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A new species of troglobitic *Schizomus* (Arachnida: Schizomida) from Ecuador

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Summary

Schizomus ashmolei, new species, a troglobite, is described from Cueva de los Tayos, Santiago-Morona Province, Ecuador. The new species possesses characteristics of both the *simonis* and *brasiliensis* species groups. *Schizomus* sp., a troglophile from Cueva de los Tayos known only from females, is briefly diagnosed and the spermathecae illustrated.

Introduction

During the course of the joint Ecuadorean-British 1976 Los Tayos Expedition several interesting arach-

nids were collected from Cueva de los Tayos, Santiago-Morona Province, Ecuador, by Dr N. Philip Ashmole. Among these specimens are two undescribed species of the order Schizomida. The description of one of these species, a troglobite, follows. We postpone naming the second species, presumably a troglophile, until the male of that species is discovered.

Cueva de los Tayos is an extensive cave system with 4.6 km of passages and attaining a depth of 401 m. The cave, which is located about 10 km from the Peruvian border and at an altitude of approximately 800 m, was first brought to the attention of the English speaking public by Erich von Däniken in his book *The Gold of the Gods* (1973), in which he claimed the cave was a gigantic mine built by alien astronauts. The Los Tayos Expedition unsurprisingly debunked this fantasy and found a major cave of considerable biological and geological interest. A detailed map and description of the cave have been published by Judson (1976) and Frankland (1978). The cave consists of two isolated segments, which are known as the Main Cave and Shovel Pot. Although morphologically related and probably joined, no connections between the two caves could be found during the 1976 expedition. Schizomids were obtained from both sections of the cave system.

Cueva de los Tayos contains an interesting arachnid

seta-like points on ventromesal margin. Tibia with five spines ventrolaterally; eight (seven on one side) setae dorsolaterally; seven spines with ends drawn to slender plumose ends on ventromesal margin. Claw about 1/4 as long as dorsal length of basitarsus-tarsus. Mesal spur slightly shorter and closer to claw than lateral spur; spurs about 1/8 as long as dorsal length of basitarsus-tarsus.

Chelicerae: With three simple tapering setae (Lawrence, 1969: fig. 1, group 4 setae); immovable finger with eight teeth (Fig. 5), brush with 10 feather bristles (Lawrence, 1969: fig. 2A, blood hairs group

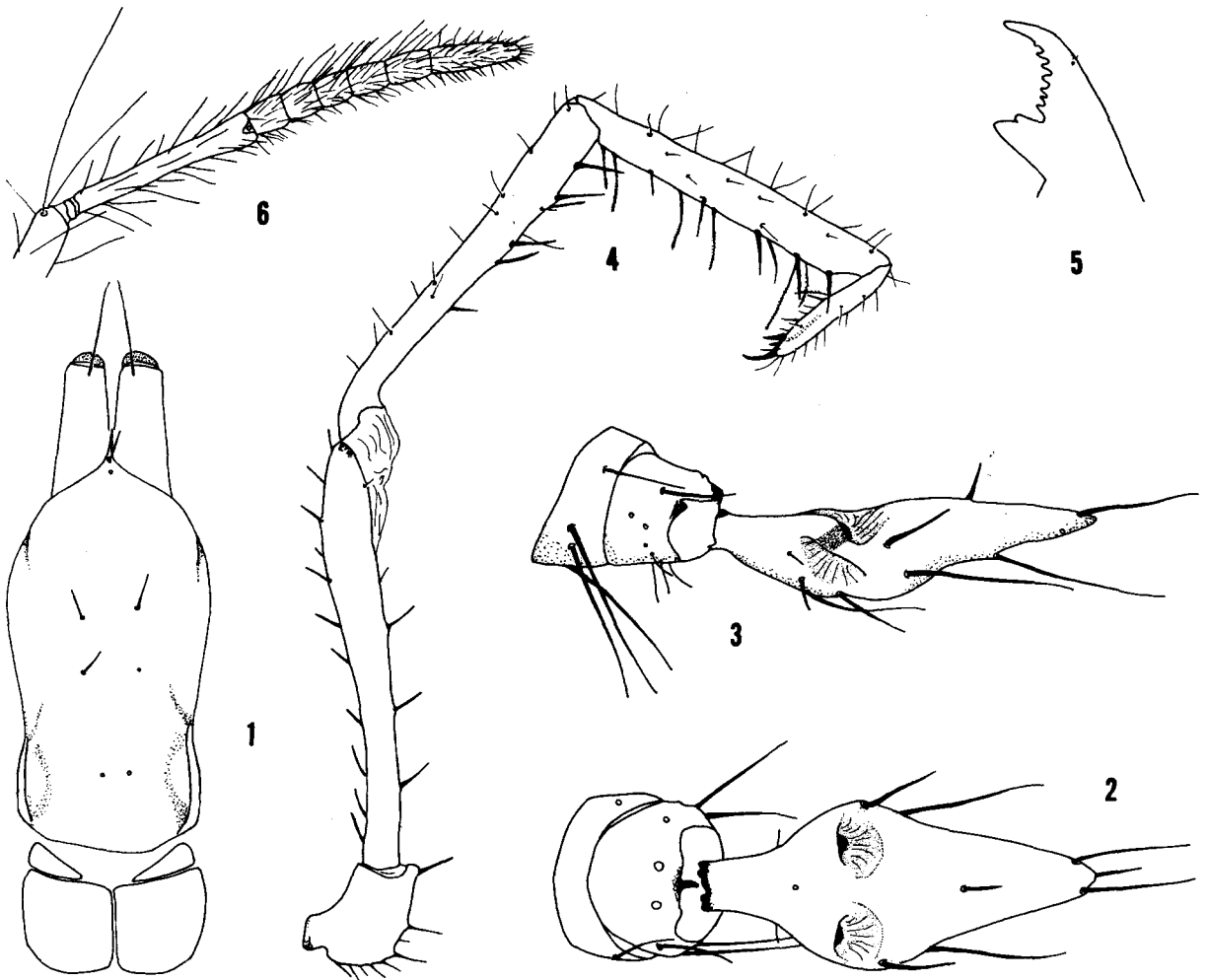
C); serrula with 24 hyaline teeth and broad guard tooth.

Legs: Lengths of segments in Table 1. Leg I, including coxa, about 11.2 mm. Femur IV about 3.6 times as long as deep; distal margin produced at less than a 90° angle (Fig. 7). Leg I basitarsal-tarsal segment proportions: 27:4:5:5:3:6:9 (Fig. 6); basitarsus two-segmented, proximal segment short.

Female paratype

Total length 5.7 mm. As male except as follows.

Cephalothorax: Carapace 1.5 mm long, 0.88 mm



Figs. 1-6: *Schizomus ashmolei*, new species, male holotype. 1 Cephalothorax, dorsal view; 2 Flagellum, dorsal view; 3 Flagellum, lateral view; 4 Pedipalp, lateral view; 5 Cheliceral fixed finger, mesal view; 6 Basitarsus-tarsus I, lateral view.

wide. Mesopeltidia separated by about 0.8 times the width of one plate. Posterior sternum with five setae.

Abdomen: Tergal chaetotaxy as in male. Sternite IV about 2.5 times as wide as long; sternite II with scattered setae over entire surface (Fig. 9); sternite III with row of 20 setae; sternite IV with irregular row of 11 setae near posterior margin and five setae slightly anterior to posterior row; sternite V with anterior row of eight setae and posterior row of 13 setae; sternite VI with anterior row of seven setae and posterior row of 13 setae; sternite VII with anterior row of eight setae and posterior row of 12 setae; sternite IX with row of seven setae. Segment X with seven ventral setae; segment XI with five ventral and two lateral setae; segment XII with four dorsal and 10 ventral setae. Abdomen not elongated; posterior dorsal process absent. Flagellum 0.6 mm long with three very faint annuli; last article longer than other three combined (Figs. 10, 11). Spermathecae (Figs. 12-13) highly sclerotised; consisting of one pair of large round lobes with narrow looped stalks, lobes covered with minute dots which apparently are areas of increased sclerotisation; lobes visible through integument of genital sternite.

Pedipalps (Fig. 14): Shorter and more robust than male. Trochanter with row of eight spinose setae and small seta on ventrolateral margin. Femur more rounded ventrally; with two spines on ventrolateral

margin; small setae near ventrolateral margin; row of nine spinose setae on dorsolateral margin; four spines near ventromesal margin. Patella with two spines on ventrolateral margin; three spinose setae near ventrolateral margin; three spines on mesoventral margin. Tibia with five slender spines on ventrolateral margin; irregular row of six spines with ends drawn out to fine plumose tips on and near ventromesal margin; scattered setae over dorsal and dorsolateral surfaces.

Legs: Segment lengths in Table 1. Femur IV more robust than male, about 2.8 times as long as deep. Approximate proportions of leg I basitarsal-tarsal segments: 19:3:4:4:4:5:12.

Discussion

The pale coloration, lack of eyespots, and elongation of legs indicate that this species is probably a troglobite (obligate cavernicole). The only other cavernicolous species of schizomid reported from Ecuador is an undescribed species from "Dolline de la grotte de Baños, Baños," reported by Rowland & Reddell (1979) as *Schizomus* sp., OTU No. 10. The latter species is dark and has distinct eyespots and probably is a troglophile. A second species of *Schizomus* inhabiting Cueva de los Tayos is small, dark, and possesses distinct eyespots; it is presumably a troglophile.

Diagnosis and comparisons

Schizomus ashmolei can be readily separated from all other Ecuadorean species (named or otherwise) by its troglobitic facies. The presence of holes passing completely through the male flagellum serves readily to distinguish this species from all other species of Schizomida. The long, lanceolate flagellum also differentiates this species from *S. cuenca*, which has a bulbous trilobate flagellum, and from *S. portoricensis*, which has an ovoid flagellum with two shallow dorsal depressions. The presence of three pairs of dorsal carapacial setae in *S. ashmolei* separates females from *S. sp.*, OTU #10 and *S. sp.*, OTU #12, which have four pairs of setae. The presence of two pairs of lobes in the spermathecae in the latter two species also distinguishes this species from *S. ashmolei*, which has only one pair of lobes. The spermathecae of the second species inhabiting Cueva de los Tayos (Fig. 15) also possess two pairs of spermathecal lobes.

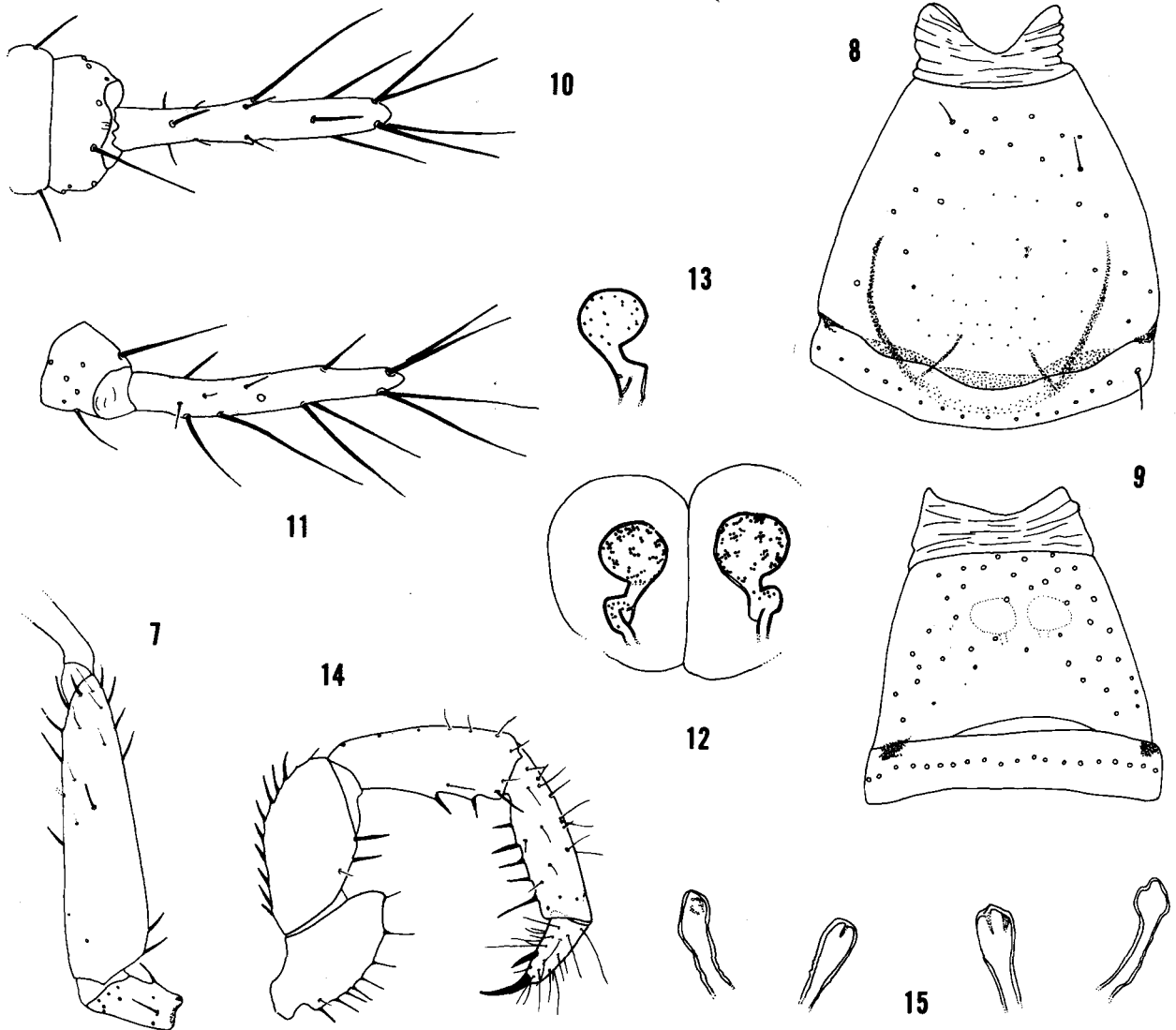
	Palp	Leg I	Leg II	Leg III	Leg IV
Male					
Trochanter	0.60	0.66	0.26	0.30	0.60
Femur	2.44	2.46	1.50	1.30	1.90
Patella	2.24	3.10	0.82	0.58	0.84
Tibia	2.06	2.40	1.04	0.68	1.28
Basitarsus			0.84	0.86	1.18
	0.82	1.40			
Tarsus			0.60	0.58	0.70
Total	8.16	10.02	5.06	4.30	6.50
Female					
Trochanter	0.24	0.36	0.30	0.30	0.50
Femur	0.80	1.70	1.16	1.02	1.40
Patella	0.86	2.02	0.66	0.44	0.70
Tibia	0.84	1.48	0.70	0.50	1.00
Basitarsus			0.60	0.64	0.96
	0.34	1.10			
Tarsus			0.44	0.52	0.64
Total	3.08	6.66	3.86	3.42	5.20

Table 1: Measurements (mm) of legs and pedipalps of male holotype and female paratype of *Schizomus ashmolei*, new species.

The female of *S. cuenca* is unknown.

The relationships of *S. ashmolei* are obscure. The spermathecal morphology most closely resembles two species of the *brasiliensis* group from southern Mexico: *S. trilobatus* Rowland (see Rowland & Reddell, 1979: fig. 62) and *S. lacandonus* Rowland

(See Rowland & Reddell, 1979: fig. 65). The female flagellum in these and other species of the *brasiliensis* group, however, possesses only three articles, while *S. ashmolei* has four. Females of the *simonis* group have four articles in the female flagellum, but the spermathecal morphology is quite different from that



Figs. 7-14: *Schizomus ashmolei*, new species. 7 Femur IV, lateral view of male holotype; 8 Genital sternite, ventral view of male holotype; 9 Genital sternite, ventral view of female paratype; 10 Flagellum, dorsal view of female paratype; 11 Flagellum, lateral view of female paratype; 12 Spermathecae, ventral view (cleared) of female paratype; 13 Spermathecal lobe, dorsal view (cleared) of female paratype; 14 Pedipalp, lateral view of female paratype.

Fig. 15: *Schizomus* sp., Cueva de los Tayos, Ecuador. Spermathecae, ventral view (cleared).

fauna which includes, in addition to the two new species of schizomid, a blind scorpion (*Troglotayosicus vachoni* Lourenço, 1981), a blind trap-door spider (*Spelocteniza ashmolei* Gertsch, 1982), a cyphophthalmid opilionid (*Metagovea philipi* Goodnight & Goodnight, 1980), and several undescribed pseudoscorpions (*Tyrannochthonius*, *Lechytia*, *Ideobisium*, *Cordylochernes*, etc.).

Only one species of schizomid has thus far been named from Ecuador, *Schizomus cuenca* Rowland & Reddell (1979) from Cuenca, Azuay Province. Two other Ecuadorean species are known only by females and were designated by Rowland & Reddell (1979) as *Schizomus* sp., OTU #10, from a cave at Baños, Oriente Province, and *Schizomus* sp., OTU #12, from Río Negro, Oriente Province. A fourth species, *Schizomus portoricensis* (Chamberlin), has been collected from Guayaquil, Guayas Province, and from the Galapagos Islands (Rowland & Reddell, 1977).

Schizomus ashmolei, new species (Figs. 1-14)

Schizomus sp. 16: Rowland & Reddell, 1977:81.

Material examined

Male holotype (#400) and female paratype (#650) from Cueva de los Tayos, 78° 12'W-3° 06'S, Morona-Santiago Province, Ecuador, 18 July 1976 (N. Philip Ashmole), from Main Cave, bottom of main chamber in silty area, under rock (male) and in rotten log (female); two immatures (#678) from Cueva de los Tayos, 26 July 1976 (N. Philip Ashmole), Shovel Pot, stream passage under rock. Specimens deposited in the American Museum of Natural History.

Etymology

This species is named for Dr N. Philip Ashmole, who collected this and other interesting arachnids in Cueva de los Tayos.

Holotype male

Length from distal edge of carapace to base of flagellum, 6.8 mm. Body reddish-brown; flagellum and pedipalps somewhat darker.

Cephalothorax (Fig. 1): Carapace 1.6 mm long, 0.9 mm wide; with two apical setae and three pairs of dorsal setae. Apical margin of carapace drawn to sharp point, not downturned. Eyespots absent. Mesopeltidia

separated by slightly less than posterior width of one plate. Metapeltidium divided by narrow line; anterior margin of metapeltidial plates straight and parallel to mesopeltidia; posterior margins of metapeltidial plates gently curved. Greatest length to width ratio of metapeltidial plates about 1:1. Anterior sternum with 14 entire setae; posterior sternum very slightly sclerotised, distal margin rounded, gradually expanded caudally, with four setae.

Abdomen: Sternite IV about 2.2 times as wide as long. Scattered setae over sternite II (Fig. 8); one row of 16 setae on posterior margin of sternite III; sternite IV with row of 12 setae near posterior margin and four setae slightly anterior to posterior row; sternite V with anterior row of six setae and posterior row of 12 setae; sternite VI and VII with anterior row of seven setae and posterior row of 12 setae; sternite VIII with anterior row of seven setae and posterior row of nine setae; sternite IX with one row of seven setae. Tergite I with two pairs of small anterior setae and one pair of large posterior dorsal setae; tergite II with three pairs of small anterior setae and one pair of large dorsal setae near posterior margin; tergites III-VIII with one pair of dorsal setae each; tergite IX with one pair of dorsolateral and one pair of lateral setae. Segment X with six ventral setae; segment XI with five ventral, two lateral, and two dorsal setae; segment XII with eight ventral and four dorsal setae. Segments X-XII slightly elongate and narrowing posteriorly. Segment XII with poorly developed posterior dorsal process (Fig. 2). Flagellum (Figs. 2-3) lanceolate, with slender stalk, widens laterally with lateral elaborations, tapers gradually to rounded end; two anterior directed holes passing through flagellum slightly posterior to stalk; 12 ventral setae, two lateral setae, and six dorsal setae.

Pedipalps (Fig. 4): Long. Trochanter strongly compressed laterally, not produced distally; with notch on proximal margin ventrally; row of nine long, slender spines ventrally. Femur long; roughly triangular in cross section, flattened to slightly concave ventrally and gently rounded dorsally; three spines and one seta on ventrolateral margin; 10 (11 on one side) spinose setae on dorsolateral margin; five spines on ventromesal margin. Patella long and slender, gradually expanding distally, flattened ventrally; three spines and one seta on distal half of ventrolateral margin; four spines with ends drawn to fine

of *S. ashmolei*. The male flagellum of *S. ashmolei* resembles most closely those of several species of the *simonis* group, which also have elongate flagella with two dorsal depressions. The slight elongation of the abdomen and the presence of a dorsal abdominal process also serves to ally the male with species of the *simonis* group. No species of the *simonis* group, however, exhibits pedipalpal dimorphism, which is a characteristic of the *brasiliensis* group. This combination of characters of such fundamental phylogenetic importance is perplexing. It cannot be said at this time whether this species represents a link between the *simonis* and *brasiliensis* groups or a separate independent lineage.

Schizomus sp. (Fig. 15)

Schizomus sp. 15: Rowland & Reddell, 1977:81.

Material examined

One female and two immatures (#650) and one female (#1582) from Cueva de los Tayos, 78° 12' W-3° 06' S, Morona-Santiago Province, Ecuador, 18 July 1976 (N. Philip Ashmole), from Main Cave, bottom of main chamber in silty area, in rotten log; one immature (#327) from Cueva de los Tayos, 16 July 1976 (N. Philip Ashmole), Main Cave, deep threshold, in soil among boulders; one immature (#1380) from Cueva de los Tayos, 20 July 1976 (N. Philip Ashmole), Main Cave, Sta. 4, under stones in dry stream bed.

Diagnosis

Female: Total length 4.0 mm. Brown. Carapace 1.18 mm long, with 2 apical setae and three pairs of dorsal setae. Eyespots irregular. Metapeltidium divided by narrow line. Abdominal tergites I-VII with 1 pair of setae; tergites VIII-IX with 2 pairs of setae. Flagellum 0.30 mm long, with three articles. Spermathecae (Fig. 15) with two pairs of lobes, the medians being slightly shorter than the laterals; ends of lobes gradually enlarged.

Comparisons

This species is apparently an undescribed form

closely related to *Schizomus* sp., OTU #10, from Baños, Ecuador. The spermathecal morphology of these two species is very similar, but *S.* sp., OTU #10, has the medians longer than the laterals and the ends of the lobes more distinctly enlarged (Rowland & Reddell, 1979: fig. 63). The species from Cueva de los Tayos also has three pairs of dorsal carapacial setae as opposed to four pairs in the species from Baños.

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