

**PSYCHODOPYGUS LEONIDASDEANEI A NEW SPECIES OF SAND FLY  
(DIPTERA: PSYCHODIDAE) FROM PARÁ STATE, BRAZIL**

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*The male and female of Psychodopygus leonidasdeanei n.sp., (Diptera: Psychodidae) are described and illustrated from specimens collected in Shannon traps near Santarém, Pará State, Brazil. This species is a member of the squamiventris series and information is given on the distribution of the members of this series in Pará. A pictorial guide to separate the males and some females from others in the series is given.*

Key words: sand fly – taxonomy – Diptera – Psychodidae – Phlebotominae – *Psychodopygus*

During this Unit's work on the epidemiology of cutaneous leishmaniasis along the areas traversed by the Transamazon highway in 1971-1975 we referred to a newly discovered sand fly of the *squamiventris* group, as *P. sp.n.* 401.63 (Fraihá et al., 1978). In our more recent work on the epidemiology of visceral leishmaniasis in Santarém (Lainson et al., 1985) we reencountered this fly, some 80km north from our earlier localities.

The species is dedicated to the eminent, paraense scientist, Professor Leonidas de Mello Deane, presently at the Instituto Oswaldo Cruz as an expression of our respect, gratitude and friendship.

*Psychodopygus leonidasdeanei* Fraihá, Ryan, Ward, Lainson & Shaw, new species  
Figs. 1 (1-10), 2 (5) and Map 1. All measurements in cms.

**Holotype** ♂. Wing length 1.44; width 0.51. The mesoscutum, mesoscutellum and the upper half of the pronotum infuscated dark brown. Head height from vertex to tip of clypeus 0.35; width 0.36. Eyes separated by 0.08. Flagellomere I, 0.29 long, II + III = 0.25; ascoids on II .07 long. Labrum 0.21 long. Length of palpal segments: 1, 0.04; 2, 0.12; 3, 0.12; 4, 0.05; 5, 0.06. Cibarium with about six dotlike remnants of teeth. Pharynx 0.17 long. Pleura with 16 upper and 11 lower episternal setae. Lengths of wing vein sections: *alpha*, 0.42; *beta*, 0.25; *delta*, 0.20; *gamma*, 0.15. Lengths of femora, tibiae, and basitarsi: foreleg, 0.74, 1.31, 0.80; hindleg, 0.85, 1.54, 0.87. **Genitalia.** Style 0.25 long, with one major spine and three small setae near the terminal spine. Coxite 0.35 long with an obvious median constriction. Paramere complex as shown, shaped like a diving bird such as a cormorant. The paramere has two long setae on the distal part, seven short setae along the median surface, three fine setae and nine blade like setae at the base. Aedeagus triangular, well pigmented, with an elongated tip and the ventral surface with a corrugated appearance. Genital pump 0.21 long, each filament slightly sclerotized, 0.70 long or ca. 3.5x length of pump; filament tips simple, appear as two widened gutters. Lateral lobe 0.33 long.

**Allotype** ♀. Wing length 2.17; width 0.67. Coloration as in ♂. Head height 0.46; width 0.42. Eyes separated by 0.13. Flagellomere I, 0.29 long, II + III = 0.23. Labrum 0.48 long. Lengths of palpal segments: 1, 0.08; 2, 0.20; 3, 0.23; 4, 0.06; 5, 0.07. Cibarium with four horizontal teeth about 16 vertical teeth. Pharynx 0.22 long. Pleura with 17 upper and 13 lower episternal setae. Lengths of wing vein sections: *alpha*, 0.61; *beta*, 0.31; *delta*, 0.34; *gamma*, 0.19. Lengths of femora, tibiae, and basitarsi: foreleg, 0.81, 1.25, 0.79; midleg, 0.78, 1.41, 0.84. Spermathecae as figured, body of the spermathecae with nine imbricated annulations, individual ducts about 2x the length of the body with "herringbone" striations, the individual duct is separated into three distinct sections. Common duct 1.5x length of the individual ducts with faint transverse striations present, terminal knob prominent with numerous fine hairs, each individual duct as wide as common duct.

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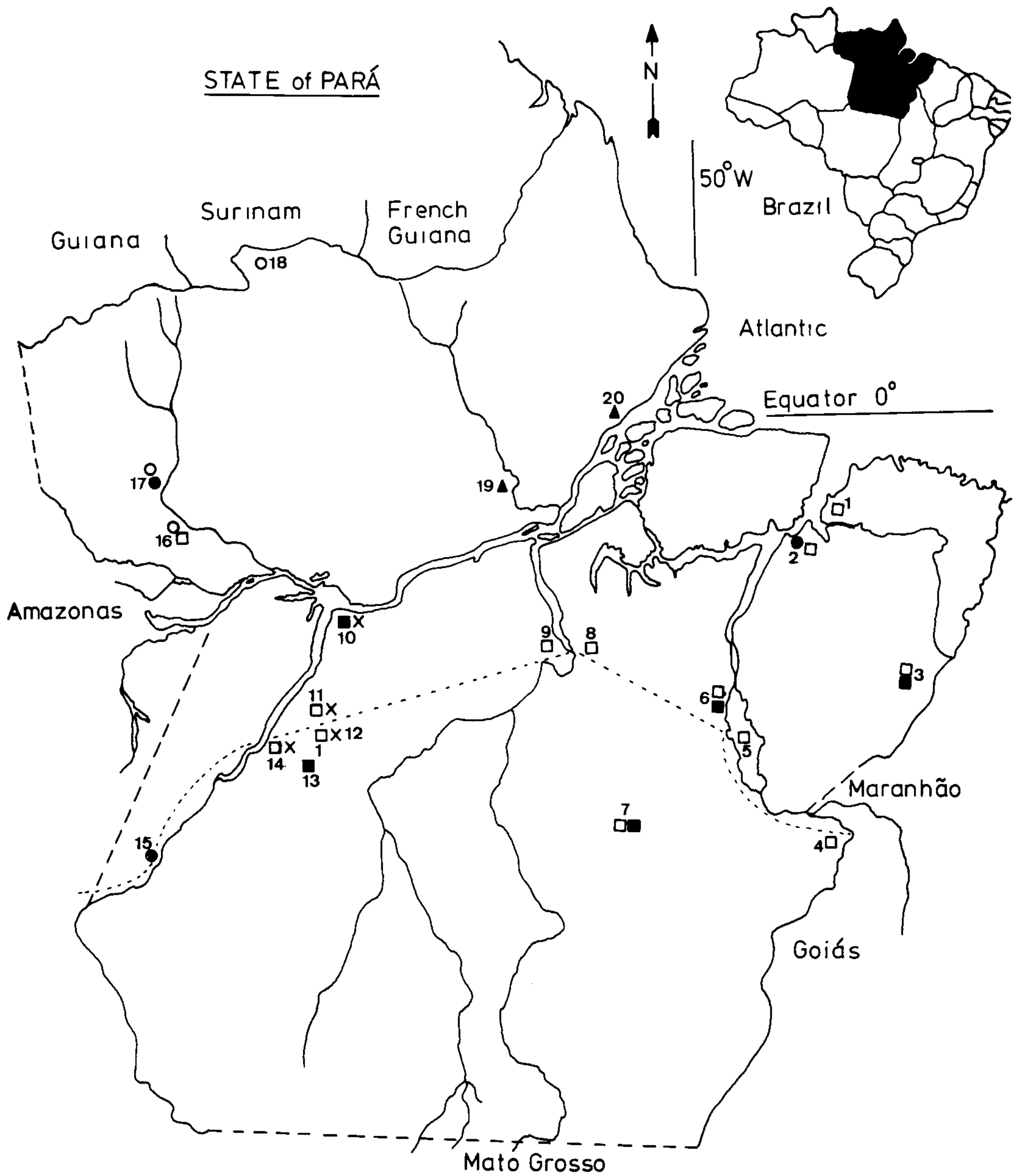
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Map 1

Distribution of the series *squamiventris* in the State of Pará, symbols represent (○) *P.s. squamiventris*; (▲) *P.s. maripaensis*; (●) *P. chagasi*; (■) *P. wellcomei*; (□) *P. complexus*; (x) *P. leonidasdeanei*. Collections were made at: 1. Pirelli forests, Belém; 2. Abaetetuba; 3. Fazenda Uraim, Paragominas; 4. Km 12 Marabá–Tocantinópolis; 5. near to Jacundan now 30 m under water; 6. Fazenda Urumatheua, Tucuruí; 7. Serra dos Carajás; 8. Km 9 Altamira–Itaituba; 9. Km 15 Belo Monte–rio Anapu; 10. Serra do BÉC, Santarém; 11. Km 112 Santarém–Cuiabá; 12. Rurópolis Presidente Médici (and 7 km to the north Km 211 Santarém–Cuiabá); 13. Km 112 Itaituba–Altamira; 14. Km 25 Itaituba–Altamira; 15. Jacareacanga; 16. Porto Trombeta; 17. Cachoeira Porteira; 18. Tiriós; 19. Jari; 20. Curiaú, Macapá. Data from our own collections and Fraiha et al., 1977 and Ready et al., 1982.

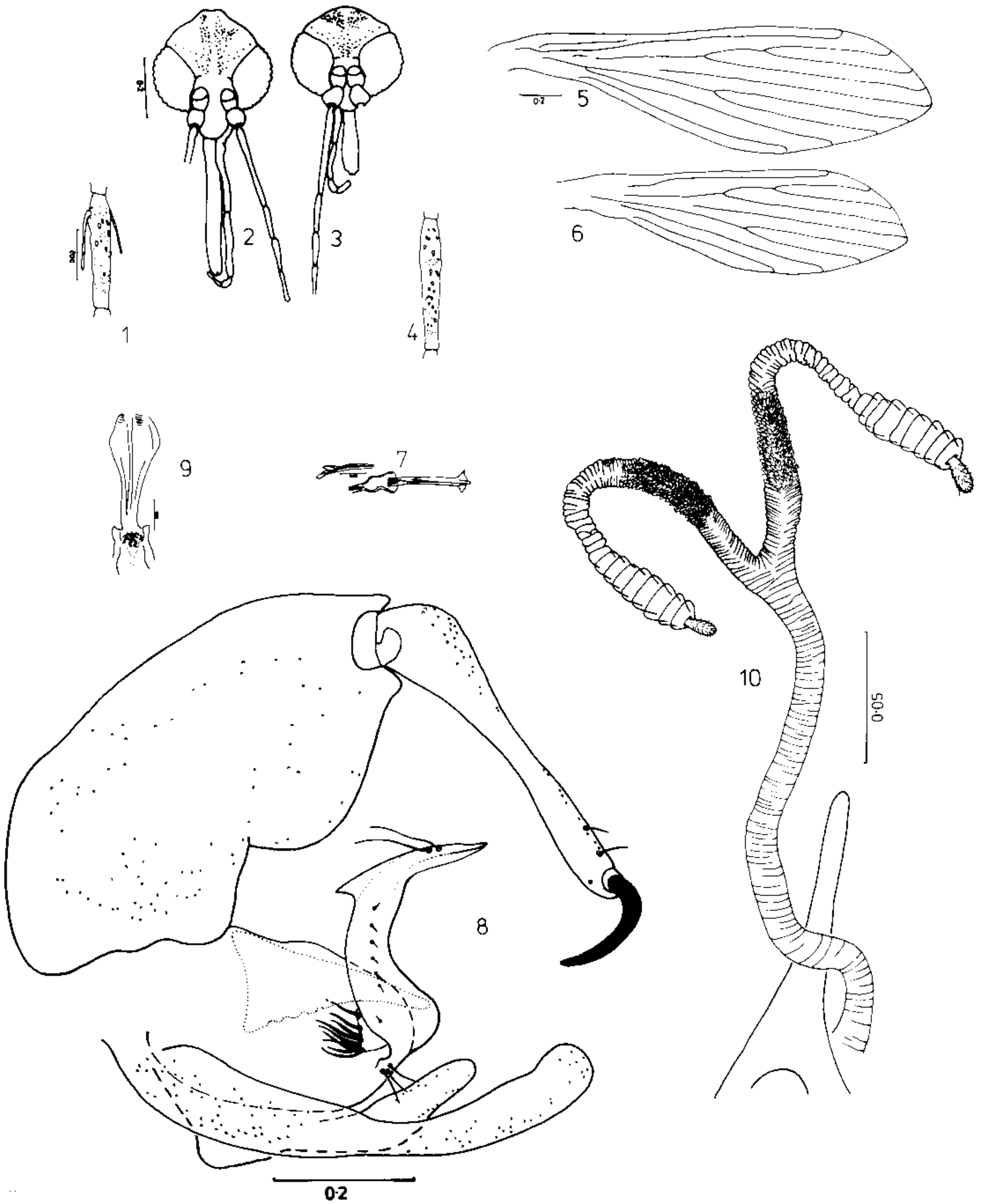


Fig. 1 (1-10) - *P. leonidasdeanei* Fraiha, Ryan, Lainson & Shaw, new species. Holotype and allotype. 1. ♀ flagellomere II; 2. ♀ head; 3. ♂ head; 4. ♂ flagellomere II; 5. ♀ wing; 6. ♂ wing; 7. genital pump and genital filament tips; 8. genitalia; 9. ♀ cibarium; 10. spermathecae. All drawn in Berlese medium to scales in mms.

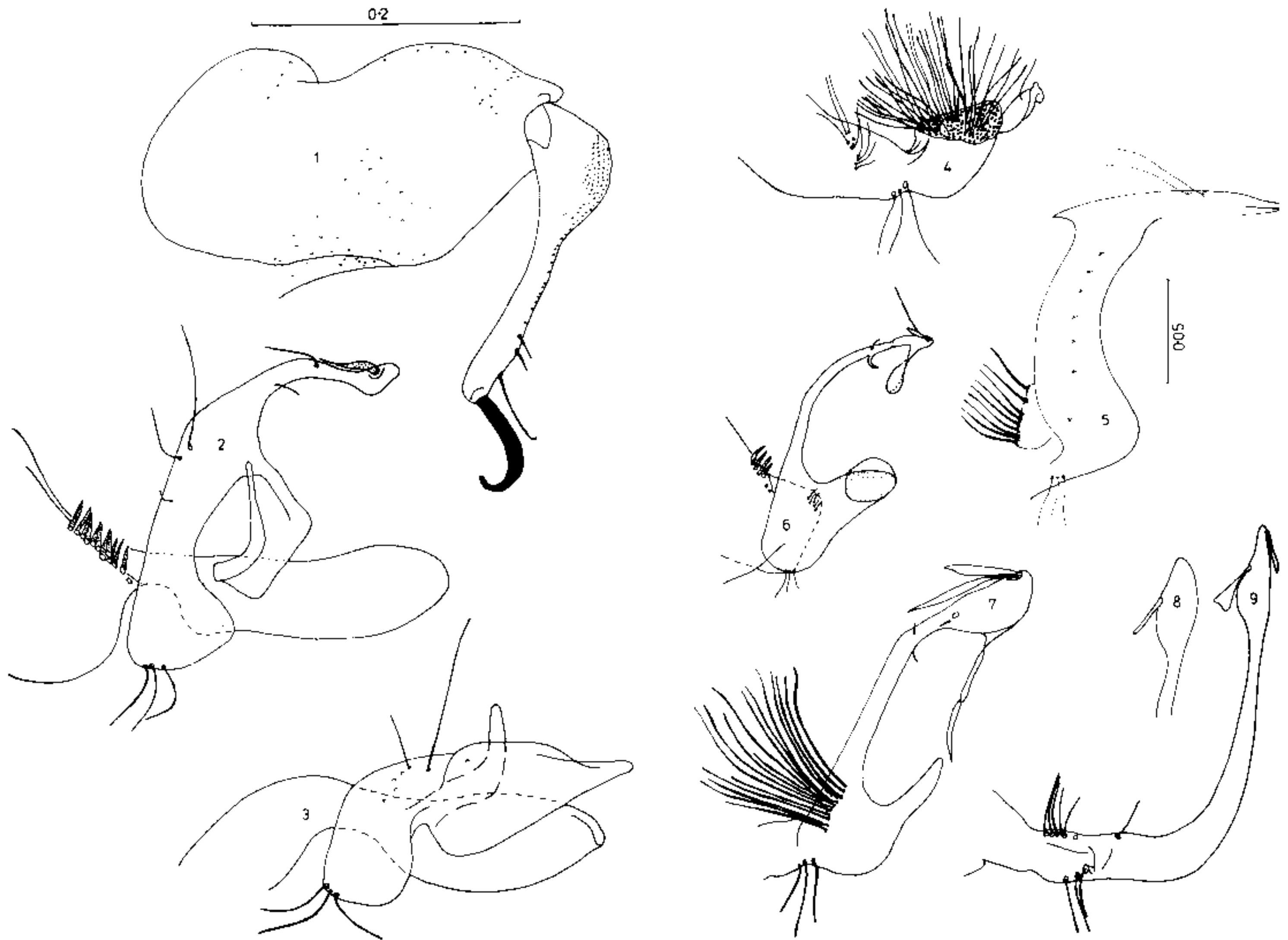


Fig. 2 (1-9) – Series *squamiventris*, male genitalia showing 1. the typical coxite with median constriction and the parameres of 2. *P. complexus*; 3. *P. wellcomei*; 4. *P. chagasi*; 5. *P. leonidasdeanei*; 6. *P. fairtigi* (after Fairchild & Hertig, 1951); 7. *P. bernalei*; 8. *P.s. squamiventris* (tip only) and 9. *P.s. maripaensis*. All drawn in Berlese medium to scale in mms.

**Type data** – Holotype ♂. Brazil. Pará State, Santarém, Serra do BEC, 2.50°S, 54.70°W, elev. about 100m, 16.VII.1985, Shannon trap.

**Allotype** ♀. Same data.

**Paratypes** 1♂ and 6♀, same data as holotype. 1♂ and 3♀ collected 20.VII.1984 in the same locality as above and 45♀ captured using human bait between 18 and 19:00 hrs, 3rd April 1975 on the Transamazonian highway, between Itaituba and Altamira (km 112). Also 80♀ and 100♂ laboratory reared from the eggs laid by the above females (by Fraiha & Ward). The latter are not included in the type series, however the males will be sent to other institutions.

Holotype, allotype and paratypes in collections of Instituto Evandro Chagas, Belém. Male and female specimens will be sent to Instituto Oswaldo Cruz, Rio de Janeiro; Instituto René Rachou, Belo Horizonte; University of Florida, Gainesville, USA; National Museum, Washington, USA; British Museum of Natural History, London, UK.



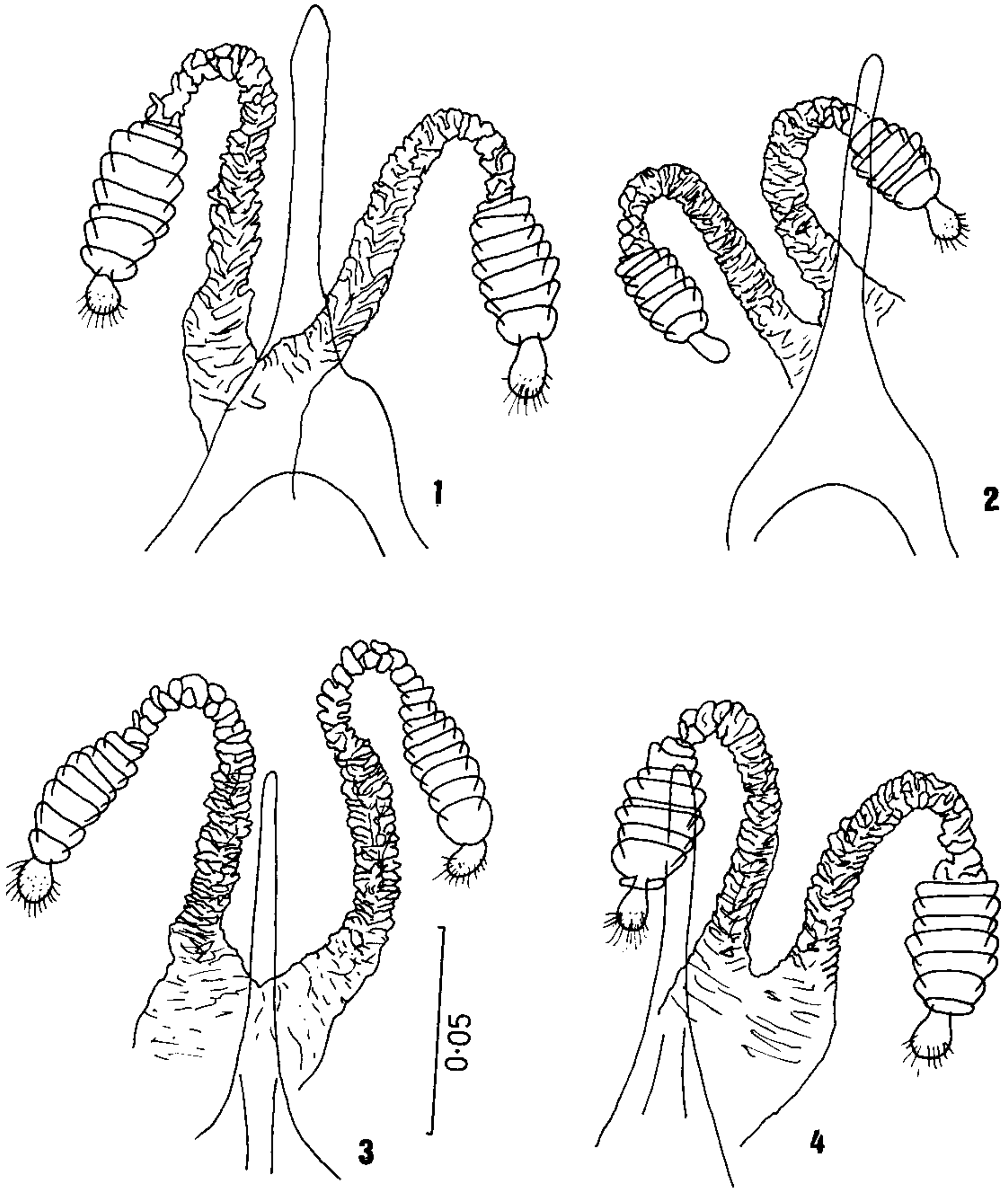


Fig. 3 (1-4) - Series *squamiventris*, female spermathecae showing 1. *P. wellcomei*; 2. *P. chagasi*; 3. *P. complexus* and 4. *P.s. squamiventris*. All drawn in Berlese medium to scale in mms.

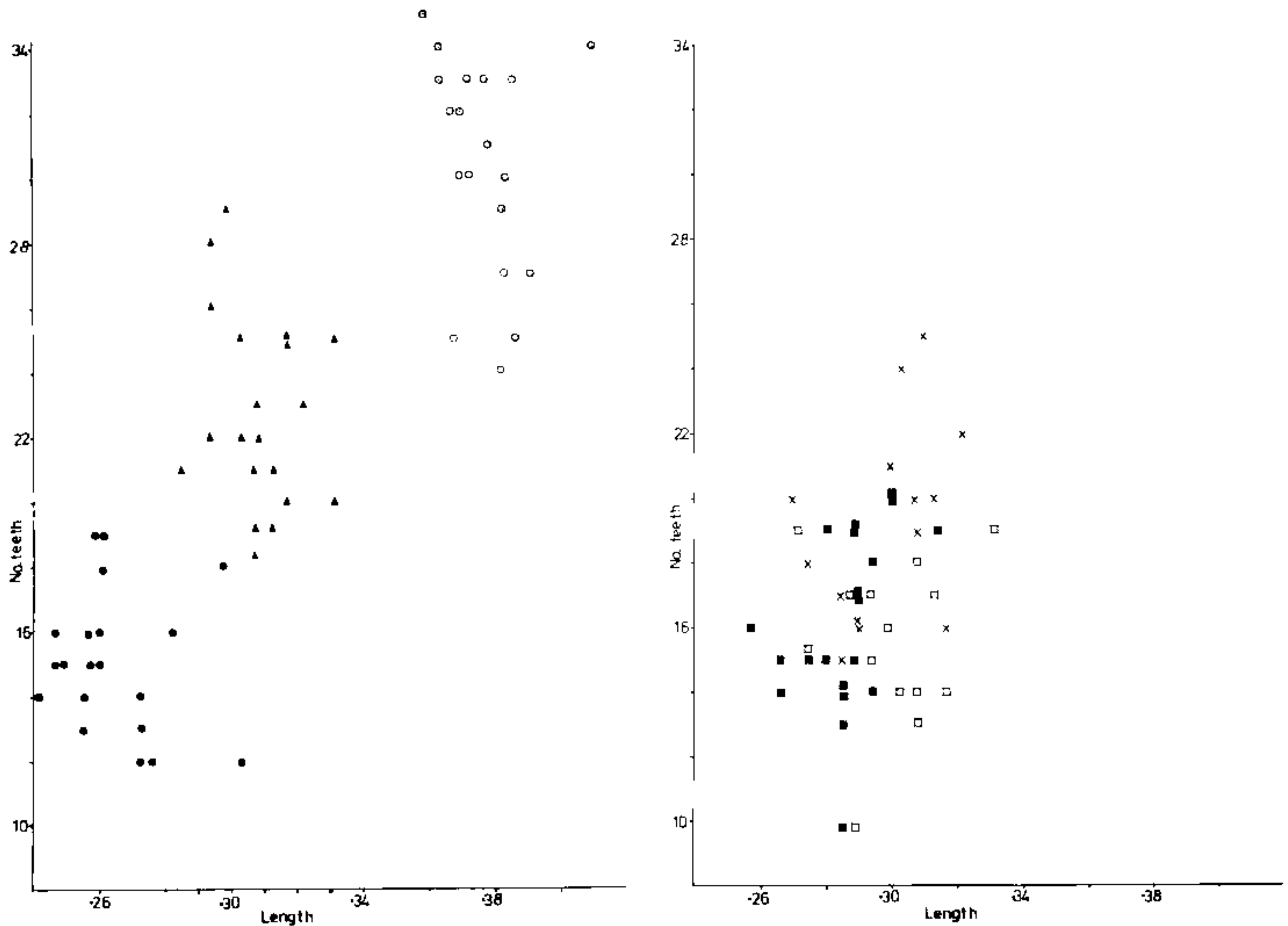


Fig. 4: plot of the number of vertical cibarial teeth against length of the 3rd antennal segment for (○) *P.s. squamiventris*; (▲) *P.s. maripaensis*; (●) *P. chagasi*; (■) *P. wellcomei*; (□) *P. complexus* and (x) *P. leonidasdeanei*. All specimens were from laboratory reared isofemale broods from our collections in the areas of Map 1 and some *P.s. maripaensis* from the Ready, Lainson & Shaw collection.

## DISCUSSION

The *squamiventris* series includes *P. bernalei*, *P. chagasi*, *P. complexus*, *P. fairtigi*, *P. leonidasdeanei*, *P. squamiventris squamiventris*, *P.s. maripaensis* and *P. wellcomei*; *P. bernalei* and *P. fairtigi* are known only from the males. Figs. 2 (1-9) show the parameres for each of these species and Figs. 3 (1-4) the indistinguishable spermathecae from four species. We do not include *P. corosoniensis*, *P. geniculatus* or *P. lainsoni* as in Ready et al. (1982) since the females do not possess the typical spermathecae nor do the males have the characteristic median constriction of the coxite. Martins et al. (1968) showed the use of the length of 3rd antennal segment and number of vertical cibarial teeth for separating *P. squamiventris* and *P. chagasi* and this criteria has been adopted here and elsewhere (Ryan, Lainson & Shaw, 1986b). Fig. 4 shows this data plotted for laboratory reared and associated females of species known to occur in Pará. Clearly we are only able to separate, with certainty, female *P. chagasi*, *P.s. maripaensis* and *P.s. squamiventris* (although this was not noted by Ready et al., 1982): in addition *P. leonidasdeanei* is distinguished by the long common sperm duct (Fig. 10). From Map 1 we can see that the species overlap in a number of combinations: and must ascertain (from laboratory rearing, or male captures) which species are present in a given area before we use these characters to separate females. A possibility for the future lies with the use of cuticular hydrocarbon analysis, which has been used to separate *P. complexus* and *P. wellcomei* (Ryan et al., 1986).

All known members of the *squamiventris* series are anthropophilic and, to date, three have been incriminated as vectors of *Leishmania* of the *braziliensis* complex: namely, *P. chagasi*, *P.s. maripaensis*, *P.s. squamiventris* (Ryan, Lainson & Shaw, 1986b) and *P. wellcomei* (Lainson et al., 1973, 1977; Ryan, Lainson & Shaw, 1986a). The authors feel it likely that as the ecology of other series members are studied in more depth, they may also prove to be involved in the transmission of *Leishmania*, possibly to man.

## RESUMO

Uma nova espécie de flebótomo da série *squamiventris* é descrita com o nome de *Psychodopygus leonidasdeanei*, a partir de exemplares machos e fêmeas coletados no município de Santarém, Estado do Pará, Brasil.

Os autores apresentam ainda, um guia ilustrado para separação de machos e fêmeas de espécies da referida série, com informes sobre sua distribuição no Estado do Pará.

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