

THREE NEW SCHIZOMIDA OF THE GENUS *SCHIZOMUS* FROM MEXICAN CAVES (ARACHNIDA)

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INTRODUCTION

Since 1938, when Chamberlin and Ivie described the first Mexican schizomid, a new subfamily, two new genera, and nearly a score of new species have been reported from México, mostly from caves. The descriptions of these species are fortunately distributed through a relatively few titles. These are Chamberlin and Ivie (1938), Gertsch (1940), Rowland (1971a, 1971b, 1973) and Brignoli (1973).

Descriptions became fairly well standardized with Gertsch's work, however, considerable confusion has recently been introduced. Brignoli (1973) attempted to introduce the spermatheca as a new means of utilizing the normally taxonomically useless females. Börner (1902) first described the spermatheca of a schizomid, but no subsequent taxonomic use was made of this character. Some time ago I also became interested in using the spermatheca as a taxonomic tool. After considerable comparative work, however, I found intraspecific variation in this character relatively great and interspecific variation relatively small. I found, for example, that the spermatheca of *S. longimanus* Rowland and *S. floridanus* Muma were inseparable. Brignoli showed marked differences between *S. sbordonii* Brignoli and *S. arganoi* Brignoli which are probably significant, however the former's spermatheca is in my eyes indistinguishable from *S. longimanus*.

It is my belief that upon a thorough study of considerable comparative material the spermatheca can

be put to some use. At this time, however, I am unable to place Dr. Brignoli's schizomids. I am further at a loss to understand how Dr. Brignoli decided that his new species were different from previously described species, having no males of *S. sbordonii* and *S. arganoi*, or females of all the other Mexican species for comparison.

Until the males of *S. sbordonii* and *S. arganoi* are described I will not certainly know if I am creating synonyms. My efforts to describe and relate new species coming to my attention will not, however, stop. In my future revisionary work on Mexican schizomids I will fully deal with the spermatheca and will attempt to place Brignoli's schizomids.

The species currently reported from México, including the species described herein, are as follows:

Family Schizomidae Hansen & Sorensen, 1905

Subfamily Schizominae Hansen & Sorenson, 1905

Genus *Schizomus* Cook, 1899

1. *S. cavernicola* Chamberlin & Ivie, 1938
2. *S. davisi* Gertsch, 1940
3. *S. mexicanus* Rowland, 1971
4. *S. longimanus* Rowland, 1971
5. *S. mitchelli* Rowland, 1971
6. *S. cookei* Rowland, 1971
7. *S. reddelli* Rowland, 1971
8. *S. bartolo* Rowland, 1973
9. *S. orthopla* Rowland, 1973

10. *S. pecki* Rowland, 1973
 11. *S. firstmani* Rowland, 1973
 12. *S. sbordonii* Brignoli, 1973
 13. *S. arganoi* Brignoli, 1973
 14. *S. lukensi*, new species
 15. *S. moisii*, new species
 16. *S. stewarti*, new species
- Genus *Heteroschizomus* Rowland, 1973
17. *H. goodnightorum* Rowland, 1973
- Subfamily Megaschizominae Rowland, 1973
- Genus *Agastoschizomus* Rowland, 1971
18. *A. lucifer* Rowland, 1971
 19. *A. pachypalpus* Rowland, 1973

The main purpose of this paper is to describe three new species of schizomids of some interest. One is a troglobite from Tamaulipas, the others are probably troglophiles from caves in Oaxaca, the first schizomids described from that state.

Thanks are due Mr. Gil Ediger, Mrs. Jill Ediger, Mr. David McKenzie, Ms. Martha McKenzie, Mr. Stuart Murphy, Mr. James Reddell, and Mr. William Russell for providing the excellent collections on which this study is based. Appreciation is also expressed to Dr. Robert W. Mitchell for his continued support.

Schizomus lukensi, new species

Holotype—An adult male, taken in Cueva del Agua, 50 km SW Soto la Marina, Tamaulipas, México, on 31 October 1970 by W. Russell, G. Ediger, and J. Ediger, and deposited in the American Museum of Natural History, New York City.

Allotype—An adult female, taken at the same locality, on the same date, by the same collectors as the holotype, and also deposited in the American Museum of Natural History.

Paratypes—An adult male and two adult females, taken at the same locality, on the same date, by the same collectors as the holotype and allotype, and deposited in The Museum, Texas Tech University, Lubbock, Texas.

Description—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with three pair of dorsal and two apical setae, more than twice as long as wide, extremely convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots absent; mesopeltidia (second pair of cephalothoracic tergites) acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, slightly emarginate posteriorly, not as deep medially as late-

rally, anterior margin parallel with posterior margin of mesopeltidium; anterior sternum with nine setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than second abdominal tergum, chevron shaped; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.

Flagellum. Spade shaped, horizontally compressed, bearing 16 setae; dorsal surface without relief.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of two long, feathered setae flanking movable finger (second cheliceral segment), group of three shorter setae arranged basally on fixed digit, horizontal group of seven setae arising on or near ventral margin; mesal surface of basal segment bearing group of four setae arranged horizontally, lower group of two setae arranged vertically, another two short, stout setae below these, arranged in a vertical line, three setae directly below large dorsal seta, movable finger flanked by another vertical group of three long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing seven closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 19 long, feathered, distally curled setae near outer margin, another vertical row of 16 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions $1 > 7 > 6 > 3, 4, 5 > 2$; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 65 per cent as long as tibia; length of segments given in Table 1.

Females differ from males in following respects: First legs proportionately shorter than in male; lengths of segments given in Table 1. Flagellum long, rod-shaped, with two annulations, the terminal section longer than the previous two; abdominal sternum II strongly emarginate posteriorly.

Comparisons—This singular species shows some similarities to *Schizomus mexicanus* Rowland, 1971, and *S. bartolo* Rowland, 1973. The shape of the male flagellum is very similar to that of *S. mexicanus*, but differs from the latter in having no dorsal relief. In the latter respect *S. lukensi* is more similar to *S. bartolo*. The latter two species are also similar in their extreme reduction in pigmentation. They are probably both troglobites.

Measurements—The total length of the male holotype and the female allotype, both from the type locality, is 4.2, and 4.7, respectively. See Table 1.

Variation—No variation disproportionate to variation in body length was noticed.

Distribution—*S. lukensi* is known only from Cueva del Agua, 50 km SW Soto la Marina, Tamaulipas, México.

Remarks—*S. lukensi*, like *S. bartolo* shows evidence of cave adaptation. Adults are very pale, notably paler than epigean species. The front legs are longer than most epigean species, though not as long as in *S. longimanus* Rowland, 1971. Also as in *S. bartolo* all ventral setae are bifid. See Rowland (1971b, 1973).

On the basis of morphology of the male flagellum *S. lukensi* seems closest related to *S. mexicanus*, a widely distributed species.

Etymology—The specific name is a patronym, given in honor of Mr. Loren Lukens, Banning, California.

Table 1. *Schizomus lukensi*

Male Holotype

	Pedipalp	I	II	III	IV
Coxa	.49	.53	.40	.34	.29
Trochanter	.29	.29	.16	.20	.29
Femur	.28	1.50	.90	.79	1.22
Patella	.38	1.94	.32	.35	.47
Tibia	.40	1.49	.57	.53	.90
Basitarsus	.20	.97	.51	.54	.79
Tarsus			.44	.46	.54

Female Allotype

	Pedipalp	I	II	III	IV
Coxa	.56	.58	.43	.38	.35
Trochanter	.30	.26	.18	.25	.32
Femur	.31	1.30	.90	.78	1.19
Patella	.40	1.16	.41	.34	.42
Tibia	.41	1.25	.62	.53	.81
Basitarsus	.21	1.00	.45	.53	.74
Tarsus			.42	.45	.48

Schizomus moisii, new species

Holotype—An adult male, taken in Grutas de Monteflor, 6 km NE Valle Nacional, Oaxaca, México, on 28 December 1972 by J. Reddell, D. McKenzie, M. McKenzie, and S. Murphy, and deposited in the American Museum of Natural History.

Allotype—An adult female, taken at the same locality, on the same date, by the same collectors as the holotype, and also deposited in the American Museum of Natural History.

Paratypes—Five adult males, five adult females and one juvenile, taken at the same locality, on the same date, by the same collectors as the holotype, and deposited in The Museum, Texas Tech University, Lubbock.

Description—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with three pair of dorsal and two apical setae, one and one half times as long as wide, gently convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots distinctly oval, pale areas on anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidium; anterior sternum with nine setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with six setae, vaguely triangular.

Abdomen. First abdominal tergum located much closer to metapeltidium than second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing vaguely darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as oval, darkened areas on sterna V to VII.

Flagellum. Diamond shaped, horizontally compressed, bearing 16 setae; dorsal surface with two deep depressions each with a lateral swelling.

Chelicerae. Lateral aspect of basal segment bearing three setae, vertical group of three long, feathered setae flanking movable finger (second cheliceral segment), group of three shorter setae arranged basally on fixed digit, horizontal group of seven setae arising

Pedipalps. Trochanter not distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 2.

Legs. Tarsal segments of leg I of the following proportions $1 > 7 > 6 > 2, 3, 4, 5$; anterolateral spur of coxa of leg II 35 per cent as long as coxa proper; patella of leg III 80 per cent as long as tibia; length of segments given in Table 2.

Females differ from males in the following respects: First legs proportionately much shorter than in male; lengths of segments given in Table 2. Flagellum long, rod shaped, with two annulations, the terminal section longer than previous two; abdominal sternum II strongly emarginate posteriorly.

Comparisons—*S. moisi* superficially resembles *S. cookei* Rowland, 1971, in having a pair of swellings lateral to the median depressions on the dorsal surface of the male flagellum. The general morphology of the flagellum is similar to *S. stewarti*, new species, but the latter lacks the deep median depressions of *S. moisi*. This species is rather distinct from any other known Mexican schizomid.

Measurements—The total length of the male holotype and the female allotype, both from the type locality, is 4.1, and 4.6, respectively. See Table 2.

Variation—The apex of the carapace (propeltidium) of the holotype is typical of most other schizomids, however two of the paratypes show variation in this character unlike any I have seen before. Two of the male paratypes have no conical process at the apex of the carapace, but merely a truncated margin, which is nearly straight from the right to the left side. The two setae usually present at the apex are reduced to one, the distal setae probably being lost. I cannot speculate on the significance of this phenomenon. No other variation disproportionate to variation in body length was noticed.

Distribution—*S. moisi* is known only from Grutas de Monteflor, 6 km NE Valle Nacional, Oaxaca, México.

Remarks—This species represents the first of a quite distinct new species group of Mexican Schizomida. It is easily distinguishable from all previously described Mexican species, but shows some similarities to *S. stewarti*, new species. *S. moisi* and the latter species are undoubtedly properly placed in the same species group, which will probably expand when more collections are available from Oaxaca and adjacent states.

Etymology—The specific name is a patronym, given in honor of Mr. Thomas Moisi, Rosemead, California.

Table 2. *Schizomus moisi*.

Male Holotype

	Pedipalp	I	II	III	IV
Coxa	.44	.58	.37	.32	.36
Trochanter	.24	.26	.17	.18	.30
Femur	.29	1.32	.78	.62	1.18
Patella	.31	1.78	.42	.28	.51
Tibia	.30	1.30	.52	.35	.82
Basitarsus	.20	.95	.50	.40	.67
Tarsus			.38	.33	.53

Female Allotype

	Pedipalp	I	II	III	IV
Coxa	.51	.58	.40	.38	.34
Trochanter	.25	.25	.19	.20	.30
Femur	.26	1.11	.70	.67	1.06
Patella	.34	1.42	.37	.31	.43
Tibia	.33	1.00	.46	.41	.80
Basitarsus	.19	.86	.44	.42	.65
Tarsus			.32	.34	.40

Schizomus stewarti, new species

Holotype—An adult male, taken in Cueva del Guayabo, 12 km NE Valle Nacional, Oaxaca, México, on 29 December 1972 by J. Reddell, D. McKenzie, M. McKenzie, and S. Murphy, and deposited in the American Museum of Natural History.

Paratype—A juvenile, taken at the same locality, on the same date, by the same collectors as the holotype, and also deposited in the American Museum of Natural History.

Description—Cephalothorax. Carapace (propeltidium, first cephalothoracic tergum) with three pair of dorsal and two apical setae, nearly twice as long as wide, acutely convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots distinct as irregular, pale areas on anterolateral surface of carapace; mesopeltidia (second pair of cephalothoracic tergites) acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium (third cephalothoracic tergum) undivided, emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidium; anterior sternum with nine setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum (metasternum) with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dor-

sal, six lateral, five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing vaguely visible apodemes of dorsoventral muscles; vestigial stigmata appearing as darkened areas on sterna V to VII.

Flagellum. Bulbous, horizontally compressed, bearing 16 setae; dorsal surface with two, small, lateral swellings.

Chelicerae. Lateral aspect of basal segment bearing four setae, vertical group of three long, feathered setae flanking movable finger (second cheliceral segment), group of three shorter setae arranged basally on fixed digit, horizontal group of seven setae arising on or near ventral margin; mesal surface of basal segment bearing group of four setae arranged horizontally, lower group of two setae arranged vertically, another two short, stout setae below these, arranged in a vertical line, two setae directly below large dorsal seta, movable finger flanked by another vertical group of three long, feathered setae as on lateral surface, three large, elongate, distally enlarged setae originating just below previous group, fixed digit bearing six closely situated, feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 19 long, feathered, distally curled setae near outer margin, another vertical row of 18 short setae or teeth near inner surface.

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 3.

Legs. Tarsal segments of leg I missing; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 80 per cent as long as tibia; length of segments given in Table 3.

Comparisons—*S. stewarti* is most closely related to *S. moisi*, but differs in the morphology of the male flagellum. *S. stewarti* has no depressions on the dorsal side of the flagellum as in *S. moisi*, and the lateral swellings are much smaller in the former than in the latter.

Measurements—The total length of the male holotype is 3.5. See Table 3.

Variation—Only one adult specimen of this species was available for study.

Distribution—*S. stewarti* is known only from Cueva del Guayabo, 12 km NE Valle Nacional, Oaxaca, México.

Remarks—See remarks under *S. moisi*.

Etymology—The specific name is a patronym, given in honor of Dr. Glenn Stewart, California State Polytechnic University, Pomona.

Table 3. *Schizomus stewarti*.

Male Holotype

	Pedipalp	I	II	III	IV
Coxa	.53	.50	.33	.32	.28
Trochanter	.22	.29	.18	.17	.25
Femur	.32	—	.61	.51	.98
Patella	.34	—	.34	.25	.33
Tibia	.28	—	.44	.31	.71
Basitarsus	.17	—	.41	.40	.55
Tarsus			.33	.32	.40

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