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A New Spider of the Genus *Archoleoneta* (Araneae, Leptonetidae) from Panama

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ABSTRACT

Leptonetid spiders have previously been known only from three disjunct areas in the Northern Hemisphere (the United States and Mexico, the Mediterranean region, and southeast Asia). A new species, *Archoleoneta stridulans*, described from Panama, provides the most southern record of the

family, and belongs to a genus that apparently represents the sister group of all other leptonetids. Males of the new species have a carapace/abdomen stridulatory system not previously reported in the subfamily and not occurring in the Californian type species, *Archoleoneta schusteri* Gertsch.

INTRODUCTION

The spider family Leptonetidae is a Northern Hemisphere group, known only from three disjunct areas (see maps in Brignoli, 1970). In the United States and Mexico, the family is represented by 45 species of *Archoleoneta* Gertsch, *Neoleoneta* Brignoli, *Appaleptoneta* Platnick, and *Calileptoneta* Platnick,

along with two species placed incertae sedis (Platnick, 1986). In the Mediterranean area, 65 species are assigned to *Leptoneta* Simon, *Paraleptoneta* Fage, *Sulcia* Kratochvíl, *Catalleptoneta* Denis, *Protoleptoneta* Deltshev, *Barusia* Kratochvíl, *Leptonetela* Kratochvíl, and *Teloleptoneta* Ribera. The southeast

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Asian leptonetids include 35 species in the genera *Masirana* Kishida, *Sarutana* Komatsu, and *Falcileptoneta* Komatsu; another 25 southeast Asian species have been described simply in *Leptoneta*, but it is doubtful that any of those taxa are actually congeneric with Mediterranean forms.

Two subfamilies are recognized; all the genera other than *Archoleptoneta* are placed in the Leptonetinae, and are characterized by a peculiar eye arrangement that is unique among spiders, with the posterior median pair situated posteriorly of the other four eyes (Gertsch, 1974: figs. 1–11). *Archoleptoneta* is characterized by a more plesiomorphic eye arrangement, in which the six eyes are clumped together (Gertsch, 1974: figs. 128, 129). Although no synapomorphies were suggested to support the monophyly of the Archoleptonetinae when it was established by Gertsch (1974), the species involved share a unique form of tibial and patellar gland plates (Platnick, 1986).

Given the distribution of the family, it was surprising to find archoleptonetine specimens in Berlese samples of forest litter taken at Cerro Colorado, Panama. These Berlese samples, from the collection of the Field Museum of Natural History, Chicago (FMNH), also provided the specimens of the world's smallest mygalomorph spider, *Micromygaladiblemma* Platnick and Forster (1982). New World leptonetids have not previously been reported farther south than Chiapas, Mexico, and the Panamanian specimens provide by far the most southern known record of any leptonetid. Study of this fascinating material has allowed several aspects of the morphology of archoleptonetines to be elucidated for the first time.

I'm indebted to John Kethley, Al Newton, Margaret Thayer, and Dan Summers for their hospitality during visits to the Field Museum, and for making these and many other specimens available for study. At the American Museum of Natural History (AMNH), assistance with illustrations and scanning electron micrographs was supplied by Mohammad Shadab and Peling Fong Melville, respectively. Helpful comments on a draft of the manuscript were received from Christa Deeleman (Ossendrecht, Netherlands), Ray Forster (Otago Museum, Dunedin), Willis

Gertsch (AMNH), and John Murphy (Hampton, England). All measurements are in millimeters.

MORPHOLOGY

Because of the apparent position of *Archoleptoneta* as the sister group of all other leptonetids, many details of its morphology are of special interest. As in the other species of the genus, the posterior eyes are situated in a transverse row (fig. 1). Males of the Panamanian species have a strongly modified carapace; the posterior margin is invaginated along the midline and is expanded on both sides of the invagination into long, heavily sclerotized, triangular extensions with stiff tips (fig. 2). The extensions serve as picks for a pair of stridulatory files situated opposite the extensions on the anterolateral surface of the abdomen; one of those files is shown in figure 2. No such stridulatory apparatus occurs in the males of the type species of the genus, *Archoleptoneta schusteri* Gertsch from California.

The chelicerae bear a typical leptonetid row of about seven promarginal teeth, the most proximal of which is enlarged (fig. 3). The endites bear a serrula composed of a single row of teeth (fig. 4). The tarsus of the male palp is long and lacks a transverse constriction; the palpal bulb is attached basally and bears a long embolus and shorter accompanying sclerites (figs. 5, 6).

Middorsal integumentary glands opening on cuticular plates on the patellae or tibiae are one of the most distinctive features of leptonetids and their relatives (Platnick, 1986). The tibial plates of the Panamanian spiders are of the same, uniquely peapod-shaped type (fig. 7) reported for the genus by Platnick (1986); they occur on each of the tibiae of both sexes. Similar plates occur on the patellae (fig. 8), but were found only on leg IV (again, in both sexes).

The tarsi appear to be fully subsegmented into long proximal and short distal portions; the distal portion bears the claws (but not the tarsal organ) and is marked by cuticular ridges that run perpendicular to those on the basal portion of the segment (figs. 9, 10). The tarsal organ is exposed, with one long and two short receptor lobes (fig. 11); no differences were

noted among the tarsal organs on different legs or sexes. Trichobothria are absent from the tarsi (as noted by Brignoli, 1979, for leptonetids in general); on the metatarsi, only a single trichobothrium was found, distally situated. The base of that metatarsal trichobothrium (fig. 12), and of each of the tibial trichobothria, is entire. The distinct slit commonly found on the distal rim of the tibial trichobothrial bases of other leptonetids (Forster et al, 1987: 106) may therefore prove to be another synapomorphy of the Leptonetinae.

The spinnerets differ from those of *Appaleptoneta gertschi* (Barrows), which were detailed in Platnick et al. (1991: figs. 216–221), in several respects. The anterior lateral spinnerets of both sexes have a single, long major ampullate gland spigot, six shorter piriform gland spigots, and at least one tartipore (figs. 13, 16). Each of the posterior median spinnerets of females bears a single minor ampullate gland spigot anteriorly, followed closely by two aciniform gland spigots and more posteriorly by a single cylindrical gland spigot (fig. 14); males have only the minor ampullate gland spigot and the more anteriorly situated one of the two aciniform gland spigots (fig. 17). The posterior lateral spinnerets of males have no spigots whatever (fig. 18), whereas those of females have a single, distal aciniform gland spigot and a more basal cylindrical gland spigot (fig. 15).

Several aspects of this spigot arrangement are noteworthy. Perhaps most importantly, the presence of three spigot types on the female posterior median spinnerets corroborates the hypothesis of Platnick et al. (1991) that the anteriorly situated nubbins on the posterior median spinnerets of both sexes of *A. gertschi* represent remnants of former minor ampullate gland spigots (which appear to be present, and fully functional, in both sexes of the Panamanian spiders), and hence that the spigot type found only in the females serves true cylindrical glands. The presence of cylindrical gland spigots is one of the characters supporting a sister-group relationship between the Leptonetidae and Telemidae (others are the presence of tibial glands and the loss of the cheliceral lamina). The leptonetids remain the only haplogynes in which tartipores have been found. However, *Ar-*

choleptoneta lacks the modifications of the posterior median and posterior lateral spinnerets found in *Appaleptoneta*; the aciniform gland spigots do not occur in a closely spaced, longitudinal row. In *A. gertschi*, those distinctive rows occupy most of the posterior median and posterior lateral spinnerets, whereas in the telemid *Usofila pacifica* (Banks), only the posterior lateral spinnerets are so modified (Platnick et al, 1991: figs. 222–227).

The respiratory system consists of a pair of anterior booklungs, each reduced to about three lamellae, and four posterior tracheal trunks. The tracheal apparatus of the Panamanian species resembles that of the Mexican *Archoleptoneta arganoi* (Brignoli, 1974: fig. 5G, printed upside down) except that the transverse duct connecting the spiracles is narrower.

SYSTEMATICS

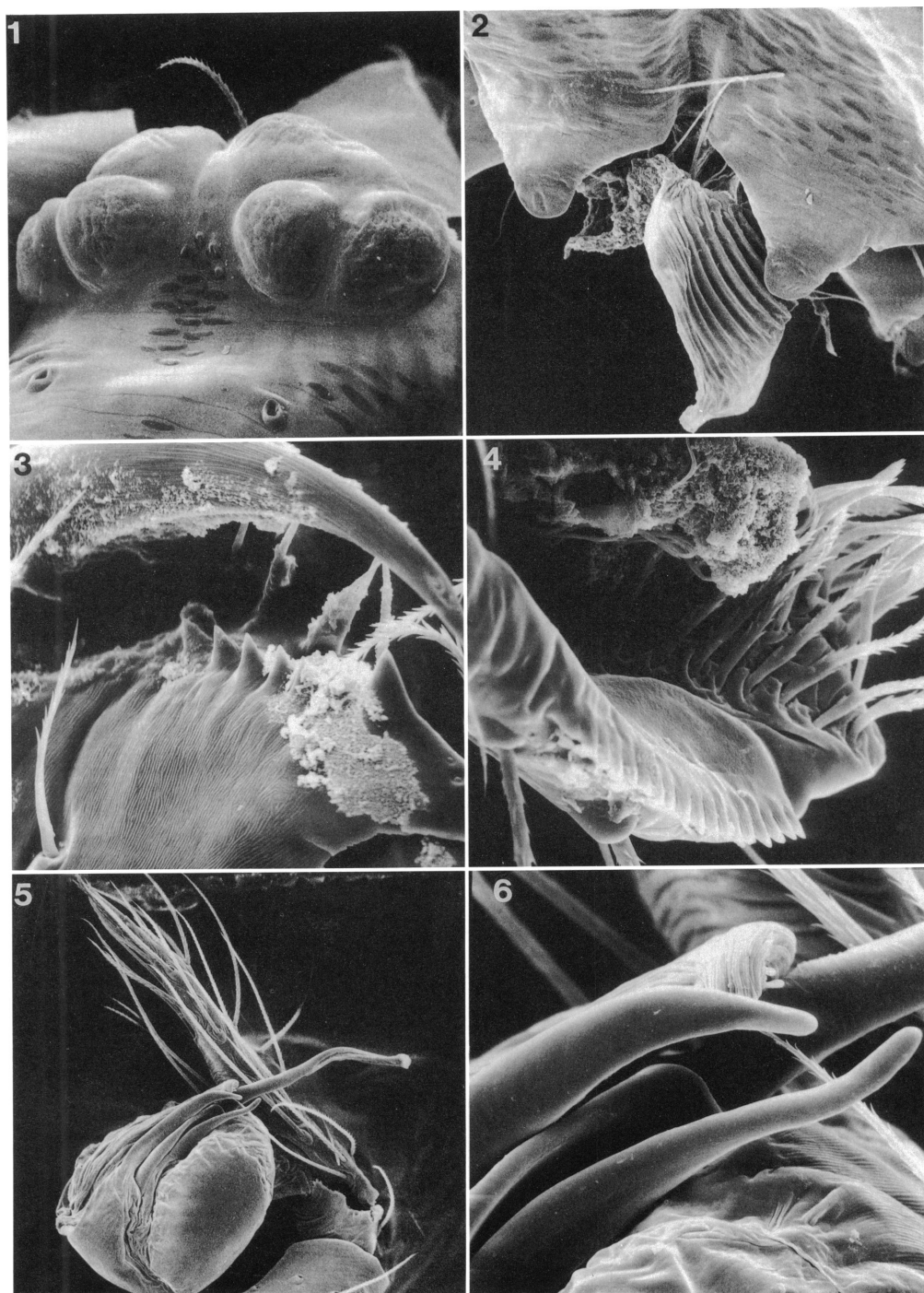
Archoleptoneta stridulans, new species

Figures 1–19

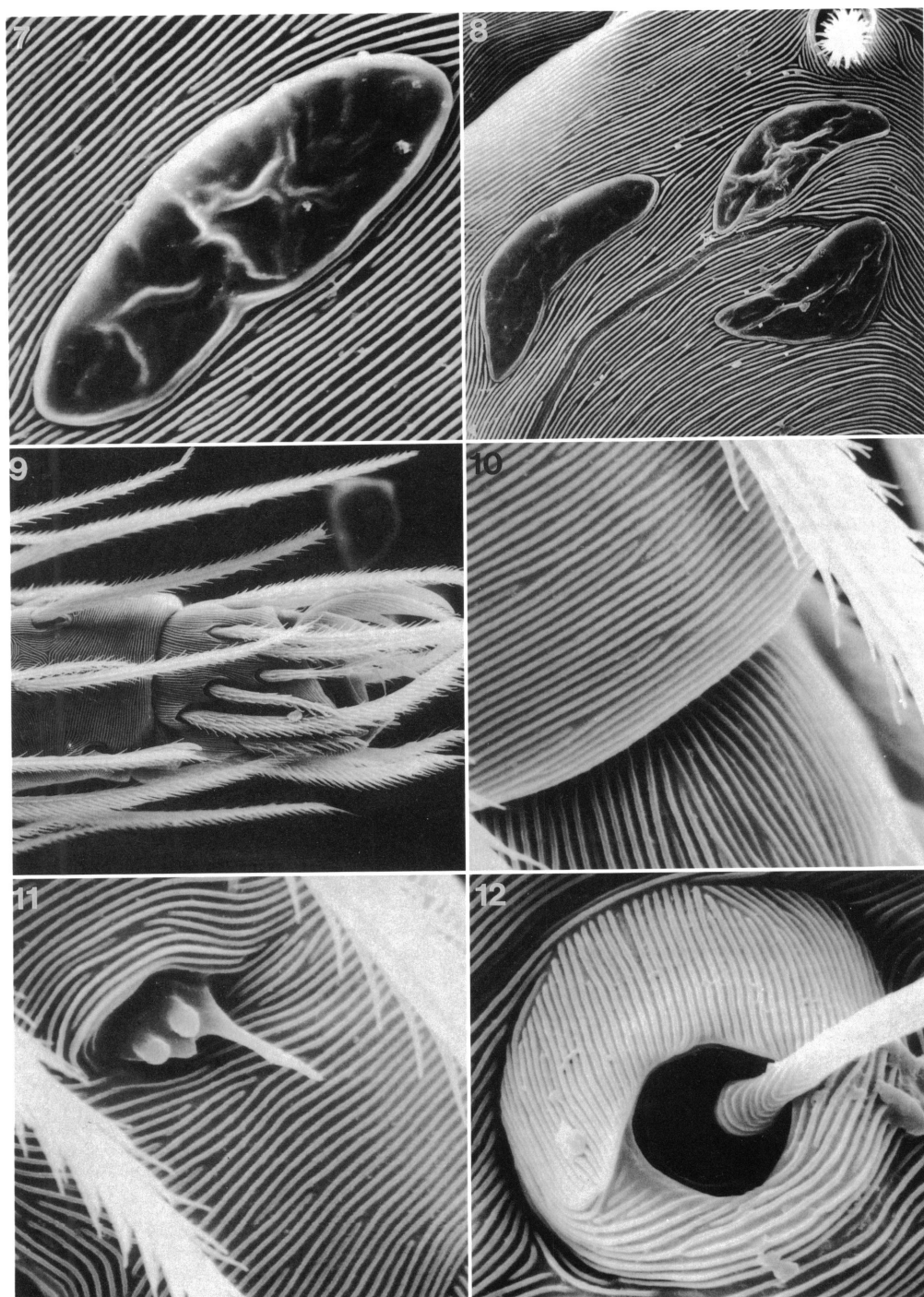
TYPE: Male holotype from Berlese sample of litter under bamboo at an elevation of 1220 m on Cerro Colorado, Chiriquí, Panama (Jan. 7, 1981; W. Suter), deposited in FMNH.

ETYMOLOGY: The specific name refers to the carapace/abdomen stridulatory system of males.

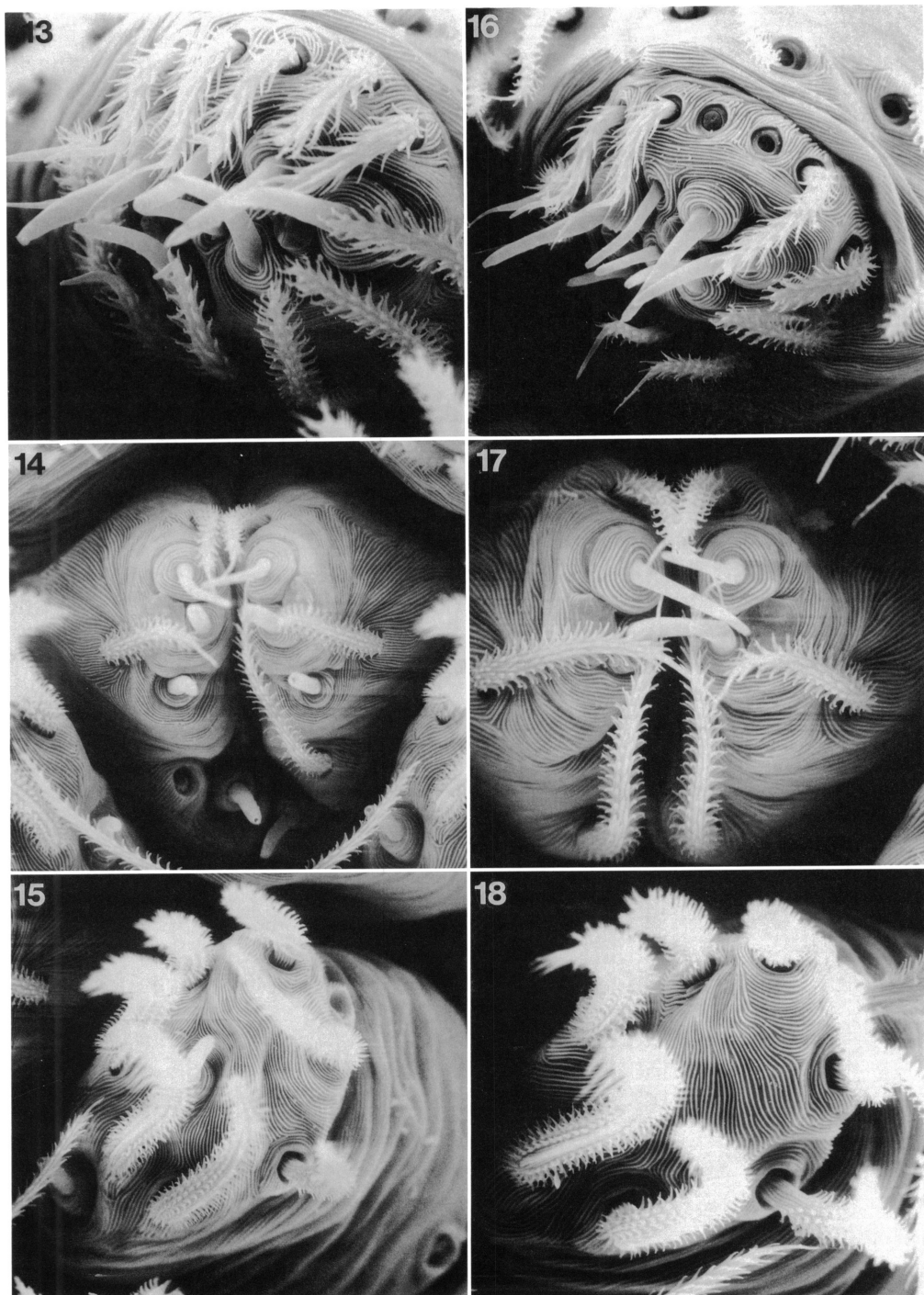
DIAGNOSIS: Four species of *Archoleptoneta* have been described. This new species can be easily distinguished from the California type species, *A. schusteri*, by the presence of a carapace/abdomen stridulatory system in males (fig. 2). Only females are known of the other three species. Those of the Texas species *A. garza* Gertsch (1974) can be distinguished from *A. stridulans* by their shiny, white carapace and sternum, and by having only five cheliceral teeth. The remaining two species were described in the same year from two different caves near Comitán, Chiapas, Mexico, by Gertsch (1974, as *A. obscura*) and Brignoli (1974, as *Neoleptoneta arganoi*, subsequently transferred to *Archoleptoneta* by Brignoli, 1977). Given the proximity of their type localities, it is possible that these two taxa are synonymous (as already indicated by Brignoli, 1977). There are a few discrepancies



Figs. 1–6. *Archoleptoneta stridulans*, new species, male. 1. Eyes, dorsal view. 2. Projections at rear of carapace, and stridulatory file from one side of abdomen, dorsal view. 3. Right chelicera, posterior view. 4. Left endite, posterior view. 5. Left male palp, ventral view. 6. Left male palpal bulb, ventral view.



Figs. 7–12. *Archoleptoneta stridulans*, new species. 7. Cuticular plate of tibial gland from leg IV of male, dorsal view. 8. Cuticular plates of patellar glands from leg IV of male, dorsal view. 9. Distal portion of tarsus II of male, lateral view. 10. Junction between subsegments of tarsus II of female, dorsal view. 11. Tarsal organ from leg II of female, dorsal view. 12. Trichobothrial base from metatarsus II of female, dorsal view.



Figs. 13–18. *Archoleptoneta stridulans*, new species, spinnerets, posterior views. 13–15. Female. 16–18. Male. 13, 16. Anterior lateral spinneret. 14, 17. Posterior median spinnerets. 15, 18. Posterior lateral spinneret.

in their descriptions, particularly regarding the size and spacing of the posterior median eyes, but those differences could reflect just varying degrees of eye reduction within the cave environment. The female holotype of *A. obscura* has the posterior median eyes larger than in *A. stridulans*. The female of *A. arganoi* has the posterior median eyes much smaller, and much more widely separated, than in *A. stridulans*.

Gertsch (1974) did not investigate the female genitalia of any *Archoleptoneta*, and Brignoli's (1974) figure for *A. arganoi* is the only published illustration. In *A. stridulans*, the lateral receptacula are longer than in *A. arganoi*, and there is a hooked, anteriorly situated median receptaculum (fig. 19) only vaguely indicated in Brignoli's figure (1974: fig. 5B).

MALE: Total length 0.92. Carapace 0.47 long, 0.39 wide. Femur II 0.49 long. Carapace brownish yellow, with narrow, black lateral margins; posterior portion of pars cephalica with black reticulations; posterior margin of pars thoracica bearing pair of triangular extensions, each tipped with stridulatory pick (fig. 2). Anterior eye row recurved, with eyes subcontiguous; anterior laterals larger than posterior laterals; posterior medians smaller than other eyes, separated by about their diameter (fig. 1). Sternum brownish yellow, sides and posterior portion with dark reticulations. Legs pale yellow, unmarked. Abdomen brownish gray, dorsum with light longitudinal median stripe and light lateral chevrons; anterior surface with pair of invaginated depressions bearing stridulatory files (fig. 2). Palp with long, sinuous embolus and shorter accessory processes (figs. 5, 6).

FEMALE: Total length 0.86. Carapace 0.42 long, 0.38 wide. Femur II 0.48 long. Coloration and eye pattern as in male; carapace without posterior projections, abdomen without stridulatory files. Internal female genitalia with hooked median and protuberant lateral receptacula (fig. 19).

OTHER MATERIAL EXAMINED: PANAMA: **Chiriqui:** Cerro Colorado, Jan. 5, 1981, elev. 1220 m, Berlese, litter under small clumps of bamboolike grass (W. Suter, FMNH), 1♂, 4♀, Jan. 5, 1981, elev. 1220, Berlese, litter from buttress with log (W. Suter, FMNH), 1♂, Jan. 7, 1981, elev. 1220 m, Berlese, litter under

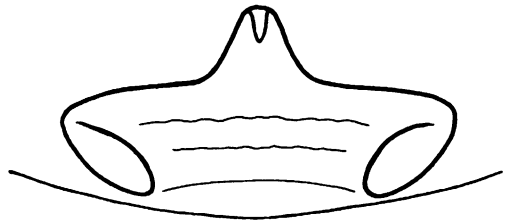


Fig. 19. *Archoleptoneta stridulans*, internal female genitalia, dorsal view.

bamboo (W. Suter, FMNH), 1♂, 1♀, Jan. 10, 1981, elev. 1290 m, Berlese, litter in depression (W. Suter, FMNH), 2♂, Jan. 10, 1981, elev. 1290 m, Berlese, grassy ecotonal debris (W. Suter, AMNH), 1♀, Jan. 13, 1981, elev. 1290 m, Berlese, litter of stage III stump, semidry (W. Suter, AMNH), 1♂, Jan. 24, 1981, elev. 1290 m, Berlese, semidry hillside litter (W. Suter, FMNH), 1♀, Jan. 25, 1981, elev. 1210 m, Berlese, litter under roadside bushes (W. Suter, FMNH), 1♀, Jan. 26, 1981, elev. 1235 m, Berlese, litter under seedling banana (W. Suter, FMNH), 1♂, Jan. 26, 1981, elev. 1290 m, Berlese, litter pocket, edge of woods (W. Suter, AMNH), 1♂, 1♀.

DISTRIBUTION: Known only from Cerro Colorado, Panama.

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