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Species of *Lachesilla* in the Caribbean islands and Trinidad
(Insects: Psocoptera: Lachesillidae)

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**Abstract:** Twenty two species of *Lachesilla* were found in the West Indies and Trinidad, 11 of which are here described. Twelve species inhabit the Greater Antilles (with two exclusive endemics), four species are found in the Lesser Antilles (with two exclusive endemics), and 11 species are found in Trinidad, four of which are exclusive endemics. Two species are shared between the Greater and the Lesser Antilles. Nine of the 12 species of the Greater Antilles also occur in México and the U.S., eight species also occur in Central America and three species are also found in South America. One of the four species of the Lesser Antilles is also found in México, the U.S., Central and South America. Four of the 11 species of Trinidad also occur in North America, four are also found in Central America, and four are also found in South America. There is a sharp drop in number of species from Trinidad to the islands north of it. The assemblages of *Lachesilla* species of the Greater Antilles, the Lesser Antilles and Trinidad are distinct. The genus has undergone little speciation in the Greater and in the Lesser Antilles; in Trinidad some speciation may have occurred by isolation from mainland populations. The greater diversity of *Lachesilla* on Trinidad may be due to more collecting and to greater proximity to the mainland.

**Key words:** West Indies, Trinidad, *Lachesilla*, new species, distribution.

**Introduction**

*Lachesilla* is a large, cosmopolitan genus, with 173 described and 165 undescribed species, already on hand in collections. Its species are well represented throughout the world, except in Australia and in the Oriental region, where only a few species have been recorded (Garcia Aldrete, 1988a, New & Lee, 1991). The genus is best represented in the Neotropics, particularly in México, where 159 species (described and undescribed) are known to occur. In this country, 144 species (91% of the total) have been collected in an area S of parallel 19°N and between meridians 91-101°W, including, in whole or in part, the states of Campeche, Chiapas, Distrito Federal, Guerrero, México, Michoacán, Morelos, Oaxaca, Puebla, Tabasco, Tlaxcala and Veracruz. It is in this area where the genus most likely has diversified and extended to areas north and south of it.

I have previously indicated that the genus probably extended to Africa before this continent separated from South America, some 150-130 mybp, and that from Africa it spread to Europe and the Orient, as far as Pakistan (García Aldrete, 1988a). Recently, New & Lee (1991), found two species of *Lachesilla* in West Malaysia, thus demonstrating a deeper penetration of the genus in the Oriental region, although the number of species in the area...
is very small. Figure 73 shows the number of species of Lachesilla in most American countries (Central America is here considered as a unit). From México to the north, the number of species drops drastically, and from México to the SE the number of species also decreases considerably in Central America, to increase again in the South American subcontinent, where probably the number of species is underestimated, given the vastness of unexplored areas and the lack of collecting by specialists.

What becomes evident from Figure 73 is that the mainlands bordering the Caribbean area are rich in species of Lachesilla.

Before this work was undertaken, only ten species of Lachesilla had been recorded in the Caribbean islands and Trinidad (Badonnel, 1977; Garcia Aldrete, 1972, 1974a, 1974b, 1982, 1988b, 1991; Mockford, 1974, Turner, 1975), but examination of important collections in the Illinois Natural History Survey (Urbana, = INIIS), Illinois State University (Normal, = ISU), and the American Museum of Natural History (New York City, = AMNH), revealed the existence of many more species, so the purpose of this work was to document the species of Lachesilla in the Caribbean area and Trinidad, to determine which of these are endemic to the area, to analyze their known distribution, and to test some tenets of West Indian zoogeography: that the biota exhibit affinities mostly with Central and South America, and that the faunas of the Greater and the Lesser Antilles are distinct (Halffter, 1975; Lescure et al., 1991; Liebherr, 1988).

Material and Methods

The specimens examined are preserved in 80% alcohol; those utilized for microscopic study were dissected in 80% alcohol, and the head, genitalia and right wings and legs were mounted permanently, either in Euparal or in Balsam of Canada. Measurements of parts mounted on slides are in microns and were taken with a filar micrometer, whose measuring unit is 1.36 microns for wings and 0.53 microns for other parts. The following abbreviations refer to length of parts measured: FW: fore wing; HW: hind wing; F: femur; T: tibia; t1 and t2: tarsomeres of hind leg; f1...fn: flagellomeres 1...n; IO: minimum distance between compound eyes; D: antero-posterior diameter of compound eye; d: transverse diameter of compound eye; PO, d/D, ctt1 is the number of ctenidia on t1.


The specimens studied are from my own collection (Instituto de Biología, UNAM., = IBUNAM), and from the collections mentioned in the preceding section. The location of the types of the new species is indicated in the corresponding descriptions. In the next section the systematic treatment of the species dealt with is presented, followed by an analysis of the assemblage of Lachesilla species.

I have included the species of Trinidad for comparative purposes, this island is on the South American continental shelf and can not be considered as part of the West Indies; there is a drastic drop in species numbers from Trinidad-Tobago to the Lesser Antilles islands north of it, documented for butterflies, scorpions, birds, reptiles and amphibians (cf. Lescure et al., 1991), and now for Lachesilla species.

In the Lesser Antilles, only species from Guadeloupe, Martinique, Dominica, St. Lucia and St. Vincent were available for study, so I faced here what Slater (1988), has referred to as 'the problem of negative evidence', but, with the data on hand, it is predictable that the islands for which evidence is missing, will have 1-2 species, and that these will be either endemics or widely distributed species, in a situation reminiscent to that of the scorpions of the Lesser Antilles (Lourenço, 1987).

Systematic Treatment

andra Group (García Aldrete, 1974a)

Lachesilla bilobata García Aldrete

L. bilobata García Aldrete, 1974b, p. 143.

This species is known from a single female collected in Piarco, Trinidad.
**forcepeta** group (García Aldrete, 1974a)

* Lachesilla acuminiforceps García Aldrete, new species
  (Figs. 1-6)

**Diagnosis.** With characters of the group, differing from other species in having a strongly pigmented area in anterior apex of ninth sternum, claspers acuminate and epiproct with two rugose, mesal protuberances.

**Female.** Color (in 80% alcohol). Body pale brown; ocelli clear, without centripetal crescents; antennae, maxillary palps and legs light brown. Wings (Fig. 1), hyaline, veins pale brown.

**Morphology.** Subgenital plate (Fig. 2), broad, setose, slightly concave posteriorly, with a hyaline band along posterior border. Gonapophyses (Fig. 3), wider basally, narrowing towards distal ends, apically blunt, with setae as illustrated. Spermapore in anterior half of ninth sternum, surrounded by a wide, pigmented ring. Ninth sternum (Fig. 3) with a pigmented band along anterior margin, and a pigmented area at the anterior apex of the sternite, anterior to the spermapore. Paraprocts (Fig. 4), semi-elliptical, setose, with well defined pigmented band on outer edge of each sensorium, these with 9-11 trichobothria. Epiproct (Fig. 4), straight anteriorly, rounded posteriorly; setae of paraprocts and epiproct as illustrated.

**Measurements.** FW: 1870; HW: 1448; F: 390; T: 694; t1: 234; t2: 88; ett1: 17; p4: 89; fl: 280; f2: 233; f3: 188; f4: 132; f5: 87; IO: 297; D: 179; d: 118; IO/D: 1.65; PO: 0.65.

**Male.** Color (in 80% alcohol). Same as the female.

**Morphology.** Hypandrium (Fig. 5), broad, setose, with sides parallel, and posterior border slightly projected posteriorly to a median, wide apex. Claspers (Fig. 5), proximally ovoid, with 6 setae; distally stout, curved outwards, terminally acuminate, each with a short, pointed apophysis on median inner edge. Phallosome apodemes (Fig. 5), forming a stout baculum that widens and divides posteriorly, each arm extending into an almost rectangular, membranous area. Paraprocts (Fig. 0), semi-elliptical, with a pigmented band on proximal end, next each sensorium, these with 10 trichobothria. Mesally a pigmented area with a small, sclerotized prong. Epiproct (Fig. 6), almost straight anteriorly, rounded posteriorly, mesally with a rounded, rugose protuberance, strongly sclerotized, on each side of longitudinal midline. Setae of paraprocts and epiproct as illustrated.

**Measurements.** FW: 1662; HW: 1251; F: 343; T: 645; t1: 221; t2: 92; ett1: 16; P4: 87; fl: 258; f2: 228; f3: 193; f4: 155; IO: 251; D: 165; d: 108; IO/D: 1.52; PO: 0.65.

**Type locality.** Mexico. Quintana Roo. 36 Km S Puerto Juárez, 31.X.1971, beating branches with dead leaves on forest edge. ANGA. Holotype M, allotype F, 2M and 18 F paratypes (IBUNAM).


**Lachesilla hiunaris** García Aldrete, new species. (Figs. 7-10)

**Diagnosis.** With characters of the group, differing from other species in having two crescent-shaped pigmented areas at the posterior margin of the subgenital plate.
Female. Color (in 80% alcohol). Body light brown; ocelli clear, without centripetal crescents. Thorax with an irregular, longitudinal brown band on each pleuron. Wings (Fig. 7), hyaline, veins golden brown.

Morphology. Subgenital plate (Fig. 8), almost trapezoidal, with mesal field of setae. Gonapophyses (Fig. 9), short, stout, acuminately blunt. Spermapore almost in the center of the ninth sternum, surrounded by a wide, pigmented ring (Fig. 9). Paraprocts (Fig. 10), semi-elliptical, setose, with a well defined pigmented band on proximal end, next each sensorium; these with 9-10 trichobothria. Epiproct (Fig. 10), almost trapezoidal, setae as illustrated.

Measurements. FW: 1469; HW: 1144; F: 298; T: 543; t1: 201; t2: 82; cttl: 15; P4: 236; f2: 179; f3: 155; f4: 120; f5: 82; f6: 75; f7: 68; f8: 68; f9: 64; f10: 61; f11: 83; 10: 212; D: 147; d: 83; PO: 1.44; D: 1.44; PO: 0.56.


Lachesilla caribe García Aldrete

This species was described from specimens of Guadeloupe and Martinique, in the Lesser Antilles. Additional records follow: Martinique. Fond La Haye, 8.I.1955, AMN, 2F, 1M. St. Vincent. King’s Hill, 27.VIII.1961, beating branches with dead leaves, ELM, 1M. Puerto Rico. Mayaguez, 19-22.I.1955, AMN, 1M.

Lacesilla denticuliforceps García Aldrete

Diagnostic. With characters of the group, differing from other species in having stout, acuminately blunt claspers, each with a large tooth and a row of small denticles on inner edge.

Female. Color (in 80% alcohol). Body light brown; ocelli clear, with brown centripetal crescents. Antennae and P3-P4 dark brown; legs light brown. Wings (Fig. 11), hyaline, veins light brown.

Morphology. Subgenital plate (Fig. 14), broad, with a central field of setae; sides irregular, posterior margin almost straight, with an unpigmented band along its length. Gonapophyses (Fig. 13), slender, acipically blunt; spermapore small, surrounded by a thin, pigmented ring; almost in the center of the ninth sternum. Paraprocts (Fig. 12), short, rounded, setose, with a pigmented band in proximal end, next to sensorium; these with 11-12 trichobothria.

Measurements. FW: 1605; HW: 1238; F: 307; T: 606; t1: 203; t2: 82; cttl: 15; P4: 254; f2: 204; f3: 164; f4: 123; f5: 88; f6: 84; f7: 69; f8: 69; f9: 66; f10: 65; f11: 88; 10: 235; D: 134; d: 84; PO: 1.75; D: 1.75; PO: 0.62.

Male. Color (in 80% alcohol). Same as the female.

Morphology. Hypandrium (Fig. 15), straight anteriorly, slightly convex posteriorly, setae as illustrated. Claspers (Fig. 15), stout, with 2-3 setae on basal halves; distal halves curved, distally acuminate, with a prominent tooth on each inner side, and a row of denticles preapically. Phallosome (Fig. 15), with apodemes fused to form a slender baculum, that divides distally and extends into irregular, membranous area. Paraprocts (Fig. 16), broad, elongate, with pigmented band on proximal end, next each sensorium, these with 9-10 trichobothria; posterior margin pigmented mesally, with a short, acuminate, sclerotized prong. Epiproct (Fig. 16), straight anteriorly, with sides converging to a posterior apex; on apical area a stout, elongate, sclerotized apophysis; setae of paraprocts and epiproct as illustrated.

Measurements. FW: 1518; HW: 1126; F: 307; T: 598; t1: 203; t2: 86; cttl: 16; P4: 83; f1: 261; f2: 217; f3: 193; f4: 137; f5: 111; f6: 95; f7: 92; f8: 83; f9: 87; f10: 80; f11: 114; 10: 212; D: 148; d: 98; PO: 1.43; D: 1.43; PO: 0.66.

Lachesilla dilatiforceps García Aldrete, new species
(Figs. 17-22)

Diagnosis. With characters of the group, differing from other species in having two large, distinct, pigmented areas on the subgenital plate, and distal halves of claspers dilated, distally pointed and with a small tooth mesally on inner edge.

Female. Color (in 80% alcohol). Body light brown; ocelli clear, with reddish brown centripetal crescents. An irregular, longitudinal brown band on each side of thorax. Wings (Fig. 17), hyaline, veins reddish brown.

Morphology. Subgenital plate (Fig. 18), broad, setose; mesally with two large, elongate, pigmented areas, one to each side of longitudinal midline. Gonapophyses (Fig. 19), elongate, apically blunt. Spermapore small, towards anterior border of ninth sternum, surrounded by a large pigmented area as illustrated. Paraprocts (Fig. 20), semi-elliptical, with a pigmented band on proximal end, next each sensorium, these with 10-11 trichobothria. Epiproct (Fig. 20), straight anteriorly, rounded posteriorly, with setal field on posterior half, and a rectangular projection on apex, with 3 setae.

Measurements. FW: 1530; HW: 1160; F: 312; T: 592; t1: 225; t2: 86; ct1: 16; P4: 81; f1: 245; f2: 192; f3: 171; f4: 131; f5: 97; f6: 88; f7: 82; f8: 74; f9: 75; f10: 69; f11: 102; IO: 234; D: 129; d: 84; IO/D: 1.81; PO: 0.65.


Lachesilla dominicaensis Garcia Aldrete, new species
(Figs. 23-27)

Diagnosis. With characters of the group, differing from other species in having subgenital plate anteriorly bilobulate, with three transverse, pigmented slender bands next to median cleft.

Female. Color (in 80% alcohol). Body light brown; ocelli clear, without centripetal crescents. Antennae, maxillary palps and legs light brown. Wings (Fig. 23), hyaline, veins light brown.

Morphology. Subgenital plate (Fig. 25), with sides converging towards broadly bilobed apex, with three transverse pigmented slender bands next to median cleft; setae as illustrated. Gonapophyses (Fig. 26), short, stout, apically blunt. Spermapore small, surrounded by a wide, pigmented ring. Paraprocts (Fig. 27), semi-elliptical, with a pigmented band along proximal end, next each sensorium; these, with 10-11 trichobothria. Epiproct (Fig. 27), straight anteriorly, posteriorly rounded, with setal field on posterior half, setae of paraprocts and epiproct as illustrated.

Measurements. FW: 1843; HW: 1527; F: 428; T: 695; t1: 236; t2: 91; ct1: 17; P4: 96; f1: 303; f2: 243; f3: 204; f4: 154; f5: 99; f6: 99; f7: 80; f8: 85; f9: 74; f10: 75; f11: 106; IO: 269; D: 164; d: 109; IO/D: 1.64; PO: 0.66.
Lachesilla magna García Aldrete, new species
(Figs. 28-31)

Diagnosis. With characters of the group, differing from other species in having large spermapore, surrounded by a large, ellipsoid pigmented area.

Female. Color (in 80% alcohol). Body pale brown; ocelli clear, with dark brown centripetal crescents. P4 dark brown, more pigmented than rest of the body. Wings (Fig. 28), hyaline, veins brown.

Morphology. Subgenital plate (Fig. 30), broad, with mesal, posteriorly triangular, setose convex area; sides of plate converging posteriorly towards straight margin. Gonapophyses (Fig. 31), large, wider in the middle, apically blunt. Spermapore large, surrounded by an ellipsoid pigmented area, the longer axis of which is longitudinal to the ninth sternum (Fig. 31). Paraprocts (Fig. 29), semi-elliptical, proximal end with a pigmented band, next each sensorium; these with 13-14 trichobothria. Epiproct (Fig. 29), almost trapezoidal, posteriorly rounded, setal field on posterior half; setae of paraprocts and epiproct as illustrated.

Measurements. FW: 2113; HW: 1620; F: 453; T: 827; tl: 286; t2: 106; cttl: 17; P4: 99; fl: 274; f2: 231; f3: 236; f4: 182; f5: 169; f6: 97; f7: 82; f8: 88; f9: 70; f10: 76; f11: 113; IO: 311; D: 198; d: 149; IO/D: 1.57; PO: 0.75.

Type Locality. Dominica. Pont Cassé. 23.X.1966, ABG. Holotype F (ISU).

Lachesilla pigmentithorax García Aldrete, new species
(Figs. 39-45)

Diagnosis. With characters of the group, differing from other species in having episterna of meso and metatorax reddish brown, contrasting with epimera and general body color pale brown.

Female. Color (in 80% alcohol). Body pale brown; ocelli clear, with ochre centripetal crescents. Antennae, P4 and legs brown. Episterna of meso and metathorax reddish brown, strongly contrasting with epimera and rest of the body, pale brown. Wings (Fig. 39), hyaline, veins brown.

Morphology. Subgenital plate (Fig. 41), broad, with mesal, setose, convex area, posteriorly triangular; posterior third of plate projected, glabrous, with border straight. Gonapophyses (Fig. 42), short, globose, apically blunt; spermapore large, surrounded by a tear-shaped pigmented area (Fig. 42). Paraprocts (Fig. 43), ovoid, densely setose, as illustrated, proximal end with a pigmented band next each sensorium; these with 12-13 trichobothria. Epiproct (Fig. 43), anteriorly straight, posteriorly rounded, with setae on posterior half.

Measurements. FW: 2433; HW: 1853; F: 582; T: 1088; t1: 400; t2: 111; ctt1: 22; P4: 121; f1: 371; f2: 324; f3: 287; f4: 212; f5: 143; f6: 115; f7: 107; IO: 424; D: 260; d: 197; IO/D: 1.63; PO: 0.75

Male. Color (in 80% alcohol). Same as the female.

Morphology. Hypandrium (Fig. 44), almost rectangular, slightly concave posteriorly, setae as illustrated. Claspers (Fig. 44), proximally broad, setose, with postero-lateral corners rounded; distally slender, curved, with apices slightly dilated. Phallosome apodemes fused to form a slender baculum that divides posteriorly, each arm extended into a large, triangular, membranous area. Paraprocts (Fig. 45), almost straight anteriorly, posteriorly rounded, mesally with a slender pigmented band along the border; sensoria with 12-13 trichobothria, one, on outer edge, without basal rosette. Epiproct (Fig. 45), straight anteriorly, rounded posteriorly, setae on distal half.

Measurements. FW: 2427; HW: 1808; F: 550; T: 968; t1: 392; t2: 106; ctt1: 22; P4: 115; f1: 354;

f2: 323; f3: 286; f4: 226; f5: 143; f6: 119; f7: 116; f8: 105; f9: 96; f10: 106; f11: 122; IO: 387; D: 239; d: 180; IO/D: 1.61; PO: 0.75.

Type Locality. Trinidad. B.W.I. Simla, ca. Arima, 24.II.1959, beating trees, ELM. Holotype M, allotype F, lM, 2F paratypes. 27.II.1959, beating cocoa trees, ELM, 1F paratype (ISU). 28.II.1959, AMN, 1F paratype, AMNH. This species is close to L. magna and to L. valvula, from which it can be separated on pigmentation details and in the shape of the spermapore sclerite (cf. L. magna García Aldrete, and New & Thornton, 1975).

Lachesilla rugosa García Aldrete, new species
(Figs. 46-52)

Diagnosis. With characters of the group, differing from other species in having a small, strongly sclerotized, obtusely concave projection at the base of the distal half of each clasper, and in having two large fields of sclerotized papillae on the male epiproct.

Female. Color (in 80 % alcohol). Body pale brown; ocelli clear, without centripetal crescents. Antennae, maxillary palps and legs pale brown. Wings (Fig. 46), hyaline, veins light brown.

Morphology. Subgenital plate (Fig. 48), broad, setose as illustrated, with a wide, median, posterior concavity, so the plate is slightly bilobed, with the posterior border glabrous. Gonapophyses (Fig. 47), wide at base, narrowing towards distal ends, apexes blunt. Spermapore on anterior third of ninth sternum, surrounded by an elliptical, pigmented area (Fig. 47). Paraprocts (Fig. 49), semi-elliptical, with pigmented bands along proximal ends, next sensoria; these with 11-12 trichobothria. Epiproct (Fig. 49), slightly concave anteriorly, rounded posteriorly, with setal field next to posterior margin. Setae of paraprocts and epiproct as illustrated.

Measurements. FW: 2158; HW: 1623; F: 425; T: 807; t1: 281; t2: 110; ctt: 17; f1: 308; f2: 257; f3: 216; IO: 303; D: 160; d: 106; IO/D: 1.89; PO: 0.66.

Male. Color (in 80% alcohol). Same as the female.

Morphology. Hypandrium (Fig. 50), straight anteriorly, slightly projected posteriorly to a wide apex, setae as illustrated. Claspers (Fig. 50), broad basally, with posterior outer corner projected, setae as illustrated, distal halves slender, slightly curved, apically blunt. each with 2-3 subapical denticles. and basally a small, sclerotized, obtusely concave projection. Phallosome apodemes fused, forming a baculum that widens posteriorly and divides, each arm extending into a broad, membranous area (Fig. 50). Paraprocts (Fig. 52), semi-elliptical, with a distinct, wide, sclerotized crescent on proximal end, next each sensorium; these with 12-13 trichobothria. Epiproct (Fig. 51), straight anteriorly and posteriorly, with a field of large, sclerotized papillae on each postero-lateral corner. Setae of paraprocts and epiproct as illustrated.

Measurements. FW: 2265; HW: 1724; F: 451; T: 841; t1: 304; t2: 112; ctt: 20; f1: 352; f2: 302; f3: 251; f4: 192; IO: 284; D: 172; d: 128; IO/D: 1.65; PO: 0.74.

Type Locality. Peru. Lima. La Molina, 18.IV.1975, on cassava, FDB. Holotype M, allotype F, 2 paratypes of each sex (ISU).


Lachesilla sandersoni Mockford
(Figs. 53-56)

L. sandersoni Mockford, 1974, p.143

This species was described from Cuba, on basis of females only. Turner (1975), described L. mona, from Jamaica, on basis of specimens of both sexes; in his description, Turner did not illustrate the subgenital plate of the female, and did not refer to the shape and pigmentation of the spermapore sclerite which, in some species, has diagnostic value. I have examined the holotype F of L. mona, deposited in the British Museum of Natural History (London), and it corresponds with the female L. sandersoni described by Mockford. I have also examined the allotype M of L. mona, deposited in the same institution, and have recently found the same Female-Male associations in the Dominican Republic, in Jamaica, and in Cuba. Lone females have been recorded in the Dominican Republic, in Haiti, French Guiana, Jamaica and in the Gulf Coast of México, whereas lone males have been collected in the Dominican Republic, in Guatemala and in Jamaica. Thus, L. mona Turner, becomes a synonym of L. sandersoni Mockford. The records of the species are the following: Cuba. Habana. Gardens of Hemingway Museum,


French Guiana. Cayenne, 16.IX.1959, beating trees in botanical garden, ELM, 1F.

Guatemala. Rio Hato, 86 Km NE Guatemala City, Hwy. to Puerto Barrios, 28.VIII.1968, beating coconutpalms, trees and shrubs, ELM, 3M.


Mexico. Veracruz. 8 Km S Tecolutla, 26.VI.1962, beating vegetation, ELM et al., 6F. 27 Km N Nautla, 27.VI.1962, beating broad leaved trees, ELM et al., IF.

Lachesilla trinidadensis Garcia Aldrete, **new species** (Figs. 57-62)

**Diagnosis.** With characters of the group, differing from other species in having a narrow hypandrium and prominent postero-lateral corners of the subgenital plate.

**Female.** Color (in 80% alcohol). Body light brown; ocelli clear, without centripetal crescents. Antennae, maxillary palps and legs brown. Wings (Fig. 57), hyaline, veins brown.

**Morphology.** Subgenital plate (Fig. 59), broad, with sides converging to almost straight, slightly projected posterior border; postero-lateral corners protruding, setal field of plate as illustrated. Gonapophyses (Fig. 58), stout, apically blunt; spermapore almost in center of ninth sternum, surrounded by a wide, pigmented ring. Paraprocts (Fig. 61), ovoid, with pigmented band along proximal end; sensoria with 11-12 trichobothria. Epiproct (Fig. 61), almost straight anteriorly, rounded posteriorly; setae of paraprocts and epiproct as illustrated.

**Measurements.** FW: 2049; HW: 1552; F: 393; T: 776; t1: 252; t2: 93; ct1: 19; f1: 340; f2: 288; f3: 242; f4: 186; f5: 128; f6: 112; f7: 94; f8: 93; f9: 89; f10: 78; IO: 294; D: 181; d: 128; IO/D: 1.62; PO: 0.70.

**Male.** Color (in 80% alcohol). Same as the female.

**Morphology.** Hypandrium (Fig. 60), narrow, approximally trapezoidal, setose. Claspers stout (Fig. 60), with 5-6 setae on proximal halves; distal halves curved, apically dilated. Phallosome apodemes fused to form a slender baculum (Fig. 60), that ends posteriorly in two wide, membranous areas. Paraprocts (Fig. 62), semi-elliptical, setose, with 12-13 trichobothria on each sensorium. Epiproct (Fig. 62), straight anteriorly, rounded posteriorly, with setal fields on posterior half.

**Measurements.** FW: 1947; HW: 1461; F: 395; T: 728; t1: 251; t2: 96; ct1: 18; f1: 371; f2: 336; f3: 276; f4: 222; f5: 155; f6: 134; f7: 117; f8: 117; f9: 102; f10: 96; f11: 130; IO: 282; D: 181; d: 126; IO/D: 1.55; PO: 0.68.


**Records.** Trinidad. Arima Valley, 266-400 m, 10-22.II.1964, R & C, 5F. Simla, 29.VIII.1961, on dead cacao leaves on branches, ELM, 1F. Blanchisseuse, 16 km from Arima, 29.XII.1954, AMN, 1M. This species is close to *L. cuala* Garcia Aldrete (1988b).

Lachesilla yanomamioides Garcia Aldrete, **new species** (Figs. 63-68)

**Diagnosis.** With characters of the group, differing from other species in having slender distal halves of claspers, each with a row of small denticles on inner edge; and in having a slender, transverse irregular projection mesally on the male epiproct.

**Female.** Color (in 80% alcohol). Body pale brown; ocelli clear, without centripetal crescents. Wings (Fig. 63), hyaline, veins brown.

**Morphology.** Subgenital plate (Fig. 68), with sides converging to slightly concave posterior margin, a pigmented band running along each side, setae as illustrated. Gonapophyses (Fig. 67), wide at base, narrowing distally, apically blunt. Spermapore small, in center of ninth sternum, surrounded by a wide, pigmented ring. Ninth sternum (Fig. 67), limited anteriorly by a pigmented band. Paraprocts (Fig. 66), semi-elliptical, sensoria with 11-12 trichobothria. Epiproct (Fig. 66), almost trapezoidal, setal field on posterior half; setae of paraprocts and epiproct as illustrated.

**Measurements.** FW: 2046; HW: 1496; F: 410; T: 749; t1: 262; t2: 95; ct1: 20; P4: 89; f1: 331; f2: 266; f3: 213; f4: 165; f5: 94; f6: 106; f7: 75; f8: 75; f9: 58; IO: 291; D: 185; d: 128; IO/D: 1.57; PO: 0.67.
Male. Color (in 80% alcohol). Same as the female.

Morphology. Hypandrium (Fig. 65), broad, anteriorly straight, slightly projected posteriorly, setae as illustrated; claspers (Fig. 65), with 5-7 setae on basal halves, distally very slender, curved, slightly dilated apically, each with a row of fine denticles along outer edge. Phallosome apodemes (Fig. 65), fused to form a slender rod, distally divided, each arm extended into a wide membranous area. Paraprocts (Fig. 64), semi-elliptical, with a distinct, sclerotized area proximally, next paraprocts and epiproct as illustrated.

Measurements. FW: 2155; HW: 1626; F: 420; T: 804; t1: 271; t2: 99; P1: 363; f2: 261; f3: 231; f4: 181; f5: 110; f6: 106; f7: 87; f8: 84; f9: 80; f10: 73; f11: 100; IO: 259; D: 220; d: 150; IO/D: 1.17; PO: 0.68.


This species is close to I. yanomami Mockford. (cf. L. denticulata Garcia Aldrete, in this paper).

Lachesilla aethiopica (Enderlein)


This species, most likely parthenogenetic, was originally described from Tanganyka, Africa, and has also been recorded in Angola, Uganda and Zaire, as well as in Brazil, Galapagos Islands, Cuba, Florida, Trinidad, Hispaniola, Jamaica, Puerto Rico, and in numerous Mexican localities in the states of Chiapas, Hidalgo, Oaxaca, Puebla and Veracruz (Badonnel & Garcia Aldrete, 1980). I include here-with additional records of this species in Central, South America, and the Caribbean region: Guatemala. 2 Km NW Panajachel, 29.VIII.1973, beating Cupressus, ANGA, 2F. Belize. Toledo District, Columbia Forestry Station, ca. San Antonio, 8-15.VII.1971, beating coihue palms and branches with dead leaves in forest, ELM, 5F. Costa Rica. Heredia Province, Finca La Selva, 1.VII.1977, beating branches with dead, hanging leaves in forest, ELM, 5F. Peru. La Merced, Chanchamayo Valley, 1.I.1959, AMN, 2F. St. Lucia. Edmunds Forestry Reserve, 8-10.VIII.1986, CWOB, 1F. Trinidad. Simla, 26.II.1959, AMN, 1F. Northern Range, Arima Blanchisseuse Rd., 10.V.1985, CW & LBOB, 2F.

**Lachesilla nadleri** Garcia Aldrete, new species

(Figs. 32-38)

**Diagnosis.** With characters of the group, differing from other species in having subgenital plate deeply obtusely concave posteriorly, with two mesal curved marks, claspers straight, directed posteriorly, and male epiproct bilobed, each lobe with a sharp, sclerotized projection.

**Female.** Color (in 80% alcohol). Body light brown; ocelli clear, without centripetal crescents. Antennae, maxillary palps and legs brown. Wings (Fig. 32), hyaline, veins brown.

**Morphology.** Subgenital plate (Fig. 33), deeply obtusely concave posteriorly, with resulting lobes stout, apically rounded, each with a distal field of 5-6 setae, other setae as illustrated; mesally with two pigmented, curved marks, one on each side of longitudinal midline Gonapophyses (Fig. 34), wider basally, narrowing towards distal ends, apices acuminate; ninth sternum (Fig. 34), pigmented as illustrated. Paraprocts (Fig. 35), broad, outer margin rounded; sensoria with 9-10 trichobothria. Epiproct (Fig. 35), straight anteriorly, distally rounded, with distal field along posterior margin; setae of paraprocts and epiproct as illustrated.

**Measurements.** FW: 1969; HW: 1506; F: 371; T: 694; t1: 249; t2: 89; ctt1: 20; P4: 98; f1: 285; f2: 258; f3: 224; f4: 171; f5: 112; f6: 121; f7: 94; f8: 92; f9: 84; IO: 258; D: 179; d: 110; IO/D: 1.44; PO: 0.61.

**Male.** Color (in 80% alcohol). Same as the female.

**Morphology.** Claspers fused laterally to almost triangular hypandrium (Fig. 36), proximal half of each clasper rounded, setae as illustrated, distal halves slender, almost straight, directed posteriorly, slightly narrowing to the apices. Phallosome apodemames fused to form a stout baculum, distally widened and extended into large, rounded membranous area (Fig. 36). Paraprocts (Fig. 37), proximally rounded, articulated to condyles in clunium; each with a stout, setose prong; sensoria with 10-11 trichobothria. Epiproct (Fig. 38), straight anteriorly, bilobed posteriorly; each lobe with a small, sclerotized, acuminate apophysis; setae of paraprocts and epiproct as illustrated.

**Type Locality.** Trinidad, B. W. I. Simla, 28.XII.1954, AMN. **Holotype M, allotype F, 1M, 1F paratypes (AMNH).**

**Records.** Peru. Madre de Dios. Rio Tambopata Reserve, 30 Km (air), SW Puerto Maldonado, 290 m., 12º 50' S: 69º 17' W. Smithsonian Institution Canopy Fogging Project, TLE et al., 25.II.1984, 05/02/054, 1F. 14.IX.1984, 05/02/049, 1F. 14.IX.1984, 01/02/062, 1M.

**Lachesilla rena** Sommerman

L. rena Sommerman, 1946, p. 653.

This species was described from Phoenix, Arizona, and has a wide distribution: it has been recorded in Arizona, California and Texas, also in the Mexican states of Baja California Norte, Baja California Sur, Campeche, Colima, Chiapas, Jalisco, Guerrero, Nuevo León, Oaxaca, Puebla; San Juanito, María Madre and Socorro Islands, San Luis Potosí, Sinaloa, Sonora, Tamaulipas, Veracruz and Yucatán, as well as in Guatemala, Honduras, Haiti, Jamaica and Puerto Rico. The Central American and Caribbean records are as follows:

**Guatemala.** 30 Km NE Guatemala City, Hwy. to Puerto Barrios, 27.VIII.1968, beating branches with dead leaves, desert scrub. ELM & ANGA, 1F, 1M.

**Honduras.** Coyoles, 12 Km W Olanchito, 20-22.V.1949, ECB, 1F, 4M.

**Hispaniola.** Haiti. Dept. du Nord. Milot, Ruins of Palais du Christophe, 20.V.1959, MWS, 1M.

**Jamaica.** Kingston. 28.VI.1958, MWS, 4F, 7M.

**Puerto Rico.** Maricao Insular Forest, 11.III.1959, beating vegetation, ELM, 1F, 1M.

**L. tectorum** Badonnel
L. tectorum Badonnel, 1931, p. 238.

This species was originally described from Mozambique (Badonnel, 1931). Badonnel (1966), described L. pilosa from Mauritius Island, which is in reality a synonym of L. tectorum, the species is also known to occur in Angola, Australia, Ivory Coast, Réunion Island, Madagascar, southern Florida and southern Texas (U.S.A.), in the Mexican states of Nuevo León and Tamaulipas, in Honduras, Grand Cayman, Cuba and Brazil (Badonnel, 1977; Mockford, 1993; Smithers, 1974, and my own records).

The following records widen considerably the distribution of the species:

Mexico: states of Chiapas, Colima, Distrito Federal, Guanajuato, Michoacán, Morelos, Nuevo León, Puebla, Sinaloa, Tamaulipas, Veracruz and Zacatecas; the localities are too numerous to be cited.

Panama: Canal Zone, Balboa, 22-28.1V.1946, lighttrap, IF.

Colombia: Ex. orchids, 10F. Brazil: Itu, 14.1.1959, AMN, 1F.

Haiti: Tombeau Cheval, 10F.

Jamaica: 1F.

Trinidad: On Persea americana, 1M.

South India: Dohnavur, Tirunelveli, 27.11.1962, ESR & DQC, 1F.

I have examined the type of Lachesilla montana Turner, deposited in the British Museum of Natural History, in London, and found that it is, in reality, L. tectorum Badonnel; thus, L. montana Turner, falls in the synonymy of the latter species.

riegeli group (Garcia Aldrete, 1974a)

Lachesilla riegeli Sommerman


This species was described from Miami Beach, Florida, state in which the species has also been recorded in Indian River, Monroe, Highlands and Polk counties. In México it has been recorded in the states of Campeche, Guerrero, Jalisco, Nuevo León, Oaxaca, Sonora and Yucatán, and in María Madre and Socorro Islands. The records for Central South America and the Caribbean region are the following: Guatemala. 30 Kms NW Guatemala City, Hwy. to Puerto Barrios, 27.VII.1968, beating branches with dead leaves, desert scrub, 1F. Honduras. 12 Kms W Olancho, 20-22.VI.1949, ECR, 67F, 27M. Comayagua, 13 Kms S Comayagua, 21.VII.1977, CWOB, 2F, 1M. Bahamas Is. N.P. Nassau, 21.IV.1958, AMN, 2F, Cuba: Matanzas, 1.V.1973, attracted to light, 1M. (Badonnel, 1977). Hispaniola: Haiti: Port au Prince, 22.V.1950, 1F. Jamaica: Negrill, 24.III.1955, AMN, 2F, Puerto Rico: La Parguera, 24.IV.1959, 1F. Colón, 8Km W Aguada, 28.IV.1959, 1M. Colombia: Valle Cali, 1000 m, 3-4.X.1970, light trap, DB, 1F.

L. sola Garcia Aldrete

L. sola Garcia Aldrete, 1982, p. 204.

This species was described from Jamaica, on basis of six females. Additional records are the following: Jamaica: Negrill, 24.III.1955, AMN, 2F, Bahamas Is. N.P. Paradise Is. 22-23.IV.1955, AMN, 8F.

Lachesilla tropica Garcia Aldrete

L. tropica Garcia Aldrete, 1982, p. 204.

This species has been recorded in Jamaica; it has also been collected in Guatemala, Honduras, in the Mexican states of Campeche, Chiapas, Guerrero, Jalisco, Nuevo León, Oaxaca, Quintana Roo, San Luis Potosí, Tamaulipas, Veracruz and Yucatán, and in southern Florida, USA.

Discussion

The three major divisions of the Caribbean - Greater Antilles, Lesser Antilles and Trinidad-Tobago - are recognizable as entities on the basis of their Lachesilla fauna. Only one species, L. aethiopica, is shared by all three major divisions. This species, widespread in tropical areas outside the Caribbean is, notably, the only species shared between the Lesser Antilles and Trinidad-Tobago. Two other species, L. denticulata and L. tectorum, are shared between Trinidad-Tobago and the Greater Antilles; both of them are relatively widespread on various mainland areas.

In the Antilles apart from Trinidad-Tobago there are 15 species. One endemic, L. canibe is found on both major divisions, but is restricted in the Greater Antilles to the easternmost island, Puerto Rico. The Greater Antilles have only two exclusive endemics: L. dilatiforceps (forcepeta group) and L. sola (riegeli group). In addition to the six aforementioned species,
six others occur in the Greater Antilles, all of which are shared with various mainland areas.

The Lesser Antilles have two exclusive endemics: *L. bilunaris* on St. Vincent and *L. dominicaensis* on Dominica (both *forcepeta* group). Both are known only from females and differ primarily in size. These two plus the two mentioned above are all that are known from the Lesser Antilles. Assuming that these numbers are not collection artifacts, one is led to believe that the Lesser Antilles are difficult to reach and/or difficult to establish upon for these psocids.

For the Antilles proper, then, excluding Trinidad-Tobago, *Lachesilla* as currently understood has undergone little speciation and most of the species have become established from other areas.

Of the 11 species on Trinidad-Tobago, four are endemics: *L. bilobata*, *L. magna*, *L. pigmentithorax*, and *L. trinidadensis* (*forcepeta* group). Some speciation may have occurred on Trinidad by isolation from adjacent mainland populations.

In addition to the four endemics and the three species mentioned above, four other species occur on Trinidad. All are shared with various mainland areas, and one, *L. yanomamioides*, reaches North America, though restricted there to southern and eastern Mexico. The seemingly greater diversity of *Lachesilla* on the relatively small land mass of Trinidad-Tobago, compared to the Greater Antilles may be due in part to more collecting and in part to greater proximity to the mainland.

**Acknowledgements**

I am indebted to the Illinois Natural History Survey, Urbana; to Dr. E. L. Mockford (Illinois State University, Normal), and to Dr. Randall T. Schuh (American Museum of Natural History, New York) for loans of *Lachesilla* specimens in their respective collections. To Dr. Mockford I also owe the discussion included in the paper. Felipe Vigil-gas (Instituto de Biología, UNAM, Mexico City), drew the distribution maps. I am also grateful to this latter institution for supporting my research throughout the years.

**References**


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Figures 1-6. *Lachesilla aruminiiforceps* n. sp. 1. Fore and hind wings, F. 2. Subgenital plate, F. 3. Gonapophyses and ninth sternum, F. 4. Right paraproct and epiproct, F. 5. Hypandrium, claspers and phalosome apodemes, M. 6. Right paraproct and epiproct, M. Scales in mm. Figs. 3-4 to scale of Fig. 2. Fig. 5 to scale of Fig. 6.
Figures 7-10. *Lachesilla bilunaris* n. sp. 7. Fore and hind wings. 8. Subgenital plate. 9. Gonapophyses and ninth sternum. 10. Right paraproct and epiproct. Scales in mm. Figs. 8-9 to scale of Fig. 10.
Figures 11-16. *Lachesilla denticuliforceps* sp. 11. Fore and hind wings. F. 12. Right paraproct and epiproct. F. 13. Gonapophyses and ninth sternum. F. 14. Subgenital plate. F. 15. Hypandrium, claspers and phallosome apodemes. M. 16. Right paraproct and epiproct, M. Scales in mm. Figs. 12-13 to scale of Fig. 14. Fig. 15. to scale of Fig. 16.
Figures 17-22. *Lachesilla dilatiforceps* n. sp. 17. Fore and hind wings, F. 18. Subgenital plate, F. 19. Gonapophyses and ninth sternum, F. 20. Right paraproct and epiproct, F. 21. Hypandrium, claspers and phallosomal apodemes, M. 22. Right paraproct and epiproct, M. Scales in mm. Fig. 20 to scale of Fig. 19. Fig. 21 to scale of Fig. 22.
Figures 28–31. *Lachesilia magna* n. sp. 28. Fore and hind wings. 29. Right paraproct and epiproct. 30. Subgenital plate. 31. Gonapophyses and ninth sternum. Scales in mm. Figs. 30-31 to scale of Fig. 29.
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Figures 46-49. Lombrica rugosa n. sp. F. 46. Fore and hind wings. 47. Gonapophyses and ninth sternum. 48. Subgenital plate. 49. Right paraproct and epiproct. Scales in mm. Figs. 47 and 49 to scale of Fig. 48.
Figures 50-52. *Lachesila rugosa* n.sp. 50. Hypandrium, claspers and phallosome apodemes. 51. Epiproct. 52. Left paraproct. Scale in mm. Figs. 50-51 to scale of Fig. 52.
Figures 53-56. *Lachesilla sandersoni* Mockford. M. 53. Fore and hind wings. 54. Epiproct and right paraproct. 55. Hypandrium, claspers and phallosome apodemes. 56. Frontal view of head. Scales in mm. Fig. 55 to scale of Fig. 54.
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Figures 63-68. *Lachesilla yanomamiodes* n. sp. 63. Fore and hind wings, F. 64. Epiproct and left paraproct, M. 65. Hypandrium, claspers and phallosome apodemes, M. 66. Epiproct and left paraproct, F. 67. Gonapophyses and ninth sternum, F. 68. Subgenital plate, F. Scales in mm. Figs. 64-66 and 68, to scale of Fig. 67.
Figure 69. Distribution of Caribbean Lachesilla: 1. *L. tectorum* Badonnel (open circle). 2. *L. aethiopica* Enderlein (closed circle).
Figure 70. Distribution of Caribbean Lachesilla: 1. *L. rena* Sommermann (closed circle). 2. *L. riegeli* Sommermann (triangle).
Figure 78. Number of species of Lachesilla in Caribbean and circum-Caribbean areas.
Table 1. Species of Lachesilla in Caribbean islands and in adjacent mainlands.

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B: Bahamas; C: Cuba; J: Jamaica; GC: Grand Cayman; H: Hispaniola; PR: Puerto Rico; G: Guadeloupe; D: Dominica; M: Martinique; SL: St. Lucia; SV: St. Vincent; T: Trinidad; NA: North America; CA: Central America; SA: South America.
Table 2. Species of *Lachesilla* shared between pairs of Caribbean islands, and between each island and adjacent mainlands. Numbers in extreme diagonal: No. of species in each island. (Vertical and horizontal lines separate Greater and Lesser Antilles).

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