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## On the Spider Genus *Attacobius* (Araneae, Dionycha)

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### ABSTRACT

The spider tribe Attacobiini contains only the enigmatic genus *Attacobius* Mello-Leitão from Brazil and Argentina; at least two of the three known species of the genus apparently live in the nests of leaf-cutting ants. *Morenilia* Mello-Leitão and *Achalaicola* Mello-Leitão are transferred from the Gnaphosidae and Prodidomidae, respectively, and placed as ju-

nior synonyms of *Attacobius*, which is transferred from the Liocranidae to the Corinninae (Corinnidae). *Attacobius attarum* (Roewer) is removed from the synonymy of *A. luederwaldti* (Mello-Leitão); *A. vestita* (Mello-Leitão) is newly synonymized with *A. nigripes* (Mello-Leitão).

### INTRODUCTION

The spider family Liocranidae is apparently not well represented in South America. Aside from five species that are (probably erroneously) placed in the Northern Hemisphere genera *Agroeca* Westring, *Liocranum* L. Koch, and *Titiotus* Simon (and some previously unreported representatives of the widespread phrurolithine genus *Orthobula* Simon that will be treated in a subsequent

paper in this series), the family has been known in South America only from two endemic (and putatively monotypic) genera. One of those, *Ferrieria* Tullgren, was recently transferred to the Anyphaenidae by Ramírez (1991), leaving *Attacobius* Mello-Leitão as the only endemic South American genus putatively belonging to the Liocranidae. (Even the Panamanian genus *Parachemmis* Chickering

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is being transferred from the Liocranidae to the Corinnidae by Bonaldo and Brescovit, in press.)

The curious spiders now in *Attacobius* were apparently first described by Mello-Leitão (1923) as the new genus and species *Myrmecobius luederwaldti*, which he placed in the new subfamily Myrmecobiinae. Mello-Leitão considered the Myrmecobiinae a subfamily of the Clubionidae, ranked equally with the groups now considered as the families Liocranidae and Corinnidae. Under Article 39 of the International Code of Zoological Nomenclature, however, Mello-Leitão's family-group name is invalid, because the name of the type genus is a junior homonym (and was subsequently replaced with *Attacobius* by Mello-Leitão, 1925). In the original description, these spiders were characterized as parasites (and as the first known parasitic spiders!) because they were found on the body of "Saúvas" (leaf-cutting ants). No type locality was mentioned, but the three female syntypes were taken on *Atta laevigata* Luederwaldt in woods at the Museu do Ipiranga in São Paulo, Brazil. Mello-Leitão provided no illustrations of the spiders, which have therefore languished in undeserved obscurity.

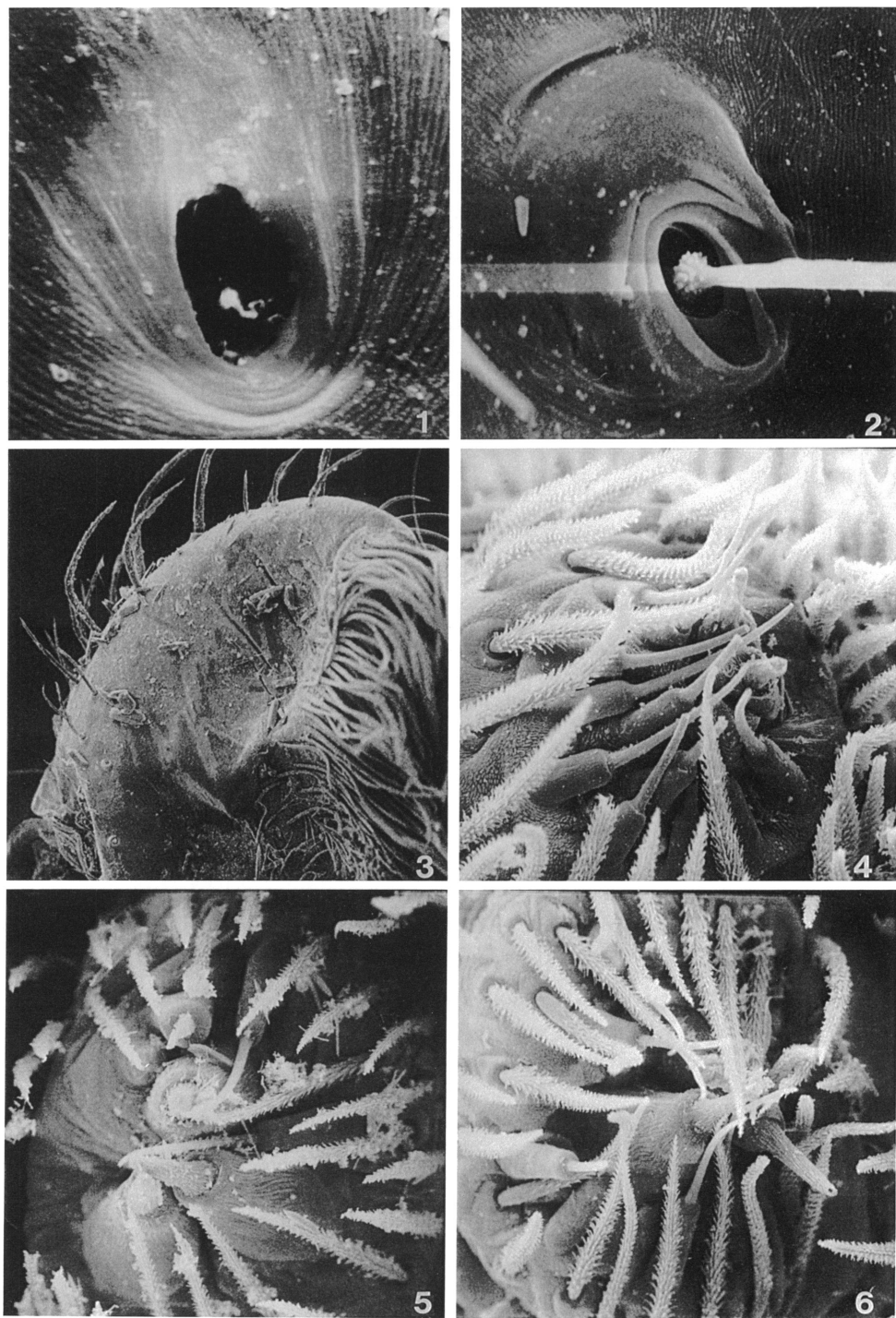
A decade later, Roewer (1935) established a new genus and species, *Myrmeques attarum*, for a series of myrmecophilous specimens taken from the nests of leaf-cutting ants at Mendes, in the state of Rio de Janeiro. Roewer assigned the genus to the family Clubionidae and the "Gruppe: Micariae" (the type genus of which is currently placed in the Gnaphosidae). Roewer described both sexes and provided illustrations of their somatic and genitalic characters. The remarkable observations of the collector, Dr. Eidmann, were reported, translated as follows:

The collected animals were found in the nests of the large leaf-cutting ant *Atta sexdens* L. and displayed a very remarkable behavior toward their host ants. They used the ants as riding animals and were always found clinging to the dorsal side of the thorax or also occasionally the head of the ant. The spiders are always found in this position; never have I seen one running around free. Even among the thickest throngs in large mushroom-chambers, I saw them only riding on their host animals. Even when the latter were seized by hand or with pincers, the spiders did not let go, and would even hold fast for a while when placed in al-

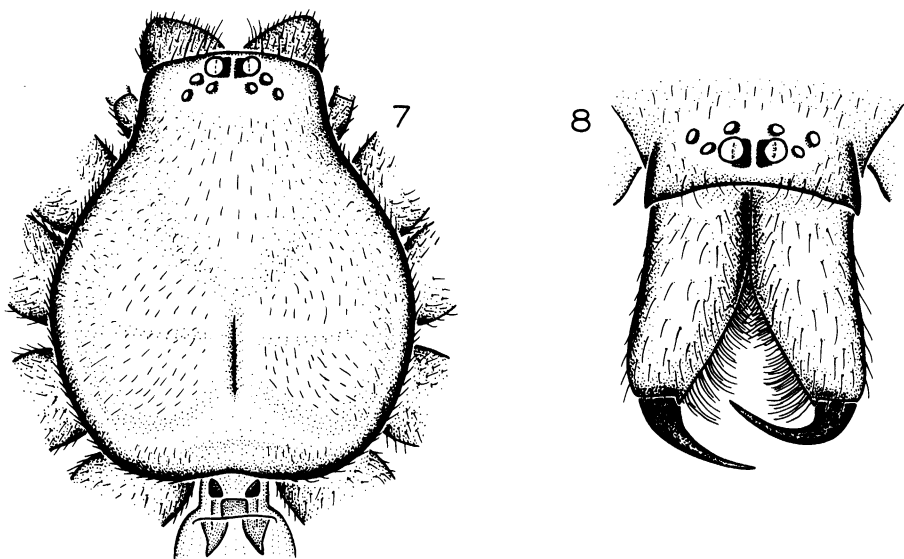
cohol for preservation. If a spider were detached from its ant and put in the midst of the rest of the ants, it would climb onto another ant immediately, and take up the usual position. As a rule the spiders ride on workers and chiefly on larger specimens. The specimens captured by me sat on ants measuring from 8.7 to 13.4 mm. in size (in a total variation of body length in the females of one colony of 3–15 mm). According to my studies on division of labor among the females of leaf-cutting ants, specimens of this size work as draggers or leaf-cutters, and partly, considering specimens over 12 mm in size, as soldiers defending the nests. So it is not surprising that the spiders also occasionally are dragged into the open by their host ants. Thus I saw, for example, on 1-10-33 by stirring up a nest opening, how an *Atta* soldier came out, carrying a spider on its back. Occasionally one even finds winged fertile animals carrying a spider. I found them on young, winged females before swarming in the interior of nests and further observed on October 16 at a large nest whose inhabitants were swarming, how various of the swarming males carried a spider riding on them. It seems to me scarcely to be doubted that in this manner the spiders are distributed and carried into newly founded colonies.

In his subsequent catalog, Roewer (1955) maintained *Myrmeques* as a genus of the Micariae, apparently overlooking the fact that Mello-Leitão (1947) had synonymized *Myrmeques attarum* with *Attacobius luederwaldti*. Roewer (1955) placed *Attacobius* in its own family-group taxon, correctly replacing Mello-Leitão's name Myrmecobiinae with Attacobieae. Attacobieae was considered by Roewer as one of five tribal-level groups within the clubionid subfamily Liocraninae. Of the other four groups, Roewer's Miturgeae is now a separate family (Miturgidae), leaving Liocraninae, Phrurolithinae, Cybaeodinae, and Attacobiinae as the currently accepted (or, more accurately, inherited through inflation) subfamilies of Liocranidae.

The senior author first encountered representatives of this group not as the Brazilian *Attacobius* but rather under two other generic names, *Morenilia* and *Achalaicola*, established by Mello-Leitão (1942, 1943) for Argentine spiders. Both those names are below placed as junior synonyms of *Attacobius*. *Morenilia* was described, and has remained, in the Gnaphosidae. *Achalaicola* was described in the Clubionidae (without more exact placement), was listed by Roewer (1955) in the Micariae (presumably only because its original description was followed by the description of a species of *Castianeira* Key-



Figs. 1–6. *Attacobius attarum* (Roewer), female. 1. Tarsal organ from leg I, dorsal view. 2. Trichobothrial base from tarsus I, dorsal view. 3. Palpal endite, posterior view. 4. Anterior lateral spinneret, posterior view. 5. Posterior median spinneret, posterior view. 6. Posterior lateral spinneret, posterior view.



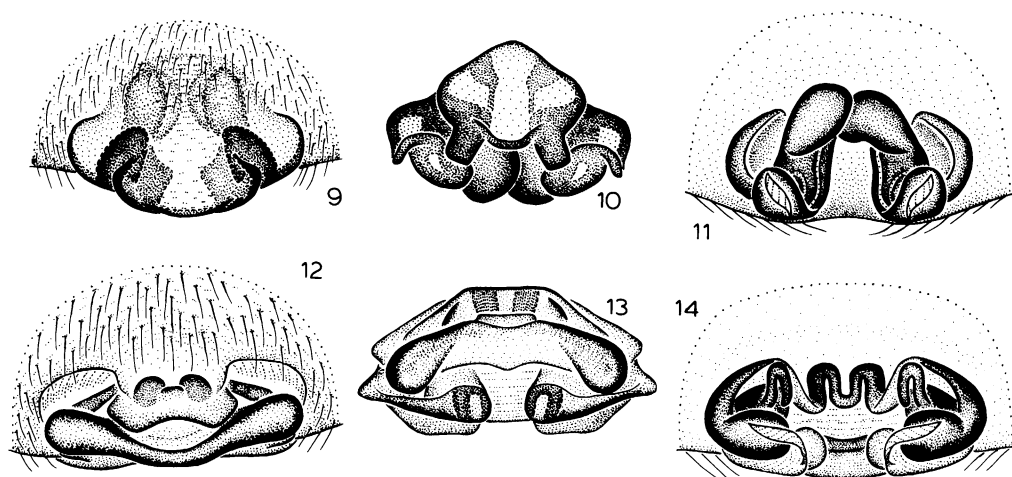
Figs. 7, 8. *Attacobius attarum* (Roewer), carapace of female. 7. Dorsal view. 8. Anterior view.

serling, also placed in the Micarieae by Roewer), and was subsequently transferred by Riskind (1969) to the Prodidomidae.

It is easy to determine that the placement of *Attacobius* and its synonyms in the Gnaphosidae, Prodidomidae, or any other gnaphosoid family is incorrect, for both sexes of these animals have conical, unsclerotized, contiguous anterior lateral spinnerets with a distinct terminal segment bearing unmodified piriform gland spigots, as well as rounded posterior median eyes and endites lacking oblique depressions. Determining the correct placement of *Attacobius* is more difficult, however, not least because the family Liocranidae still lacks an explicit diagnosis based on congruent synapomorphies. Liocranids differ from typical Clubionidae in having cylindrical gland spigots on the female posterior median and lateral spinnerets (their presence is, however, plesiomorphic for entelegynes; see Platnick et al., 1991) and in having numerous paired ventral spines (and often similarly modified ventral bristles) on the anterior tibiae and metatarsi (see Platnick and Ubick, 1989; Ubick and Platnick, 1991: figs. 2, 4, 6, 8, 10; Platnick and Di Franco, 1992).

The leg spination of *Attacobius* is greatly reduced, and shows few traces of a liocranid pattern; we detected no liocranine-like bris-

cles (only wide setae generally bearing only two undivided sideshafts). There is thus little evidence available to support placement of the genus in the Liocranidae. Among the other known liocranids, the only described taxon that seems a likely candidate to be the sister group of *Attacobius* is the African genus *Andromma* Simon (1893). Those animals resemble *Attacobius* in having enlarged anterior median eyes and reduced leg spination; at least some of the species of *Andromma* are also myrmecophilous (Simon, 1899) or termitophilous (Fage, 1936). However, neither the male nor female genitalia of *Andromma* indicate any close relationship to *Attacobius*. In addition to their relatively large size, the anterior median eyes of *Andromma* (and, to a lesser degree, *Attacobius*) have a very curious appearance; at least when preserved in alcohol, each anterior median eye shows a sharp demarcation between a medial, dark portion and a lateral, light portion. That same feature occurs in another group of spinose liocranids, apparently unnamed but nevertheless very common (and speciose) in African forests, that have similarly enlarged anterior median eyes (as well as curious modifications of the dorsal surface of the anterior metatarsi). The male and female genitalic patterns of these spinose animals con-



Figs. 9–14. 9–11. *Attacobius luederwaldti* (Mello-Leitão), epigynum. 12–14. *Attacobius nigripes* (Mello-Leitão), epigynum. 9, 12. Ventral view. 10, 13. Posterior view. 11, 14. Dorsal view.

form to those of *Andromma*, leaving little doubt that *Andromma* is more closely related to those African liocranids than to *Attacobius*.

The morphology of the male palp of *Attacobius* (figs. 15–17) suggests instead that the genus belongs to the subfamily Corinninae (Corinnidae). The sperm duct occupies a slightly smaller proportion of the tegular surface than is typical for corinnines, but nevertheless shows the frequently coiling pattern of loops that is typical of that subfamily. The tibial apophysis is highly branched, and intertwines with elaborately developed cymbial processes, features that may also prove to be synapomorphic for the Corinninae. Even the trichobothrial bases (fig. 2) resemble those of other corinnines in bearing an elongated ridge traversing an enlarged plate (Bonaldo and Brescovit, in litt; cf. Platnick, 1975: fig. 5). *Attacobius* and its synonyms are therefore transferred to that subfamily. The similarities between *Attacobius* and the African *Andromma* (and their undescribed close relatives) in anterior median eye morphology are presumed to be parallelisms.

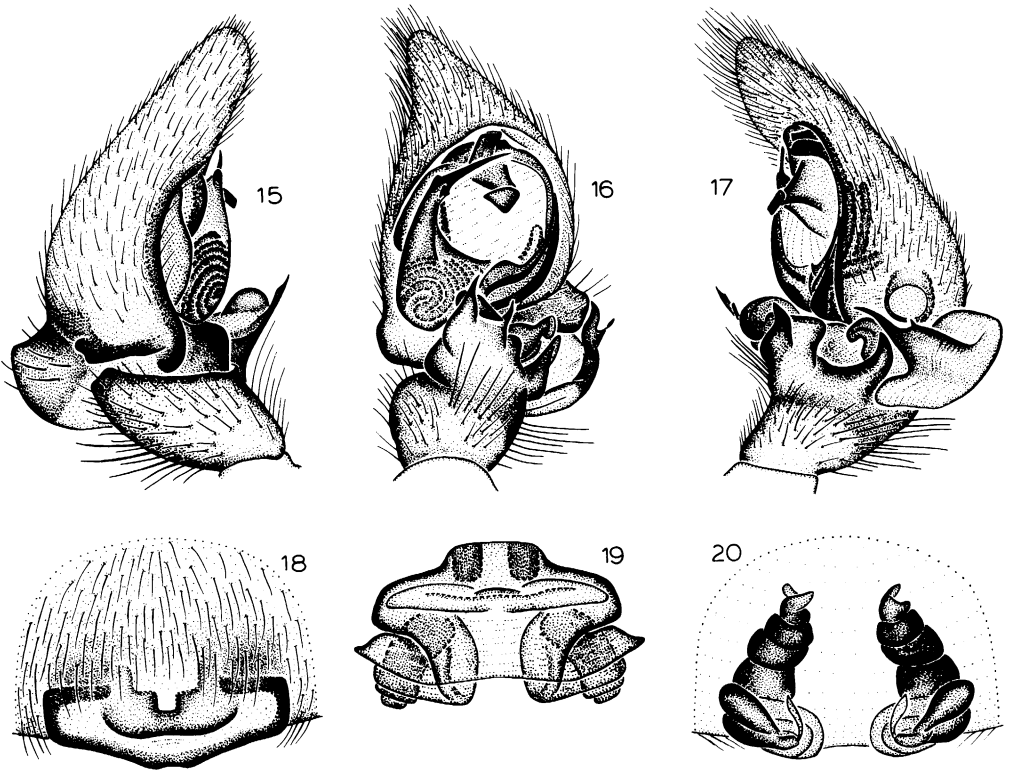
#### ACKNOWLEDGMENTS

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#### SYSTEMATICS

The format of the descriptions, and standard abbreviations of morphological terms,

follow those used in Platnick and Shadab (1975). All measurements are in millimeters.



Figs. 15–20. *Attacobius attarum* (Roewer). 15. Left male palp, prolateral view. 16. Same, ventral view. 17. Same, retrolateral view. 18. Epigynum, ventral view. 19. Same, posterior view. 20. Same, dorsal view.

#### ATTACOBIIINI ROEWER

Myrmecobiinae Mello-Leitão, 1923: 524 (type genus *Myrmecobius* Mello-Leitão, preoccupied).  
 Attacobieae Roewer, 1955: 581 (type genus *Attacobius* Mello-Leitão).

**DIAGNOSIS:** Although no modern generic revision of the subfamily has yet been carried out, attacobiines can seemingly be distinguished from other members of the Corinninae by their recurved anterior eye row including enlarged anterior median eyes (figs. 7, 8), their reduced leg spination, the absence of a serrula, and the darkened and laterally compressed tips of the leg and female palpal tarsi.

#### *Attacobius* Mello-Leitão

*Myrmecobius* Mello-Leitão, 1923: 524 (type species by original designation *Myrmecobius luederwaldti* Mello-Leitão; preoccupied).

*Attacobius* Mello-Leitão, 1925: 455 (replacement name for *Myrmecobius* Mello-Leitão).

*Myrmeques* Roewer, 1935: 193 (type species by monotypy *Myrmeques attarum* Roewer). First synonymized with *Attacobius* by Mello-Leitão, 1947: 285.

*Morenilia* Mello-Leitão, 1942: 412 (type species by original designation *Morenilia nigripes* Mello-Leitão). NEW SYNONYMY.

*Achalaicola* Mello-Leitão, 1943: 113 (type species by original designation *Achalaicola vestita* Mello-Leitão). NEW SYNONYMY.

**DIAGNOSIS:** With the characters of the tribe; the greatly darkened and laterally compressed tips of the leg tarsi give the animals a very distinctive appearance (well expressed by Mello-Leitão's choice of specific name for the Argentine species, *A. nigripes*).

**DESCRIPTION:** Araneomorph, ecribellate, entelegyne, dionychan spiders. Total length 3.5–4.5. Carapace pyriform in dorsal view,

widest between coxae II and III, narrowed opposite palpal insertion, light orange; cephalic area flattened, thoracic groove longitudinal, long, occupying about one-sixth of carapace length; ocular area and clypeus with few weak setae. From above, both eye rows slightly recurved; from front, anterior row very slightly recurved, posterior row procurved; AME circular, with median portion dark, lateral portion light, twice as wide as other, subequal eyes; PME circular, light; ALE and PLE oval, light; AME separated by less than their diameter, by less than their radius from ALE; PME separated by more than twice their diameter, by more than their diameter from PLE; ALE and PLE separated by less than their diameter; MOQ wider in front than in back, wider in front than long; clypeal height slightly greater than AME diameter. Chelicerae with two large promarginal teeth situated near tip of fang furrow and two smaller retromarginal teeth situated closer to base of fang. Mouthparts and sternum light orange, darkest at base of labium and endites; endites distally rounded, without oblique depressions or serrula (fig. 3), extending far beyond labium; labium much wider than long, invaginated deeply at posterolateral corners and slightly at midline of anterior rim; sternum shield-shaped, rebordered, with sclerotized extensions to (but not between) coxae. Leg formula 4123; legs pale yellow except distal portions of metatarsi and proximal portions of tarsi slightly darkened, distal portions of tarsi dark brown; tarsi with two relatively small, dentate claws, distinct, rounded onychium, and conspicuous claw tufts; trochanters not notched; tarsal organ capsulate (fig. 1); trichobothria present on tibiae, metatarsi, and tarsi, with elongated bases bearing ridges (fig. 2); legs with numerous short, stiff, setae, often arranged in longitudinal rows. Typical leg spination pattern (only surfaces bearing spines listed): femora I-IV d1-1-0; tibiae: I v3-3-0; II v3-2-0; III v0-1p-0; metatarsi: I, II v2-2-0; III v0-1r-0. Abdomen white, relatively high in front, with light brown setae of two size classes, regularly interspersed; males without dorsal scutum; anterior lateral spinnerets conical, contiguous, with distinct distal segment bearing two major ampullate gland spigots and several piriform gland spigots (fig. 4) not enlarged in

either sex; posterior median spinnerets short, tubular in both sexes, females with two minor ampullate gland spigots, two elongate aciniform gland spigots, and two large cylindrical gland spigots (fig. 5); posterior lateral spinnerets smaller than anterior laterals, females with two large, centrally situated cylindrical gland spigots and at least four elongated aciniform gland spigots (fig. 6); colulus represented by small, sclerotized, setose triangle. Male palpal femur unmodified, patella small, tibia greatly expanded distally, prolonged on prolateral side beyond insertion of tarsus, retrolateral apophysis elaborate, with multiple processes; cymbium greatly expanded basally into bipartite, broad flange partially cupping process of retrolateral tibial apophysis; sperm duct highly coiled proximal to base of embolus, embolus situated prolaterally, passing across heavily sclerotized median apophysis, tip resting on translucent flange of retrolaterally situated, bifid conductor with folded medial arm and heavily sclerotized lateral arm at edge of bulb (figs. 15-17). Epigynum large, convex, protuberant, heavily sclerotized, with chunky spermathecae (figs. 9-14, 18-20).

**SYNONYMY:** Mello-Leitão provided no characters by which to distinguish *Morenilia* or *Achalaicola* from *Attacobius* (or from each other, although he assigned the former two generic names to the Gnaphosidae and Clubionidae, respectively), and there appear to be none.

*Attacobius luederwaldti*

(Mello-Leitão)

Figures 9-11

*Myrmecobius luederwaldti* Mello-Leitão, 1923: 524 (three female syntypes, from Ipiranga, São Paulo, Brazil, in MZSP, examined).

*Attacobius luederwaldti*: Mello-Leitão, 1925: 455.

**DIAGNOSIS:** Females resemble those of *A. attarum* in having relatively long spermathecae but can be distinguished by the rounded epigynal margins (figs. 9-11).

**MALE:** Unknown.

**FEMALE:** Described by Mello-Leitão (1923).

**MATERIAL EXAMINED:** Only the type series.

**DISTRIBUTION:** Known only from the type locality; apparently an obligate myrmecophile.

*Attacobius attarum* (Roewer)

Figures 1–8, 15–20

*Myrmeques attarum* Roewer, 1935: 194, figs. 1a–d, 2a–d (one male and three female syntypes from Mendes, Rio de Janeiro, Brazil, in NMS, examined).

*Attacobius attarum*: Platnick, 1993: 602.

NOTE: The synonymy (by Mello-Leitão, 1947: 285) of this species with *A. luederwaldti* is here rejected.

DIAGNOSIS: Females resemble those of *A. luederwaldti* in having relatively long spermathecae but can be distinguished by the squared epigynal margins and distally twisted spermathecae (figs. 18–20); this is the only species of *Attacobius* for which males are known, and their palpal morphology (figs. 15–17) is presumably distinctive.

MALE: Described by Roewer (1935).

FEMALE: Described by Roewer (1935).

MATERIAL EXAMINED: Only the type series.

DISTRIBUTION: Known only from the type locality; apparently an obligate myrmecophile.

*Attacobius nigripes*

(Mello-Leitão),

new combination

Figures 12–14

*Morenilia nigripes* Mello-Leitão, 1942: 412, fig. 38 (female holotype from General Capdevila, Chaco, Argentina, in MLP, examined).

*Achalaicola vestita* Mello-Leitão, 1943: 113, fig. 15 (female holotype from Pampa de Achala, Córdoba, Argentina, in MLP, examined). NEW SYNONYMY.

DIAGNOSIS: Females can be distinguished from those of *A. luederwaldti* and *A. attarum* by the shorter, wider spermathecae (figs. 12–14).

MALE: Unknown.

FEMALE: Described by Mello-Leitão (1942, 1943).

MATERIAL EXAMINED: Only the two holotypes, both collected by Dr. M. Birabén.

DISTRIBUTION: Chaco and Córdoba, Argentina; it is not known whether this species is myrmecophilous.

SYNONYMY: Mello-Leitão presumably managed to separate the two holotype specimens only by dint of assigning them to different families.

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