ZOOTAXA

1887

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HUMBERTO FONSECA MENDES & TROND ANDERSEN

Magnolia Press
Auckland, New Zealand

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(*Zootaxa* 1887)

75 pp.; 30 cm.

29 Sept. 2008

ISBN 978-1-86977-279-6 (paperback)

ISBN 978-1-86977-280-2 (Online edition)

FIRST PUBLISHED IN 2008 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

http://www.mapress.com/zootaxa/

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Zootaxa 1887: 1–75 (2008)
www.mapress.com/zootaxa/

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HUMBERTO FONSECA MENDES & TROND ANDERSEN

The Natural History Museum, University of Bergen, N-5020 Bergen, Norway.
E-mails: humberto.mendes@bm.uib.no, trond.andersen@zmb.uib.no

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Accepted by J. Moulton: 2 Jul. 2008; published: 29 Sept. 2008

Abstract

The genus *Antillocladius* Sæther, 1981 currently comprises 17 described species. In the present paper, seven new Brazilian species, *A. atalaia* **sp. n.**, *A. axitiosus* **sp. n.**, *A. brazuca* **sp. n.**, *A. campususp* **sp. n.**, *A. gephyrus* **sp. n.**, *A. plicatus* **sp. n.**, and *A. ultimus* **sp. n.** are described and illustrated as males, and *Parametriocnemus subnubilus* Sinharay *et* Chaudhuri, 1979 from India is transferred to *Antillocladius*. Two new species of the closely related genus, *Litocladius* Mendes, Andersen *et* Sæther, 2004, *L. floripa* **sp. n.** and *L. confusus* **sp. n.**, are described and figured as males. Two new Neotropical genera are described and figured. *Gravatamberus* **gen. n.** with five included species, *G. apicalus* **sp. n.**, *G. curtus* **sp. n.**, *G. guatemaltecus* **sp. n.**, *G. nidularium* **sp. n.**, and *G. pilosus* **sp. n.**, is based on larva, pupa, and male. *Lyrocladius* **gen. n.** with the single included species *L. radulatus* **sp. n.** is based on the male only. Keys to orthoclad genera with scalpellate acrostichals and to the males of the included genera are provided. According to the cladogram presented, three monophyletic groups can be recognized; one composed of *Antillocladius*, *Litocladius* and *Lyrocladius*; one composed of *Compterosmittia* Sæther, *Hanocladius* Wang *et* Sæther, *Limnophyes* Eaton and *Paralimnophyes* Brundin; and a third, composed of *Gravatamberus*, Genus H *sensu* Epler, and *Gynocladius* Mendes, Sæther *et* Andrade-Morraye.

Key words: Chironomidae, Orthocladiinae, *Antillocladius*, *Gravatamberus*, *Litocladius*, *Lyrocladius*, *Parametriocnemus*, new species, new genus, Neotropical region, Brazil, Mata Atlântica

Introduction

During the last decade collecting in South- and Central America has revealed numerous orthoclad species that are difficult to place in previously described, mostly Holarctic genera, and several new genera have been erected to accommodate some of them (Andersen & Mendes 2007; Andersen & Sæther 2005; Cranston 2000; Cranston & Edward 1999; Mendes *et al.* 2004; Mendes *et al*. 2005). In the present paper we review the genera *Antillocladius* Sæther, 1981 and *Litocladius* Mendes, Andersen *et* Sæther, 2004, and describe two new genera *Gravatamberus* and *Lyrocladius*. All four genera have scalpellate acrostichals, a comparatively frequent feature amongst Neotropical orthoclads.

The genus *Antillocladius* was erected by Sæther (1981) based on *A. antecalvus* Sæther, 1981, from the British West Indies. Subsequently, Sæther (1982) described two new species from the southeastern United States and emended the genus. Later, Wang and Sæther (1993) added two new species from Palaearctic and Oriental China, and Andersen and Contreras-Ramos (1999) a sixth species from Ecuador. Mendes *et al.* (2004) recognized 15 species of *Antillocladius,* describing nine new Neotropical species. The same year Yamamoto (2004) transferred two Japanese species to the genus. The genus is now known from the Neotropical, Nearctic, eastern Palaearctic, and Oriental regions. The genus *Litocladius* was described by Mendes *et al.* (2004) based on *L. mateusi* Mendes, Andersen *et* Sæther, 2004 from the São Paulo State in Brazil.

Recent collecting in Brazil keeps yielding new material. Seven new Brazilian species of *Antillocladius* and two new species of *Litocladius* are described below, and new distributional records are given. Most of these species have been taken in the southern and southeastern Atlantic Rainforest, Mata Atlântica, in the Santa Catarina, Paraná, São Paulo, and Rio de Janeiro States, but one species was collected in Bahia on the Brazilian northeastern coast. Further, *Parametriocnemus subnubilus* Sinharay *et* Chaudhuri, 1979 from India is transferred to *Antillocladius*. In addition two new genera with scapellate acrostichals are described, *Gravatamberus* with five included species from Chile, Brazil, Venezuela, Guatemala, Costa Rica and Mexico, and *Lyrocladius* with a single species from southeastern Brazil.

Mendes *et al*. (2004) proposed a key to orthoclad genera with scalpellate acrostichals. This key has been updated to include the new genera, and keys to the males of *Antillocladius, Gravatamberus,* and *Litocladius* are provided. The phylogeny of the included genera is assessed based on a data matrix of 157 characters in 77 taxa and the biogeography is outlined.

Material and methods

Terminology and specimen management

Adults were collected in Malaise traps and light traps or with sweep nets. Rearing of larvae followed the procedures outlined by Mendes (2002). The emergence trap used for collecting *G. nidularium* was described by Marcondes and Pinho (2005) (see also Pinho *et al*. 2005). All material examined have been mounted in Canada balsam or Euparal on slides following the procedure outlined by Sæther (1969). The general terminology follows Sæther (1980). Measurements are taken according to Sæther (1968) and Schlee (1966), and are given as ranges followed by the mean when 4 or more specimens are measured, followed by the number of specimens measured in parentheses.

Types of the species described herein and other material examined are deposited, as indicated in the species descriptions, in the following institutions:

MZUSP	Museu de Zoologia da Universidade de São Paulo, São Paulo, SP, Brazil.
MIZA	Museo del Instituto de Zoología Agrícola "Francisco Fernández Yépes", Faculdad de Agronomia, Universidad Central de Venezuela, Maracay, Venezuela.

NSM	The Sasa collection, National Science Museum, Tokyo, Japan.
UFSCar	Laboratório de Entomologia Aquática da Universidade Federal de São Carlos, São Carlos, SP, Brazil.
ZMBN	The Natural History Museum, University of Bergen, Bergen, Norway.
ZSM	Zoologische Staatssammlung, Munich, Germany.

Other abbreviations:

BIOTA-FAPESP	The Biodiversity Virtual Institute Program (www.biota.org.br). Project BIOTA is financially supported by Fundação de Amparo a Pesquisa do Estado de São Paulo (FAPESP).
UCAD	Unidade de Conservacão Ambiental Desterro, Florianópolis, SC, Brazil.

Phylogenetic analysis

To assess the phylogenetic relationship of the involved species, a data matrix for 157 characters in 77 taxa was compiled. All species of *Antillocladius*, *Gravatamberus* gen. n., *Litocladius* and *Lyrocladius* gen. n. plus an undescribed genus, Genus H *sensu* Epler [description submitted to the proceedings of the XV International Symposium on Chironomidae in Minneapolis, MN, U.S.A. in 2001; the genus is also taken in south and southeastern Brazil] were entered separately. In addition, the following genera were included: *Aagaardia* Sæther, 2000; *Apometriocnemus* Sæther, 1985; *Botryocladius* Cranston *et* Edward, 1999; *Brillia* Kieffer, 1913; *Bryophaenocladius* Thienemann, 1934; *Chaetocladius* Kieffer, 1911; *Compterosmittia* Sæther, 1981; *Corynoneura* Winnertz, 1846; *Cricotopus* van der Wulp, 1874; *Diplocladius* Kieffer, 1908; *Doithrix* Sæther *et* Sublette, 1983; *Eukiefferiella* Thienemann, 1926; *Georthocladius* Strenzke, 1941; *Gymnometriocnemus* Goetghebuer, 1932; *Gynocladius* Mendes, Sæther *et* Andrade-Morraye, 2005; *Hanocladius* Wang *et* Sæther, 2002; *Heleniella* Gowin, 1943; *Heterotanytarsus* Spärck, 1923; *Heterotrissocladius* Spärck, 1923; *Hydrobaenus* Fries, 1830; *Krenosmittia* Thienemann *et* Krüger, 1939; *Limnophyes* Eaton, 1875; *Lopescladius* Oliveira, 1967; *Metriocnemus* van der Wulp, 1874; *Naonella* Boothroyd, 1994; *Orthocladius* van der Wulp, 1874; *Parachaetocladius* Wülker, 1959; *Parakiefferiella* Thienemann, 1936; *Paralimnophyes* Brundin, 1956; *Parametriocnemus* Goetghebuer, 1932; *Parasmittia* Strenzke, 1950; *Propsilocerus* Kieffer, 1923; *Psectrocladius* Kieffer, 1906; *Pseudorthocladius* Goetghebuer, 1932; *Pseudosmittia* Edwards, 1932; *Rheocricotopus* Thienemann *et* Harnisch, 1932; *Smittia* Holmgren, 1869; *Stictocladius* Edwards, 1931; *Tonnoirocladius* Cranston, 2007; *Tvetenia* Kieffer, 1922; *Unniella* Sæther, 1982; and *Zalutschia* Lipina, 1939. *Brillia*, *Diplocladius* and *Propsilocerus* combined were used as outgroup.

The following characters were used in the parsimony analysis:

Imagines

1. Number of flagellomeres (male): (0) always 13; (1) sometimes fewer.
2. Antennal apex (male): (0) without subapical seta; (1) with.
3. Antennal apex (female): (0) without subapical seta; (1) with.
4. Eyes: (0) bare, at most partly pubescent; (1) hairy or pubescent.
5. Palpomeres: (0) always 5 palpomeres of normal length; (1) at least sometimes 4 or less palpomeres or palpomeres strongly reduced in length.
6. Sensilla clavata of palpomeres: (0) palpomere 3 at most with few sensilla in one group, palpomere 4 without sensilla; (1) at least female with sensilla in more than one group on palpomere 3 and palpomere 4 usually also with at least one sensilla clavata, or, in *Chaetocladius*, numerous sensilla clavata at well developed sensillum coeloconicum.

7. Dorsomedian eye elongation: (0) moderately to well developed; (1) absent or very weak.

8. Temporals: (0) inner verticals present or replaced by frontals, usually more outer verticals; (1) inner verticals absent, outer verticals usually few.

9. Tentorium (male): (0) normal (less than 7 times as long as wide); (1) at least sometimes female like (more than 7 times as long as wide).

10. Antepronotal lobes: (0) broad, collar like, at most slightly narrowed medially; (1) distinctly narrowed medially.

11. Dorsal antepronotals: (0) absent; (1) present.

12. Humeral pit: (0) inconspicuous; (1) consisting of several smaller areas; (2) conspicuous, oval.

13. Dorsocentrals: (0) uniserial anterior; (1) bi- to multiserial anterior.

14. Dorsocentrals: (0) uniserial posterior; (1) bi- to multiserial posterior.

15. Acrostichals: (0) moderately long to long and strong, (1) short, or absent.

16. Acrostichals: (0) starting in front; (1) starting some distance from antepronotum; (2) in centre of scutum. (Absence scored as ?)

17. Acrostichals: (0) simple or absent; (1) anterior simple, posterior scalpellate; (2) all scalpellate.

18. Acrostichals: (0) consisting of one type or absent; (1) consisting of two different types: generally simple and scalpellate; (2) consisting of three different types: anterior decumbent, middle simple, and posterior scalpellate.

19. Prealars: (0) uniserial; (1) bi- to multiserial, at least in some species.

20. Prealars: (0) restricted posteriorly (not positioned anterior to the anterior margin of median anepisternum II); (1) extended anteriorly, at least in some species.

21. Supraalar(s): (0) present; (1) absent.

22. Setae of preepisternum and/or anepisternum: (0) present; (1) absent.

23. Scutellars: (0) uniserial; (1) bi- to multiserial.

24. Postnotum: (0) bare; (1) sometimes with setae.

25. Wing spots: (0) absent; (1) sometimes present.

26. Setae in cells in male: (0) absent in all cells; (1) present in cell r_{4+5}; (2) present in cell r_{4+5} and m_{1+2}; (3) present also in cell m_{3+4}; (4) present also in cell $cu+cu_1$.

27. Wing membrane: (0) not to moderately punctuated; (1) coarsely punctuated.

28. Anal lobe: (0) well developed, right-angled or protruding; (1) weak to distinct, but not right-angled or protruding; (2) reduced or wing cuneiform.

29. Costal extension (male): (0) absent or short, less than 0.04 of wing length; (1) 0.04–0.06 of wing length; (2) 0.07–0.08 of wing length; (3) 0.09 or more of wing length.

30. R_{4+5}: (0) ends above or distal to apex of M_{3+4}; (1) ends proximal to apex of M_{3+4}.

31. Cu_1: (0) not sinuous; (1) slightly sinuous; (2) strongly sinuous.

32. Anal veins: (0) An_1 extending well beyond cubital fork and An_2 conspicuous; (1) anal veins shorter.

33. R veins: (0) setae present on R, R_1 and usually R_{4+5} in both sexes; (1) setae present on R, absent on R_1 and often R_{4+5} of male, at most absent on R_1 in female; (2) setae absent on R of male, present in female; (3) setae absent on R and R_1 of both sexes, at most 1 apical seta on R_{4+5}.

34. Setae on veins (male): (0) absent on all except brachiolum and C-extension, and apically on M_{1+2} when wing hairy; (1) present on R, R_1 or R_{4+5}; (2) present on R veins and M, M_{1+2} or M_{3+4}.

35. Squama: (0) with setae; (1) bare.

36. Inner tibial spur of hind leg: (0) At least 1/2 as long as outer spur; (1) shorter; (2) absent with also second spur of midleg absent.

37. Hind tibial comb: (0) well developed, occupying full width of tibia; (1) weak or absent.

38. Hind tibial comb: (0) with less than 13 setae; (1) conspicuous with 13 or more setae of which some about as long as longest spur.

39. Pseudospurs: (0) present; (1) absent.

40. Sensilla chaeticae of tarsi: (0) present; (1) absent.

41. Pulvilli: (0) present and distinct; (1) absent or vestigial, less than 1/2 length of claw.

42. Anal point: (0) absent; (1) small and anterior on tergite; (2) represented by hump-like extension of tergite or if absent represented by some stronger median setae; (3) well set off and posterior on tergite.

43. Anal point: (0) not with spatulate microtrichia-free apex; (1) often with small or large spatulate, microtrichia-free apex.

44. Anal point: (0) not very broad and rounded to bluntly triangular; (1) conspicuously broad and rounded to bluntly triangular.

45. Anal point: (0) not long; (1) moderately sized, triangular with concave margins; (2) conspicuously long, triangular with nearly straight sides; (3) long, nearly parallel-sided apically with blunt apex.

46. Setae on anal point: (0) normal, hair-like, relatively few or anal point absent; (1) strong, stiff, bristle-like or lamellate, numerous; (2) short, numerous, often directed anteriorly or laterally.

47. Superior volsella: (0) present; (1) absent.

48. Superior volsella: (0) absent or with setae and/or microtrichia, not plate-like; (1) bare and plate-like.

49. Inferior volsella: (0) at least some species with anterior dorsal, often triangular or digitiform part and a usually more rounded, small to large ventral, posterior part, sometimes separated from dorsal part, occasionally more than 2 simple parts, well developed to reduced; (1) different.

50. Inferior volsella: (0) without microtrichia-free digitiform projection; (1) with anterior microtrichia-free, digitiform projection and long rounded, low to prominent posterior lobe.

51. Inferior volsella: (0) short, simple and projecting; (1) simple, sharply triangular to tongue-shaped or digitiform, sometimes hooked, occasionally spiniform.

52. Inferior volsella: (0) not adpressed to gonocoxite; (1) simple, elongate, adpressed to gonocoxite, sometimes pediform with free end.

53. Inferior volsella: (0) not consisting of long posteromedially directed lobe; (1) consisting of a posteromedially directed, simple or apically bifid lobe.

54. Inferior volsella: (0) not consisting of long bifid lobe; (1) consisting of an apically bifid lobe.

55. Inferior volsella: (0) not conspicuously set off; (1) circular, conspicuously set off, sometimes without additional rounded posterior extension.

56. Inferior volsella: (0) not conspicuously set off; (1) circular, conspicuously set off, with additional rounded posterior extension.

57. Gonostylus: (0) simple; (1) double.

58. Heel of gonostylus: (0) absent; (1) present.

59. Transverse sternapodeme: (0) convex; (1) straight or concave; (2) absent, sternapodeme triangular.

60. Oral projections of transverse sternapodeme: (0) strongly developed; (1) weak to moderately developed; (2) absent.

61. Crista dorsalis: (0) evident, triangular or rounded preapical; (1) elongate, low; (2) not evident / weak.

62. Megaseta: (0) present; (1) absent.

63. Megaseta: (0) not dentate; (1) dentate.

64. Virga: (0) in some species consisting of cluster of at least 6 short spines or two groups of very strong spines; (1) virga not consisting of cluster or groups of spines.

65. Virga: (0) not consisting of narrow or broad field of scattered spinules; (1) in some species consisting of narrow or broad field of scattered spinules.

66. Virga: (0) not consisting of single plate; (1) in some species consisting of single plate.

67. Virga: (0) virga not consisting of 2–4 short spines; (1) in some species consisting of 2–4 short, often partly fused, sometimes plate-like spines without distinct lateral lamellae.

68. *Virga:* (0) virga without lateral lamellae; (1) in some species consisting of 2–12 median, usually fused, spines, and distinct lateral lamellae.

69. *Virga:* (0) virga clearly shorter than half the length of phallapodeme or without lateral lamellae; (1) clearly longer than half the length of phallapodeme and with lateral lamellae.

70. *Virga:* (0) virga not consisting of long spines without lamellae; (1) in some species consisting of spines at least nearly as long as half the length of phallapodeme, but without lateral lamellae.

71. *Virga:* (0) virga not consisting of long spines without lamellae; (1) in some species consisting of spines clearly longer than half the length of phallapodeme, without lateral lamellae.

72. *Gonocoxapodeme:* (0) absent, short and straight or evenly curved and ending at base of gonapophysis; (1) continuing basal of vagina or at least past base of gonapophysis.

73. *Female tergite IX:* (0) undivided; (1) divided by caudal concavity or notch; (2) divided into two setigerous protrusions.

74. *Female gonocoxite IX:* (0) large, projecting; (1) moderately developed to reduced.

75. *Female gonocoxite IX:* (0) with long setae only; (1) with some long and some short setae; (2) with short setae only.

76. *Gonapophysis VIII:* (0) undivided; (1) divided with ventrolateral lobe much smaller and more or less brush-like; (2) divided, with lobes of about same size; (3) divided with dorsomesal lobe smaller and with anterior rounded projection; (4) divided with dorsomesal lobe narrow, often line-like.

77. *Apodeme lobe:* (0) not apparent; (1) well developed, but not meeting at midline and with microtrichia; (2) meeting at midline and/or with microtrichia or fully sclerotized.

78. *Number of seminal capsules:* (0) 3; (1) 2.

79. *Seminal capsules:* (0) spherical to ovoid, small or of normal size; (1) large, spherical to elongate ovoid.

80. *Seminal capsules:* (0) at least partly colored; (1) often completely pale. Polymorphies are scored as synapomorphies as no genera have all included species with pale capsules and the character otherwise would be uninformative.

81. *Opening of spermathecal ducts:* (0) separate; (1) common.

82. *Spermathecal ducts:* (0) not fused; (1) partly fused ducts before common opening.

83. *Bulbs of spermathecal ducts:* (0) absent; (1) present.

84. *Spermathecal ducts:* (0) straight; (1) with bend or loop.

Pupa

85. *Frontal apotome:* (0) without warts or tubercles; (1) with warts or tubercles.

86. *Frontal setae:* (0) present; (1) absent.

87. *Thoracic horn:* (0) present; (1) absent.

88. *Thoracic horn:* (0) not rounded to ovoid; (1) mostly rounded to elongate ovoid. Polymorphies are scored as synapomorphies as only *Botryocladius* have all included species with rounded thoracic horn and the character otherwise would be uninformative.

89. *Thoracic horn:* (0) not with bulbous base and narrow apical portion; (1) with. *Eukiefferiella* is scored as (1) since most species have a thoracic horn with bulbous base and species without thoracic horn apparently have this secondarily reduced.

90. *Thorax:* (0) mostly smooth to wrinkled; (1) mostly tuberculose or spinulose.

91. *Antennal sheath pearl row:* (0) absent; (1) present.

92. *Wing sheath:* (0) without pearls; (1) with.

93. *Dorsocentrals:* (0) anterior 2 and posterior 2 paired, anterior 3 grouped, all in row or 2–3 dorsocentrals only; (1) posterior 3 grouped or all 4 together.

94. *Tergites II–VIII:* (0) without posterior spine, or tubercle row(s), but may have caudal hooklets; (1) some with spines or tubercles.

95. Median field of tergite IV: (0) without discrete spine patch(es) or row(s); (1) with.

96. Tergite I: (0) without posterior spine row(s); (1) sometimes with.

97. Tergal armament: (0) lacks elongate, needle-like spines; (1) includes elongate, parallel-sided, needle-like spines in some species.

98. Sternites II–VII: (0) without posterior spine row(s), but may have caudal hooklets; (1) some with spines or tubercles.

99. Sternites or sternal conjunctives: (0) without caudal hooklets; (1) sometimes with.

100. Male sternite VIII: (0) without posterior spine or tubercle row(s); (1) with.

101. Sternite II or II and III: (0) without anterior spine group; (1) sometimes with.

102. Tergites and sternites: (0) with single or no posterior row of spines; (1) at least some with double to multiple row of spines.

103. Tergite III: (0) without caudal hooklets; (1) with minute or conspicuous caudal hooklets.

104. Tergite IV: (0) without caudal hooklets; (1) with caudal hooklets.

105. Tergite V: (0) without caudal hooklets, although rows of conjunctival spinules may be hook-like anteriorly directed; (1) with minute or conspicuous caudal hooklets.

106. Tergite VI: (0) without caudal hooklets, although rows of conjunctival spinules may be hook-like anteriorly directed; (1) sometimes with caudal hooklets.

107. Caudal hooklets of tergite II: (0) present; (1) absent.

108. Pedes spurii B: (0) present; (1) absent.

109. Pedes spurii A on sternite IV: (0) present; (1) absent.

110. Pedes spurii A on sternite VI: (0) present; (1) absent.

111. Tergal conjunctives or posterior of tergal spines: (0) without spinules, but may have hooklets in single row; (1) with spinules which may be hooklet-like recurved.

112. Spinules on tergal conjunctives: (0) absent or not hooklet-like recurved or anteriorly directed; (1) hooklet-like recurved or anteriorly directed spinules in about 3 rows.

113. Taeniate L setae: (0) present; (1) absent.

114. Segment VIII: (0) with more than 1 L seta; (1) with at most 1 L seta.

115. Posterolateral corners of tergites VI–VIII: (0) without embedded spines; (1) at least tergite VIII with in most species.

116. Anal lobe: (0) not extended into projections; (1) extended posteriorly into cylindrical projections with macrosetae at apex.

117. Anal lobe: (0) not with apical projections or extensions; (1) with apical spurs or extended distal of macrosetae.

118. Anal lobe: (0) without lateral expansions; (1) sometimes with.

119. Apical spines of anal lobe: (0) absent; (1) present.

120. Anal lobe: (0) with fringe of setae; (1) without fringe of setae.

121. Inner margin of anal lobe: (0) without long seta; (1) with.

122. Anal macrosetae: (0) not short and spine-like, but may be short and hair-like or absent; (1) short and spine- or thorn-like.

123. Width of anal macrosetae or apical spines: (0) < 5 µm; (1) > 5 µm.

124. Number of anal macrosetae: (0) 3 or more; (1) 2; (2) 0–1.

125. Genital sac of the male: (0) not reaching apex of anal lobe; (1) reaching somewhat beyond lobe; (2) reaching much beyond anal lobe.

Larva

126. Antenna: (0) with 6–7 segments; (1) with 5; (2) with 3–4.

127. Ultimate antennal segment: (0) normal; (1) whip- or thread-like.

128. Antenna: (0) reduced, less than half mandible length; (1) 1/3 as long as head capsule or shorter, but not reduced; (2) longer.
129. Second antennal segment: (0) undivided, fully sclerotized; (1) divided or partly unsclerotized.
130. Lauterborn organs: (0) moderately large to well developed; (1) weak or absent.
131. Antennal blade: (0) short to moderate length, shorter than flagellum when antenna of normal length; (1) conspicuous, longer than flagellum except when flagellum extremely long.
132. S I: (0) plumose, branched, toothed or palmate; (1) bifid or simple.
133. S I: (0) not palmate; (1) palmate.
134. S I: (0) not bifid; (1) bifid.
135. S I: (0) not simple; (1) simple.
136. Labral lamella: (0) with pectinate, plumose or rugose apex, mostly well developed; (1) weak, no apical teeth or plumosity; (2) absent.
137. Pecten epipharyngis: (0) consisting of 3 simple scales or single scale; (1) of several teeth.
138. Chaetulae laterales: (0) simple or reduced; (1) at least one serrated or plumose.
139. Premandible: (0) simple; (1) with 2 or more teeth.
140. Premandibular brush: (0) present; (1) absent.
141. Mandible: (0) with 2–3 inner teeth; (1) with 4 or more.
142. Mola of mandible: (0) smooth; (1) with teeth or spines.
143. Seta interna of mandible: (0) with smooth, slightly plumose laterally or apically, or serrate branches; (1) branches conspicuously branched; (2) seta interna absent.
144. Median tooth of mentum: (0) single; (1) double, bifid or with several median teeth.
145. Lateral teeth of mentum: (0) 7 or more pairs; (1) 5–6 pairs; (2) fewer.
146. Lateral teeth of mentum: (0) outer tooth not larger or higher than one of the inner teeth; (1) clearly larger or higher.
147. Ventromental plates: (0) well developed, extending past lateral teeth on flattened mentum, sometimes double; (1) reduced or weak.
148. Ventromental plates: (0) never double; (1) at least sometimes double.
149. Ventromental plates: (0) without setae (beard) underneath; (1) with setae underneath.
150. Setae submenti: (0) situated at level of base of outer lateral tooth or higher; (1) lower.
151. Claws of anterior parapods: (0) with relatively distinct teeth; (1) smooth or teeth very indistinct.
152. Procercus: (0) well developed; (1) reduced or absent.
153. Anal setae: (0) 5 or more setae, none conspicuously long; (1) 3–4 setae, none conspicuously long; (2) 0–2 not conspicuously long anal setae; (3) 2 or more setae with 1 or 2 conspicuously long.
154. Supraanal setae: (0) weak or absent, shorter than 1/2 length of anal setae when these well developed or shorter than 2/3 when anal setae short; (1) well developed, longer than 1/2 length of anal setae when anal setae long, longer than 2/3 when anal setae short.
155. Posterior parapods: (0) well developed; (1) small, digitiform; (2) absent to weak, but not digitiform.
156. Anal tubules: (0) at least 1/2 length of posterior parapods; (1) shorter than 1/2 length of posterior parapods or these absent; (2) conspicuously long and narrow.
157. Anal segment: (0) not projecting posterior over posterior parapods or bent at right angles to axis of rest of body; (1) projecting posterior over posterior parapods or bent at right angles to axis of rest of body.

Parsimony analysis was carried out using PAUP 4.0b10 (Swofford 1998) operating on Macintosh, and employing 1000 random addition sequence replicates. The search method employed was Heuristic-branch-swapping called Tree Bissection and Reconnection (TBR) (Swofford & Olsen 1990).

Only characters 16, 26, 28, 29, 31, 33, 34, 126 and 136 were set as ordered. Characters 2, 6, 10, 15, 17, 18, 20, 22, 30, 32, 42, 44, 46–48, 51, 52, 55, 57, 62, 68, 76, 78, 82, 86, 87, 94–102, 107, 120–122, 124, 126–137, 141, 143, 145, 147–149, 152, 153 and 155 were considered very important on genus level and given a weight of 10. Characters 7, 12, 16, 21, 26–28, 39–41, 45, 61, 64, 66, 69, 70, 73, 90–92, 108–119, 138–140, 142, 144, 146, 150, 151, 154, 156 and 157 were considered important for separating subgenera or species groups, and were given a weight of 5. The remaining characters were kept with weight 1 as being plastic, sometimes showing intra- or inter-specific variation.

SYSTEMATICS

Phylogeny

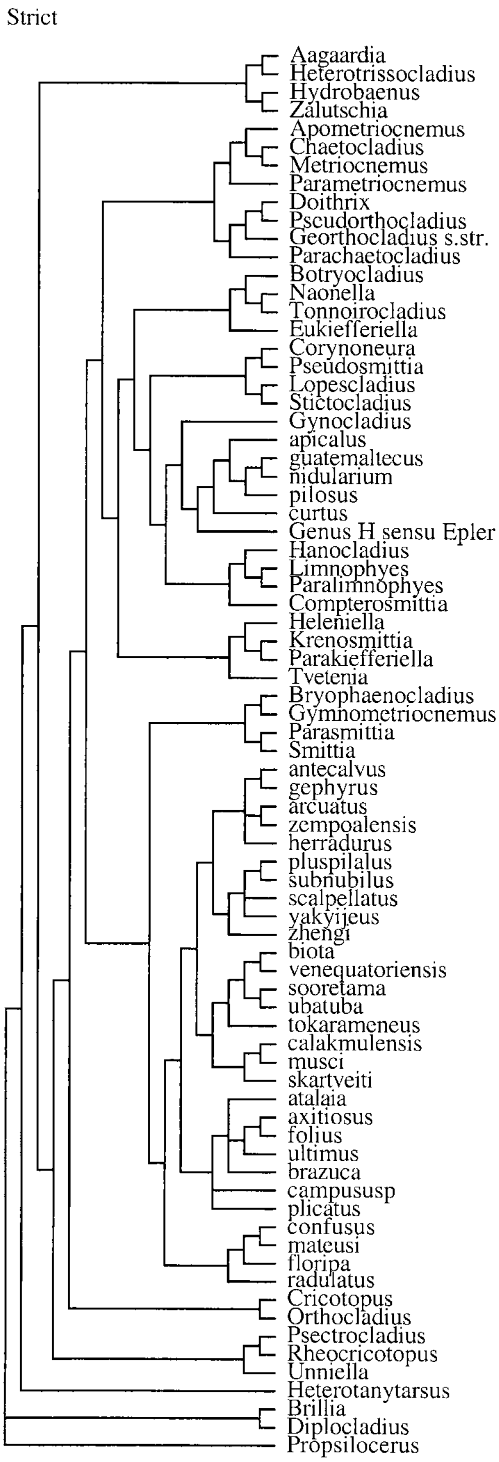
Based on the data matrix, Appendix 1, fifty nine trees were obtained, all with 1589 steps, after weights were reset to one, consistency index (CI) of 0.53, retention index (RI) of 0.58, homoplasy index (HI) of 0.86 and rescaled consistency index (RC) of 0.30. The strict consensus tree is shown in Figure 1. When the results were successively reweighted according to RC, the trees became stable after reweighted five times. Nine trees with 1597 steps after weights were reset to one, CI = 0.54, RI = 0.70, HI = 0.78 and RC = 0.38 were obtained (for the consensus tree, see Fig. 2).

A preferred tree was constructed based on the strict consensus tree after weighting and reweighting according to RC. Two groups were transferred, making the tree one step shorter (1596 steps). Firstly, the clade formed by the species (*radulatus* (*floripa* (*mateusi* + *confusus*))) was transferred to the base, becoming the sister group of the other *Antillocladius* species in agreement with the first tree obtained (Fig. 1). Secondly, the clade (*zhengi* (*subnubilus* + *scalpellatus* + (*yakyijeus* + *pluspilalus*))) was transferred to form the sister group of *tokarameneus*. If *tokarameneus* instead is moved to the base of the clade *zhengi* ++, the tree becomes 1600 steps long, and the move was thus avoided.

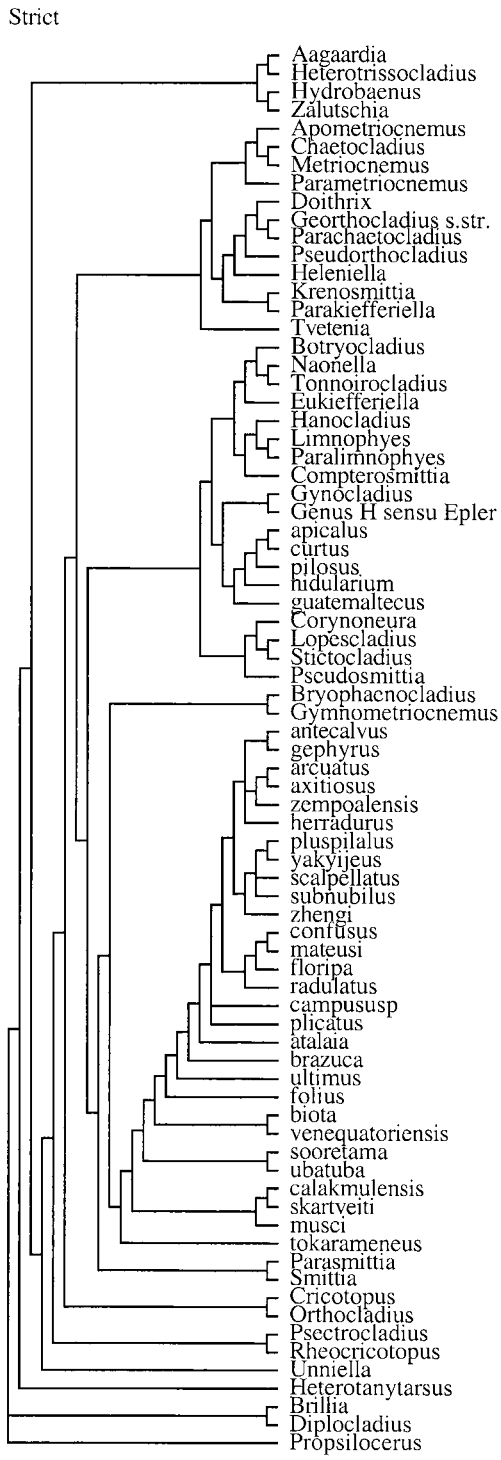
The results show clearly three monophyletic groups; one including *Antillocladius*, *Litocladius*, and *Lyrocladius*; one including *Compterosmittia*, *Hanocladius*, *Limnophyes*, and *Paralimnophyes*; and a third including *Gravatamberus* and the two parthenogenetic genera *Gynocladius* and Genus H *sensu* Epler. The first two groups were also treated in Mendes *et al*. (2004) with a similar result. The question whether *Hanocladius* deserves a separate genus or should be included in *Compterosmittia*, as mentioned by Mendes *et al*. (2004), is not addressed here. *Gravatamberus* and Genus H *sensu* Epler were not included in the previous analysis and Mendes *et al*. (2005) instead suggested *Hanocladius* as the sister group to *Gynocladius*. However, *Gynocladius* is known as female imago and immatures, while *Hanocladius* is known as male imago only, and the relationship obtained by Mendes *et al.* (2005) appears to be based on missing data and symplesiomorphies rather than on synapomorphic characters. The present analysis is based on more data, and the position of *Hanocladius* grouping with *Compterosmittia*, *Limnophyes* and *Paralimnophyes* seems more likely.

The three *Litocladius* species fall among the *Antillocladius* species in the tree after weighting and reweighting. However, the genus possesses unique characters (autapomorphies) like three different types of acrostichals, and some characters that are shared with *Gymnometriocnemus*, such as lateral lamellae of the virga in the males, absence of anal macrosetae and row of spines on the tergites in the pupa. This supports retaining *Litocladius* as a separate genus for the three species *L. mateusi*, *L. floripa* sp. n. and *L. confusus* sp. n.

The genus *Lyrocladius* is erected for *L. radulatus* sp. n. The strong, flattened setae on the gonostylus, the megaseta sitting on a lateral tubercle, and the ridge-like anal point are autapomorphies separating it from other genera. This genus is positioned as the sister group of *Litocladius*, due to the shape of the setae on the anal point and the lateral lamella of the virga. However, without associated immatures, this placement has to be regarded as tentative. In the preferred tree, *Litocladius* + *Lyrocladius* form the sistergroup of *Antillocladius*.

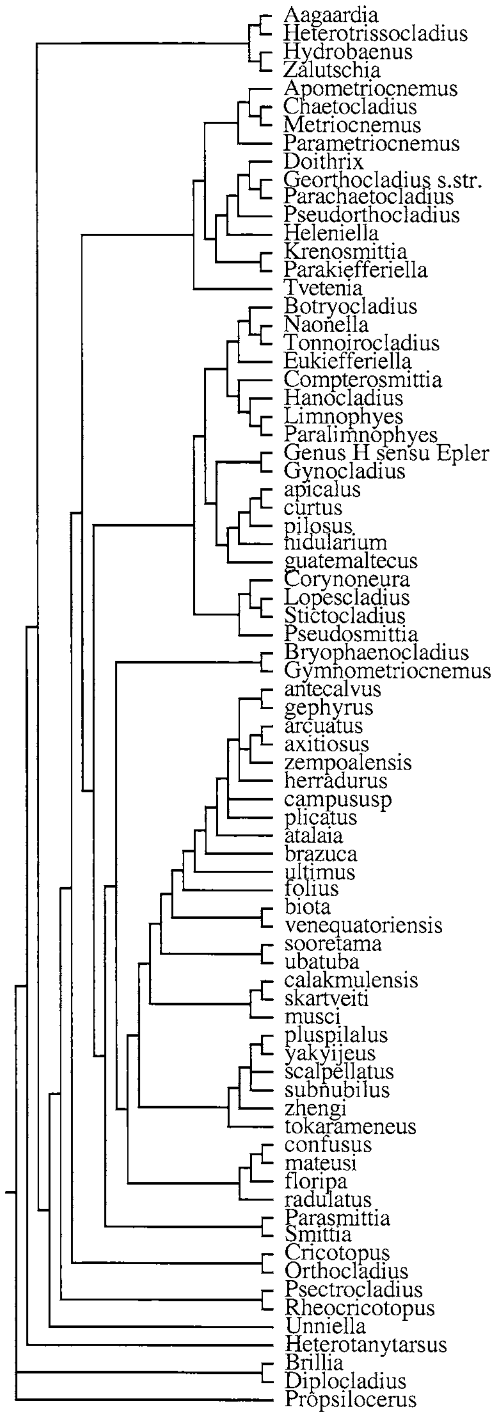


1

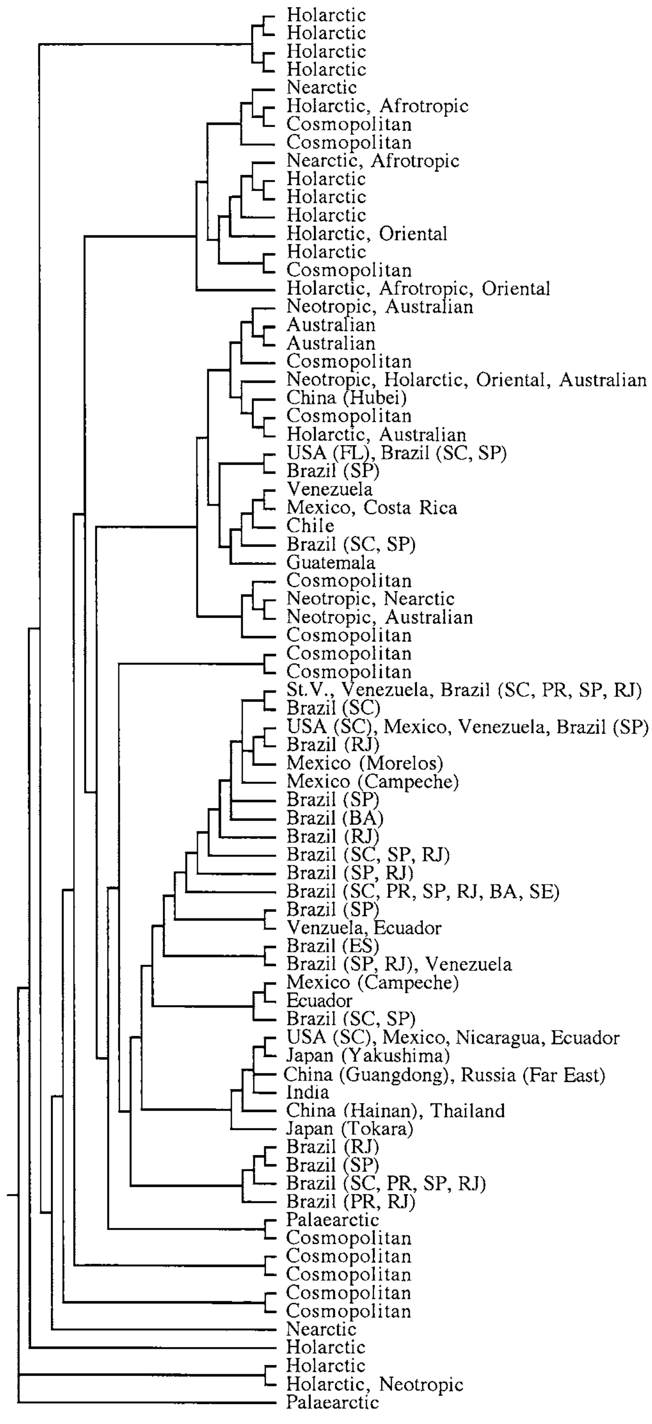


2

FIGURES 1–2. Parsimony analysis of some Orthocladiinae genera and species with *Brillia* Kieffer, *Diplocladius* Kieffer and *Propsilocerus* Kieffer fixed as outgroup. Characters and character states as in text, matrix of characters as in Appendix 1. **1**—strict consensus of shortest tree; **2**—strict consensus of shortest tree after reweighting according to rescaled consistency index.



3



4

FIGURES 3–4. Parsimony analysis of some Orthocladiinae genera and species with *Brillia* Kieffer, *Diplocladius* Kieffer and *Propsilocerus* Kieffer fixed as outgroup. Characters and character states as in text, matrix of characters as in Appendix 1. **3**—preferred tree based on strict consensus (Fig. 2) which is one step shorter than the tree after reweighting according to rescaled consistency index; **4**—area cladogram based on the preferred tree.

The tentative placement of the *Antillocladius* species into groups proposed by Mendes *et al*. (2004) does not hold when compared with the results from the present analysis (Fig. 1). Based on the preferred tree, two main groups are evident, one with a Neotropical-Holarctic-Oriental distribution, and another mostly Neotropical with one species, *A. arcuatus,* from the southern Nearctic.

The clade composed of *Tonnoirocladius*, *Naonella* and *Botryocladius* is in accordance with Cranston (2007). However, its placement as sister group of *Compterosmittia* + (Fig. 2) should be regarded as tentative.

Biogeography

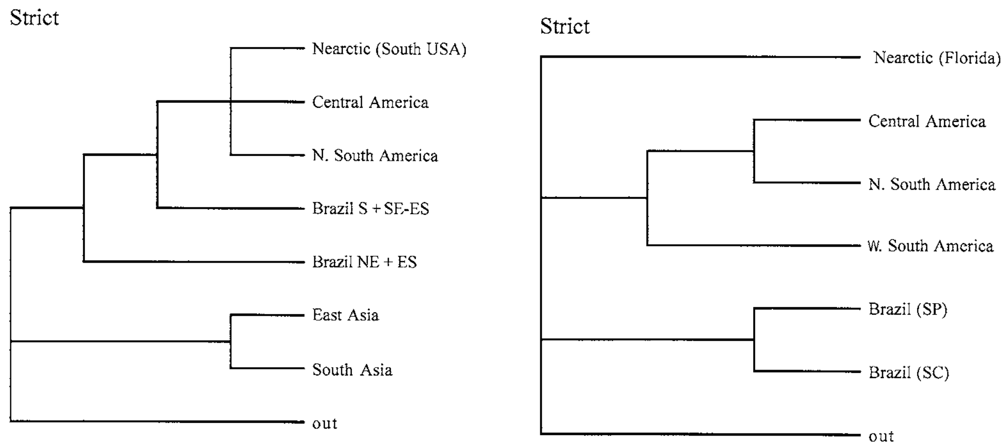
The area cladogram shown in Figure 4 was obtained by simply replacing the taxa names to the name of the area where they occur in the preferred tree (Fig. 3) following Humphries and Parenti (1999: 62). According to the cladogram, *Antillocladius* could have originated in the Neotropical region, as indicated by the outgroup, with one group dispersing to the Nearctic, Eastern Palaearctic and Oriental regions, and another group almost entirely Neotropical with a second dispersal event of *A. pluspilalus* into the Neotropical Region.

Among the different methods to infer relationships among different areas discussed by van Veller *et al.* (1999, 2001), Brooks Parsimony Analyses (BPA) was chosen due to its simplicity and feasibility, as well as its applicability to the data. Despite the errors regarding BPA and assumption 0 analyses, vividly explored by Humphries and Parenti (1999) and Ebach *et al*. (2003), this is the only biogeographical analysis that shows area relationship based on a single set of species, and is thus a possible method for the species treated here. One point to be emphasized is that collections of chironomids are completely lacking for many regions, including vast parts of South America, and South and East Asia. For this reason, the results presented here must be regarded as merely tentative. The BPA analyses follow Brooks (1990) and Brooks *et al*. (2001, 2004). The preferred cladogram was used as a base to assign character numbers for use in the analyses. A hypothetical "out"-area, where no species occur, was set as outgroup. The subdivisions of the Palaearctic and Oriental regions into High, East and South Asia follow those proposed by Banarescu (1990, 1991, 1995).

Two independent analyses were carried out, one for *Antillocladius*, and another for *Gravatamberus*. The BPA analyses of the *Antillocladius* species gave two trees, each with 55 steps (CI = 0.78, HI = 0.22, RI = 0.80, and RC = 0.68), the consensus tree is shown in Figure 5. According to this analysis, the genus has two main components, one in Asia and another in the Neotropical / southern Nearctic regions, confirming the area cladogram predictions. Pilot analyses indicate a group comprising the southern and southeastern states of Brazil and a different group for the northeastern states plus Espírito Santo, and these groups were then included in the analysis. According to the cladogram obtained, the southernmost parts of Brazil are more closely related to the remaining areas in America than to northeastern Brazil, which might indicate a subdivision of the Atlantic Rainforest into two components. However, as collections especially from the northeastern States of Brazil are lacking, further inventories are required for a better understanding of possible areas of endemism. The inclusion of the sister group of *Antillocladius*, *Litocladius* + *Lyrocladius*, in the BPA analyses yielded no single difference in the consensus cladogram (Fig. 5) (2 trees, each with 64 steps, CI = 0.69, HI = 0.30, RI = 0.78, and RC = 0.65).

A BPA analysis was carried out for *Gravatamberus* and its sister groups, Genus H *sensu* Epler and *Gynocladius* combined (Fig 6). Two trees were obtained, each 14 steps long (CI = 0.78, HI = 0.22, RI = 0.80, and RC = 0.68). In this analysis, three groups can be recognized, one for the Nearctic region, one for Brazil (subdivided into two states), and a third showing a western South American connection, linking Chile in the south to Venezuela and Costa Rica and Mexico in Central America.

The BPA analyses used here are primary BPA and as the data on taxa distribution and actual number of species could be highly underestimated, secondary BPA analysis will have to wait until the South American fauna is better known.



5 6

FIGURES 5–6. Brooks Parsimony Analysis (BPA) of the species belonging to: **5—***Antillocladius* Sæther; **6—***Gravatamberus* **gen. n.**, *Gynocladius* Mendes, Sæther *et* Andrade-Morraye, and Genus H *sensu* Epler.

Key to males and parthenogenetic females of orthoclad genera with scalpellate acrostichals

1. Acrostichals scalpellate....................2
- Acrostichals not scalpellate, but may be hooked....................not keyed
2. Only two scalpellate acrostichals in mid scutum....................3
- More than 2 scalpellate acrostichals that can begin close to antepronotum or be restricted to mid scutum 7
3. Anal point absent....................4
- Anal point present, but can be weak....................5
4. Inferior volsella hooked; claws simple. New Zealand.................... *Naonella* Boothroyd
- Inferior volsella rectangular; claws terminally pectinate. New Zealand.................... *Tonnoirocladius* Cranston
5. R_{4+5} ending distal to the end of M_{3+4}....................6
- R_{4+5} ending proximal or above the end of M_{3+4}. Holarctic, Afrotropical ....*Synorthocladius* Thienemann
6. Anal point well developed, wide and with lateral setae; virga consisting of a cluster of scattered spines. Nearctic.................... *Unniella* Sæther
- Anal point reduced, bare; virga present or absent, but never consisting of a cluster of scattered spines. Australia, South America.................... *Botryocladius* Cranston *et* Edward (in part, see couplet 12)
7. Epimeron, posterior anepisternum II always and preepisternum usually with setae; membrane with coarse punctuation. Cosmopolitan.................... *Limnophyes* Eaton, pro parte
- Epimeron, posterior anepisternum II and preepisternum bare; wing membrane with coarse to fine punctuation....................8
8. Wing hairy with bare squama....................9
- Wing membrane generally bare, if hairy, squama with setae....................10
9. R_{4+5} ending distal to apex of M_{3+4}; parthenogenetic. Brazil.................... *Gynocladius* Mendes, Sæther *et* Andrade-Morraye
- R_{4+5} ending proximal to apex of M_{3+4}. Brazil.................... *Gravatamberus* **gen. n.**

10. All acrostichals scalpellate; squama bare, or at most with one seta 11
- All acrostichals generally scalpellate or anterior acrostichals simple; squama generally with more than one seta. (*Antillocladius zempoalensis* Mendes, Andersen *et* Sæther and *Lyrocladius* **gen. n.** have squama bare or with one seta, but the anterior acrostichals are simple)...13
11. Scalpellate acrostichals in mid scutum; prealars restricted to posterior part; mid basitarsus without sensilla 12
- Scalpellate acrostichals starting close to anterior margin; prealars extended anteriorly; mid basitarsus with row of sensilla chaetica. Parthenogenetic; Brazil, U.S.A. .... Genus H *sensu* Epler
12. Virga usually absent, but may consist of numerous spines (*C. virga* Wang) or a single plate (*C. tsujii* (Sasa, Shimomura *et* Matsuo)); with more than 4 acrostichals; leg ratio < 1.0; megaseta often dentate. Holarctic, Oriental, Australian, Neotropical... *Compterosmittia* Sæther
- Virga broad, scale-like; with 4 acrostichals; leg ratio about 1.15. China ....*Hanocladius* Wang *et* Sæther
13. Anal point well developed 14
- Anal point short, posterior on tergite. Australia, southern South America .... *Botryocladius* Cranston *et* Edward (in part, see couplet 5)
14. Wing with coarse punctuation, without setae; gonocoxite with 2 lobes, the anterior appearing to be superior volsella and dorsal part of inferior volsella combined, extending from base of gonocoxite to distal of midpoint, posterior lobe extending to close to insertion of gonostylus; virga absent. Holarctic, Australian. .... *Paralimnophyes* Brundin
- Wing with fine punctuation, often with apical setae; volsellae variable, but never as above; virga usually present...15
15. Megaseta sitting on tubercle; anal point lyre-shaped. Brazil... *Lyrocladius* **gen. n.**
- Megaseta sitting directly on the gonostyle; anal point tapering or parallel-sided 16
16. Virga long, with lateral lamellae; costal extension short. Brazil ...*Litocladius* Mendes, Andersen *et* Sæther
- Virga absent, short or long, but never with lateral lamellae; costal extension short to very long. Neotropical, Oriental, Palaearctic .... *Antillocladius* Sæther

SPECIES DESCRIPTIONS

Antillocladius Sæther

Antillocladius Sæther, 1981: 4; Coffman *et al.* (1986: 160); Cranston *et al.* (1983: 157); Cranston *et al.* (1989: 176); Sæther (1982: 471; 1984: 1); Mendes *et al*. (2004: 27).

Type species: *Antillocladius antecalvus* Sæther, 1981, by original designation.

Other included species: *A. arcuatus* Sæther, 1982; *A. atalaia* sp. n.; *A. axitiosus* sp. n.; *A. biota* Mendes, Andersen *et* Sæther, 2004; *A. brazuca* sp. n.; *A. calakmulensis* Mendes, Andersen *et* Sæther, 2004; *A. campususp* sp. n.; *A. folius* Mendes, Andersen *et* Sæther, 2004; *A. gephyrus* sp. n.; *A. herradurus* Mendes, Andersen *et* Sæther, 2004; *A. musci* Mendes, Andersen *et* Sæther, 2004; *A. pluspilalus* Sæther, 1982; *A. plicatus* sp. n.; *A. scalpellatus* Wang *et* Sæther, 1993; *A. skartveiti* Andersen *et* Contreras-Ramos, 1999; *A. sooretama* Mendes, Andersen *et* Sæther, 2004; *A. subnubilus* (Sinharay *et* Chaudhuri, 1979) comb. n.; *A. tokarameneus* (Sasa *et* Suzuki, 1995); *A. ubatuba* Mendes, Andersen *et* Sæther, 2004; *A. ultimus* sp. n.; *A. venequatoriensis* Mendes, Andersen *et* Sæther, 2004; *A. yakyijeus* (Sasa *et* Suzuki, 2000); *A. zempoalensis* Mendes, Andersen *et* Sæther, 2004; and *A. zhengi* Wang *et* Sæther, 1993.

Diagnostic characters: The males can be separated from other orthoclads by the following combination of characters: scalpellate acrostichals at least in the middle of scutum (some simple anterior acrostichals may occur) combined with a moderately to extremely long anal point with lateral setae; virga present or absent, but lateral lamellae never present. All known females and several males have setae apically on the wing membrane. The combination of absence of thoracic horn and presence of thorn-like macrosetae will separate the pupae from other genera. The larva is distinguished by a palmate S I; pecten epipharyngis divided into about 8–12 teeth; anal segment protruding over posterior parapods; and anal setae absent or perhaps reduced to single seta on minute tubercle.

Generic diagnosis:

Imago. Small to medium sized species, wing length 0.8–2.3 mm.

Antenna. Female antenna with 5 flagellomeres. Male antenna with 13 flagellomeres, groove beginning at flagellomere 3, sensilla chaetica on flagellomeres 2, 3 and 13. Male antennal ratio 0.50–1.70.

Head. Eye naked, with or without minute pubescence between ommatidia, without dorsomedian extension. Temporal setae divided into weak inner verticals, stronger outer verticals, postorbitals absent or few. Third palpomere with about 3 sensilla clavata subapically, longest 8–23 µm long.

Thorax. Antepronotum well developed, lobes meeting medially along short suture. Acrostichals, short, all scalpellate or anterior few simple, beginning close to antepronotum, some distance from antepronotum or in the middle of scutum, situated lateral of median suture; prealars uniserial; supraalar(s) 0–2; scutellars uniserial.

Wing. Anal lobe protruding to absent. Costal extension moderately to strongly developed, 1/2 to 4 times the length of RM. R_{2+3} running and ending midway between R_1 and R_{4+5}; R_{4+5} ending opposite or slightly distal to M_{3+4}; FCu far distal to RM; Cu_1 straight to slightly sinuous; An ending proximal to FCu. Veins bare or with setae on R, R_1, R_{4+5}, M_{1+2}, M_{3+4}, Cu, Cu_1 and An. Membrane with apical setae in female; male without setae, with few weak setae apically in cell r_{4+5}, or with numerous setae apically in cells r_{4+5}, m_{1+2} and m_{3+4}. Squama bare or with up to 15 setae.

Legs. Pseudospurs, sensilla chaetica and pulvilli lacking. Comb and tibial spurs normal. Spurs smooth or with small denticles.

Abdomen. Tergites with irregularly arranged setae.

Male hypopygium. Anal point long, pointed, with strong lateral setae, with microtrichia only at base or nearly to apex. Phallapodeme and aedeagal lobe well developed. Anterior margin of sternapodeme nearly straight to strongly arcuate, oral projections barely indicated to strongly developed. Virga absent or consisting of 2–6 spines of variable size. Inferior volsella highly variable; simple and rounded or triangular; with anterior dorsal triangular or digitiform part and a more rounded ventral, posterior part; with microtrichia-free, digitiform anterior projection and long rounded, low to prominent posterior lobe; consisting of a posteriomedially directed, apically simple or bifid lobe; or circular with or without additional rounded posterior extension and conspicuously set off. Gonostylus with or without heel; crista dorsalis absent to rounded and well developed. Megaseta normal.

Female genitalia. Gonocoxapodemes curved and meeting anterior of vagina. Gonocoxite relatively well developed, with few long setae and additional short setae. Tergite IX divided or undivided with setae concentrated to lateral halves. Gonapophysis IX with large ventrolateral lobe covering apodeme lobe and apex of narrow, line-like dorsomesal lobe. Labia relatively large, pointed. Cerci small. Seminal capsules small to medium-sized, circular, with triangular neck. Spermathecal ducts with bends or loops, with weak bulbs before separate openings.

Pupa. Small to medium sized, total length 2.0 to 3.5 mm.

Cephalothorax. Frontal setae absent. Frontal apotome smooth. Antennal sheath with or without pearl row above pedicel. Ocular field with 2 reduced postorbitals. Thoracic horn absent. Three weak precorneals situated in row or narrow triangle. Apparently 2 median and 0–1 lateral antepronotals. Dorsocentrals very small, in two groups of two. Thorax and wing sheath smooth.

Abdomen. Tergite I without shagreen; tergites II–VIII covered with coarse shagreen except along anterior margin; tergite IX with strong shagreen except along anterior and posterior margins. Sternites I and II bare;

sternite III with median and lateral shagreen; sternites IV–VI with slightly more extensive median and lateral shagreen; sternites VII and VIII with extensive shagreen; sternite IX with anterolateral shagreen. Tergite II without posterior hooklets. Tergites II–VII or VIII with posterior row of weak spines. Conjunctives bare. Pedes spurii A and B absent. Apophyses weak, nearly straight. Segment II–VIII with 2 weak, hair-like L setae. Anal lobe with 3 thorn-like macrosetae, sometimes laterally expanded; male genital sac overreaching anal lobe, female genital sac not reaching apex of lobe.

Larva. Small to medium sized, 3.0–3.3 mm long.

Head. Antenna 5-segmented, less than half as long as mandible, last 3 segments short. Blade as long as or longer than flagellum, striated. Lauterborn organs absent, style large. S I nearly palmate with 5–6 teeth, one of them usually larger. Other S setae normal. No discernible labral lamellae. Pecten epipharyngis of 8–12 teeth (each of the normal 3 scales divided into 2–5 teeth). Chaetulae laterales simple, 3 strong and sclerotized, 4–5 weak, pointed and unsclerotized. Chaetulae basales simple or bifid. Mandible with apical tooth shorter than the combined widths of 4 inner teeth, fourth tooth sometimes joined to mola. Seta subdentalis triangular. Seta interna slender, composed of 4–5 nearly smooth to strongly serrated branches. Mentum with large, irregular triangular, sometimes medially notched median tooth higher than 5 pairs of lateral teeth, fourth pair smaller than fifth and apparently occasionally completely reduced. Ventromental plates small, visible only below 3 outermost teeth, no beard. Maxilla without pecten galearis, lacinial chaeta reduced to rounded lamellae.

Abdomen. Without distinct setae. Anterior parapods fused for most of their lengths, with groups of minute claws and some longer mostly smooth claws. Procercus apparently absent, but a vestigial tubercle with one short seta may represent procercus at least in some species. Anal tubules shorter than half the length of posterior parapods (shape not clear in any available material). Posterior parapods well developed, with strong apical claws.

Key to the males of *Antillocladius* Sæther

1. Squama bare. Mexico .... *A. zempoalensis* Mendes, Andersen *et* Sæther
- Squama with at least one seta 2
2. Anal point nearly parallel-sided with numerous, weak, partly anteriorly directed setae; inferior volsella either pointed triangular or consisting of a long apically simple or bifid lobe; wing bare...........................3
- Anal point tapering with numerous, usually strong and posterolaterally directed setae; inferior volsella either with a dorsal anterior triangular to digitiform part and a more rounded ventral lobe or circular with or without additional rounded posterior extension, and conspicuously set off; wing usually with apical setae 9
3. Inferior volsella pointed triangular; costal extension very long 4
- Inferior volsella consisting of a long posteromedially directed simple or apically bifid lobe; costal extension moderately long...6
4. Inferior volsellae triangular, leaf-like. Brazil .... *A. folius* Mendes, Andersen *et* Sæther
- Inferior volsella small, sharply pointed or with rounded apex 5
5. Inferior volsella small, sharply pointed. Brazil................................. *A. biota* Mendes, Andersen *et* Sæther
- Inferior volsella with rounded apex. Brazil .... *A. axitiosus* **sp. n.**
6. Inferior volsella apically bifid...7
- Inferior volsella simple 8
7. Virga absent. Brazil.. *A. sooretama* Mendes, Andersen *et* Sæther
- Virga present. Brazil .... *A. atalaia* **sp. n.**
8. Inferior volsella uniformly colored, with sharply pointed apex. Brazil, Venezuela ....
.... *A. ubatuba* Mendes, Andersen *et* Sæther

- Inferior volsella with a distinctly darker oral part bearing strong setae, with rounded apex. Brazil............. .... *A. ultimus* **sp. n.**

9. Virga at least nearly as long as half the length of phallapodeme; wing membrane with apical setae........10
- Virga absent or short; wing membrane with or without apical setae...16
10. Anal point with numerous weak setae; inferior volsella small. Venezuela, Ecuador .... *A. venequatoriensis* Mendes, Andersen *et* Sæther
- Anal point with strong, stiff setae; inferior volsella well developed..11
11. Wing with few setae apically in cell r_{4+5}; AR 1.4–1.7..12
- Wing with more numerous apical setae present also in cells m_{1+2} and sometimes m_{3+4}; AR 0.9–1.6.........13
12. Virga nearly as long as phallapodeme. Brazil.................................. *A. musci* Mendes, Andersen *et* Sæther
- Virga less than half the length of phallapodeme. China, Thailand...................... *A. zhengi* Wang *et* Sæther
13. Virga about two-third the length of phallapodeme 14
- Virga half the length of phallapodeme..15
14. Squama with 5–6 setae; cell m_{3+4} with several setae. Ecuador, Mexico, Nicaragua, U.S.A.......................... .... *A. pluspilalus* Sæther
- Squama with 9–13 setae; cell m_{3+4} bare. Japan... *A. yakyijeus* (Sasa *et* Suzuki)
15. Cell m_{3+4} bare; AR 1.22–1.56. China, Russia .... *A. scalpellatus* Wang *et* Sæther
- Cell m_{3+4} with setae; AR about 1.0 (Holotype). India....... *A. subnubilus* (Sinharay *et* Chaudhuri) **comb. n.**
16. Virga consisting of 2 or 6 very short spines; costal extension short..17
- Virga absent; costal extension long 21
17. Virga consisting of 6 spines; inferior volsella with digitiform dorsal anterior lobe covering rounded posteroventral lobe. Mexico.. *A. calakmulensis* Mendes, Andersen *et* Sæther
- Virga consisting of 2 spines 18
18. Inferior volsella apically split in 2 semicircular lobes. Mexico. *A. herradurus* Mendes, Andersen *et* Sæther
- Inferior volsella not divided into lobes..19
19. Wing with protruding anal lobe; inferior volsella with median, oblique fold. Brazil .... *A. plicatus* **sp. n.**
- Anal lobe weak or absent; inferior volsella consisting of single lobe 20
20. Costa distinctly extended; inferior volsella perpendicular to gonocoxite; setae on anal point weak. Brazil . ... *A. brazuca* **sp. n.**
- Costa not extended; inferior volsella inclined in relation to gonocoxite; setae on anal point strong. Japan.. .... *A. tokarameneus* (Sasa *et* Suzuki)
21. Inferior volsella a well set off circular lobe, or weak and adpressed to gonocoxite; wing membrane usually with setae 22
- Inferior volsella a well set off parallel-sided or circular lobe with additional posterior semicircular extension; wing membrane bare..24
22. Inferior volsella with dorsal ridge; cell r_{4+5} with few setae apically. Brazil..................... *A. gephyrus* **sp. n.**
- Inferior volsella simple 23
23. Wing membrane with numerous apical setae, present also in cell m_{3+4}. Ecuador .... *A. skartveiti* Andersen *et* Contreras-Ramos
- Wing membrane with 0–3 setae apically in cell r_{4+5}. Brazil, Saint Vincent, Venezuela .... *A. antecalvus* Sæther
24. Inferior volsella a well set off circular lobe with additional posterior semicircular extension; costal extension > 54 µm long. Brazil, Mexico, Venezuela, U.S.A. .... *A. arcuatus* Sæther
- Inferior volsella a well set off parallel-sided lobe with broadly rounded apex; costal extension < 45 µm. Brazil.. *A. campususp* **sp. n.**

***Antillocladius antecalvus* Sæther**

Antillocladius antecalvus Sæther, 1981: 4, Fig. 2; Spies and Reiss (1996: 75); Mendes *et al.* (2004: 27, Fig. 2).

Material examined: Type material as in Sæther (1981). **BRAZIL: Santa Catarina:** São Bento do Sul, 26°19'25.6"S, 48°18'26.5"W, 1 male, 13–16.x.2001, Malaise trap, M.V. Yamada. **Paraná:** Morretes, Parque Estadual do Pau Oco, 25°34'27.9"S 48°53'46.7"W, 2 males, 07–10.iv.2002, Malaise trap (Bosque-2), M.T. Tavares *et al*. (BIOTA-FAPESP); 1 male as previous except for (Trilha-3); 2 males as previous except for (Bosque-1); 2 males as previous except for 10–13.iv.2002, (Bosque-2); 1 male as previous except for (Trilha-4); 2 males as previous except for (Bosque-1); 1 male as previous except for (Bosque-4). **São Paulo:** Pedregulho, Furna São Pedro, 1 male with pupal exuviae, 7.vii.2000, S. Mateus. **Rio de Janeiro:** Nova Iguaçu, Reserva Biológica Tinguá, 22°34'30"S 43°26'07"W, 1 male, 5–8.iii.2002, Malaise trap (Trilha-4), S.T.P. Amarante *et al.*; 1 male as previous, except for 8–11.iii.2002; 1 male as previous except for 22°34'27"S 43°26'11.4"W, 5–8.iii.2002, (Bosque-6). **VENEZUELA: Aragua:** Parque Nacional Henri Pittier, Rancho Grande, 10°21.047'N, 67°41.198'W, about 1000 m a.s.l., 21 males, 16–18.ix.1999, sweep net & light trap, T. Andersen. **Falcón:** Rio Mitare near San Luis, 11°07.930'N, 69°39,184'W, 589 m a.s.l., 18 males, 7.vi.2001, light trap, R.W. Holzenthal, R. Blahnik, H. Paprocki & C. Cressa (MIZA, MZUSP, UFSCar, ZMBN).

Diagnostic characters: The male can be separated from all other members of the genus by having 0–3 apical setae on the wing membrane; squama with 1–3 setae; few scalpellate or non-scalpellate acrostichals in mid scutum; virga absent; and inferior volsella large with anterior bare, strongly set off rounded projection and low posterior lobe. The female differs from other known females by having tergite IX undivided, but tergite setae still in two groups. The pupa has thorn-like macrosetae and anal lobe laterally expanded.

Distribution: The species is known from Saint Vincent and Venezuela, and from Santa Catarina, Paraná, São Paulo, and Rio de Janeiro States in Brazil.

***Antillocladius arcuatus* Sæther**

Antillocladius arcuatus Sæther, 1982: 474, Fig. 5; Mendes *et al*. (2004: 29).

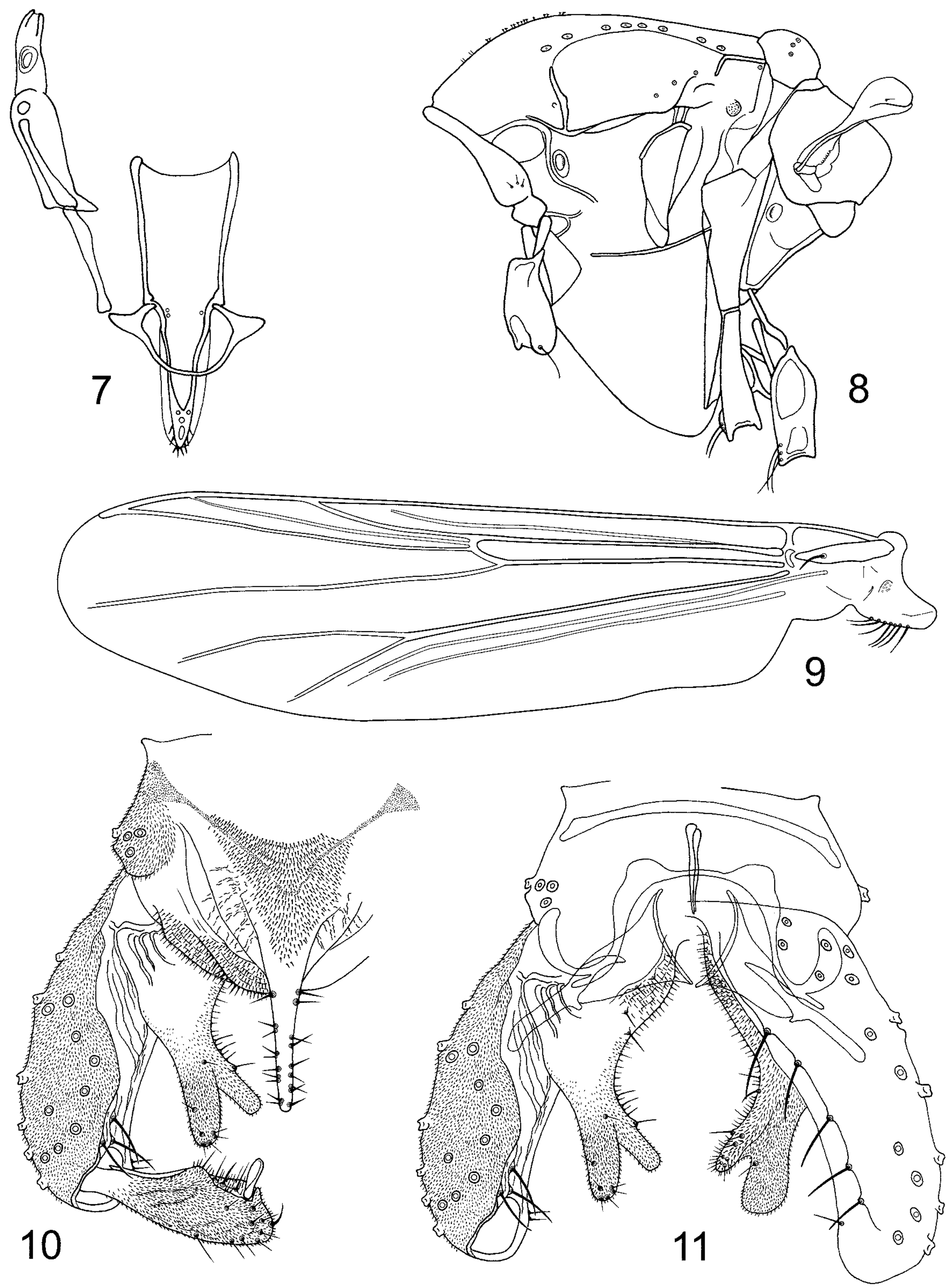
Material examined: Type material as in Sæther (1982). **BRAZIL: São Paulo:** Cajuru, Fazenda Rio Grande, 21°12'S, 47°09'W, 2 males, 18.xii.1999–10.i.2000, Malaise trap, G. Melo & F. Nascimento. **VENEZUELA: Falcón:** Rio Mitare near San Luis, 11°07.930'N, 69°39,184'W, 589 m a.s.l., 8 males, 07.vi.2001, R.W. Holzenthal, R. Blahnik, H. Paprocki & C. Cressa. **MEXICO: Nuevo Leòn:** Santiago, 30 km west of Cola Caballo on road to Laguna de Sánchez, 2 males, 19.ix.1998, light trap, T. Andersen & A. Contreras-Ramos; Allende, Rio Ramos at Raices, 2 km west of highway 85, 2 males, 20.ix.1998, sweep net & light trap, T. Andersen & A. Contreras-Ramos (MIZA, MZUSP, ZMBN).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane; squama with 2–3 setae; acrostichals starting in front, non-scalpellate anterior, scalpellate in mid scutum; virga absent; anal point narrow, tapering to point; and inferior volsella strongly projecting and lobe-like.

Distribution: The species is known from Brazil, Mexico, Venezuela, and U.S.A.

***Antillocladius atalaia* sp. n.**
(Figs 7–11)

Type material: Holotype male, **Brazil: Rio de Janeiro:** Arraial do Cabo, Morro do Atalaia, 10.i.2006, sweep net (swarming), H.F. Mendes (MZUSP). Paratypes: 9 males, same data as holotype (ZSM, ZMBN).



FIGURES 7–11. *Antillocladius atalaia* **sp. n.**, male. **7—**tentorium, stipes, and cibarial pump; **8—**thorax; **9—**wing; **10—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **11—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Diagnostic characters: The species can be separated from all other members of the genus by the presence of setae on squama, bifid inferior volsella, and long virga.

Etymology: Named after the type locality; the name is to be regarded as a noun in apposition.

Male (n = 10, except when otherwise stated). Total length 1.87–2.14, 2.03 mm. Wing length 1.14–1.30, 1.22 mm. Total length / wing length 1.45–1.76, 1.66. Wing length / length of profemur 2.19–2.50, 2.28. Coloration brown, thorax dark brown without distinct marks.

Head. AR 1.23–1.54, 1.38. Ultimate flagellomere 400–479, 439 µm long. Temporal setae 7–14, 11; including 1–5, 4 inner verticals; 3–5, 4 outer verticals; and 3–4, 3 postorbitals. Clypeus with 3–8, 6 setae. Tentorium, stipes, and cibarial pump as in Figure 7. Tentorium 91–120, 108 µm long; 18–22, 20 µm wide. Stipes 102–136, 117 µm long. Palp segment lengths (in µm): 16–24, 21; 36–54, 44; 84–113, 96; 77–100, 87; 95–120, 107 (9). Third palpomere with 3–6, 5 sensilla clavata subapically; longest 9–16, 13 µm long.

Thorax (Fig. 8). Antepronotum with 2–5, 3 setae. Dorsocentrals 7–13, 10; acrostichals 15–23, including 3–8, 4 simple anterior and 10–19, 14 scalpellate; prealars 3–5, 4; supraalar 1. [One paratype with weak seta on left side of preepisternum, others lack seta]. Scutellum with 6–10, 8 setae.

Wing (Fig. 9). VR 1.22–1.39, 1.32. C extension 57–86, 72 µm long. Brachiolum with 1–2, 1 setae; R with 0–5, 2 setae; R_1 with 0–2, 1 setae, other veins and membrane bare. Squama with 4–11, 8 setae.

Legs. Spur of foretibia 50–59, 54 µm long; spurs of midtibia 25–38, 32 µm and 23–27, 25 µm long; spurs of hind tibia 43–59, 51 µm and 18–27, 24 µm long. Width at apex of foretibia 29–34, 31 µm; of midtibia 32–34, 33 µm; of hind tibia 39–45, 42 µm. Comb with 12–16, 14 setae; longest 29–48, 37 µm; shortest 16–23, 20 µm. Lengths and proportions of legs as in Table 1.

TABLE 1. Lengths (in µm) and proportions of legs of *Antillocladius atalaia* **sp. n.**, male (n = 10).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	497–580, 534	479–589, 551	350–443, 403	184–258, 142	129–157, 142	74–92, 82
p_2	488–580, 528	479–580, 539	175–313, 224	101–129, 119	83–92, 87	46–64, 57
p_3	562–663, 618	562–700, 644	304–378, 348	166–295, 206	129–166, 148	55–74, 68

	ta_5	LR	BV	SV	BR
p_1	46–64, 58	0.69–0.79, 0.73	2.77–3.21, 2.94	2.51–2.82, 2.67	3.1–4.2, 3.6
p_2	37–55, 48	0.36–0.57, 0.41	3.88–4.55, 4.22	3.47–5.53, 4.84	3.3–4.4, 3.8
p_3	46–64, 60	0.51–0.55, 0.53	2.72–3.78, 3.41	3.49–3.83, 3.63	4.5–5.5, 5.1

Hypopygium (Figs 10–11). Tergite IX covered with microtrichia; laterosternite IX with 5–8, 7 setae. Anal point triangular, 36–61 (3) µm long, 25–29 (3) µm wide at base, 6–9 (3) µm wide at apex, with 10–19, 14 setae. Phallapodeme 79–98, 87 µm long; transverse sternapodeme 27–43, 34 µm long. Virga 25–48, 40 µm long composed of two spines. Gonocoxite 159–193, 177 µm long. Gonostylus 77–98, 87 µm long; megaseta 14–17, 15 µm long. HR 1.93–2.13, 2.02; HV 2.15–2.56, 2.33.

Biology and distribution: The species was collected together with *A. axitiosus* sp. n., *A. brazuca* sp. n., *A. folius*, and *A. ultimus* sp. n. in a hill-side close to the sea in Rio de Janeiro State, Brazil (Fig. 12). All five species were collected swarming together from noon to 6:00 pm. The air temperature was around 30º C. The hill-side is covered by restinga vegetation with large cactus plants. There are no streams nearby, but some phytotelmata (mostly bromeliads) and a few rock-pools along the coast. At the sampling site the soil was covered by mosses and lichens, which could be the habitat of the larvae. The immatures of *A. musci*, *A. folius* and *A. pluspilalus* are all terrestrial and have been found living in mosses and lichens on tree-trunks and stones.

***Antillocladius axitiosus* sp. n.**
(Figs 13–17)

Type material: Holotype male, **Brazil: Rio de Janeiro:** Arraial do Cabo, Morro do Atalaia, 10.i.2006, sweep net (swarming), H.F. Mendes (MZUSP).

Diagnostic characters: The species can be separated from all other members of the genus by the presence of setae on the squama, anal point parallel-sided, rounded inferior volsella, and long costal extension.

Etymology: From Latin, *axitiosus*, meaning together, in combination, as the species can only be identified by a combination of characters.

Male (n = 1). Total length 1.99 mm. Wing length 1.21 mm. Total length / wing length 1.65. Wing length / length of profemur 2.38. Coloration light brown, thorax light brown, foreleg darker than mid- and hind leg.

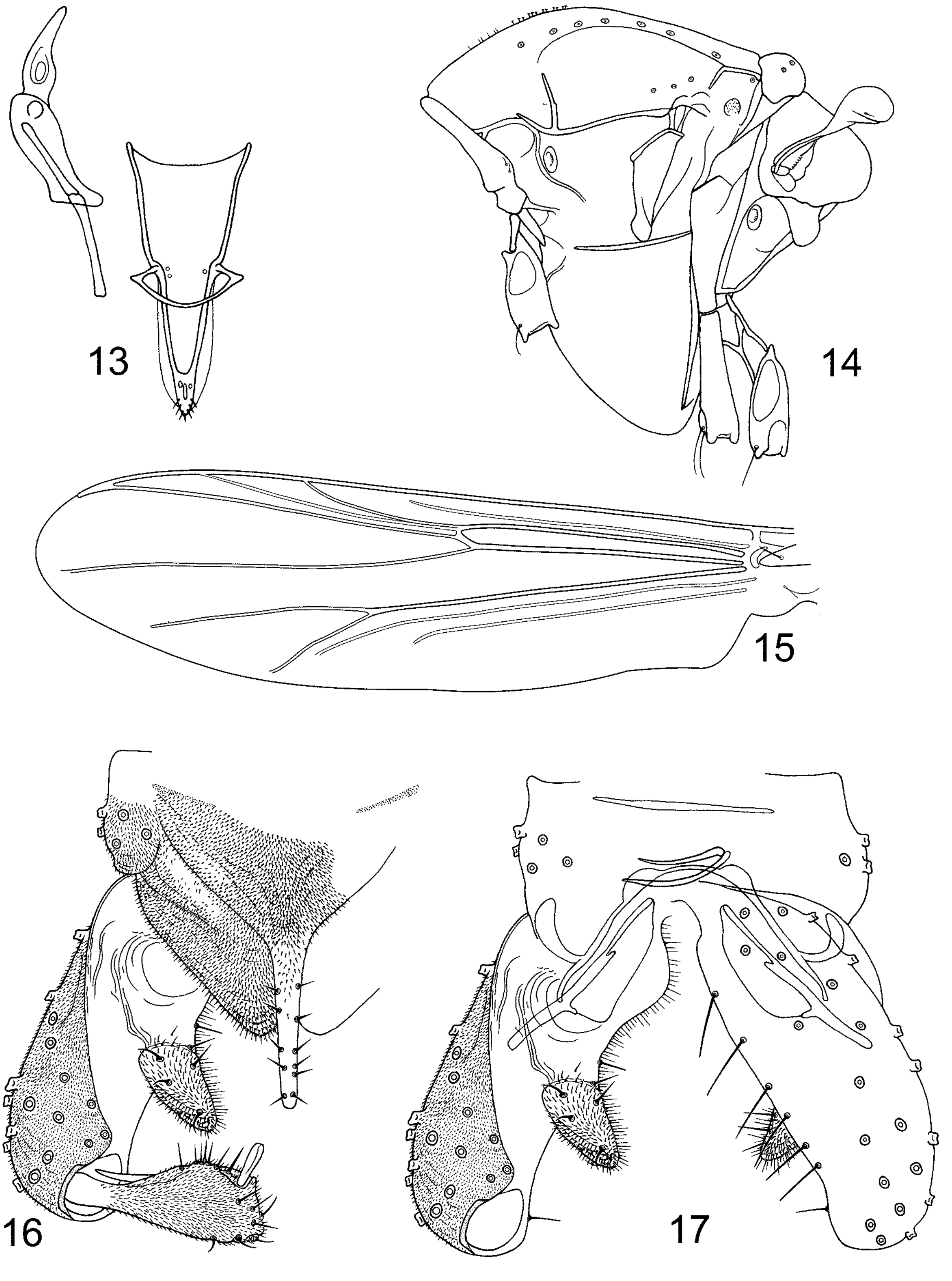
Head. AR 1.22. Ultimate flagellomere 396 µm long. Temporal setae 8, including 2 inner verticals, 3 outer verticals, and 3 postorbitals. Clypeus with 9 setae. Tentorium, stipes, and cibarial pump as in Figure 13. Tentorium 86 µm long, 20 µm wide. Stipes 84 µm long. Palp segment lengths (in µm): 18, 38, 91, 86, 100. Third palpomere with 5 sensilla clavata subapically, longest 11 µm long.

FIGURE 12. Restinga vegetation in Morro do Atalaia, Arraial do Cabo, Rio de Janeiro State, Brazil, 10.i.2006; the type locality of *Antillocladius atalaia* **sp. n.**, *A. brazuca* **sp. n.**, and *A. ultimus* **sp. n.** (Photo: H. F. Mendes).

Thorax (Fig. 14). Antepronotum with 2 setae. Dorsocentrals 7, acrostichals 18, composed of 6 simple anterior and 12 scalpellate posterior; prealars 3; supraalar 1. Scutellum with 4 setae.

Wing (Fig. 15). VR 1.36. C extension 95 µm long. Brachiolum with 1 setae, R with 0–1 seta, other veins and cells bare. Squama with 4 setae.

Legs. Spur of foretibia 50 µm long, spurs of midtibia 32 µm and 20 µm long, spurs of hind tibia 48 µm and 20 µm long. Width at apex of foretibia 29 µm, of midtibia 29 µm, of hind tibia 36 µm. Comb with 17 setae, longest 34 µm, shortest 21 µm. Lengths and proportions of legs as in Table 2.



FIGURES 13–17. *Antillocladius axitiosus* **sp. n.**, male. **13—**tentorium, stipes, and cibarial pump; **14—**thorax; **15—**wing; **16—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **17—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

TABLE 2. Lengths (in µm) and proportions of legs of *Antillocladius axitiosus* **sp. n.**, male (n = 1).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	504	558	450	241	144	86	50	0.81	2.90	2.36	3.3
p_2	497	522	220	119	86	50	36	0.42	4.25	4.64	3.8
p_3	580	619	349	187	140	47	43	0.56	3.71	3.43	5.2

Hypopygium (Figs 16–17). Tergite IX covered with microtrichia; laterosternite IX with 5 setae. Anal point triangular, 66 µm long, 14 µm wide at base, 7 µm wide at apex, with 11 setae. Phallapodeme 73 µm long, transverse sternapodeme 23 µm long. Virga 34 µm long. Gonocoxite 138 µm long. Gonostylus 70 µm long, megaseta 14 µm long. HR 1.97, HV 2.83.

Biology and distribution: The species was taken together with *A. atalaia* sp. n. in Rio de Janeiro State, Brazil (see above).

Antillocladius biota Mendes, Andersen *et* Sæther

Antillocladius biota Mendes, Andersen and Sæther, 2004: 30, Fig. 3.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane, squama with few setae, long costal extension, scalpellate acrostichals starting near antepronotum, long virga, nearly parallel-sided anal point with blunt apex and weak lateral setae, and inferior volsella short and pointed triangular.

Biology and distribution: The species has only been taken in the Parque Estadual Intervales in southern São Paulo State, Brazil, at the border with Paraná, where the larvae were collected among mosses growing on tree trunks. The type locality is a primary forest with some springs and rivulets, as well as swampy areas.

Antillocladius brazuca sp. n.
(Figs 18–22)

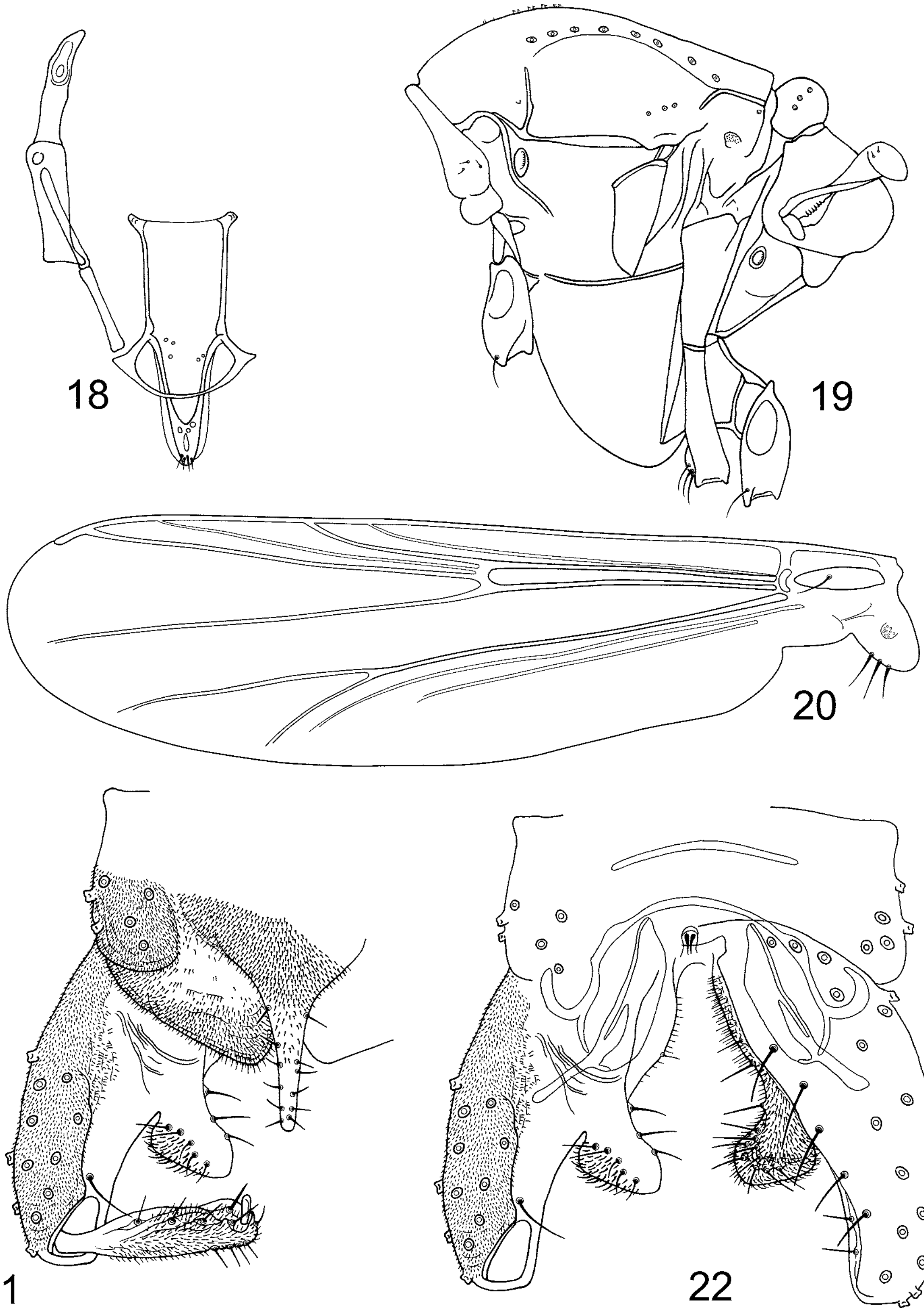
Type material: Holotype male, **BRAZIL: Rio de Janeiro:** Arraial do Cabo, Morro do Atalaia, 10.i.2006, sweep net (swarming), H.F. Mendes (MZUSP). Paratypes: 3 males, **Santa Catarina:** São Bento do Sul, 26º19'25.6"S, 48º18'26.5"W, 660 m a.s.l., (Trilha-1, Rugendas), 13–16.x.2001, Malaise trap, M.V. Yamada; 1 male, Florianópolis, UCAD, 10–13.xii.2002, Malaise trap, L.C. Pinho. 1 male, **São Paulo:** Estação Biológica Boracéia, Rio Claro, 2nd bridge, 09.xii.2002, light trap, H.F. Mendes & C.G. Froehlich (ZSM, ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by the presence of setae on squama, simple pediform inferior volsella, short virga consisting of two small spines, and costa clearly extended.

Etymology: From colloquial Portuguese, *brazuca*, meaning a Brazilian; the name is to be regarded as a noun in apposition.

Male (n = 6, except when otherwise stated). Total length 1.67–1.85, 1.76 mm. Wing length 1.04–1.26, 1.12 mm. Total length / wing length 1.39–1.75, 1.58. Wing length / length of profemur 2.30–2.69, 2.55. Coloration brown, thorax dark brown without distinct marks.

Head. AR 1.02–1.16, 1.07. Ultimate flagellomere 324–385, 361 µm long. Temporal setae 7–11, 9; including 3–5, 4 inner verticals; 2–4, 3 outer verticals; and 2–3, 3 postorbitals. Clypeus with 4–9, 6 setae. Tentorium, stipes, and cibarial pump as in Figure 18. Tentorium 98–111, 105 µm long; 16–23, 19 µm wide. Stipes 95–104, 100 µm long; 36 (1) µm wide. Palp segment lengths (in µm): 19–23, 19; 32–41, 37; 75–88, 81; 73–82, 77 (6); 88–109, 99 (4). Third palpomere with 3–6, 5 sensilla clavata subapically; longest 9–14, 11 µm long.



FIGURES 18–22. *Antillocladius brazuca* **sp. n.**, male. **18—**tentorium, stipes, and cibarial pump; **19—**thorax; **20—**wing; **21—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **22—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Thorax (Fig. 19). Antepronotum with 2–3, 3 setae. Dorsocentrals 7–9, 8; acrostichals composed of 0–4, 2 simple anterior and 8–11, 9 scalpellate posterior setae; prealars 3–4, 3; supraalar 1. Scutellum with 4–8, 6 setae.

Wing (Fig. 20). VR 1.35–1.47, 1.41. C extension 41–73, 63 µm long. Brachiolum with 1 seta; all veins and cells bare. Squama with 1–7, 4 setae.

Legs. Spur of foretibia 34–43, 38 µm long; spurs of midtibia 20–25, 23 (5) µm and 16–23, 20 (5) µm long; spurs of hind tibia 32–41, 37 µm and 16–20, 18 µm long. Width at apex of foretibia 34–43, 38 µm; of midtibia 25–32, 28 µm; of hind tibia 34–39, 36 µm. Comb with 11–13, 12 setae; longest 27–34, 30 µm; shortest 14–20, 17 µm. Lengths and proportions of legs as in Table 3.

TABLE 3. Lengths (in µm) and proportions of legs of *Antillocladius brazuca* **sp. n.**, male (n = 5–6).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	403–482, 448	461–601, 522	274–392, 335	176–230, 193	101–137, 120	47–100, 70
p_2	439–472, 452	436–500, 465	176–205, 191	94–112, 104	61–83, 69	36–50, 41
p_3	475–540, 513	490–605, 563	270–338, 326	137–184, 162	122–144, 131	47–68, 57

	ta_5	LR	BV	SV	BR
p_1	40–50, 44	0.45–0.85, 0.65	2.85–3.35, 3.04	2.49–3.96, 2.95	3.0–3.8, 3.4
p_2	29–36, 31	0.36–0.45, 0.41	4.14–4.76, 4.46	4.49–5.09, 4.81	3.0–4.7, 3.7
p_3	32–47, 41	0.54–0.61, 0.58	3.39–3.98, 3.60	3.20–3.57, 3.36	3.4–4.8, 4.4

Hypopygium (Figs 21–22). Tergite IX covered with microtrichia; laterosternite IX with 4–9, 6 setae. Anal point narrowly triangular; 45–57, 52 µm long; 20–32, 25 µm wide at base; 4–7, 5 µm wide at apex; with 10–17, 14 setae. Phallapodeme 64–77, 68 µm long; transverse sternapodeme 48–57, 53 µm long. Virga 7–9, 8 µm long. Gonocoxite 127–138, 132 µm long. Gonostylus 66–73, 68 µm long; megaseta 7–10, 8 µm long. HR 1.87–2.03, 1.94; HV 2.41–2.77, 2.59.

Biology and distribution: The species has been collected in Malaise traps, light traps and with sweep nets. In the type locality it was taken together with four other *Antillocladius* species (see *A. atalaia* sp. n. for details). The species has also been taken together with *A. antecalvus* in São Bento do Sul and Florianópolis (see Pinho *et al*. 2005), with *A. gephyrus* sp. n. in Florianópolis, and with *A. folius* in São Bento do Sul and Boracéia. The species is distributed in Southern and Southeastern Brazil, occurring along the Mata Atlântica, at least from Santa Catarina north up to Rio de Janeiro.

Antillocladius calakmulensis Mendes, Andersen *et* Sæther

Antillocladius calakmulensis Mendes, Andersen and Sæther, 2004: 32, Fig. 4.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having a virga consisting of 6 short spines; apical setae on the wing membrane; squama with a few setae; short costal extension; scalpellate acrostichals in mid scutum; anal point long, triangular, with strong lateral setae; and inferior volsella prominent with anterior digitiform projection equally long as and partly covering rounded posterior lobe.

Distribution: The species is known from Calakmul Biosphere Reserve, a large rainforest reserve on the Yucatan Peninsula in Mexico.

***Antillocladius campususp* sp. n.**
(Figs 23–27)

Type material: Holotype male, **BRAZIL: São Paulo:** Ribeirão Preto, University of São Paulo Campus, 26–29.i.2003, Malaise trap, H.F. Mendes & T. Andersen (MZUSP). Paratypes: 5 males, same data as holotype; 1 male, São Simão, ponte Tio Zito, 19.i.2003, sweep net, H.F. Mendes & T. Andersen (ZSM, ZMBN).

Diagnostic characters: The new species can be separated from all other members of the genus by the absence of virga, and the well set off, parallel-sided inferior volsella, with broadly rounded apex.

Etymology: The name refers to the type locality, the University of São Paulo (USP) campus; the name is to be regarded as a noun in apposition.

Male (n = 7, except when otherwise stated). Total length 1.59–1.77, 1.70 mm. Wing length 1.00–1.14, 1.08 mm. Total length / wing length 1.55–1.73, 1.60. Wing length / length of profemur 2.52–2.81, 2.63. Coloration brown, thorax light brown with darker markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head. AR 1.00–1.12, 1.06. Ultimate flagellomere 333–382, 352 µm long. Temporal setae 7–10, 9; including 3–5, 4 inner verticals; 2–3, 3 outer verticals; and 2–3, 2 postorbitals. Clypeus with 3–6, 4 setae. Tentorium, stipes, and cibarial pump as in Figure 23. Tentorium 91–100, 97 µm long; 13–18, 16 µm wide. Stipes 91–102, 97 µm long; 39 (1) µm wide. Palp segment lengths (in µm): 14–16, 15; 25–41, 33; 61–91, 76; 66–77, 71 (4); 77–88 (2). Third palpomere with 2–5, 3 sensilla clavata subapically, longest 9–12, 10 µm long.

Thorax (Fig. 24). Antepronotum with 1–3, 2 setae. Dorsocentrals 4–8, 6; acrostichals composed of 0–2, 1 simple anterior and 7–12, 10 scalpellate posterior setae; prealars 3; supraalar 1. Scutellum with 4–6, 4 setae.

Wing (Fig. 25). VR 1.28–1.35, 1.32. C extension 54–70, 60 µm long. Brachiolum with 1 setae; all veins and cells bare. Squama with 1–3, 2 setae.

Legs. Spur of foretibia 36–43, 39 µm long; spurs of midtibia 20–23, 21 µm and 18–19, 18 µm long; spurs of hind tibia 34–41, 37 µm and 16–20, 18 µm long. Width at apex of foretibia 24–27, 26 µm; of midtibia 25–27, 26 µm; of hind tibia 29–34, 31 µm. Comb with 12–14, 13 setae; longest 29–34, 31 µm; shortest 16–18, 17 µm. Lengths and proportions of legs as in Table 4.

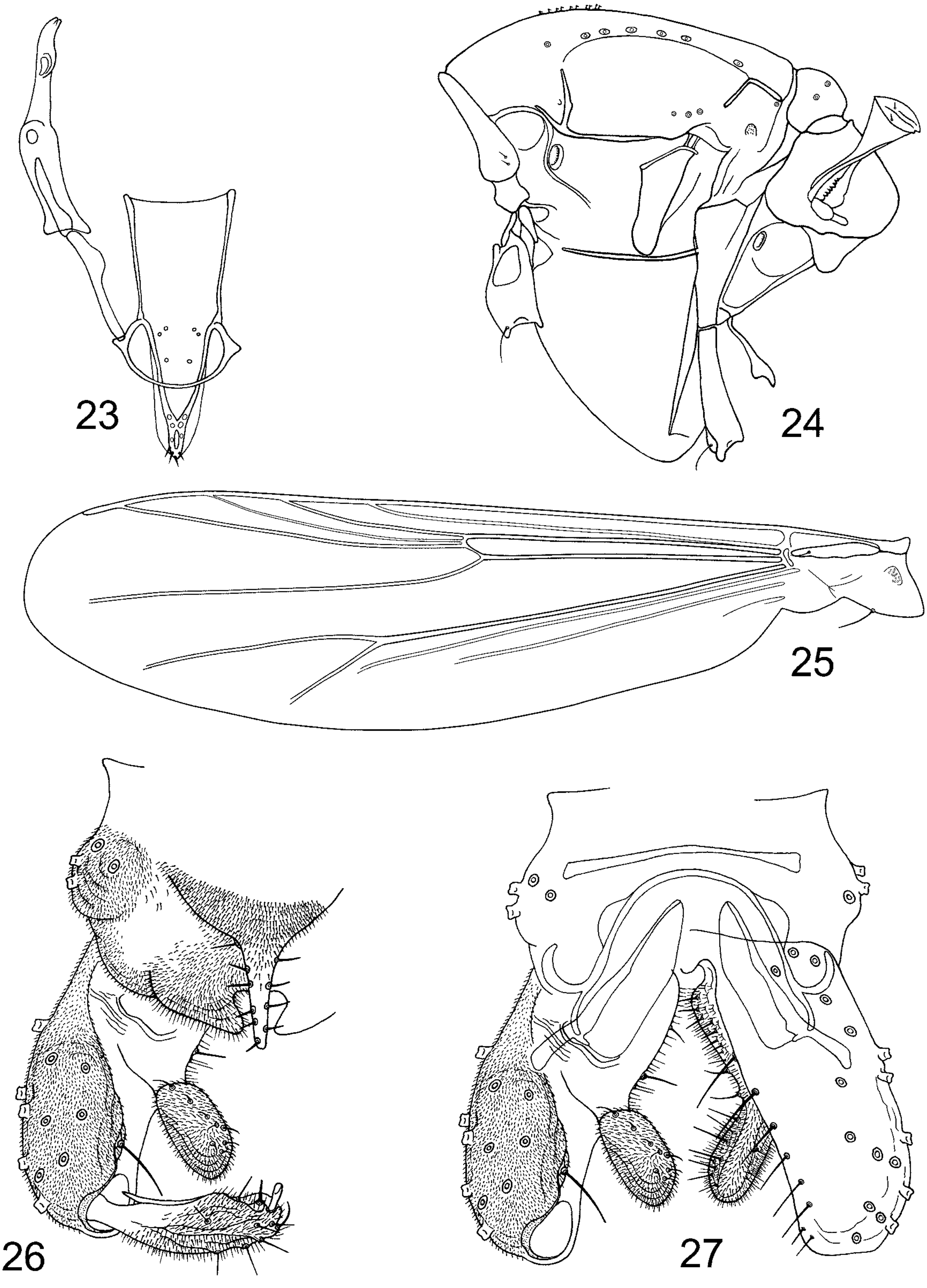
TABLE 4. Lengths (in µm) and proportions of legs of *Antillocladius campususp* **sp. n.**, male (n = 3–5).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	396–436, 413	414–461, 439	324–374	176–209	108–122	68–79
p_2	407–436, 421	403–439, 424	162–176, 169	83–97, 90	61–68, 65	36–47, 41
p_3	443–482, 470	443–533, 499	259–295, 282	122–154, 142	108–126, 117	40–52, 61

	ta_5	LR	BV	SV	BR
p_1	40–47	0.76–0.86	2.70–2.89	2.30–2.50	3.2–3.8
p_2	29–32, 31	0.38–0.41, 0.39	4.27–4.65, 4.48	4.75–5.33, 5.00	3.2–4.3, 3.8
p_3	36–47, 38	0.55–0.58, 0.56	3.42–3.74, 3.57	3.38–3.56, 3.44	4.1–6.1, 5.2

Hypopygium (Figs 26–27). Tergite IX covered with microtrichia; laterosternite IX with 4–6, 5 setae. Anal point narrowly triangular; 34–48, 40 µm long; 14–23, 17 µm wide at base; 2–5, 3 µm wide at apex; with 8–13, 10 setae. Phallapodeme 57–68, 63 µm long; transverse sternapodeme 29–36, 32 µm long. Virga absent. Gonocoxite 102–120, 110 µm long. Gonostylus 57–66, 63 µm long; megaseta 5–9, 7 µm long. HR 1.62–1.92, 1.74; HV 2.60–2.82, 2.69.

Biology and distribution: The species was taken together with *A. folius* and *A. musci* in the Ribeirão Preto area, São Paulo State, Brazil, with most of the specimens collected on the USP Campus, and one specimen at São Simão. The sampling site on the USP Campus is a small patch of large, old rainforest.



FIGURES 23–27. *Antillocladius campususp* **sp. n.**, male. **23—**tentorium, stipes, and cibarial pump; **24—**thorax; **25—**wing; **26—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **27—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

***Antillocladius folius* Mendes, Andersen *et* Sæther**

Antillocladius folius Mendes, Andersen and Sæther, 2004: 34, Figs 5–7.

Material examined: Type material as in Mendes *et al.* (2004). **BRAZIL: Paraná:** Morretes, Parque Estadual do Pau Oco, 25°34'27.9"S 48°53'46.7"W, 10 males, 07–13.iv.2002, Malaise trap, M.T. Tavares *et al.* (BIOTA-FAPESP). **São Paulo:** Peruíbe, Estação Ecológica Juréia-Itatins, 24°31'06"S 47°12'06"W, 25 males, 3–6.v.2002, Malaise trap, N.W. Perioto *et al.* (BIOTA-FAPESP); Ubatuba, Parque Estação Serra do Mar, 23°21'43"S 44°59'22"W, 15 males, 21–24.i.2002, Malaise trap, N.W. Perioto *et al.* (BIOTA-FAPESP); Salesópolis, Estação Biológica Boracéia, Trilha dos Pilões, 23°39'05.8"S 45°53'44.6"W, 1 male, 30.iii–02.iv.2001, Malaise trap (Trilha-4), S.T.P. Amarante *et al.* (BIOTA-FAPESP). **Rio de Janeiro:** Nova Iguaçu, Reserva Biológica Tinguá, 6 males, 5–11.iii.2002, Malaise trap, S.T. P. Amarante *et al.* (BIOTA-FAPESP). **Espírito Santo:** Linhares, Reserva Biológica Sooretama, 23 m a.s.l., 18°58'02.7"S 40°08'06.8"W, 1 male, 24–27.iii.2002, Malaise trap (Bosque-5), C.O. Azevedo *et al.* (BIOTA-FAPESP). **Bahia:** Mata de São João, Reserva de Sapiranga, 12°33'36.4"S 38°02'57.2"W, 2 males, 19–22.vii.200, Malaise trap (Bosque-3), M.T. Tavares *et al.* (BIOTA-FAPESP). **Sergipe:** Sta Luzia do Itanhy Castro, 11°22'31.2"S 37°24'50.9"W, 1 male, 29.vii–01.viii.2001, Malaise trap (Bosque-5), M.T. Tavares *et al.* (BIOTA-FAPESP) (MZUSP, ZMBN).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane and squama with few setae; acrostichals starting in front, anterior ones hair-like, posterior ones scalpellate; virga well developed; anal point nearly parallel-sided with blunt apex, with weak lateral setae; and inferior volsella consisting of triangular, pointed lobe. The pupa differs from that of other known species by having antennal sheath with pearl row and thorn-like anal macrosetae less than half as long as the male gonopodal sheaths. The larva has mentum with 5 lateral teeth and antennal blade subequal in length to flagellum.

Remarks: This species is rather variable in the shape of the inferior volsella, with some specimens having an extremely long volsella, almost reaching the tip of gonostylus; the anal point also varies in shape and size, but is always parallel-sided with weak, lateral setae.

Distribution: The species occurs all along the Brazilian Atlantic Forest, from Santa Catarina in the south north up to Sergipe on the northeastern coast.

***Antillocladius gephyrus* sp. n.**
(Figs 28–32)

Type material: Holotype male, **BRAZIL: Santa Catarina:** Florianópolis, UCAD, 10–13.xii.2002, Malaise trap, L.C. Pinho (MZUSP). Paratype: 1 male, same data as holotype.

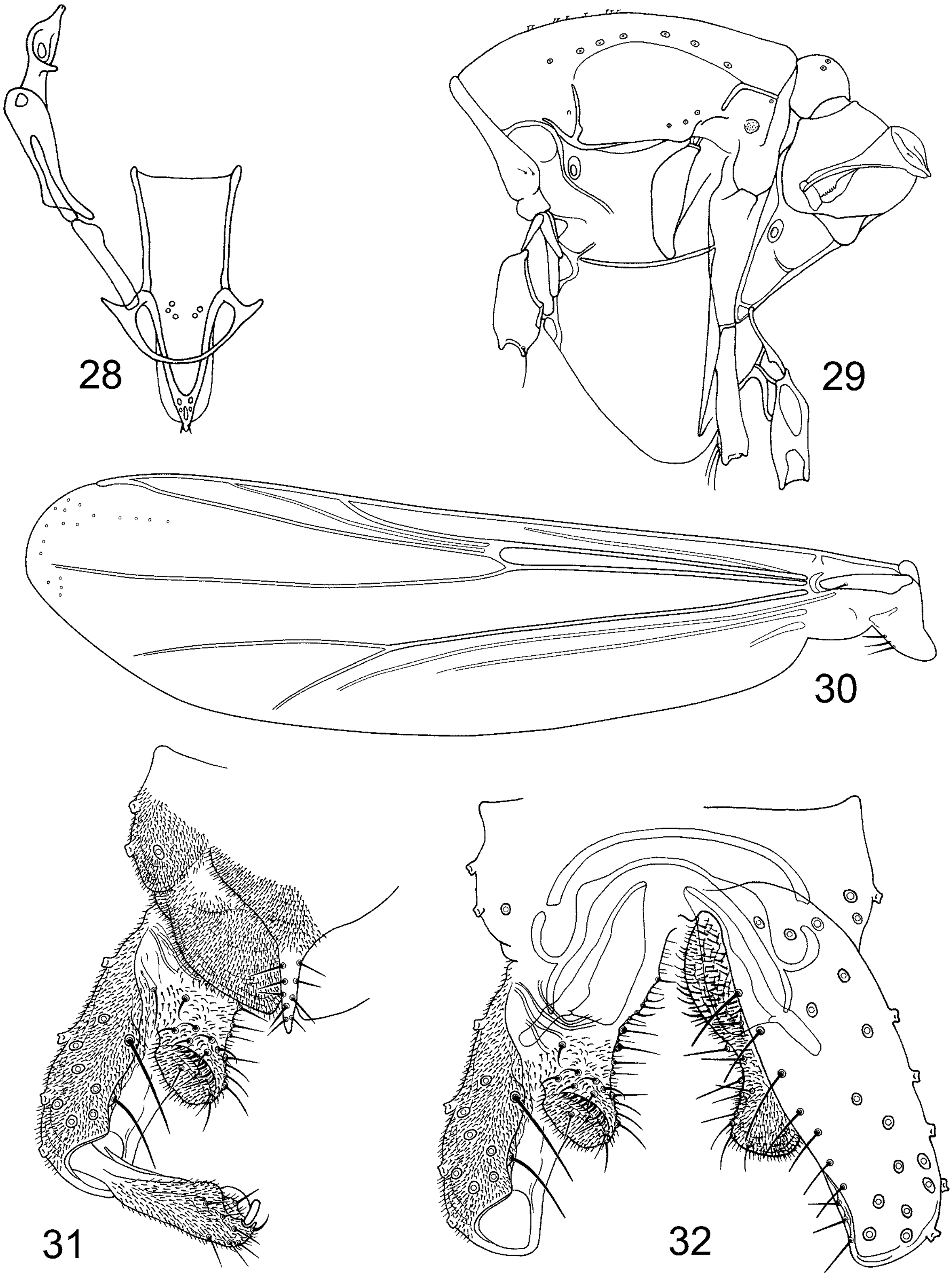
Diagnostic characters: The species can be separated from all other members of the genus by the absence of virga and the shape of the inferior volsella having a dorsal ridge.

Etymology: From Greek, *gephyra*, meaning bridge, referring to the shape of the inferior volsella.

Male (n = 1–2). Total length 1.68–1.76 mm. Wing length 1.00–1.10 mm. Total length / wing length 1.59–1.67. Wing length / length of profemur 2.48–2.67. Coloration light brown, thorax brown without distinct marks.

Head. AR 0.94–1.11. Ultimate flagellomere 324–367 µm long. Temporal setae 8, including 3 inner verticals, 2–3 outer verticals, and 2–3 postorbitals. Clypeus with 4–5 setae. Tentorium, stipes, and cibarial pump as in Figure 28. Tentorium 86–101 µm long, 14–17 µm wide. Stipes not measurable. Palp segment lengths (in µm): 14–16, 23–36, 91, 79, 95. Third palpomere with 2 sensilla clavata subapically, longest 14 µm long.

Thorax (Fig. 29). Antepronotum with 2–3 setae. Dorsocentrals 7, acrostichals composed of 0–3 simple anterior and 9–10 scalpellate posterior setae, prealars 3–4, supraalars 1–2. Scutellum with 4–6 setae.



FIGURES 28–32. *Antillocladius gephyrus* **sp. n.**, male. **28—**tentorium, stipes, and cibarial pump; **29—**thorax; **30—** wing; **31—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **32—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Wing (Fig. 30). VR 1.29–1.38. C extension 68–75 µm long. Brachiolum with 1 seta, C extension with 0–3 non-marginal setae, cell r_{4+5} with 0–15 setae, m_{1+2} with 0–4 setae, other veins and cells bare. Squama with 1–3 setae.

Legs. Midleg lost in both specimens. Spur of foretibia 27–38 µm long, spurs of hind tibia 36 µm and 18 µm long. Width at apex of foretibia 27–45 µm, of hind tibia 39 µm. Comb with 13 setae, longest 32 µm, shortest 18 µm. Lengths and proportions of legs as in Table 5.

Hypopygium (Figs 31–32). Tergite IX covered with microtrichia, laterosternite IX with 5–6 setae. Anal point narrowly triangular, 32–36 µm long, 11–14 µm wide at base, 2 µm wide at apex, with 9–13 setae. Phallapodeme 61–68 µm long, transverse sternapodeme 61 µm long. Virga absent. Gonocoxite 123–132 µm long. Gonostylus 61 µm long, megaseta 7–9 µm long. HR 2.00–2.15, HV 2.73–2.87.

Biology and distribution: The species is known from the Santa Catarina State, Brazil, where it was collected in a reserve with secondary forest together with *A. brazuca* sp. n. and *A. antecalvus*.

TABLE 5. Lengths (in µm) and proportions of legs of *Antillocladius gephyrus* **sp. n.**, male (n = 1–2).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	414–461	421–508	364–403	194–23	130–133	58–72
p_2	–	–	–	–	–	–
p_3	450	486	302	166	130	50

	ta_5	LR	BV	SV	BR
p_1	32–43	0.79–0.86	2.84–2.89	2.30–2.40	3.3–3.8
p_2	–	–	–	–	–
p_3	36	0.62	3.24	3.09	6.0

Antillocladius herradurus **Mendes, Andersen *et* Sæther**

Antillocladius herradurus Mendes, Andersen and Sæther, 2004: 39, Fig. 8.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having a few setae apically on the wing membrane; squama with few setae; costa barely extended; acrostichals starting in front, anterior ones hair-like, posterior ones scalpellate; virga short; anal point triangular, tapering to blunt apex, with strong lateral setae; and inferior volsella strongly projecting posteriomedially, ending in two rounded lobes.

Distribution: The species is known from Calakmul Biosphere Reserve, a large rainforest reserve on the Yucatan Peninsula in Mexico.

Antillocladius musci **Mendes, Andersen *et* Sæther**

Antillocladius musci Mendes, Andersen and Sæther, 2004: 41, Figs 9–12.

Material examined: Type material as in Mendes *et al*. (2004). **BRAZIL: Santa Catarina:** Urubici, Morro da Igreja, 1822 m a.s.l., 1 male, 05.xii–08.iii.2005, Malaise trap, cloud forest, L.E.M. Bizzo & H. Mozerle.

Diagnostic characters: The male can be separated from all other members of the genus by having a few apical setae on the wing membrane; setose squama; acrostichals all scalpellate, starting some distance from antepronotum; virga long; anal point tapering, with strong lateral setae; and inferior volsella rectangular with anterior digitiform projection. The female has a wing length of about 2.0 mm and tergite IX divided. The pupa differs from that of other known species by having antennal sheath with pearl row, and thorn-like anal macrosetae more than half as long as the distance by which the male genital sac is overreaching the anal lobe. The larva has pecten epipharyngis with about 12 teeth, mentum with 5 lateral teeth, and antennal blade longer than flagellum.

Distribution: The species is known from Santa Catarina, São Paulo, and Minas Gerais States in Brazil.

***Antillocladius plicatus* sp. n.**
(Figs 33–37)

Type material: Holotype male, **Brazil: Bahia:** Porto Seguro, Estação Ecológica Pau Brasil, 16°23'17.6"S, 39°10'55.6"W, 17.v.2002, 107 m a.s.l., Malaise trap (Trilha-1) C.O. Azevedo *et al.* (BIOTA-FAPESP) (MZUSP). Paratypes: 4 males, same data as holotype (MZUSP, ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by the short virga apparently attached to the penis cavity and the long inferior volsella with median, oblique fold.

Etymology: From Latin, *plicatus*, meaning fold; referring to the shape of the inferior volsella.

Male (n = 5, except when otherwise stated). Total length 1.43–1.80, 165 mm. Wing length 0.91–1.03, 1.00 mm. Total length / wing length 1.42–1.76, 1.65. Wing length / length of profemur 2.47–2.68, 2.53. Coloration dark brown, thorax brown without distinct marks.

Head. AR 1.10–1.25, 1.20. Ultimate flagellomere 310–360, 341 µm long. Temporal setae 7–9, 8; including 3–4, 3 inner verticals; 3–4, 3 outer verticals; and 2 postorbitals. Clypeus with 4–6, 5 setae. Tentorium, stipes, and cibarial pump as in Figure 33. Tentorium 79–84, 82 µm long; 15–18, 16 µm wide. Stipes 79–93, 87 µm long; 27 (1) µm wide. Palp segment lengths (in µm): 13–16, 14; 34–36, 35; 61–75, 68; 57–75, 66; 75–107, 90. Third palpomere with 2–4, 3 sensilla clavata subapically, longest 11–14, 13 µm long.

Thorax (Fig. 34). Antepronotum with 2–3, 3 setae. Dorsocentrals 5–7, 6; acrostichals in mid scutum, composed of 2–4, 3 simple anterior and 7–17, 12 scalpellate posterior setae, irregularly biserial; prealars 2–3, 3; supraalar 1. Scutellum with 4 setae.

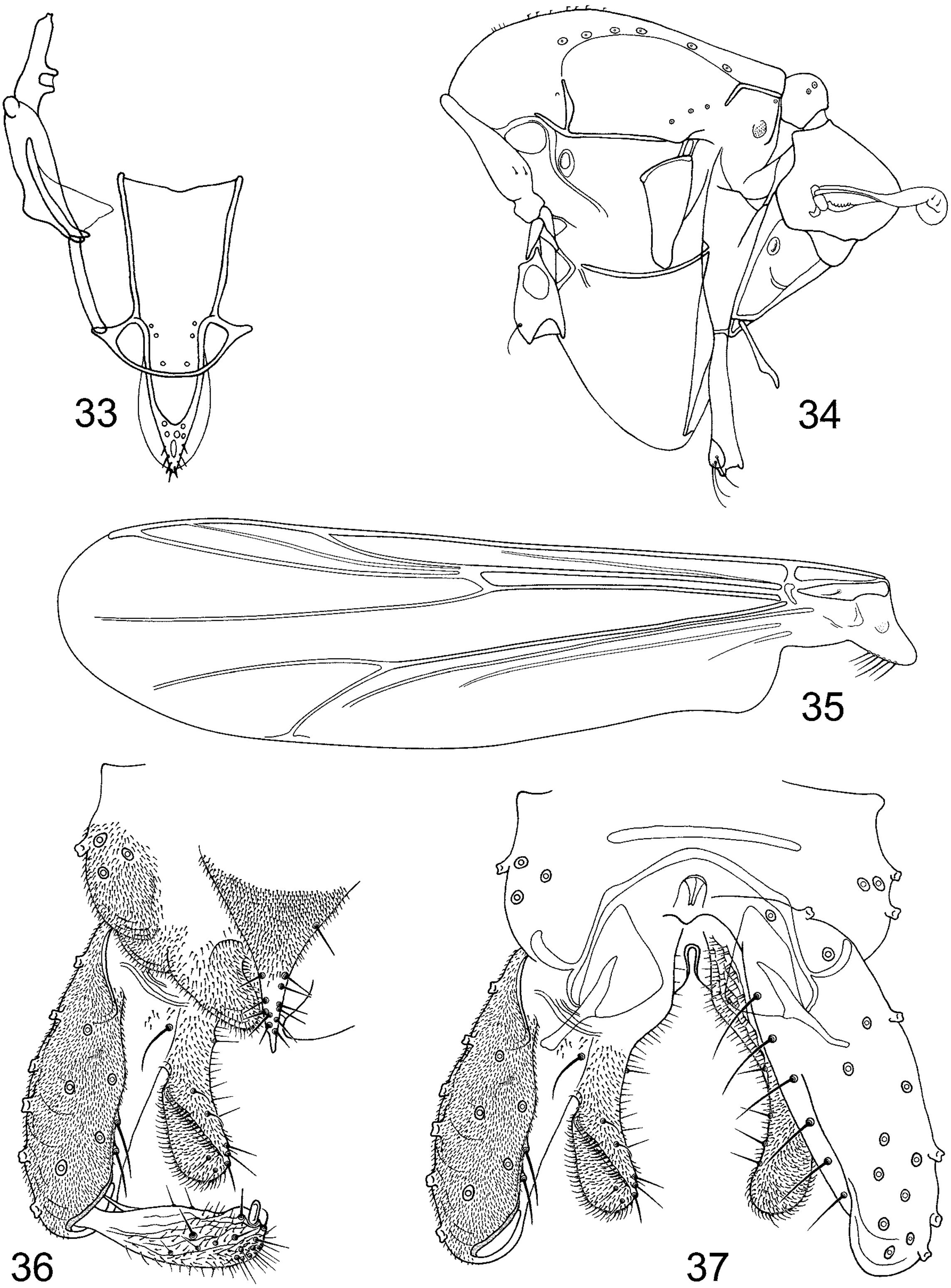
Wing (Fig. 35). VR 1.33–1.48, 1.39. C extension 23–36, 29 µm long. Brachiolum with 1 seta; R with 0–1, 0 seta; other veins and cells bare. Squama with 5–6, 6 setae.

Legs. Spur of foretibia 34–41, 38 µm long; spurs of midtibia 18–23, 20 µm and 18–20, 19 µm long; spurs of hind tibia 34–43, 38 µm and 16–23, 19 µm long. Width at apex of foretibia 24–27, 25 µm; of midtibia 23–27, 24 µm; of hind tibia 27–29, 28 µm. Comb with 12–13, 13 setae; longest 25–32, 29 µm; shortest 16–18, 17 µm. Lengths and proportions of legs as in Table 6.

TABLE 6. Lengths (in µm) and proportions of legs of *Antillocladius plicatus* **sp. n.**, male (n = 5).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	364–425, 399	407–443, 430	292–349, 316	162–205, 183	101–126, 111	58–68, 65
p_2	364–418, 395	385–443, 418	158–191, 174	83–97, 89	50–65, 60	32–47, 39
p_3	410–472, 447	443–514, 489	245–295, 276	140–158, 150	112–122, 116	47–58, 53

	ta_5	LR	BV	SV	BR
p_1	36–43, 40	0.67–0.80, 0.73	2.70–2.98, 2.88	2.42–2.83, 2.63	3.2–4.5, 3.7
p_2	25–32, 29	0.38–0.44, 0.41	4.16–5.09, 4.60	4.36–5.02, 4.70	3.5–4.5, 3.9
p_3	32–38, 35	0.55–0.58, 0.56	3.28–3.53, 3.42	3.34–3.48, 3.40	4.0–5.5, 4.9



FIGURES 33–37. *Antillocladius plicatus* **sp. n.**, male. **33**—tentorium, stipes, and cibarial pump; **34**—thorax; **35**—wing; **36**—anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **37**—hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Hypopygium (Figs 36–37). Tergite IX covered with microtrichia; laterosternite IX with 4–8, 6 setae. Anal point narrowly triangular; 32–45, 38 µm long; 23–29, 24 µm wide at base; 1–3, 2 µm wide at apex; with 9–15,

12 setae. Phallapodeme 50–64, 59 µm long; transverse sternapodeme arcuate, 50–57, 54 µm long, oral projections barely indicated. Virga 7–10, 9 µm long. Gonocoxite 123–152, 134 µm long. Gonostylus 59–66, 62 µm long; megaseta 4–6, 5 µm long. HR 2.07–2.31, 2.15; HV 2.34–2.94, 2.65.
Distribution: The species is known from Bahia State, Brazil.

Antillocladius pluspilalus Sæther

Antillocladius pluspilalus Sæther, 1982: 474, Fig. 6; Sæther (1984: 1, Figs 1–2); Spies and Reiss (1996: 75); Mendes *et al*. (2004: 48).

Material examined: Type material as in Sæther (1982). **ECUADOR: Provincia Pichincha:** Setor Palmeras, unión Rios Guajalito y Bricador, Bosque Protector Rio Guajalito, 00°14.925'N, 78°48.193'W, 1900 m a.s.l., 1 male, 4–10.ii.2000, light trap, F.M. Quesada. **MEXICO: Campeche:** Reserva de la Biosfera Calakmul, Zona Arqueológica, 18°07'26.7"N, 89°48'56.7"W, 265 m a.s.l., 1 male, 20.ix.1997, light trap, A. Contreras-Ramos *et al.* (ZMBN).

Diagnostic characters: The male can be separated from all other members of the genus by having numerous apical setae on the wing membrane, cell m_{3+4}. with several setae; setose squama; acrostichals in mid scutum, all more or less scalpellate; long virga; anal point long, tapering, with moderately strong lateral setae; and inferior volsella prominent with anterior digitiform projection equally long as and partly covering rounded posterior lobe. The pupa has thorn-like macrosetae, caudal spines on tergites, no pearl row on antennal sheath, and anal lobe not extended laterally.

Remarks: *Antillocladius pluspilalus*, *A. yakyijeus*, *A. scalpellatus* and *A. subnubilus* are only separable on the size of the virga and the chaetotaxy of squama and cell m_{3+4}. We retain the four species as separate species. However, further studies using different approaches should be carried out in order to clarify whether this is a single, widespread and variable species or four closely related species. *A. pluspilalus* is Nearctic-Neotropical, while the remaining three are Palaearctic.

Biology and distribution: The species was described from southeastern U.S.A., and has later been recorded from Ecuador, Nicaragua, and Mexico (Spies & Reiss 1996; Mendes *et al*. 2004). It is described as male, pupa and larva. The larva was taken in a seep area on the shore of a reservoir in South Carolina, U.S.A. (Sæther 1984).

Antillocladius scalpellatus Wang *et* Sæther

Antillocladius scalpellatus Wang and Sæther, 1993: 228, Fig. 1; Wang (2000: 634); Tiunova *et al*. (2003: 66); Mendes *et al*. (2004: 49).

Material examined: Type material as in Wang and Sæther (1993).

Diagnostic characters: The male can be separated from all other members of the genus by having several apical setae on the wing membrane; setose squama; costa barely extended; acrostichals starting in front, anterior ones hair-like, posterior ones scalpellate; a short virga; anal point long, tapering, with strong lateral setae; and inferior volsella prominent, rectangular.

Remarks: *Antillocladius pluspilalus*, *A. yakyijeus*, *A. scalpellatus* and *A. subnubilus* are only separable on the size of the virga and the chaetotaxy of squama and cell m_{3+4}. See *A. pluspilalus* for comments.

Distribution: The species is recorded from China (Guangdong) and the Russian Far East (Wang & Sæther 1993; Tiunova *et al.* 2000).

Antillocladius skartveiti Andersen *et* Contreras-Ramos

Antillocladius skartveiti Andersen and Contreras-Ramos, 1999: 150, Figs 1–6; Mendes *et al*. (2004: 49).

Material examined: Type material as in Andersen and Contreras-Ramos (1999).

Diagnostic characters: The male can be separated from all other members of the genus by having several apical setae on the wing membrane; setose squama; costa moderately extended; acrostichals scalpellate, in the middle of scutum; no virga; anal point long, tapering, with strong lateral setae; and inferior volsella strongly set off, rectangular to rounded.

Distribution: The species is known from Ecuador.

Antillocladius sooretama Mendes, Andersen *et* Sæther

Antillocladius sooretama Mendes, Andersen and Sæther, 2004: 50, Fig. 13.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane and wing veins; setose squama; costa barely extended; acrostichals starting in front, all scalpellate; no virga; anal point long, nearly parallel-sided, with blunt apex and weak lateral setae; and inferior volsella long, posteriorly directed, well set-off and apically bifid.

Distribution: The species is known only from Parque Sooretama, Espírito Santo State, Brazil.

Antillocladius subnubilus (Sinharay *et* Chaudhuri) comb. n.

Parametriocnemus subnubilus Sinharay and Chaudhuri, 1979: 121, Fig. 2; Chaudhuri and Guha (1987: 27); Chaudhuri *et al*. (2001: 344).

Material examined: Holotype as in Sinharay and Chaudhuri (1979).

Diagnostic characters: The male can be separated from all other members of the genus by having numerous apical setae on the wing membrane; setose squama; virga half as long as phallapodeme; acrostichals starting close to antepronotum, anterior simple and posterior scalpellate; anal point long, tapering, with moderately strong lateral setae; and inferior volsella prominent with anterior digitiform projection equally long as and partly covering rounded posterior lobe.

Remarks: *Antillocladius pluspilalus*, *A. yakyijeus*, *A. scalpellatus* and *A. subnubilus* are only separable on the size of the virga and the chaetotaxy of squama and cell m_{3+4}. See *A. pluspilalus* for comments.

Distribution: The species is known from West Bengal, India.

Antillocladius tokarameneus (Sasa *et* Suzuki)

Paratrissocladius tokarameneus Sasa and Suzuki, 1995: 277, Fig. 17.
Antillocladius tokarameneus (Sasa *et* Suzuki); Yamamoto (2004: 4, Fig. 2).

Material examined: Holotype as in Sasa and Suzuki (1995) (NSM).

Diagnostic characters: This species can be separated from all other members of the genus by the presence of setae on squama, simple inferior volsella, inclined in relation to the gonostyle, short virga consisting of two small spines, and costa not extended.

Distribution: The species is known from Japan.

Antillocladius ubatuba Mendes, Andersen *et* Sæther

Antillocladius ubatuba Mendes, Andersen and Sæther, 2004: 52, Fig. 14.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane; setose squama; costa moderately extended; acrostichals starting in front, all scalpellate; moderately long virga; anal point long, nearly parallel-sided subapically, with blunt apex and weak lateral setae; and inferior volsella long, posteriorly directed and digitiform.

Distribution: This species is known from Rio de Janeiro and São Paulo States in Brazil and from Venezuela.

Antillocladius ultimus sp. n.
(Figs 38–42)

Type material: Holotype male, **BRAZIL: Rio de Janeiro:** Arraial do Cabo, Morro do Atalaia, 10.i.2006, sweep net (swarming), H.F. Mendes (MZUSP). Paratypes: 13 males, same data as holotype. 1 male, **São Paulo:** Ribeirão Preto, University of São Paulo Campus, 26–29.i.2003, Malaise trap, H.F. Mendes & T. Andersen (ZSM, ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by the dark area on the inferior volsella.

Etymology: From Latin, *ultimus*, meaning last, as this is the last *Antillocladius* species to be described here.

Male (n =10, except when otherwise stated). Total length 1.78–2.39, 2.13 mm. Wing length 1.07–1.36, 1.26 mm. Total length / wing length 1.48–1.78, 1.68. Wing length / length of profemur 2.24–2.67, 2.43. Coloration brown, thorax light brown with markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head. AR 1.22–1.43, 1.31. Ultimate flagellomere 382–482, 436 µm long. Temporal setae 8–11, 10; including 3–4, 4 inner verticals; 3–4, 3 outer verticals; and 2–3, 3 postorbitals. Clypeus with 5–13, 8 setae. Tentorium, stipes, and cibarial pump as in Figure 38. Tentorium 84–125, 111 µm long; 16–25, 21 µm wide. Stipes 104–125, 118 µm long. Palp segment lengths (in µm): 18–25, 22; 36–50, 42; 77–104, 89; 82–104, 93; 95–127, 109. Third palpomere with 2–5, 4 sensilla clavata subapically, longest 9–16, 11 µm long.

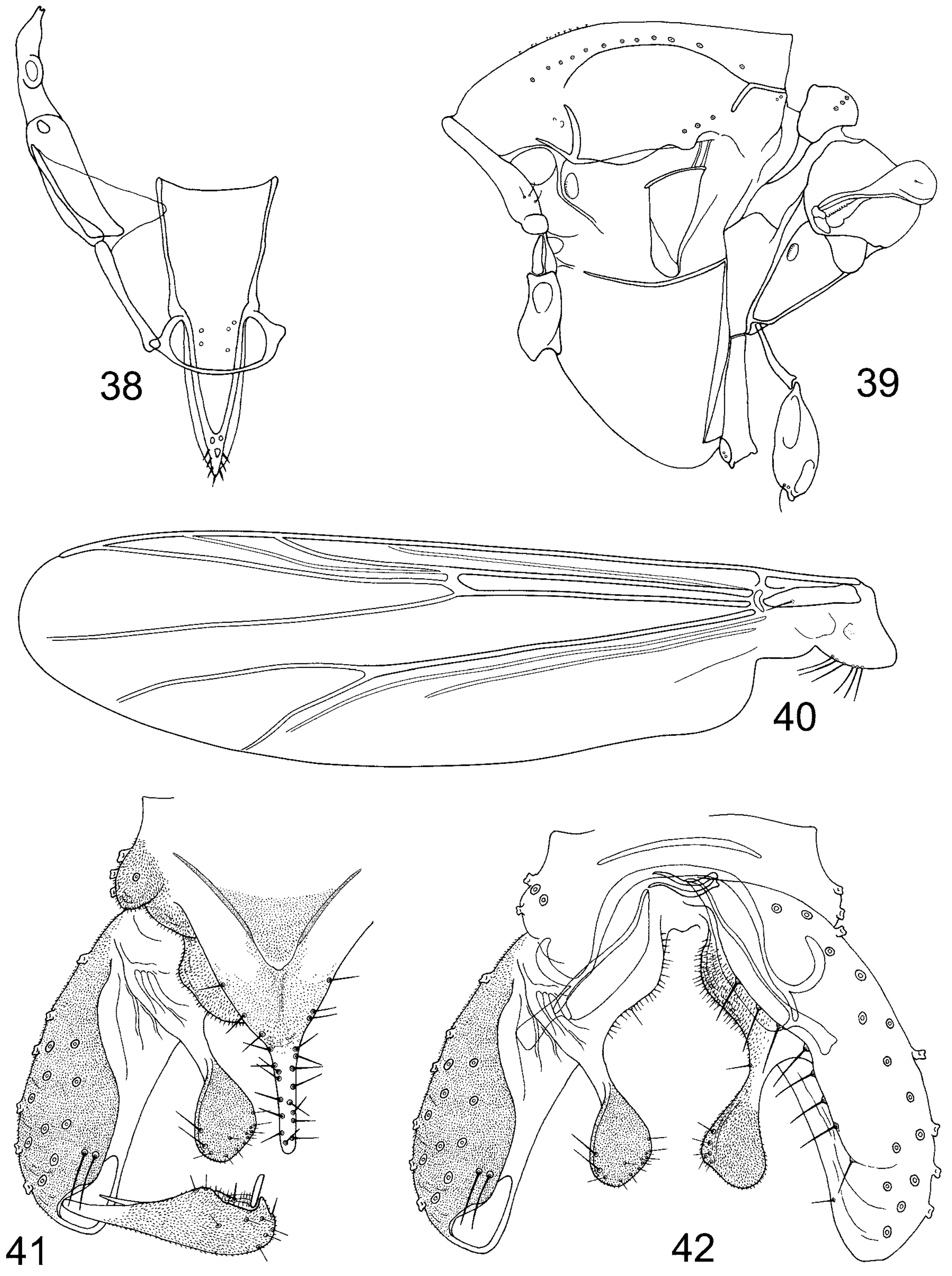
Thorax (Fig. 39). Antepronotum with 2–4, 3 setae. Dorsocentrals 8–12, 10, acrostichals composed of 0–4, 2 anterior simple and 7–17, 11 scalpellate posterior setae; prealars 2–4, 3; supraalar 1–2, 1. Scutellum with 4–8, 6 setae.

Wing (Fig. 40). VR 1.31–1.37, 1.33. C extension 41–95, 78 µm long. Brachiolum with 1 seta; R with 0–4, 2 setae, other veins and cells bare. Squama with 5–7, 6 setae.

Legs. Spur of foretibia 41–54, 51 µm long; spurs of midtibia 27–38, 32 µm and 16–31, 23 µm long; spurs of hind tibia 43–59, 49 µm and 16–25, 21 µm long. Width at apex of foretibia 27–36, 31 µm; of midtibia 29–36, 33 µm; of hind tibia 34–48, 40 µm. Comb with 13–17, 14 setae; longest 29–41, 36 µm; shortest 16–23, 20 µm. Lengths and proportions of legs as in Table 7.

Hypopygium (Figs 41–42). Tergite IX covered with microtrichia; laterosternite IX with 5–9, 7 setae. Anal point triangular; 43–73, 53 (4) µm long; 23–45, 32 (4) µm wide at base; 5–7, 6 (4) µm wide at apex; with 11–22, 14 (4) setae. Phallapodeme 75–95, 86 µm long; transverse sternapodeme 34–48, 39 µm long. Virga 29–48, 34 µm long. Gonocoxite 150–184, 171 µm long. Gonostylus 77–98, 87 µm long; megaseta 11–16, 14 µm long. HR 1.70–2.20, 1.98; HV 2.12–2.83, 2.46.

Remarks: This species frequently has a bent anal point, which is considered an artifact due to the slide-mounting.



FIGURES 38–42. *Antillocladius ultimus* **sp. n.**, male. **38—**tentorium, stipes, and cibarial pump; **39—**thorax; **40—**wing; **41—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **42—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

TABLE 7. Lengths (in µm) and proportions of legs of *Antillocladius ultimus* **sp. n.**, male (n = 10).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	433–617, 529	470–645, 569	378–497, 447	184–276, 237	101–175, 141	64–92, 81
p_2	451–608, 533	442–617, 535	184–267, 225	92–175, 128	64–92, 80	46–64, 57
p_3	497–672, 597	608–737, 644	295–424, 368	166–221, 197	120–175, 151	55–83, 70

	ta_5	LR	BV	SV	BR
p_1	46–74, 56	0.76–0.82, 0.78	2.75–3.50, 3.06	2.36–2.55, 2.46	3.2–3.5, 3.4
p_2	37–46, 41	0.41–0.43, 0.42	4.11–4.68, 4.36	4.59–4.92, 4.77	2.9–4.0, 3.5
p_3	46–64, 51	0.55–0.61, 0.57	3.26–3.59, 3.42	3.17–3.48, 3.37	4.0–5.5, 4.9

Biology and distribution: This species was taken together with *A. atalaia*, *A. axitiosus*, and *A. brazuca* in Arraial do Cabo, Rio de Janeiro State; and with *A. campususp*, *A. folius*, and *A. musci* in Ribeirão Preto, São Paulo State. See *A. atalaia* sp. n. for more details.

Antillocladius venequatoriensis Mendes, Andersen *et* Sæther

Antillocladius venequatoriensis Mendes, Andersen and Sæther, 2004: 54, Fig. 15.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having numerous setae in apical half of wing membrane; setose squama; costa weakly extended; acrostichals starting in front, all scalpellate; long virga; anal point long, nearly triangular with pointed apex and moderately strong lateral setae; and inferior volsella relatively small and rounded.

Distribution: This species is known from Venezuela and Ecuador.

Antillocladius yakyijeus (Sasa *et* Suzuki)

Metriocnemus yakyijeus Sasa and Suzuki, 2000: 88, Fig. 47.
Antillocladius yakyijeus (Sasa *et* Suzuki); Yamamoto (2004: 4).

Material examined: Holotype as in Sasa and Suzuki (2000) (NSM). **JAPAN: Mie Prefecture:** Toba city, Futami-chyo, 6 males, 18.v.1985, T. Hirabayashi.

Diagnostic characters: The male can be separated from all other members of the genus by having numerous apical setae on the wing membrane, cell m_{3+4} bare; setose squama; acrostichals starting close to antepronotum, all scalpellate; long virga; anal point long, tapering, with moderately strong lateral setae; and inferior volsella prominent with anterior digitiform projection equally long as and partly covering rounded posterior lobe.

Remarks: *Antillocladius pluspilalus*, *A. yakyijeus*, *A. scalpellatus* and *A. subnubilus* are only separable on the size of the virga and the chaetotaxy of squama and cell m_{3+4}. See *A. pluspilalus* for comments.

Distribution: The species is known from Japan.

Antillocladius zempoalensis Mendes, Andersen *et* Sæther

Antillocladius zempoalensis Mendes, Andersen and Sæther, 2004: 57, Fig. 16.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The male can be separated from all other members of the genus by having bare wing membrane, veins and squama; costa strongly extended; acrostichals starting in front, anterior one hair-like, posterior ones scalpellate; no virga; anal point moderately long, triangular with pointed apex and strong lateral setae; and inferior volsella well developed, set off and rounded.

Distribution: The species is known only from Parque Nacional Lagunas de Zempoala, Morelos province in Mexico.

Antillocladius zhengi Wang *et* Sæther

Antillocladius zhengi Wang and Sæther, 1993: 229, Fig. 2; Mendes *et al*. (2004: 59).

Material examined: Type material as in Wang and Sæther (1993) (ZMBN). **THAILAND: Chiang Mai:** Nankoi Waterfall near Samoeng, 1 male, 10.iv.1991, sweep net, T. Andersen (ZMBN).

Diagnostic characters: The male can be separated from all other members of the genus by having a few apical setae on the wing membrane; bare veins; setose squama; costa strongly extended; acrostichals starting in front, anterior one hair-like to lanceolate, posterior ones scalpellate; moderately long virga; anal point moderately long, triangular with pointed apex and strong lateral setae; and inferior volsella well developed, rectangular, with anterior part somewhat pointed and of about the same length as posterior rounded part.

Distribution: This species is known from China (Hainan) and Thailand.

Gravatamberus gen. n.

Gen. n. 2 Pinho *et al*., 2005: 46.

Type species: *Gravatamberus nidularium* sp. n. by present designation.

Other included species: *G. apicalus* sp. n., *G. curtus* sp. n., *G. guatemaltecus* sp. n., and *G. pilosus* sp. n.

Etymology: From the native Brazilian language Tupy, *gravata***,** meaning bromeliad, pineapple, and *mberu*, meaning midge, mosquito, small insect. Both words combined thus mean "the midge that inhabits bromeliads". Gender of genus: masculine.

Diagnostic characters: The imagines can be separated from all other orthoclad genera by having scalpellate acrostichals combined with no anal point; stout seta on the tip of the antenna; eyes bare, without dorsomedian extension; and hairy wings with R_{4+5} ending proximal to M_{3+4}. The combination of absence of thoracic horn, wing sheath with nose, two macrosetae on spined tubercles and caudal row of spines on tergites II–VIII will separate the pupa from all other orthoclad genera. The larva is similar to those of *Compterosmittia*, *Limnophyes*, *Paralimnophyes*, and Genus H *sensu* Epler, but can be recognized by the single median tooth of the mentum and the pair of setal tufts on the abdomen..

Generic diagnosis:

Male. Small, wing length about 1.0 mm.

Antenna. With 12–13 flagellomeres, 12th and 13th flagellomeres may be distinct to completely fused; groove beginning on flagellomere 2; sensilla chaetica on flagellomeres 2, 3 and 13 (12 when fused); apex rounded with stout setae; fully plumed. Antennal ratio about 0.50.

Head. Eye bare, without dorsomedian extension. Temporal setae strong, consisting of inner verticals, outer verticals, and postorbitals. Third palpomere about as long as fourth, with two long, weak lanceolate sensilla clavata subapically.

Thorax. Antepronotum well developed with lobes meeting medially, with few lateral setae. Acrostichals strong, in mid scutum, apparently all scalpellate, uniserial to irregularly biserial; dorsocentrals beginning close to antepronotum, anterior uniserial, posterior biserial; prealars few, uniserial; supraalars present. Scutellars uniserial.

Wing. Membrane with setae, with moderately coarse punctuation (visible at 250X magnification). Anal lobe weakly developed. Costa moderately to strongly extended. R_{2+3} running and ending midway between R_1 and R_{4+5}; R_{4+5} ending proximal to M_{3+4}; Cu_1 nearly straight; FCu distal to RM. Postcubitus ending distal to FCu, An ending below FCu. Veins with setae except for R_{2+3}. Brachiolum with one seta. Squama bare.

Legs. Pseudospurs, sensilla chaetica, and pulvilli absent.

Abdomen. Tergites and sternites with few setae.

Hypopygium. Tergite IX rounded posteriorly without anal point, covered with microtrichia, without or with few setae. Laterosternite IX setose. Sternapodeme slightly arched, oral projection well developed. Virga absent. Gonocoxite with well developed inferior volsella. Gonostylus with well developed, rounded crista dorsalis.

Female: Unknown.

Pupa: Small, about 1.80 mm long. Exuviae transparent.

Cephalothorax. Frontal setae absent, frontal apotome smooth. Head smooth, antennal pedicel sheath with weak pearl row. Ocular field apparently with one vertical and one postorbital. Thoracic horn absent. Setation: 3 antepronotals, 3 grouped dorsocentrals, 3 precorneals and 1 prealar. Thorax smooth. Wing sheath with nose.

Abdomen. Tergite I bare, tergites II–IX and sternites IV–VIII with shagreen, extensive on tergites, coarse on sternites. Conjunctives II/III, III/IV, IV/V and V/VI with small spines. Tergite II without caudal hooklets. Tergites II–VIII with single caudal row of spines, no caudal spines on sternites. Pedes spurii A and B absent. Segments II–VII apparently with 2 L–setae, one of them strong, about half the length of segments. D, V and O setae present, but weak. Anal lobe with 2 subequal hooked macrosetae about three and a half times the length of anal lobe and situated on spined tubercles. Genital sac of male rounded, overreaching apex of anal lobe.

Larva: Small, about 2.10 mm long.

Head. Antenna with 5 segments, basal segment shorter than flagellum; third antennal segment nearly as long as fourth, segments 3 and 4 more sclerotized basally. Basal antennal segment nearly twice as long as basally wide, with ring organ situated medially. Lauterborn organs weak, style well developed. Blade longer than flagellum, accessory blade apparently absent. S I plumose. Other S setae simple. Labral lamella apparently absent. Few spinulae and chaetae. Pecten epipharyngis consisting of two pointed teeth. Chaetulae laterales and chaetulae basales apparently simple. Premandible with 3 apical teeth, with third about half as long as second apical; without brush. Mandible with apical tooth shorter than combined width of inner teeth. Fourth inner tooth fused with mola, but distinct. Seta subdentalis slender, curved; seta interna with apparently 7 branches, shorter branches with rounded apex, longer branches pectinate or plumose apically. Mentum with 1 median tooth and 5 pairs of lateral teeth of which median tooth slightly smaller than the first lateral. Ventromental plates inconspicuous, beard absent. Setae submenti just below base of ventromental plates. Maxilla and maxillary palp apparently normally developed.

Abdomen. Anterior and posterior parapods well developed; claws of parapods smooth. Procercus minute with about 9 long anal setae, supraanal seta weak. Anal tubules apparently absent. Abdominal segments with one pair of setal tufts.

Taxonomy: The males key to *Apometriocnemus* in Cranston *et al*. (1989) due to the lack of anal point; to *Tosacladius* Sasa, Suzuki *et* Sakai in Sæther *et al*. (2000); and to *Botryocladius* Cranston *et* Edward in Mendes *et al*. (2004). The pupa keys to couplet 94 in Coffman *et al*. (1986), but does not correspond to the two alternatives, *Gymnometriocnemus* or *Metriocnemus*; in Sæther *et al*. (2000) it will key to *Metriocnemus*. The larva keys to *Limnophyes* in Cranston *et al*. (1983) and Sæther *et al*. (2000), and to *Compterosmittia* in Epler (2001).

The pupa shares absence of thoracic horn and row of spines caudally on the tergites with *Antillocladius* and *Gynocladius*, but the nose on the wing sheath must be considered to be an autapomorphy. The larva shows clear similarities with *Gynocladius*, *Limnophyes*, *Paralimnophyes*, *Compterosmittia* and Genus H *sensu* Epler.

Key to the males of *Gravatamberus* gen. n.

1. Cell m with less than 10 (1–7) setae proximal to RM 2
- Cell m with more than 10 (13–33) setae proximal to RM 3
2. Costal extension 68–86 µm long, ending well before wing tip; inferior volsella apically without free lobe. Costa Rica, Mexico.................... *G. curtus* **sp. n.**
- Costal extension about 150 µm long, ending close to wing tip; inferior volsella apically with short free lobe. Venezuela .... *G. apicalus* **sp. n.**
3. Costal extension ending well before wing tip. Brazil.................... *G. nidularium* **sp. n.**
- Costal extension ending close to wing tip 4
4. AR 0.26. Guatemala .... *G. guatemaltecus* **sp. n.**
- AR 0.74–0.84. Chile .... *G. pilosus* **sp. n.**

***Gravatamberus apicalus* sp. n.**
(Figs 43–47).

Type material: Holotype male, **VENEZUELA: Aragua:** Parque Nacional Henri Pittier, Rancho Grande, 10º21.047’N, 67º41.198’W, approximately 1000 m a.s.l., 16–18.ix.1999, sweep net & light trap, rainforest, T. Andersen (MIZA). Paratype: 1 male, as holotype (ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by having less than 10 setae in cell m proximal to RM; Sc with 0–1 seta; costal extension 147–154 µm long, ending close to the wing tip; and AR 0.84–0.88.

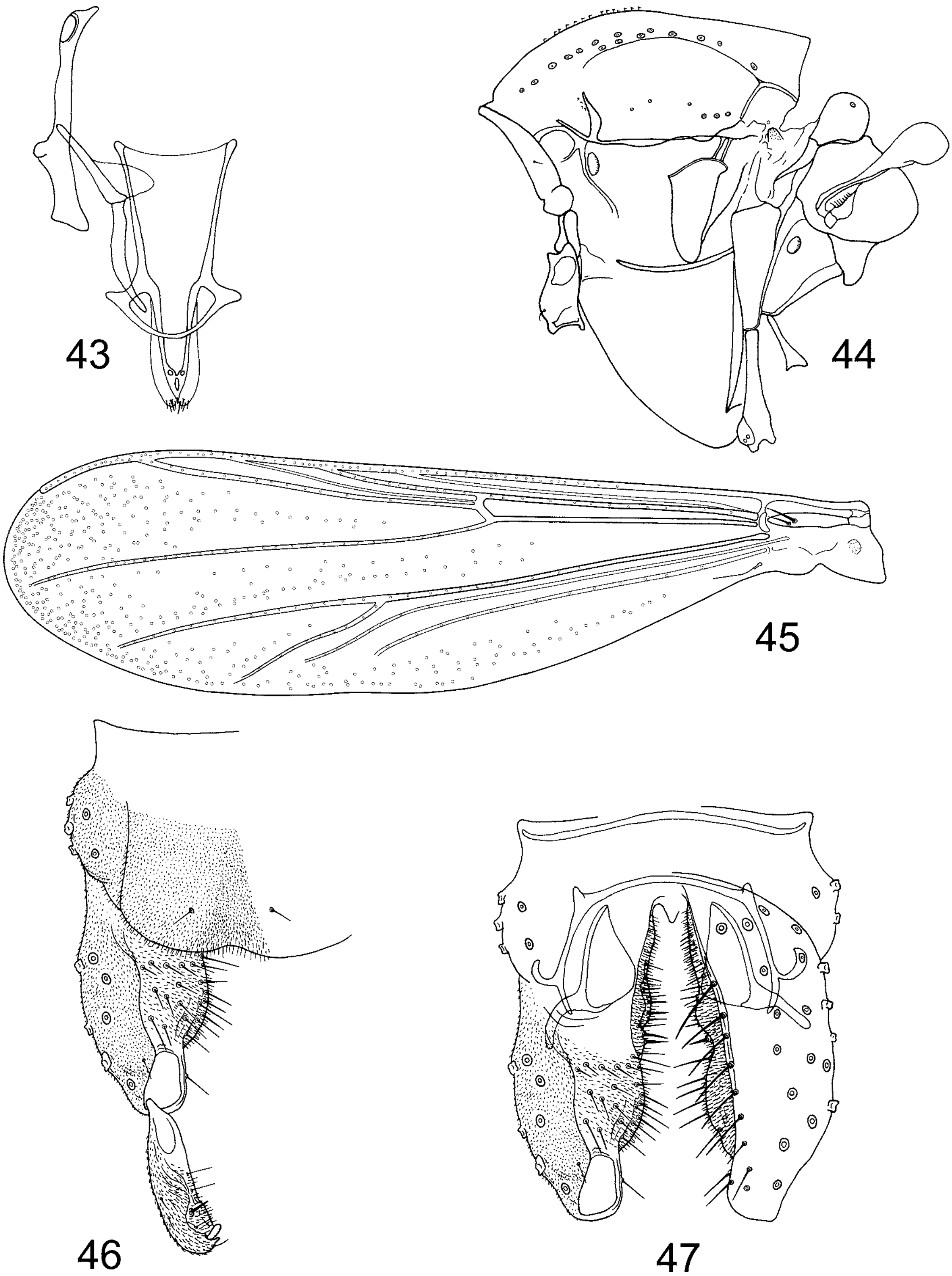
Etymology: From Latin *apicalus*, meaning apex, referring to the long costal extension nearly reaching the wing tip.

Male (n = 1–2). Total length 1.61–1.64 mm. Wing length 1.01–1.05 mm. Total length / wing length 1.56–1.59. Wing length / length of profemur 2.50–2.65. Coloration brown, thorax dark brown without distinct pattern.

Head. AR 0.84–0.88. Ultimate flagellomere 248–270 µm long, stout subapical seta 29–54 µm long. Temporal setae 8, including 3–4 inner verticals, 1–2 outer verticals, and 3 postorbitals. Clypeus with 13–16 setae. Tentorium, stipes, and cibarial pump as in Figure 43. Tentorium 73–91 µm long, 16–20 µm wide. Stipes 86–93 µm long, 32–41 µm wide. Palp segment lengths (in µm): 14–16, 23–25, 57–59, 73–77, fifth segment not measurable. Third palpomere with 2 sensilla clavata subapically, longest 9 µm long.

Thorax (Fig. 44). Antepronotum with 1–2 setae. Dorsocentrals 12–15; acrostichals 12–14, all scalpellate; prealars 5–6, extended anteriorly; supraalar 1. Scutellum with 2 setae.

Wing (Fig. 45). VR 1.41. C extension 147–154 µm long. Brachiolum with 1–2 setae, Sc with 0–1 seta, C extension with 15–17 non-marginal setae, R with 12–13 setae, R_1 with 13 setae, R_{4+5} with 12 setae, M_{1+2} with 29–35 setae, M_{3+4} with 13–16 setae, Cu with 10–12 setae, Cu_1 with 8–10 setae, PCu with 9–10 setae, An with 10–14 setae. Cell m with 1–4 setae, r_{4+5} with 100–200 setae, m_{1+2} with 100–150 setae, m_{3+4} with 26–43 setae, cu with 5–19 setae, and an with 18–36 setae.



FIGURES 43–47. *Gravatamberus apicalus* **sp. n.**, male. **43—**tentorium, stipes, and cibarial pump; **44—**thorax; **45—**wing; **46—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **47—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Legs. Spur of foretibia 27–29 µm long, spurs of midtibia 29–34 µm and 14–18 µm long, spurs of hind tibia 36–39 µm and 16–18 µm long. Width at apex of foretibia 23 µm, of midtibia 23 µm, of hind tibia 29 µm. Comb with 9–11 setae, longest 34–36 µm, shortest 20 µm long. Lengths and proportions of legs as in Table 8.

TABLE 8. Lengths (in µm) and proportions of legs of *Gravatamberus apicalus* **sp. n.**, male (n = 1–2).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	407–414	490–500	310	154	115	65
p_2	396–407	410–429	209	90	65	36
p_3	429–454	468–490	259–288	130–144	119–137	54–58

	ta_5	LR	BV	SV	BR
p_1	32	0.62	3.34	2.95	3.4
p_2	25	0.49	4.77	3.93	4.4
p_3	29	0.55–0.59	3.35–3.48	3.27–3.44	5.8–6.1

Hypopygium (Figs 46–47). Tergite IX with 2 setae, laterosternite IX with 5–6 setae. Phallapodeme 52–54 µm long, transverse sternapodeme 59–63 µm long. Gonocoxite 116 µm long. Gonostylus 59 µm long, megaseta 4 µm long. HR 1.96, HV 2.73–2.78.

Biology and distribution: This species is known only from the type locality in the coastal mountain range in Venezuela, where it was collected in an old rainforest reserve at about 1000 m altitude.

Gravatamberus curtus sp. n.

(Figs 48–52)

Type material: Holotype male, **MEXICO: Campeche:** Calakmul, Ejido Novo Becan, El Chorro, 18º35'25.5''N, 89º15'28.8''W, 130 m a.s.l., 30.iv.1997, Malaise trap, A. Contreras-Ramos *et al.* (ZMBN). Paratypes: 2 males, **COSTA RICA: Guanacaste:** Caccao, 4–7.v.1993, Malaise trap, T. Andersen (MZUSP, ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by having less than 10 setae in cell m proximal to RM; Sc with 6–15 setae; costal extension 68–86 µm long, ending well before wing tip; and AR 0.64–0.69.

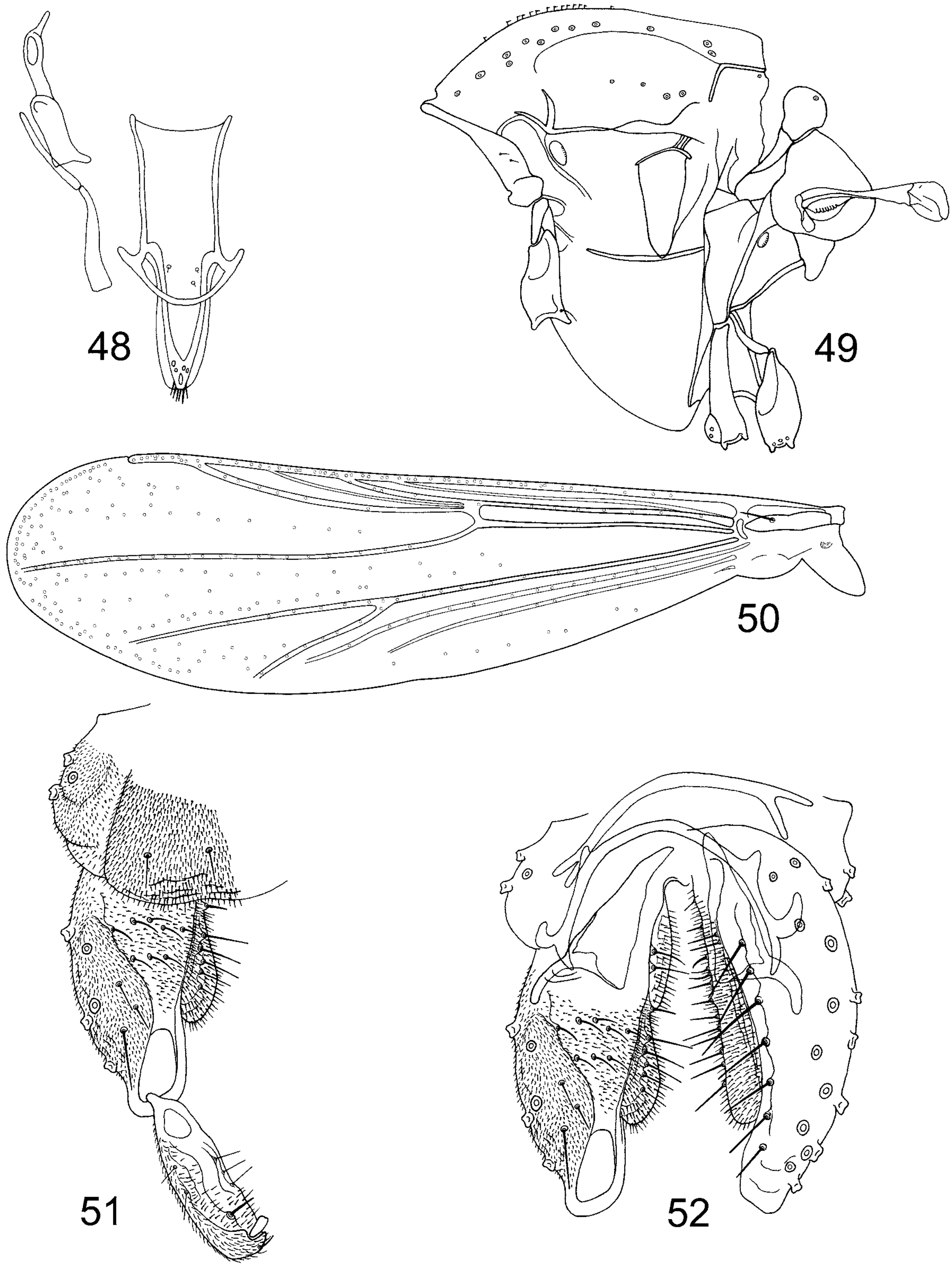
Etymology: From Latin, *curtus*, meaning short, referring to the short costal extension.

Male (n = 1–3). Total length 1.29–1.43 mm. Wing length 0.71–0.84 mm. Total length / wing length 1.63–1.81. Wing length / length of profemur 2.43–2.68. Coloration brown; thorax light brown with darker markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head. AR 0.64–0.69. Antenna with 12 flagellomeres, ultimate flagellomere 173–187 µm long, stout subapical seta 32–50 µm long. Temporal setae 8–10, including 3–4 inner verticals, 2–3 outer verticals, and 3–4 postorbitals. Clypeus with 8–11 setae. Tentorium, stipes, and cibarial pump as in Figure 48. Tentorium 61–73 µm long, 11–13 µm wide. Stipes 84–86 µm long. Palp segment lengths (in µm): 14–16, 20–23, 57–61, 57–68, 75–116. Third palpomere with 2 sensilla clavata subapically, longest 9–11 µm long.

Thorax (Fig. 49). Antepronotum with 1–3 setae. Dorsocentrals 8–13; acrostichals 7–14, all scalpellate; prealars 4–7, extended anteriorly; supraalar 1. Scutellum with 2 setae.

Wing (Fig. 50). VR 1.33–1.41. C extension 68–86 µm long. Brachiolum with 1 seta, Sc with 6–15 seta, C extension with 7–8 non-marginal setae, R with 10–17 setae, R_1 with 6–8 setae, R_{4+5} with 5–18 setae, M_{1+2} with 23–35 setae, M_{3+4} with 8–17 setae, Cu with 10–13 setae, Cu_1 with 6–11 setae, PCu with 16–24 setae, An with 10–14 setae. Cell m with 1–7 setae, r_{4+5} with about 75–100 setae, m_{1+2} with about 60–90 setae, m_{3+4} with 15–49 setae, cu with 0–19 setae, and an with 11–58 setae.



FIGURES 48–52. *Gravatamberus curtus* **sp. n.**, male. **48—**tentorium, stipes, and cibarial pump; **49—**thorax; **50—**wing; **51—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **52—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Legs. Spur of foretibia 27–32 µm long, spurs of midtibia 20–29 µm and 14–16 µm long, spurs of hind tibia 32–36 µm and 14–18 µm long. Width at apex of foretibia 20 µm, of midtibia 20–23 µm, of hind tibia 25–27 µm. Comb with 11 setae, longest 23–34 µm, shortest 14–20 µm long. Lengths and proportions of legs as in Table 9.

TABLE 9. Lengths (in µm) and proportions of legs of *Gravatamberus curtus* **sp. n.**, male (n = 1–3).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	310–349	353–410	173–227	108–126	76–94	50–61
p_2	277–349	302–353	126–151	61–76	43–51	25–32
p_3	356–360	331–396	173–202	86–108	76–90	32–40

	ta_5	LR	BV	SV	BR
p_1	29–36	0.49–0.57	3.02–3.18	3.22–3.83	3.2–3.8
p_2	22	0.36–0.43	4.56–4.67	4.60–5.41	3.3–4.2
p_3	25–29	0.51–0.53	3.61–3.64	3.69–3.75	5.5–5.9

Hypopygium (Figs 51–52). Tergite IX with 0–2 setae, laterosternite IX with 3–5 setae. Phallapodeme 52–59 µm long, transverse sternapodeme 43–61 µm long. Gonocoxite 95–111 µm long. Gonostylus 50–54 µm long, megaseta 4–9 µm long. HR 1.91–2.04, HV 2.48–2.62.

Biology and distribution: The species is known from Mexico and Costa Rica where males were collected in Malaise traps. In Mexico it was taken in the Calakmul Biosphere Reserve, a large lowland rainforest reserve on the Yucatan Peninsula. In Costa Rica it was taken in a mountain rainforest in the Guanacaste Province

***Gravatamberus guatemaltecus* sp. n.**
(Figs 53–57)

Type material: Holotype male, **GUATEMALA: Santa Rosa:** Pueblo Nueve Viñas, Finca Maria Mundo, Bosque Pino-Eucino, 1800 m a.s.l., 9.xi.1999, Malaise trap, A.C. Baily & J. Monzon (ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by having more than 10 setae in cell m proximal to RM, costal extension ending close to wing tip, and AR lower than 0.50.

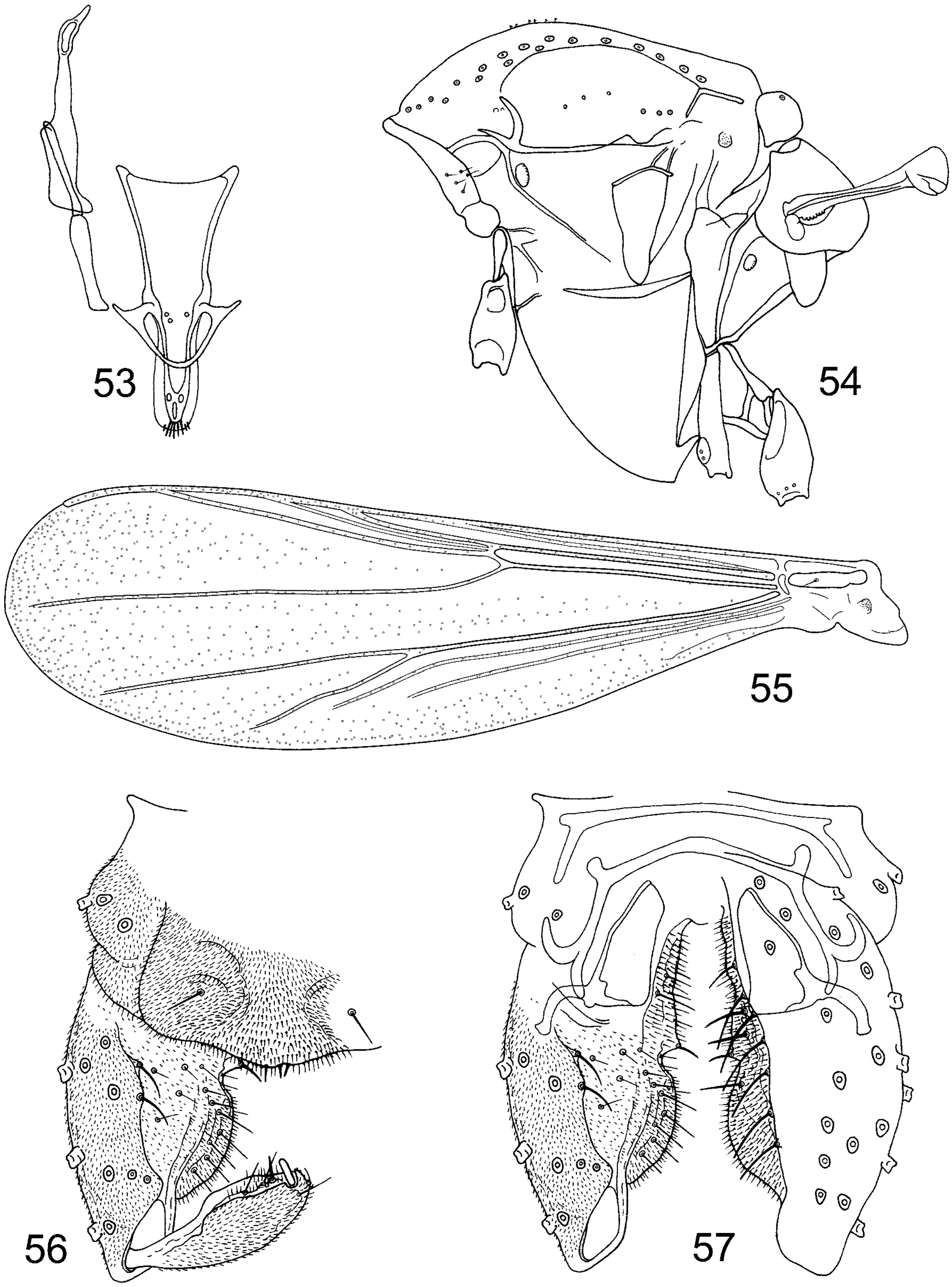
Etymology: From Spanish *guatemalteco*, a native of Guatemala; the name is to be regarded as a noun in apposition.

Male (n = 1). Total length 1.45 mm. Wing length 1.23 mm. Total length / wing length 1.17. Wing length / length of profemur 2.53. Coloration brown; thorax dark brown with markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head. AR 0.26. Ultimate flagellomere 112 µm long, stout subapical seta 40 µm long. Temporal setae 9, including 4 inner verticals, 3 outer verticals, and 2 postorbitals. Clypeus with 13 setae. Tentorium, stipes, and cibarial pump as in Figure 53. Tentorium 91 µm long, 18 µm wide. Stipes 95 µm long. Palp segment lengths (in µm): 18, 27, 82, 95, fifth palpomere not measurable. Third palpomere with 2 sensilla clavata subapically, longest 14 µm long.

Thorax (Fig. 54). Antepronotum with 5 setae. Dorsocentrals 18; acrostichals 6, all scalpellate; prealars 6, extended anteriorly; no supraalar. Scutellum with 2 setae.

Wing (Fig. 55). VR 1.33. C extension 161 µm long. Brachiolum with 1 seta, Sc with 16 seta, C extension with 23 non-marginal setae, R with 15 setae, R_1 with 11 setae, R_{4+5} with 20 setae, M_{1+2} with 45 setae, M_{3+4} with 24 setae, Cu with 17 setae, Cu_1 with 14 setae, PCu with 36 setae, An with 20 setae. Cell m with 19 setae, r_{4+5} with 224 setae, m_{1+2} with 223 setae, m_{3+4} with 96 setae, cu + an with 227 setae.



FIGURES 53–57. *Gravatamberus guatemaltecus* **sp. n.**, male. **53—**tentorium, stipes, and cibarial pump; **54—**thorax; **55—**wing; **56–**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **57—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Legs. Spur of foretibia 29 µm long, spurs of midtibia 32 µm and 16 µm long, spurs of hind tibia 39 µm and 18 µm long. Width at apex of foretibia 23 µm, of midtibia 25 µm, of hind tibia 32 µm. Comb with 10 setae, longest 36 µm, shortest 16 µm long. Lengths and proportions of legs as in Table 10.

TABLE 10. Lengths (in µm) and proportions of legs of *Gravatamberus guatemaltecus* **sp. n.**, male (n = 1).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	475	522	353	184	140	90	43	0.68	2.95	2.83	3.7
p_2	443	443	216	101	72	47	32	0.49	4.37	4.10	4.3
p_3	468	511	277	137	126	54	32	0.54	3.60	3.53	6.6

Hypopygium (Figs 56–57). Tergite IX with 2 setae, laterosternite IX with 5 setae. Phallapodeme 57 µm long, transverse sternapodeme 57 µm long. Gonocoxite 120 µm long. Gonostylus 57 µm long, megaseta 7 µm long. HR 2.12, HV 2.55.

Distribution: This species is known only from the type locality in Guatemala.

***Gravatamberus nidularium* sp. n.**
(Figs 58–73).

Gen. n. 2 Pinho *et al*., 2005: 46.

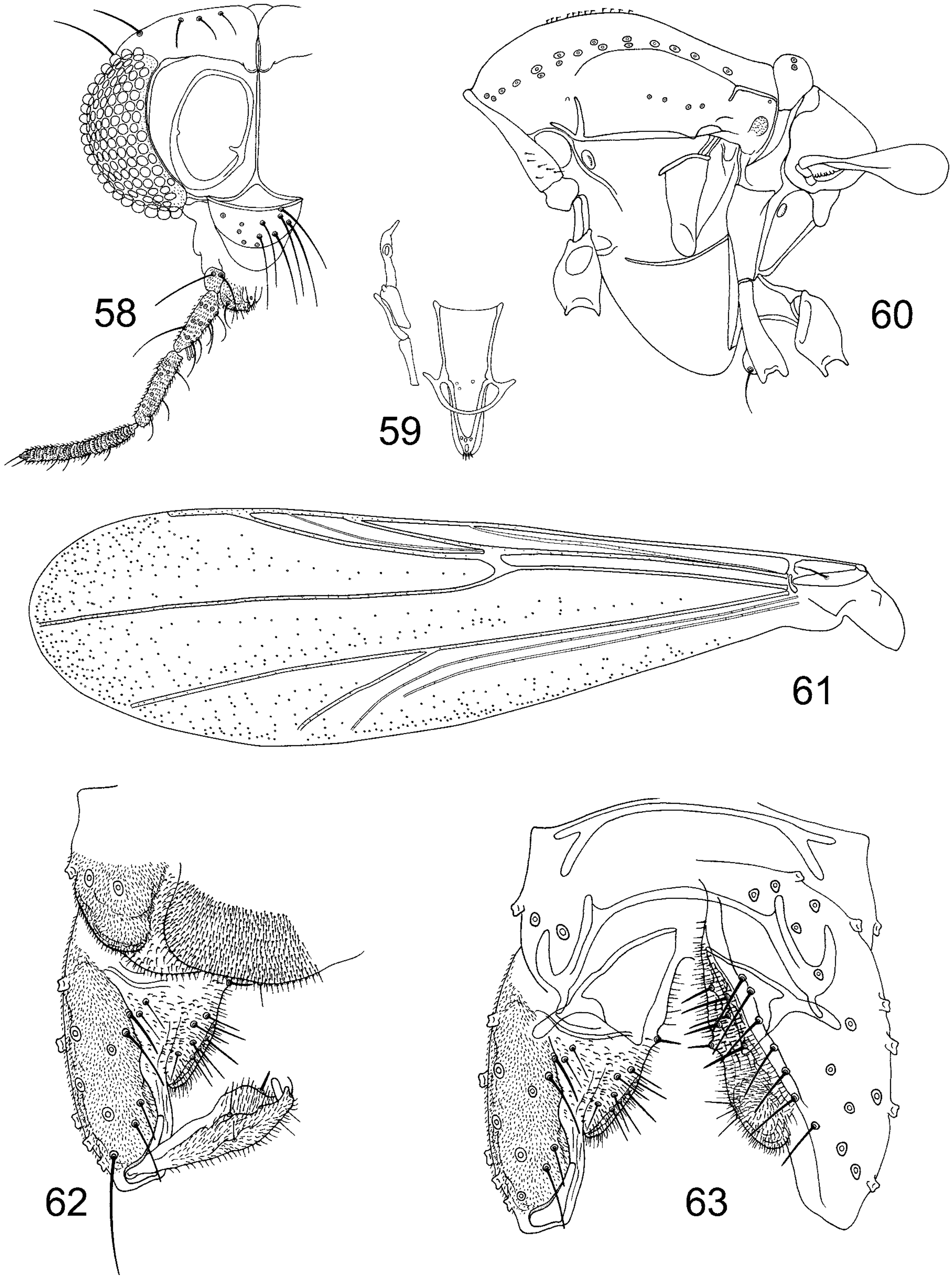
Type material: Holotype male with pupal exuviae, **BRAZIL: Santa Catarina:** Florianópolis (UCAD), in *Nidularium innocentii* Lemaire, 29.iv.2004, reared, F.H. Platt (MZUSP). Paratypes: 4 males, as holotype except for 04–19.ix.2003, emergence trap, L.C. Pinho; 2 males, as holotype except for 19.ix–03.x.2003, emergence trap, L.C. Pinho; 1 larva tentatively associated, as holotype except for L.C. Pinho; 4 males, São Bento do Sul, 26º19’25.6’’S, 48º18’26.5’’W, 660 m a.s.l., 13–16.x.2001, Malaise trap, M.V. Yamada; 1 male, São Francisco do Sul, Vila Glória, 26º13’40’’S, 48º40’49’’W, 6 m a.s.l., 14–17.x.2001, Malaise trap, M.V. Yamada. 1 male, **São Paulo:** Salesópolis, Estação Biológica Boracéia, Trilha dos pilões, 23°39'04.8"S 45°53'41.8"W, 02–05.iv.2001, Malaise trap (Trilha-3), S.T.P. Amarante *et al.* (BIOTA-FAPESP) (MZUSP, UFSCar, ZMBN, ZSM).

Diagnostic characters: The species can be separated from all other members of the genus by having more than 10 setae in cell m proximal to RM, costal extension ending well before wing tip, and AR about 0.50 (0.42–0.78).

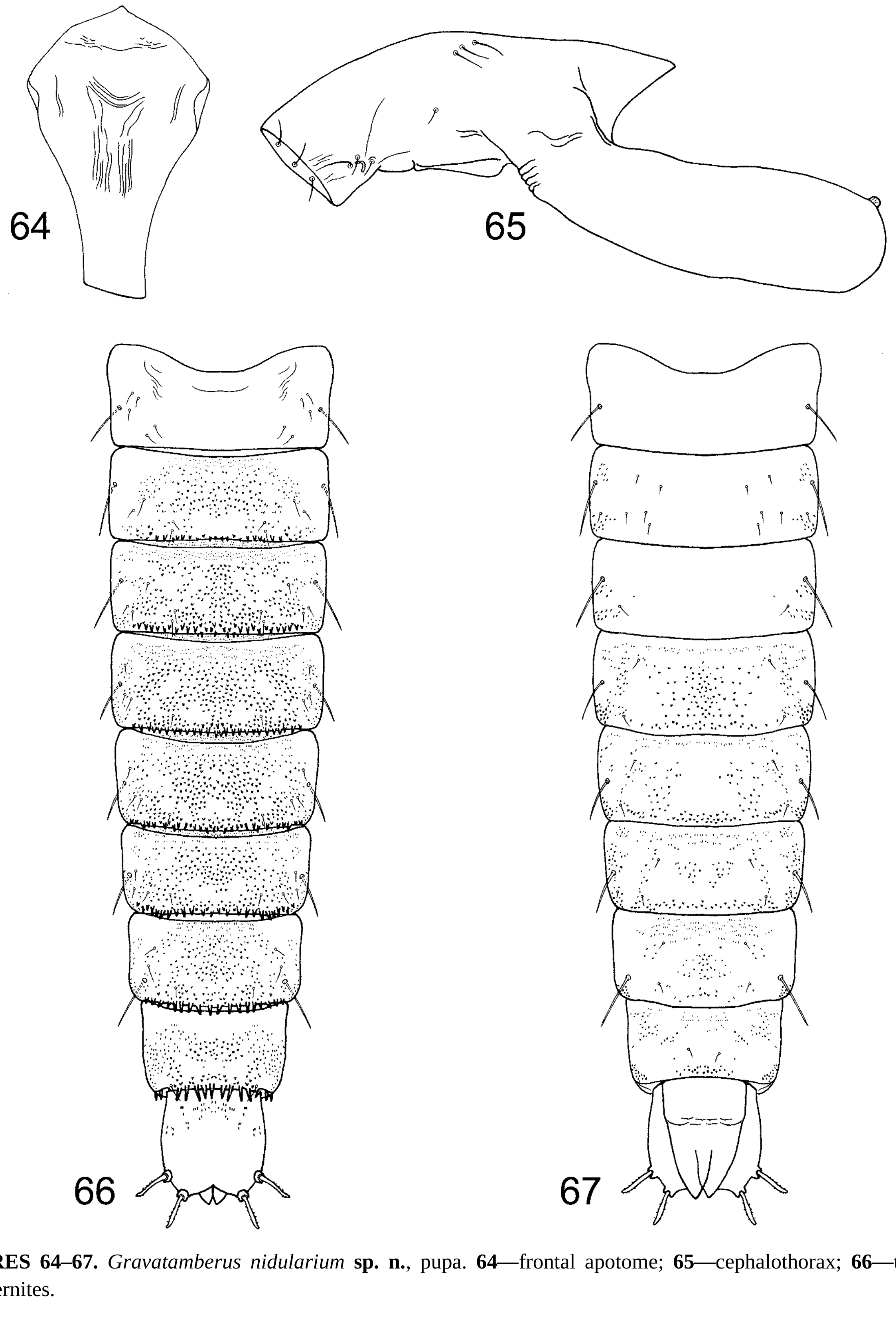
Etymology: From *Nidularium*, the generic name of the bromeliad, *N. innocentii* Lemaire, in which the species was collected; the name is to be regarded as a noun in apposition.

Male (n = 10, except when otherwise stated). Total length 1.27–1.48, 1.34 mm. Wing length 0.74–1.12, 0.94 mm. Total length / wing length 1.27–1.80, 1.42. Wing length / length of profemur 2.29–2.58, 2.44. Coloration light brown; thorax light brown with darker markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head (Fig. 58). Most specimens from the type locality with 13 flagellomeres; AR 0.42–0.49, 0.46 (4); ultimate flagellomere 102–163, 135 µm long; stout subapical seta 39–48 (3) µm long. Two specimens from the type locality have only 12 flagellomeres due to fusion of segments 12 and 13, AR 0.57–0.61, and ultimate flagellomere 170–172 µm long. All paratypes from São Bento do Sul have 13 flagellomeres; AR, 0.65–0.78, 0.74 (4); ultimate flagellomere 191–286, 243 (4) µm long. Temporal setae 6–8, 7; including 2–3, 3 inner verticals; 2–3, 2 outer verticals; and 1–3, 2 postorbitals. Clypeus with 8–13, 10 setae. Tentorium, stipes, and cibarial pump as in Figure 59. Tentorium 86–100, 91 µm long; 14–18, 16 µm wide. Stipes 73–93, 83 µm long; 23–29 (3) µm wide. Palp segment lengths (in µm): 14–16, 15; 24–29, 27; 41–77, 66; 70–98, 81 (7); 100–123, 113 (6). Third palpomere with 2 sensilla clavata subapically; longest 9–13, 11 µm long.



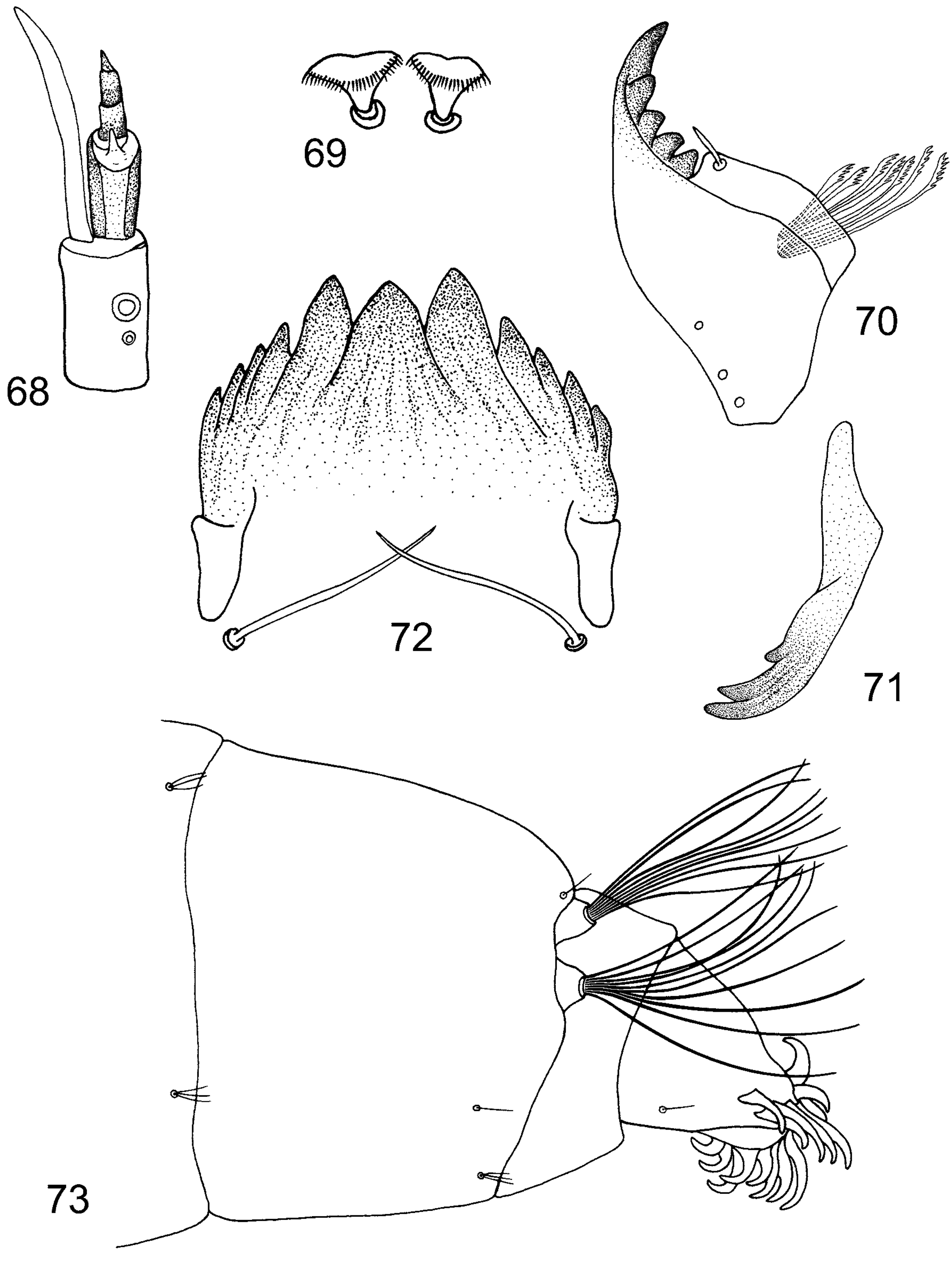
FIGURES 58–63. *Gravatamberus nidularium* **sp. n.**, male. **58—**head; **59—**tentorium, stipes, and cibarial pump; **60—**thorax; **61—**wing; **62—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **63—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.



FIGURES 64–67. *Gravatamberus nidularium* **sp. n.**, pupa. **64—**frontal apotome; **65—**cephalothorax; **66—**tergites; **67—**sternites.

Thorax (Fig. 60). Antepronotum with 3–7, 4 setae. Dorsocentrals 13–20, 16; acrostichals 8–14, 11 (9); prealars 3–5, 4; supraalar 1. Scutellum with 2–5, 4 setae.

Wing (Fig. 61). VR 1.30–1.56, 1.38. C extension 86–107, 98 µm long. Brachiolum with 1–2, 1 seta; Sc with 13–21, 16 seta; C extension with 12–20, 17 non-marginal setae; R with 14–19, 16 setae; R_1 with 6–13, 11 setae; R_{4+5} with 13–19, 16 setae; RM with 0–1, 0 seta; M with 0–1, 0 seta; M_{1+2} with 28–48, 42 setae; M_{3+4} with 13–23, 19 setae; Cu with 10–19, 15 setae; Cu_1 with 9–16, 14 setae; PCu with 28–40, 32 setae; An with 12–21, 16 setae. Cell m with 10–18, 15 setae proximal to RM; r_{4+5} with 150–200 setae; m_{1+2} with 150–200 setae; m_{3+4} with 33–89, 69 setae; cu + an with 93–148, 121 setae.



FIGURES 68–73. *Gravatamberus nidularium* **sp. n.**, larva. **68—**antenna; **69—**S I; **70—**mandible; **71—**premandible; **72—**mentum; **73—**anal end.

Legs. Spur of foretibia 25–36, 31 µm long; spurs of midtibia 23–29, 25 µm and 14–16, 15 µm long; spurs of hind tibia 27–43, 37 µm and 14–20, 16 µm long. Width at apex of foretibia 23–25, 24 µm; of midtibia 23–25, 24 µm; of hind tibia 29–32, 30 µm. Comb with 9–11, 10 setae; longest 32–48, 38 µm; shortest 20–23, 21 µm long. Lengths and proportions of legs as in Table 11.

TABLE 11. Lengths (in µm) and proportions of legs of *Gravatamberus nidularium* **sp. n.**, male (p_1 & p_2 n = 4, p_3 n = 8).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	360–141, 376	414–482, 441	216–256, 238	115–140, 131	90–101, 94	58–61, 60
p_2	371–418, 383	374–410, 384	151–162, 156	79–83, 81	50–61, 56	32
p_3	385–457, 420	418–511, 456	209–277, 232	104–144, 118	90–144, 104	36–50, 45

	ta_5	LR	BV	SV	BR
p_1	32–40, 36	0.49–0.56, 0.53	3.24–3.40, 3.31	3.29–3.72, 3.45	3.7–4.0, 3.8
p_2	25	0.39–0.42, 0.41	4.48–5.09, 4.78	4.73–5.11, 4.90	3.2–3.8, 3.4
p_3	25–32, 30	0.47–0.54, 0.51	3.60–3.85, 3.73	3.49–4.24, 3.80	4.1–7.4, 5.8

Hypopygium (Figs 62–63). Tergite IX without setae; laterosternite IX with 2–4, 3 setae. Phallapodeme 50–61, 58 µm long; transverse sternapodeme 52–61, 57 µm long. Gonocoxite 84–129, 115 µm long. Gonostylus 50–66, 61 µm long; megaseta 4–7, 6 µm long. HR 1.68–2.11, 1.87; HV 2.00–2.65, 2.21.

Pupa (n = 1). Total length 1.79 mm. Exuviae transparent.

Cephalothorax (Figs 64–65). Frontal apotome smooth. Ocular field apparently with 1 postorbital and 1 vertical, not measurable. Antennal sheath smooth. Three median antepronotals about 38 µm long. Precorneals 3, 48, 16, and 20 µm long, respectively. Dorsocentrals 3, Dc_2 29 µm, Dc_3 34 µm, and Dc_4 32 µm long. Distance between Dc_2 and Dc_3 7 µm, between Dc_3 and Dc_4 18 µm. Prealar 16 µm long.

Abdomen (Figs 66–67). Numbers of caudal spines on tergites II–VIII as: 22, 27, 25, 26, 22, 17, 14. Length (in µm) of longest caudal spine on tergites II–VIII (in µm) as: 7, 11, 11, 13, 14, 18, 20. Anal lobe 143 µm long, with two macrosetae about 40 µm long. Genital sac overreaches anal lobe by 14 µm.

Larva (n = 1) fourth instar (tentatively associated). Head capsule 186 µm long; postmentum 61 µm long. Larva cleared, color not discernable.

Head. Antenna as in Figure 68; segment lengths in µm: 23, 9, 4, 4, 2. Blade 27 µm long, longer than flagellum; apical style of second segment 4 µm long. S I plumose (Fig. 69), other labral setae simple. Mandible (Fig. 70) 66 µm long, with apical tooth and four inner teeth, fourth tooth fused with mola; seta subdentalis slender; seta interna with seven branches. Premandible (Fig. 71) 34 µm long. Mentum (Fig. 72) 57 µm wide; median tooth 7 µm long, 9 µm wide; with five lateral teeth.

Abdomen (Fig. 73) with sparse setae and tufts, more evident on last segments. Anterior parapods fused, with numerous claws, all simple; posterior parapods 68 µm long. Supraanal seta 14 µm long. Procerci 9 µm wide, 11 µm long; with 8 setae, all about 110 µm long. Anal tubules apparently absent.

Remarks: The males from São Bento do Sul have higher AR than the males from Florianópolis (see description) and might belong to a separate species. The pupa is associated with the male adult by rearing, while the larva is tentatively associated. However, only three orthoclad genera occur in the bromeliads surveyed, Genus H *sensu* Epler, *Limnophyes* with one abundant and one rare species, and *Gravatamberus* gen. n. As the larvae of the other genera are associated, the larva described here most probably is correctly associated. For more information on the chironomid fauna in the bromeliads, see Pinho *et al*. (2005).

Biology and distribution: The species was collected in emergence traps covering the bromeliad *Nidularium innocentii* Lemaire (Pinho *et al*. 2005; Marcondes & Pinho 2005). Adults were also collected in Malaise traps in the Atlantic Rainforest in the Santa Catarina and São Paulo states in Brazil.

***Gravatamberus pilosus* sp. n.**
(Figs 74–78)

Type material: Holotype male, **CHILE: VII Region:** Talca, El Golfe, 24–27.xii.1995, Malaise trap, T. Andersen (ZMBN). Paratypes: 3 males, same date as holotype; 7 males, same date as holotype except for 27.xx.1995–2.i.1996; 1 male, Pichilemu Centro, 34º23.121'S, 71º59.983'W, 1 m a.s.l., 17.xi.1998, sweep net, T. Andersen (MZUSP, ZMBN).

Diagnostic characters: The species can be separated from all other members of the genus by having more than 10 setae in cell m proximal to RM, costal extension ending close to wing tip, and AR 0.74–0.84.

Etymology: From Latin *pilosus*, hairy, referring to the strongly hairy wings.

Male (n = 8–10, except when otherwise stated). Total length 1.30–1.50, 1.39 mm. Wing length 0.90–1.12, 1.02 mm. Total length / wing length 1.28–1.47, 1.38. Wing length / length of profemur 2.16–2.39, 2.29 (9). Coloration brown, thorax dark brown without markings, legs uniformly light brown.

Head. AR 0.74–0.84, 0.80. Ultimate flagellomere 220–274, 251 µm long; stout subapical seta 40–65, 51 µm long. Temporal setae 9–12, 10; including 4–6, 5 inner verticals; 2–4, 3 outer verticals; and 2–4, 3 postorbitals. Clypeus with 6–16, 12 setae. Tentorium, stipes, and cibarial pump as in Figure 74. Tentorium 75–91, 83 µm long; 14–20, 16 µm wide. Stipes 84–98, 91 µm long; 27–34, 30 µm wide. Palp segment lengths (in µm): 14–18, 16; 23–29, 26; 57–79, 68; 66–82, 73; 84–148, 113. Third palpomere with 1–2, 2 sensilla clavata subapically; longest 9–16, 14 µm long.

Thorax (Fig. 75). Antepronotum with 2–3, 3 setae. Dorsocentrals 16–26, 20; acrostichals 9–17, 11, all scalpellate; prealars 6–8, 7, extended anteriorly; supraalar 0–1, 0. Scutellum with 6–9, 7 setae.

Wing (Fig. 76). VR 1.35–1.56, 1.40. C extension 145–168, 157 µm long. Brachiolum with 1 seta; Sc with 19–31, 23 seta; C extension with 25–44, 34 non-marginal setae; R with 18–27, 21 setae; R_1 with 11–19, 14 setae; R_{4+5} with 17–29, 23 setae; RM with 0–2, 1 seta; M with 0–2, 1 seta; M_{1+2} with 40–70, 52 setae; M_{3+4} with 23–36, 29 setae; Cu with 17–23, 20 setae; Cu_1 with 10–18, 14 setae; PCu with 31–61, 46 setae; An with 21–28, 25 setae. Cell m with 17–36, 28 setae proximal to RM; r_{4+5} with 350–400 setae; m_{1+2} with 400–450 setae; m_{3+4} with 10–167, 133 setae; cu + an with 168–262, 210 setae.

Legs. Spur of foretibia 18–29, 23 (6) µm long; spurs of midtibia 18–27, 22 µm and 11–16, 14 µm long; spurs of hind tibia 32–41, 36 µm and 11–18, 15 µm long. Width at apex of foretibia 20–25, 23 (6) µm; of midtibia 23–25, 24 µm; of hind tibia 25–32, 28 µm. Comb with 8–10, 9 setae; longest 27–38, 33 µm; shortest 16–23, 18 µm long. Lengths and proportions of legs as in Table 12.

TABLE 12. Lengths (in µm) and proportions of legs of *Gravatamberus pilosus* **sp. n.**, male (n = 6–8).

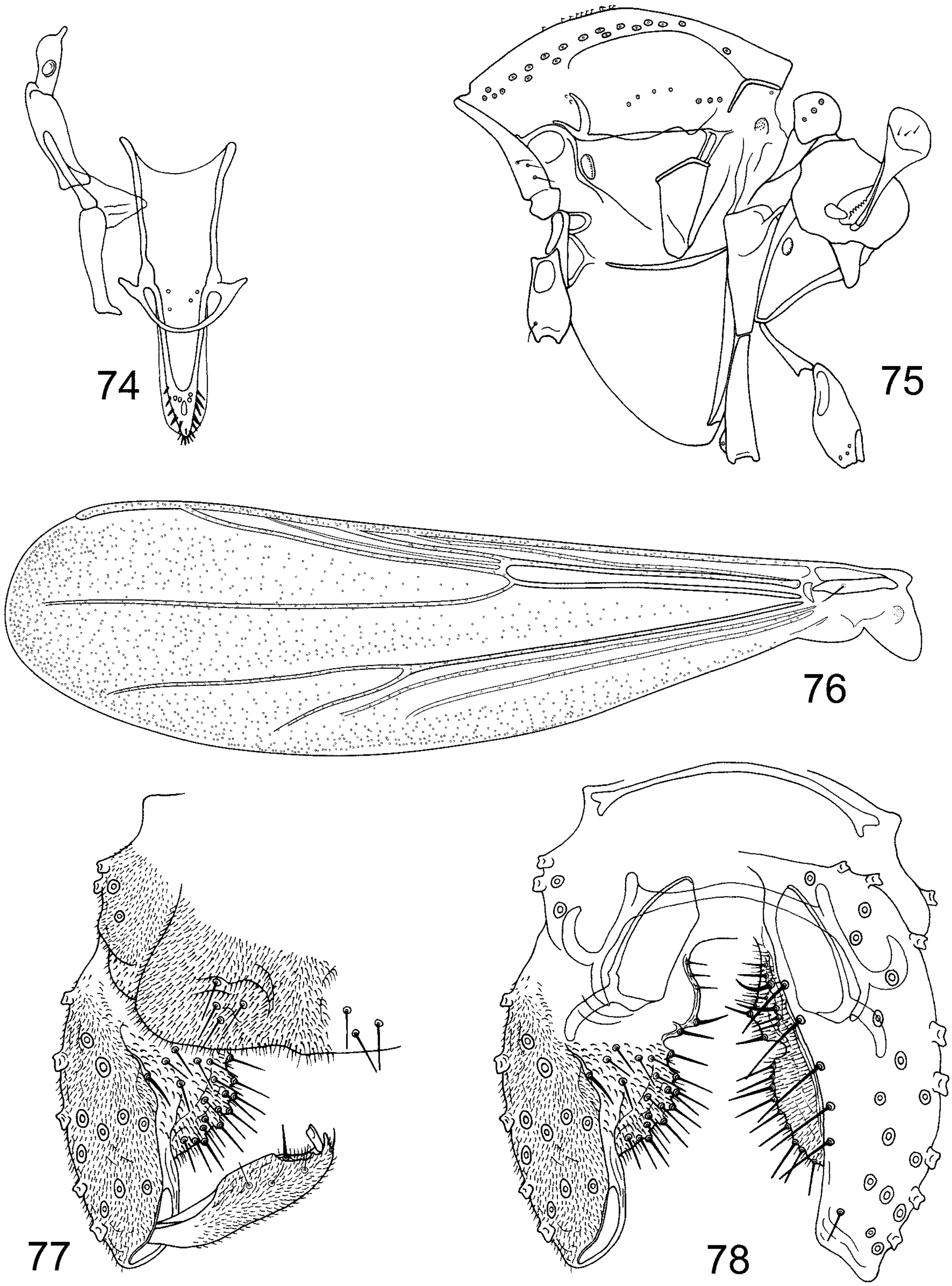
	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	382–482, 429	421–533, 477	259–356, 297	148–194, 169	97–133, 117	65–90, 74
p_2	353–457, 418	356–454, 416	166–216, 200	83–108, 96	58–76, 69	36–50, 39
p_3	389–490, 445	421–536, 480	234–295, 269	126–158, 141	108–137, 124	47–68, 59

	ta_5	LR	BV	SV	BR
p_1	25–43, 35	0.60–0.70, 0.62	2.90–3.18, 3.04	2.79–3.18, 3.05	3.7–5.2, 4.2
p_2	25–32, 28	0.46–0.50, 0.48	4.24–4.52, 4.38	4.03–4.41, 4.16	4.7–6.7, 6.0
p_3	29–36, 32	0.55–0.58, 0.56	3.26–3.43, 3.34	3.34–3.50, 3.42	6.5–9.6, 7.3

Hypopygium (Figs 77–78). Tergite IX with 4–10, 6 setae; laterosternite IX with 3–5, 4 setae. Phallapodeme 48–59, 53 µm long; transverse sternapodeme 52–61, 56 µm long. Gonocoxite 104–118, 111 µm long.

Gonostylus 50–66, 60 µm long; megaseta 4–7, 6 µm long. HR 1.70–2.36, 1.87; HV 2.12–2.88, 2.36.

Biology and distribution: This species is recorded only from Central Chile. The type locality is a boggy area densely grown with 3–4 m high shrubs. The locality at Pichilemu is a river estuary.



FIGURES 74-78. *Gravatamberus pilosus* **sp. n.**, male. **74—**tentorium, stipes, and cibarial pump; **75—**thorax; **76—**wing; **77—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **78—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Litocladius Mendes, Andersen *et* Sæther

Litocladius Mendes, Andersen and Sæther, 2004: 72.

Type species: *Litocladius mateusi* Mendes, Andersen *et* Sæther, 2004, by original designation.

Other included species: *L. confusus* sp. n., *Litocladius floripa* sp. n.

Diagnostic characters: The males can be separated from other orthoclad genera by the combination of the following characters: acrostichals divided into anterior decumbent, middle simple, and posterior scalpellate; virga long with lateral lamellae; costal extension short (< length of RM); setae on wing membrane and squama; supraalars present; and anal point with several lateral setae. The female genitalia cannot be separated from those of *Antillocladius*. However, the acrostichals are presumably of the same type as in the males. The pupa can be separated from *Gymnometriocnemus* by the absence of frontal setae and by having all thoracic setae reduced. The larva is unknown.

Generic diagnosis:

Imago. Small to medium sized species, wing length about 1.4 mm.

Antenna. Female antenna with 5 flagellomeres. Male antenna with 13 flagellomeres, groove beginning at flagellomere 3, sensilla chaetica on flagellomeres 2, 3 and 13. Male antennal ratio about 1.5.

Head. Eye naked, without dorsomedian extension. Temporal setae divided into weak inner verticals, stronger outer verticals, postorbitals absent or few. Third palpomere with about 3 sensilla clavata subapically, longest about 20 µm long; with or without strong apical spines.

Thorax. Antepronotum well developed lobes meeting medially along short suture. Acrostichals beginning close to antepronotum, composed of few anterior strong decumbent, weak simple, and posterior scalpellate; dorsocentrals uniserial; prealars uniserial; supraalar 0–1; scutellars uniserial, occasionally biserial.

Wing. Anal lobe developed. Costa at most moderately extended. R_{2+3} running and ending midway between R_1 and R_{4+5}; R_{4+5} ending slightly distal to M_{3+4}; FCu far distal to RM; Cu_1 straight; PCu ending distal to FCu; An ending proximal to FCu. Veins bare or setose. Membrane with apical setae in female; male without or with setae apically in cells r_{4+5}, m_{1+2} and m_{3+4}. Anal lobe well developed. Squama setose.

Legs. Pseudospurs, sensilla chaetica and pulvilli lacking. Comb and tibial spurs normal; spurs with small denticles.

Abdomen. Tergites with irregularly arranged setae.

Male hypopygium. Anal point long, pointed, with few lateral setae, without microtrichia near apex. Phallapodeme and aedeagal lobe well developed. Anterior margin of sternapodeme weakly arcuate, oral projections moderately developed. Virga consisting of two long, strong spines with lateral lamellae. Inferior volsella with anterior dorsal triangular part and a more rounded ventral, posterior part or adpressed to gonocoxite. Gonostylus without heel, crista dorsalis rounded and well developed. Megaseta normal.

Female genitalia. Gonocoxapodemes curved and meeting anterior of vagina. Gonocoxite well developed, with few long and some short setae. Tergite IX divided. Gonapophysis IX apparently with large ventrolateral lobe covering apodeme lobe, and narrow, line-like dorsomesal lobe. Labia relatively large, pointed. Cerci small. Seminal capsules small to medium-sized, circular, with triangular neck. Spermathecal ducts not observable in available specimen.

Pupa. Small, total length 2.3 mm.

Cephalothorax. Frontal setae absent. Frontal apotome smooth. Antennal sheath with basal pearl row. Ocular field with 2 reduced postorbitals. Thoracic horn absent. Three weak precorneals situated in narrow triangle. Two weak antepronotals. Dorsocentrals very small, in two groups of two. Thorax and wing sheath smooth.

Abdomen. Tergite I–VIII covered with coarse shagreen except along anterior margin, tergite IX with strong shagreen except along posterior margin. Sternites I–IV bare, sternite V with median shagreen, sternites

VI–VII with slightly more extensive median and lateral shagreen, sternite VIII with extensive shagreen, sternite IX with anterolateral shagreen. Tergite II without posterior hooklets. Tergites without posterior row of weak spines. Conjunctives bare. Pedes spurii A and B absent. Apophyses weak, nearly straight. Segment II–VIII with 2 weak, hair-like L setae. Anal lobe without macrosetae, male genital sac overreaching anal lobe.

Larva. Unknown.

Key to the males of *Litocladius* Mendes, Andersen *et* Sæther

1. Third palpomere with 1–2 strong spines apically; r_{4+5} with at least 10 setae........................ *L. floripa* **sp. n.**
- Third palpomere with setae only; r_{4+5} with 0–1 setae 3
2. Crista dorsalis distinct; inferior volsella with rounded oral projection .... *L. mateusi* Mendes, Andersen *et* Sæther
- Crista dorsalis absent; inferior volsella low, adpressed to gonocoxite. .... *L. confusus* **sp. n.**

Litocladius confusus sp. n.
(Figs 79–83)

Type material: Holotype male, **Brazil: Rio de Janeiro:** Nova Iguaçu, Reserva Biológica Tinguá, 22°34'34"S 43°26'05"W, 5–8.iii.2002, Malaise trap (Trilha-2), S.T.P. Amarante *et al.* (BIOTA-FAPESP) (MZUSP).

Diagnostic characters: The species can be separated from the two other members of the genus by the absence of spines on the third palpomere, wing cells and veins bare, the shape of the lateral lamellae of the virga, and the low inferior volsella.

Etymology: From Latin *confusio*, meaning confusion, as it superficially looks like an *Antillocladius*.

Male (n = 1). Total length 2.16 mm. Wing length 1.24 mm. Total length / wing length 1.73. Wing length / length of profemur 2.67. Coloration dark brown, thorax dark brown without distinct marks.

Head. AR 1.28. Ultimate flagellomere 446 µm long. Temporal setae 9, including 4 inner verticals, 3 outer verticals, and 2 postorbitals. Clypeus with 3 setae. Tentorium, stipes, and cibarial pump as in Figure 79. Tentorium 107 µm long, 20 µm wide. Stipes 104 µm long, 45 µm wide. Palp segment lengths (in µm): 18, 48, 68, 59, 82. Third palpomere with 3 sensilla clavata subapically, longest 14 µm long.

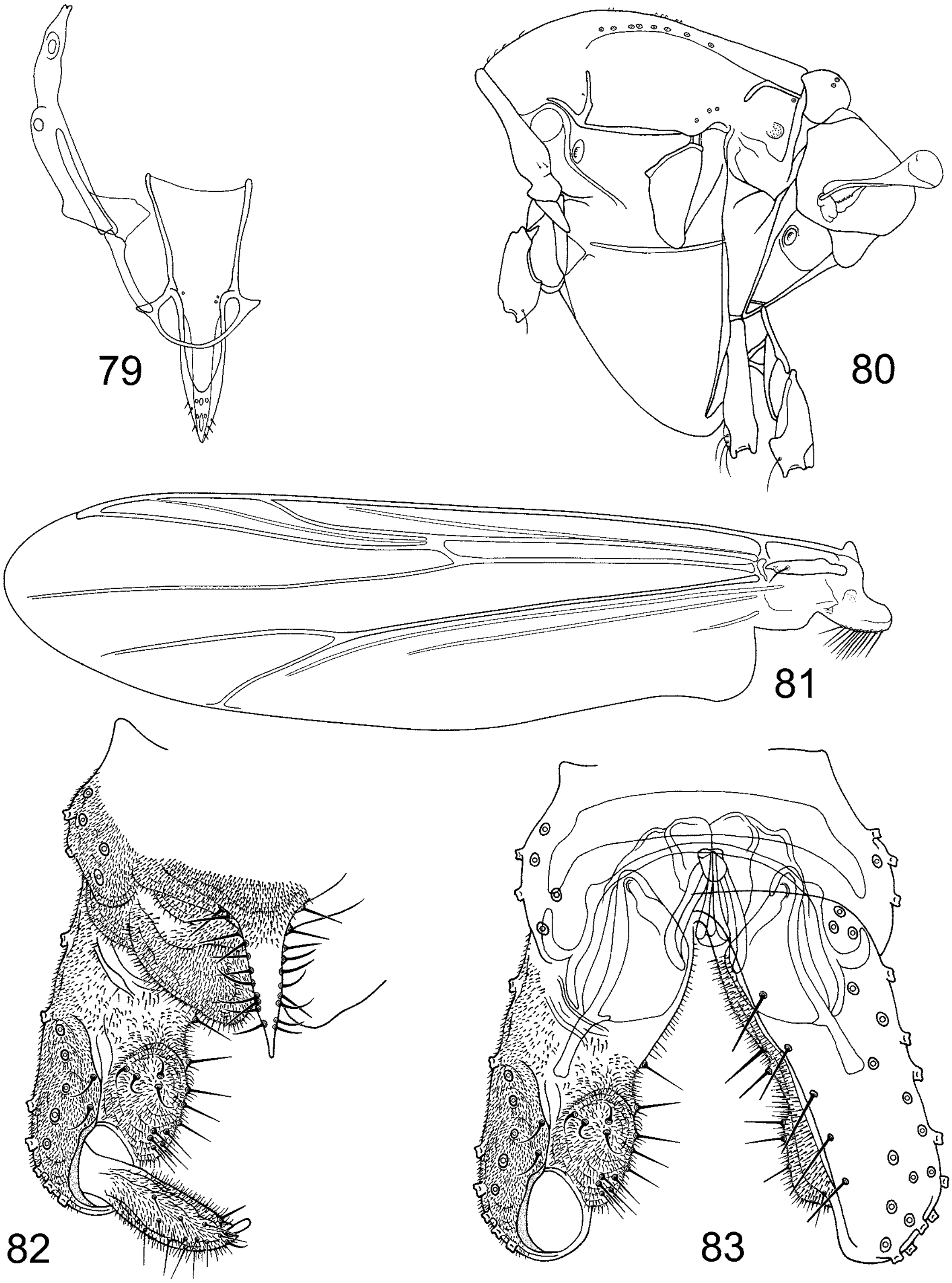
Thorax (Fig. 80). Antepronotum with 2 setae. Dorsocentrals 8; acrostichals composed of at least 4 anterior strong decumbent setae, 2 weak simple, and 5 posterior scalpellate setae; prealars 3; supraalar 1. Scutellum with 4 setae.

Wing (Fig. 81). VR 1.37. C extension 36 µm long. Brachiolum with 1 seta, veins and cells bare. Squama with 11 setae.

Legs. Spur of foretibia 43 µm long, spurs of midtibia 23 µm and 15 µm long, spurs of hind tibia 39 µm and 15 µm long. Width at apex of foretibia 27 µm, of midtibia 25 µm, of hind tibia 29 µm. Comb with 13 setae, longest 27 µm, shortest 11 µm long. Lengths and proportions of legs as in Table 13.

Hypopygium (Figs 82–83). Tergite IX covered with strong microtrichia, laterosternite IX with 6–7 setae. Anal point narrowly triangular, 59 µm long, 38 µm wide at base, 3 µm wide at apex, with 22 setae. Phallapodeme 75 µm long, transverse sternapodeme 73 µm long. Virga 39 µm long. Gonocoxite 134 µm long. Gonostylus 64 µm long, megaseta 7 µm long. HR 2.11, HV 3.38.

Distribution: This species is known only from the type locality in Rio de Janeiro State, Brazil, where it was collected in a Malaise trap.



FIGURES 79–83. *Litocladius confusus* **sp. n.**, male. **79—**tentorium, stipes, and cibarial pump; **80—**thorax; **81—**wing; **82—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **83—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

TABLE 13. Lengths (in µm) and proportions of legs of *Litocladius confusus* **sp. n.**, male (n = 1).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	475	572	–	–	–	–	–	–	–	–	–
p_2	472	508	227	112	101	65	36	0.45	3.85	4.32	–
p_3	547	616	–	–	–	–	–	–	–	–	–

Litocladius floripa **sp. n.**
(Figs 84–89)

Type material: Holotype male, **Brazil: Santa Catarina:** Florianópolis, UCAD, close to main stream, 20.xi–21.xii.2003, Malaise trap, L.C. Pinho (MZUSP). Paratypes: 1 male, as holotype except for 03–24.x.2003; 1 male, as holotype except for emergence trap on *Nidularium innocentii* (212), 09.i–10.ii.2004. 1 male, **São Paulo:** Peruíbe, Estação Ecológica Juréia, Itatins, 24°31'06"S 47°12'06"W, 3.v.2002, Malaise trap (Bosque-7), N.W. Perioto *et al.* (BIOTA-FAPESP); 2 males, Ubatuba, Parque Estação Serra do Mar, 23°21'43"S 44°59'22"W, 24.i.2002, Malaise trap (Trilha-4), N.W. Perioto *et al.* (BIOTA-FAPESP); 1 male, as previous except for Malaise trap (Trilha-5); 1 male, as previous except for 21.i.2002, Malaise trap (Trilha-1); 1 male, as previous except for 21.i.2002, Malaise trap (Bosque-9). 2 males, **Rio de Janeiro:** Nova Iguaçu, Reserva Biológica Tinguá, 22°34'30"S 43°26'07"W, 5–8.iii.2002, Malaise trap (Trilha-4), S.T.P. Amarante *et al.* (BIOTA-FAPESP); 1 male, as previous except for 22°34'28"S 43°26'09"W, 8–11.iii.2002, Malaise trap (Trilha-5) (MZUSP; ZMBN; ZSM).

Diagnostic characters: The species can be separated from the two other members of the genus by the presence of spines on third palpomere, the shape of the lateral lamellae of the virga, and by having setae on R, R_1 and R_{4+5} and in cells r_{4+5}, m_{1+2} and m_{2+3}.

Etymology: Floripa is slang for Florianópolis City, the type locality of the species; the name is to be regarded as a noun in apposition.

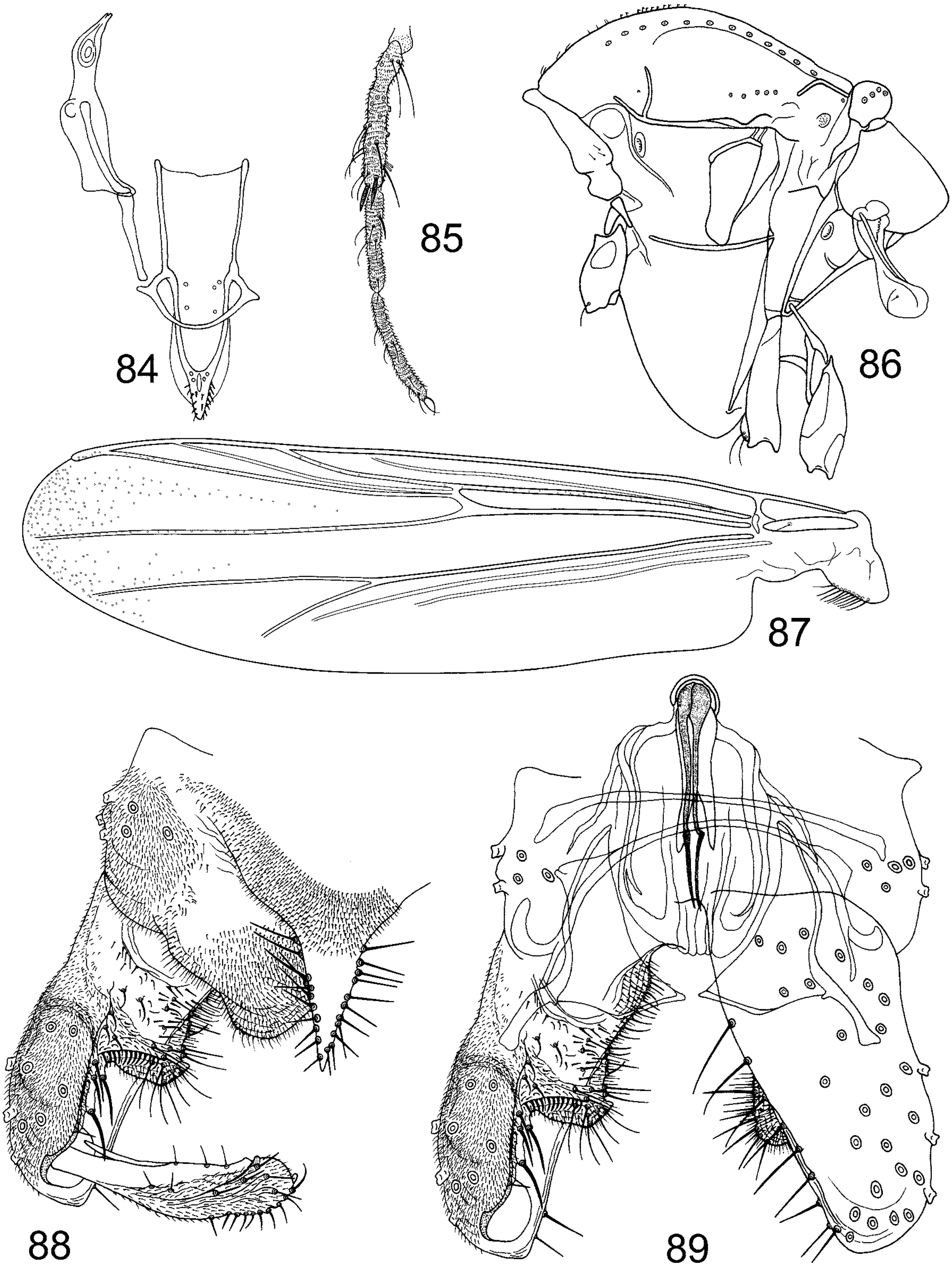
Male (n = 10–12, except when otherwise stated). Total length 1.93–2.38, 2.13 mm. Wing length 1.11–1.47, 1.28 mm. Total length / wing length 1.54–1.83, 1.66. Wing length / length of profemur 2.16–2.44, 2.36. Coloration dark brown, thorax dark brown without distinct pattern.

Head. AR 1.04–1.48, 1.27. Ultimate flagellomere 360–475, 417 µm long. Temporal setae 9–13, 10; including 3–5, 4 inner verticals; 2–6, 4 outer verticals; and 2–4, 3 postorbitals. Clypeus with 6–11, 8 setae. Tentorium, stipes, and cibarial pump as in Figure 84. Tentorium 95–120, 109 µm long; 18–29, 23 µm wide. Stipes 109–136, 122 µm long. Palp (Fig. 85) segment lengths (in µm): 16–27, 21; 32–45, 39; 100–136, 112; 82–111, 97; 102–123, 114 (6). Third palpomere with 2–4, 3 sensilla clavata subapically, longest 9–16, 12 µm long; with 1–3, 2 apical spines, 23–34, 29 µm long.

Thorax (Fig. 86). Antepronotum with 2–5, 4 setae. Dorsocentrals 8–16, 12; acrostichals 19–21, composed of 3–4, 4 anterior strong decumbent, 3–6, 5 weak simple, and 9–19, 12 posterior scalpellate; prealars 4–7, 5; 1 supraalar. Scutellum with 10–14, 11 setae, uniserial to biserial.

Wing (Fig. 87). VR 1.27–1.37, 1.33. C extension 32–75, 53 µm long. Brachiolum with 1 seta; costal extension with 4–8, 5 non-marginal setae; R with 7–18, 9 setae; R_1 with 6–12, 8 setae; R_{4+5} with 8–14, 9 setae; M with 0–1, 0 seta; M_{1+2} with 23–38, 30 setae; cell r_{4+5} with 83–148, 109 (7) setae; m_{1+2} with 43–76, 59 setae; m_{3+4} with 3–21, 13 setae. Squama with 5–12, 9 setae.

Legs. Spur of foretibia 45–61, 53 µm long; spurs of midtibia 25–41, 30 (8) µm and 23–32, 26 (9) µm long; spurs of hind tibia 43–57, 50 µm and 18–29, 23 µm long. Width at apex of foretibia 29–36, 33 µm; of midtibia 27–34, 31 (9) µm; of hind tibia 37–45, 41 µm. Comb with 11–14, 13 setae; longest 34–48, 41 µm; shortest 16–27, 22 µm long. Lengths and proportions of legs as in Table 14.



FIGURES 84–89. *Litocladius floripa* **sp. n.**, male. **84—**tentorium, stipes, and cibarial pump; **85—**palp; **86–**thorax; **87—**wing; **88—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **89—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Hypopygium (Figs 88–89). Tergite IX covered with microtrichia; laterosternite IX with 4–8, 6 setae. Anal point triangular; 57–70, 63 µm long; 36–54, 45 µm wide at base; 2–4, 3 µm wide at apex; with 18–29, 23 setae. Phallapodeme 73–100, 87 µm long; transverse sternapodeme 64–86, 74 µm long. Virga 82–95, 88 µm long. Gonocoxite 147–170, 153 µm long. Gonostylus 86–100, 92 µm long; megaseta 7–10, 8 µm long. HR 1.50–1.79, 1.65; HV 2.18–2.43, 2.29.

TABLE 14. Lengths (in µm) and proportions of legs of *Litocladius floripa* **sp. n.**, male (n = 8–9).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	470–617, 538	497–718, 619	414–525, 461	212–322, 263	147–212, 179	83–120, 98
p_2	479–626, 534	479–654, 564	216–276, 243	120–166, 138	83–101, 91	46–74, 58
p_3	543–682, 585	589–764, 656	332–433, 368	175–239, 195	138–175, 151	64–83, 70

	ta_5	LR	BV	SV	BR
p_1	55–83, 59	0.69–083, 0.75	2.52–2.87, 2.71	2.44–2.67, 2.50	2.9–4.2, 3.5
p_2	37–46, 42	0.39–0.50, 0.43	3.77–4.27, 4.09	3.89–4.87, 4.52	2.7–4.2, 3.4
p_3	37–46, 42	0.53–0.58, 0.56	3.27–3.62, 3.44	3.20–3.53, 3.37	3.5–5.2, 4.4

Remarks: The occurrence of palp elongation and strong spines on third palp segment were reviewed by Ferrington and Sæther (1995) and considered to be a homoplastic character among Orthocladiinae.

Biology and distribution: The males were collected in Malaise traps, except for one specimen which was taken in an emergence trap set on a bromeliad. This species is known from the Atlantic Rainforest from Santa Catarina north up to Rio de Janeiro State in Brazil.

Litocladius mateusi Mendes, Andersen *et* Sæther

Litocladius mateusi Mendes, Andersen and Sæther, 2004: 74, Figs 21–23.

Material examined: Type material as in Mendes *et al*. (2004).

Diagnostic characters: The species can be separated from the two other members of the genus by absence of spines on third palpomere, wing veins and membrane bare, inferior volsella with rounded oral projection, and by having a distinct crista dorsalis.

Remarks: This species was originally described with two types of acrostichals. Reexamination of the holotype reveals that the anteriormost acrostichals had fallen off, but the size of the seta bases indicate that the acrostichals most probably can be subdivided into three groups: anterior strong decumbent, middle simple weak, and posterior scalpellate, as in the other two species included in the genus.

Biology and distribution: This species was collected among mosses on tree trunks and is described as male, female and pupa. The larvae could not be found, but is certainly terrestrial. The species is only known from the type locality in São Paulo State, Brazil.

Lyrocladius gen. n.

Type species: *Lyrocladius radulatus* sp. n. by present designation.

Etymology: From Greek, *lyra*, meaning lyre, referring to the shape of the anal point, adding -*cladius* a common suffix among Orthocladiinae genera. Gender of genus: masculine.

Diagnostic characters: The male can be separated from all other orthoclad genera by having scalpellate acrostichals combined with lyre-shaped anal point, eyes without dorsomedian extension; wing membrane bare, squama with setae, costa extended, and megaseta sitting on tubercle. Females and immatures are unknown.

Generic diagnosis:

Male. Small species, wing length about 1.0 mm.

Antenna. With 13 flagellomeres; fully plumed; groove beginning on flagellomere 2; sensilla chaetica on flagellomeres 2, 3 and 13. Antennal ratio 0.70–0.90.

Head. Eye bare, without dorsomedian extension. Temporal setae strong, consisting of inner verticals, outer verticals, and few postorbitals. Third and fourth palpomeres of approximately same length, third palpomere with 2–3 weak sensilla clavata subapically.

Thorax. Antepronotum well developed with lobes meeting medially, without or with few lateral setae. Acrostichals strong, beginning close to antepronotum, anterior simple, slightly decumbent, posterior scalpellate, uniserial to irregularly biserial; dorsocentrals uniserial beginning at some distance from antepronotum; prealars few uniserial, extended anteriorly; supraalar present. Scutellars uniserial.

Wing. Membrane bare, with fine punctuation. Anal lobe protruding. Costa moderately extended (about 3 times the length of RM). R_{2+3} running and ending midway between R_1 and R_{4+5}; R_{4+5} ending distal to M_{3+4}; Cu_1 slightly curved; FCu distal to RM. Postcubitus ending distal to FCu, An ending proximal to FCu. Veins bare, except for R and R_1 which may have single seta. Brachiolum with one seta. Squama with one seta.

Legs. Pseudospurs, sensilla chaetica and pulvilli absent. Comb and tibial spurs normally developed.

Abdomen. Tergites and sternites with few setae.

Hypopygium. Tergite IX covered with microtrichia, anal point posterior on tergite, lyre-shaped with strong lateral setae. Laterosternite IX with setae. Sternapodeme arched, oral projections present. Virga composed of two strong spines, with lateral lamellae. Gonocoxite with well developed inferior volsella. Gonostylus with row of strong marginal setae, crista dorsalis absent, megaseta sitting on tubercle.

Female and immatures: Unknown.

Taxonomy: Regarding the gonostylus as simple, the species will key to couplet 155 in Sæther *et al.* (2000) and does not go any further as the acrostichals begin close to the antepronotum and the posterior acrostichals are scalpellate. Similarly, the species will only key as far as couplet 76 in the key by Cranston *et al.* (1989).

***Lyrocladius radulatus* sp. n.**
(Figs 90–95)

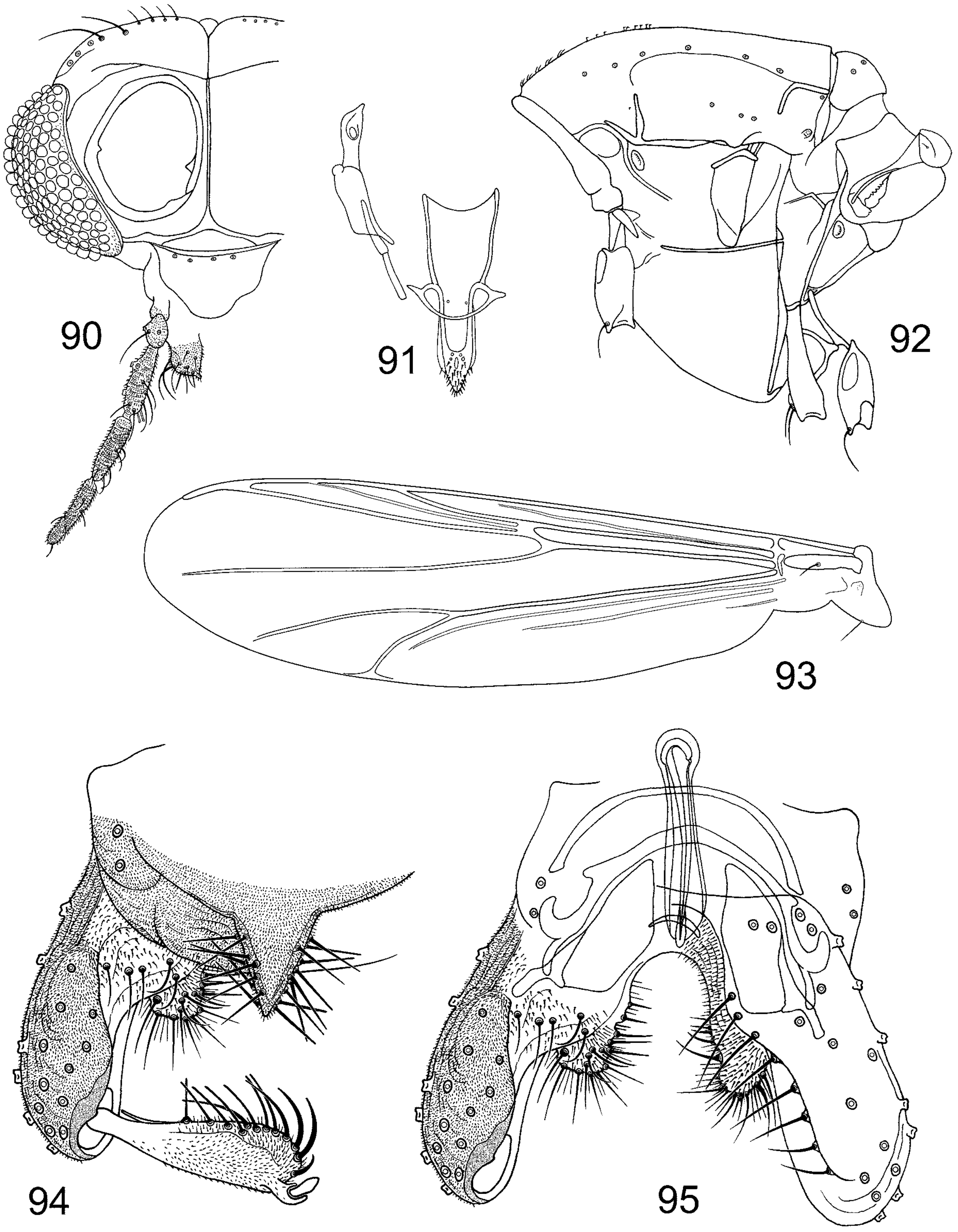
Type material: Holotype male, **BRAZIL: Paraná:** Morretes, Parque Estadual do Pau Oco, 25°34'27.9"S 48°53'46.7"W, 07–10.iv.2002, Malaise trap (Trilha-5), M.T. Tavares *et al*. (BIOTA-FAPESP) (MZUSP). Paratypes: 1 male, as holotype except for 10–13.iv.2002, Malaise trap (Bosque-4). 1 male, **Rio de Janeiro:** Nova Iguaçu, Reserva Biológica Tinguá, 22°34'28"S 43°26'09"W, 5–8.iii.2002, Malaise trap (Trilha-5), S.T.P. Amarante *et al.* (BIOTA-FAPESP); 1 male, as previous except for 22°34'27"S 43°26'11.4"W, Malaise trap (Bosque-6) (MZUSP, ZMBN).

Diagnostic characters: See diagnostic characters for the genus.

Etymology: From Latin *radula*, scraper, adding the suffix *-atus;* referring to the resemblance of the gonostylus with the radula of some Gastropoda.

Male (n = 4, except when otherwise stated). Total length 1.38–1.52, 1.46 mm. Wing length 0.87–0.91, 0.89 mm. Total length / wing length 1.58–1.70, 1.64. Wing length / length of profemur 2.50–2.57, 2.54. Coloration brown; thorax light brown with dark markings on preepisternum, median anepisternum and notum; legs and tarsi uniformly light brown.

Head (Fig. 90). AR 0.74–0.85, 0.77. Ultimate flagellomere 223–252, 235 µm long. Temporal setae 7–10, 9; including 3–5, 4 inner verticals; 3–5, 3 outer verticals; and 1–2, 2 postorbitals. Clypeus with 4–9, 6 setae. Tentorium, stipes, and cibarial pump as in Figure 91. Tentorium 70–102, 83 µm long; 14–19, 15 µm wide. Stipes 70–86, 80 µm long. Palp segment lengths (in µm): 13–16, 14; 27–30, 28; 43–59, 53; 52–59, 55; 57–75, 69. Third palpomere with 2–3 sensilla clavata subapically, longest 9–14, 11 µm long.



FIGURES 90–95. *Lyrocladius radulatus* **sp. n.**, male. **90—**head; **91—**tentorium, stipes, and cibarial pump; **92—**thorax; **93—**wing; **94—**anal point and tergite IX and dorsal aspect of left gonocoxite and gonostylus; **95—**hypopygium with anal point and tergite IX removed, dorsal aspect to the left and ventral aspect to the right.

Thorax (Fig. 92). Antepronotum with 0–1, 1 seta. Dorsocentrals 6–9, 7; acrostichals 7–19, 14 beginning close to antepronotum, composed of 4–10, 6 anterior simple and 3–13, 8 posterior scalpellate; prealars 3; supraalar 1. Scutellum with 4 setae.

Wing (Fig. 93). VR 1.40–1.47, 1.43. C extension 77–86, 81 µm long. Brachiolum with 1 seta; R with 0–1, 1 seta; other veins and cells bare. Squama with 1 seta.

Legs. Spur of foretibia 29–44, 35 µm long; spurs of midtibia 17–20, 19 µm and 13–16, 15 µm long; spurs of hind tibia 25–41, 33 µm and 12–18, 15 µm long. Width at apex of foretibia 20–23, 21 µm; of midtibia 21–23, 22 µm; of hind tibia 27–29, 28 µm. Comb with 10–12, 11 setae; longest 27–34, 30 µm; shortest 15–18, 17 µm long. Lengths and proportions of legs as in Table 15.

TABLE 15. Lengths (in µm) and proportions of legs of *Lyrocladius radulatus* **sp. n.**, male (n = 4, except when otherwise stated).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	349–367, 355	396–410, 402	209–223(2)	144–148(2)	97–101(2)	58(2)
p_2	349–371, 359	342–360, 353	158–169(3)	76–79(3)	54–58(3)	32–36(3)
p_3	374–389, 381	385–414, 400	216–220(2)	112(1)	95(1)	44(1)

	ta_5	LR	BV	SV	BR
p_1	32–36(2)	0.52–0.54(2)	2.88–2.90(2)	3.42–3.60(2)	3.6(2)
p_2	25–29(3)	0.44–0.47(3)	4.42–4.72(3)	4.32–4.52(3)	3.2–3.5(3)
p_3	29(1)	0.54(2)	3.54(1)	3.60(1)	3.4(1)

Hypopygium (Figs 94–95). Tergite IX covered with microtrichia; laterosternite IX with 2–5, 4 setae. Anal point triangular, lyre-shaped; 29–34, 32 µm long; 25–27, 26 µm wide at base; 3–5, 4 µm wide at apex; with 14–21, 16 strong marginal setae. Phallapodeme 52–64, 58 µm long; transverse sternapodeme 48–61, 54 µm long. Virga 65–75, 70 µm long. Gonocoxite 118–132, 124 µm long. Gonostylus 68–75, 71 µm long; megaseta 9–12, 11 µm long. HR 1.62–1.90, 1.75; HV 1.90–2.23, 2.07.

Distribution: The species is known from Paraná and Rio de Janeiro States in Brazil. All specimens were collected with Malaise traps.

Acknowledgements

We are indebted to Dr. Carlos J. E. Lamas for the loan of the chironomid material from the BIOTA-FAPESP project. Dr. Masaru Yamamoto, Dr. Tadashi Kobayashi, and Dr. Akihiro Shinohara kindly sent us *Antillocladius* material from Japan. Fábio de Oliveira Roque and Fernando Henrique Platt provided us with orthoclads collected in the Santa Catarina State. Thanks are also due to the project on the fauna associated with bromeliads [Fauna associada a bromélias em Mata Atlântica em Santa Catarina (CNPq, Proc.-690143/01-0)] and the leader of the project, Dr. Carlos B. Marcondes. Gladys Ramirez and Luiz Carlos de Pinho made some of the slide preparations.

The study was partially funded through the Brazilian Research Council of São Paulo State (FAPESP 02/12180-9 and 98/05073-4) within the BIOTA-FAPESP - The Biodiversity Virtual Institute Program (www.biota.org.br) and the Museum of Natural History, University of Bergen. Thanks are also due to the Programa de Pós-Graduação em Entomologia da FFCLRP-USP (CAPES-PROAP) for financial support during field work in Brazil.

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Appendix 1

Characters states for characters 1–157 in some genera of Orthocladiinae. Polymorphies: A = 0&1, B = 0&1&2, C = 1&2, D = 1&2&3, E = 0&2, F = 0&3, G = 2&3, H = 0&1&2&3, I = 1&3, J = 0&1&3, K = 0&1&2&3&4, L = 0&4, M = 2&4, N = 3&4.

Character no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Aagaardia	0	0	0	0	0	0	1	0	0	0	0	0	A	A	0	0	0	0	0	0	1	1	A	0	0	0	1	1	C	0	A	0
Apometriocnemus	0	0	?	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	0	0	4	1	1	2	0	2	0
Botryocladius	0	0	0	0	0	0	1	0	0	0	0	2	0	0	1	2	2	0	0	0	0	1	0	0	0	0	0	A	0	0	0	1
Brillia	0	1	1	0	0	A	0	0	0	0	1	0	A	1	1	?	0	0	1	0	0	1	1	0	0	4	1	0	0	0	0	0
Bryophaenocladius	0	A	0	0	0	0	A	0	0	0	0	0	A	A	A	0	0	0	0	1	1	1	0	0	0	0	A	A	B	0	0	0
Chaetocladius	1	A	0	A	0	A	A	0	1	0	0	2	A	A	1	0	0	0	0	1	A	1	0	0	0	0	1	A	A	0	A	0
Compterosmittia	A	0	0	0	0	0	1	0	0	0	0	0	0	0	1	C	2	0	0	0	A	1	0	0	0	A	0	C	G	0	B	1
Corynoneura	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	?	0	0	0	0	1	1	0	0	0	0	0	2	0	1	A	1
Cricotopus	1	A	A	1	0	0	A	A	0	0	0	A	A	A	1	0	0	0	0	0	A	A	A	1	1	0	A	A	A	0	0	1
Diplocladius	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
Doithrix	0	1	?	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	A	0	0	0	1	1
Eukiefferiella	1	0	1	A	0	0	A	A	0	0	0	0	0	0	1	E	0	0	0	0	1	1	0	0	0	0	0	0	0	A	0	A
Georthocladius s. str.	0	1	0	0	0	1	1	0	0	0	0	0	A	A	0	0	0	0	0	1	1	A	A	0	0	0	A	0	0	0	A	0
Genus H sensu Epler	?	?	0	0	0	0	1	0	?	0	0	0	A	A	0	0	2	0	0	1	0	1	0	0	0	?	1	2	?	0	1	1
Gymnometriocnemus	0	1	0	0	0	0	1	0	0	1	0	0	?	A	1	1	0	0	0	1	1	1	0	0	0	N	1	1	G	0	A	0
Gynocladius	?	?	0	0	0	0	1	0	?	0	0	0	1	0	0	2	2	0	0	0	1	1	0	0	0	?	0	2	?	0	0	1
Hanocladius	1	0	?	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	1	1	0	0	0	0	1	2	3	0	2	1
Heleniella	0	0	0	1	0	0	1	0	0	0	0	0	1	1	1	?	0	0	1	1	1	0	1	1	1	0	0	A	1	0	2	1
Heterotanytarsus	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	1	1	0	0	0	0	A	0	1	A	0	0	0
Heterotrissocladius	0	0	1	0	0	0	0	0	0	0	0	0	A	A	A	0	0	0	1	1	1	1	A	0	0	K	A	0	0	0	0	0
Hydrobaenus	1	0	0	0	1	0	A	0	0	0	0	0	A	0	1	1	0	0	0	1	1	A	A	0	0	0	A	A	A	0	0	0
Krenosmittia	1	0	0	0	0	0	1	1	0	1	0	0	0	0	1	?	0	0	0	0	1	1	0	0	0	0	0	2	3	1	C	1
Limnophyes	1	0	0	0	0	0	1	A	0	0	1	2	A	A	1	1	2	0	0	1	0	0	0	1	0	0	1	1	C	0	1	0
Lopescladius	1	0	?	1	0	0	1	1	1	1	0	1	0	0	1	?	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0
Metriocnemus	1	A	A	0	0	0	A	0	1	0	0	0	1	1	0	0	0	0	1	1	0	A	1	0	0	N	A	A	C	A	0	0
Naonella	0	?	?	0	0	?	0	0	1	0	0	0	0	0	1	2	2	0	0	0	1	1	0	0	0	0	0	1	0	0	0	A
Orthocladius	0	0	0	0	0	0	1	0	0	0	0	E	?	A	1	0	0	0	0	0	A	A	A	0	1	0	0	A	A	0	0	0
Parachaetocladius	0	1	0	0	0	1	1	0	0	0	0	0	A	0	1	?	0	0	0	0	1	A	0	0	0	0	A	0	0	0	1	0
Parakiefferiella	1	0	?	0	0	0	1	1	0	1	0	0	0	0	1	?	0	0	0	0	1	1	0	0	0	0	0	1	C	0	2	1
Paralimnophyes	0	1	?	0	0	?	1	0	0	0	0	0	1	1	0	2	2	0	0	0	0	1	0	0	0	0	1	1	C	0	0	0
Parametriocnemus	1	0	0	0	0	A	0	0	0	0	0	0	A	A	0	0	0	0	0	0	1	1	A	0	0	N	A	B	C	0	1	0
Parasmittia	0	1	?	0	0	?	0	0	0	0	0	0	1	A	1	0	0	0	0	1	1	1	1	0	0	3	0	1	2	0	0	1
Propsilocerus	1	0	0	0	1	A	1	A	0	0	0	0	A	A	1	?	0	0	1	0	1	A	A	0	0	0	1	0	0	0	0	0
Psectrocladius	0	0	A	0	0	0	1	0	0	0	0	0	A	A	A	0	0	0	1	1	1	1	A	0	0	0	0	0	0	0	0	0
Pseudorthocladius	0	1	0	0	0	1	A	0	0	0	0	0	A	A	0	0	0	0	1	1	1	1	1	0	0	L	0	1	A	0	1	A
Pseudosmittia	0	A	A	0	0	A	1	A	0	A	0	0	0	A	1	2	0	0	0	0	A	1	0	0	0	0	0	B	0	A	B	1
Rheocricotopus	0	0	0	1	0	0	1	A	0	0	0	C	A	0	1	A	0	0	0	0	1	1	0	0	0	0	A	A	0	0	0	0
Smittia	0	1	1	1	0	0	1	0	0	0	0	0	0	0	1	?	0	0	0	0	A	1	0	0	0	0	0	A	2	0	1	0
Stictocladius	0	0	1	1	0	0	1	1	1	A	0	C	A	A	1	?	0	0	0	0	1	1	A	1	1	0	0	A	A	A	A	0
Tonnoirocladius	0	0	?	0	0	0	1	1	?	0	0	?	0	0	1	2	2	0	0	0	1	1	0	0	0	0	0	1	0	?	0	?
Tvetenia	1	0	0	0	0	0	1	A	0	0	0	0	0	0	1	?	0	0	0	0	1	1	0	0	0	0	0	A	0	A	0	1
Unniella	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	2	0	0	0	1	1	0	0	0	0	0	1	0	0	2	0
Zalutschia	0	0	0	0	0	0	A	0	0	0	0	0	0	0	1	1	0	0	0	0	1	A	0	0	0	0	0	B	A	0	0	0

antecalvus	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	1	1	0	0	1	1	0	0	0	1	0	1	1	0	0	1
arcuatus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	0	1	0	1	1
apicalus	0	1	?	0	0	0	1	0	0	0	0	1	0	0	0	1	2	0	0	1	0	1	0	0	0	4	0	2	3	1	1	0
atalaia	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0
axitiosus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	2	0	1	1
biota	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	1	1	0	0	0	0	0	2	2	0	0	1
brazuca	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	A	A	0	0	0	1	0	0	0	0	0	1	1	0	0	1
calakmulensis	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	2	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1
campususp	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	A	A	0	0	0	1	0	0	0	0	0	1	1	0	0	1
confusus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	0	0	0	1	0	0	0	1	0	1	1	0	0	1
curtus	1	1	?	0	0	0	1	0	0	0	0	1	0	0	0	1	2	0	0	1	0	1	0	0	0	4	0	2	3	1	1	0
floripa	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	0	0	0	1	A	0	0	1	0	0	1	0	0	0
folius	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	2	2	0	0	1
gephyrus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0	0	A	0	1	2	0	0	1
guatemaltecus	0	1	?	0	0	0	1	0	0	0	0	1	0	0	0	2	2	0	0	1	1	1	0	0	0	4	0	2	3	1	0	0
herradurus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	1	0	1	0	0	0	1
mateusi	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	0	0	0	1	0	0	0	1	0	1	1	0	0	1
musci	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1
nidularium	A	1	?	0	0	0	1	0	0	0	0	1	1	0	0	2	2	0	0	1	0	1	0	0	0	4	0	2	3	1	0	0
pilosus	0	1	?	0	0	0	1	0	0	0	0	1	1	0	0	1	2	0	0	1	A	1	0	0	0	4	0	2	3	1	0	0
plicatus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	2	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1
pluspilalus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	3	0	0	1	0	0	1
radulatus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	1	2	0	0	1
scalpellatus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	2	0	0	0	0	0	1
skartveiti	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	2	0	0	0	1	1	0	0	0	3	0	2	2	0	0	1
sooretama	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1
subnubilus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	3	0	0	0	0	0	1
tokarameneus	0	0	?	0	0	0	1	0	?	0	0	0	0	0	1	0	2	0	0	0	?	1	0	0	0	0	0	1	0	0	0	1
ubatuba	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1
ultimus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	1	A	A	0	0	0	1	0	0	0	0	0	1	0	0	1	1
venequatoriensis	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0	1	1	0	0	0	4	0	1	1	0	0	1
yakyijeus	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	2	0	0	0	0	0	1
zempoalensis	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	0	0	2	1	0	0	1
zhengi	0	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	1	0	0	1	0	0	1

Appendix 1 (continued).

Character no	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	6	6	6	6	6
	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
Aagaardia	1	1	1	1	0	0	1	0	1	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	E	0	0	0
Apometriocnemus	0	2	0	1	0	0	1	1	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Botryocladius	1	1	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0
Brillia	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	2	1	0	1
Bryophaenocladius	0	1	A	A	A	0	A	1	1	F	0	A	0	0	A	0	0	1	1	1	1	0	0	0	0	0	0	C	1	0	0	0
Chaetocladius	A	A	A	1	0	1	0	0	A	3	0	A	H	E	1	0	0	0	0	0	0	0	0	0	A	A	0	1	B	A	0	1
Compterosmittia	A	A	1	1	0	0	1	1	1	3	0	0	C	A	1	0	0	A	A	0	0	0	0	0	0	0	A	1	2	0	A	A
Corynoneura	3	0	1	C	0	A	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	2	E	0	0	1
Cricotopus	B	C	0	C	0	0	1	0	A	J	0	0	0	0	A	0	0	0	1	0	0	0	0	0	A	0	0	1	B	0	0	1
Diplocladius	1	1	1	0	0	0	1	1	1	3	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	1	2	1	0	0
Doithrix	0	1	0	1	1	0	1	1	0	2	0	0	G	1	1	0	1	0	1	0	1	0	0	0	0	0	0	2	2	0	0	1
Eukiefferiella	D	A	0	C	0	0	A	A	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	A	B	0	0	1

Georthocladius s. str.	A	1	0	A	0	0	0	1	0	2	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	A	0	C	0	0	1
Genus H sensu Epler	3	?	A	1	0	0	1	0	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Gymnometriocnemus	0	2	1	1	0	0	1	1	1	2	0	0	0	A	1	0	0	0	0	0	0	0	0	0	0	0	A	C	B	0	0	1
Gynocladius	0	?	1	1	0	0	1	?	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Hanocladius	3	0	1	0	0	0	1	1	1	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1
Heleniella	1	1	1	A	0	0	1	A	1	F	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	A	2	0	0	1
Heterotanytarsus	0	C	0	1	1	0	1	A	1	3	0	0	0	0	A	0	0	0	1	0	0	0	0	0	0	A	A	1	2	0	0	1
Heterotrissocladius	0	C	0	1	0	0	1	A	1	3	1	0	I	C	1	0	0	0	0	0	0	0	0	0	0	A	0	1	0	0	0	0
Hydrobaenus	A	1	0	1	0	0	0	0	1	3	0	0	0	A	1	0	0	0	0	0	0	0	0	0	0	A	0	1	2	0	0	0
Krenosmittia	1	0	1	1	0	0	1	1	1	G	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0	0	1
Limnophyes	C	A	A	1	0	0	1	A	1	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Lopescladius	3	0	1	1	0	0	1	1	0	0	0	0	0	0	1	0	?	0	1	0	0	0	0	0	0	0	A	C	2	1	0	1
Metriocnemus	0	2	0	A	0	A	0	1	1	3	0	0	B	A	1	0	0	0	0	0	0	0	0	0	0	0	0	A	A	0	0	0
Naonella	0	0	0	1	0	0	0	1	0	0	?	?	?	?	1	0	1	0	1	0	1	0	0	0	0	0	A	C	2	0	0	1
Orthocladius	A	1	0	0	0	0	A	0	1	3	0	0	1	0	A	0	0	0	0	0	0	0	0	0	0	0	0	1	A	0	0	0
Parachaetocladius	0	1	0	A	0	0	A	1	0	2	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	2	0	0	1
Parakiefferiella	1	1	1	1	0	A	1	1	1	3	0	1	0	0	A	0	0	1	1	0	0	0	0	0	0	0	0	1	C	0	0	0
Paralimnophyes	1	1	0	0	?	?	1	0	1	3	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1
Parametriocnemus	0	C	0	1	0	0	1	1	1	3	1	0	B	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Parasmittia	0	2	1	0	?	?	1	1	1	3	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Propsilocerus	1	1	0	0	1	0	A	0	1	F	0	0	A	0	A	0	0	1	0	0	1	1	0	0	1	0	1	0	1	0	0	1
Psectrocladius	A	1	0	B	0	A	0	0	0	F	0	0	B	A	1	0	0	0	1	0	0	0	0	0	0	0	0	A	E	0	0	1
Pseudorthocladius	0	C	0	1	0	0	1	1	0	C	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1	C	0	0	0
Pseudosmittia	D	A	1	1	0	A	A	A	1	A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	A	C	C	0	0	1
Rheocricotopus	1	1	A	1	0	A	1	0	0	3	0	0	C	0	0	1	0	0	1	0	1	0	0	0	0	0	0	A	A	0	0	1
Smittia	1	1	1	0	0	0	1	1	1	3	0	1	2	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Stictocladius	H	A	A	E	A	0	A	1	1	F	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	A	C	2	1	0	1
Tonnoirocladius	1	1	0	0	?	?	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	2	0	0	1
Tvetenia	1	1	0	1	0	0	0	A	1	3	0	0	C	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	C	0	0	0
Unniella	1	1	0	1	0	0	1	0	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Zalutschia	1	1	0	1	0	0	0	0	1	3	0	0	A	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0
antecalvus	1	A	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1
arcuatus	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1
apicalus	0	2	1	0	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	2	0	0	1
atalaia	A	A	0	1	0	1	1	1	1	3	0	0	3	2	1	0	1	0	0	0	1	1	0	0	0	0	0	1	2	0	0	1
axitiosus	1	1	0	1	0	1	1	1	1	3	0	0	3	2	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1
biota	?	A	0	1	0	0	1	1	1	3	0	0	3	2	1	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1
brazuca	?	0	0	1	0	0	1	1	1	3	0	0	3	2	1	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1
calakmulensis	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1
campususp	?	0	0	1	0	A	1	1	1	3	0	0	2	1	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1
confusus	1	0	0	1	0	0	1	1	1	3	0	0	2	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	2	0	0	1
curtus	0	2	1	1	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1
floripa	?	1	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
folius	1	A	0	1	0	0	1	1	1	3	0	0	3	2	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1
gephyrus	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1
guatemaltecus	0	2	1	1	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	2	0	0	1
herradurus	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1
mateusi	1	0	0	1	0	0	1	1	1	3	0	0	2	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1
musci	1	A	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
nidularium	0	2	1	1	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1

pilosus	0	2	1	1	0	0	1	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
plicatus	?	0	0	1	0	A	1	1	1	3	0	0	2	1	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1
pluspilalus	0	2	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
radulatus	1	1	0	1	0	0	1	1	1	3	0	1	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1
scalpellatus	0	2	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
skartveiti	A	2	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1
sooretama	?	0	0	1	0	0	1	1	1	3	0	0	3	2	1	0	1	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1
subnubilus	0	2	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
tokarameneus	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
ubatuba	?	A	0	1	0	0	1	1	1	3	0	0	3	2	1	0	1	0	0	0	1	0	0	0	0	0	0	1	2	0	0	1
ultimus	1	A	0	1	0	1	1	1	1	3	0	0	3	2	1	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1
venequatoriensis	1	2	0	1	0	0	1	1	1	3	0	0	2	2	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
yakyijeus	0	2	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
zempoalensis	?	0	1	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1
zhengi	?	0	0	1	0	0	1	1	1	3	0	0	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Appendix 1 (continued).

Character no	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Aagaardia	0	0	0	0	0	0	0	1	2	1	0	2	1	1	1	0	0	0	0	1	0	0	0									
Apometriocnemus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	0	0	0	0	0	0
Botryocladius	0	1	1	0	0	0	0	0	0	0	1	1	1	1	0	?	?	?	A	1	1	0	0	?	?	?	?	?	?	?	?	?
Brillia	0	0	0	0	0	0	0	1	0	0	0	4	1	1	1	0	0	0	0	0	A	0	0	1	1	1	0	0	0	1	A	0
Bryophaenocladius	0	0	0	0	0	0	0	1	0	0	0	4	1	1	1	0	A	0	0	1	0	1	1	0	0	1	1	0	1	0	0	0
Chaetocladius	0	0	0	0	0	0	0	0	C	1	1	4	1	1	0	0	0	0	1	1	A	0	0	0	0	1	1	0	A	0	0	0
Compterosmittia	0	A	0	0	0	A	0	1	2	1	1	4	1	1	1	0	1	1	0	1	0	1	1	0	0	0	1	0	0	1	0	0
Corynoneura	0	0	0	0	0	0	0	0	1	1	1	0	2	1	1	0	1	0	0	?	0	0	1	0	0	0	?	0	?	1	0	0
Cricotopus	1	0	0	0	0	0	0	0	2	B	B	3	1	1	A	0	1	0	A	A	0	A	A	0	0	0	0	0	0	A	0	0
Diplocladius	0	0	0	0	0	0	0	1	0	0	0	4	1	0	0	0	1	1	0	1	1	0	0	1	0	0	A	A	0	0	0	0
Doithrix	1	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	0	1	1	0	0	1	1	0	0	0	0	0
Eukiefferiella	1	0	0	0	0	0	0	0	0	0	0	0	A	1	1	1	1	0	0	1	0	1	A	0	0	0	0	0	0	1	0	0
Georthocladius s. str.	0	0	0	0	0	0	0	1	0	0	0	4	1	1	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	1	0	0
Genus H sensu Epler	?	?	?	?	?	?	?	1	1	1	0	1	1	1	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0
Gymnometriocnemus	0	0	0	1	1	0	0	1	0	1	1	4	1	1	1	0	1	0	0	1	0	A	1	0	0	0	0	0	1	0	0	0
Gynocladius	?	?	?	?	?	?	?	0	0	1	1	1	1	1	0	0	1	1	0	0	0	1	1	0	0	A	1	0	A	A	0	0
Hanocladius	0	1	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	0	0	0	1	0	1
Heleniella	0	0	0	1	1	0	0	0	2	0	0	4	1	1	0	0	1	0	0	1	0	A	0	?	?	?	?	?	?	?	?	?
Heterotanytarsus	0	0	0	0	0	0	0	1	2	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
Heterotrissocladius	0	0	0	0	0	0	0	1	2	A	0	2	1	1	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0
Hydrobaenus	0	0	0	0	0	0	0	1	C	1	1	M	1	1	1	0	1	0	A	1	1	0	0	0	0	1	0	A	0	0	0	1
Krenosmittia	0	0	0	1	1	0	0	0	2	1	1	1	1	1	0	0	1	0	1	1	0	0	0	0	0	0	A	0	0	0	0	0
Limnophyes	0	1	1	0	0	0	0	1	B	1	1	4	1	1	0	0	1	A	1	1	0	0	1	0	0	1	0	0	0	1	0	0
Lopescladius	0	0	0	0	0	0	0	0	1	1	2	1	1	1	1	1	0	0	0	1	0	1	1	0	0	0	A	0	A	1	0	0
Metriocnemus	0	0	0	0	0	0	0	A	A	A	A	4	1	1	A	1	1	0	1	1	0	A	1	0	0	A	0	0	0	1	0	0
Naonella	0	1	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	1	0	0	1	A	0	1	1	0	0
Orthocladius	0	0	0	0	0	0	0	A	0	0	A	3	1	1	A	0	A	0	A	A	A	A	0	0	0	0	0	0	0	1	1	0
Parachaetocladius	0	0	0	0	0	0	0	0	0	0	0	4	1	1	1	0	0	0	0	1	0	1	1	1	0	A	A	0	A	A	1	0
Parakiefferiella	0	0	0	1	1	0	0	0	2	1	1	1	1	1	0	0	1	0	1	A	0	0	A	0	0	0	0	0	0	1	0	0
Paralimnophyes	0	0	0	0	0	0	0	1	B	1	1	4	1	1	0	0	1	A	1	1	0	0	1	1	0	0	A	0	0	0	0	0
Parametriocnemus	0	0	0	0	0	0	0	1	2	1	1	M	1	1	0	0	1	0	1	1	A	1	0	0	0	0	?	0	1	1	0	0

Parasmittia	0	0	0	0	0	0	0	0	0	1	0	3	2	1	0	0	?	1	0	1	?	1	1	0	0	A	A	1	0	1	0	1
Propsilocerus	0	0	0	0	0	0	0	A	C	0	0	4	2	0	0	0	0	0	0	0	0	A	0	0	0	0	?	0	1	1	0	0
Psectrocladius	0	1	0	0	0	0	0	A	2	A	1	M	C	1	A	0	1	0	0	A	1	A	0	0	0	A	1	0	0	0	0	0
Pseudorthocladius	1	0	0	1	1	1	1	1	0	A	1	4	1	1	1	0	0	0	0	1	0	1	1	0	0	A	A	0	A	1	1	0
Pseudosmittia	0	1	1	0	0	0	0	0	E	1	A	4	2	1	0	0	A	0	A	1	A	A	1	0	0	0	A	0	0	1	0	1
Rheocricotopus	0	0	0	0	0	0	0	0	E	1	1	4	1	1	1	1	0	0	0	1	0	A	0	0	0	0	A	0	1	0	0	0
Smittia	1	0	1	0	0	0	0	0	0	1	0	3	2	1	0	0	?	1	0	1	0	1	1	0	0	0	0	0	A	1	1	0
Stictocladius	0	0	0	0	0	0	0	1	2	C	C	4	2	1	A	0	0	0	0	A	0	1	A	0	0	0	1	0	0	0	0	0
Tonnoirocladius	0	0	0	?	?	0	0	?	?	?	?	0	1	1	0	1	1	1	1	1	0	0	1	0	0	A	0	0	A	1	0	1
Tvetenia	0	0	0	0	0	0	0	1	2	1	1	4	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0
Unniella	1	0	0	0	0	0	0	1	0	1	?	4	1	1	0	0	0	0	0	0	0	0	0	0	1	A	0	1	0	1	0	1
Zalutschia	0	0	0	0	0	0	0	1	B	1	1	4	1	1	0	0	A	A	A	1	0	0	0	0	0	0	0	0	0	1	0	0
antecalvus	0	0	0	0	0	0	0	0	1	1	1	4	1	1	0	0	0	0	1	1	0	1	1	0	0	1	A	0	0	0	0	0
arcuatus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	0	0	0	1	0	0
apicalus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
atalaia	0	0	1	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
axitiosus	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
biota	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
brazuca	0	1	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
calakmulensis	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
campususp	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
confusus	0	0	0	1	1	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
curtus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
floripa	0	0	1	1	1	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
folius	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	0	1	1	?	?	?	?	?	?	?	?	?
gephyrus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	1	0	0	1	0	0
guatemaltecus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
herradurus	0	0	1	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
mateusi	0	0	0	1	1	0	0	0	2	1	1	4	1	1	0	0	?	0	?	?	0	1	1	?	?	?	?	?	?	?	?	?
musci	0	0	0	0	0	1	1	0	2	1	1	4	1	1	0	0	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0
nidularium	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	0	1	1	0	0	0	1	0	0	1	0	0
pilosus	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	0	0	0	1	0	0
plicatus	0	0	1	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
pluspilalus	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	0	1	1	?	?	?	?	?	?	?	?	?
radulatus	0	0	0	1	1	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	0	0	0	0	0	0	1	0	0
scalpellatus	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
skartveiti	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
sooretama	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
subnubilus	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
tokarameneus	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ubatuba	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ultimus	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
venequatoriensis	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
yakyijeus	0	0	0	0	0	1	1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zempoalensis	0	0	0	0	0	0	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zhengi	0	0	0	0	0	1	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

Appendix 1 (continued).

Character no	9	9	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	7	8	9	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
				0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
Aagaardia	0	0	0	0	0	0	0	0	0	0	1	A	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Apometriocnemus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Botryocladius	1	1	A	0	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	C	A	1
Brillia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Bryophaenocladius	0	0	0	0	0	0	0	0	0	0	1	1	1	1	A	0	1	A	0	0	0	1	0	1	0	0	0	2	A	1	0
Chaetocladius	0	1	0	A	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	1	0	1	0	0	A	1	0
Compterosmittia	1	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0
Corynoneura	0	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
Cricotopus	0	0	0	0	0	0	A	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	B	A	C	0
Diplocladius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0
Doithrix	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	1	0	1	1	0	0	1	2	1	1	0
Eukiefferiella	1	A	1	A	0	0	A	1	1	0	A	1	1	1	0	0	A	0	0	0	0	0	0	1	0	0	0	E	A	C	0
Georthocladius s. str.	0	1	0	1	0	0	0	0	0	0	1	1	1	1	A	0	1	0	0	0	0	0	0	1	0	A	1	A	1	1	0
Genus H sensu Epler	0	0	1	?	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	1	0	1	0	0	0	1	?	1	0
Gymnometriocnemus	0	0	0	0	0	0	0	0	0	0	1	1	1	1	A	0	1	0	0	0	0	1	0	1	0	0	0	C	A	1	0
Gynocladius	0	1	0	?	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	?	1	0
Hanocladius	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Heleniella	0	1	0	1	1	0	0	0	0	0	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	0	0	1	1	0
Heterotanytarsus	0	0	0	0	0	0	0	0	0	0	0	A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
Heterotrissocladius	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1
Hydrobaenus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	A	0	0
Krenosmittia	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0	2	0
Limnophyes	1	0	0	1	1	1	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0
Lopescladius	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	1	1
Metriocnemus	0	A	0	A	0	0	0	0	0	0	1	1	A	A	A	0	1	0	0	0	0	0	0	1	0	0	0	B	A	1	0
Naonella	1	1	0	?	0	1	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0
Orthocladius	0	0	0	0	0	A	0	0	0	0	A	A	A	A	A	A	1	0	0	0	A	0	A	1	0	0	0	E	A	C	0
Parachaetocladius	0	1	0	1	0	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	1	0	0	1	0	1	1	0
Parakiefferiella	0	0	0	0	0	0	0	0	0	0	1	0	0	A	1	0	1	0	0	0	1	0	1	1	0	0	0	0	A	1	1
Paralimnophyes	1	0	0	1	1	0	0	0	0	1	1	1	1	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	1	A	0
Parametriocnemus	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	A	0	0	0	0	B	1	0
Parasmittia	0	0	0	?	?	0	0	?	1	1	?	?	?	?	1	?	?	?	?	0	0	0	0	1	0	0	0	2	?	2	0
Propsilocerus	0	0	0	0	0	0	0	0	0	0	0	0	0	A	A	0	0	0	0	0	0	0	0	0	0	0	0	0	1	C	0
Psectrocladius	1	A	0	0	0	A	0	0	0	0	0	A	0	A	1	A	0	0	0	0	A	0	0	0	0	0	0	E	A	1	0
Pseudorthocladius	0	1	0	1	1	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	1	1	0	0	0	C	C	1	0
Pseudosmittia	0	0	0	0	0	0	0	0	0	0	1	1	1	1	A	A	1	1	0	0	0	0	0	1	0	0	0	B	1	2	0
Rheocricotopus	0	A	0	0	0	1	0	0	0	0	0	A	0	0	1	A	0	0	0	0	0	0	0	A	0	0	0	0	1	1	0
Smittia	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	0	0	0	0	0	1	0	0	0	2	C	2	0
Stictocladius	0	1	0	A	1	1	0	0	0	0	1	1	A	A	A	0	1	1	0	1	0	0	A	1	0	0	1	A	A	1	1
Tonnoirocladius	1	1	0	1	0	1	0	0	0	0	0	1	1	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0
Tvetenia	0	1	0	1	0	1	1	1	A	1	1	1	1	1	0	0	1	0	0	0	0	0	1	1	1	0	0	0	1	1	0
Unniella	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Zalutschia	0	0	0	0	0	0	0	0	0	0	0	1	A	A	0	0	0	0	1	0	0	0	0	0	0	0	0	0	A	0	0
antecalvus	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	1	0	1	0	1	0	0	1	?	?
arcuatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
apicalus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

atalaia	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
axitiosus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
biota	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
brazuca	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
calakmulensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
campususp	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
confusus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
curtus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
floripa	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
folius	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	2	1	0
gephyrus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
guatemaltecus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
herradurus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
mateusi	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	2	1	?	?
musci	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	1	1	0
nidularium	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	0	1	0	0	0	0	1	0	0	0	1	1	1	0
pilosus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
plicatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
pluspilalus	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	A	1	1	0
radulatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
scalpellatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
skartveiti	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
sooretama	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
subnubilus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
tokarameneus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ubatuba	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ultimus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
venequatoriensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
yakyijeus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zempoalensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zhengi	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

Appendix 1 (continued).

Character no	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157
Aagaardia	1	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0
Apometriocnemus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Botryocladius	1	0	A	1	1	0	1	0	1	0	?	A	0	1	0	0	0	1	0	0	0	1	1	0	0	0	?	0	0	0
Brillia	1	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0	0	1	0	0	0	0	0	1	0
Bryophaenocladius	1	0	0	A	1	0	0	1	2	0	0	1	1	0	0	2	A	2	A	1	0	0	1	1	1	2	0	2	1	1
Chaetocladius	1	0	0	A	0	0	0	0	A	0	A	1	0	A	0	1	A	C	0	A	0	0	1	0	0	0	0	0	A	0
Compterosmittia	1	0	1	0	0	0	0	0	2	0	0	1	0	1	0	0	1	1	0	1	0	0	1	?	0	0	0	0	?	0
Corynoneura	2	0	1	0	1	0	0	1	2	0	1	1	0	1	0	E	1	1	0	1	0	0	1	?	0	1	0	0	0	0
Cricotopus	A	0	A	0	1	0	A	A	2	0	A	A	1	0	A	0	0	1	0	1	0	0	1	0	0	0	0	0	A	0
Diplocladius	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0
Doithrix	1	0	1	1	0	0	0	0	1	0	0	1	1	0	0	1	1	2	0	1	0	0	1	0	1	0	0	1	2	0
Eukiefferiella	1	0	0	0	1	0	0	1	2	0	0	0	1	A	1	0	A	C	0	1	0	0	1	A	0	A	A	0	1	0
Georthocladius s. str.	1	0	1	1	0	0	0	0	1	0	?	0	1	0	0	1	0	2	1	1	0	0	0	1	1	C	0	1	2	0
Genus H sensu Epler	1	0	1	1	0	0	0	0	2	0	0	1	1	1	0	0	1	1	0	1	0	0	1	0	1	0	1	0	?	0

Gymnometriocnemus	1	0	0	A	1	0	0	1	2	0	0	1	1	0	0	2	1	2	A	1	0	0	1	1	1	2	0	2	1	1
Gynocladius	1	0	1	1	0	0	0	0	2	0	0	1	1	1	0	0	0	1	0	1	0	0	1	0	1	1	1	0	0	0
Hanocladius	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
Heleniella	1	1	0	1	0	0	0	0	2	0	0	1	1	0	0	1	1	1	1	1	0	0	0	0	0	0	1	0	1	0
Heterotanytarsus	2	0	0	1	0	0	0	0	1	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	A	0	0	0
Heterotrissocladius	C	0	1	A	0	0	0	0	1	0	0	1	1	A	0	1	A	1	0	0	0	0	1	0	0	0	0	0	0	0
Hydrobaenus	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0	1	0	0	0	A	0	0	0
Krenosmittia	1	0	1	0	A	0	0	A	2	0	0	1	1	0	0	0	0	1	0	1	0	0	1	?	0	3	0	0	0	0
Limnophyes	1	0	1	A	0	0	0	0	2	0	0	1	0	0	0	0	1	1	0	1	0	0	1	A	0	0	1	0	A	0
Lopescladius	2	1	1	1	1	0	0	0	2	0	0	0	0	1	0	0	0	1	0	1	0	0	1	?	0	3	1	0	0	0
Metriocnemus	1	0	A	A	A	0	0	A	A	0	0	1	0	1	0	1	A	1	0	1	0	0	1	1	0	0	0	0	0	0
Naonella	1	0	0	0	1	0	1	0	2	0	0	1	1	1	0	0	1	1	0	0	0	1	1	?	0	0	?	0	0	0
Orthocladius	1	0	0	0	1	0	1	0	2	0	A	A	A	0	0	A	0	A	0	1	0	A	A	0	0	0	0	0	A	0
Parachaetocladius	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	A	2	1	1	0	0	1	1	0	3	0	1	2	0
Parakiefferiella	1	0	1	0	1	0	0	1	C	0	0	A	1	0	0	0	A	1	0	0	0	0	0	?	0	0	0	0	A	0
Paralimnophyes	1	0	1	A	0	0	0	0	C	0	0	A	0	1	0	0	1	1	0	1	0	0	1	A	0	0	1	0	A	0
Parametriocnemus	1	0	0	0	0	0	0	0	1	0	A	1	1	0	0	A	1	1	0	0	1	0	0	1	0	0	1	0	0	0
Parasmittia	0	0	0	1	0	1	0	0	2	0	1	1	1	0	0	0	0	1	0	1	0	0	1	1	1	2	0	0	1	0
Propsilocerus	1	0	1	0	0	0	0	0	0	0	1	1	1	1	0	0	1	A	0	0	0	0	0	0	0	0	A	0	0	0
Psectrocladius	1	0	1	0	0	1	0	0	2	0	0	0	1	0	0	E	A	1	0	0	0	1	0	1	0	A	0	0	0	0
Pseudorthocladius	1	0	A	A	0	0	0	0	2	0	0	0	1	0	0	1	1	2	A	1	0	0	0	1	0	3	0	1	C	0
Pseudosmittia	0	0	1	1	1	0	1	0	2	0	1	1	0	A	0	E	0	C	0	1	0	0	1	A	1	C	0	2	0	0
Rheocricotopus	1	0	0	0	A	0	A	0	2	0	0	0	1	0	0	0	A	1	0	0	0	1	0	0	0	0	A	0	0	0
Smittia	1	0	0	0	0	0	0	0	2	0	?	1	0	0	0	0	0	1	0	1	0	0	0	0	1	2	0	0	1	0
Stictocladius	C	1	1	1	A	0	0	A	2	0	1	0	1	A	0	1	A	C	1	1	0	0	0	A	0	3	1	1	1	0
Tonnoirocladius	1	0	0	0	1	0	1	0	2	0	1	1	1	0	0	0	0	2	0	0	1	1	1	0	1	1	?	0	0	0
Tvetenia	1	0	0	A	0	0	0	0	2	0	A	0	1	0	1	0	A	1	0	1	0	0	1	1	0	0	1	0	0	0
Unniella	1	0	1	0	0	0	0	0	2	0	?	1	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Zalutschia	1	0	0	A	0	0	0	0	1	0	1	1	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	E	0
antecalvus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
arcuatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
apicalus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
atalaia	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
axitiosus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
biota	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
brazuca	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
calakmulensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
campususp	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
confusus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
curtus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
floripa	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
folius	0	0	1	0	0	1	0	0	2	1	1	1	1	1	0	0	0	1	1	1	0	0	1	1	1	2	0	0	0	1
gephyrus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
guatemaltecus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
herradurus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
mateusi	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
musci	0	0	1	1	0	1	0	0	2	1	1	1	1	1	0	0	0	1	1	1	0	0	1	1	1	2	0	0	0	1
nidularium	1	0	1	1	0	0	0	0	2	0	0	1	1	1	0	0	0	1	0	1	0	0	1	1	0	0	0	0	?	0
pilosus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
plicatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?

pluspilalus	0	0	1	1	0	1	0	0	2	1	1	1	1	1	0	0	0	1	1	1	0	0	1	1	1	2	0	0	0	?
radulatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
scalpellatus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
skartveiti	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
sooretama	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
subnubilus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
tokarameneus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ubatuba	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
ultimus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
venequatoriensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
yakyijeus	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zempoalensis	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
zhengi	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?