

## A REVIEW OF THE NEOTROPICAL PREDACEOUS MIDGE GENUS *PARYPHOCONUS* (DIPTERA: CERATOPOGONIDAE)

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*Abstract.*—A key is presented for identification of females of the 38 species of the Neotropical genus *Paryphoconus* Enderlein, including the following 11 species described as new: *apicalis*, *brunneipennis*, *ecuadorensis*, *fittkaui*, *flinti*, *fusciradi-  
alis*, *latipennis*, *leei*, *maya*, *paranaensis*, and *steineri*. *Ceratobezzia flavida* Johann-  
sen and *Bezzia telmatophilus* Macfie are transferred to *Paryphoconus* (New Com-  
binations). *Paryphoconus lanei* Wirth is a junior synonym of *P. flavidus* (Johannsen)  
and *P. travassosi* Lane a junior synonym of *P. subflavus* Macfie (New Synonymy).  
Previous erroneous identifications and synonymy are corrected and new distri-  
bution records are presented.

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Since the publication of Wirth and Ratanaworabhan's revision of the *Stenoxenini* in 1972 a large amount of new Neotropical material of the genus *Paryphoconus* Enderlein has accumulated in the U.S. National Museum of Natural History. In connection with concurrent studies of the Neotropical species of *Bezzia* Kieffer we have discovered several species that bridge the taxonomic gap between the two genera and necessitate a re-evaluation of the tribe *Stenoxenini*. At the same time we have separated a significant number of undescribed species of *Paryphoconus* and found a number of erroneous or new synonymies that are reported here. As a result of our studies we now recognize 38 species of *Paryphoconus*, of which 11 are described as new. Unfortunately we have been unable to find good characters for separation of species in the male sex, which shows considerable sexual dimorphism from the corresponding females. Our re-evaluation of the tribe *Stenoxenini* is still incomplete, pending completion of our studies on *Bezzia* and revision of generic concepts in the *Palpomyia-Bezzia* complex.

For explanation of our terminology see the papers by Wirth (1952) and Downes and Wirth (1981). All material examined is from the collection of the National Museum of Natural History in Washington, D.C., unless otherwise noted.

### Genus *Paryphoconus* Enderlein

*Paryphoconus* Enderlein, 1912:57. Type-species, *Paryphoconus angustipennis* Enderlein, by original designation.

*References.*—Mayer, 1952:582 (egg; classification); Lane, 1956:299 (revision; key); Mayer, 1959:233 (pupa); Lane, 1961b:453 (key); Wirth and Ratanaworabhan, 1972:1369 (revision).

*Diagnosis.*—Moderate to large size species; body slender, dorsoventrally flattened. Eyes bare, widely separated. Female antenna much elongated, segments with dense setose hairs, these sometimes conspicuously flattened (hastate). Palpus 5-segmented; 3rd segment slender, without sensory pit. Mesonotum narrowed in



front, sometimes conically produced, usually with an erect anteromedian spine or tubercle. Legs long and slender; femora unarmed; femoral and tibial vestiture of very fine, erect hairs; last 3 tarsomeres relatively short; 4th tarsomere cordiform; 5th tarsomere without ventral batonnets. Female claws short and equal, each with small internal basal tooth. Wing long and narrow, often with color pattern; r-m crossvein distinct but short; costa long, extending nearly to wing tip; 1 very narrow radial cell, posterior branch of radius closely approaching costa; medial fork broadly sessile. Female abdomen slender, with paired gland rods and eversible glands. Male genitalia: 9th sternite short, 9th tergite tapering with well-developed apicolateral lobes; gonocoxite slender, gonostylus elongated; aedeagus with high, rounded basal arch and slender, pointed distomedian process projecting posteriorly from just behind tip; parameres separated, with contiguous clavate apices.

*Discussion.*—Females of *Stenoxenus* Coquillett can be distinguished readily from those of *Paryphoconus* by the following combination of characters: thorax broadly rounded in front, without anterior spine; palpus 4-segmented; and wing with vein M2 elbowed at the base. Males of *Stenoxenus* closely resemble those of *Paryphoconus* in wing venation, but lack the anterior mesonotal spine, have the palpus 4-segmented (only 1 segment distad of the one bearing the sensory organ), and the parameres are fused on the distal portion. In only a few species of *Paryphoconus* does the female costa extend to the wing tip as it does in all *Stenoxenus*; the non-elbowed media and 5-segmented palpus will readily distinguish these. Similarly, the females of some *Paryphoconus* species with the anterior mesonotal spine lacking can be distinguished by wing venation and their 5-segmented palpus. We have seen a few males with the parameres separate distally but with 4-segmented palpus, that we cannot associate with any known females of either genus; we are unable to interpret this combination of characters on the basis of the limited material available. Possibly they may represent species that may bridge the gap between the two genera, or one or the other of the characters may prove to be unreliable. Reared specimens in which the sexes can be definitely associated by pupal characters are badly needed for all species.

*Included Species.*—

*aemulus* Macfie, 1940b:180. Guyana.

*amapaensis* Lane, 1961a:450. Brazil.

*angustipennis* Enderlein, 1912:57. Brazil.

*anomalicornis* Kieffer, 1917:333. Colombia and Paraguay.

*apicalis* n. sp. Ecuador.

*barrettoi* Lane, 1946:203. Brazil.

*batesi* Lane, 1961b:455. Brazil.

*brunneipennis* n. sp. Brazil.

*ecuadorensis* n. sp. Ecuador.

*enderleini* Lane, 1956:301. Brazil.

*fittkawi* n. sp. Brazil.

*flavidus* (Johannsen), 1943a:761 (*Ceratobezzia*). Guyana.

*flinti* n. sp. Mexico.

*fusciradialis* n. sp. Brazil.

*fuscus* Lane, 1946:206. Brazil.

*goianensis* Lane, 1961b:456. Brazil.



*grandis* Macfie, 1939:6. Brazil.  
*guianae* Macfie, 1940c:180. Guyana.  
*kiefferi* Lane, 1956:302. Brazil.  
*lanei* Wirth, 1959:236. Brazil. Syn. of *flavidus* (Johannsen).  
*latipennis* n. sp. Colombia.  
*leei* n. sp. Colombia.  
*macfiei* Lane, 1946:203. Brazil.  
*maya* n. sp. Belize.  
*mayeri* Wirth, 1959:236. Brazil.  
*neotropicalis* (Lane), 1948:229 (*Macropeza*). Brazil.  
*nigripes* Macfie, 1939:8. Argentina.  
*nubifer* Macfie, 1939:5. Brazil.  
*oliveirai* Lane, 1956:303. Brazil.  
*paranaensis* n. sp. Argentina.  
*paulistensis* Lane, 1961b:457. Brazil.  
*sonorensis* Wirth and Ratanaworabhan, 1972:1374. Mexico.  
*steineri* n. sp. Peru.  
*subflavus* Macfie, 1940a:23. Guyana.  
*telmatophila* (Macfie), 1940b:77 (*Bezzia*). Brazil.  
*terminalis* (Coquillett), 1904:90 (*Ceratopogon*). Nicaragua.  
*travassosi* Lane, 1956:304. Brazil. Synonym of *subflavus* Macfie.  
*unimaculatus* Macfie, 1940c:179. Guyana.  
*wirthi* Lane, 1961b:458. Brazil.  
*wygodzinskyi* Lane, 1946:208. Brazil.

Key to the Species of *Paryphoconus* (Females)

- 1. Wing entirely hyaline, without dark markings (may become gradually and slightly unfuscated toward apex) ..... 2
- Wing entirely or partly infuscated, at least a distinct dark marking over r-m crossvein and/or at wing tip ..... 8

Wing Hyaline Without Markings

- 2. Legs entirely yellowish or whitish; mesonotum with yellowish ground color; small species, wing 2–3 mm long ..... 3
- Legs with at least hind tibia darkened at apex; mesonotum dark brown or blackish; larger species, wing 3–7 mm long ..... 4
- 3. Mesonotum completely yellow and with strong anterior spine .... *mayeri* Wirth
- Mesonotum yellow except for large blackish mark in front of wing root; anterior spine absent ..... *wygodzinskyi* Lane
- 4. Large species, wing 5–7 mm long; legs brown, fore femur yellow, hind femur blackish on distal ¼ ..... *batesi* Lane
- Smaller species, wing 3.2–4.0 mm long ..... 5
- 5. All femora and tibiae dark at apices ..... *neotropicalis* (Lane)
- Legs yellow, hind tibia partly dark ..... 6
- 6. Hind tibia brown at base and apex; hind tarsus pale at base; antenna slender, light brown ..... *paulistensis* Lane



-	Hind tibia brown on distal ¼; hind tarsus brown to base; antennal segments short, all black	7
7.	Mesonotum without anterior spine; antenna longer, antennal ratio 1.18	<i>sonorensis</i> Wirth and Ratanaworabhan
-	Mesonotum with prominent anterior spine; antenna short, antennal ratio 0.71	<i>paranaensis</i> , n. sp.
8(1).	Wing infuscated over entire surface	9
-	Wing with dark spots or shading but not darkened over entire surface	17

Wing Entirely Infuscated

9.	Femora and tibiae brownish black	10
-	Femora and tibiae yellowish, at most with narrow apices dark	11
10.	Hind femur with subapical pale band; tarsi brownish; wing 5 mm long (female)	<i>fuscus</i> Lane
-	Hind femur without subapical pale band; tarsomeres 1-3 pale yellow; wing 3.3 mm long	<i>aemulus</i> Macfie
11.	Large species, wing 5-7 mm long	12
-	Smaller species, wing 1.5-3.0 mm long; (wing without well defined distal dark band)	13
12.	Wing with more intense dark band at apex: tibiae and hind femur with narrow apices dark; base of hind basitarsus pale	<i>barrettoi</i> Lane
-	Wing darker on anterior margin and along veins, without well-defined distal dark band; hind tibia dark on distal ¼; hind basitarsus all brown	<i>grandis</i> Macfie
13.	Small species, wing 1.5 mm long; wing broad, uniformly infuscated; antenna entirely dark brown; legs with vestiture normal, the setae short	14
-	Larger species, wing 2-3 mm long; wing narrower; antenna with base paler; legs with longer, fuzzier, pilose vestiture	15
14.	Mid and hind femora with prominent broad brown bands; wing infuscation much darker in radial cell, paler posteriorly; spermatheca large, 0.130 mm in diameter	<i>fusciradialis</i> , n. sp.
-	Femora unbanded; wing infuscation in radial cell scarcely darker than on posterior portion of wing; spermatheca smaller, 0.053 by 0.040 mm.	<i>latipennis</i> , n. sp.
15.	Fore tibia all brown; wing pale brownish, gradually darker toward costa	<i>leei</i> , n. sp.
-	Fore tibia yellowish to pale brown; wing pale brown, veins darker	16
16.	Legs uniform yellowish to pale brown, apex of hind tibia darker, hind tarsus pale; antenna long and slender, antennal ratio 1.45, segments 3-10 white, 11-15 brown; anal angle of wing poorly developed	<i>brunneipennis</i> , n. sp.
-	Legs dirty yellowish brown, hind femur, tibia, tarsus dark brown; antenna pale brown, segments 3-10 with pale bases, antennal ratio 2.38; wing with anal angle broad	<i>ecuadorensis</i> , n. sp.



- 17(8). Wing with a single dark spot or area over r-m crossvein ..... 18  
 – Wing with additional markings or without a spot at r-m crossvein 21

#### Dark Spot Over R-M Crossvein

18. Mesonotum yellow, or yellowish with dark markings ..... 19  
 – Mesonotum dark brown or blackish; (wing 2.5 mm long) . *wirthi* Lane  
 19. Large species, wing 6 mm long ..... *unimaculatus* Macfie  
 – Smaller species, wing 2.3–3.0 mm long ..... 20  
 20. Legs entirely yellowish; mesonotum without anterior spine; marking  
 on r-m crossvein small and inconspicuous ..... *enderleini* Lane  
 – Hind tibia with dark apical band; mesonotum with strong anterior  
 spine; marking on r-m crossvein prominent ..... *flavidus* (Johannsen)  
 21(17). Wing with dark mark at r-m crossvein and also dark on entire anterior  
 margin, wing tip pale; (thorax blackish; large species, wing 6 mm  
 long) ..... *goianensis* Lane (part)  
 – Wing with dark marking at apex ..... 22  
 22. Wing without dark mark over r-m crossvein; mesonotum blackish 23  
 – Wing with dark mark over r-m crossvein; mesonotum various ... 25

#### R-M Crossvein Pale: Dark Mark at Wing Tip

23. Wing with a single dark mark, at apex; legs yellowish except apex of  
 hind tibia brown; small species, wing 2.0–2.9 mm long ..... 24  
 – Wing with dark apical shading and a mark on lower branch of cubital  
 fork (vein Cul); legs blackish; larger species, wing 5.5 mm long ...  
 ..... *nigripes* Macfie  
 24. Antenna all black; wing 2.9 mm long ..... *guianae* Macfie  
 – Antenna with segments 3–10 white, 11–15 black; wing 2.0 mm long  
 ..... *terminalis* (Coquillett)  
 25(22). Wing infuscated at base, over r-m crossvein, and at broad distal  
 portion, forming more or less 3 bands, these sometimes connected  
 by infuscation along veins; mesonotum yellowish, usually with dark  
 brown markings; large species, wing 4–7 mm long ..... 26  
 – Wing markings confined to r-m crossvein, wing tip, and rarely nar-  
 rowly along veins; mesonotum various; size various, usually smaller 29

#### Angustipennis Group; Large Species With Banded Wing

26. Mesonotum entirely yellowish ..... *oliveirai* Lane  
 – Mesonotum with dark brown markings ..... 27  
 27. Antenna stout with prominent, dense, long, black, hastate setae ..  
 ..... *angustipennis* Enderlein  
 – Antenna long and slender with slender setae ..... 28  
 28. Antenna uniformly dark brown ..... *flinti*, n. sp.  
 – Antenna with segments 3–10 pale yellow; wing more or less infus-  
 cated between the 3 dark bands ..... *macfie* Lane (part)



29(25). Mesonotum yellowish or pale brown, with dark brown markings . . . 30  
- Mesonotum uniform dark brown or blackish . . . . . 31

Yellowish Species

30. Larger species, wing 5.5 mm long; mid and hind tibiae dark at apices;  
wing without infuscation on vein Cul . . . . . *kiefferi* Lane  
- Smaller species, wing 2.2–3.0 mm long; only hind tibia with dark  
apex; wing with faint dark mark along vein Cul . . . . . *subflavus* Macfie

Mesonotum Blackish

31(29). Antenna with 5 distal segments contrasting white, proximal segments  
blackish with prominent hastate setae . . . . . *anomalicornis* Kieffer  
- Antenna with segments uniformly colored or with distal 5 darker . . 32

Wing With Dark Marks Over R-M Crossvein and at Tip

32. Large species, wing 6–6.5 mm long . . . . . 33  
- Small species, wing 2.5–3.0 mm long . . . . . 35  
33. Legs completely dark brown; wing infuscated around entire margin  
. . . . . *goiaensis* Lane (part)  
- Legs with tibiae yellowish at least in part . . . . . 34  
34. All tibiae extensively marked with brown; wing very broad as in  
genus *Jenkinshalea* . . . . . *amapaensis* Lane  
- Only hind tibia marked with brown; no dark mark on vein M1; small  
dark mark in base of anal cell . . . . . *macfie* Lane (part)  
35(32). Antenna short, all black; wing veins all infuscated . . . . . *nubifer* Macfie  
- Antenna long and slender, more or less pale at base; veins not in-  
fuscated except r-m and/or Cul . . . . . 36  
36. Hind tibia dark brown; (legs dirty yellowish, fore and mid tibiae  
brownish, hind tarsus wholly brown; wing white, narrow apex in-  
fuscated, faint dark marks on r-m and Cul; antenna with segments  
3–10 white, 11–15 brownish) . . . . . *maya*, n. sp.  
- Hind tibia with only distal half or less brown . . . . . 37  
37. Wing distally with broad brown band, radius and costa, r-m and Cul  
more or less infuscated; antenna with proximal segments brownish  
on apices, antennal ratio no more than 2.24 . . . . . 38  
- Wing white with narrow tip infuscated, r-m infuscated, Cul very  
slightly infuscated; antenna white on 3–10, pale brown on 11–15,  
extremely long and slender with slender setae, antennal ratio 2.60;  
(legs pale yellow, narrow apex of hind tibia brown, basal ½ of hind  
basitarsus pale; halter dark brown) . . . . . *fittkau*, n. sp.  
38. Wing whitish with narrow tip infuscated; hind tarsus all brown;  
antennal ratio 2.24; 4 pairs of gland rods . . . . . *steineri*, n. sp.  
- Wing gray overall with broad, ill-defined infuscation distally; legs  
pale yellow, narrow apex of hind tibia dark brown; hind basitarsus  
pale at base; antennal ratio 1.65; 1 pair of gland rods . . . *apicalis*, n. sp.



*Paryphoconus aemulus* Macfie

*Paryphoconus aemulus* Macfie, 1940c:180 (male; Guyana).—Lane, 1946:206 (female; Brazil).—Wirth and Ratanaworabhan, 1972:1371 (female notes; figs.; rec. Brazil).

*Distribution*.—Brazil, Guyana.

*Notes*.—The species is placed in the key on the basis of female characters given by Lane (1946) and Wirth and Ratanaworabhan (1972) from Brazilian specimens. The species resembles *P. fuscus* Lane and *barrettoi* Lane in its completely infuscated wing, but it is a smaller species (wing 3.3 mm long), has legs entirely dark except for the trochanters and extreme bases of the femora, and tarsomeres 1–3, which are pale yellowish. The antennae are unusually long, slender, and whitish in color. Spermatheca oval.

*Paryphoconus amapaensis* Lane

*Paryphoconus amapaensis* Lane, 1961a:450 (female; Brazil; fig. wing).—Wirth and Ratanaworabhan, 1972:1371 (notes).

*Distribution*.—Brazil.

*Notes*.—Wing length 6 mm. A large, shining dark brown species. Legs pale, fore and mid femora dark brown distally, tibiae brown except distally on mid leg; hind leg with only knee brownish; tarsi pale, distal tarsomeres brownish on fore and hind leg. Wing unusually broad, with expansion at margin of mediocubital fork; extensive infuscation narrowly around wing margin and across r-m crossvein to base of vein M3+4. Halter pale. No new data.

*Paryphoconus angustipennis* Enderlein

Fig. 13a

*Paryphoconus angustipennis* Enderlein, 1912:58 (female; Brazil; figs.).—Macfie, 1939:5 (Brazil; fig. wing).—Lane, 1946:202 (Brazil; figs.).—Lane, 1956:300 (Brazil, Argentina).—Wirth and Ratanaworabhan, 1972:1371 (redescription; figs.; distribution).

*Distribution*.—Argentina, Brazil, Colombia, Peru, Venezuela.

*New Record*.—ARGENTINA: Misiones, Arroyo Piray Guazu, San Pedro, 22 Nov 1973, O.S. Flint, Jr., 5 females.

*Notes*.—Wing length 5.8–6.5 mm; a large yellowish brown species with dark brown abdomen; legs yellow, distal tarsomeres and narrow tip of hind tibia dark brown; halter knob brownish. Antenna with torus yellowish, flagellum dark brown, the segments elongated, cylindrical, antennal ratio 1.35; last 5 segments with dense black hastate setae. Wing (Fig. 13a) with extensive dark brown pattern as figured; costal ratio 0.91. Spermatheca large, elongate oval, measuring 0.194 by 0.097 mm including the short neck. Male much smaller, wing length 2.1 mm; costal ratio 0.86. Genitalia figured by Wirth and Ratanaworabhan (1972). The female from Mexico reported by Wirth and Ratanaworabhan was misidentified, and is here described as *P. flinti* n. sp.



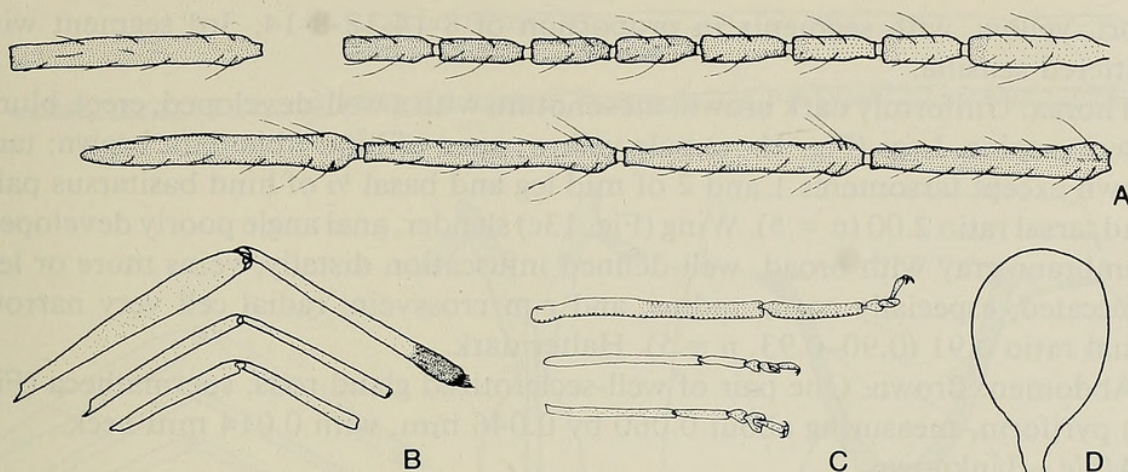


Fig. 1. *Paryphoconus apicalis*, female: a, Antenna; b, Femora and tibiae of (top to bottom), hind, mid, and fore legs; c, Tarsi of (top to bottom) hind, mid, and fore legs; d, Spermatheca.

*Paryphoconus anomalicornis* Kieffer

Fig. 13b

*Paryphoconus anomalicornis* Kieffer, 1917:333 (female; Colombia, Paraguay; figs.).—Wirth and Ratanaworabhan, 1972:1372 (redescribed; figs.; distribution).

*Distribution*.—Brazil, Colombia, Honduras, Mexico, Paraguay, Venezuela.

*New Records*.—BRAZIL: Amazonas, Rio Irapirapi, Cachoeira, 11 Jan 1963, E. J. Fittkau, at light, 1 female; Rio Solimões, 15 Sep 1961, Fittkau, at light, 3 females.

*Notes*.—Female wing length 3.1–4.2 mm. A shining black species with yellow legs, hind tarsus and extreme tip of hind femur dark brown. Wing (Fig. 13b) slightly infuscated along anterior margin; r-m crossvein and an apical area darker brown, slight infuscation narrowly along apices of veins M1, M2, M3+4, and Cul; costal ratio 0.88. Antenna with proximal flagellar segments black, bearing dense black hastate setae; distal 5 segments much elongated, contrasting whitish; antennal ratio 1.60. Spermatheca small and ovoid with long slender neck, measuring 0.097 by 0.072 mm, neck 0.011 mm.

The females from Rio Solimões are larger (wing 4.2 mm long) and darker than typical *P. anomalicornis*, with wing deeply infuscated along veins and around margins, the femora somewhat infuscated in midportions, and the hind tibia dark except at the base.

*Paryphoconus apicalis*, new species

Figs. 1, 13c

*Female*.—Wing length 2.36 (2.23–2.45,  $n = 5$ ) mm; breadth 0.62 (0.60–0.65,  $n = 5$ ) mm.

*Head*: Dark brown including scape and pedicel. Eyes separated for a distance equal to diameter of 5 ommatidial facets (0.092 mm). Antenna (Fig. 1a) dark brown, 2 or 3 basal segments slightly pale; lengths of flagellar segments in proportion of 38-26-24-26-24-24-25-27-77-72-72-74-80; antennal ratio 1.65 (1.53–1.75,  $n = 5$ ); verticils and setae sparse and fine, no black hastate setae. Palpus



short, yellow, with segments in proportion of 8-14-18-8-14; 3rd segment with scattered sensilla.

Thorax: Uniformly dark brown; mesonotum with a well-developed, erect, blunt, anterior spine. Legs (Fig. 1b, c) pale yellow, apex of hind tibia dark brown; tarsi brown except tarsomeres 1 and 2 of mid leg and basal  $\frac{1}{2}$  of hind basitarsus pale; hind tarsal ratio 2.00 ( $n = 5$ ). Wing (Fig. 13c) slender, anal angle poorly developed; membrane gray with broad, well-defined infuscation distally; veins more or less infuscated, especially costa, radius, and r-m crossvein; radial cell very narrow; costal ratio 0.91 (0.90–0.93,  $n = 5$ ). Halter dark.

Abdomen: Brown. One pair of well-sclerotized gland rods; spermatheca (Fig. 1d) pyriform, measuring about 0.060 by 0.046 mm, with 0.014 mm neck.

*Male*.—Unknown.

*Distribution*.—Ecuador, Panama.

*Types*.—Holotype female, Ecuador, Pastaza, Cononaco, 30 May 1976, J. Cohen, at light. Paratypes, 4 females, as follows: ECUADOR: same data as holotype, 2 females. PANAMA: Darien Prov., Santa Fe, 11 Sep 1967, A. Broce, 2 females.

*Discussion*.—This species is very similar to *P. fittkaui*, *maya*, and *steineri*; characters to separate all of them are found in the key.

### *Paryphoconus barrettoi* Lane

*Paryphoconus barrettoi* Lane, 1946:203 (female; Brazil; fig. wing, spermatheca).

*Distribution*.—Brazil.

*Notes*.—No new records. The specimens from Mexico and Venezuela described as *P. barrettoi* by Wirth and Ratanaworabhan (1972:1373) were misidentified and are actually *P. grandis* Macfie (which see).

*Paryphoconus barrettoi* is a large species, wing 6.5 mm long; wing infuscated throughout, with distinct darker band on distal  $\frac{1}{5}$ ; base of wing very narrow, anal angle not developed; costal ratio 0.90. Antenna dark brown, with dense dark setae; antennal ratio 1.8. Thorax reddish brown, blackish at sides of mesonotum and in front of wing; mesonotum, scutellum, and postnotum densely covered with short pale pile; mesonotum with short anterior tubercle. Legs yellowish brown; narrow apices of femora and fore and mid tibiae, extreme base and distal  $\frac{1}{5}$  of hind tibia, apices of basitarsi, and all of tarsomeres 2–5, dark brown.

### *Paryphoconus brunneipennis*, new species

Figs. 2, 13d

*Female*.—Wing length 2.23 mm; breadth 0.67 mm.

Head: Pale brown including scape, pedicel, and palpus. Eyes separated for a distance equal to diameter of 5 ommatidial facets (0.090 mm). Antenna (Fig. 2a) long and slender; brown, except antennal segments 3–10 and narrow bases of 11–15 pale; lengths of flagellar segments in proportion of 57-38-38-39-40-41-37-36-75-70-78-102-146; antennal ratio 1.45; verticils and setae sparse and fine, no black hastate setae. Palpus with lengths of segments in proportion of 8-14-20-13-19; 3rd segment with scattered sensilla.

Thorax: Brown with abundant small black mottlings; mesonotum with a well-developed, pale, pointed anterior spine. Legs (Fig. 2b, c) yellowish brown, narrow



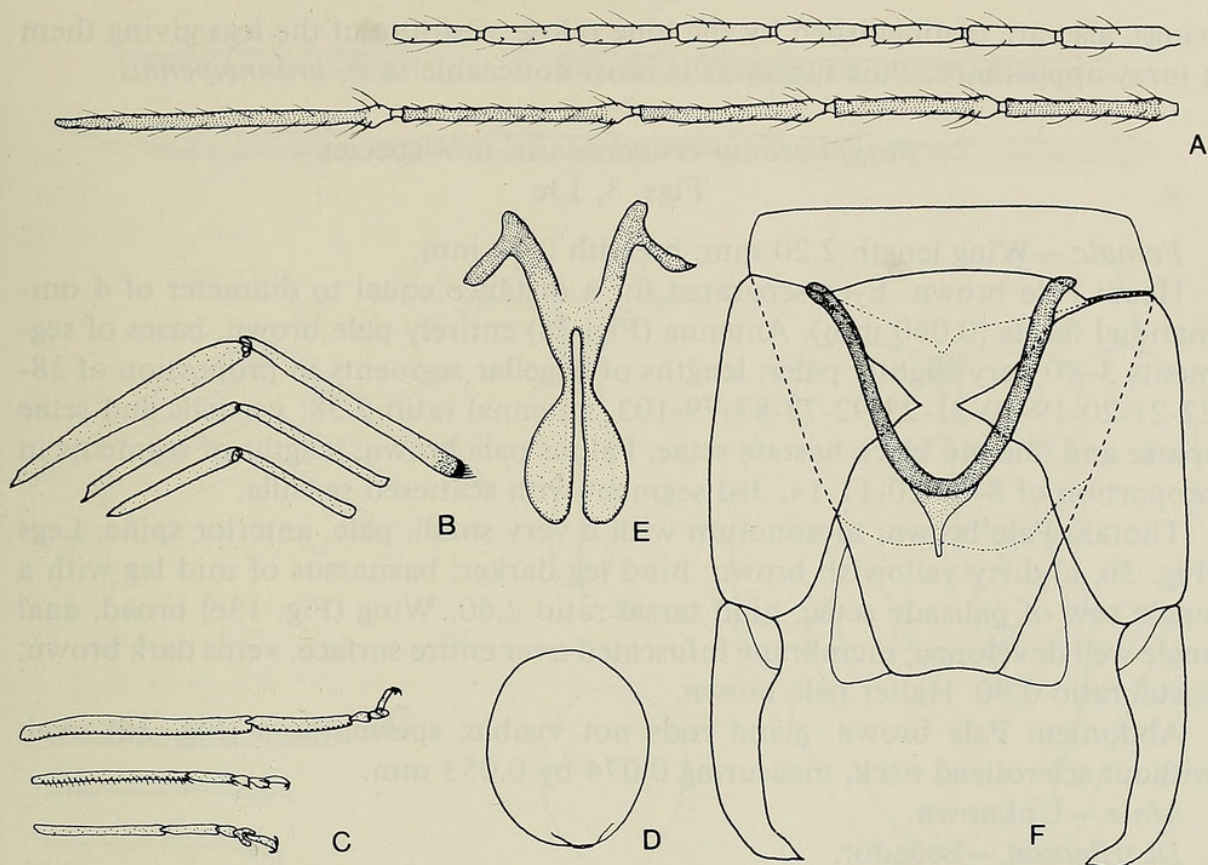


Fig. 2. *Paryphoconus brunneipennis*; a-d, female; e-f, male: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca; e, Parameres; f, Genitalia, parameres omitted.

apex of hind tibia infuscated; tarsi yellowish, basitarsus of mid leg with a single row of palisade setae; hind tarsal ratio 2.40. Wing (Fig. 13d) broad posteriorly, anal angle poorly developed; membrane infuscated over entire surface; veins darker, especially on r-m crossvein area; radial cell narrow to tip; costal ratio 0.90. Halter pale.

Abdomen: Brown. Apparently 4 pairs of sclerotized gland rods; spermatheca (Fig. 2d) subspherical with short neck, measuring 0.100 by 0.085 mm.

*Male*.—Wing length 1.77 mm.

Similar to female with usual sexual differences. Antenna with lengths of flagellar segments in proportion of 43-30-26-26-25-24-23-24-26-31-90-117-190. Wing with costal ratio 0.85. Genitalia (Fig. 2f): Ninth sternite narrow without caudomedian excavation; 9th tergite tapered distally, with 2 very well-developed apicolateral lobes. Gonocoxite with a triangular mesal protuberance; gonostylus shorter than gonocoxite, pointed. Aedeagus and parameres (Fig. 2e) typical of the genus.

*Distribution*.—Brazil (Amazonas), Colombia.

*Types*.—Holotype female, Brazil, Amazonas, Rio Solimões, 15 Sep 1961, E. J. Fittkau, at light. Allotype male, Colombia, Valle, Rio Raposo, May 1965, V. H. Lee, light trap.

*Discussion*.—This species is similar to *P. ecuadorensis*, n. sp. and *P. leei*, n. sp., but differs from these by the pale coloration of the proximal antennal segments; other differences are found in the key. This group of similar species, all with the general wing infuscation as in *P. fusciradialis* and *P. latipennis*, but with narrower



wings, also are distinguished by the long pilose vestiture of the legs giving them a fuzzy appearance. This fuzziness is most noticeable in *P. brunneipennis*.

*Paryphoconus ecuadorensis*, new species

Figs. 3, 13e

*Female*.—Wing length 2.20 mm; breadth 0.74 mm.

Head: Pale brown. Eyes separated for a distance equal to diameter of 4 ommatidial facets (0.060 mm). Antenna (Fig. 3a) entirely pale brown, bases of segments 3–10 very slightly paler; lengths of flagellar segments in proportion of 38–22–21–20–19–20–21–23–92–78–83–79–103, antennal ratio 2.38; verticils and setae sparse and fine, no black hastate setae. Palpus pale brown; lengths of segments in proportion of 8–13–20–11–14; 3rd segment with scattered sensilla.

Thorax: Pale brown; mesonotum with a very small, pale, anterior spine. Legs (Fig. 3b, c) dirty yellowish brown; hind leg darker; basitarsus of mid leg with a single row of palisade setae; hind tarsal ratio 2.60. Wing (Fig. 13e) broad, anal angle well developed; membrane infuscated over entire surface, veins dark brown; costal ratio 0.90. Halter pale brown.

Abdomen: Pale brown, gland rods not visible; spermatheca (Fig. 3d) oval, without sclerotized neck, measuring 0.074 by 0.053 mm.

*Male*.—Unknown.

*Distribution*.—Ecuador.

*Type*.—Holotype female, Ecuador, Pichincha, 113 km via Puerto Quito, 2700 ft, 30 Aug 1976, J. Cohen, CDC light trap.

*Discussion*.—*Paryphoconus ecuadorensis* can be distinguished from *P. brunneipennis* by the color of the antenna and legs, and by the well-developed anal angle of the wing.

*Paryphoconus fittkaui*, new species

Figs. 4, 13f

*Female*.—Wing length 2.90 (2.80–3.10,  $n = 3$ ) mm; breadth 0.72 (0.71–0.75,  $n = 3$ ) mm.

Head: Dark brown including scape and pedicel. Eyes separated for distance equal to diameter of 4.5 ommatidial facets (0.070 mm). Antenna (Fig. 4a) very long and slender and slender setae; pale brown except segments 3–10 and narrow bases of 11–15 paler; lengths of flagellar segments in proportion of 32–21–21–23–21–21–20–20–99–88–81–84–110, antennal ratio 2.60 (2.58–2.62,  $n = 3$ ). Palpus short, yellow, lengths of segments in proportion of 10–15–23–13–21; 3rd segment with scattered sensilla.

Thorax: Dark brown; mesonotum with a very small, blunt anterior spine. Legs (Fig. 4b, c) pale yellow, narrow apex of hind tibia brown; proximal  $\frac{1}{2}$  of hind basitarsus pale, the rest brown; tarsi of fore and mid leg pale except tarsomeres 3–5 of fore leg infuscated; hind tarsal ratio 1.82 (1.80–1.85,  $n = 3$ ). Wing (Fig. 13f) narrow; membrane white, narrow tip of wing infuscated; costa, radius, and r-m crossvein more or less infuscated, rest of veins when infuscated, only at tip and very slightly; radial cell very narrow; costal ratio 0.88 (0.87–0.89,  $n = 3$ ). Halter dark brown, apex of knob blackish.

Abdomen: Dark brown. Four pairs of slender gland rods; spermatheca (Fig. 4d)



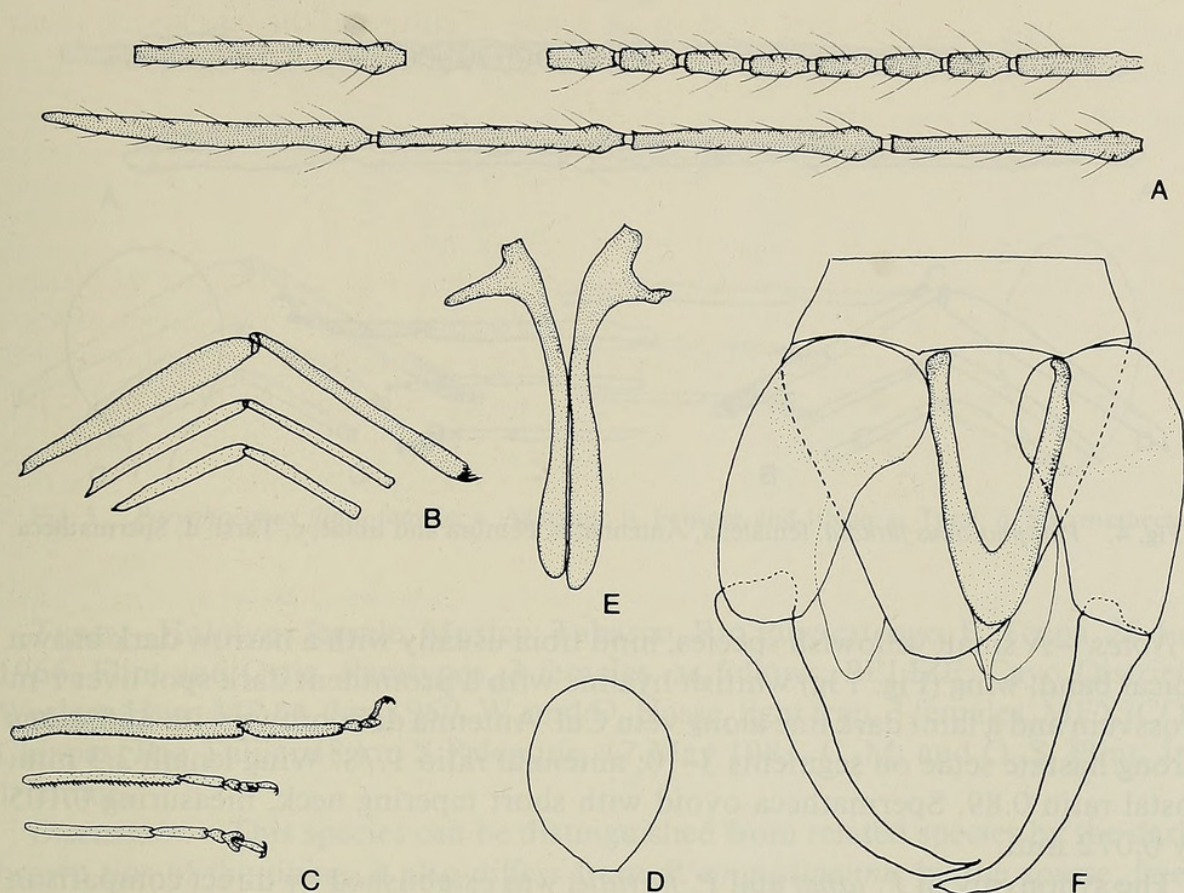


Fig. 3. *Paryphoconus ecuadorensis*; a–d, female; e–f, male: a, Antenna; b, Femora and Tibiae; c, Tarsi; d, Spermatheca; e, Parameres; f, Genitalia, parameres omitted.

oval with well-sclerotized neck, measuring 0.065 by 0.050 mm with neck 0.023 mm.

*Male*.—Unknown.

*Distribution*.—Brazil (Amazonas).

*Types*.—Holotype female, Brazil, Amazonas, Rio Marauia, Jan–Feb 1963, E. J. Fittkau, at light. Paratypes, 2 females, Amazonas, Rio Cueiras, Dec 1960, Fittkau, at light.

*Discussion*.—This species can be recognized by the peculiar, very long antenna with slender setae, and very high antennal ratio (2.60).

*Paryphoconus flavidus* (Johannsen), new combination

Fig. 13g

*Ceratobezzia flavida* Johannsen, 1943a:761 (female; Guyana).—Johannsen, 1940b: 767 (fig. antenna, thorax).

*Paryphoconus lanei* Wirth, 1959:236 (male, female; Brazil; fig. male genitalia).—Mayer, 1959:233 (pupae; fig. respiratory horn).—Wirth and Ratanaworabhan, 1972:1374 (redescribed; figs.; distribution).

*Distribution*.—Brazil.

*New Record*.—BRAZIL: Mato Grosso, Cuiaba, 2 Apr 1972, W. H. Whitcomb, 12 females.



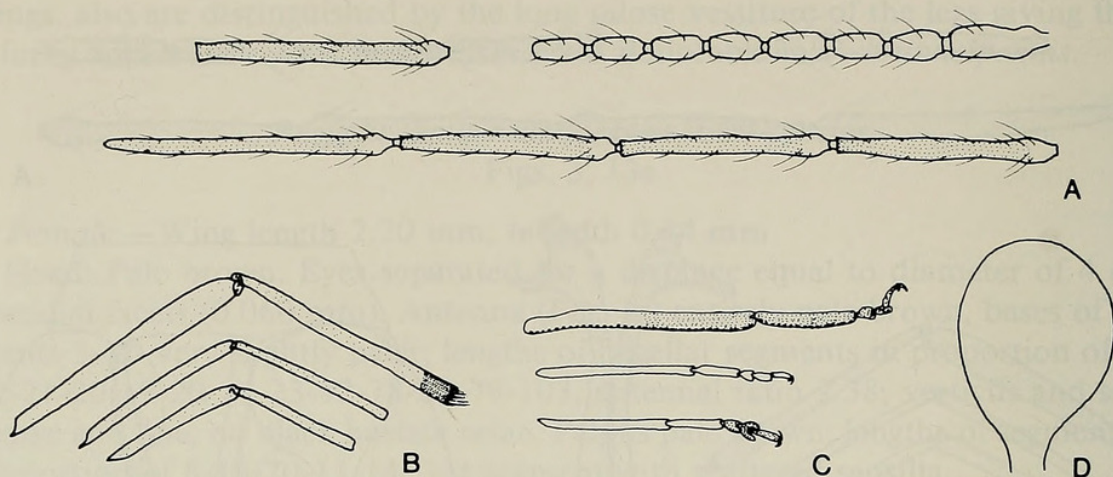


Fig. 4. *Paryphoconus fittkaui*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

*Notes.*—A small yellowish species, hind tibia usually with a narrow dark brown apical band; wing (Fig. 13g) whitish hyaline with a prominent dark spot over r-m crossvein and a faint dark line along vein Cul. Antenna dark brown with numerous strong hastate setae on segments 3–10; antennal ratio 1.78. Wing length 2.3 mm; costal ratio 0.89. Spermatheca ovoid with short tapering neck, measuring 0.105 by 0.072 mm.

The synonymy of *P. lanei* and *P. flavidus* was established by direct comparison of the holotypes, that of *P. flavidus* by courtesy of Dr. Quentin D. Wheeler of Cornell University.

*Paryphoconus flinti*, new species

Figs. 5, 13h

*Female.*—Wing length 4.30 (4.10–4.50,  $n = 4$ ) mm; breadth 1.03 (0.99–1.05,  $n = 4$ ) mm.

Head: Yellowish, including scape, with numerous small dark mottlings. Eyes separated for a distance equal to diameter of 5 ommatidial facets (0.10 mm). Antenna (Fig. 5a) slender, pedicel brown, flagellum entirely dark brown; lengths of flagellar segments in proportion of 40-22-22-23-23-22-22-22-54-48-52-57-100; antennal ratio 1.50 (1.43–1.57,  $n = 2$ ); verticils and setae sparse and fine, no black hastate setae. Palpus moderately long, 3 proximal segments brown, last 2 dark brown; 3rd segment with scattered sensilla; lengths of segments in proportion of 10-25-30-23-30.

Thorax: Yellowish brown with numerous small dark mottlings; mesonotum with a small blunt, black anterior spine. Legs (Fig. 5b, c) dirty yellowish brown, tip of tibiae dark brown. Wing (Fig. 13h) brownish at base, at middle, and on broad apex, plus some infuscation along veins in between; costal ratio 0.91 ( $n = 4$ ). Halter yellowish.

Abdomen: Dark brown, terga shining black. Five pairs of well-sclerotized gland rods; spermatheca (Fig. 5c) elongate oval with short neck, measuring 0.138 by 0.088 mm.

*Male.*—Unknown.

*Distribution.*—Belize, Mexico.



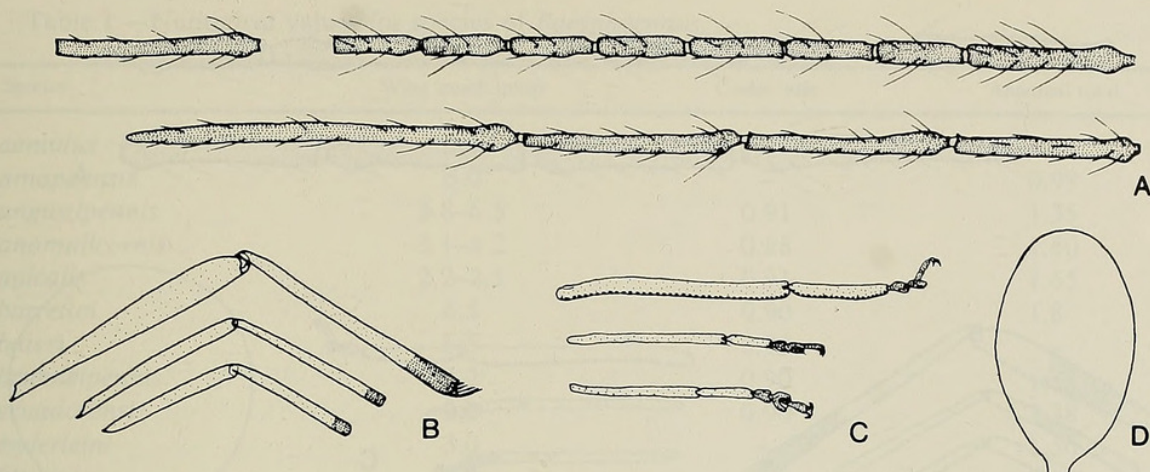


Fig. 5. *Paryphoconus flinti*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

*Types*.—Holotype female, Mexico, Tabasco, Rio Puyacatengo, E. Teapa, 28 Jul 1966, Flint and Ortiz. Paratypes, 3 females, as follows: BELIZE: Cayo District, Western Hwy. MP 66, Jun 1969, W. and D. Hasse, light trap, 3 females. MEXICO: Chiapas, Rio Tuliya, 48 km S Palenque, 17 May 1981, C. M. and O. S. Flint, Jr. 1 female.

*Discussion*.—This species can be distinguished from related species by the dark brown tips of the tibiae; it also differs from *P. angustipennis* by the sparse, fine, antennal setae and verticils, and from *P. macfieii* by the antennal coloration (segments 3–10 white).

*Paryphoconus fusciradialis*, new species

Figs. 6, 13i

*Female*.—Wing length 1.55 ( $n = 3$ ) mm; breadth 0.60 ( $n = 3$ ) mm.

Head: Dark brown. Eyes broadly separated, for a distance equal to diameter of 7 ommatidial facets (0.110 mm). Antenna (Fig. 6a) entirely brown, bases of segments 3–10 very slightly paler; lengths of flagellar segments in proportion of 34-22-20-20-20-20-20-20-57-57-57-57-80; antennal ratio 1.74; verticils and setae sparse and fine, no black hastate setae. Palpus short, pale; lengths of segments in proportion of 5-10-20-12-14; 3rd segment broad, bearing a group of 5–6 sensilla on midportion.

Thorax: Dark brown; mesonotum without anterior spine. Legs (Fig. 6b, c) yellowish except mid  $\frac{1}{3}$  of mid and hind femora, and distal  $\frac{1}{3}$  of hind tibia dark brown; tarsi yellowish, last 3 segments slightly infuscated; hind tarsal ratio 2.23 (2.15–2.30,  $n = 3$ ). Wing (Fig. 13i) with membrane infuscated over entire surface, anterior veins and radial cell brown; venation as figured; costal ratio 0.88 ( $n = 3$ ). Halter pale brown.

Abdomen: Dark brown. One pair of very short gland rods present; spermatheca (Fig. 6d) exceptionally large, spherical with short neck, measuring 0.130 mm in diameter.

*Male*.—Unknown.

*Types*.—Holotype female and 2 female paratypes, Brazil, Para, Belem, Apr 1970, T.H.G. Aitken, light trap in APEG Forest.



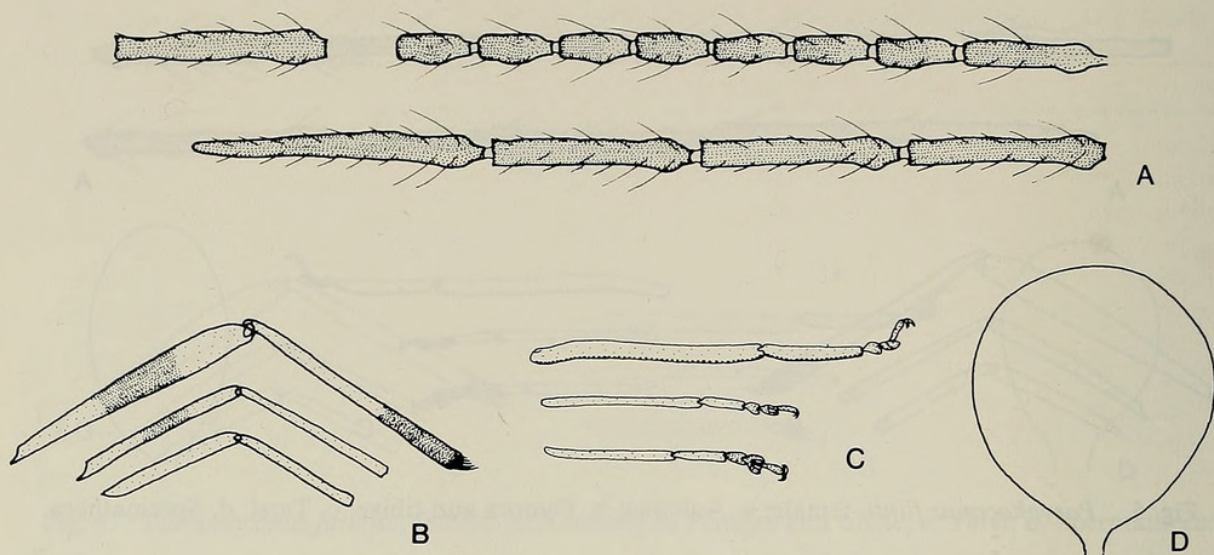


Fig. 6. *Paryphoconus fusciradialis*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

*Discussion.*—This small species can be distinguished from the closely related *P. latipennis* n. sp. by the broad dark brown bands of the mid and hind femora, by the deep infuscation of the radial cell, by the extremely short gland rods, and by the voluminous spherical spermatheca. This species and *P. latipennis* have the general habitus of some species of the genus *Bezzia*, and may in fact be primitive members of the genus *Paryphoconus* indicating closer relationships of the two genera than previously thought.

*Paryphoconus grandis* Macfie

Fig. 13j

*Paryphoconus grandis* Macfie, 1939:6 (female; Brazil; fig. wing).

*Paryphoconus barrettoi* Lane of Wirth and Ratanaworabhan (misident.), 1972: 1373 (female; Mexico, Venezuela; figs.).

*Distribution.*—Belize, Brazil, Mexico, Venezuela.

*Specimens Examined.*—BELIZE: Cayo Dist., Western Hwy., 3 Jul 1969, W. Hasse, 1 female. MEXICO: On railway car from Mexico in quarantine at Nogales, Arizona, 24 Apr 1963, C. H. Spitzer, 2 females. VENEZUELA: Est. Portuguesa, Guanare, 10–13 Sep 1957, B. Malkin, 1 female (Calif. Acad. Sci.).

*Notes.*—Wirth and Ratanaworabhan (1972) misidentified their material which they described as *P. barrettoi* Lane. This description and figures should therefore be compared with Macfie's original description of *P. grandis*, which is in agreement. The large size (wing 5–7 mm long) and long costa (costal ratio 0.98) on the brownish wing with darker brown anterior margin and obscure dark lines along the tips of the medial and cubital veins are diagnostic (Fig. 13j). Halter with dark brown knob. Antenna short and uniformly black, without strong setae; antennal ratio 1.37. Legs yellowish brown, knees blackish; extreme tips of fore and mid tibiae, distal 2–3 tarsomeres on fore and mid legs, distal  $\frac{1}{4}$  of hind tibia and all of hind tarsus blackish. Thorax dark brown, with dense pubescence and short hairs; anterior tubercle of mesonotum small. Spermatheca large, oval; measuring 0.173 by 0.122 mm with narrow neck 0.018 mm long.



Table 1.—Numerical values for species of *Paryphoconus*.

Species	Wing length (mm)	Costal ratio	Antennal ratio
<i>aemulus</i>	3.3	0.89	1.18
<i>amapaensis</i>	6.0	—	0.99
<i>angustipennis</i>	5.8–6.5	0.91	1.35
<i>anomalicornis</i>	3.1–4.2	0.88	1.60
<i>apicalis</i>	2.2–2.5	0.91	1.65
<i>barrettoi</i>	6.5	0.90	1.8
<i>batesi</i>	6.5	0.95	—
<i>brunneipennis</i>	2.2	0.90	1.45
<i>ecuadorensis</i>	2.2	0.90	2.38
<i>enderleini</i>	3.0	—	1.50
<i>futkaui</i>	2.9	0.88	2.60
<i>flavidus</i>	2.3	0.89	1.78
<i>flinti</i>	4.3	0.91	1.50
<i>fusciradialis</i>	1.5	0.88	1.74
<i>fuscus</i>	5.0	0.87	3.10
<i>goianensis</i>	6.0	0.93	—
<i>grandis</i>	5.0–7.0	0.98	—
<i>guianae</i>	2.9	0.87	2.00
<i>kiefferi</i>	5.5	—	1.42
<i>latipennis</i>	1.5	0.91	2.05
<i>leei</i>	2.4	0.90	2.00
<i>macfei</i>	6.5	0.90	—
<i>maya</i>	2.5	0.88	1.95
<i>mayeri</i>	2.4	—	—
<i>neotropicalis</i>	3.2	—	1.10
<i>nigripes</i>	5.5	—	0.92
<i>nubifer</i>	3.0	0.87	1.20
<i>oliveirai</i>	4.0	—	1.55
<i>paranaensis</i>	4.6	0.99	0.71
<i>paulistensis</i>	4.0	—	—
<i>sonorensis</i>	3.8	0.98	1.18
<i>steineri</i>	2.8	0.90	2.24
<i>subflavus</i>	2.5	0.90	1.40
<i>terminalis</i>	2.0	0.87	1.70
<i>unimaculatus</i>	6.0	—	2.00
<i>wirthi</i>	2.5	—	—
<i>wygodzinskyi</i>	2.6	—	—

*Paryphoconus guianae* Macfie  
Fig. 13k

*Paryphoconus guianae* Macfie, 1940c:180 (female; Guyana).—Lane, 1956:302 (Brazil record).—Lane, 1961b:456 (Brazil records).—Wirth and Ratanaworabhan, 1972:1377 (erroneous synonym of *terminalis*).

*Distribution*.—Brazil, Ecuador, Guyana.  
*New Record*.—ECUADOR: Pastaza, Cononaco, 30 May 1976, J. Cohen, at light, 1 female.

*Notes*.—A small black species; wing hyaline with tip faintly infuscated (Fig. 13k). Wing length 2.9 mm; costal ratio 0.91. Antenna all dark brown; antennal ratio 2.00. The species is almost identical with the widespread species, *P. ter-*



*minalis* (Coquillett) and Wirth and Ratanaworabhan erroneously made *P. guianae* a junior synonym in 1972. *Paryphoconus terminalis* is a smaller species (wing 2.0 mm long), and segments 3–10 of the antennae are whitish.

*Paryphoconus latipennis*, new species

Figs. 7, 13l

*Female*.—Wing length 1.50 (1.30–1.60,  $n = 4$ ) mm; breadth 0.54 (0.48–0.58,  $n = 4$ ) mm.

Head: Dark brown, except frontoclypeus and palpus pale brown. Eyes broadly separated, for a distance equal to diameter of 8 ommatidial facets (0.140 mm). Antenna (Fig. 7a) entirely brown; lengths of flagellar segments in proportion of 35-23-20-19-21-23-22-24-70-70-70-72-102; antennal ratio 2.05 ( $n = 2$ ); verticils and setae sparse and fine, no black hastate setae. Palpus short, lengths of segments in proportion of 7-14-17-10-15.

Thorax: Dark brown; mesonotum with a small, erect, anterior spine. Legs (Fig. 7b, c) yellowish, apex of hind tibia and distal 3 tarsomeres brown; hind tarsal ratio 2.42 (2.30–2.50,  $n = 4$ ). Wing (Fig. 13l) infuscated over entire surface; broad posteriorly, anal angle poorly developed; radial cell broad, vein R4+5 more or less arcuate; costal ratio 0.91 (0.90–0.93,  $n = 4$ ). Halter pale.

Abdomen: Brown. One pair of slender, lightly sclerotized, gland rods; spermatheca (Fig. 7d) oval with short neck, measuring 0.053 by 0.046 mm, with neck 0.010 mm long.

*Male*.—Wing length 1.30 mm; breadth 0.40 mm. Similar to female with usual sexual differences. Antenna with lengths of flagellar segments in proportion of 38-24-22-21-20-20-20-20-20-25-75-100-135. Wing with costal ratio 0.88. Genitalia (Fig. 7f): Ninth sternite with very deep caudomedian excavation; 9th tergite with 2 rounded apicolateral lobes. Gonocoxite short, with pointed mesal protuberance and more or less developed ventromesal lobe; gonostylus elongated, slender. Aedeagus with very high basal arch and slender pointed tip. Parameres (Fig. 7e) separate, slender, each with distal portion slightly expanded in a bladelike process.

*Distribution*.—Colombia, Venezuela.

*Types*.—Holotype female, Colombia, Rio Raposo., Apr 1963, V. H. Lee, light trap. Allotype male, same data except May 1965. Paratypes, 3 females, as follows: COLOMBIA: same data as types except Oct 1964, 1 female, and Feb 1965, 1 female. VENEZUELA: Guarico, 12 km S Calabozo, 6 Feb 1969, P. and P. Spangler, light trap, 1 female.

*Discussion*.—The reduced size distinguishes *P. latipennis* from all other congeners with entirely infuscated wings except *P. fusciradialis*; characters to separate these two species are found in the key and the discussion of the latter species.

*Paryphoconus leei*, new species

Figs. 8, 14a

*Female*.—Wing length 2.37 (2.32–2.45,  $n = 3$ ) mm; breadth 0.66 (0.64–0.68,  $n = 3$ ) mm.

Head: Dark brown including scape and pedicel. Eyes separated for a distance equal to diameter of 3.5 ommatidial facets (0.060 mm). Antenna (Fig. 8a) brown,



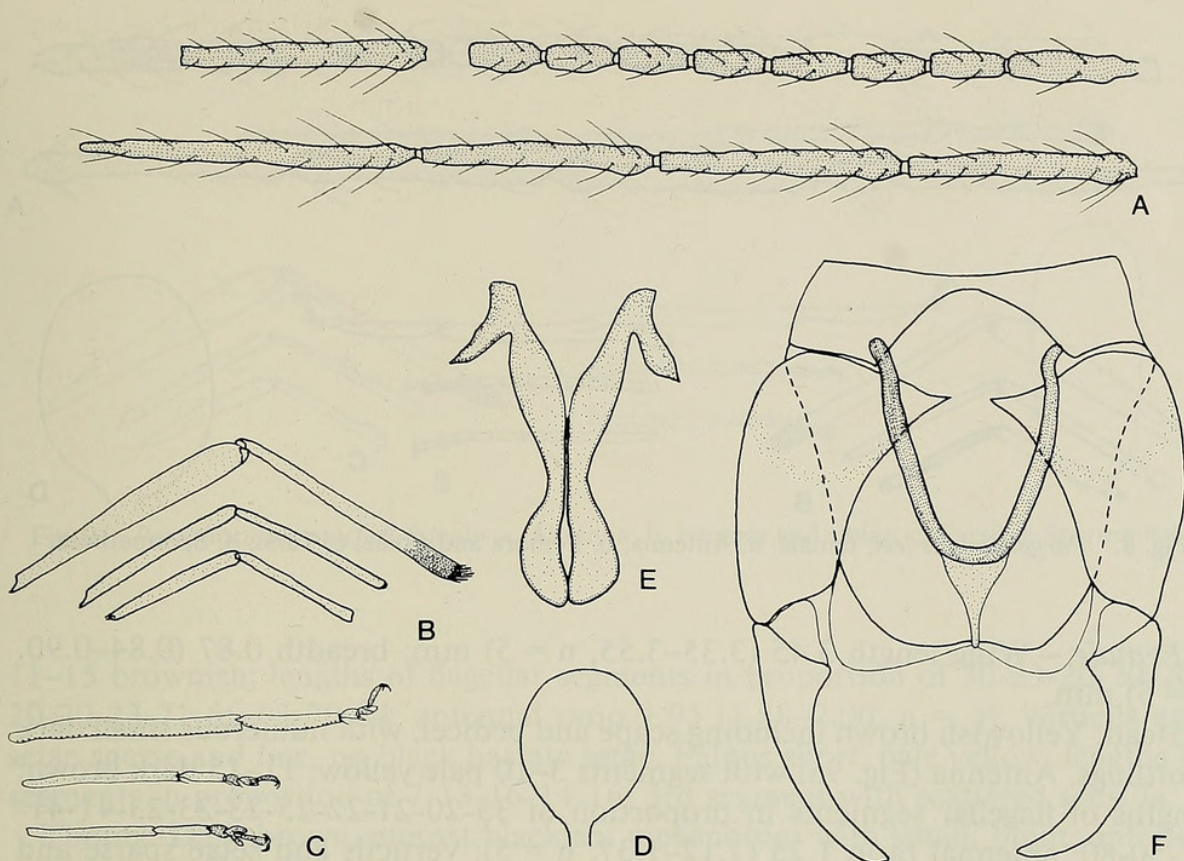


Fig. 7. *Paryphoconus latipennis*; a-d, female; e-f, male: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermathecae; e, Parameres; f, Genitalia, parameres omitted.

bases of flagellar segments 4-10 pale; lengths of flagellar segments in proportion of 45-26-24-24-24-25-25-28-84-77-77-80-125; antennal ratio 2.00 ( $n = 2$ ); verticils and setae sparse and fine, no black hastate setae. Palpus short, last segment deeply infuscated; 3rd segment broad (palpal ratio 1.25) with scattered sensilla; lengths of palpal segments in proportion of 10-15-16-11-16.

Thorax: Uniformly blackish; mesonotum with very small anterior spine. Legs (Fig. 8b, c) yellowish, fore tibia all brown; basitarsus of mid leg with single row of palisade setae; hind tarsal ratio 2.38 (2.28-2.46,  $n = 3$ ). Wing (Fig. 14a) narrow, especially toward apex; membrane infuscated over entire surface, gradually darker toward costa; radial cell narrow; costal ratio 0.90 ( $n = 3$ ). Halter dark.

Abdomen: Very dark brown. Four pairs of well sclerotized gland rods; spermatheca (Fig. 8d) oval with very short neck, measuring 0.078 by 0.060 mm.

*Male*.—Unknown.

*Distribution*.—Colombia.

*Types*.—Holotype female, Colombia, Valle, Rio Raposo, Aug 1964, V. H. Lee, light trap. Paratypes, 2 females, same data except Mar 1964 and Jun 1965.

*Discussion*.—This species can be distinguished from other related species by the narrow distal portion of the wing, and by the entirely brown fore tibia.

### *Paryphoconus macfiei* Lane

Figs. 9, 14b

*Paryphoconus macfiei* Lane, 1946:203 (female; Brazil; fig. wing).—Wirth and Ratanaworabhan, 1972:1371 (in key).



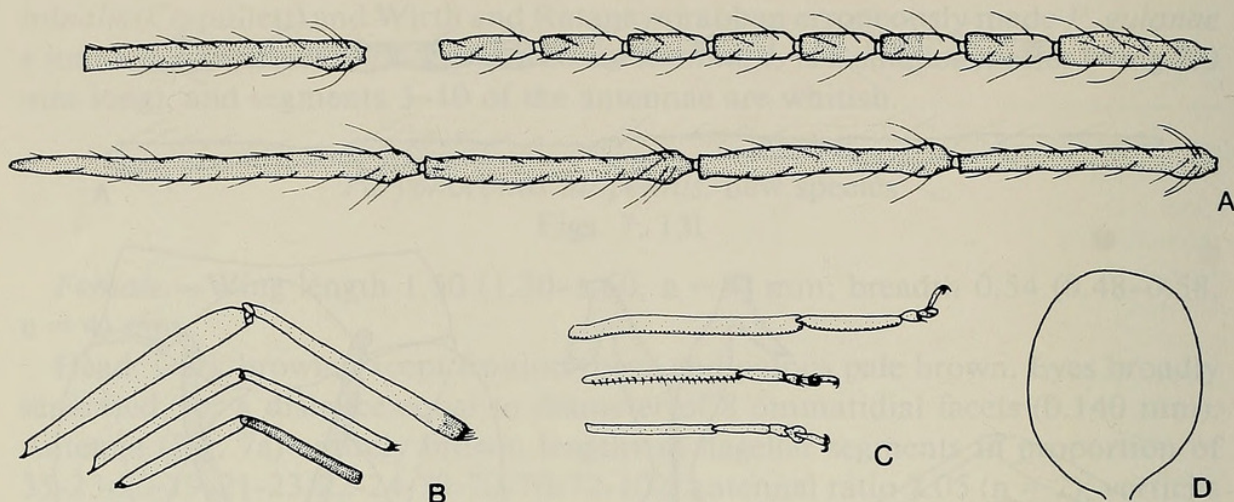


Fig. 8. *Paryphoconus leei*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

*Female*.—Wing length 3.45 (3.35–3.55,  $n = 5$ ) mm; breadth 0.87 (0.84–0.90,  $n = 5$ ) mm.

Head: Yellowish brown including scape and pedicel, with numerous small dark mottlings. Antenna (Fig. 9a) with segments 3–10 pale yellow, 11–15 dark brown; lengths of flagellar segments in proportion of 35-20-21-22-23-23-23-41-41-47-50-80; antennal ratio 1.25 (1.12–1.37,  $n = 5$ ); verticils and setae sparse and fine, no black hastate setae. Palpus moderately long, 3 proximal segments brown, last 2 dark brown; 3rd segment with scattered sensilla; lengths of segments in proportion of 10-18-28-18-28.

Thorax: Yellowish to brown with small dark mottlings; mesonotum with very small, blunt, anterior spine. Legs (Fig. 9b, c) dirty yellowish brown; tibiae much infuscated, only tip of hind tibia dark brown; tarsi yellowish brown, last 2 tarsomeres infuscated; hind tarsal ratio 2.20 (2.15–2.30,  $n = 5$ ). Wing (Fig. 14b) as in *P. angustipennis*, but infuscation also lighter between the 3 bands; costal ratio 0.90 (0.90–0.91,  $n = 5$ ). Halter pale.

Abdomen: Brown, terga shining black. Five pairs of sclerotized gland rods; spermatheca (Fig. 9d) very elongate oval with short neck, measuring 0.156 by 0.060 mm.

*Male*.—Unknown.

*Distribution*.—Brazil, Ecuador, Venezuela.

*Specimens Examined*.—BRAZIL: Mato Grosso, Cuiaba, 4 Apr 1972, W. H. Whitcomb, 10 females. ECUADOR: Pastaza, Cononaco, 30 May 1976, J. Cohen, light trap, 3 females (wing bands more distinct in this series). VENEZUELA: Bolivar, Anacoco, Rio Cuyuni, 1–23 Aug 1979, Exp. Sta. La Salle, 1 female (wing bands distinct, only distal band prominent).

*Paryphoconus maya*, new species

Figs. 10, 14c

*Female*.—Wing length 2.45 (2.35–2.51,  $n = 5$ ) mm; breadth 0.64 (0.61–0.66,  $n = 5$ ) mm.

Head: Dark brown. Eyes separated for a distance equal to diameter of 4 ommatidial facets (0.060 mm). Antenna (Fig. 10a) with flagellar segments 3–10 white,



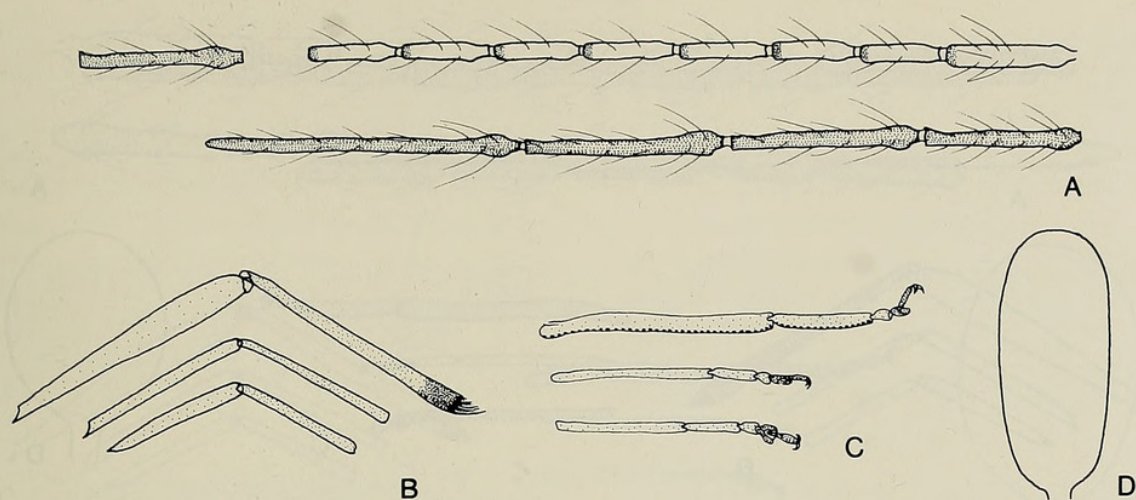


Fig. 9. *Paryphoconus macfieii*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

11–15 brownish; lengths of flagellar segments in proportion of 30-23-20-20-20-20-20-23-71-66-63-70-84; antennal ratio 1.95 (1.88–2.00,  $n = 5$ ); verticils and setae sparse and fine, no black hastate setae. Palpus short, pale yellow; lengths of segments in proportion of 7-13-16-14-16; 3rd segment with scattered sensilla.

Thorax: Dark brown, almost blackish; mesonotum with small, blunt, anterior spine. Legs (Fig. 10b, c) dirty yellowish, fore and mid tibiae brownish hind tibia dark brown (specimens from Mexico with only distal  $\frac{1}{2}$  of hind tibia dark brown); tarsi brownish, hind tarsus wholly brown (base of hind basitarsus slightly pale in some specimens); hind tarsal ratio 1.90 (1.83–2.00,  $n = 5$ ). Wing (Fig. 14c) narrow; membrane white, narrow apex infuscated; costa, radius, r-m, and Cul with faint dark mark; M1, M2, and M3+4, when infuscated, only at tips and then very slightly; costal ratio 0.88 (0.87–0.89,  $n = 5$ ). Halter dark brown, end of knob blackish.

Abdomen: Dark brown. Apparently with 3 pairs of sclerotized gland rods; spermatheca (Fig. 10d) oval with relatively long neck, measuring 0.058 by 0.049 mm with neck 0.018 mm long.

*Male*.—Unknown.

*Types*.—Holotype female, Belize, Cayo District, Western Hwy MP 66, Jun 1969, W. and D. Hasse, light trap. Paratypes, 8 females, as follow: BELIZE: same data as holotype, 6 females. MEXICO: San Luis Potosi, El Salto, 8 May 1964, F. S. Blanton, light trap, 2 females.

*Discussion*.—The species can be distinguished from related species by the coloration of the legs, especially the dark brown hind tibia. The antennal coloration is similar to that of *P. fittkaui* n. sp., but *P. fittkaui* is larger (wing length 2.9 mm) and the antennal ratio is much higher (2.60).

### *Paryphoconus nubifer* Macfie

Fig. 14f

*Paryphoconus nubifer* Macfie, 1939:5 (female; Brazil; fig. wing).—Lane, 1946:206 (Brazil record).—Lane, 1956:300 (in key).—Wirth and Ratanaworabhan, 1972: 1374 (female diagnosis; figs.; distribution).



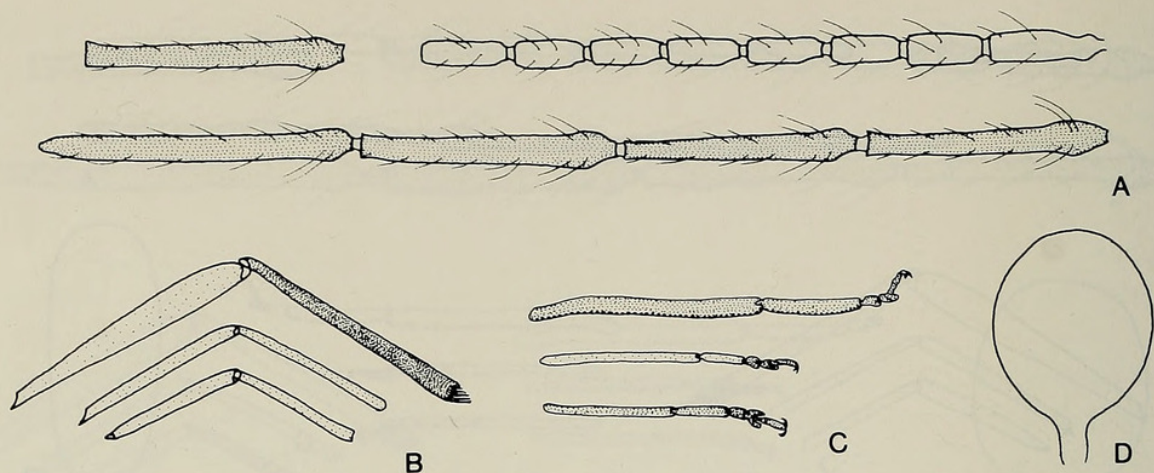


Fig. 10. *Paryphoconus maya*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

*Distribution.*—Argentina, Bolivia, Brazil, Paraguay, Uruguay.

*New Records.*—ARGENTINA: Misiones, Arroyo Piray Guazu, N San Pedro, 22 Nov 1973, O. S. Flint, Jr., 4 females. PARAGUAY: Rio Aquidoban, Cerro Cora, 29 Nov 1973, O.S. Flint, Jr., 1 female.

*Notes.*—Wirth and Ratanaworabhan's (1972) record from Panama is erroneous, and this species does not occur north of Bolivia and Brazil. The species is readily distinguished by the extensive dark mark around the wing tip and the prominently infuscated veins (Fig. 14f). The antenna is unusually short and entirely black.

*Paryphoconus oliveirai* Lane

Fig. 14g

*Paryphoconus oliveirai* Lane, 1956:303 (female; Brazil).—Wirth and Ratanaworabhan, 1972:1374 (female redescribed; pupa; figs.; Brazil).

*Distribution.*—Brazil, Colombia.

*New Record.*—COLOMBIA: Amazonas, Leticia, 7 Sep 1969, D. H. Messersmith, at light, 1 female.

*Note.*—Wing as in Fig. 14g.

*Paryphoconus paranaensis*, new species

Figs. 11, 14h

*Female.*—Wing length 4.60 (4.45–4.70,  $n = 3$ ) mm; breadth 1.18 (1.15–1.20,  $n = 3$ ) mm.

Head: Dark brown. Eyes separated for a distance equal to diameter of 4 ommatidial facets (0.065 mm). Antenna (Fig. 11a) short, entirely dark brown; lengths of flagellar segments in proportion of 35-19-20-19-18-20-19-18-24-21-23-21-27; antennal ratio 0.71 (0.65–0.79,  $n = 3$ ); verticils and setae sparse and fine, no black hastate setae. Palpus short, pale brown; lengths of segments in proportion of 13-25-17-14-22; 3rd segment short and broad (palpal ratio 1.15), bearing scattered sensilla on midportion.

Thorax: Dark reddish brown; mesonotum with prominent, pale, pointed anterior spine (visible only on holotype). Legs (Fig. 11b, c) bright yellow, deep shade;



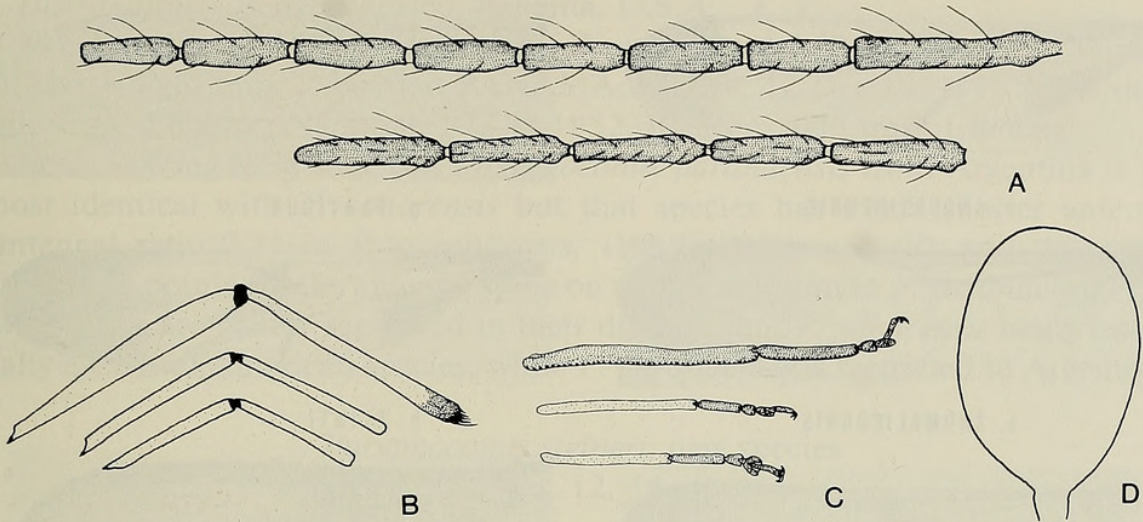


Fig. 11. *Paryphoconus paranaensis*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.

knees blackish, narrow apex of hind tibia dark brown; tarsi dark brown except fore and mid basitarsi pale brown; hind tarsal ratio 2.20 (2.15–2.25, n = 3). Wing (Fig. 14h) pale, gradually darkening at distal ½ of costa to wing tip; costal ratio 0.99 (n = 3). Halter stem pale brown, knob dark.

Abdomen: Dark brown, terga not shining. Spermatheca (Fig. 11d) elongate oval with moderately long neck; measuring 0.095 by 0.060 mm, neck 0.012 mm long.

Male.—Unknown.

Distribution.—Argentina.

Types.—Holotype female and 2 female paratypes, Argentina, Misiones Prov., Arroyo Piray Guazu, NE San Pedro, 22 Nov 1973, O. S. Flint, Jr.

Discussion.—This species is very similar to *Paryphoconus sonorensis* Wirth and Ratanaworabhan, from which it differs especially by the short antenna (antennal ratio 0.71 vs 1.18 in *P. sonorensis*). In addition, all the type material of *P. sonorensis* lacks the prominent anterior mesonotal spine found in the holotype of *P. paranaensis*.

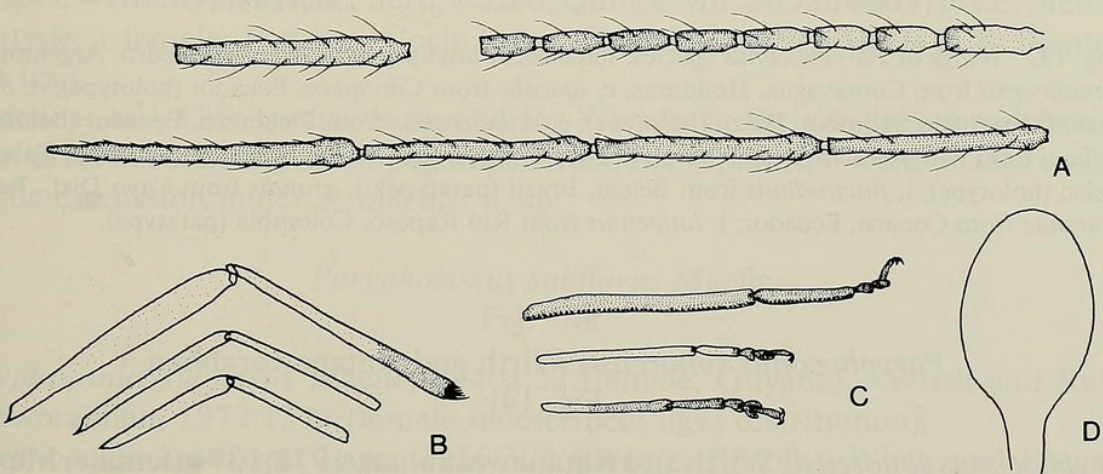


Fig. 12. *Paryphoconus steineri*, female: a, Antenna; b, Femora and tibiae; c, Tarsi; d, Spermatheca.



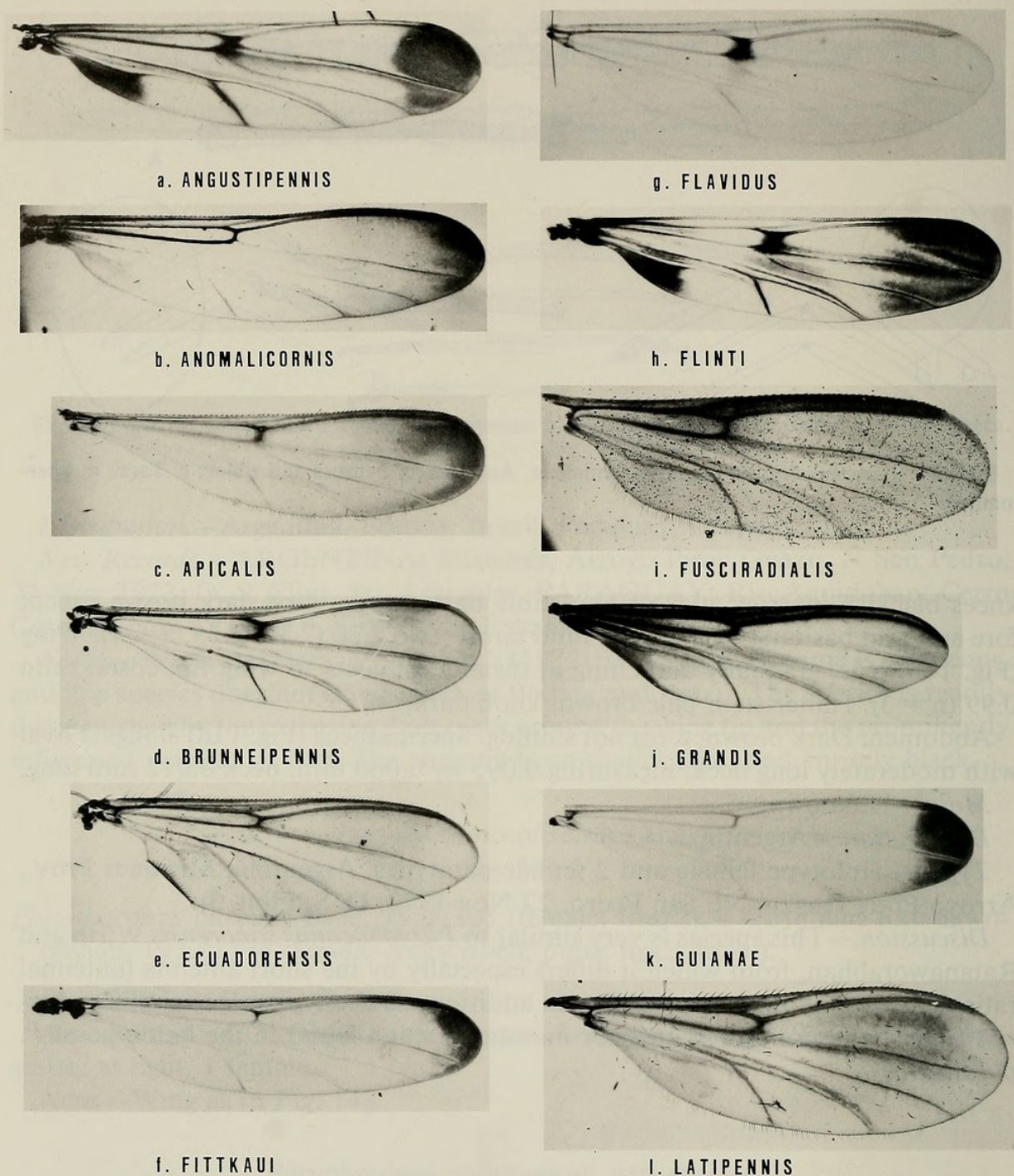


Fig. 13. Wings of *Paryphoconus* species, females: a, *angustipennis* from San Pedro, Argentina; b, *anomalicornis* from Comayagua, Honduras; c, *apicalis* from Cononaco, Ecuador (holotype); d, *brunneipennis* from Rio Solimões, Brazil (holotype); e, *ecuadorensis* from Pichincha, Ecuador (holotype); f, *fittkaui* from Rio Marauia, Brazil (holotype); g, *flavidus* from Cuiaba, Brazil; h, *flinti* from Tabasco, Mexico (holotype); i, *fusciradialis* from Belem, Brazil (paratype); j, *grandis* from Cayo Dist., Belize; k, *guianae* from Conaco, Ecuador; l, *latipennis* from Rio Raposo, Colombia (paratype).

*Paryphoconus sonorensis* Wirth and Ratanaworabhan

Fig. 14i

*Paryphoconus sonorensis* Wirth and Ratanaworabhan, 1972:1374 (female; Mexico (Sonora), U.S.A. (Oklahoma); figs.).



*Distribution.*—Belize, Mexico, Panama, U.S.A.

*New Records.*—BELIZE: Cayo Dist., Western Hwy. MP 66, Jun 1969, W. and D. Hasse, light trap, 2 females. PANAMA: Dolega, 12 Dec 1952, F. S. Blanton, light trap, 2 female; Naranjal, 10 Oct 1952, Blanton, light trap, 1 female.

*Notes.*—Wing as in Fig. 14i. *Paryphoconus paranaensis* from Argentina is almost identical with *P. sonorensis* but that species has much shorter antenna (antennal ratio 0.71 in *P. paranaensis*, 1.18 in *P. sonorensis*), and there is a prominent pointed, pale, anterior spine on the mesonotum in *P. paranaensis*. The two species are widely separated in their distribution, *P. sonorensis* being essentially a Central American species, while *P. paranaensis* is restricted to Argentina.

*Paryphoconus steineri*, new species

Figs. 12, 14j

*Female.*—Wing length 2.80 (2.60–3.00,  $n = 2$ ) mm; breadth 0.71 (0.65–0.78,  $n = 2$ ) mm.

Head: Dark brown. Eye separation not visible on slide preparations available. Antenna (Fig. 12a) dark brown, 4 proximal segments slightly paler; lengths of flagellar segments in proportion of 40-26-24-26-26-25-25-25-96-88-88-92-122; antennal ratio 2.24; verticils and setae sparse and fine, no black hastate setae. Palpus short, yellow; lengths of segments in proportion of 9-15-20-14-18; 3rd segment with scattered sensilla.

Thorax: Uniformly blackish. Mesonotum apparently without anterior spine. Legs (Fig. 12b, c) pale yellow, distal  $\frac{1}{3}$  of hind tibia dark brown; tarsi dark brown except tarsomeres 1 and 2 of mid leg and proximal  $\frac{1}{3}$  of basitarsus of hind leg pale; hind tarsal ratio 1.85 (1.80–1.90,  $n = 2$ ). Wing (Fig. 14j) with anal angle poorly developed; membrane whitish with narrow tip infuscated; costa, radius and r-m crossvein all infuscated; M1, M2, M3+4 and Cul infuscated only distally; radial cell very narrow; costal ratio 0.90 ( $n = 2$ ). Halter yellowish, end of knob darkish.

Abdomen: Dark brown. Four pairs of sclerotized gland rods. Spermatheca (Fig. 12d) elongate oval, with long neck broad at base; measuring 0.070 by 0.045 mm, plus neck 0.025 mm long.

*Male.*—Unknown.

*Distribution.*—Panama, Peru.

*Types.*—Holotype female, Peru, Cuzco, Quince Mil, 26 Jan 1979, W. E. Steiner. Paratype, 1 female, Panama, Cocle Prov., Hermita, 18 Sep 1952, F. S. Blanton, light trap.

*Discussion.*—This species is named for Warren E. Steiner, in appreciation of his interest in collecting ceratopogonids for us. For separation from related species see the discussion under *P. apicalis* n. sp.

*Paryphoconus subflavus* Macfie

Fig. 14k

*Paryphoconus subflavus* Macfie, 1940a:23 (female; Guyana).—Wirth and Ratana-worabhan, 1972:1376 (female redescribed; figs.; distribution).

*Paryphoconus travassosi* Lane, 1956:304 (female; Brazil).—Wirth and Ratana-worabhan, 1972:1378 (female redescribed; figs.; Brazil). New Synonymy.



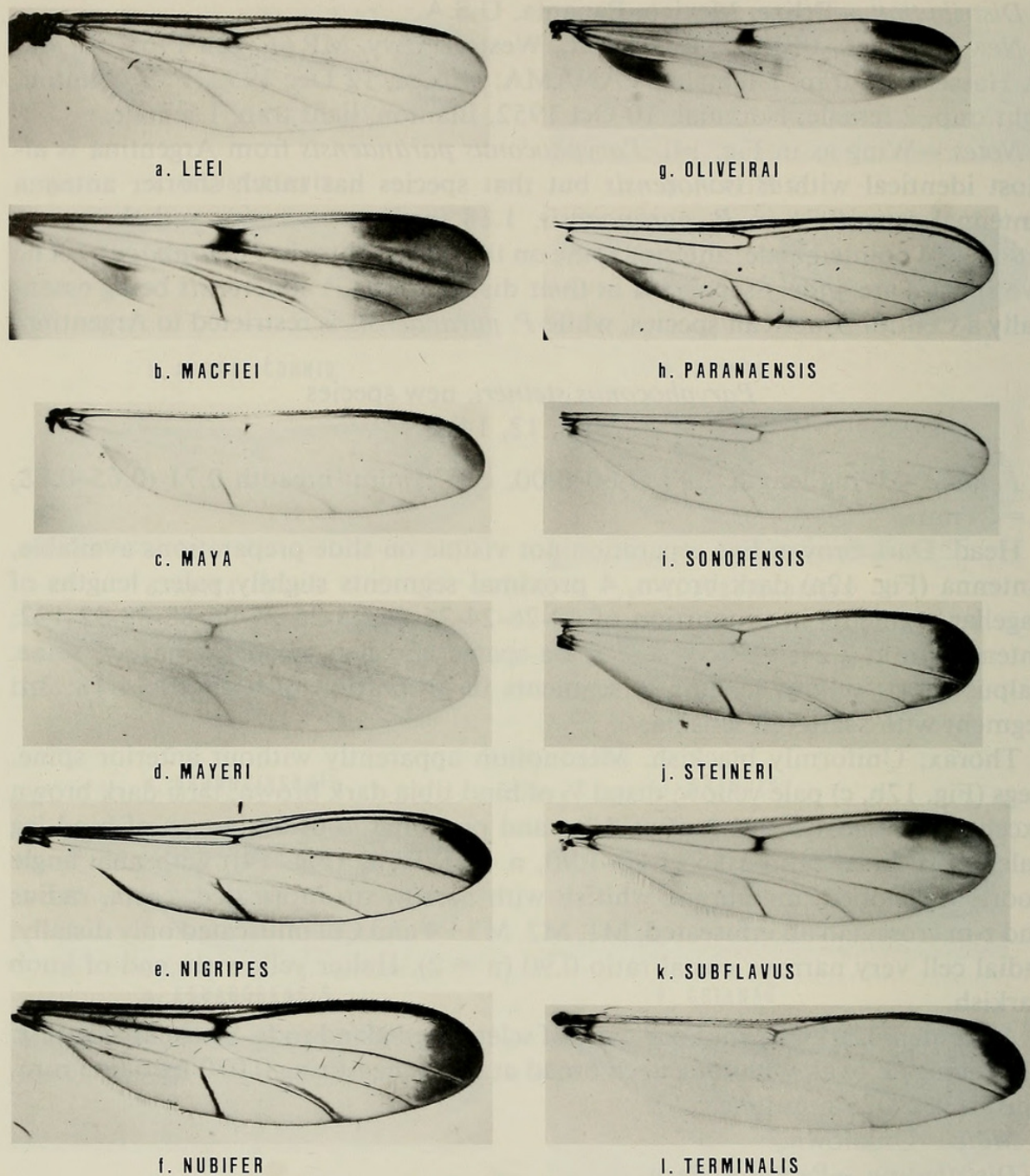


Fig. 14. Wings of *Paryphoconus* species, females: a, *leei* from Rio Raposo, Colombia (holotype); b, *macfiei* from Cuiaba, Brazil; c, *maya* from Cayo District, Belize (holotype); d, *mayeri* from Tabacorama, Brazil (holotype); e, *nigripes* from Cuiaba, Brazil; f, *nubifer* from San Pedro, Argentina; g, *oliveirai* from Leticia, Colombia; h, *paranaensis* from San Pedro, Argentina (paratype); i, *sonorensis* from Sonora, Mexico (paratype); j, *steineri* from Cuzco, Peru (holotype); k, *subflavus* from Rio Raposo, Colombia; l, *terminalis* from Tocumen, Panama.

*Distribution.*—Brazil, Colombia, Guyana.

*Note.*—Wing as in Fig. 14k. The characters which Wirth and Ratanaworabhan (1972) used to separate *P. subflavus* and *P. travassosi*, the dark line along vein Cul, and the infuscation on the fore and mid tibiae, are entirely unreliable, and in our opinion *P. travassosi* is a junior synonym.



*Paryphoconus telmatophilus* (Macfie), new combination

*Bezzia* (*Probezzia*) *telmatophila* Macfie, 1940b:77 (male; Brazil; figs.).

*Bezzia telmatophila* Macfie.—Lane, 1958:35 (male redescribed; fig. genitalia; Brazil).

*Distribution*.—Brazil.

*Notes on Types*.—Through the courtesy of Richard Lane and the Trustees of the British Museum (Nat. Hist.) Macfie's holotype of *Bezzia telmatophilus* was examined and found to belong to the genus *Paryphoconus*. The male that Lane (1958) described as the allotype of *P. telmatophilus* is not congeneric with Macfie's species and appears to represent the male (taken at the same time and place) of Lane's new species *Bezzia brasiliensis*, which is a junior synonym of *Nilobezzia schwarzii* (Coquillett).

Because of the difficulty of distinguishing species of *Paryphoconus* in the male we are treating this species as a species inquirenda in *Paryphoconus*.

*Paryphoconus terminalis* (Coquillett)

Fig. 141

*Ceratopogon terminalis* Coquillett, 1904:90 (female; Nicaragua).

*Paryphoconus terminalis* (Coquillett).—Wirth and Ratanaworabhan, 1972:1377 (combination; erroneous synonym *guianae*; redescribed female; figs.; distribution).

*Distribution*.—Belize, Brazil, Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Peru.

*New Records*.—BELIZE: Cayo Dist., Western Hwy. MP 66, Jun 1969, W. and D. Hasse, light trap, 2 females. ECUADOR: Pastaza, Cononaco, 30 May 1976, J. Cohen, at light, 1 female.

*Notes*.—Wing as in Fig. 141. Wirth and Ratanaworabhan's synonymy of *P. guianae* Macfie under *P. terminalis* was erroneous. Characters for separating the two species are given in the key and in the discussion under *P. guianae*, *P. terminalis* appears to be one of the most widespread species of the genus, and is fairly common in collections.

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