

NEW BRAZILIAN PREDACEOUS MIDGES OF THE GENUS *MONOHELEA*
KIEFFER, AND REDESCRIPTION OF *M. GUAIMIESI*
(DIPTERA: CERATOPOGONIDAE)

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Two new Brazilian species of Monohelea Kieffer, M. affinis and M. roraimensis are described and illustrated, and a redescription of M. guaimiesi Lane & Wirth is given.

Key words: Neotropical biting midges – genus *Monohelea* – *Monohelea affinis* sp. n. – *Monohelea roraimensis* sp. n. – *Monohelea guaimiesi* Lane & Wirth

The genus *Monohelea*, which is worldwide in distribution, includes 64 species, 3 of which were originally described from Brazil: *aguirrei* Tavares & Souza, *archibaldoi* T. & S., and *brasilensis* Lane (Wirth & Grogan, 1988). Only two other species, *hieroglyphica* Kieffer and *poncai* Lane & Wirth, have also been recorded for Brazil (Lane & Wirth, 1964; Tavares & Souza, 1980).

In this paper descriptions of two new Brazilian species of *Monohelea* are given: *M. affinis* from Feijoal, Amazonas, and *M. roraimensis* from Missão Catrimani, Roraima. The discovery and description of these two species, and their close relation to *M. guaimiesi* Lane & Wirth, prompt us to redescribe and illustrate *M. guaimiesi* from paratype specimens.

The terminology used in our descriptions follows those explained in previous *Monohelea* revisions, by Wirth & Williams (1964) for Northamerican species, Lane & Wirth (1964) for Neotropical species, and Ratanaworabhan & Wirth (1972) for Oriental species.

Monohelea affinis Felipe-Bauer & Spinelli,
new species
(Figs 1-13)

Type locality: Feijoal, Amazonas, Brazil.

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Female Allotype: wing length 1.08 mm; breadth 0.44 mm.

Head: eyes (Fig. 4) black, narrowly contiguous in lower portion, bare. Antenna (Fig. 3) appearing pale brown in the mounted specimen; flagellar segments cylindrical, with lengths in proportion of 32-21-23-24-24-25-26-27-37-38-41-43-43; antennal ratio (11-15/3-10) 1.0; 6 sensilla chaetica subbasally in all flagellar segments; 3 sensilla trichodea in segments 3-10, more abundant in 11-15; 1-4 sensilla basiconica (Fig. 10) in distal portion of segments 7-10 (1 in segment 7, 2 in segments 8-9, 4 in segment 10), and sparsely distributed between the sensilla trichodea in segments 11-15. Palpus (Fig. 9) uniformly pale brown, longer than proboscis by the length of segments 3-5; lengths of segments in proportion of 7-15-15-10-21; 3rd segment slightly ovoid, with a subapical, rounded, moderately deep sensory pit; P. R. 1.8. Mandible (Fig. 6) with 9 teeth.

Thorax: mesonotum pale brown, apparently without a definite pattern; scutellum with a median brown band. Legs (Fig. 5) unarmed, brown with yellowish bands (median and subapical in femora, basal and medial in tibiae); knees yellowish; hind tibial comb with 7 spines, apical spur slender, spine-like; fore tibia with a subapical, semicircular comb of closely set spines, apical spur slender, greatly longer than that one of hind tibia. Tarsi pale (Fig. 7); fore and mid basitarsi dark basally; hind basitarsus with one row of ventral palisade setae; 5th tarsomeres of fore and mid legs with enlarged and hairy bases; basitarsi of fore and hind legs with one basal and one apical spine, basal



Wing photographs of *Monohalea affinis* sp. n. Fig. 1: female. Fig. 2: male.

spine absent in tarsomeres 2-4; basitarsus of mid leg with 2 basal and 2 apical spines, basal spines absent in tarsomeres 2-4. Fore, mid and hind tarsal segments with lengths in the following proportions: tarsomere 1: 27-34-34; 2: 11-13-15; 3: 7-7-10; 4: 5-5-9; 5: 12-11-8. Claws of fore and mid legs paired, equal, about 0.8 times the length of 5th tarsal segment, each one with internal and external basal tooth; hind claw simple, 1.5 times the length of 5th tarsal segment. Wing (Fig. 1) with irregular dark areas and spots, defining the figured hieroglyphic pattern; macrotrichia scarce, restricted to distal portion of cell M1 and veins M1 and M2, microtrichia absent; 2nd radial cell nearly 1.7 times longer than 1st; costal ratio 0.83. Halter stem pale, knob brown.

Abdomen: spermathecae (Fig. 8) very unequal, measuring 0.104 by 0.083 mm, and 0.044 by 0.044 mm, the larger one with sclerotized neck bent abruptly, forming a right angle with the axis of the spermatheca; smaller one subspherical with long, threadlike neck 0.118 mm.

Male Holotype: wing length 0.87 mm; breadth 0.33 mm. Similar to female with usual sexual differences; pedicel brown; flagellar segments 13-15 elongated; segment 12 slightly more than twice as long as wide; segments 12-15 with lengths in proportion of 18-54-50-55; antennal ratio (12-15/3-11) 1.0. Palpus as in Fig. 11; relative lengths of segments 3-5: 15-9-19. Wing (Fig. 2) with a characteristic hieroglyphic pattern; costal ratio 0.76. Genitalia: 9th sternum spiculate, posterior margin moderately convex in middle, with 4 long hairs; 9th tergum tapered, with a pair of moderately developed apicolateral processes. Gonocoxite stout, nearly 1.5 times as long as basal wide; gonostylus nearly straight, gradually narrowed to apex, with 3 thin hairs in basal 1/2 (2 in the ventral face, and one anteriorly in the dorsal

face). Aedeagus (Fig. 13) with 2 pointed ventral plates, and a slightly sclerotized dorsal structure, which arises in the middle way to aedeagus base, which is greatly expanded laterally. Parameres (Fig. 12) each with a well expanded bilobed base, mid portion swollen and slightly joined together; stem gradually narrowed distally, bearing apically a beak-shaped process externally directed.

Distribution: Brazil (Amazonas).

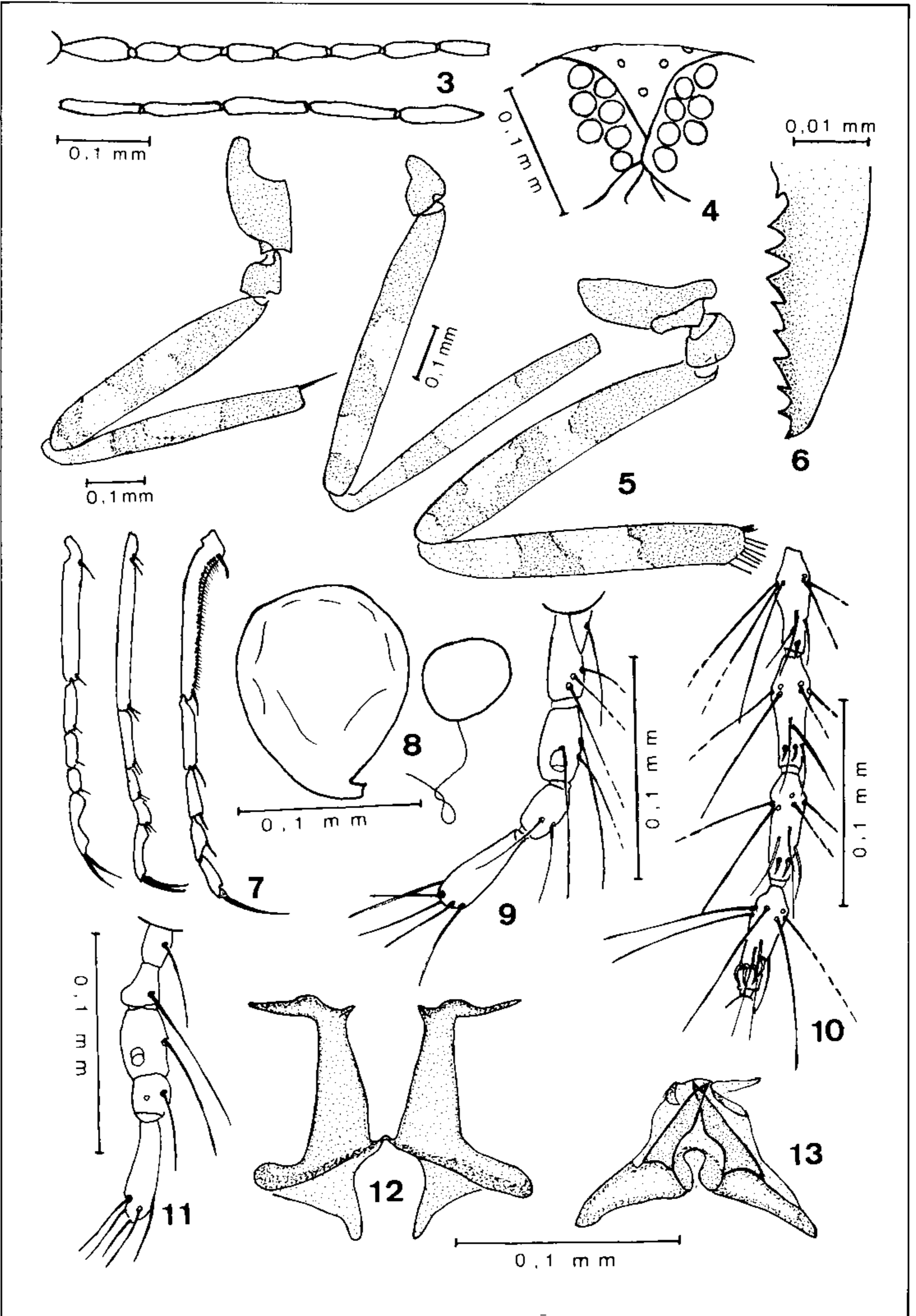
Types: Holotype ♂ (no. 199), Rio Solimões, Feijoa, Amazonas, BRAZIL (69° 25'W, 4° 7'S), X, 1978, Shelley & Luna coll.; *ibidem*, allotype ♀ (no. 200) deposited in the Instituto Oswaldo Cruz (IOC), Rio de Janeiro, Brazil.

Etymology: the name of this species is based on its close affinity with *M. guaimiesi* Lane & Wirth.

Discussion: *Monohalea affinis* is closely related to *M. guaimiesi*, from which it can be separated by its smaller length, by the wing pattern, and by the broader yellowish bands of femora and tibiae. The wing pattern differs in the dark spot located anteriorly and contiguous to the r-m crossvein, which is large and rounded in *affinis* and minute in *guaimiesi*, and in the presence in *guaimiesi* of 2 small, rounded, subapical dark spots in cell M1 (absent in *affinis*). The male genitalia of both species are very similar, but the posterior margin of 9th sternum bears 4 long hairs in *affinis* (5 in *guaimiesi*), the aedeagus base is more curved in *affinis*, and the beak-shaped apical process of the parameres is slender.

Monohalea roraimensis Felipe-Bauer
& Spinelli, new species
(Figs 14-17)

Type locality: Roraima, Brazil.



Monohelea affinis sp. n. Fig. 3: ♀ antenna. Fig. 4: eyes separation. Fig. 5: legs (left to right) fore, mid and hind. Fig. 6: mandible. Fig. 7: tarsi (left to right) fore, mid and hind. Fig. 8: spermathecae. Fig. 9: ♀ palpus. Fig. 10: ♀ antennal segments 7-10. Fig. 11: ♂ palpus. Fig. 12: paramers. Fig. 13: aedeagus.



Fig. 14: wing photograph of *Monohelea roraimensis*, male.

Male Holotype: wing length 0.79 mm; breadth 0.33 mm.

Head: eyes widely separated, bare. Antenna with flagellar segments 4-11 somewhat barrel-shaped, wider in midportion; 12 elongate, slightly more than twice as long as wide; relative lengths of segments 12-14: 15-40-45; 15 missing. Third palpal segment with a shallow, circular sensory organ located near mid portion; relative lengths of segments 3-5: 15-11-16.

Thorax: pale brown, apparently without a prominent pattern. Wing (Fig. 14) with a characteristic hieroglyphic pattern; micro and macrotrichia absent; 2nd radial cell nearly 1.5 times as long as 1st; costal ratio 0.74. Legs (Fig. 15) unarmed, pale brown with yellowish bands (median and subapical in femora, basal and medial in tibiae); knees pale; apex of hind tibia with a somewhat slanted row of 8 subequal bristles, and a distinct darkened patch of 20 densely packed short setae; apical spur small, slender, spine-like; fore tibia with a subapical, semicircular comb of closely set spines, apical spur slender, greatly longer than that one of hind tibia. Tarsi pale; hind basitarsus with one row of ventral palisade setae; basitarsi of fore and hind legs with one basal and one apical spines, basal spine absent in tarsomeres 2-4; basitarsus of mid leg with 2 basal and 2 apical spines, basal spines absent in tarsomeres 2-4. Fore, mid and hind tarsal segments with lengths in the following proportions: tarsomere 1: 19-22-22; 2: 7-8-12; 3: 6-6-9; 4: 5-5-7; 5: 6-5-7. Claws equal and simple in all legs.

Abdomen: ninth sternum spiculate, posterior margin slightly convex, with 4 hairs; 9th tergum tapered, with a pair of prominent apicolateral processes. Gonocoxite moderately stout, nearly twice as long as basal wide; gonostylus gradually

narrowed, with only one moderately strong seta on basal 1/2. Aedeagus (Fig. 17) with 2 pointed ventral plates, and a dorsal structure which arises near the aedeagus base and slightly produced beyond the apices of the ventral plates. Parameres (Fig. 16) separated, each with a well expanded bilobed base; mid portion swollen; apical portion with 2 processes, one beak-shaped, the other bilobed.

Female: unknown.

Distribution: Brazil (Roraima).

Type: Holotype ♂ (no. 201), Missão Catrimani, Roraima, BRAZIL (62° 25'W, 2° 18'S), I. 1979, C. A. E. coll., deposited in the Instituto Oswaldo Cruz (IOC), Rio de Janeiro, Brazil.

Etymology: this species is named after the State of Roraima, where the type-specimen was collected.

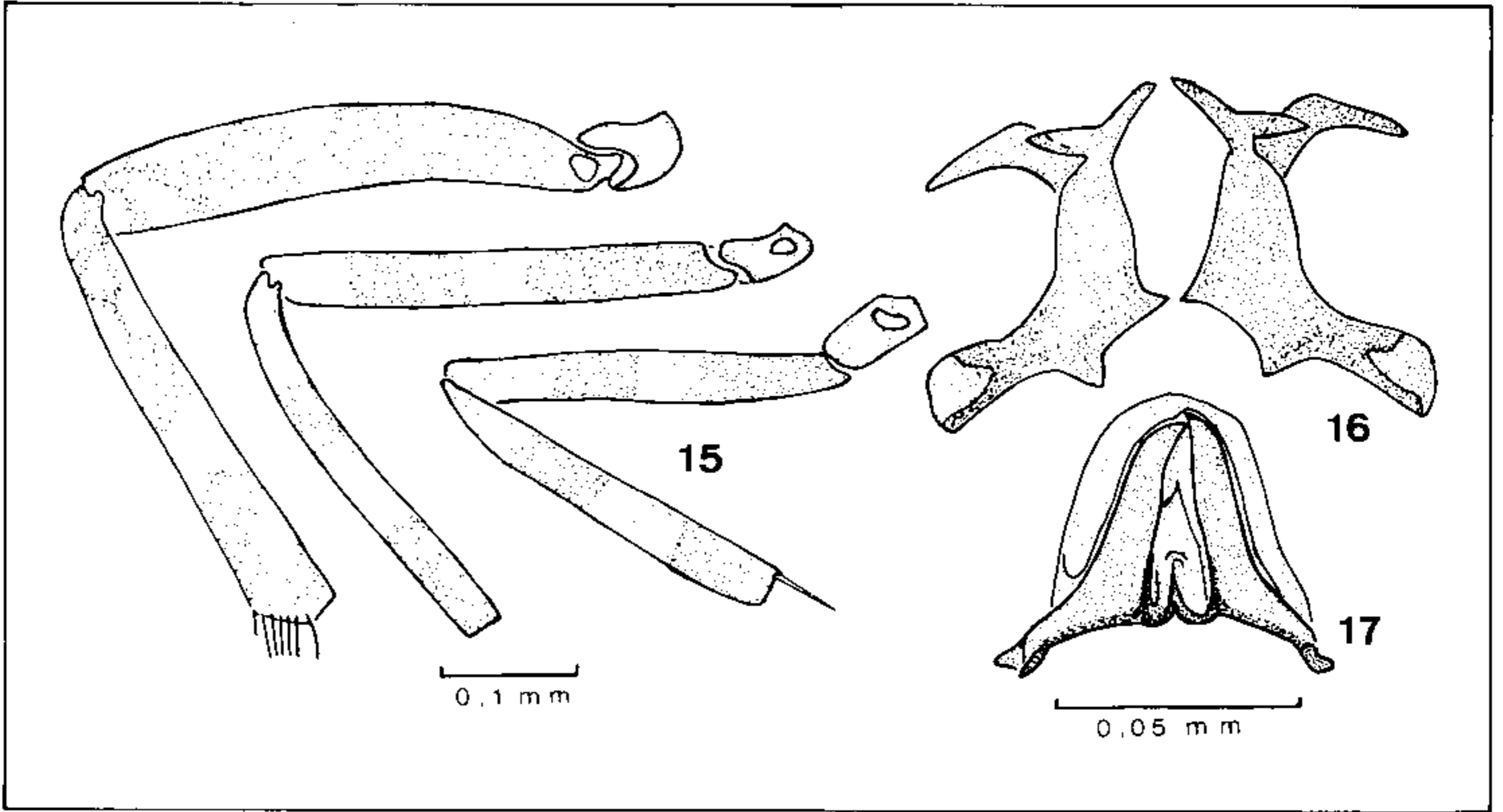
Discussion: this species is closely allied to *M. guaimiesi* and *M. ornata* Wirth, from which it can be separated by its smaller length and wing and legs patterns. The most important genital differences with *guaimiesi* are the stouter parameres, with an apical extrabilobed process and the aedeagus shape, while the presence of an extra beak-shaped distal process in the parameres distinguishes *roraimensis* from *ornata*.

Monohelea guaimiesi Lane & Wirth
(Figs 18-29)

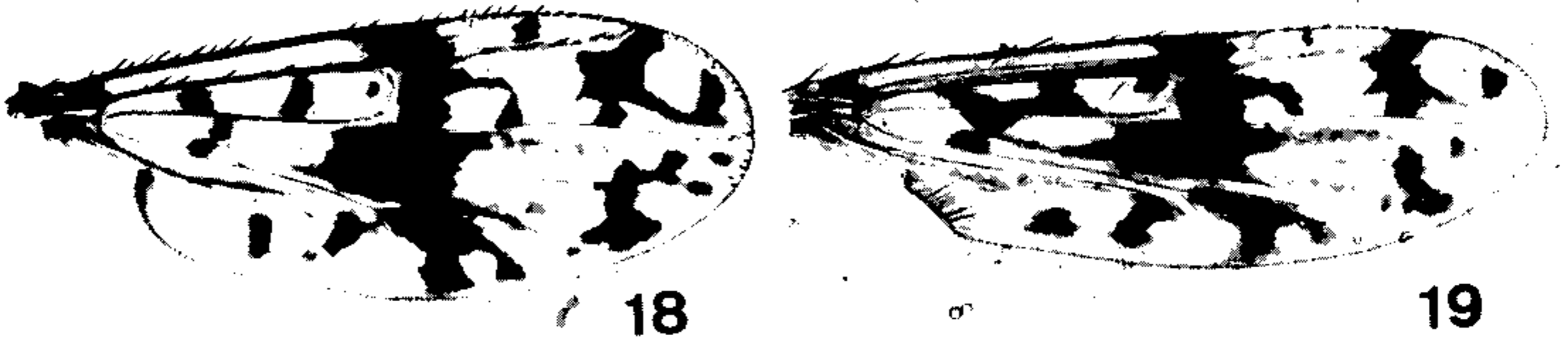
Monohelea guaimiesi Lane & Wirth, 1964: 227 (male, female; fig. male genitalia; Panama).

Female: wing length 1.20 (1.18-1.23; n = 2) mm; breadth 0.50 (0.49-0.51; n = 2) mm.

Head: eyes (Fig. 25) black, narrowly contiguous in lower portion, bare. Occiput pale. Clypeus and proboscis brown. Antenna (Fig. 21) pale brown; flagellar segments cylindrical, lengths in proportion of 35-24-25-28-28-30-29-33-36-41-45-50-55; antennal ratio (11-15/3-10) 0.98; 6 sensilla chaetica subbasally in all flagellar segments; 3 sensilla trichodea in segments 3-10, more abundant in 11-15; 2 sensilla basiconica in distal portion of segments 8-9, 4 in segment 10 (Fig. 27), and sparsely distributed between the sensilla trichodea in segments 11-15. Palpus (Fig. 26) brown, longer than proboscis by the



Monohelea roraimensis sp. n. Fig. 15: legs (left to right) hind, mid and fore. Fig. 16: parameres. Fig. 17: aedeagus.

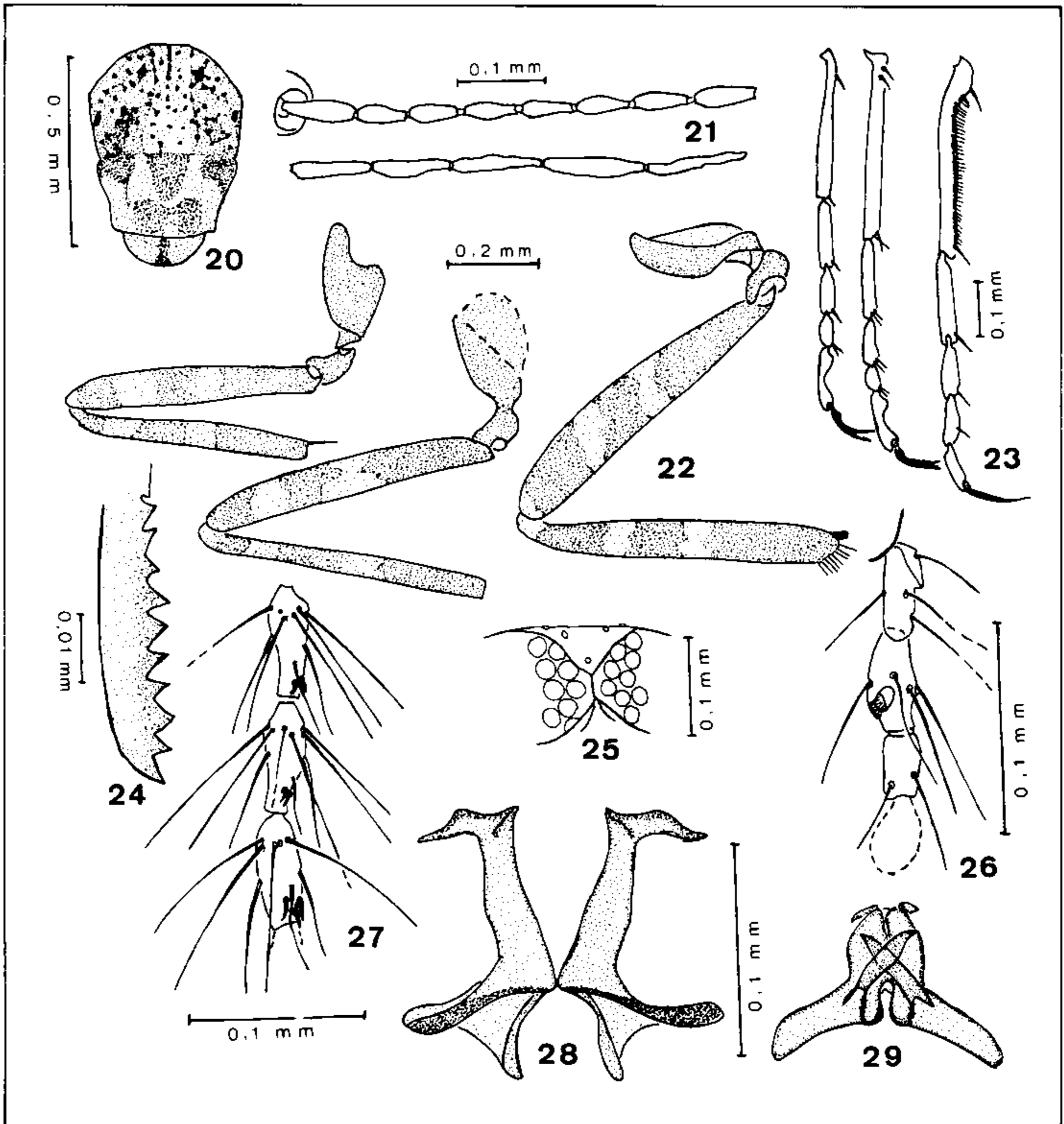


Wing photographs of *Monohelea guaimiesi* Lane & Wirth. Fig. 18: female. Fig. 19: male.

length of segments 3-5; lengths of segments in proportion of 10-20-20-12-25; 3rd segment slightly ovoid, with a subapical, rounded, shallow sensory pit; P. R. 2.0. Mandible (Fig. 24) with 8-9 teeth.

Thorax: mesonotum (Fig. 20) pruinose gray, with pale brown patches and dots pattern; scutellum yellow, with a pale brown band in middle; postscutellum brown. Pleura brown. Pleura brown. Legs (Fig. 22) unarmed, dark brown with yellowish bands (median and subapical in femora, subbasal and median in tibiae); coxae and trochanters dark brown; knees yellow; hind tibial comb with 8 spines, apical spur slender, spine-like; fore tibia with a subapical, semicircular comb of closely set spines, apical spur slender, greatly longer than

that one of hind tibia. Tarsi pale (Fig. 23); hind basitarsus with one row of ventral palisade setae; 5th tarsomeres of fore and mid legs swollen basally and covered with hairs; basitarsus of fore leg with one basal and one apical spine, basal spine absent in tarsomeres 2-3, tarsomere 4 with 2 apical spines; basitarsus of mid leg with 2 basal and 2 apical spines, basal spines absent in tarsomeres 2-4; basitarsus of hind leg with one basal and one apical spine, basal spine absent in tarsomeres 2-4. Fore, mid and hind tarsal segments with lengths in the following proportions: tarsomere 1: 30-39-40; 2: 15-17-20; 3: 10-10-13; 4: 7-7-10; 5: 13-12-9. Claws of fore and mid legs paired, equal, about 0.75 times the length of 5th tarsal segment, each one with internal and external basal tooth; hind claw simple, 1.4 times the length of 5th



Monohelea guaimiesi Lane & Wirth. Fig. 20: mesonotum. Fig. 21: ♀ antenna. Fig. 22: legs (left to right) fore, mid and hind. Fig. 23: tarsi (left to right) fore, mid and hind. Fig. 24: mandible. Fig. 25: eyes separation. Fig. 26: ♀ palpus. Fig. 27: ♀ antennal segments 8-10. Fig. 28: parameres. Fig. 29: aedeagus.

tarsal segment. Wing (Fig. 18) with irregular dark areas and spots, defining the figured hieroglyphic pattern; macrotrichia restricted to distal portion of vein M1, microtrichia absent; 2nd radial cell nearly 1.5 times longer than 1st; costal ratio 0.83. Halter stem yellowish, knob with a dorsal pale brown spot.

Abdomen: brown ventrally, yellow dorsally; 10th sternum with 3 pairs of median hairs, the distal one longer. Spermathecae very unequal, measuring 0.104 by 0.083 mm, and

0.048 by 0.048 mm, the larger one with sclerotized neck bent abruptly, forming a right angle with the axis of the spermatheca; smaller one subspherical with long, threadlike neck 0.086 mm long.

Male: wing length 1.13 mm; breadth 0.41 mm. Similar to female with usual sexual differences; pedicel brown, flagellum paler; flagellar segments 13-15 elongated, darker than 3-12; segments 4-11 barrel-shaped, segment 12 twice as long as wide; segments 12-15 with

lengths in proportion of 15-15-16; antennal ratio (12-15/3-11) 1.0. Relative lengths of papal segments 3-5: 16-12-20. Wing (Fig. 19) with a characteristic hieroglyphic pattern; costal ratio 0.79. Genitalia: 9th sternum spiculate, posterior margin moderately convex in middle, with 5 long hairs; 9th tergum tapered, with a pair of stout, well developed apicolateral processes. Gonocoxite stout, as long as basal wide; gonostylus nearly straight, gradually narrowed, with 3 thin setae in the basal 1/2. Aedeagus (Fig. 29) with 2 pointed ventral plates, and a slightly sclerotized dorsal structure which arises before the middle way to aedeagus base, and produced beyond the apices of the ventral plates; aedeagus base large, greatly expanded laterally. Parameres (Fig. 28) each with a well expanded bilobed base; mid portion swollen, slightly joined together; stem gradually narrowed, bearing apically a typical beak-shaped process externally directed.

Distribution: Panama (Coclé Prov.; Panama Prov.; Canal Zone).

Specimens examined: 1 ♂, 2 ♀♀, Paratypes, Antón, Coclé Prov., PANAMA, 11.XI.1952, F. S. Blanton coll.; 1 ♂, Paratype, La Jolla, Panama Prov., PANAMA, IX.1951, F. S. Blanton coll. [2 ♂♂, 1 ♀ (no. 8159, 8160, 8161), Faculdade de Saúde Pública, Universidade de

São Paulo, São Paulo, Brasil; 1 ♀, Museo de La Plata, La Plata, Argentina].

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