

New species of Psocoptera (Insecta) from Brazil

ALFONSO N. GARCÍA ALDRETE

Resumen. Se describen e ilustran sendas especies de psócidos en los géneros *Rhyopsocus*, *Loneura* y *Lachesilla*, procedentes la primera y la tercera del estado de Amazonas, y la segunda del estado de Roraima, Brasil. El género *Rhyopsocus* no se había encontrado previamente en Brasil. Los tipos serán depositados en la colección del Instituto Nacional de Pesquisas da Amazônia (Manaus, Amazônas, Brasil).

Palabras clave. *Rhyopsocus*, *Loneura*, *Lachesilla*, nuevas especies, Amazonas, Roraima, Brasil.

Abstract. One species each, in the genera *Rhyopsocus*, *Loneura* and *Lachesilla*, are here described and illustrated. The first and third were collected in the state of Amazonas, and the second was collected in the state of Roraima, Brazil. The genus *Rhyopsocus* was not known in Brazil. The types will be deposited in the collection of the Instituto Nacional de Pesquisas da Amazônia (Manaus, Amazônas, Brazil).

Key words. *Rhyopsocus*, *Loneura*, *Lachesilla*, new species, Amazonas, Roraima, Brazil.

Introduction

From any point of view, Brazil is a country of superlatives; together with Madagascar originated the concept of megadiversity (Mittermeier 1988, Mittermeier & Mittermeier 1997). Its biological richness is immense and abundantly documented (Mittermeier & Mittermeier 1997) particularly in what concerns vascular plants and vertebrates. For invertebrates, the diversity is also enormous, possibly the greatest worldwide, but, other than for a few groups, it is largely unknown and hard data are not easy to find.

*Instituto de Biología, UNAM. Departamento de Zoología, Apartado postal 70-153, 04510 México, D. F., México. anga@ibiologia.unam.mx

The World Catalogue and Bibliography of the Psocoptera (Lienhard & Smithers 2002), lists 371 described species recorded in Brazil, in 85 genera and 29 families; but there are indications that the psocid fauna of that country could easily be at least doubled: recent examination of Psocoptera in the collection of the Instituto Nacional de Pesquisas da Amazônia (INPA), in Manaus, made available through the kindness of Dr. José Albertino Rafael, revealed that, for only four genera analyzed in detail (*Loneura*, *Euplocania*, *Triplocania* and *Lachesilla*), there are 51 undescribed species, so the number of undescribed species in the country may well surpass that of the described ones.

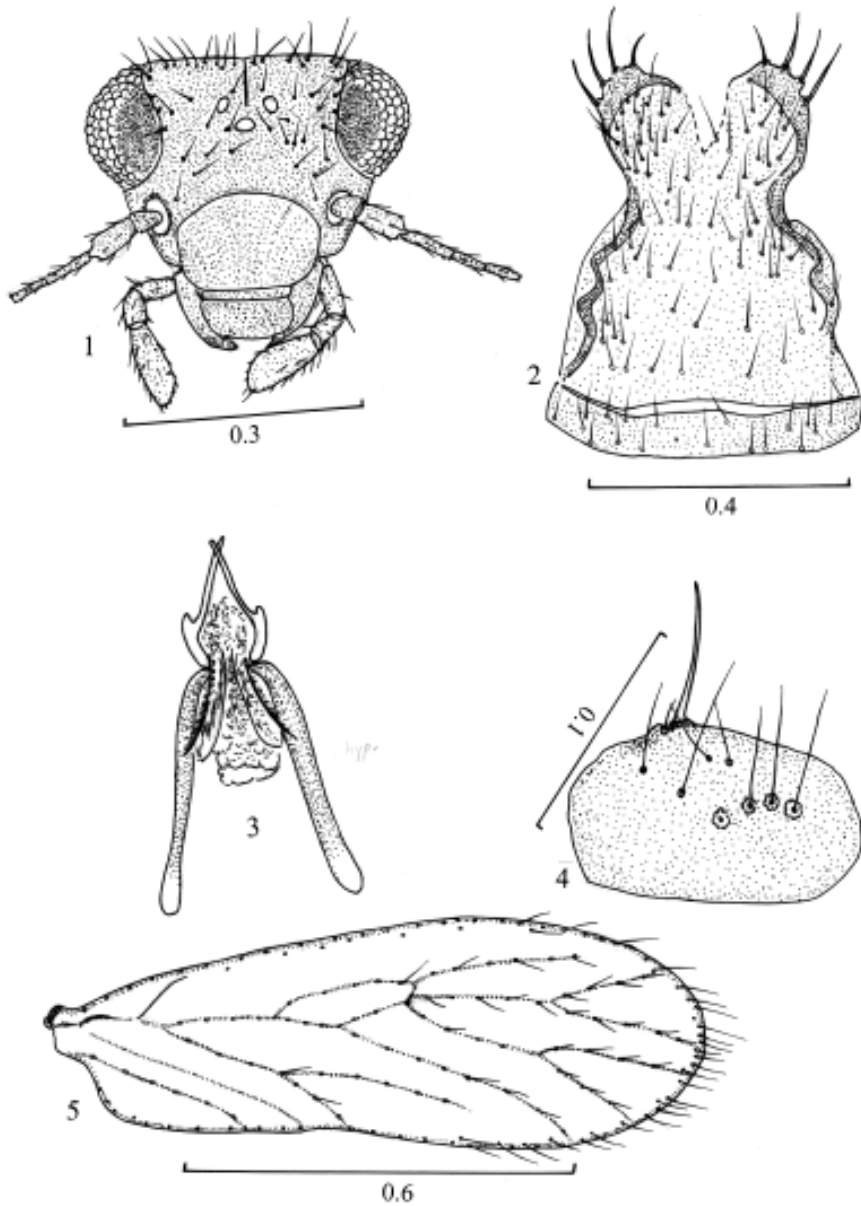
The purpose of this paper is to present descriptions of three Brazilian psocid species, from the INPA collection, to contribute to the knowledge of the diversity of these insects in Brazil.

The specimens studied were dissected in 80% alcohol and their parts (head, right antennae, wings, legs and genitalia) were mounted on slides in Canada Balsam. Measurements, given in μm , were taken with a filar micrometer whose measuring unit is $1.36 \mu\text{m}$ for wings and $0.53 \mu\text{m}$ for other parts. Abbreviations of parts measured, or counted are as follow: FW: length of right forewing, HW: length of right hindwing, F, T, t1...tn: length of femur, tibia and tarsomeres 1...n of hind leg, ctt1: number of trichobothria on t1 of hind leg, Mx4: length of fourth segment of right maxillary palp, fl...fn: length of flagellomeres 1...n of right antenna, IO: minimum distance between compound eyes in front view of head, D: antero-posterior diameter of right compound eye in front view of head, d: transverse diameter of right compound eye in front view of head, PO: d/D. Color was recorded by placing the whole specimen in 80 % alcohol under the dissecting microscope at 50X, illuminated with white cold light. The types of the species here described will be deposited in the collection of the INPA, Manaus, Brazil, where they belong.

Family Psoquillidae
Rhyopsocus rafaeli n. sp. (σ)
(Figs. 1-5)

Color. Body reddish brown. Head without distinct pigmented pattern (Fig. 1). Compound eyes black, ocelli hyaline, without pigmented centripetal crescents. Antennae, maxillary palps and legs pale brown. Wings hyaline, veins pale brown.

Morphology. Forewing venation (Fig. 5): R1 and Cu1a not reaching wing margin; closed cell elongate. Hypandrium (Fig. 2) setose, straight anteriorly, with a strongly sclerotized sinuous band on each side, extending posteriorly to distinct, distal round lobes, each with four marginal setae, the inner one much smaller. Phallosome (Fig. 3) plier-shaped, elongate, slender, with inner bodies elongate and with proximal and distal membranous areas. Paraprocts (Fig. 4) broad, setose as illustrated, with slender mesal prong and sensory fields with four trichobothria, almost in line,



Figs. 1-5. *Rhyopsocus rafaeli* n. sp. ♂. 1. Front view of head. 2. Hypandrium. 3. Phallosome. 4. Right paraproct. 5. Right forewing. Scales in mm. Fig. 3 to scale of Fig. 2.

issuing from basal rosettes. Epiproct narrow, approximately trapeziform, with field of setae on distal half.

Measurements. FW: 1014, F: 249, T: 351, t1: 150, t2: 47, t3: 47, Mx4: 100, f1: 63, f2: 42, f3: 45, IO: 218, D: 155, d: 86, PO: 0.55.

Type locality. **BRAZIL.** Amazonas. Reserva Ducke, 26 km NE Manaus. 24.IX. 1982, Malaise trap, holotype ♂. José Albertino Rafael.

Etymology. This species is dedicated to Dr. José Albertino Rafael (INPA, Manaus, Brazil), in recognition to his important and heuristic work in Brazilian entomology, and to his work as a specialist in the Zoraptera.

Comments. *Rhyopsocus rafaeli* is the first species of *Rhyopsocus* recorded in Brazil; two species of that genus occur in South America: *R. bicornis* Badonnel is found in Colombia and *R. speciophilus* Enderlein was described from Peru. Two species of *Rhyopsocus* are known in Jamaica: *R. confusus* Turner and *R. grandiphallus* Turner, whereas *R. orthatus* Thornton & Woo is found in the Galapagos archipelago and has been recorded in Mexico (Lienhard & Smithers 2002). *R. rafaeli* differs from all of them in the structure of the hypandrium and phallosome and in forewing venation details.

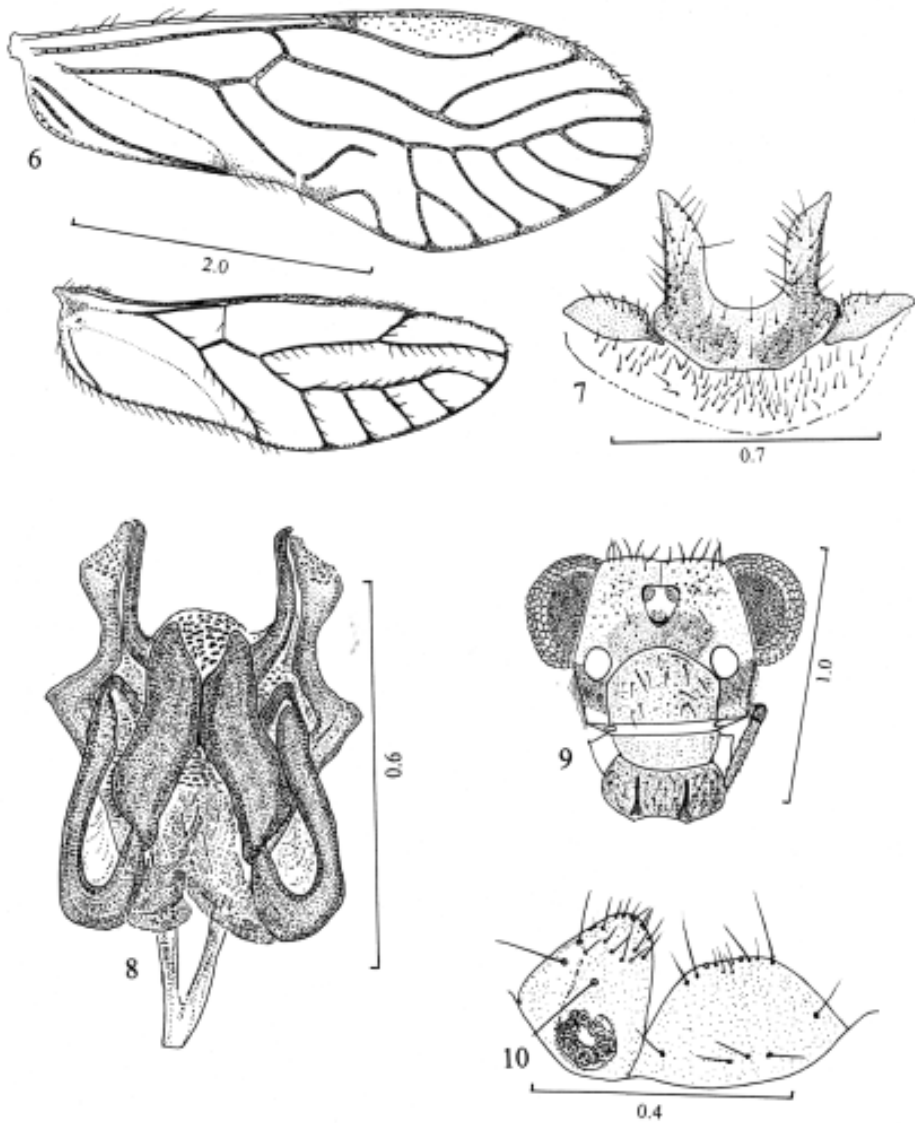
Family Ptiloneuridae

Loneura maracaensis n. sp. (♂)

(Figs. 6-10)

Color. Body chestnut brown. Head pale brown, with large, almost rectangular brown area between antennal fossae, limited anteriorly by epistomal sulcus and reaching posteriorly the level of the third ocellus; a deep brown band on each gena, below antennal fossae; postclypeus, clypeus and labrum brown; maxillary palps pale brown; scape and pedicel reddish brown, flagellum missing. Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Femur dirty white, with proximal, mesal and distal brown areas. Tibia pale brown, with distal reddish brown band; t1 pale brown, t2 and t3 more pigmented. Wings hyaline, veins brown; forewing pterostigma with proximal brown band and a brown hue on both sides of R1 at wing margin. Veins from R2+3 to Cu1a with distal small brown spots at wing margin. Abdomen dirty white, with brown, transverse subcuticular rings, more pigmented at sides and dorsally.

Morphology. Outer cusp of lacinial apex broad, with seven denticles. Forewing venation anomalous and asymmetric: right forewing with an incomplete vein arising from Cu2; areola postica very small (Fig. 6); M six-branched, the branch near areola postica distally forked (Fig. 6). Left forewing with M five-branched, the



Figs. 6-10. *Loneura maracaensis* n. sp. ♂. 6. Fore- and hind- wings. 7. Hypandrium. 8. Phallosome. 9. Front view of head. 10. Right paraproct and epiproct. Scales in mm.

branch near areola postica with three forks and one of the veins incomplete. Hindwings also asymmetric: right hindwing with M five-branched (Fig. 6); left hindwing with M three-branched, the most anterior branch forked. Hypandrium (Fig. 7), with central piece large, setose, with two falcate projections; lateral sclerites small, elongate. Phallosome complex (Fig. 8), with basal arms of the parameres fused anteriorly, diverging posteriorly and continuing into the external parameres, these slender, distally dilated, with a field of short spicules; internal parameres slender, distally acuminate, slightly bent inwards. Phallosome sclerites symmetric, each consisting of a robust, elongate mesal body, continuous anteriorly with a stout, hook-shaped sclerite, the long stem of the hook ending posteriorly in a broad area turned inwards; a membranous area anteriorly, between the sclerites, with some mesal papillae and a membranous area posteriorly, between the internal parameres, with many papillae. Paraprocts (Fig. 10), broadly triangular, setose as illustrated; sensory fields with 26-28 trichobothria issuing from basal rosettes. Epiproct trapeziform (Fig. 10) with three mesal macrosetae near anterior margin, other setae as illustrated.

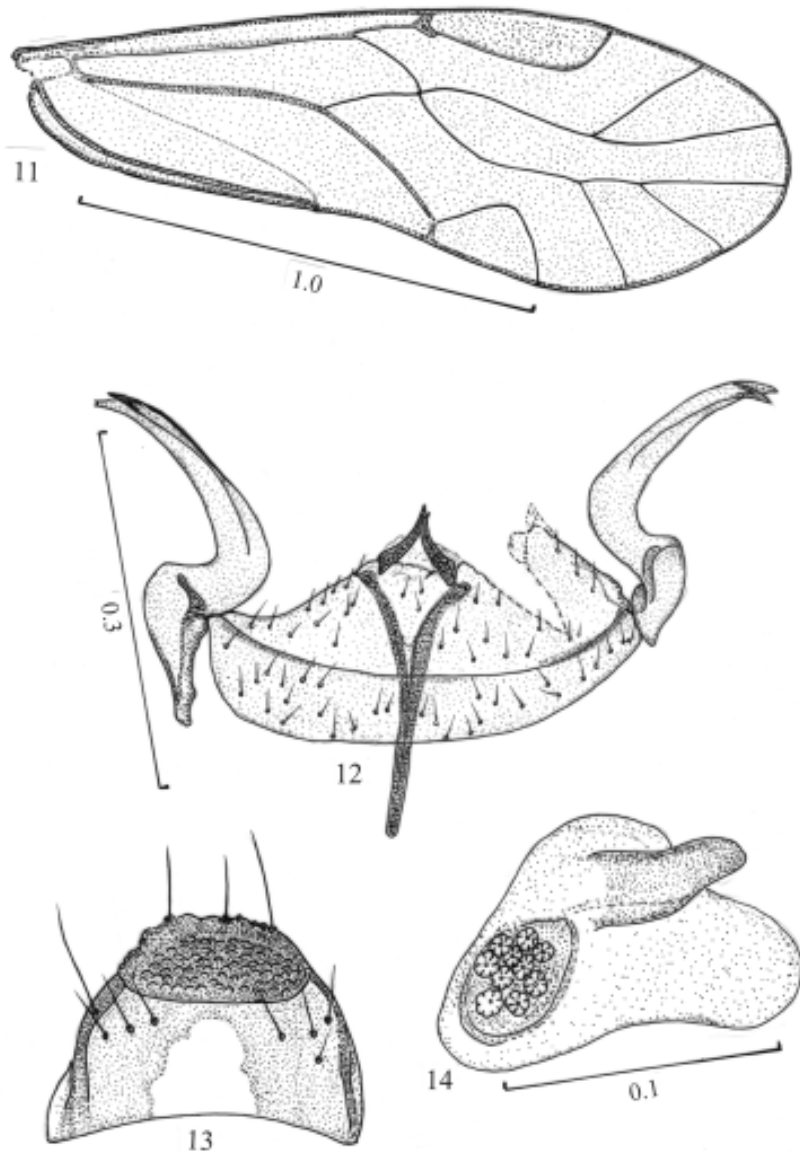
Measurements. FW: 4014, HW: 2788, F: 1112, T: 1797, t1: 780, t2: 74, t3: 136, ctt1: 29, Mx4: 285, IO: 437, D: 435, d: 277, PO: 0.63.

Type locality: **BRAZIL.** Roraima. Río Uraricoera, Ilha de Maracá. 21-30.XI.1987. Malaise trap. José Albertino Rafael *et al.* Holotype ♂.

Etymology. The specific name refers to the Ilha de Maracá, where the type specimen was collected.

Comments. *Loneura maracaensis* is the third species of *Loneura* described from Brazil, where other five undescribed species are known to occur – only in the INPA collection-. The other described species are *L. amazonica* (New) and *L. brasiliensis* Roesler. *L. maracaensis* differs from the former in the hyaline forewing, lacking its pattern of pigmentation; in both the hypandrium is projected posteriorly, but they are distinct, as well as the phallosomes (compare Figs. 12-14 of New 1980 with Figs. 6-8 in this paper). *Loneura brasiliensis* is known only from the female sex, but the wing venation is clearly different in the two species (cf. Fig. 21 in Roesler 1940).

Loneura maracaensis has the same general hypandrium plan as *L. amazonica* (New), *L. meridionalis* García Aldrete, from northwestern Argentina, *L. splendida* Mockford, from southern Mexico and Guatemala and *L. raramuri* García Aldrete, from northwestern Mexico, in which the central piece of the hypandrium has two posterior projections.



Figs. 11-14. *Lachesilla ariasi* n. sp. ♂. 11. Right forewing. 12. Phallosome apodemes, hypandrium and claspers. 13. Epiproct. 14. Left paraproct. Scales in mm. Fig. 13 to scale of Fig. 14.

Family Lachesillidae
Lachesilla ariasi n. sp. (♂)
(Figs. 11-14)

Color. Body pale brown. Head without distinct pigmented pattern. Compound eyes black, ocelli hyaline, without pigmented centripetal crescents. Antennae, maxillary palps and legs yellowish brown. Wings hyaline, veins brown. Tergal lobes of meso- and metathorax slightly more pigmented than rest of thorax. Abdomen dirty white, with transverse, pale brown subcuticular rings, less conspicuous ventrally.

Morphology. Forewing (Fig. 11) elongate, with pterostigma almost rectangular, widest distally; Rs and M diverging from a point, areola postica wide, apically rounded. Hypandrium setose (Fig. 12), with an anterior half long, narrow, and a posterior half almost triangular. Phallosome apodemes (Fig. 12) Y-shaped, with a strongly sclerotized acuminate prong joined distally to each arm. Claspers (Fig. 12), long, robust, on each side of the hypandrium, proximally rounded, curved outwards, distally bifid, acuminate. Paraprocts (Fig. 14), with a mesal prong; sensory fields with 10-11 trichobothria issuing from basal rosettes (the illustration is schematic, as both paraprocts were damaged in the mounting of the genitalia, surface setae are not figured and the mesal prong may prove to be different from the illustration). Epiproct (Fig. 13) slightly concave anteriorly, with a mesal unpigmented area as illustrated; rounded posteriorly, with a strongly sclerotized rim; one setal field on each side, a row of setae along the posterior margin and a large, sclerotized papillary field posteriorly.

Measurements. FW: 1659, F: 323, T: 624, t1: 222, t2: 73, ctt1: 17, Mx4: 86, fl: 192, f2: 164, f3: 139, f4: 77, f5: 58, f6: 53, IO: 241, D: 182, d: 118, PO: 0.64.

Type locality. BRAZIL. Amazonas. Río Purus. 13-17.VIII.1983. CDC trap, 1m. Jorge R. Arias. Holotype ♂.

Etymology. This species is dedicated to Dr. Jorge R. Arias (INPA, Manaus), who collected it, and who has collected many other Psocoptera throughout the years; also for his studies on the insects of an amazon forest, in collaboration with Dr. Norman Penny.

Comments. *Lachesilla ariasi* belongs in the large species group *forcepeta* of the genus *Lachesilla*, diagnosed by García Aldrete (1974); it is unique among the 65 described species in the group, on the structure of the hypandrium, divided in two halves, on the Y-shaped phallosome apodemes with the distal acuminate prongs, on the distally bifid claspers and on the broad papillate area of the epiproct. It constitutes the 32nd species of *Lachesilla* recorded in Brazil, where at least other nine species remain to be described.

Acknowledgments. To Dr. José Albertino Rafael (INPA, Manaus, Amazonas, Brazil), for the loan of the specimens here studied.

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