

A revision of the Neotropical predaceous midges of *Brachypogon* (*Brachypogon*) Kieffer (Diptera: Ceratopogonidae)

Gustavo R. Spinelli

Instituto de Limnología "Dr. Raúl A. Ringuelet",
Casilla de Correo 712, 1900 La Plata, Argentina

and

William L. Grogan, Jr.

Department of Biological Sciences, Salisbury State
University, Salisbury, Maryland 21801

Abstract: This revision of the Neotropical predaceous midges of the genus *Brachypogon* (*Brachypogon*) Kieffer, recognizes 18 extant species, including the following 12 new species: *Brachypogon* (*B.*) *apunctipennis*, *bifidus*, *bimaculatus*, *ecuadorensis*, *ethelae*, *insularis*, *monicae*, *pseudoparaensis*, *schmitzi*, *spatuliformis*, *telesfordi*, and *woodruffi*. Two species groups are recognized, the *fuscivenosus* and *impar* groups. The hitherto unknown male of *B. paraensis* Wirth & Blanton is described and illustrated, and the female of that species as well as both sexes of *B. impar* (Johannsen) and *B. fuscivenosus* (Lutz) are redescribed and illustrated. Diagnoses are provided for previously described species, as well as a key for the recognition of all Neotropical species. New records of *B. impar* are from Brazil, Colombia, and Argentina.

The small to minute predaceous midges of the genus *Brachypogon* (*Brachypogon*) Kieffer are world wide in distribution except for Antarctica. Due mostly to their small size, and because many species were often regarded as belonging to supposed subgenera of the genus *Ceratopogon* Meigen, they have remained poorly known taxonomically until recently. For example, Wirth & Grogan (1988) listed 26 species of the subgenus from all major biogeographic regions of the World, but only 3 from the Neotropics: *fuscivenosus* (Lutz), *impar* (Johannsen), and *paraensis* Wirth & Blanton. Since then, 3 new species were described from Argentina by Spinelli (1990), *bonaerensis*, *calchaqui*, and *ringueleti* and the Neotropical species of *Brachypogon* (*Isohelea*) have been addressed by Spinelli & Grogan (1994). In the most recent World catalog, Borkent & Wirth (1997) list 45 extant and 4 fossil species in the subgenus. These fossil species are from Baltic and Saxonian amber (Szadziewski 1988, 1993), but Szadziewski & Grogan (1998) describe a new fossil species from Dominican amber.

Materials and Methods

The present study was based primarily on slide mounted specimens in the collections of the U. S. National Museum of Natural History (USNM), Washington, D. C., the Florida State Collection of Arthropods (FSCA), Gainesville, and the Museo de La Plata (MLPA), La Plata, Argentina. In this material, we discovered 12 undescribed species that belong to 2 species groups, the

fuscivenosus and *impar* groups. We also describe and illustrate the hitherto unknown male of *B. impar*, redescribe the female of that species and both sexes of *B. paraensis* and *B. fuscivenosus*, give diagnoses of previously described species, and present a key for all Neotropical species.

All Neotropical species of *Brachypogon* (*sensu lato*) have fused male flagellomeres 2-11, a synapomorphy that is unique for the genus within the Ceratopogonidae (Borkent 1992, Grogan & Borkent 1992). The Neotropical species of the subgenus *Brachypogon* may be distinguished from all Neotropical species in the subgenus *Isohelea* by lacking radial cells and macrotrichia on the margin of their wing membranes, lack of setae on palpal segment 4, and a single spermatheca. Because our study is based primarily on museum material, we anticipate that many more undescribed species await discovery in the Neotropics.

The following special terms and their abbreviations are used: Wing length (WL) is measured from the basal arculus to the wing tip; costal ratio (CR) was obtained by dividing the value of the costal length by the wing length. Antennal proportions (AP) are the relative lengths of flagellomeres of females; antennal ratio (AR), presented for females only, is the value of the combined lengths of flagellomeres 9-13, divided by the value of the combined lengths of 1-8. Palpal proportions (PP) are the relative lengths of the palpal segments; palpal ratio (PR) is the length of palpal segment 3 divided by its greatest breadth. Hind tarsal ratio (TR) is obtained by dividing the length of the hind tarsomere 1 by the length of hind tarsomere 2.

Claw proportions (CP) are the relative proportion of the larger and smaller claws of females, in the order of fore, mid and hind legs. In cases where a species is known from only a few specimens, the values provided are for those of the holotype and allotype. For those species with other available specimens, a range of values is presented for each measured character.

For general ceratopogonid terminology see Downes & Wirth (1981), and Spinelli & Wirth (1993) for those genera inhabiting the Neotropical Region. A diagnosis of the genus *Brachypogon* and a detailed discussion of subgeneric characters is found in Wirth & Grogan (1988). Borkent (1992), Grogan & Borkent (1992), and Borkent & Grogan (1995) discuss additional characters that distinguish *Brachypogon* from related genera in the tribe Ceratopogonini. Unless otherwise indicated, types of all new species are deposited in the USNM; when available, paratypes are deposited in the MLPA, and the Canadian National Collection of Insects (CNCI), Ottawa.

Key to the Neotropical species of *Brachypogon* (*Brachypogon*)

(Males of *B. bonaerensis*, and females of *B. apunctipennis*, *insularis*, *pseudoparaensis*, *schmitzi*, and *spatuliformis* are unknown)

- | | |
|--|----|
| 1. Females | 2 |
| —Males | 15 |
| 2. Wing membrane with conspicuous dark spots in cells r5, m1, and m2, and/or veins darkly infuscated with dark spot over r-m crossvein and posterior to costa; spermatheca with well developed conical to subconical neck (<i>fuscivenosus</i> group) | 3 |
| —Wing membrane without conspicuous dark spots or with single large spot above base of vein M1 or directly on stigma; spermatheca without well developed conical or subconical neck (<i>impar</i> group) | 5 |
| 3. Sensilla coeloconica present only on flagellomere 1; wing veins pale; yellowish species | |
| <i>paraensis</i> Wirth & Blanton | |
| —Sensilla coeloconica on flagellomeres 1-3 or 1-4; wing veins darkly infuscated; brownish species | 4 |
| 4. Wing membrane with one large dark spot in cell r5 posterior to stigma, veins darkly infuscated; | |
| claws with basal internal and external teeth; large species, WL 0.95-1.05mm | |
| <i>fuscivenosus</i> (Lutz) | |
| —Wing membrane with three small brown spots, in cells r5, m1 and m2, veins pale; claws only with internal teeth; small species, WL 0.66 mm | |
| <i>ethelae</i> n. sp. | |
| 5. Wing lacking vein M2 | 6 |
| —Wing with vein M2 | 8 |
| 6. Antenna with 12 flagellomeres, 12-13 fused; costa very short, CR 0.41-0.46 | |
| <i>ecuadorensis</i> , n. sp. | |
| —Antenna with 13 flagellomeres; costa longer, CR 0.47-0.55 | 7 |
| 7. Flagellomeres 2-4 and 12-13 broadly abutting; costa with 11 marginal setae; tibiae yellowish with broad brown bands .. | |
| <i>bonaerensis</i> Spinelli | |
| —Flagellomeres 2-3 broadly abutting; costa with 19 marginal setae; tibiae uniformly dark brown | |
| <i>ringueletii</i> Spinelli | |
| 8. Antenna with 12 flagellomeres, 12-13 fused | 9 |
| —Antenna with 13 flagellomeres | 12 |
| 9. Costa very short (CR 0.44-0.48), with interrupted row of 6-7 setae; vein M2 complete to base or nearly so, obsolete distally; flagellomeres 3-4 indistinctly fused | |
| <i>woodruffi</i> n. sp. | |
| —Costa longer (CR 0.47-0.59), with row of 11-19 setae; vein M2 broadly obsolete at base; flagellomeres 3-4 not fused | 10 |
| 10. Wing membrane with large dark spot above base of vein M1 and pale area distad of the dark spot below radial sector; spermatheca elongated, ovoid | |
| <i>bifidus</i> , n. sp. | |
| —Wing membrane without large dark spot above base of vein M1, with or without pale area below radial sector; spermatheca globose to ovoid | 11 |
| 11. Wing membrane deeply infuscated, veins dark brown; palpus brown | |
| <i>monicae</i> , n. sp. | |
| —Wing membrane hyaline, most veins pale; palpus pale or whitish | |
| <i>impar</i> (Johannsen) (in part) | |
| 12. Palpus pale or whitish | |
| <i>impar</i> (Johannsen) (in part) | |
| —Palpus brown | 13 |

13. Only distal 3 flagellomeres elongated.....
 *telesfordi* n. sp.
 —Distal 5 flagellomeres elongated 14
14. Wing with 2 spots, one proximad of r-m cross-
 vein, other at end of costa, membrane hyaline,
 costa with row of 10-14 setae; palpus very
 short *bimaculatus* n. sp.
 —Wing without spots, membrane hyaline, costa
 with row of 24-25 setae *calchaqui* Spinelli
15. Wing membrane usually with small dark spots
 in cells r5, m1, and m2, and/or wing veins dar-
 kly infuscated with dark spot over r-m cross-
 vein and posterior to costa (*fuscivenosus*
 group) 16
 —Wing membrane without small dark spots in
 cells r5, m1 and m2, or posterior to costa
 (*impar* group) 22
16. Wing lacking spots in cells m1 and m2;
 aedeagus with extensive longitudinal wrinkles;
 sensilla coeloconica present on flagellomeres 1-
 3 *fuscivenosus* (Lutz)
 —Wing with spots in cells m1 and m2; aedeagus
 without longitudinal wrinkles; sensilla coelo-
 conica present only on flagellomere 1 17
17. Gonostylus strongly bent and constricted at
 base, tip with broad spatulate lobe; basal arch
 of aedeagus slightly convex
 *spatuliformis* n. sp.
 —Gonostylus nearly straight at base and not con-
 stricted, tip narrow and pointed; basal arch of
 aedeagus concave 18
18. Caudal margin of sternite 9 deeply excavated ..
 19
 —Caudal margin of sternite 9 nearly straight ... 20
19. Gonostylus slightly curved; parameres with
 stout, heavily sclerotized spine arising from
 medial portion of apical processes; aedeagus
 with two slender apical processes
 *schmitzi* n. sp.
 —Gonostylus abruptly curved distally; parameres
 without stout, heavily sclerotized apical spine;
 aedeagus with long stout pointed tip
 *apunctipennis* n. sp.
20. Aedeagus with straight basal arms; gonostylus
 1.25 X longer than gonocoxite, nearly straight;
 tergite 9 with subparallel lateral margins
 *pseudoparaensis* n. sp.
- Aedeagus with recurved basal arms; gonostylus
 shorter than or as long as gonocoxite, greatly
 curved at apex; tergite 9 tapering distally ... 21
21. Basal portion of parameres broader than long,
 H-shaped; tergite 9 tapering gradually dis-
 tally; basal arch of aedeagus very low, nearly
 straight *ethelae*, n. sp.
 —Basal portion of parameres longer than broad,
 triangular; tergite 9 tapering abruptly on dis-
 tal 1/2; basal arch of aedeagus extending 0.2 of
 total length, concave
 *paraensis* Wirth & Blanton
22. Parameres separate *ringueleti* Spinelli
 —Parameres fused 23
23. Wing lacking vein M2; ventral membrane of
 aedeagus with longitudinal wrinkles 24
 —Wing with vein M2; ventral membrane of
 aedeagus without longitudinal wrinkles 25
24. Parameres rhomboidal; sternite 9 with a
 straight caudal margin *insularis* n. sp.
 —Parameres not rhomboidal, basal arch heavily
 sclerotized, semicircular in shape; sternite 9
 with an extended caudal margin
 *ecuadorensis* n. sp.
25. Sternite 9 very short, continuous distally with
 aedeagus *calchaqui* Spinelli
 —Sternite 9 longer, separate from aedeagus 26
26. Parameres with bifid or bifurcate tip
 *bifidus* n. sp.
 —Parameres with entire, rounded tip 27
27. Caudal margin of sternite 9 deeply excavated
 *impar* (Johannsen)
 —Caudal margin of sternite 9 straight or slightly
 curved, not deeply excavated 28
28. Wing with two spots, over r-m crossvein and at
 end of costa; palpus very short
 *bimaculatus* n. sp.
 —Wing without spots, or only one spot at end of
 costa; palpus longer, of normal length 29
29. Apicolateral processes present on tergite 9;
 costa with only 3 marginal setae
 *woodruffi* n. sp.
 —Apicolateral processes not present on tergite 9;
 costa with 7 or more marginal setae 30

30. Apex of tergite 9 broadly rounded or truncate; vein M2 very pale, barely perceptible
 *monicae* n. sp.
 —Apex of tergite 9 narrowly rounded or pointed; vein M2 broadly obsolete at base
 *telesfordi* n. sp.

The *fuscivenosus* group

Wing membrane with conspicuous dark spots in cells r5, m1, and m2, and/or veins darkly infuscated with dark spot over r-m crossvein and posterior to stigma; spermatheca with well developed conical to subconical neck.

Brachypogon (B.) fuscivenosus (Lutz)

(Figs. 1-6)

Palpomyia fuscivenosa Lutz 1914:94 (male, female; Brazil); Floch & Abonnenc, 1942:4 (Guyana; fig. wing, palpus).

Parabazzia fuscivenosa (Lutz); Lane 1945:370 (types redescribed; Brazil; fig. male genitalia).

Brachypogon fuscivenosus (Lutz); Wirth & Blanton 1970:101 (comb.; reductio ad unum; distrib.).

Brachypogon (B.) fuscivenosus (Lutz): Wirth & Grogan 1988:29 (in list); Spinelli 1990:744 (in key).

Diagnosis: Female: only Neotropical species with sensilla coeloconica on flagellomeres 1-3 or 1-4; wing with large dark spot just posterior of costa, veins darkly infuscated, and WL 0.95-1.05 mm. Male: only Neotropical species with sensilla coeloconica on flagellomeres 1-3; and ventral surface of aedeagus with extensive longitudinal wrinkles.

Female: WL 0.95-1.05 mm. Eyes contiguous the length of 2 ommatidia. Antenna with sensilla coeloconica on flagellomeres 1-3 or 1-4 (Fig. 1); AP 30-20-20-20-20-20-20-20-30-32-38-40-40; AR 1.06. Palpus (Fig. 2) slender; PP 10-25-31-23-25; segment 3 moderately swollen with deep pit; PR 1.70. Femora brownish except bases pale, knees blackish, tibiae yellowish; femora and tibiae covered with stout bristle-like setae; 4th tarsomeres cordiform; female claws unequal with internal and external basal teeth, CP 16:12, 16:12, 21:16. Wing (Fig. 3) membrane slightly infuscated with darkly infuscated veins and two large dark brown spots, one at base of r-m crossvein, other just beyond end of costa, extending caudad about 1/3 across cell r5; r-m crossvein unusually long, nearly perpendicular; vein M2 obsolete at base; CR 0.61-0.63. Halter pale. Spermatheca (Fig. 4) large, round to ovoid with moderately long conical neck.

Male: WL 0.90-0.97 mm; CR 0.57-0.59. Similar to female with the following notable differences. Eyes separated the space of 2 ommatidia. Sensilla coeloconica on flagellomeres 1-3. Genitalia as in Fig. 5-6. Sternite 9 produced caudomedially; tergite 9 gradually tapering distally, apex truncated, proctiger large, quadrate, heavily sclerotized, with anterior margin notched to fit the tip of the parameres. Gonocoxite moderately long, straight; gonostylus slightly curved, with ventral subapical swelling, tip pointed. Aedeagus with short basal arms; main portion tapering to a bluntly rounded point, ventral surface with extensive longitudinal wrinkles, dorsal side with a semi-hyaline sheath with pointed apex extending beyond tip of aedeagus proper. Parameres fused, lyre-shaped; basal apodeme nearly straight; distal portion with pointed tip.

Distribution: Florida south to Brazil and Jamaica and the Virgin Islands.

Types: The original description by Lutz (1914) was based on a male and female mounted on microscope slides, captured by light trap in Manginhos, Brazil, which are housed in the collection of the Instituto Oswaldo Cruz, Rio de Janeiro.

Remarks: The illustrations of this species provided by Wirth & Blanton (1970) are reproduced herein for comparison purposes with the following new species.

Brachypogon (B.) ethelae, new species

(Figs. 7-12)

Brachypogon fuscivenosus Wirth & Blanton, 1970:101 (in part, female from Panama, Almirante, Bocas del Toro).

Diagnosis: A very small species of the *fuscivenosus* group, most closely resembling *B. fuscivenosus* in having well defined, darkly infuscated wing veins. Female: only Neotropical species with sensilla coeloconica on flagellomeres 1-3; wing with small spots in cells r5, m1 and m2, veins darkly infuscated with dark spots on r-m crossvein and end of costa, and WL 0.66 mm. Male: only Neotropical species having a wing with spots in cells r5, m1 and m2, veins infuscated with spots on r-m crossvein and end of costa; parameres with H-shaped proximal portion, distal portion with pair of long apical processes; apicolateral processes absent on tergite 9.

Allotype female: WL 0.66. Head: Dark brown. Eyes barely contiguous. Antennal scape with 2 setae; flagellum (Fig. 7) brown; flagellomeres 1-3 with sensilla coeloconica; AP 16-11-10-

10-10-11-13-13-21-23-28-27-33; AR 1.40. Palpus (Fig. 8) pale; PP 6-11-21-7-19; segment 3 with rounded deep pit; PR 1.40. Mandible with 8 coarse teeth. Thorax: Dark brown. Legs brown, tibiae with subbasal and apical pale bands, tarsi pale brown; hind tibial comb with 6 setae; TR 2.30; claws slightly unequal with short internal basal teeth (not measurable for CP). Wing (Fig. 9) membrane infuscated, with small spots in cells r5, m1 and m2; veins darkly infuscated with dark spots on r-m crossvein and end of costa; costa with row of 20 marginal setae; radius with 1 seta at intersection with r-m crossvein and at base of junction with costa; CR 0.58. Halter stem brown, knob white. Abdomen: Golden brown, pleurae brown. Spermatheca (Fig. 10) ovoid, with subconical neck, measuring 0.057 X 0.045 mm.

Holotype male: Similar to female with the following notable differences: Antennal flagella missing. Wing wrinkled due to mounting, unmeasurable; membrane lightly infuscated, small spots in cells r5, m1, and m2 barely perceptible; costa with row of 15 marginal setae. Genitalia as in Figs. 11-12. Sternite 9 with nearly straight caudal margin; tergite 9 tapering gradually distally to broadly rounded apex and a distal hyaline projection bearing the cerci, apicolateral processes apparently absent. Gonocoxite stout, nearly twice as long as broad with mesobasal projection; gonostylus slender, as long as gonocoxite, straight proximally, distal 1/4 abruptly curved, tip pointed. Aedeagus triangular, basal arch very low; basal arm heavily sclerotized, recurved 45°; distal portion lightly sclerotized, tapering abruptly distally to slender pointed tip. Parameres fused, heavily sclerotized; proximal portion H-shaped which are poorly articulated at bases with gonocoxites; distal portion with pair of long apical processes.

Distribution: Panama, known only from the type-locality.

Types: Holotype male, allotype female, Panama, Almirante, Bocas del Toro Prov., April 1953, F. S. Blanton, LT (USNM).

Etymology: Named for Ethel Liddle Grogan, the wife of the second author.

Discussion: The only other Neotropical species with females having sensilla coeloconica on flagellomeres 1-3 (or 1-4) and a similar appearing wing is *B. fuscivenosus*. But females of that species are much larger (WL 0.95-1.05 mm) and their wing lacks 3 small spots in cells r5, m1, and m2, and instead, has only a single spot on the wing membrane in cell r5 just posterior to end of the costa. In addition, the female claws of this new species

only have basal inner teeth, and lack the basal outer teeth that are present on female claws of *B. fuscivenosus*.

Despite the fact that females of *B. ethelae* closely resemble those of *B. fuscivenosus*, the male genitalia of this new species are quite unlike those of *B. fuscivenosus*, which has an aedeagus with longitudinal wrinkles on its ventral membrane and distinctive lyre-shaped parameres. Instead, the male genitalia of *B. ethelae*, more closely resemble those species of the *paraensis* complex, most notably *B. pseudoparaensis*, in that they are quite small. However, males of *B. pseudoparaensis* differ from this new species in having an aedeagus with straight basal arms and a basal arch that extends 1/2 of its total length, the parameres are not H-shaped on the proximal portion, and tergite 9 has well defined apicolateral processes.

The holotype male is missing its antennal flagella, and therefore, we could not determine whether it, like the female, possesses sensilla coeloconica on flagellomeres 1-3. However, we suspect that these sensilla may be present in males of this species, as they are present in males of *B. fuscivenosus*. If so, this would be further evidence that we have correctly associated the holotype and allotype, and that this species is indeed a close relative of *B. fuscivenosus*.

***Brachypogon (B.) paraensis* Wirth & Blanton**
(Figs. 13-23)

Brachypogon paraensis Wirth & Blanton 1970:99 (female, male; Brazil).

Brachypogon (B.) paraensis Wirth & Blanton: Wirth & Grogan 1988:29 (in list); Spinelli 1990:744 (in key).

Diagnosis: Female: only Neotropical species having a wing with a large quadrate or H-shaped spot in the center of cell r5 and pale veins; yellowish body; and an obliquely ovoid spermatheca with short broad conical neck. Males: only Neotropical species having a wing with spots in cells r5, m1, and m2; tergite 9 tapering abruptly at midlength; aedeagus triangular with low concave basal arch and long pointed tip; and parameres with long broad basal portion, and a pair of subapical slender heavily sclerotized submedian processes.

Female: WL 0.90-0.95 mm. Head: Eyes contiguous. Antennal flagellum (Fig. 13) slender, AP 23-15-15-15-16-18-20-20-30-35-40-35-35; AR 1.23. Palpus (Fig. 14) slender; PP 10-15-30-15-25; seg-

ment 3 with small deep sensory pit; PR 2.50. Legs (Fig. 15) pale yellow, knees brownish, tibiae with or without light brown median bands, tarsi (Fig. 16) pale; hind tibial comb with 6 setae; 4th tarsomeres subcylindrical, claws (Fig. 17) unequal, with internal and external basal teeth, CP 20:15, 20:15, 20:15. Wing (Fig. 18) hyaline with 3 prominent small spots, on r-m crossvein, on the end of costa and radius, and in middle of cell r5, and brown streaks in cells m1 and m2 directly behind the spot in cell r5; r-m crossvein long, perpendicular; vein M2 obsolete at base; CR 0.57-0.60. Halter pale. Spermatheca (Fig. 19) obliquely ovoid with short, very broad conical neck.

Male: WL 0.77-0.79 mm; CR 0.55-0.56. Antennal flagellum (Fig. 20) with plume extending nearly to apex of flagellomere 12. Claws (Fig. 21) small, without basal teeth, tips slightly bifid. Genitalia as in Figs. 22-23. Sternite 9 with very shallow caudomedian excavation; tergite 9 tapering abruptly on distal half, proctiger well developed, quadrate, apicolateral processes large with single apical seta, cerci small, setose. Gonocoxite straight, with mesobasal tubercle; gonostylus slender with slender tip abruptly curved 90°, apex pointed. Aedeagus triangular; basal arch low, concave; basal arm heavily sclerotized, recurved; distal portion lightly sclerotized, tapering distally to slender, pointed tip. Parameres fused; main portion short, heavily sclerotized, with a slender median point extending caudally between the slender submedian dorsal processes; a pair of heavily sclerotized processes arise from base of main portion and articulate with mesobasal tubercle of gonocoxites.

Distribution: Brazil.

Types: Holotype female, allotype male, Brazil, Para, Rio Paru, Mission Tiriyos, 14-III-1962, E. J. Fittkau, at light (in USNM).

Remarks: The illustrations of this species provided by Wirth & Blanton (1970) are reproduced herein with modifications to the male genitalia, and for comparison purposes with the following 4 new species, which are known only from males.

***Brachypogon (B.) apunctipennis*, new species**
(Figs. 26-27)

Diagnosis. A small species of the *fuscivenosus* group and member of the *paraensis* complex. Male: only Neotropical species with a wing lacking a spot in cell r5 but with small spots in cells m1 and m2; male genitalia large, greatly elongated; aedeagus

with a shallow, straight basal arch and very long slender tip; caudal margin of sternite 9 with deep excavation; and distal processes of parameres greatly elongated, nearly twice as long as main body of parameres. Female unknown.

Male: Holotype. Similar to *B. paraensis*, with the following notable differences. Eyes slightly separated. Body dark golden brown; legs pale brown, unbanded. WL 0.64 mm; CR 0.56; no dark spot in cell r5. Genitalia as in Figs. 26-27. Sternite 9 with broad, deep caudomedian excavation; tergite 9 greatly elongated, tapering abruptly past base and parallel sided on distal 3/4, apex broadly rounded, apicolateral processes short, triangular, cerci large, roundly conical, setose. Gonocoxite elongated, 2.3 X times longer than broad, mesobasal projection elongate with mesally curving tip; gonostylus slender, nearly straight on proximal 3/4, distal 1/4 curved abruptly nearly 90°, with slender pointed tip. Aedeagus triangular; basal arm short, heavily sclerotized, recurved 120°; basal arch shallow, straight; main portion lightly sclerotized with slender, elongated, distal portion with sharply pointed tip. Parameres fused; proximal portion heavily sclerotized, broadly H-shaped, poorly articulated with mesobasal projections of gonocoxites; distal portion lightly sclerotized with pair of dorsally directed, greatly elongated processes.

Female: Unknown.

Distribution: Known only from the type-locality in Rondonia, Brazil.

Type: Holotype male, Brazil, Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, 25-IX-1992, U. Schmitz, UVLT, deposited in FSCA.

Etymology: The specific name refers to the lack of a spot in cell r5 in this species, which is present in all other species in the *paraensis* complex.

Discussion: This species has the most elongated male genitalia of any species of the *paraensis* complex. In overall appearance, its genitalia most closely resemble those of *B. schmitzi* n. sp., but that species differs in having an even deeper caudomedian excavation on sternite 9, the elongated tip on its aedeagus is divided into 2 slender processes, the gonostylus is nearly straight distally, and the distal processes of its parameres have a median sharply pointed heavily sclerotized spine.

***Brachypogon (B.) pseudoparaensis*,**
new species
(Figs. 24-25)

Brachypogon paraensis Wirth & Blanton 1970:99

(in part; male; Brazil).

Diagnosis: A small species of the *fuscivenosus* group and member of the *paraensis* complex. Male: only Neotropical species having a wing with spots in cells r5, m1 and m2; aedeagus with straight basal arms; gonostylus 1.25X longer than gonocoxite; and tergite 9 with subparallel lateral margins. Female unknown.

Male holotype: Similar to *B. paraensis*, with the following notable differences. Body, including legs light brown; tibiae with pale subbasal and subapical pale bands. WL 0.71 mm; CR 0.54. Genitalia as in Figs. 24-25. Sternite 9 short, caudomedian margin nearly straight; tergite 9 short, tapering abruptly after base to subparallel-sided on distal 3/4 with broadly rounded apex, apicolateral processes short, triangular bearing 2 small apical setae, cerci slender and setose. Gonocoxite twice as long as broad with slender basomesal projection; gonostylus slender, nearly straight, 1.25X longer than gonocoxite, apex curved with pointed tip. Aedeagus triangular; basal arm straight, heavily sclerotized; basal arch high, extending 0.4 of total length; distal portion more lightly sclerotized, extending beyond parameres, with slender pointed tip. Parameres fused; proximal portion shield-shaped, heavily sclerotized, articulating at base with inner corners of gonocoxite, apex narrow and sharply pointed; distal processes very heavily sclerotized, subparallel.

Female: Unknown.

Distribution: Known only from the type-locality in Para, Brazil.

Type: Holotype male, Brazil, Para, Rio Paru, 14-II/22-IV-1962, E. J. Fittkau, at light (a paratype of *Brachypogon paraensis* Wirth & Blanton), deposited in FSCA.

Etymology: The specific name is a reference to the resemblance of this species to *B. paraensis*, and also to the fact that it was discovered amongst the original paratypes of that species.

Discussion: This new species most closely resembles *B. paraensis*, but that species has an aedeagus with a much lower basal arch with short curved basal arms, the gonostylus is shorter than the gonocoxite and its tip is abruptly curved 90°, and tergite 9 is much longer and narrowed distally.

***Brachypogon (B.) schmitzi*, new species**
(Figs. 28-29)

Diagnosis. A small species of the *fuscivenosus* group and member of the *paraensis* complex. Male:

only Neotropical species with an aedeagus bearing an elongate, slender, bifurcate apical portion and large recurved basal arms; distal processes of parameres with stout, very heavily sclerotized, sharply pointed spine; and sternite 9 with broad deep caudomedian excavation. Female unknown.

Male holotype: Similar to *B. paraensis*, with the following notable differences. Body dark brown; legs light brown, tibiae with broad subbasal and subapical pale bands, pale bands widest on hind legs. WL 0.67 mm; CR 0.56. Genitalia as in Figs. 28-29. Sternite 9 with broad, deep caudomedian excavation; tergite 9 tapering on distal 2/3 to a bluntly rounded apex, apicolateral processes well developed, broadly triangular, cerci moderately short, setose. Gonocoxite twice as long as broad with mesobasal protuberance, dorsal root well developed; gonostylus slender, slightly curved, with pointed tip. Aedeagus with very heavily sclerotized, long basal arms that are recurved more than 120°; basal arch low, extending 1/5 of total length; main portion broadly subtriangular, lightly sclerotized except for lateral margins; distal portion very slender, elongate, deeply bifurcate. Parameres fused; proximal portion heavily sclerotized, roughly H-shaped, with a very heavily sclerotized sharply pointed distal section; distal processes very long, very slender apically and extending nearly to tip of aedeagus, with a sharply pointed ventrally directed spine arising at midlength.

Female: Unknown.

Distribution: Known only from the type-locality in Rondonia, Brazil.

Type: Holotype male, paratype male, Brazil, Rondonia. 62 km SW Ariquemes, vic. Rancho Grande, 25-IX-1992, U. Schmitz, UVLT, deposited in FSCA.

Etymology: The specific name is a patronym in honor of the collector of the holotype.

Discussion: This species differs from all other members of the *paraensis* complex in having an aedeagus with an elongated tip that is divided into two slender processes and a heavily sclerotized sharply pointed spine arising from the distal processes of its parameres.

***Brachypogon (B.) spatuliformis*, new species**
(Figs. 30-31)

Diagnosis: A very small species of the *fuscivenosus* group and member of the *paraensis* complex. Male: only Neotropical species with a gonostylus that is greatly curved proximally with a

spatulate subapical lobe, and a shield-shaped aedeagus with convex basal arch, well developed recurved basal arms and a bifid tip. Female unknown.

Male holotype: Similar to *B. paraensis* with the following notable differences. Body dark brown; legs brown, tibiae with pale subbasal and subapical bands. WL 0.58 mm; CR 0.56. Genitalia as in Figs. 30-31. Sternite 9 short, with shallow caudomedian excavation; tergite 9 tapering gradually distally to broadly pointed apex, proctiger with pair of subapical, hornlike, ventrally directed processes, apicolateral processes minute with single apical seta, cerci moderately short, setose. Gonocoxite moderately stout, broadest proximally, slightly curved; gonostylus pale, 0.85 the length of gonocoxite, narrow and greatly curved proximally, broadening distally to subapically spatulate lobe, tip roundly pointed. Aedeagus broad, shield-shaped; basal arms long, heavily sclerotized, recurved, basal arch convex; main portion lightly sclerotized with bifid tip. Parameres fused, articulating at base with mesal corners of gonocoxites; main portion elongate, triangular, tapering distally to pointed tip; distal processes arising dorsally, tips sharply pointed.

Female: Unknown.

Distribution: Known only from the type-locality in Rondonia, Brazil.

Type: Holotype male, Brazil, Rondonia, 62 km SW Ariquemenes, Vic. Rancho Grande, 25-IX-1992, U. Schmitz, UVLT, deposited in FSCA.

Etymology: The specific name is a reference to the broad, spatulate aedeagus.

Discussion. Among the species of the *paraensis* complex, the only other species that could possibly be mistaken for this one is *B. schmitzi* n. sp. That species differs in having a distinct sharply pointed spine that arises from the distal processes of its parameres, an aedeagus with an elongated tip that is divided into two slender processes, and a nearly straight gonostylus.

The *impar* group

Species typically with unadorned wings and spermatheca with slender neck.

Brachypogon (B.) bifidus, new species (Figs. 32-37)

Diagnosis: A small (female WL 0.52-0.65 mm), dark brown species of the *impar* group. Female: only Neotropical species with 12 flagel-

lomes; wing with large dark spot on membrane above base of vein M1 and pale spot distal to radial sector; and an elongated ovoid spermatheca with short neck. Males: only Neotropical species having fused parameres with bifid tip and gonostylus longer than gonocoxite.

Female: WL 0.51-0.65 mm. Head: Brown, proboscis slightly paler. Antennal scape with 2 setae; flagellum (Fig. 32) brown, pale on extreme bases of flagellomeres, with 12 flagellomeres (distal 2 fused); AP 20-12-12-12-13-14-14-15-23-23-28-46; AR 1.07-1.14; flagellomere 1 with 2 apical sensilla coeloconica. Palpus (Fig. 33) brown, distal 2 segments paler; PP 9-20-26-10-20; segment 3 with a rounded, deep sensory pit; PR 1.35-1.70. Mandible with 8 coarse teeth. Thorax: Uniformly dark brown. Legs brown, tibiae with subbasal and apical pale bands, tarsi whitish; hind tibial comb with 6 setae; TR 2.60; 4th tarsomeres subcylindrical; claws unequal, with short internal and external basal teeth, CP 14:10, 16:12, 16:12. Wing (Fig. 34) membrane slightly infuscated, a large dark spot above base of vein M1, stigma and r-m crossvein dark brown, other veins pale brown; r-m crossvein slightly oblique; M2 obsolete at base; M1, M2, M3+4 and Cu1 obsolete at wing margin; costa with 2 basal setae, and row of 13-18 marginal setae; radius with 1 seta at extreme base and at tip of stigma; CR 0.52-0.56. Halter whitish. Abdomen: Dark brown. Sternite 10 with one pair of setae. Spermatheca (Fig. 35) elongated, ovoid with short neck, measuring 0.071 X 0.038 mm.

Male: Similar to female with the following notable sexual differences. WL 0.45-0.61; CR 0.48-0.51; antenna with 13 flagellomeres, flagellomeres 1-10 light brown, 11-13 darker brown; palpus entirely brown. Genitalia as in Figs. 36-37. Sternite 9 broad, with straight caudal margin; tergite 9 tapering gradually distally to broad, truncate apex, apicolateral processes small, triangular with single apical seta, cerci short, rounded, setose. Gonocoxite slightly elongated, with short mesobasal tubercle; gonostylus slightly longer than gonocoxite, curved, with slender sharply pointed tip. Aedeagus with heavily sclerotized, subparallel basal arms; basal arch extending 0.6 of total length; distal portion lightly sclerotized, apex truncate with blunt medial tip. Parameres fused; basal arms straight, very heavily sclerotized; basal arch extending to 0.4 of total length; distal portion heavily sclerotized, apex bifid.

Distribution: Dominica, El Salvador.

Types: Holotype male, Dominica, 3 mi E Pont Casse, 6-V-1964, O.S. Flint, at light; allotype fe-

male, Dominica, Pont Casse, IV-1964, O.S. Flint, at light. Paratypes, 24 females, 19 males, as follows: Dominica, 1.6 mi W Pont Casse, VI-1964, O.S. Flint, 11 females, 9 males; 0.4 mi E Pont Casse, 15/16-VI-1964, O.S. Flint, at light, 1 female, 3 males; same data except 23-VI-1964, 3 females, 1 male; Pont Casse, IV-1964, O.S. Flint, 2 females; Gleau Gommier, 17-III-1956, J.F.G. Clarke, light trap, 2 females, 1 male; Fond Figues River, 13-III-1965, W. Wirth, light trap, 1 female; 0.5 mi W Pt. Lolo, 25-I-1965, W. Wirth, light trap, 1 female; Trafalgar Hydroelectric Plant, 10-V-1968, P.C. Drummond, black light, 1 female, 2 males; Carhohn Estate, 7-II-1965, W.W. Wirth, sweeping, 2 males; Cabrit swamp, 23-II-1965, W.W. Wirth, 1 male. El Salvador, Cuscatlán, San Pedro Perupán, 2000 ft., 10-VII-1966, J.F. Matta, 1 female; same data except 2-VIII-1966, 1 female.

Etymology: The specific epithet refers to the bifid apex of the parameres.

Discussion: This species differs from all others in the *impar* group by having fused male parameres with a bifurcate tip, a darkly infuscated wing with a dark spot just distad of the r-m crossvein and a pale spot just distal to the dark spot, and a female flagellum with 12 flagellomeres.

***Brachypogon (B.) bimaculatus*, new species**
(Figs. 38-43)

Diagnosis: A very small (female WL 0.51-0.53 mm) dark brown species of the *impar* group. Female: only Neotropical species having a wing with 2 spots, proximal to r-m crossvein and on the end of the costa, membrane hyaline, and vein M2; and palpus very short, dark brown. Male: only Neotropical species having a wing with 2 spots, proximal to r-m crossvein and on end of costa, membrane hyaline, and vein M2; palpus very short, dark brown; and caudal margin of sternite 9 straight.

Female: WL 0.51-0.53 mm. Head: Dark brown. Antennal scape with 2 setae; flagellum (Fig. 38) pale brown; AP 20-10-13-12-13-14-15-15-20-19-28-24-26; AR 1.04-1.08; flagellomere 1 with 2 apical sensilla coeloconica. Palpus (Fig. 39) very short, dark brown; PP of 9-14-20-11-14; segment 3 with a rounded deep sensory pit; PR 1.30-1.40. Mandible with 8 coarse teeth. Thorax: Dark brown. Legs dark brown, except tibiae with subbasal narrow pale bands and tarsomeres 2-5 pale; hind tibial comb with 6 setae; TR 2.70-2.80; 4th tarsomeres cordiform; claws unequal, with short internal and external basal teeth, CP 11:9, 16:12,

13:10. Wing (Fig. 40) membrane hyaline; with two dark brown spots, proximal to r-m crossvein and on end of costa; veins brownish; vein M2 obsolete at base; M1, M3+4, and Cu1 nearly reaching wing margin; costa with 2 basal setae, and row of 10-14 marginal setae; radius with 3 setae, one immediately distal to basal arculus, and 2 on stigma; CR 0.52-0.54. Halter whitish. Abdomen: Dark brown. Sternite 10 with 1 pair of setae. Spermatheca (Fig. 41) pyriform with short neck, measuring 0.056 x 0.043 mm.

Male: Similar to female with the following notable sexual differences. WL 0.51-0.65 mm; CR 0.45-0.49. Genitalia as in Figs. 42-43. Sternite 9 moderately long, caudal margin straight; tergite 9 relatively short, tapering gradually distally, with very small apicolateral processes, cerci very short, broad, setose. Gonocoxite straight, twice as long as broad; gonostylus as long as gonocoxite, curved, tip broadly pointed. Aedeagus triangular; basal arms heavily sclerotized, recurved 90°; basal arch 0.2 of total length; distal portion lightly sclerotized except bases of margins, tapering gradually to rounded tip. Parameres fused, triangular; basal arms heavily sclerotized, straight; basal arch extending nearly 1/2 of total length; distal portion more lightly sclerotized with bluntly rounded apex.

Distribution: Brazil, Colombia.

Types: Holotype male, allotype female, Colombia, Rio Raposo, 10-VI-1964, V. H. Lee, light trap; paratypes, 1 female, 4 males, as follows: same data as types, 2 males; same data except XII-1964, 1 female; III-1965, 1 male. Brazil, Matto Grosso, Cuiaba, 19-IV-1972, W. H. Whitcomb, 1 male. [FSCA]

Etymology: The specific epithet refers to the 2 dark spots on the wing of this species.

Discussion: This species most closely resembles *B. impar* which also has a wing with a darkened stigma, but in this species the other smaller dark spot is distal to the r-m crossvein, not proximal to the r-m crossvein as in this new species.

***Brachypogon (B.) bonaerensis* Spinelli**

Brachypogon (Brachypogon) bonaerensis Spinelli 1990:744 (female; Argentina); Spinelli & Wirth 1993:41 (in list).

Diagnosis: A small (female WL 0.58 mm), dark brown species of the *impar* group. Female: only Neotropical species with flagellomeres 2-4 and 12-13 broadly abutting; wing lacking vein M2, costa with 11 marginal setae; palpal segment 3

relatively slender (PR 2.00); legs dark brown, tibiae with subbasal and apical pale bands; and spermatheca ovoid with slender neck. Male unknown.

Distribution: Known only from the female holotype which was collected in the hills of Sierra de la Ventana, a remnant of the old Brazilian mountains in the province of Buenos Aires, Argentina.

Type: Holotype female, Argentina, Buenos Aires Prov., Villa Ventana, 10-II-1986, G. Spinelli, sweeping (in MLPA).

Remarks: The original description and illustrations provided by Spinelli (1990), along with the diagnosis and key provided herein are sufficient to identify this species.

Brachypogon (B.) calchaqui Spinelli

Brachypogon (Brachypogon) calchaqui Spinelli 1990:746 (female, male; Argentina); Spinelli & Wirth 1993:41 (in list).

Diagnosis: A medium-sized (female WL 0.71 mm), dark brown species of the *impar* group.

Female: only Neotropical species with flagellomeres 12-13 broadly abutting; femora and tibiae entirely brown, tarsi brownish; wing membrane infuscated, costa with 24-25 marginal setae; halter whitish; and spermatheca pyriform with short neck. **Male:** only Neotropical species with sternite 9 very short, continuous distally with midportion of aedeagus; tergite 9 with minute apicolateral processes; aedeagus triangular; parameres fused, basal arms joined by a strong cross-bar, distal portion stout with rounded apex.

Distribution: Argentina; known only from the Calchaqui Valley of Salta Province in the north-western part of the country.

Types: Holotype female, allotype male, Argentina, Salta Prov., 15 km N Cafayate, 2-XII-1986, G. Spinelli, sweeping (in MLPA).

Remarks: The original description and illustrations provided by Spinelli (1990), along with the diagnosis and key provided herein are sufficient to identify this species

Brachypogon (B.) ecuadorensis, new species (Figs. 44-49)

Diagnosis: A small to medium sized (female WL 0.48-0.71 mm) dark brown species of the *impar* group most closely resembling *B. woodruffi*, n. sp. **Female:** only Neotropical species with 12 flagellomeres; wing lacking vein M2, membrane hyaline with dark stigma, very short costa (CR 0.41-

0.46), and costa with marginal row of 5-9 setae. **Male:** only Neotropical species with caudal margin of sternite 9 produced slightly posteriorly; basal arch of parameres semicircular; and ventral surface of aedeagus with longitudinal wrinkles.

Female: WL 0.48-0.71 mm. Head. Brown. Antennal scape with 2 setae; flagellum (Fig. 44) brown except narrow bases pale, with 12 flagellomeres, (12-13 fused), AP 20-13-13-9-9-10-10-11-18-18-25-42; AR 1.06-1.22; flagellomere 1 with 2 apical sensilla coeloconica. Palpus (Fig. 45) brown; PP 8-18-23-10-20; segment 3 with rounded, deep sensory pit; PR 1.45-1.65. Mandible with 8 coarse teeth. Thorax dark brown. Legs dark brown, tibiae with subbasal and apical pale bands, tarsi brownish; hind tibial comb with 7 setae; TR 2.30-2.60; 4th tarsomeres subcylindrical; claws unequal, with short internal and external basal teeth, CP 13:10, 17:14, 17:14. Wing (Fig. 46) membrane hyaline, stigma dark, other veins pale; r-m cross-vein short, oblique; vein M2 absent; M1, M3+4, and Cu1 broadly obsolete at wing margin; costa with 2 basal setae, and an interrupted row of 5-9 marginal setae; radius with 1 seta immediately distad to basal arculus, and 1-2 setae on stigma in some specimens; CR 0.41-0.46. Halter whitish. Abdomen dark brown. Sternite 10 with one pair of setae. Spermatheca (Fig. 47) pyriform with short narrow neck, measuring 0.069 x 0.051 mm.

Male: Similar to female with the following notable differences. WL 0.53-0.59 mm; CR 0.38-0.41; antenna with 13 flagellomeres. Genitalia as in Figs. 48-49. Sternite 9 with caudomedian margin produced slightly posteriorly; tergite 9 tapering slightly distally, apicolateral processes large, triangular, cerci short, setose. Gonocoxite twice as long as broad, without mesobasal tubercle; gonostylus slender, pale, slightly longer than gonocoxite, nearly straight except curved on distal 1/4, tip pointed. Aedeagus triangular, stout; basal arms short, heavily sclerotized, recurved 90°; basal arch very low; distal portion lightly sclerotized with wrinkled ventral surface, apex broadly rounded. Parameres fused; basal arch very heavily sclerotized, semicircular in shape; distal portion hyaline, tapering slightly distally to bluntly rounded tip.

Distribution: Belize, Colombia, Costa Rica, Ecuador, Jamaica, Panama.

Types: Holotype male, Ecuador, Loja, Catamayo, XI-1955, R. Levi Castillo; allotype female, same data except XII-1955. Paratypes, 22 females, 16 males, as follows: Belize, Nattieville, 8-VII-1968, W. Haase, 1 female, light. Colombia,

Valle, Rio Raposo, VI-1963, V.H. Lee, 1 female; same data except VIII-1964, 1 female. Costa Rica, San Jose, San Isidro del General, 20-VI-1964, F.S. Blanton, 1 female; same data except 10 mi south, 1 female; Limon, Los Diamantes Expt. Sta., 16/17-VII-1964, F.S. Blanton, 1 female. Ecuador, Macas, Santiago Zamora, 6-II-1955, R. Levi Castillo, 1 male; Pastaza, Napo, Rio Puyo, II-1955, R. Levi Castillo, 1 male; Loja, Catamayo, XI-1955, R. Levi Castillo, 2 females, 4 males; same data except XII-1955, 10 females, 10 males. Jamaica, Hardwar Gap, Hollywell, 16-VI-1970, E.G. Farnworth, 1 female, light trap. Panama, Darien, Santa Fe, 11-IX-1967, A. Broce, 2 females; C.Z., Gatun rain forest, Hura tree canopy, 3-VII-1979, E. Broadhead, 1 female.

Etymology: The specific name is a reference to Ecuador, where the holotype, allotype, and some paratypes were collected.

Discussion: Males of this new species most closely resemble those of *B. insularis* n. sp., in having an aedeagus with a wrinkled ventral membrane and a wing that lacks vein M2. However, males of *B. insularis* differ from this new species in having an aedeagus with straight basal arms, rhomboidal shaped parameres, elongated gonocoxites that extend beyond tergite 9, and a nearly straight caudal margin on sternite 9.

***Brachypogon (B.) impar* (Johannsen)**
(Figs. 50-55)

Ceratopogon (Brachypogon) impar Johannsen 1938:223 (female; Puerto Rico).

Brachypogon impar (Johannsen): Wirth & Blanton 1970:103 (combination; in list).

Brachypogon (B.) impar (Johannsen): Wirth & Grogan 1988:29 (in list); Spinelli 1990: 744 (in key).

Diagnosis: A small species (female WL 0.56-0.69 mm) of the *impar* group. Female: only Neotropical species with 12 or 13 flagellomeres, distal 2 flagellomeres fused in some specimens; legs primarily yellow, hind femur brown, fore and mid femora brown on proximal 1/2; palpus whitish; wing membrane hyaline, stigma brown, other veins pale; spermatheca large, globose to ovoid with short narrow neck. Male: only Neotropical species with tergite 9 lacking apicolateral processes; sternite 9 with deep caudomedian excavation; and U-shaped parameres.

Female: WL 0.56-0.69 mm. Head: Dark brown, proboscis slightly paler. Antennal scape

with 3 setae; flagellum light brown, with 13 or rarely 12 flagellomeres, a typical specimen with 13 flagellomeres has AP 20-11-11-10-11-11-11-12-13-17-16-21-22-26, whereas a specimen with 12 flagellomeres (12-13 fused) (Fig. 50), has AP 20-12-11-12-14-14-14-22-10-24-38; AR 0.94-1.03. Palpus (Fig. 51) pale or whitish, a typical specimen has PP of 10-18-20-11-12; segment 3 with deep sensory pit; PR 1.35-1.70. Mandible with 8 coarse teeth. Thorax dark brown. Legs primarily yellowish, proximal 1/2 or more of fore and mid femora brownish; hind femur variable in color, but typically brown to yellowish, a subapical pale band may be present, knees dark, tibiae yellow with mid and hind tibiae slightly darkened on midportion in some specimens; hind tibial comb with 6 setae; tarsi pale; TR 2.10-2.50; 4th tarsomeres cordiform; claws large, unequal, with short internal and external basal teeth, CP of 12:10, 16:12, 16:12. Wing (Fig. 52) membrane hyaline, stigma brown, other veins barely perceptible; r-m crossvein oblique; vein M2 obsolete at base; veins M1, M2, M3+4, and Cu1 obsolete at wing margin; costa with 2 basal setae, and a row of 13-16 marginal setae; radius with 4 setae, 1 immediately distad to basal arcus, 1 at level of r-m crossvein, remaining 2 on the stigma; CR 0.47-0.54. Halter pale or whitish. Abdomen: Yellow or light brown except for dark brown apex. Sternite 10 with 1 pair of setae. Spermatheca (Fig. 53) large, globose to ovoid with distinct narrow neck, a typical specimen measures 0.070 x 0.062 mm, with 0.016 mm long neck.

Male: Similar to female with the following notable sexual differences. Wing more slender; WL 0.48-0.53 mm; costa with 10-11 marginal setae; CR 0.52-0.55. Genitalia as in Figs. 54-55. Sternite 9 with broad deep caudomedian excavation; tergite 9 tapering gradually distally to rounded, shallow bifid apex, apicolateral processes absent, cerci short, setose. Gonocoxite relatively stout; gonostylus lightly sclerotized, as long as gonocoxite, with small mesal tooth on proximal 1/4, distal 1/2 curved, tip pointed. Aedeagus triangular, lightly sclerotized, basal arch low; basal arms heavily sclerotized, recurved beyond 90°. Parameres fused, U-shaped; basal arm heavily sclerotized, straight and long, extending 1/2 or more of total length; distal portion lightly sclerotized, with rounded tip.

Distribution: Brazil, Colombia, Puerto Rico, Venezuela.

Types: Holotype female, Puerto Rico, El Yunque trail, 7-VI-1935, J. Garcia-Diaz; paratype female, Puerto Rico, Luquillo Mts., 7-VI-1935, J. Garcia-Diaz (in Cornell University collection).

New records: Brazil, Santa Catarina, Nova Teutonia, IX-1970, F. Plaumann, 1 female; same data except II-1971, 2 females, 1 intersex. Colombia, Meta, Finca Barbasal, 27/30-IX-1964, V.H. Lee, light trap, 1 female. Venezuela, Guarico, 12 km S Calabozo, 6-II-1969, P. & P. Spangler, light trap, 1 female; Zulia, El Tucuco, Sierra de Perija, 28-I-1978, J. B. Heppner, light trap, 1 female, 6 males.

Discussion: One specimen from Brazil is a damaged intersex specimen and lacks a flagellum, palpus and wing. Nevertheless, it can be readily identified as a member of this species by the coloration of its legs and abdomen, and by the large, globose spermatheca with distinct neck. The male genitalia is also damaged, but clearly exhibits a gonostylus and gonocoxite typical of this species.

***Brachypogon (B.) insularis*, new species**

(Figs. 56-58)

Diagnosis: A medium sized, dark brown species of the *impar* group. Male: only Neotropical species with fused rhomboidal parameres; ventral surface of aedeagus with longitudinal wrinkles; gonocoxite elongated; wing lacking vein M2; and tergite 9 with very long cylindrical apicolateral processes. Female unknown.

Male: WL 0.76 mm. Head: Dark brown; antennal scape with single seta; flagellum pale brown except distal 3 flagellomeres brown. Palpus pale brown; PP 10-20-30-14-25; segment 3 with rounded pit; PR 1.65. Thorax: Dark brown. Legs brown, knees darkish, tibiae with narrow subbasal pale bands; hind tibial comb with 8 setae; TR 1.80; 4th tarsomeres subcylindrical; claws small, equal sized, simple, tips bifid. Wing (Fig. 56) membrane hyaline, stigma and r-m crossvein brown, other veins pale; r-m crossvein nearly perpendicular; vein M2 absent; M1, M3+4 and Cu1 obsolete at wing margin; costa with 2 basal and 6 distal marginal setae; radius with one seta immediately distal to basal arculus, stigma devoid of setae; CR 0.52. Halter missing. Genitalia as in Figs. 57-58. Sternite 9 short, caudomedian excavation very shallow; tergite 9 narrow, tapering gradually distally, apicolateral processes slender, very long, cylindrical, cerci short, setose. Gonocoxite elongated, mesobasal tubercle small; gonostylus as long as gonocoxite, nearly straight with pointed tip. Aedeagus roughly triangular; basal arms heavily sclerotized, straight; basal arch 0.2 of total length; distal portion lightly sclerotized, lateral margins of ventral surface wrinkled, apex bluntly rounded,

hyaline portion slightly surpassing tip of aedeagus proper. Parameres fused, rhomboidal; basal arm heavily sclerotized, short, straight; distal portion more lightly sclerotized with broadly pointed tip.

Distribution: Cuba; known only from the type-locality.

Type: Holotype male, Cuba, Guantanamo Bay, XII-1969, J.E. Tisdale (USNM).

Etymology: The specific name is a reference to the island of Cuba, where the holotype was collected.

Discussion: The fused rhomboidal parameres, elongated gonocoxite, wing lacking vein M2, and wrinkled ventral surface of the aedeagus is sufficient to distinguish this species from all other Neotropical species of *Brachypogon*. The males of 2 other species have an aedeagus with a wrinkled ventral surface, *B. fuscivenosus* and *B. ecuadorensis* n. sp. However, males of *B. fuscivenosus* differ from this new species in having spots on their wing membrane and vein M2, the caudal margin of sternite 9 is produced posteriorly and the parameres are small and lyre-shaped. As in this new species, males of *B. ecuadorensis*, n. sp., also have a wing that lacks vein M2, but they differ from males of *B. insularis* in having parameres with broad semicircular-shaped basal arms, the caudal margin of sternite 9 is produced posteriorly, and the gonocoxites are much shorter than tergite 9.

***Brachypogon (B.) monicae*, new species**

(Figs. 59-64)

Diagnosis: A very small (female WL 0.50-0.57 mm) dark brown species of the *impar* group. Female: only Neotropical with 12 flagellomeres; legs dark brown, including tarsi; wing membrane darkly infuscated, veins dark brown; and brown palpus. Male: only Neotropical species with tergite 9 with truncate or broadly rounded apex and lacking apicolateral processes.

Female: WL 0.50-0.57 mm. Head: Dark brown. Antennal scape with 2 setae; flagellum (Fig. 59) brown, with 12 flagellomeres (12-13 fused); AP 20-12-14-13-13-13-14-14-19-20-24-48; AR 0.95-1.00; flagellomere 1 with 2 apical sensilla coeloconica. Palpus (Fig. 60) brown; PP 8-16-24-10-18; segment 3 with a deep, rounded sensory pit; PR 1.35-1.50. Mandible with 8 coarse teeth. Thorax: Dark brown. Legs including tarsi dark brown, tibiae with faint narrow subbasal pale bands on some specimens; hind tibial comb with 5 setae; TR 2.60-2.80; 4th tarsomeres subcylindrical; claws

unequal, each with short internal and external basal teeth, CP 11:8, 13:10, 13:10. Wing (Fig. 61) membrane darkly infuscated, a transverse hyaline area present in some specimens in cell r5, stigma and veins dark brown; r-m crossvein nearly perpendicular; vein M2 obsolete at base; M1, M2, M3+4 and Cu1 broadly obsolete at wing margin; costa with 2 basal setae and row of 11-19 marginal setae, radius with 1 seta immediately distal to basal arculus, and 1 at tip of stigma; CR 0.55-0.59. Halter whitish. Abdomen: Brown. Sternite 10 with 1 pair of setae. Spermatheca (Fig. 62) pyriform with short slender neck, measuring 0.052 x 0.040 mm.

Male: Similar to female with the following notable sexual differences. WL 0.42-0.44 mm; CR 0.50-0.55; antenna with 13 flagellomeres. Genitalia as in Figs. 63-64. Sternite 9 with nearly straight caudal margin; tergite 9 rounded distally, proctiger divided ventromesally, apicolateral processes absent, cerci short, setose. Gonocoxite stout, with poorly developed mesobasal tubercle; gonostylus as long as gonocoxite, nearly straight, tip pointed. Aedeagus triangular; basal arm heavily sclerotized, slightly recurved on extreme base; basal arch extending 1/2 of total length; distal portion with only proximal 1/2 heavily sclerotized, tip roundly pointed. Parameres fused, U-shaped; basal arm heavily sclerotized, straight; basal arch extending 1/3 of total length; distal portion lightly sclerotized with broadly rounded tip.

Distribution: Colombia.

Types: Holotype male, Colombia, Valle, Rio Raposo, V-1963, V.H. Lee, light trap; allotype female, same data except VIII-1964. Paratypes, 52 females, 18 males, same data as holotype except as follows: III-1963, 1 female; IV-1963, 1 female, 3 males; V-1963, 7 females, 3 males; VII-1963, 7 females, 1 male; V-1964, 1 female; VI-1964, 5 females, 2 males; VII-1964, 2 males; VIII-1964, 9 females, 4 males; X-1964, 1 female; XII-1964, 3 females, 1 male; II-1965, 2 females; IV-1965, 1 female; V-1965, 7 females, 1 male; VI-1965, 1 female; VII-1965, 1 male; VIII-1965, 2 females.

Etymology: This species is named after Monica A. Caviglia, the wife of the senior author.

Discussion: Females of *B. impar* closely resemble those of this new species in that some specimens have 12 flagellomeres and a dark wing. However, the legs of *B. impar* are primarily yellow, including its tarsi, whereas those of this new species are primarily brown. In addition, the veins on the radial sector of this new species are darker, and the female CR is greater (0.55-0.59) than that

of *B. impar* (0.47-0.50). The male genitalia of both species are generally similar, and both species lack apicolateral processes on tergite 9. However, males of *B. impar* differ from those of this new species in having a deeply excavated caudal margin on sternite 9, an aedeagus with a lower basal arch, and parameres with a higher basal arch.

Brachypogon (B.) ringueleti Spinelli

Brachypogon (B.) ringueleti Spinelli 1990:748 (female, male; Argentina).

Diagnosis: A medium-sized (female WL 0.70 mm), dark brown species of the *impar* group. Female: only Neotropical species with wing lacking vein M2; flagellomeres 2-3 broadly abutting; uniformly dark brown tibiae; and costa with 19-21 marginal setae. Male: only Neotropical species with separate parameres.

Distribution: Southwestern Argentina, in the subantarctic *Nothofagus* forest.

Type: Holotype female, Argentina, Rio Negro Prov., arroyo Blanco y ruta a Cascada de los Alerces, 31-I-1986, G. Spinelli, sweeping, in MLPA.

Remarks: The original description and illustrations provided by Spinelli (1990), along with the diagnosis and key herein are sufficient to identify this species.

Brachypogon (B.) telesfordi new species (Figs. 65-70)

Diagnosis: A small (female WL 0.54-0.57 mm), dark brown species of the *impar* group. Female: only Neotropical species with only distal 3 flagellomeres elongated; vein M2; palpus dark brown; and dark brown tarsi. Male: only Neotropical species with apex of tergite 9 narrowly rounded or pointed and lacking apicolateral processes; and wing with vein M2.

Female: WL 0.54-0.57 mm. Head: Dark brown. Antennal scape with 3 setae; flagellomere 1 with 2 apical sensilla coeloconica; flagellum (Fig. 65) with only distal 3 flagellomeres elongated; AP 23-16-16-17-17-17-17-22-22-34-35-40; AR 1.03-1.09. Palpus (Fig. 66) dark brown; PP 10-22-34-14-20; segment 3 with deep rounded sensory pit; PR 1.50. Mandible with 9 coarse teeth. Thorax: Dark brown. Legs including tarsi dark brown, mid femur with subapical pale band, tibiae with subbasal pale bands; hind tibial comb with 7 setae; TR 2.35-2.70; 4th tarsomeres cordiform; claws unequal with short external basal teeth, CP 9:6, 11:8, 9:6. Wing (Fig. 67) membrane slightly infuscated,

stigma dark brown; r-m crossvein pale, other veins brown; vein M2 obsolete at base; M1, M2, M3+4 and Cu1 reaching at or near wing margin; costa with 2 basal setae and row of 13-15 marginal setae; radius with 4 setae, 1 immediately distal to basal arculus, other 3 on stigma; CR 0.45-0.48. Halter whitish. Abdomen: Yellowish, sterna dark brown. Sternite 10 with pair of setae. Spermatheca (Fig. 68) pyriform with tapered neck, measuring 0.057 X 0.038 mm.

Male: Similar to female with the following notable sexual differences. WL 0.45-0.51 mm; CR 0.38-0.46; costa with 8 marginal setae. Genitalia as in Figs. 69-70. Sternite 9 with straight caudal margin; tergite 9 short, tapering slightly distally, without apicolateral processes, cerci long, setose. Gonocoxite twice as long as broad, with small pointed mesobasal tubercle; gonostylus as long as gonocoxite, curved on distal 2/3 with pointed tip. Aedeagus triangular; basal arms heavily sclerotized, recurved beyond 90°; basal arch extending 0.4 of total length; distal portion lightly sclerotized except for margins, surface smooth, tip rounded. Parameres fused; basal arms heavily sclerotized, straight, subparallel; basal arch extending 1/3 of total length; distal portion lightly sclerotized with broad round tip.

Distribution: Grenada, St. Vincent, Costa Rica.

Types: Holotype male, allotype female, St. Vincent, Hermitage Forest Cottage, 11/13-X-1991, R. E. Woodruff. Paratypes, 3 females, 9 males as follows: same data as holotype, 2 females, 2 males. Grenada, Mirabeau Agr. Sta., 30-I-1990, J. Telesford, black light trap, 1 female, 6 males; St. Georges Parish Botanical Garden, 6-II-1990, malaise trap, 1 male. [FSCA]

Remarks: Four specimens (1 female, 3 males) from Costa Rica, B. Carillo N. P., 10/11-IV-1985, H. Goulet & L. Masner, in CNCI appear to belong to this species. However, in these specimens, the r-m crossvein is darker, and the single female is missing its distal 7 flagellomeres, precluding accurate identification to species. Therefore, we have not included these specimens in the type series.

Etymology: The specific name is a patronym in honor of J. Telesford, who collected some of the paratypes on Grenada.

Discussion: Females of this new species differ from all other Neotropical species of *Brachypogon* in having only the distal 3 flagellomeres elongated. Males of *B. impar* and *B. monicae* n. sp. resemble males of this new species in lacking apicolateral processes on tergite 9. Males of *B. impar* differ

from those of this new species in having a deeply excavated caudal margin on sternite 9. Whereas those of *B. monicae* differ from this new species in having a well developed mesobasal tubercle on their gonocoxites and a very broad sternite 9 with a straight caudal margin.

***Brachypogon (B.) woodruffi* new species**
(Figs. 71-76)

Diagnosis: A small (female WL 0.57-0.64 mm) dark brown species of the *impar* group. Female: only Neotropical species with an antenna with 12 flagellomeres and flagellomeres 3-4 indistinctly fused; wing hyaline with dark stigma, vein M2 long, complete or nearly complete to base; and spermatheca with long tapering slender neck. Male: only Neotropical species having a wing with only 3 marginal costal setae, and vein M2 long, complete or nearly complete to base.

Female: WL 0.57-0.64 mm. Head: Dark brown. Antennal scape with 2 setae; flagellum (Fig. 71) with 12 flagellomeres (12-13 fused) and 3-4 indistinctly fused; flagellomere 1 with 2 apical sensilla coeloconica; AP 26-22-22-14-14-14-16-17-30-28-40-70; AR 1.07-1.16. Palpus (Fig. 72) brown; PP 14-20-34-14-24; segment 3 with deep rounded sensory pit; PR 1.25-1.50. Mandible with 8 coarse teeth. Thorax dark brown. Legs dark brown except fore and mid femora with subapical pale bands, tibiae with subbasal and apical pale bands, tarsi brown; hind tibial comb with 7 setae; TR 2.35-2.50; 4th tarsomeres cordiform; claws unequal with short internal and external basal teeth, CP 9:6, 11:9, 11:8. Wing (Fig. 73) membrane hyaline, stigma dark brown, r-m crossvein dark anteriorly, other veins brownish; vein M2 long, complete or nearly so at base; M1, M2, M3+4 and Cu1 obsolete at wing margin; costa with 2 basal setae, and interrupted row of 6-7 marginal setae; radius with one seta immediately distad of basal arculus and 1-2 setae on stigma; CR 0.44-0.48. Halter pale brown. Abdomen: Dark brown. Sternite 10 with pair of setae. Spermatheca (Fig. 74) ovoid with long slender, tapering neck, measuring 0.057 X 0.038 mm.

Male: Similar to female with the following notable sexual differences. WL 0.52-0.58 mm; CR 0.41-0.45; costa with 3 marginal setae; antennal flagellum with 13 flagellomeres. Genitalia as in Figs. 75-76. Sternite 9 with nearly straight caudal margin; tergite 9 tapering gradually distally, apicolateral processes short, cerci elongated, setose. Gonocoxite twice as long as broad with sharply

Gonocoxite twice as long as broad with sharply pointed mesobasal tubercle; gonostylus shorter than gonocoxite, lightly sclerotized, curved distally, tip bluntly pointed. Aedeagus triangular; basal arms heavily sclerotized, recurved more than 120°; basal arch extends 0.4 of total length; distal portion lightly sclerotized, surface smooth, tip roundly truncated. Parameres fused, U-shaped; basal arms straight, heavily sclerotized; basal arch extends 0.6 of total length; distal portion lightly sclerotized with rounded tip.

Distribution: Dominican Republic, known only from the type-locality.

Types: Holotype male, allotype female, 2 female and 3 male paratypes, Dominican Republic: Barahona Pr. nr. Filipinas, Larimar Mine, 26-VI/7-VII-1992, R. E. Woodruff, black light trap, in FSCA.

Etymology: We are pleased to name this new species after the collector of the type-series, our good friend and colleague, Robert E. Woodruff.

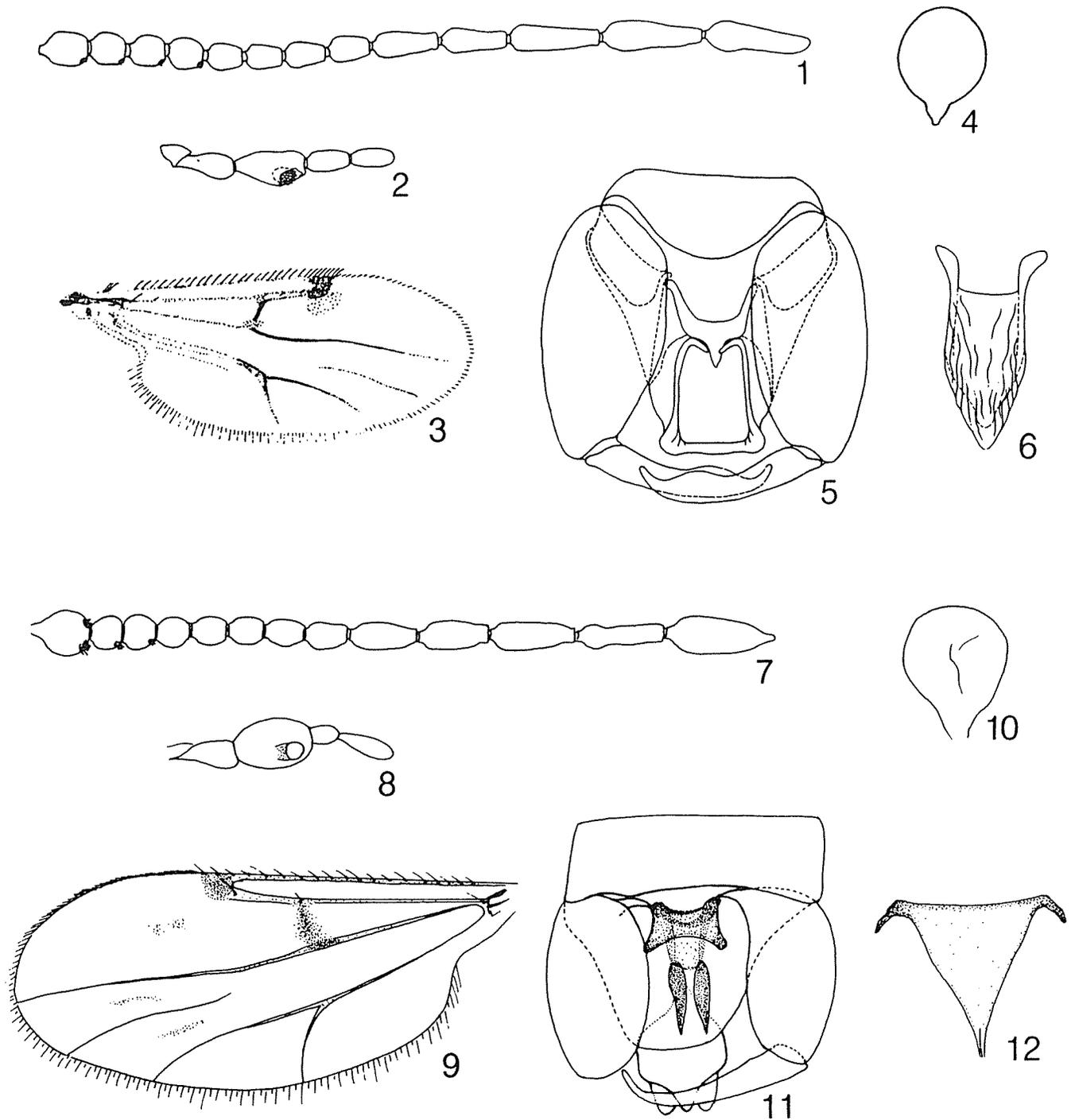
Discussion: Females of *B. ecuadorensis* n. sp. resemble those of this new species in having 12 flagellomeres, but the wing of that species lacks vein M2, flagellomeres 3 and 4 are not indistinctly fused, and the spermatheca has a much shorter neck. Males of *B. ecuadorensis* differ from this new species in having an aedeagus with a wrinkled ventral membrane, the basal arms of its parameres are broadly semicircular in shape, and the caudal margin of sternite 9 is produced posteriorly.

Acknowledgments

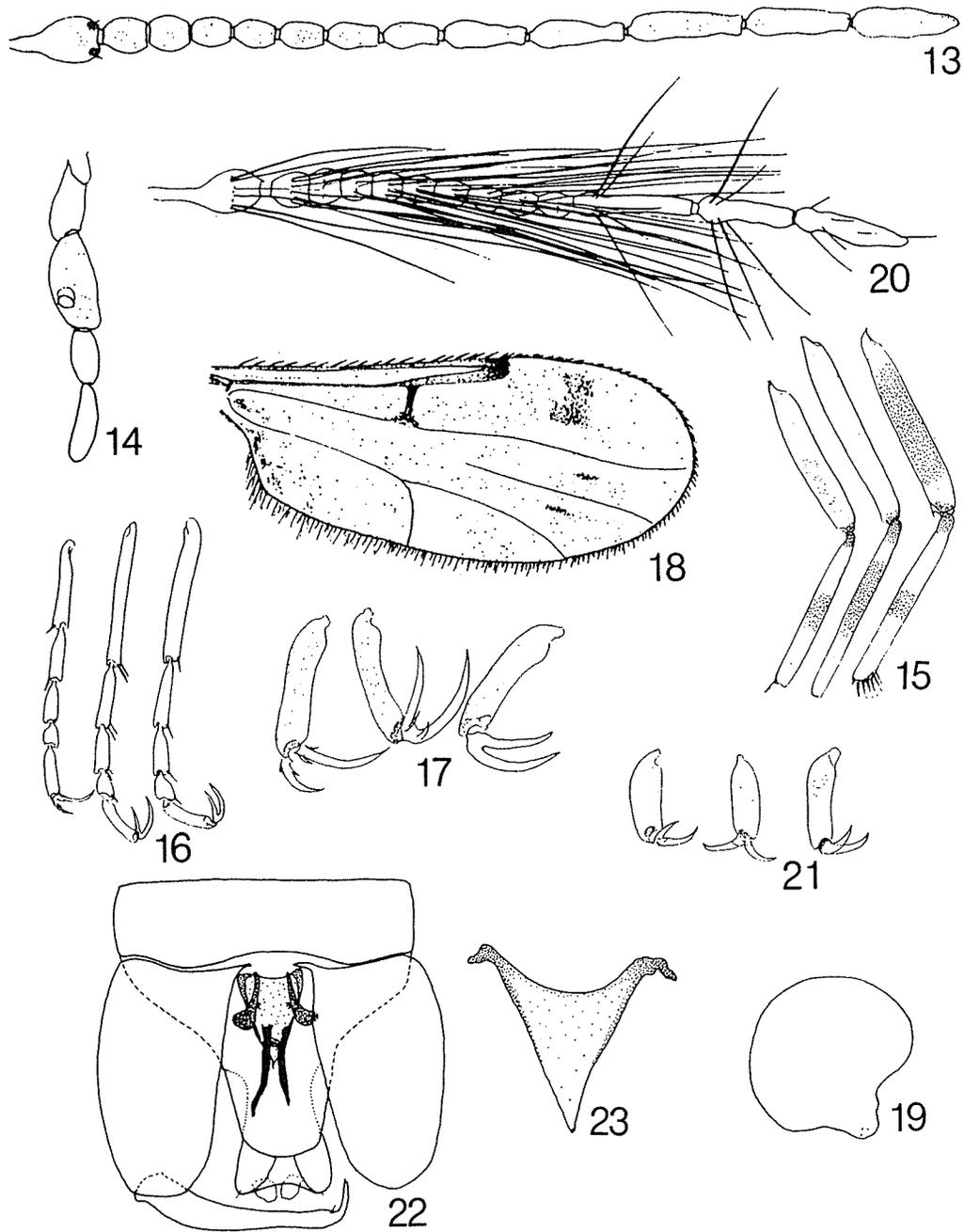
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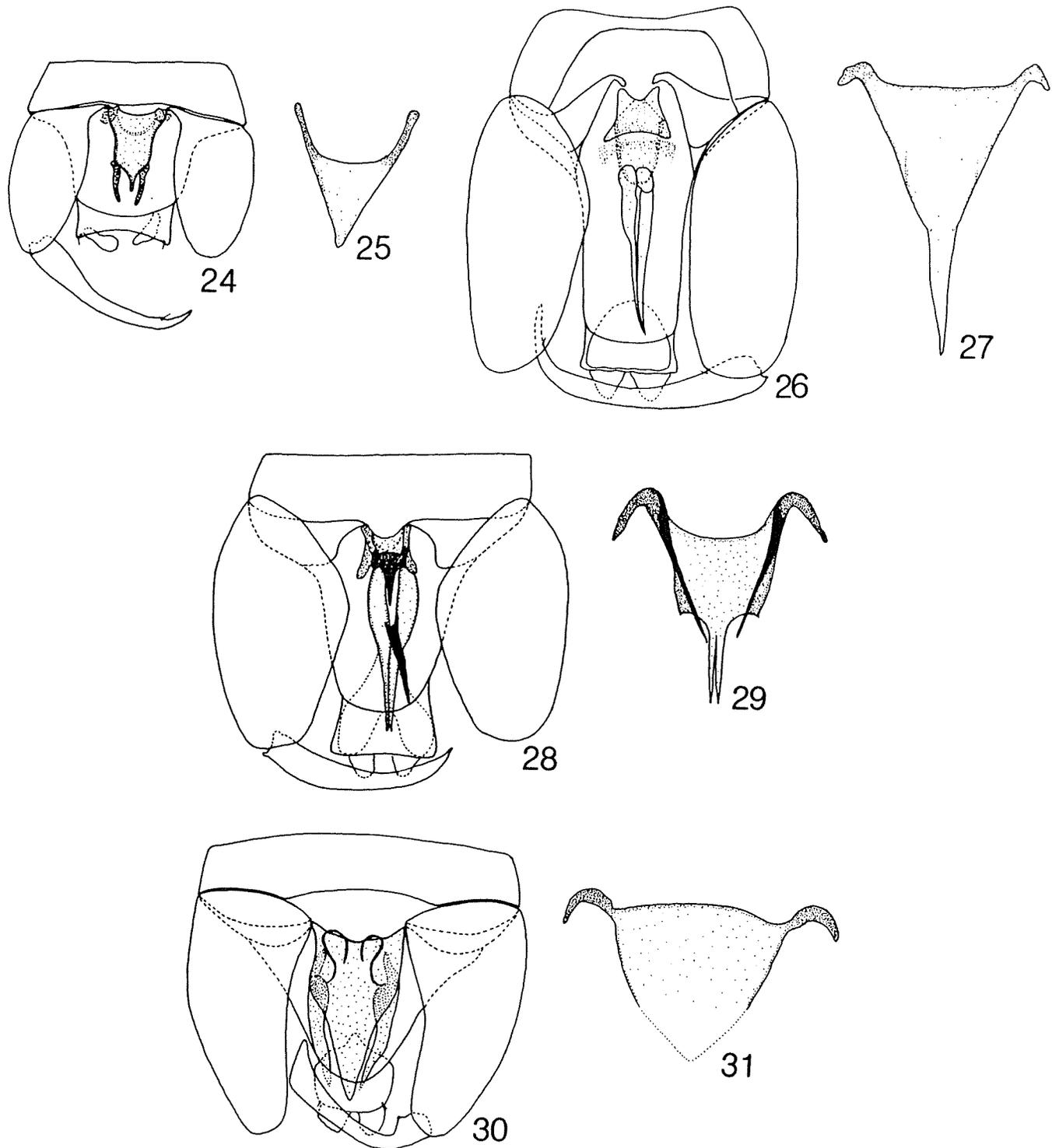
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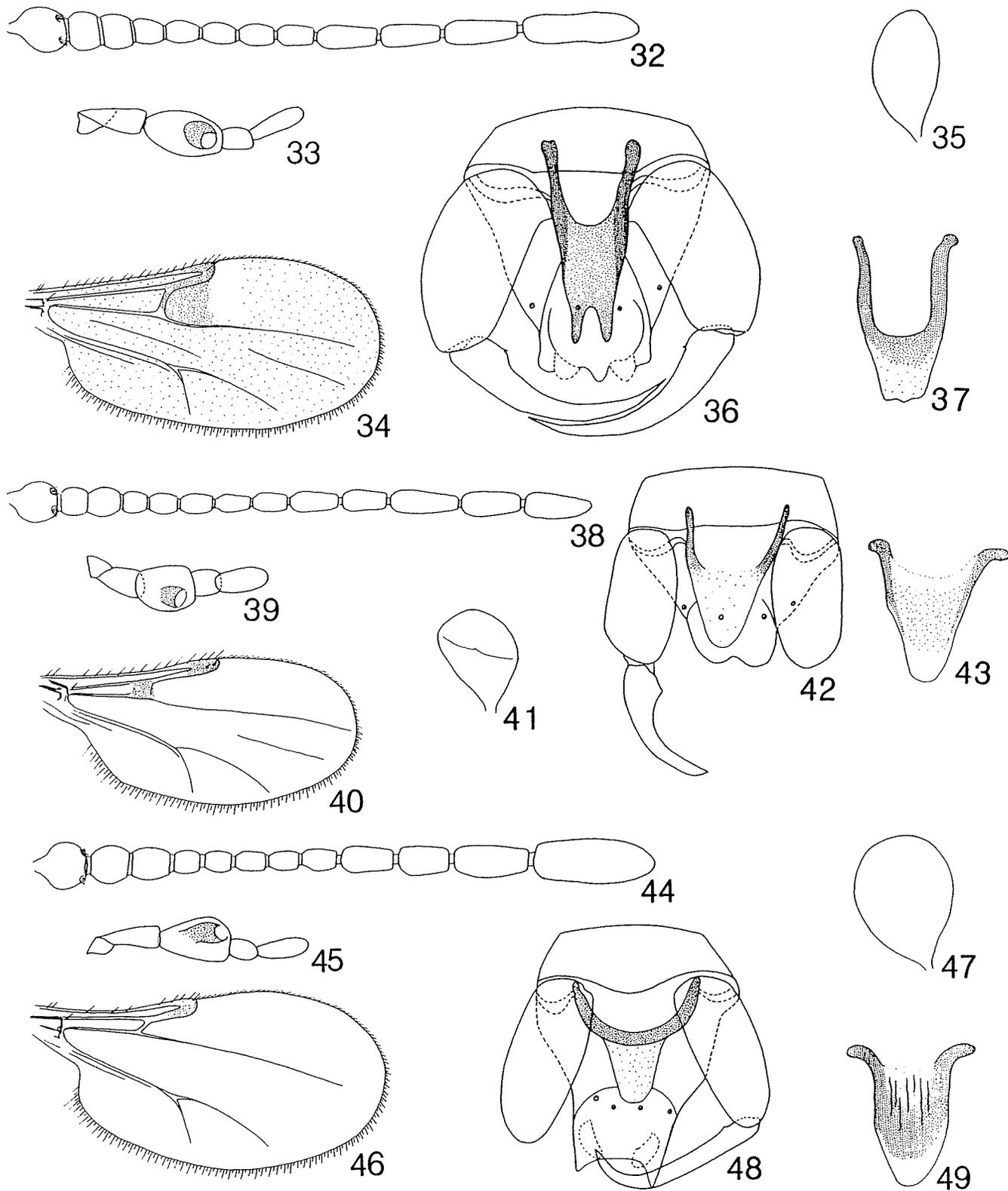
Figs. 1-12. 1-6, *Brachypogon fuscivenosus*; 7-12, *B. ethelae*: 1, 7 female antennal flagella; 2, 8, female palpi; 3, 9, female wings; 4, 10, spermathecae; 5, 11, male genitalia, aedeagi removed; 6, 12, aedeagi.



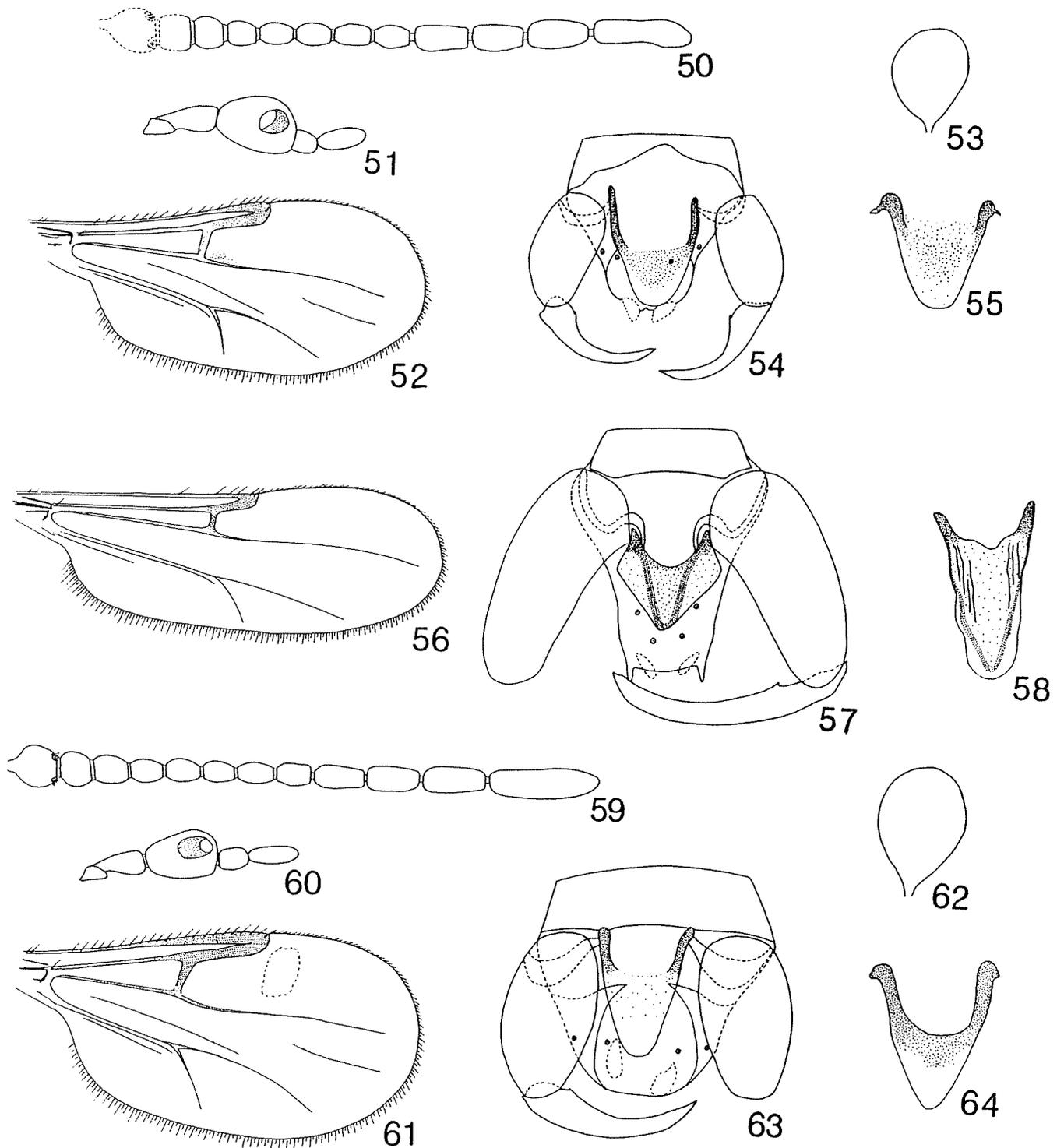
Figs. 13-23, *Brachypogon paraensis*: 13-19, female; 20-23, male. 13, 20, antennal flagella; 14 palpus; 15, femora and tibiae; 16, tarsi; 17, 21, 5th tarsomeres and claws; 18, wing; 19, spermatheca; 22, genitalia, aedeagus removed; 23, aedeagus.



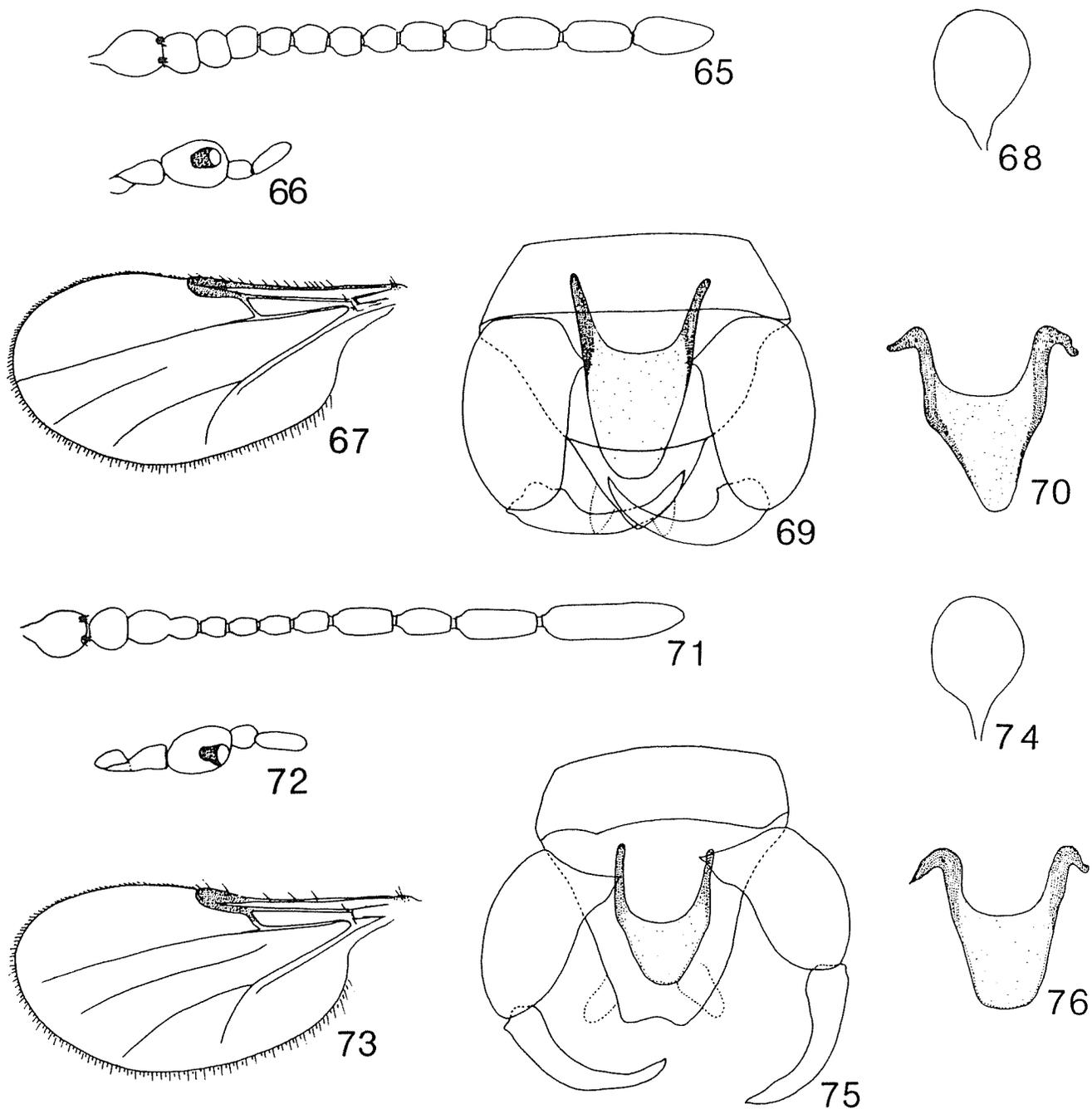
Figs. 24-31. Male genitalia of: 24-25, *Brachypogon pseudoparaensis*; 26-27, *B. apunctipennis*; 28-29, *B. schmitzi*; 30-31, *B. spatuliformis*: 24, 26, 28, 30, genitalia, aedeagi removed; 25, 27, 29, 31, aedeagi.



Figs. 32-49. 32-37, *Brachypogon bifidus*; 38-43, *B. bimaculatus*; 44-49, *B. ecuadorensis*: 32, 38, 44, female antennal flagella; 33, 39, 45, female palpi; 34, 40, 46, female wings; 35, 41, 47, spermathecae; 36, 42, 48, male genitalia, aedeagi removed; 37, 43, 49, aedeagi.



Figs. 50-64. 50-55, *Brachypogon impar*; 56-58, *B. insularis*; 59-64, *B. monicae*: 50, 59, female antennal flagella; 51, 60 female palpi; 52, 61 female wings; 56, male wing; 53, 62, spermathecae; 54, 57, 63, male genitalia, aedeagi removed; 55, 58, 64, aedeagi.



Figs. 65-76. 65-70, *Brachypogon telesfordi*, 71-76, *B. woodruffi*: 65, 71 female flagella; 66, 72, female palpi; 67, 73, female wings; 68, 74 spermathecae; 69, 75, male genitalia, aedeagi removed; 70, 76, aedeagi.