, A. Freidberg (3♂, 3♀; USNM); Puerto Arista, 18 May 1985, W.N. Mathis, A. Freidberg (1♂; USNM). *Tabasco*: Paraíso (5 km E), 6 May 1985, W.N. Mathis, A. Freidberg (3♂, 5♀; USNM).

PANAMA. *Canal Zone*: Mojinga Swamp, Fort Sherman, Jan 1953 (1♀; USNM). *Darien*: Jaque, 24 Jul 1952, F.S. Blanton (1♀; USNM). *Panama*: San Carlos, 17 Sep 1952, F.S. Blanton (1♀; USNM); Vique Cove, 7 Oct 1952, F.S. Blanton (1♂; USNM).

UNITED STATES. *Florida*: Dade Co., Biscayne Bay, A.T. Slosson (1♀; USNM).

WEST INDIES. DOMINICA. Cabrits (swamp), 22 Mar 1989, W.N. Mathis (1♂, 2♀; USNM); Calibishie, 22 Mar 1989, W.N. Mathis (1♀; USNM); Layou River (mouth), 6 Feb 1965, W.W. Wirth (3♂; USNM); Rosalie, 23 Mar 1989, W.N. Mathis (3♂, 3♀; USNM).

DISTRIBUTION (Figure 26).—Chile, Ecuador, Mexico, Panama, United States (Florida), and the West Indies (Dominica and St. Vincent).

REMARKS.—This is the only species of the subgenus to have a conspicuous, presutural seta, which is subequal in length to the postpronotal seta. For other distinguishing characters, see "Key to the Species of the Subgenus *Pseudohecamede* Hendel"

Allotrichoma (Pseudohecamede) jamaicense, new species

FIGURES 26, 27

DESCRIPTION.—Small to moderately small shore flies, length 1.60 to 2.10 mm.

Head: Proclinate fronto-orbital seta present, subequal in length to reclinate seta; pseudopostocellar setae present, about $\frac{3}{4}$ length of ocellar setae. Arista with basal thickened portion short, about $\frac{1}{3}$ total arista length; arista bearing 4–5 dorsal rays, basal 3 subequal in length. Face of male and female unicolorous, brown, concolorous with frons; facial carina ended ventrally as a subshiny to shiny tubercle; lower facial margin shallowly emarginate.

Thorax: Presutural seta either absent or inconspicuous, similar to surrounding setulae; acrostichal setulae in 4 rows although lateral rows with sparse to no setulae anteriorly; mesonotum and pleural areas brown, becoming more thinly microtomentose ventrally, subshiny, lacking horizontal stripes. Wing hyaline; veins pale colored, costal vein yellowish, those behind whitish; costal vein ratio 0.47; M vein ratio 0.36. Legs, except for tarsi, grayish to grayish brown; tarsi with basal 3 tarsomeres yellowish, apical 2 grayish brown.

Abdomen: Terga brown, microtomentum sparse laterally,



FIGURE 26.—Distribution map of *Allotrichoma slossonae* (filled circles) and *Allotrichoma jamaicense* (filled diamonds).

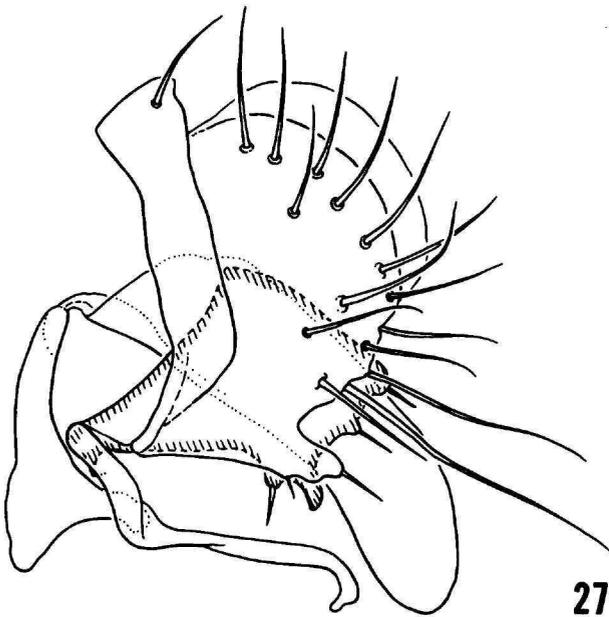


FIGURE 27.—*Allotrichoma jamaicense*: male terminalia, lateral aspect.

subshiny to shiny. Male terminalia (Figure 27) as follows: Epandrium in lateral view narrowly developed, a narrow band, posteroventral angle distinctly produced; cercus well devel-

oped, width about twice that of epandrium; surstylus moderately developed comparatively, narrow, length less than width of cercus, apex slightly pointed; aedeagal apodeme with basal portion small, irregularly shaped, with a short posterior projection, which attaches to the hypandrium, and a longer dorsal projection, which attaches to the base of the aedeagus; aedeagus simple, more or less parallel sided, apex moderately rounded; gonite as an irregular rectangle, posteroventral angle produced, but only slightly more than 2 other projections along posterior margin, anterodorsal surface shallowly concave; hypandrium in lateral view slightly angulate, ventral arm longer but no more robust than dorsal arm.

TYPE MATERIAL.—The holotype male is labeled "JAMAICA Wag Water R[iver]. 25 Feb. 1969 W.W. Wirth stream." The allotype female and six paratypes (4♂, 2♀; USNM) are labeled "JAMAICA Runaway Bay Feb. 1969 W.W. Wirth stream bed." Other paratypes are as follows: JAMAICA. Annotto Bay (marsh), 25 Feb 1969, W.W. Wirth (1♂, 1♀; USNM). The holotype specimen is double mounted (minute nadel in a polyporous block), is in good condition, and is deposited in the Smithsonian Institution (USNM).

DISTRIBUTION (Figure 26).—West Indies: Jamaica.

ETYMOLOGY.—The species epithet, *jamaicense*, is a Latinized geographical name meaning from the island of Jamaica.

REMARKS.—The subshiny to shiny abdominal dorsum, especially toward the lateral margins, is unique among congeners of *Pseudohecamele* and distinguishes this species. For other characters, see "Key to the Species of the Subgenus *Pseudohecamele* Hendel" and the species diagnosis above.

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