*Zootaxa* 2618: 61–68 (2010)
www.mapress.com/zootaxa/


**Article**

ISSN 1175-5326 (print edition)
**ZOOTAXA**
ISSN 1175-5334 (online edition)

# *Psoquilla infuscata* Badonnel (Psocoptera: Psoquillidae) in the Western Hemisphere with description of the male and brachypterous form

EDWARD L. MOCKFORD[1] & ALFONSO N. GARCÍA ALDRETE[2]

[1]*School of Biological Sciences, Illinois State University, Normal, Illinois 61790-4120 USA. E-mail: elmockf@ilstu.edu*
[2]*Instituto de Biología, Universidad Nacional Autónoma de México, Departamento de Zoología, Apartado Postal 70-153, 04510, México, D. F., México. E-mail: anga@ibiologia2.unam.mx*

## Abstract

*Psoquilla infuscata* Badonnel, previously known from a single locality in coastal West Africa, is recorded from southern Mexico, Belize, Panamá, Suriname, and Perú. The original description is based entirely on macropterous females, while our material includes brachypterous forms of both sexes as well as macropterous specimens. Augmented descriptions of adults of this species and its only congener, *Psoquilla marginepunctata* Hagen are presented. The synonymy of *Heteropsocus dispar* Verrill with *P. marginepunctata* is confirmed. We attempt to homologize the skeletal parts of the complex phallosome of the Psoquillidae and the subfamily Perientominae in the closely related family Lepidopsocidae.

**Key words:** Psocoptera, Psoquillidae, *Psoquilla infuscata*, comparative morphology, Western Hemisphere records

## Introduction

The genus *Psoquilla* Hagen contains only two described species, *Psoquilla marginepunctata* Hagen, the type, and *Psoquilla infuscata* Badonnel. The latter species was described from nine macropterous females collected at Le Banco, a forest area at Abidjan, coastal Ivory Coast, West Africa. No new information about this species has appeared since its original description (Badonnel, 1949). *Psoquilla marginepunctata* has a very wide distribution (cf. Lienhard and Smithers, 2002), having spread in human commerce. Recently, it has come to our attention that several lots of *Psoquilla* from tropical America differ consistently from *P. marginepunctata*. Closer examination reveals that they agree in the known diagnostic morphological and color characters with *P. infuscata* and so, beyond reasonable doubt, represent this species. We present records of *P. infuscata* for Mexico, Belize, Panamá, Perú, and Suriname.

The original description of *P. infuscata* was a differential diagnosis. It separated this species clearly from its congener, *P. marginepunctata*, but it did not include some important information, such as size and body color other than that of the wing. Here, we present a more detailed description, including the hitherto unknown male and the brachypterous form of both sexes. In order to permit detailed comparison with *P. marginepunctata*, we include an augmented description of that species as well. The complex psoquillid phallosome is analyzed and its parts are tentatively homologized with those of the perientomine lepidopsocids (cf. Mockford, 2005).

## Material and methods

The material consists of 33 adult specimens of *P. infuscata* from the regions indicated above. Approximately 225 adult specimens of *P. marginepunctata* are on hand for comparison. One female of *P. infuscata* from each of the localities indicated above was dissected and slide-mounted. Two males of *P. infuscata* were also dissected and slide-mounted, as were two males of *P. marginepunctata*, thus permitting a detailed comparison

*Accepted by L.A. Mound: 27 Aug. 2010; published: 20 Sep. 2010*

of phallosome structure of the two species. Measurements (μm) were made on one macropterous and one brachypterous female, as well as one brachypterous male with a filar micrometer. Illustrations were made with the aid of a drawing tube. Color descriptions are based on observations through a dissecting microscope with direct light on specimens preserved in 80–95% ethyl alcohol for various periods of time.

Abbreviations used for measurements, etc., are as follows: BL = body length; F = hind femur; f1–f4 = first to fourth flagellomeres; FW = forewing; HW = hindwing; IO/d = least distance between compound eyes divided by lateral diameter of a compound eye in either anterior or dorsal view; P2 = second segment, and P4 = distal segment of maxillary palpus; T = hind tibia; t1, t2, and t3 = first, second, and third tarsomeres.

Material studied is deposited in the following collections indicated in the "Material examined" sections: E. L. Mockford Collection (School of Biological Sciences, Illinois State University, Normal, Illinois, USA; ELMC); Colección Nacional de Insectos, Instituto de Biología, Universidad Nacional Autónoma de México, México City (CNIN); United States National Museum, Washington, D. C. (USNM).

**A note on the psoquillid phallosome.** In the following account, numbers assigned to structures represent probable homologies with those designated by Mockford (2005) for the perientomine psocids (Family Lepidopsocidae) and will be utilized in the descriptions.

The phallosome in this family always consists of two basal struts, either straight or slightly incurved anteriorly. Distally, each strut produces a slender, medially-directed internal paramere, and a stouter external paramere. In *Psoquilla* and *Rhyopsocus* the external paramere is hinged or divided by a transverse suture, and distal to this suture, it produces an external semimembranous or sclerotized cowl (Fig. 1, #1) and a well-sclerotized internal arm (Fig. 1, #2); these two structures may fuse together beyond their base. More internally on each side lies a spatula-shaped apodeme (Fig. 1, #3) with excavated surface facing medially. One edge of the apodeme joins the edge of the opposite side disto-medially to form a semimembranous bridge. The two internal parameres appear to contribute to this bridge in some species, while in others, the internal parameres form the main body of the bridge or fuse to #3 before the bridge. The other edge of the spatula-shaped apodeme bears or joins a distal piece (Fig. 1, #4) which flanks the side of a sclerotized distal basket-like structure (Fig. 1, d) which apparently surrounds the distal end of the ejaculatory duct. In *Eosilla jacobsoni* Ribaga, the external paramere is not hinged or divided by a suture, and the internal paramere joins directly to part #3 (pers. obs. of ELM).

### ***Psoquilla infuscata*** Badonnel

*Psoquilla infuscata* Badonnel, 1949:27.

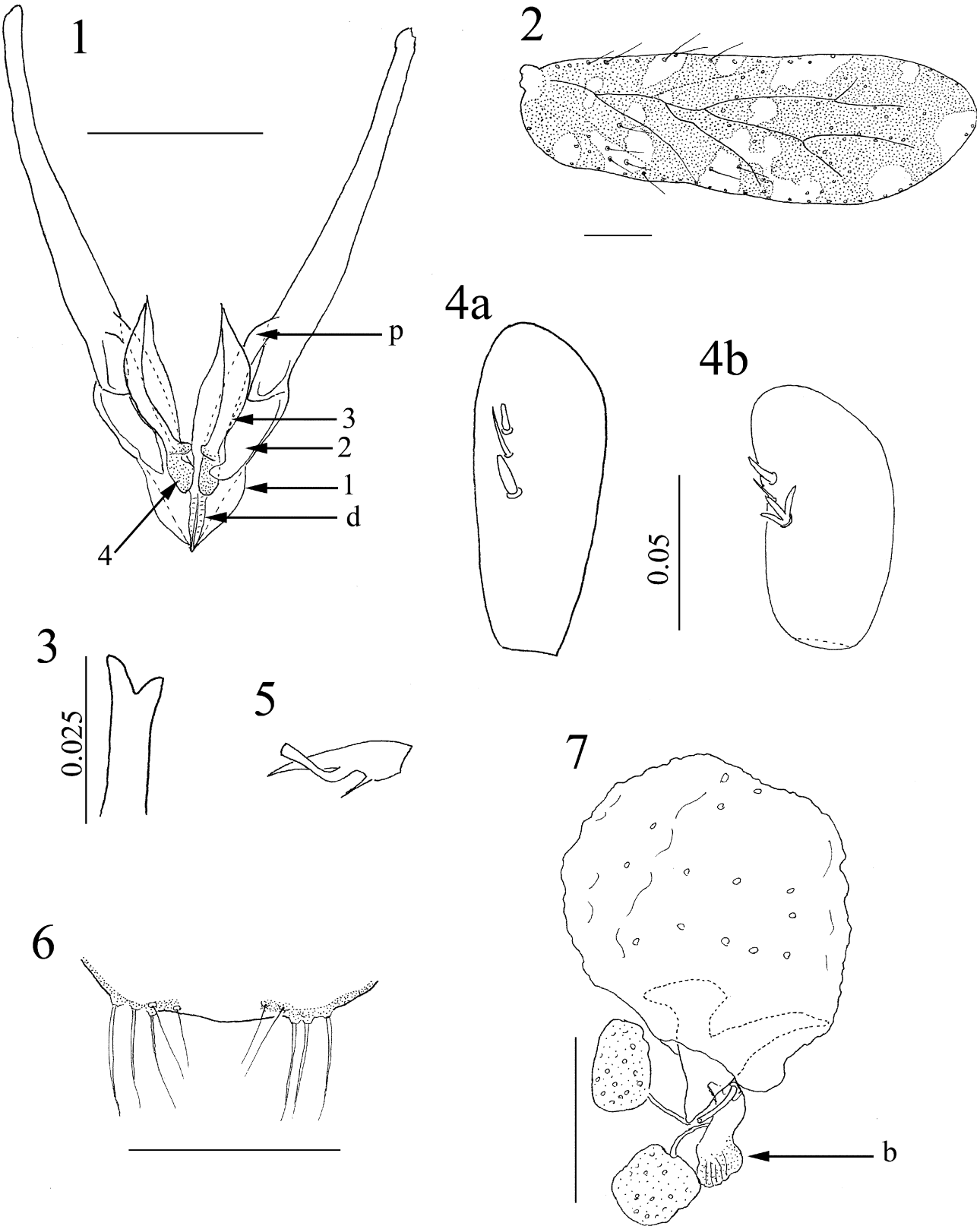
**Diagnosis.** See Badonnel, 1949, plus the following. All tibiae with a dark spot at about basal one-third and a dark band near apex. Brachypterous form with colorless spots in interior of forewing (Fig. 2) in addition to those on margin. Spermathecal sac with a large Y-shaped sclerotization near its opening.

**Note.** The tibial and spermathecal sac characters in the following description apply to the macropterous, as well as the brachypterous forms. Other than in wing length and venation, the macropterous form differs little from the description below except in having ocelli (laterals larger than median), and four instead of one trichobothria with basal florets on the paraproct.

Male (macropterous). Color as noted for brachypterous male (below). Wing markings and venation as described by Badonnel (1949). Hypandrium and phallosome as described for the brachypterous male (below).

Male (macropterous). Measurements. BL not recorded; FW = 1060; HW = 918; F = 205; T = 324; t1 = 202; t2 = 45; t3 = 32; f1 = 53; other flagellomeres missing; IO = 212; d = 91; IO/d = 2.32.

Male (brachypterous) color (in alcohol 45 years). Compound eyes black; remainder of head including antennae and maxillary palpi dusky beige, slightly darker on genae and on an obscure anchor-shaped mark in middle of frons just before postclypeus. Ocelli absent. Thorax dusky beige dorsally and dorso-laterally, white ventrally, with an abrupt color change along a line above coxal bases. Legs white, tibiae each marked with a dark brown spot at about basal two-fifths and a dark brown band near distal end; tarsi each with a dark brown




**FIGURES 1–7.** *Psoquilla infuscata* Badonnel. **(1)** Male B ( = brachypterous), phallosome (d = 'basket' around tip of ejaculatory duct, p = internal paramere, see text for numbered parts); **(2)** Male B, forewing; **(3)** Male B, lacinial tip; **(4)** Male B, two variants (a & b) of P4 showing thin-walled preapical sensilla (setae not shown); **(5)** Male B, pretarsal claw; **(6)** Male B, distal end of hypandrium; **(7)** Female B, spermathecal sac and accessory glands (b = beak). Scale bars = 0.1 mm unless indicated otherwise. Fig. 5 to scale of Fig. 3.

basal band. Forewing (Fig. 2) mottled brown and colorless: 4 colorless spots along anterior margin, the third out from base much larger than the others and extending from just beyond expiration of vein R1 to just before vein R2+3; this large colorless spot forming anterior end of a transverse band of such spots extending to hind margin of wing just basal to vein M3; a smaller transverse band of colorless spots at about basal one-third of wing; a colorless spot at distal end of wing between expirations of veins R4+5 and M1; hind margin of wing with 5 colorless spots. Hindwings minute, dusky. Preclunial abdominal segments dusky beige; clunium and hypandrium slightly darker.

Male (brachypterous) structural characters. Vertex, frons, and clypeus sparsely setose. Ocelli absent. Median ecdysial line distinct; frontal lines visible only at their bases. Lacinial tip (Fig. 3) narrow, bifid, lateral cusp longer than median. Maxillary palpus: P2 with long, slender, pointed spur sensillum; P4 expanded distally, with three subapical sensilla (Figs. 4a, b), the basal either simple or trifid; more distally a setal sensillum and a short, simple sensillum. Antenna: 15 flagellomeres, all ringed with whorls of microtriches; f1 with a long seta near base and another near tip; other flagellomeres with one or two setae near tip; f3, f4, f7, f8, f10, and f12 each with a sense cone near tip, those of f8 and f10 longer than the others. Prothorax about equal in size to mesothorax. Meso- and metanota closely joined, flat dorsally. Forewing (Fig. 2) extending to about distal two-thirds of abdomen; veins in basal one-third of wing (except for Cu2) extremely vague, marked mostly by rows of setae; more distally Sc apparently absent, or its distal end represented by a small spur off R1; R1 not reaching wing margin; Rs vague before junction with M; Rs fork stem long; R2+3, R4+5, M1 and M2 expiring before reaching wing margin; Cu1 and IA vague throughout their length. Hindwing about two-fifths length of forewing, with a vague single vein forking before apex. Legs sparsely setose from femur through end of t1; each tibia with 3 apical spurs; t1 and t2 each with 2 apical spurs; pretarsal claw (Fig. 5) without denticles, with curved, ribbon-like pulvillus slightly widened at tip, and one basal seta; Pearman's organ absent. Hypandrium (Fig. 6) slightly bilobed at tip, each lobe bearing 3–4 stout setae; remainder of hypandrium sparsely setose. Phallosome (Fig. 1): distal cowl (#1) semimembranous; part #2 stout, denticulate on inner surface; part #3 as described (above) for the family, its ventral edge bearing distally a stout part #4 with internal thickenings; internal paramere apparently fusing with part #4 at base of the latter; distal encasement of ejaculatory duct slender, its outer wall denticulate. Epiproct and paraproct sparsely setose; paraproctal spine long and slightly curved; paraproct with one trichobothrium with basal floret.

Male (brachypterous) measurements. BL = 1152; FW = 693; HW = 180; F = 235; T = 314; t1 = 182; t2 = 37; t3 = 35; f1 = 53; f2 = 40; f3 = 48; f4 = 63; IO = 76; d = 29; IO/d = 2.62.

Female (brachypterous) color (in alcohol 42 years). Head and its appendages as described for male. Likewise, thorax and its appendages except thorax dorso-laterally heavily marked with dark reddish-brown, especially along suture lines. Preclunial abdominal segments dorsally and telson creamy yellow; laterally a broad band of dark reddish-brown variegated with paler spots running length of preclunial region and onto clunium. Clunium laterally brown.

Female (brachypterous) structural characters. Head and its appendages as described for male except antenna with 17 flagellomeres; f5, f6, f8, f13, and f17 each with a sense cone near tip, those of f13 and f17 longer than the others. Thorax, including wings and legs, as described for male. Forewings about same length as in male but only extending about half-way down the much larger abdomen. Hindwings shorter than in male. Subgenital plate region semimembranous. Ovipositor valvula and spermapore plate as described and illustrated for macropterous form (see Badonnel, 1949, Figs. 21, 22). Spermatheca (Fig. 7) with Y-shaped sclerotization partially protruding from end of sac near duct and separate from beak, the latter short, rugose at distal end. Epiproct and paraproct as described for male.

Female (brachypterous) measurements. BL = 1261; FW = 662, HW = 141, F = 281, T = 342, t1 = 204, t2 = 48, t3 = 48, f1 = 62, f2 = 44, f3 = 54, f4 = 67, IO = 85, d = 31, IO/d = 2.73. Female (macropterous) measurements. BL = 1273, FW = 973, HW = 894, F = 277, T = 363, t1 = 238, t2 = 44, t3 = 49, f1 = 66, f2 = 52, f3 = 61, f4 = 74, IO = 85, d = 23, IO/d = 3.70.

**Material examined** (B = brachypterous, M = macropterous).—**BELIZE**: Cayo District: Chiquibul Forest Reserve: Cuevas, 4–7 & 17–30 April 1995, flight trap, 2 ♀ M, 1 ♂ M, coll. T. King *et al.* (CNIN); Grano de Oro, 16–19 October 1994, Malaise trap, 1 ♀ M, coll. T. King *et al.* (CNIN); 24 March 1995, Malaise trap, 1 ♀

M, coll. T. King *et al.* (CNIN); 8–11 May 1995, Malaise trap, 1 ♀ M, coll. T. King *et al.* (CNIN); New Maria, 4–7 April 1995, flight trap, 1 ♀ M, coll. T. King *et al.* (CNIN); Pastor, 23–26 March 1995, flight trap, 2 ♀ M, Malaise trap, 1 ♀ M; 2–6 April 1995, 2 ♀ M, coll. T. King *et al.* (CNIN). **MEXICO**: Chiapas: Finca Prusia, 31 km S Jaltenango, el. 1000 m, 5 May 1993, on dead hanging leaves of yucca, 1 ♀ B, coll. A. N. García Aldrete (CNIN); Tabasco: 9.7 km W Macuspana, 5 April 1964, beating broad-leaf plants in forest, 6 ♂ B, 1 ♀ M, coll. E. L. Mockford (ELMC); Veracruz: 12.9 km N Santiago Tuxtla, 7–8 July 1967, on trunks of buttress-based trees in forest, 3 ♂ B, 6 ♀ B, 1 nymph, coll. E. L. Mockford & J. Manzano (ELMC). PANAMÁ: Canal Zone: Pipeline Road, 25 July 1979, sifting ground litter around fallen tree, 1 ♀ M, coll. E. L. Mockford (ELMC). **PERÚ**: Loreto Province: Explornapo Camp on Río Sucusari, 9 August 1992, on wall of latrine, 1 ♀ B, coll. E. L. Mockford (ELMC). **SURINAME**: Paramaribo: Agricultural Experiment Station, 19 February 1959, on orange trees, 1 ♂ B, 1 ♀ B, coll. E. L. Mockford (ELMC).

### *Psoquilla marginepunctata* Hagen

*Psoquilla marginepunctata* Hagen, 1865:123.
*Heteropsocus dispar* Verrill, 1902:817.

It is important to note that a nomenclature problem does not exist with regard to the two named species. The original description of *P. marginepunctata* (Hagen, 1865), though brief, includes a diagnostic statement about the brachypterous form: “superior wings…black, with white points on the margin”. Clearly, this statement cannot apply to *P. infuscata*. Also, the synonymy of *Heteropsocus dispar* with *P. marginepunctata* is confirmed in that Verrill (1902, Fig. 192c) illustrates a brachypterous form with forewing dark throughout the middle region.

Although this species has been described in detail (Hagen 1865, McLachlan 1867, Verrill 1902 [under the name *Heteropsocus dispar*], Enderlein 1915, 1925, Pearman 1931, Roesler 1940, Badonnel 1949, 1977, Broadhead 1961, Günther 1974, Mockford 1993, Lienhard 1998), some aspects are not well enough known to allow comparison with details of the description of *P. infuscata* given above.

The color description of *P. marginepunctata* needs no further elaboration (opera cit. sup.). Structural features described below seem not to have been published previously. Also, measurements of an individual of each wing morph are included to allow ready comparison with those of *P. infuscata.*

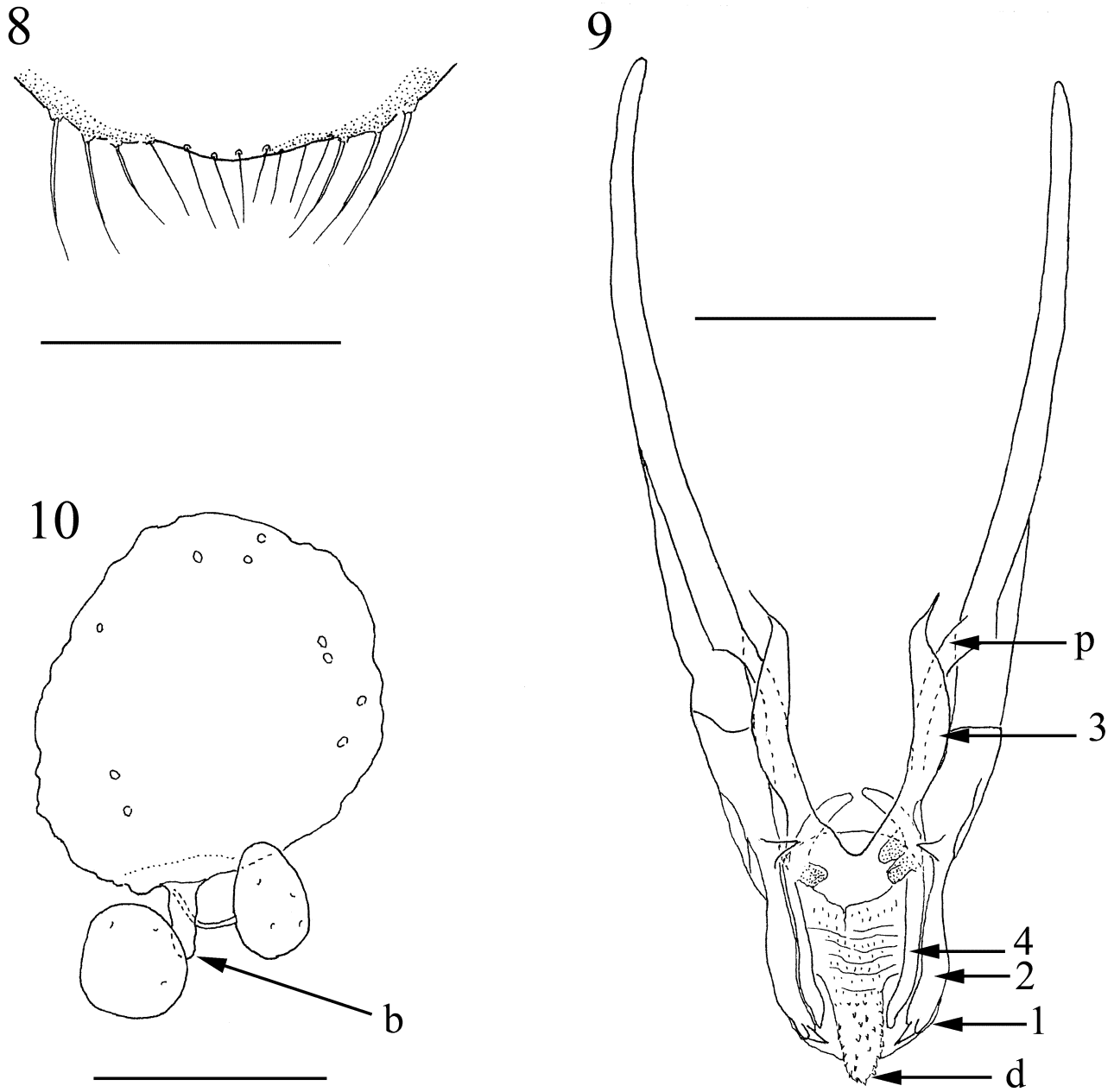
**Augmented description.** Male (brachypterous) structural characters. Head and its appendages as described for *P. infuscata* except antenna with 21 flagellomeres; f5, f7, f9, f14, and f18 on left and f6, f7, f9, f11, f14, and f18 on right each with a sense cone near tip, those on f14 and f18 somewhat longer than others. Thorax and its appendages as described for *P. infuscata* except all veins in basal one-third of forewing distinct; Sc present as a short spur from the main trunk near wing base; Cu1a represented by a short spur from Cu1, and all principal veins reaching wing margin. Hindwing as described for *P. infuscata*. Hypandrium as described for *P. infuscata* except the pair of lobes at tip only very slightly raised (Fig. 8). Phallosome (Fig. 9): parts #1 and #2 of each side fused, bearing 2 spines, one directed inward at basal two-fifths of this compound structure, the other at its tip; part #3 with its upper surface joining that of opposite side, forming a semimembranous bridge, its lower surface disappearing at (fused with?) base of part #4; #4 of two shafts on each side—an upper one fusing basally with that of opposite side and a lower one giving off a ventral lobe near its base and converging basally towards that of opposite side; internal paramere joining outer surface of part #3; distal encasement of ejaculatory duct a broad scoop narrowing distally with denticulate outer walls. Epiproct and paraproct as described for *P. infuscata*.

Male (brachypterous) measurements. BL = 1028; FW = 669, HW = 220, F = 274, T = 352, t1 = 198, t2 = 37, t3 = 41, f1 = 64, f2 = 44, f3 = 53, f4 = 78, IO = 222, d = 78, IO/d = 2.85. Male (macropterous) measurements. BL = 1302, FW = 1181, HW = 990, F = 271, T = 374, t1 = 208, t2 = 39, t3 = 41, f1 = 71, f2 = 59, f3 = 65, f4 = 78, IO = 226, d = 105, IO/d = 2.15.

Female (brachypterous) structural characters. Head as described for *P. infuscata* except antenna with 15–17 flagellomeres; sense cones on f4, f7, f10, f12, f14/f4, f6, f8, f10, f15. Thorax and its appendages as

described for male. Ovipositor valvulae as illustrated for *P. infuscata* (Badonnel, 1949, Fig. 21). Spermapore sclerite quadrate with two ear-like appendages distally (see Badonnel, 1949, Fig. 31). Spermatheca (Fig. 10) lacking sclerotization inside the sac; the beak slender, arising from a broad, semimembranous base; spermathecal duct entering near base of beak. Epiproct and paraproct as described for male.

Female (brachypterous) measurements. BL = 1202; FW = 580, HW = 173, F = 273, T = 365, t1 = 189, t2 = 43, t3 = 44, f1 = 68, f2 = 62, f3 = 64, f4 = 68, IO = 263, d = 79, IO/d = 3.33. Female (macropterous) measurements. BL = 1468, FW = 1273, HW = 1036, F = 318, T = 458, t1 = 236, t2 = 53, t3 = 51, f1 = 77, f2 = 59, f3 = 76, f4 = 81, IO = 264, d = 102, IO/d = 2.59.




**FIGURES 8–10.** *Psoquilla marginepunctata* Hagen. **(8)** Male B, distal end of hypandrium; **(9)** Male B, phallosome (numbers and letters as in Fig. 1); **(10)** Female B, spermathecal sac and accompanying glands (b = beak). Scale bars = 0.1 mm.

**Material examined. BRAZIL**: Santa Catarina: Nova Teutonia, el. 300–500 m, (all coll. F. Plaumann), June 1952, 3 ♂, 18 ♀ M, August 1971, 3 ♂ B, November 1972, 5 ♂, 20 ♀ M, 3 ♂, 5 ♀ B, December 1972, 21 ♂, 75 ♀ M, 1 ♂ B (USNM). **MEXICO**: Chiapas: Sima de las Cotorras ca. Ocozocoautla, 3 December 1993,

on tree trunk, 2 ♂, 1 ♀ B, coll. A. Casasola (CNIN); Guerrero: ca. Acapulco, sifting litter, 1 ♀ M, coll. W. López Forment (CNIN); Ixtapa, ca. Zihuatanejo, 12 December 1975, on dead hanging leaves in forest, 4 ♀ M, 4 ♀ B, coll. A. N. García Aldrete (CNIN); Jalisco: Chamela: UNAM Biological Station (all but last coll. D. Yáñez), 20–21 August 1979, on bracket fungus on tree trunk, 2 ♂, 4 ♀ M, 8 ♂, 5 ♀ B, 1 nymph; 3–4 November 1979, on tree bark and at white light, 3 ♀ M, 2 ♂, 4 ♀ B, 3 nymphs; 27 February 1980, beating foliage in forest, 1 ♂ B; 1 March 1980, beating dead shrub branches, 1 ♂ B; 22 April 1980, beating foliage in forest, 1 ♂ B; 9 September 1987, beating branches in forest, 1 ♀ M, coll. A. N. García Aldrete (CNIN); Nayarit (all coll. A. N. García Aldrete): María Madre Island: Rd. Puerto Balleto-La Antena, el. 210 m, 26 March 1984, beating vegetation in forest, 4 ♀ B; ca. San Juan Papalillo Camp, 29 March 1984, on buttressed *Ficus* trunk, 1 ♂ M; ca. Venustiano Carranza Camp, 27 March 1984, el. 90 m, beating vegetation in forest, 1 ♀ M (CNIN); Quintana Roo: 5 km E Polyuc, 25 March 1964, beating vegetation at forest edge, 1 ♀ M, coll. E. L. Mockford (ELMC); Veracruz: Los Tuxtlas: UNAM Biology Station, 17 August 1987, under loose bark of dead tree, 1 ♂ B, coll. A. N. García Aldrete (CNIN). **UNITED STATES**: Arizona: Nogales, 3 July 1960, intercepted on *Tamarindus indicus* from Mazatlán, Mexico, 1 ♀ B, coll. E. Wilson (ELMC); Florida: Alachua Co.: Gainesville, 2 August 1953, in building, 1 ♀ M, coll. E. L. Mockford (ELMC); 23 October 1953, on car windshield, 1 ♀ M, coll. E. L. Mockford (ELMC); Dade Co.: Miami Beach, 6 July 1953, in hotel furniture, 1 ♂, 2 ♀ M, 3 ♂, 10 ♀ B, 16 nymphs, coll. K. M. Sommerman (ELMC).

## Discussion

Pearman (1931) speculated that *P. marginepunctata* is probably a native of the Western Hemisphere, based on the fact that, at the time of his writing, field collections were known only from the Western Hemisphere. Subsequently, however, the species has been found in field collections in West Africa, from Ivory Coast and Angola (Badonnel, 1949, 1955). Hence, its region of origin remains uncertain. As a result of its adaptation to human dwellings, it has become widely distributed in commerce and dwells with man far beyond its field distribution (cf. Lienhard and Smithers, 2002). In contrast, its close congener, *P. infuscata*, has been taken only in field collections, with the single exception of an individual taken in a rustic outbuilding in Amazonian Perú. Our data show that the species is widely distributed in Central and South America, suggesting that it is quite likely native to the Western Hemisphere. Its occurrence at a single locality on the coast of West Africa may have resulted from introduction in ballast or introduction on plants such as cacao.

## Acknowledgments

We thank C. Lienhard for providing a copy of the pages from Verrill (1902) including the description of *Heteropsocus dispar*. We thank C. Lyal and L. Cervantes Peredo for the donation of specimens from the Chiquibul Forest Preserve, Belize. We also thank A. Eggert and K. Yoshizawa for critical reading and useful comments on this manuscript.

## References

Badonnel, A. (1949) Psocoptères de la Cote d'Ivoire Mission Paulian-Delamare (1945). *Revue Française d'Entomologie,* 16, 20–46.

Badonnel, A. (1955) Psocoptères de l'Angola. *Publicacões culturais da Companhia de Diamantes de Angola*, 26, 1–267.

Broadhead, E. (1961) The biology of *Psoquilla marginepunctata* (Hagen) (Corrodentia, Trogiidae). *Transactions of the Society for British Entomology,* 14, 223–236.

Enderlein, G. (1925) Beiträge zur Kenntnis der Copeognathen IX. *Konowia*, 4, 97–108.

Günther, K.K. (1974) Staubläuse, Psocoptera. *In*: *Die Tierwelt Deutschlands. Jena,* 61, 314 pp.

Hagen, H. (1865) Synopsis of the Psocina without ocelli. *Entomologist's Monthly Magazine*, 2, 121–124.

Lienhard, C. (1998) Psocoptères euro-méditeranéens. *Faune de France* 83, xx + 517 pp.

Lienhard, C. & Smithers, C.N. (2002) Psocoptera (Insecta) World Catalogue and Bibliography. *Instrumenta Biodiversitatis V. Muséum d'histoire naturelle, Genève,* xli + 745 pp.
McLachlan, R. (1867) A monograph of the British Psocidae. *Entomologist's Monthly Magazine,* 3, 177–181, 194–197, 226–231, 241–245, 270–276.
Mockford, E.L. (1993) North American Psocoptera (Insecta). *Flora and Fauna Handbook. Sandhill Crane Press, Gainesville, FL.*, 10, xviii + 455 pp.
Mockford, E.L. (2005) A new genus of perientomine psocids (Psocoptera: Lepidopsocidae) with a review of the perientomine genera. *Transactions of the American Entomological Society,* 131, 201–215.
Pearman, J.V. (1931) More Psocoptera from warehouses. *Entomologist's Monthly Magazine,* 67, 95–98.
Roesler, R. (1940) Neue und wenig bekannte Copeognathengattungen I. *Zoologischer Anzeiger,* 129, 225–243.
Verrill, A.E. (1902) The Bermuda Islands: their scenery, climate, productions, physiography, natural history, and geology; with sketches of their early history and changes due to man. *Transactions of the Connecticut Academy of Arts and Sciences,* 11, 413–957. (Psocoptera pp. 818–819).