

AMERICAN MUSEUM *Novitates*

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, N.Y. 10024

Number 2734, pp. 1–13, figs. 1–28

June 9, 1982

On the Micromygalinae, A New Subfamily of Mygalomorph Spiders (Araneae, Microstigmatidae)

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ABSTRACT

The subfamily Micromygalinae is established for a new genus and species (*Micromygal dilemma*) from Panama that contains the world's smallest known mygalomorph spider, and the only one known to have only two eyes, a complete dorsal scutum in males, and no lungs. Cladistic anal-

ysis indicates that the species belongs to the Microstigmatidae but represents the sister group of all other known microstigmatids. The two previously recognized subfamilies of that group are therefore relegated to tribal status within the Microstigmatinae.

INTRODUCTION

Of all spiders the most poorly known are probably those which occur in leaf litter, moss, and similar surface habitats in tropical and south temperate parts of the world. Over recent years, the increasing availability of collections from such habitats (particularly samples extracted by Berlese funnels) has revealed vast numbers of undescribed taxa. Most of these spiders are small araneomorphs, with "haplogyne" groups such as oonopids, ochyroceratids, and tetrablemids, and "symphytognathoid" groups such as anapids, textricellids, and micropholcommatids, being particularly abundant. Mygalomorph spiders, being generally fairly large, are rare (as adults) in Berlese samples, the

only group encountered with any regularity being the small diplurids of the subfamily Masteriinae (Raven 1979, 1981a).

The first author has recently had the good fortune to study large collections of litter spiders, particularly from the Neotropical and Australian regions, made available through the Berlese residue sorting program at the Field Museum of Natural History, Chicago. This paper is devoted to what is probably the most unusual species so far encountered in these samples, a Panamanian mygalomorph that is unprecedented in its small size (adult males are only 0.75 mm. long), degree of eye reduction, serrula development, lung loss, and extent of abdominal scutation.

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We are deeply indebted to the staff of the Division of Insects at the Field Museum (particularly to Dr. John Kethley, Dr. Larry Watrous, and Mr. Dan Summers) for making this material available and for their continued assistance and hospitality during visits, and to the National Science Foundation for its funding of their sorting program. We also thank Dr. Mohammad Shadab and Ms. Joan Whelan of the American Museum of Natural History for assistance with illustrations and scanning electron micrographs, respectively, and Drs. Fred Coyle and Robert Raven for reviewing a draft of the manuscript. The first author has been responsible for the cladistic analysis, and the second for investigations of the respiratory system. All measurements are in millimeters.

RELATIONSHIPS

Raven and Platnick (1981) indicated that there are three characters that seem to be synapomorphic for the Microstigmatidae: the tiny spiracles, the scaly cuticle, and the peculiar tarsal claw dentition. Examination of the Panamanian species described below as *Micromygale diblemma* indicates that it shares with the three previously known genera of microstigmatids the first two of those characters, but not the third. A cladogram for the four genera, tested by these and other characters, is presented in figure 1. For purposes of outgroup comparison, the hypothesis of Raven and Platnick (1981) that the Microstigmatidae represents the sister group of the Mecicobothriidae and Hexathelidae plus Dipluridae is accepted.

Characters 1 and 2 refer to the tiny, oval spiracles (figs. 17, 18; Raven and Platnick, 1981, figs. 1, 50) and the scaly cuticle (fig. 8; Raven and Platnick, 1981, figs. 5–10) common to all microstigmatids. Characters 3, 11, and 15 refer to the structure of the serrula. Each of the four recognized genera of microstigmatids has a distinct type of serrula. Of these, the type found in *Microstigmata*, consisting of a large patch of regularly spaced, erect teeth (Raven and Platnick, 1981, fig. 25), is also found in the Mecicobothriidae (Gertsch and Platnick, 1979, figs. 1–4), Hex-

athelidae (Platnick, 1977, figs. 20, 21, 23), and Dipluridae (Platnick, 1977, fig. 22), and is therefore considered plesiomorphic. The types of serrula found in *Micromygale* (character 3: teeth clustered into transverse series of two to nine teeth; figs. 2–5), *Pseudonemesia* (character 11: teeth reduced in number, flattened, and widely separated; Raven and Platnick, 1981, figs. 27, 28), and *Ministigmata* (character 15: teeth widened, contiguous, reduced to several oblique ridges; Raven and Platnick, 1981, fig. 26) are each unique among spiders, so far as is known, and are therefore considered apomorphic.

Characters 4, 5, and 6 refer to peculiarities of *Micromygale* that are not found, to our knowledge, in any other mygalomorph, and that are therefore considered autapomorphic: the loss of all but two eyes (fig. 6), the presence in males of an anterior scutum so extensive as to cover most of the abdominal dorsum (fig. 23), and the absence of book-lungs (figs. 17, 18).

Characters 7 and 13 refer to the structure of the tarsal organ. The previously known microstigmatids have unusual tarsal organs that protrude above the dorsal surface of the tarsus. In *Microstigmata* and *Ministigmata* only the protrusion is obvious (Raven and Platnick, 1981, figs. 29, 30, 33, 34), but in *Pseudonemesia* concentric ridges surround the protrusion (*ibid.*, figs. 31, 32, 35, 36). Because the tarsal organ of the Mecicobothriidae (Gertsch and Platnick, 1979, figs. 29–32), Hexathelidae (*ibid.*, figs. 23–28), and most Dipluridae, including the plesiomorphic Masteriinae (*ibid.*, figs. 17–22), is a flattened structure bearing concentric ridges, Raven and Platnick (1981, p. 13) argued that “the microstigmatids seem merely to have an apomorphic form of the type of tarsal organ found in their putative sister group.” This hypothesis has been well corroborated by examination of the tarsal organ of *Micromygale*, which has a typical dipluroid structure (fig. 7). Hence, the modifications of this structure, first by elevation of the central area (character 7) and subsequently by loss of the concentric ridges (character 13), are considered apomorphic.

Characters 8, 9, and 10 refer to three other

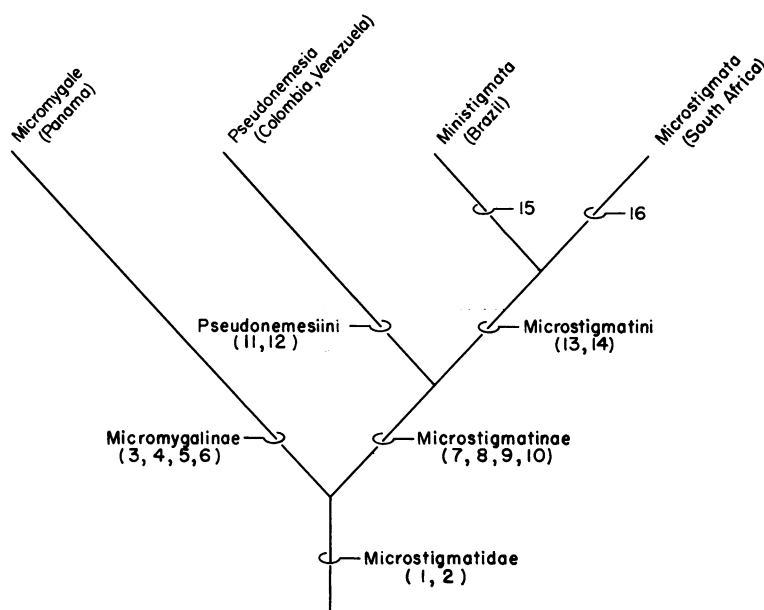


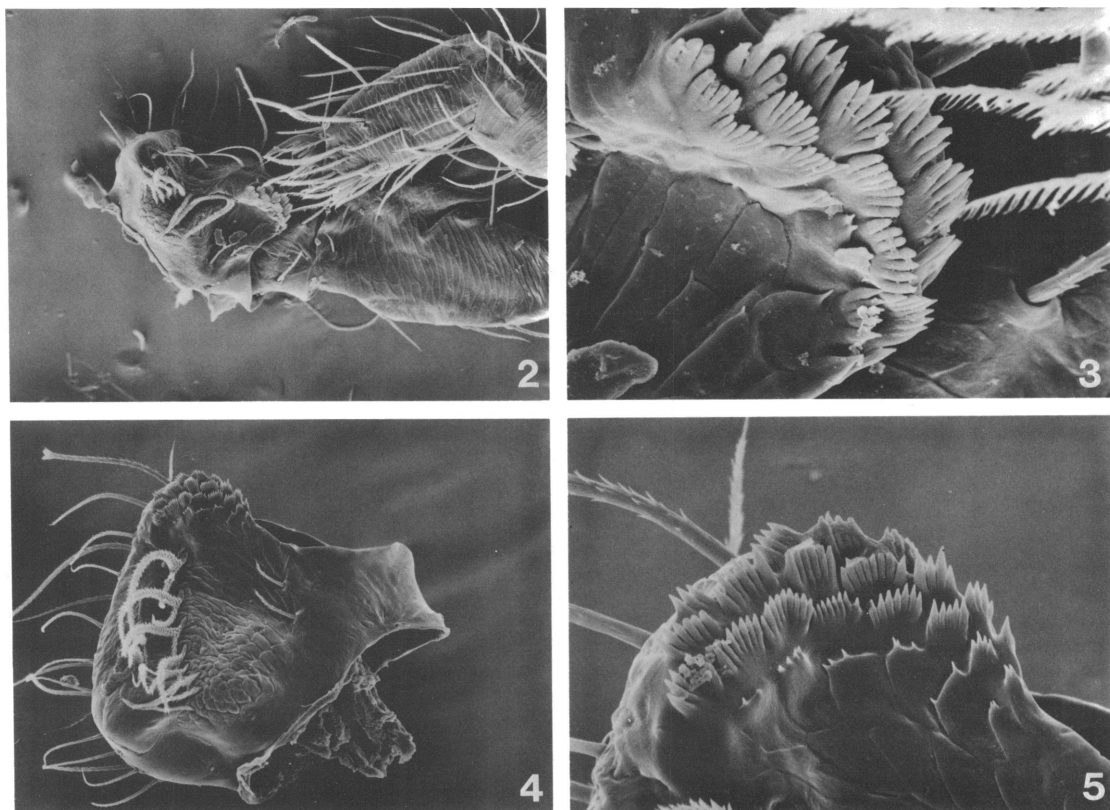
FIG. 1. Cladogram of microstigmatid genera; numbers refer to characters discussed in text.

peculiarities of the previously known microstigmatids not also found in *Micromygale*: the presence of two rows of dorsally originating teeth on the paired tarsal claws, the presence of only four spinnerets, and the absence of a palpal conductor. Arguments for regarding the first of these as apomorphic were presented by Raven and Platnick (1981); the plesiomorphic condition (a single row of ventrally originating teeth) is found in *Micromygale* (figs. 10, 11). The retention of the anterior lateral spinnerets in *Micromygale* is considered plesiomorphic because of its occurrence in all meciobothriids other than *Hexura rothi* (Gertsch and Platnick, 1979), in plesiomorphic hexathelids (Raven, 1980b), and also in more plesiomorphic families: Atypidae (Gertsch and Platnick, 1980) and two of the three genera of Antrodiaetidae (Coyle, 1968, 1971, 1975). Similarly, the retention of a palpal conductor in *Micromygale* (figs. 12–15) is considered plesiomorphic because of its occurrence in all meciobothriids (Gertsch and Platnick, 1979, figs. 48, 54, 61, 77) as well as atypids and antrodiaetids.

Characters 12 and 14 refer to features previously used to corroborate the existence of

the subfamilies Pseudonemesiinae and Microstigmatinae, respectively. The pars thoracica of *Pseudonemesia* is elevated above the level of the pars cephalica (Raven and Platnick, 1981, fig. 51), a feature seemingly unrecorded in other mygalomorphs. Similarly, the cuticular scales of *Microstigmata* and *Ministigmata* bear numerous digitiform pustules (Raven and Platnick, 1981, figs. 7–10); the only other mygalomorphs known to have cuticular pustules, *Ixamatus* and *Xamiatus* (Dipluridae, Diplurinae), do not appear to have scales under the pustules (Raven, 1980a, figs. 11–13; 1981b, figs. 68, 69), and seem to have acquired pustules independently.

Finally, the three described species of *Microstigmata* are united by their habit of encrusting the abdomen with dirt (character 16), a behavior known elsewhere in the Mygalomorphae only in the Paratropididae and therefore considered apomorphic. These 16 characters, taken together, support an arrangement in which *Micromygale* constitutes the sister group of the formerly recognized Pseudonemesiinae plus Microstigmatinae. Rather than establish a monotypic family for



FIGS. 2-5. *Micromygale diblemma*, new species, female. 2. Right palp, anterior view, 320X. 3. Serrula from right palp, anterior view, 2250X. 4. Coxa of left palp, anterior view, 520X. 5. Serrula from left palp, anterior view, 1750X.

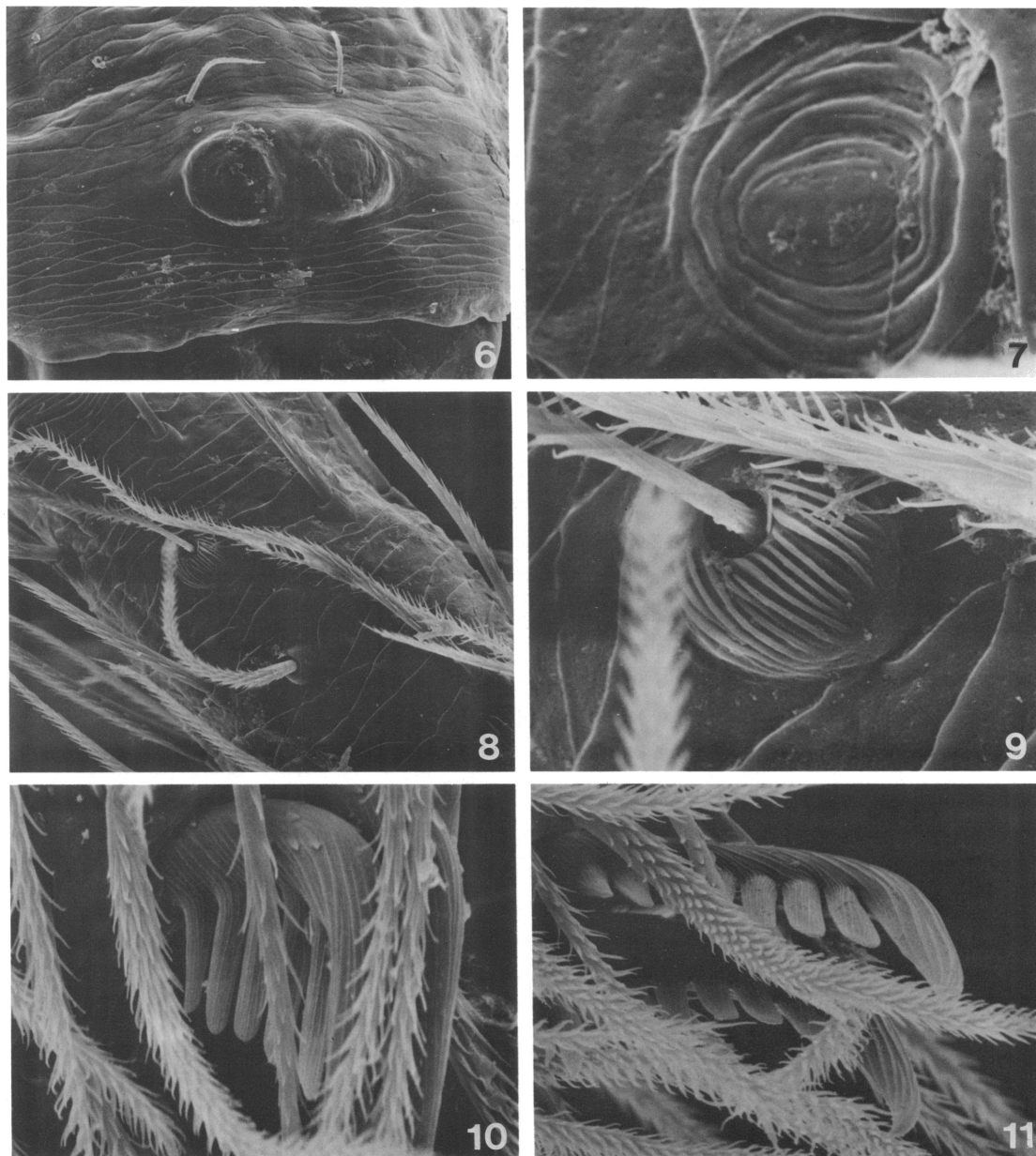
Micromygale, the formerly recognized subfamilies are here relegated to tribal status as the Pseudonemesiini and Microstigmatini, respectively, within a single subfamily.

Two other characters of greater phylogenetic ambiguity are worthy of comment. Two kinds of trichobothrial bases are found in the family: *Microstigmata* and *Ministigmata* have smooth bases (Raven and Platnick, 1981, figs. 37, 38), whereas *Pseudonemesia* (*ibid.*, figs. 39, 40) and *Micromygale* (figs. 8, 9) have corrugated bases. The more plesiomorphic dipluroids (Mecicobothriidae and Hexathelidae) have smooth trichobothrial bases (Raven, 1980b). The distribution of the corrugated base within the Microstigmatidae is explained with equal parsimony as an acquisition by the common ancestor of the fam-

ily with a subsequent loss in the Microstigmatini, or as a parallel acquisition in Micromygalinae and Pseudonemesiini. Similarly, the loss of the posterior median spinnerets (leaving only the posterior laterals) in *Pseudonemesia* and *Ministigmata* is explained with equal parsimony as an acquisition by the common ancestor of the Microstigmatinae with subsequent reversal in *Microstigmata*, or as a parallel loss in the two genera.

THE RESPIRATORY SYSTEM

It has always been assumed that one of the constant characters of the orthognath spiders was the possession of four book-lungs. Hence finding a mygalomorph which does not con-

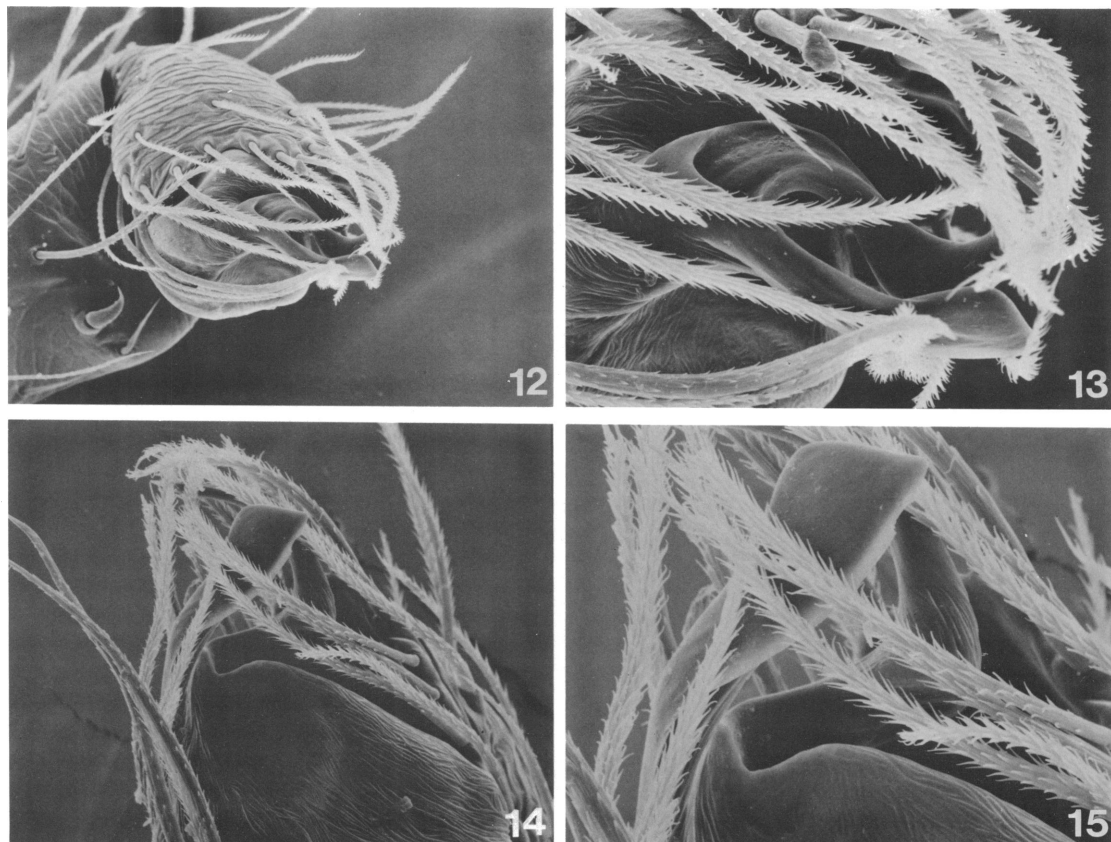


FIGS. 6–11. *Micromygale diblemma*, new species, female. 6. Carapace, anterior view, 690 \times . 7. Tarsal organ from tarsus I, dorsal view, 12,000 \times . 8. Metatarsus I, dorsal view, 1450 \times . 9. Trichobothrium from metatarsus I, dorsal view, 5700 \times . 10. Paired claws of tarsus I, lateral view, 3900 \times . 11. Paired claws of tarsus II, ventral view, 3200 \times .

form to this rule is a matter of considerable interest.

Because only a single specimen of *Micro-*

mygale was available for internal examination, it was decided to use a maceration technique (rather than sectioning) as direct



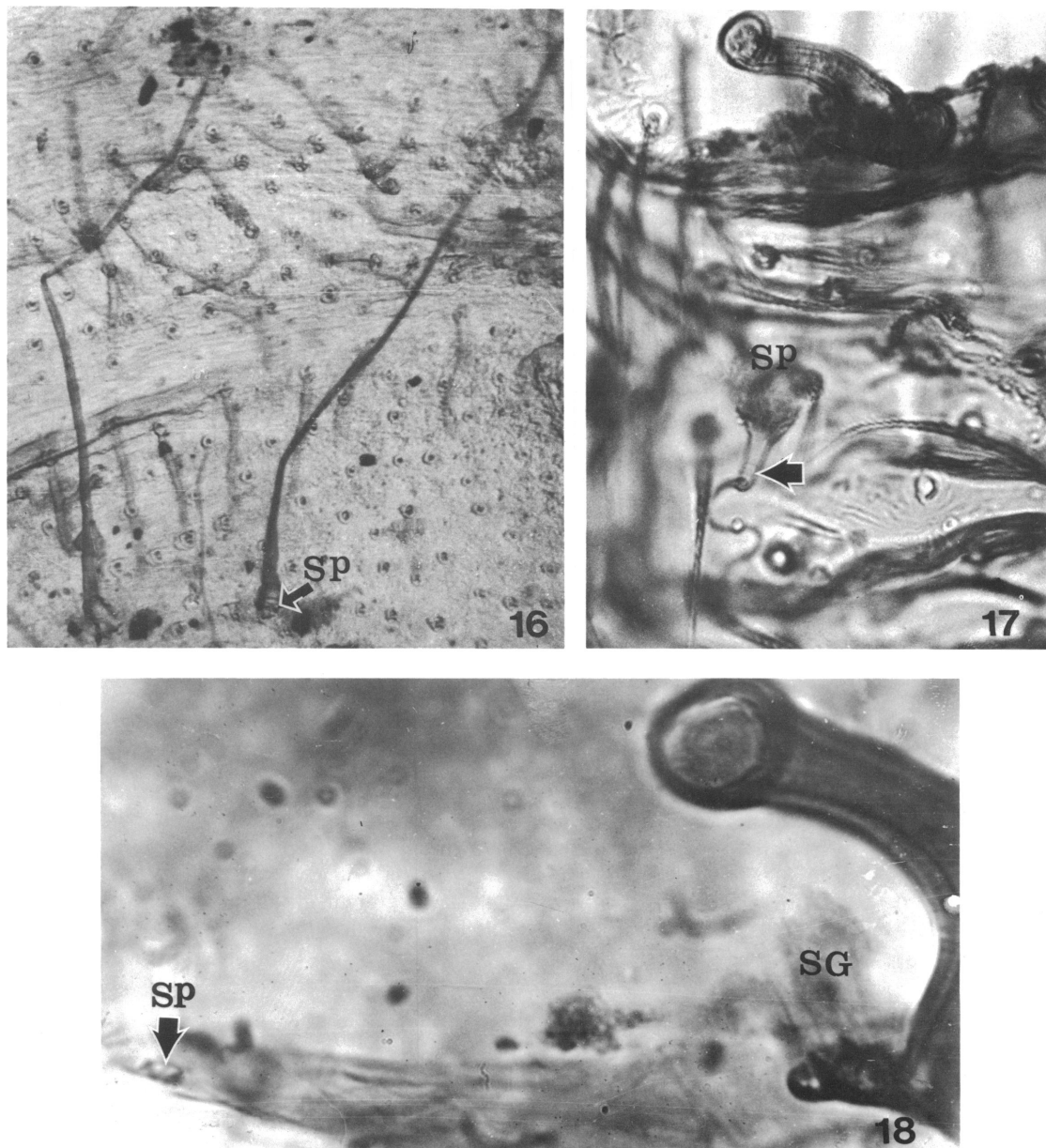
FIGS. 12-15. *Micromygale diblemma*, new species, left male palp. 12. Retrolateral view, 650 \times . 13. Retrolateral view, 1780 \times . 14. Ventral view, 1160 \times . 15. Ventral view, 2100 \times .

examination usually provides a much more reliable picture of the structural organization.

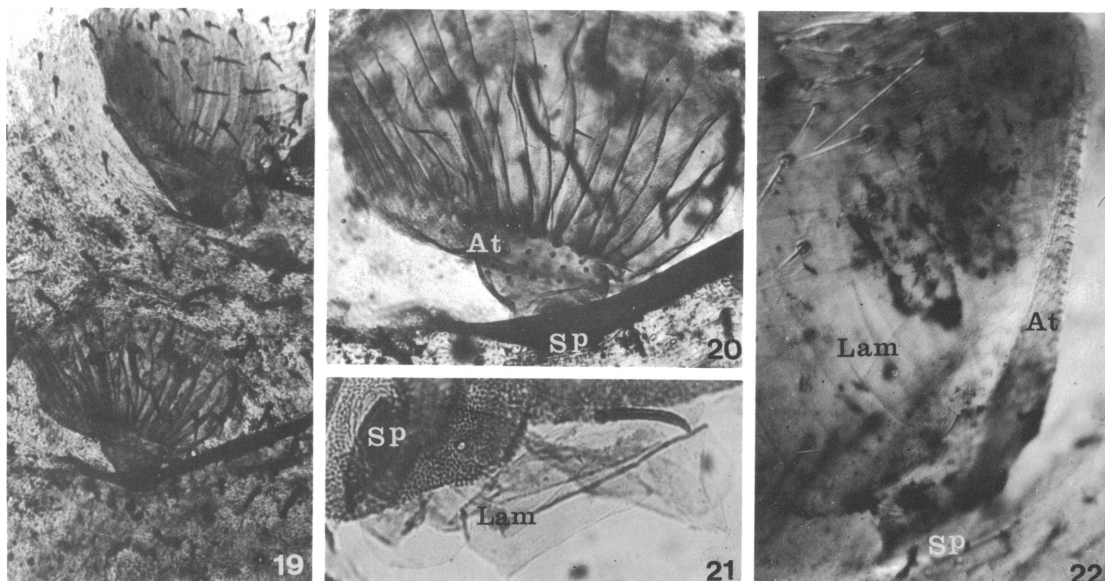
The ventral portion of the abdomen was dissected free, macerated in hot 4 percent KOH, and transferred to water. The initial examination was carried out under a stereo microscope with oblique lighting over a black baseplate. Experience has shown that this method of examination reveals the presence of both book-lungs and tracheae in even the smallest of the labidognath spiders, although detailed examination under higher magnification is usually required to resolve the details of the structures. Surprisingly, no sign of any respiratory structures was discerned by this method and it was not until the specimen had been stained with Chlorazol Black

and prepared as a permanent mount for examination under a Zeiss Universal Compound Microscope that any respiratory structures were found.

The posterior spiracles are located at approximately two-thirds of the distance from the spinnerets to the epigastric furrow (fig. 17). The spiracles are round and only weakly sclerotized. Each spiracle leads into a short atrium which is the same width as the spiracle and then narrows into a short trunk. From the tip of this trunk a very slender and sinuous duct extends forward to terminate near the epigastric furrow. There are no lamellae. No trace of any anterior respiratory organs could be found, but a search under oil immersion did bring to light a pair of slightly



FIGS. 16-18. Respiratory structures, ventral views. 16. The tracheal tubes in the third abdominal segment of *Archaea vadoni* (family Archaeidae), which open from separate spiracles (Sp). 17, 18. *Micromygale diblemma*, new species. 17. Left ventral portion of the macerated abdomen showing the respiratory tube (arrow) and spiracle (Sp). One receptaculum is shown in the upper portion. The respiratory tube, which has been displaced during the preparation of the slide, is in life directed forward. 18. The epigastric region photographed under oil immersion to show the minute spiracle (Sp) situated between the two hairs shown on the outer left of figure 17; the spermathecal gland (SG) associated with the secretory lobe of the receptaculum is indicated.



FIGS. 19–22. Book-lungs of mygalomorph spiders, ventral views. 19, 20. *Microstigmata* sp. 19. Left anterior and posterior book-lungs. 20. Posterior book-lung showing the modified atrial pouch (At) and the position of the spiracle (Sp). 21. *Ministigmata minuta* Raven and Platnick, anterior book-lung, showing the spiracle (Sp), the few lamellae (Lam), and the absence of a well-developed atrial region. 22. *Hexurella rupicola* Gertsch and Platnick, anterior book-lung, showing numerous lamellae (Lam), the typical mygalomorph slit spiracle (Sp), and the attenuated lateral extension of the atrial cavity (At).

sclerotized indentations in the position where the original spiracles would have been situated. We have indicated the position of these “spiracles” in figure 18. They are extremely small, less than one-third the size of adjacent hairbases, and do not appear to lead into any internal structures. It appears then that the only respiratory organs in *Micromygale* are the relict structures present in the third abdominal segment.

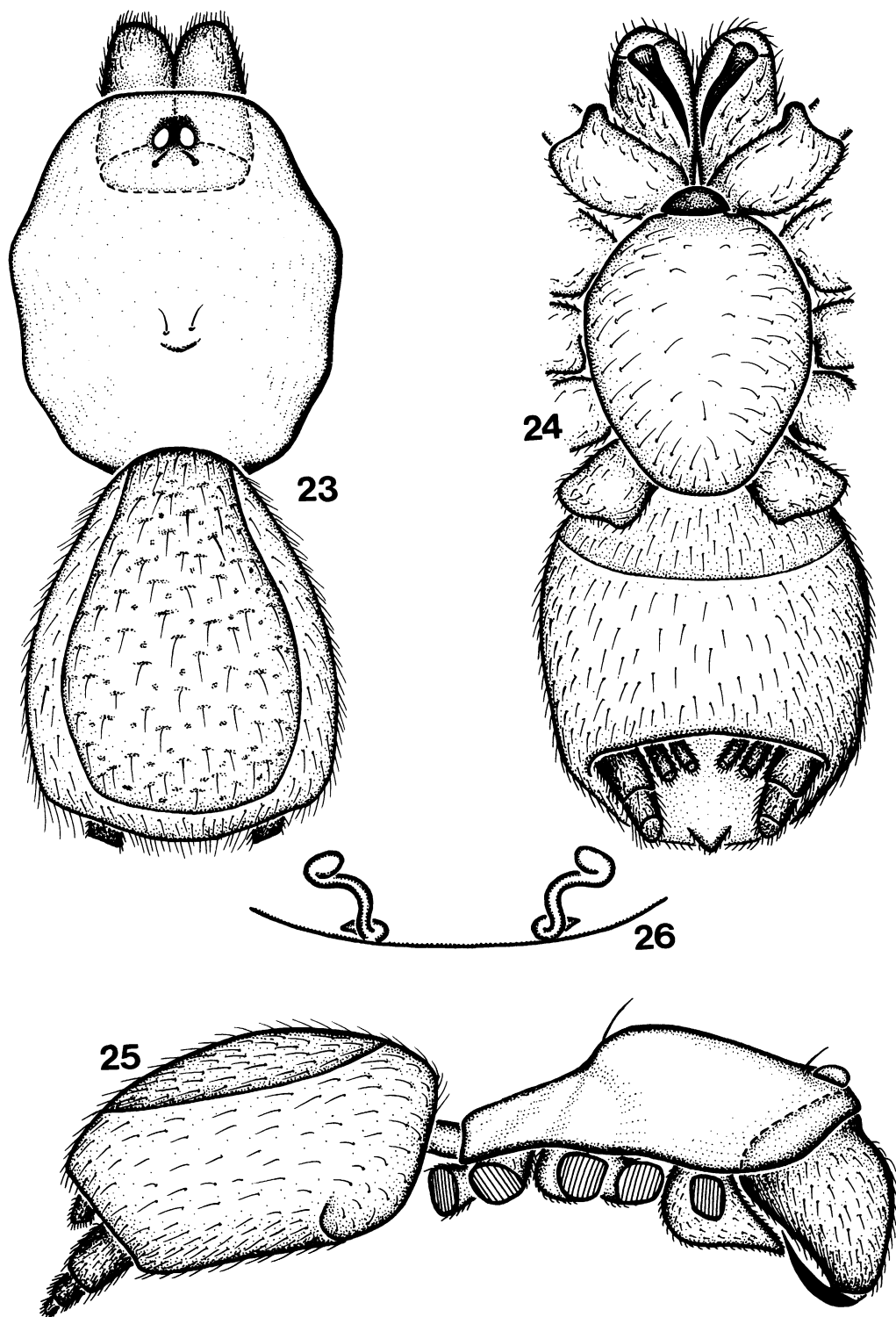
It has long been suspected that if any modifications of the respiratory system had taken place in the orthognath spiders, that these would be found among the minute representatives (Forster, in prep.). Earlier examination of the minute *Masteria* (Dipluridae) had shown that in this genus the book-lungs are normal and differ little from the larger diplurids, but that the number of lamellae in the second pair has been reduced to about 10.

To provide a more direct comparison with *Micromygale*, it was decided to examine the

respiratory system of the meciobothriid *Hexurella rupicola* Gertsch and Platnick and two other microstigmatid genera, *Microstigmata* and *Ministigmata*.

It was not expected that there would be any striking developments in *Hexurella* because the spiracle is not modified and closely related larger species exist. Indeed the book-lungs were found to possess even more lamellae than *Masteria*: 25 in the anterior pair and 18 in the posterior pair. However, there is a most interesting development which might be of some significance in the interpretation of the tubular organ in *Micromygale*. The atrium extends anteriorly along the outer margin to form a slender apically pointed duct (fig. 22). It is readily seen that if the lamellae were lost from this form of book-lung, then the relict structure could well be similar to the *Micromygale* organ.

It was, however, anticipated that the peculiarly modified spiracles found in the other microstigmatid genera would indicate some



FIGS. 23–26. *Micromygalé diblemma*, new species. 23. Male, dorsal view. 24. Male, ventral view. 25. Male, lateral view. 26. Female spermathecae, ventral view (cleared).



FIGS. 27, 28. *Micromygale diblemma*, new species, female spermathecae, ventral views (cleared and stained).

radical pulmonary modifications, but this does not appear to be the case. Both of the other genera examined have four functional book-lungs, although the degree of development in the two genera is markedly different. In *Microstigmata*, the lamellae are relatively numerous, with 22 in the anterior book-lungs and 18 in the posterior pair. However, the atrial region adjacent to the spiracle is modified to form a short duct which then expands to form a distinctive chamber (figs. 19, 20) which is more strongly developed in the posterior pair. The lateral extensions of the atria are relatively short.

Ministigmata minuta Raven and Platnick has the number of lamellae greatly reduced. In this species there are five lamellae associated with the anterior pair and four with the posterior pair. There is virtually no atrial cavity so that the lamellae extend to near the spiracular opening (fig. 21).

The respiratory modifications found in *Micromygale* are unique among spiders. Considering the rudimentary nature of the organ present in the third abdominal segment, it may be concluded that the spider must rely on cutaneous respiration for part, if not all, of its respiratory needs. The question which does arise is the origin and homologies of the abdominal organ. One of us (Forster, in prep.) has suggested that because of a fundamental difference in respiratory

organization between the orthognath and labidognath spiders (the absence of a transverse duct linking the atria of the book-lungs), full tracheal development cannot take place in the orthognath spiders. The present discovery accords with that view. The logical homologues of the tubular organs in *Micromygale* are the atria of the original book-lungs. The slender extension of the atrial region in *Hexurella* shows clearly the possible transformation series needed to lead to such a structure, although it is equally feasible for such a development to take place from a more typical atrial pouch. There are a number of groups of labidognath spiders with comparable vestigial structures, but because of the presence of the transverse duct these tend to merge in the median line and then open through a single median spiracle. There is, however, a directly comparable organ present in the Archaeidae (Forster, in prep.) where presumably the transverse duct was lost before the loss of the book-lung lamellae (fig. 16). It must be remembered, however, that in this family the anterior book-lungs are present and so the overall respiratory organization is not directly comparable.

MICROSTIGMATIDAE ROEWER

Microstigmatae Roewer, 1942, p. 194.

Pseudonemesiinae Caporiacco, 1955, p. 265. First synonymized by Raven and Platnick, 1981, p. 14.

DIAGNOSIS: Microstigmatids can be easily recognized by the small, oval spiracles (figs. 17, 18; Raven and Platnick, 1981, figs. 1, 50) and the scaly cuticle (figs. 6, 8; Raven and Platnick, 1981, figs. 5–10). The comparisons with other mygalomorph families provided by Raven and Platnick (1981, p. 14) should be amended as follows: microstigmatids can be distinguished from the Paratropididae by their scaly cuticle and the absence of long anterior lobes on the palpal coxae, from the Migidae by their closely spaced eyes, and from the Atypidae by their posterior median spinnerets being narrow or absent.

DESCRIPTION: Small to tiny mygalomorph spiders. Carapace oval, with narrow thoracic groove and two or eight eyes. Chelicerae paraxial, geniculate, with promarginal row of teeth, with or without mesal teeth, without rastellum. Palpal coxae longer than wide, with or without short anterior lobes, with or without cuspules, with serrula; female palp with claw bearing single row of teeth. Labium wider than long, with or without cuspules. Sternum cordate, with or without visible sigilla. Tarsi with three claws, paired claws with one or two rows of teeth, unpaired claws long, with or without teeth; tarsal organ with or without concentric ridges, flat or elevated; trichobothria present on tibiae and metatarsi, present or absent on tarsi; trichobothrial bases smooth or corrugated; claw tufts and scopulae absent. Cuticle scaly, with or without digitiform pustules. Abdomen with or without tergite-like anterior scutum in males, with spiracles very small, oval; book-lungs present or absent; spinnerets six, four, or two, posterior laterals very short, three-segmented, with apical segment shorter than median, coniform. Males with pyriform palpal bulb, with or without conductor, with or without incrassate spine on tibia I.

MICROMYGALINAE, NEW SUBFAMILY

TYPE GENUS: *Micromygale*, new genus.

DIAGNOSIS: Micromygalines can be distinguished from microstigmatines by the presence of six spinnerets (fig. 24), a single row of teeth on the paired tarsal claws (figs. 10, 11), a flattened tarsal organ (fig. 7), an en-

larged abdominal scutum in males (fig. 23), serrula teeth clumped into series (figs. 2–5), only two eyes (fig. 6), a short, slightly produced anterior lobe on the palpal coxae (fig. 24), a palpal conductor (figs. 12–15), and the loss of book-lungs (figs. 17, 18).

MICROMYGALE, NEW GENUS

TYPE SPECIES: *Micromygale diblemma*, new species.

ETYMOLOGY: The generic name is derived from the Greek *mikros* (small) and *Mygale* (an early generic name, now replaced as a homonym, from which the term mygalomorph is derived), referring to the small size.

DIAGNOSIS: With the characters of the subfamily.

DESCRIPTION: Tiny mygalomorph spiders. Thoracic groove slightly procurved, depressed behind pars thoracica. Two eyes. Chelicerae with mesal teeth. Palpal coxae with short, slightly produced anterior lobe bearing serrula with teeth clumped into series, without cuspules. Labium without cuspules. Sternum without visible sigilla. Paired tarsal claws with single row of ventrally originating teeth, unpaired claws with two teeth. Tarsal organ flattened, with concentric ridges. Trichobothria absent on tarsi, with corrugated bases. Tarsi without whorled seta at base of claws. Cuticle without digitiform pustules. Abdomen with large dorsal scutum in males. Book-lungs absent. Six spinnerets; posterior medians and anterior laterals short, one-segmented, functional. Males without clasping spines, with both embolus and conductor.

Micromygale diblemma, new species

Figures 2–15, 17, 18, 23–28

TYPES: Male holotype and female paratype taken in a Berlese sample of litter from the buttress of a small tree on a slope at an elevation of 1290 m. on Cerro Colorado, Chiriquí, Panama (January 26, 1981; W. Suter), deposited in the Field Museum of Natural History.

ETYMOLOGY: The specific name is from the Latin *di-* (two) and the Greek *blemma* (glance), referring to the eye number.

DIAGNOSIS: With the characters of the

subfamily and genus and genitalia as in figures 12–15 and 26–28.

MALE: Total length, including chelicerae, 0.76. Carapace and legs pale brownish white with femora I and chelicerae slightly darker; underside of cephalothorax paler except for anterior lobe on palpal coxae. Dorsum of abdomen almost completely covered by shiny light brown scutum, venter and sides uniformly white.

Carapace 0.32 long, 0.25 wide, 0.18 high at rear of pars cephalica, with anteriorly excavated, steeply sloping pars thoracica, gradually sloping toward elevated ocular area, glabrous, with pair of bristles just behind eyes, and pair at rear of pars cephalica (fig. 23). Thoracic groove a short, procurved transverse slit situated back two-thirds of carapace length, occupying about one-seventh of carapace width at that point.

Two eyes (apparently anterior laterals), situated on low black tubercle occupying about one-fifth of front width, separated by roughly their diameter (fig. 6); another pair of eyes (apparently posterior laterals) represented by black pigment scattered posterolaterally of tubercle.

Sternum 0.18 long, 0.23 wide, coated with fine bristles, without visible sigilla. Labium 0.09 long, 0.13 wide, triangular, rounded anteriorly, without cuspules, with about six bristles anteriorly. Palpal coxae 0.15 long, 0.13 wide, without cuspules, with distinct anterior lobe (fig. 24) bearing serrula (figs. 2–5). Chelicerae short, promargin with at least five teeth, mesally with at least two teeth; fang long, slender.

Leg formula 1423. Legs without spines or clasping modifications but with erect bristles. Paired tarsal claws with single row of five to seven teeth originating ventrally, unpaired claw with two teeth. Metatarsi usually with single trichobothrium, tibiae usually with two; tarsi lacking trichobothria.

	I	II	III	IV
Femur	0.29	0.24	0.19	0.25
Patella	0.14	0.13	0.09	0.13
Tibia	0.22	0.18	0.13	0.20
Metatarsus	0.13	0.11	0.12	0.13
Tarsus	<u>0.14</u>	<u>0.12</u>	<u>0.11</u>	<u>0.14</u>
Total	0.92	0.78	0.64	0.85

Palp with incrassate tibia and tarsus; tip of tarsus lined with erect bristles; bulb bearing twisted embolus and distally expanded conductor (figs. 12–15).

Abdomen 0.43 long, 0.25 wide, hirsute; spiracles difficult to see (figs. 17, 18). Three-segmented posterior lateral spinnerets with basal, median, and apical segments 0.11, 0.07, 0.05 long, respectively; anterior laterals and posterior medians shorter than basal segment of posterior laterals (fig. 18).

FEMALE: As in male, except as noted. Total length, including chelicerae, 0.81. Dorsum of abdomen shiny and coriaceous but without distinctly delimited scutum. Carapace 0.39 long, 0.28 wide, 0.12 high. Sternum 0.24 long, 0.25 wide. Labium 0.08 long, 0.13 wide. Palpal coxae 0.14 long, 0.14 wide.

	I	II	III	IV
Femur	0.29	0.26	0.22	0.25
Patella	0.13	0.11	0.10	0.12
Tibia	0.16	0.13	0.13	0.16
Metatarsus	0.14	0.13	0.10	0.17
Tarsus	<u>0.14</u>	<u>0.12</u>	<u>0.11</u>	<u>0.14</u>
Total	0.86	0.75	0.66	0.84

Palp with claw bearing single row of teeth. Abdomen 0.42 long, 0.31 wide. Posterior lateral spinnerets with basal, median, and apical segments 0.08, 0.06, 0.02 long, respectively. Spermathecae two, elongate, laterally directed, distally expanded, with outer, basal secretory lobe (figs. 26–28).

MATERIAL EXAMINED: All the known specimens were taken by Berlese sampling in the area of Cerro Colorado; because the border between provinces runs along this mountain range, the collections are from two provinces. Specimens have been distributed among the Field Museum, American Museum, and Otago Museum. **PANAMA:** *Bocas del Toro:* Quebrada Alicia cloud forest, 25 km. NNE San Félix, latitude 8°34'N, longitude 81°50'W, elevation 1500 m., epiphytic soil and root mat on log (June 17, 1980; J. Wagner), 10 ♀. *Chiriquí:* Cerro Colorado minesite, 24 km. NNE San Félix, same coordinates, elevation 1300 m., floor litter and root mat (June 24, 1980; J. Wagner), 1 ♀; Cerro Colorado, elevation 1290 m., tree buttress (Jan. 10, 1981; W. Suter), 1 juv.; elevation 1290 m., tree

buttress, damp pocket (Jan. 24, 1981; W. Suter), 1 ♂, 2 ♀; elevation 1290 m., buttress of small tree on slope (Jan. 26, 1981; W. Suter), 1 ♂, 5 ♀, 1 juv.; elevation 1290 m., litter pocket, edge of woods (Jan. 26, 1981; W. Suter), 1 ♂; Cerro Colorado, E side, elevation 1175 m., gully litter, oak fringe (Jan. 27, 1981; W. Suter), 1 ♀.

DISTRIBUTION: Known only from north-central Panama.

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