

A new genus of harvestmen from Costa Rica with comments on the status of the Neotropical Phalangiinae (Opiliones, Phalangiidae)

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Summary

The four species described as members of the Phalangiinae from the Neotropics are discussed. *Opilio chickeringi* Roewer, from Costa Rica, is redescribed and designated the type species of the new genus *Lanthanopilio*. The male and female genitalia are illustrated for the first time. *Opilio mexicanus* Roewer and *Opilio gertschi* Roewer, from Mexico and Costa Rica respectively, are transferred to the genus *Metopilio* Roewer. The similarity of *Opilio bolivianus* Roewer to African species is noted and the collection locality is questioned.

Introduction

During examinations of material from the American Museum of Natural History of the genus *Metopilio* Roewer, we discovered a misidentified male specimen of a remarkable new genus. The new genus, *Lanthanopilio*, is a member of the Phalangiinae. The Phalangiinae and Oligolophinae are herein considered the same (see Spoek, 1963; Cokendolpher, 1981b), whereas the *Metopilio* assemblage is considered a distinct and separate subfamily (see Cokendolpher, 1984). New World representatives of the Phalangiinae are relatively few and decrease in numbers as one travels south. Of the 14 described species known from the U.S.A. and Canada, five are probably introductions from Europe (Lindroth, 1957; Gruber & Hunt, 1973; Bell, 1974; Bragg & Holmberg, 1975), and three are synonyms of already described North American species (unpubl. data). Roewer (1956) described four species of "*Opilio*" from Mexico, Costa Rica and Bolivia. Our studies reveal that one of these species (*O. chickeringi*), known up to now by

one female, is conspecific with the American Museum of Natural History specimen mentioned above. Furthermore, our studies revealed that two of Roewer's "*Opilio*" spp. from Mexico (*O. mexicanus*) and Costa Rica (*O. gertschi*) are misplaced, resulting in the new genus being the only Central American representative of the Phalangiinae. "*Opilio*" *bolivianus* Roewer, 1956, bears little resemblance to the new genus. It is a true member of the Phalangiinae, but appears to share more characters with African species than it does with any New World group. It may prove to be mislabelled and not a member of the Neotropical fauna. Roewer (1956) lists the collection locality as "Bolivien (genaue Loc.?)"

Thus of the four species described as members of the Phalangiinae from the Neotropics, two are misplaced and should be in a different subfamily (genus *Metopilio*), one is a member of the new genus *Lanthanopilio* and one is close to the African genera *Cristina* Loman and *Rhampsinitus* Simon.

Methods

All anatomical measurements are in millimetres and were obtained by using a binocular microscope equipped with an ocular micrometer as outlined by Cokendolpher (1981a). The genitalia were removed from the body, examined and illustrated and then placed in microvials, which in turn were placed in the specimen vials. The ovipositor was first dehydrated and then examined in 100% clove oil. Prior to rehydration and placement in a microvial, the ovipositor was soaked in absolute ethyl alcohol to remove all traces of clove oil. The penis was immersed in 100% glycerol for study. All illustrations were prepared with the aid of a camera lucida.

"*Opilio*" *bolivianus* Roewer

Opilio bolivianus Roewer, 1956:277, 284, figs. 100-103.

Material examined: Holotype ♂, paratype ♀ (SMF - RII/8701/293), Bolivia (locality correct?), pre-1955 collection.

Remarks: This species is quite unlike any other in the New World, but appears to be similar to species of the African genera *Cristina* Loman and *Rhampsinitus* Simon. Roewer (1956) does not report leg I of the male to be noticeably incrassate. Unfortunately, all but one femur III of the male and one femur IV

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of the female are detached and mixed in the type specimen vial. Judging from the comparative lengths of the detached legs with those presently attached to the specimens, leg I of the male is lost. The male chelicerae are attached and do not appear to be enlarged or otherwise modified. The generic placement of this species will have to await much needed revisionary studies of African genera (including descriptions of the genitalia), at which time the type specimens of *O. bolivianus* may prove to be mislabelled African specimens.

Genus *Metopilio* Roewer, 1911

Type species: Phalangium armigerum F. O. Pickard-Cambridge, 1905, by original designation by Roewer, 1911.

Diagnosis and comparisons: Metopilio, Diguëtinus Roewer, *Globipes* Banks, *Eurybunus* Banks, and *Dalquestia* Cokendolpher are members of an as yet unnamed assemblage of subfamilial (maybe familial) rank (Gruber, 1969; Cokendolpher, 1984). *Metopilio* is most similar to *Diguëtinus* and they may eventually prove to be synonyms. *Metopilio* differs from *Diguëtinus* only by the number of tubercles making up the abdominal rows (Roewer, 1923: figs. 1028, 1030, key to genera pp. 747-750). *Metopilio* and *Diguëtinus* differ from the other members of the *Metopilio* assemblage by having the penis alate and by the curved stylus (see Gruber, 1969: figs. 1, 4, 5).

Remarks: The genus *Metopilio* is badly in need of revision. The relationships of the species are difficult to interpret at the moment. Most *Metopilio* spp. need to be redescribed, devoting particular attention to the genitalia. To further complicate matters, several species are based on juveniles. There are currently 15 described species known from Mexico to Panama. At least seven new species from the U.S.A. south to Costa Rica await description. Currently, five other described *Metopilio* species from Mexico and Costa Rica are misplaced in *Diguëtinus*, *Eurybunus*, *Globipes*, and *Opilio* Herbst. The two species misplaced in *Opilio* will be dealt with, in part, in the following paragraphs.

Metopilio gertschi (Roewer) comb. nov.

Opilio gertschi Roewer, 1956:277, 287, figs. 119-121.
Eurybunus sp. Šilhavý, 1970:173, fig. 11.

Material examined: Holotype ♂, paratypes 2♀♀ (SMF-RII/3708/179), Hamburg Farm, 20 km N of Siquirres, Limón Province, Costa Rica.

Remarks: This species is not related to "*Opilio*" *chickeringi* Roewer, as reported by Roewer (1956), but is rather a member of the genus *Metopilio*. The relationship of *M. gertschi* to the other species of "medium sized" *Metopilio* will have to await much needed revisionary studies.

Metopilio mexicanus (Roewer) comb. nov.

Opilio mexicanus Roewer, 1956:279, 292, figs. 136-138.

Material examined: Holotype ♂ (SMF-RII/2831/118), Tampico, Tamaulipas, Mexico.

Remarks: This species, owing to its large size and the spiny nature of the ocular tubercle, is easily separated from most species of *Metopilio*. At least two undescribed species and *Metopilio cambridgei* Mello-Leitão appear closely related to *M. mexicanus*. For reasons stated above a redescription will not be presented at this time.

Genus *Lanthanopilio* n. gen.

Opilio, Roewer, 1956:285 (in part).
Metopilio, Goodnight & Goodnight, 1942:19 (in part).

Type species: Opilio chickeringi Roewer, 1956.

Derivatio nominis: The generic name *Lanthanopilio* is masculine in gender and formed from the Greek *λανθανω* (*lanthano*) meaning to mistake or escape notice and *opilio* meaning harvestmen.

Diagnosis and comparisons: Lanthanopilio differs from all known genera of Phalangiinae by the unique features of the penis. The leathery exoskeleton with rows of large abdominal tubercles will likewise separate this genus from all known Phalangiinae in the New World. The trichoid "setae" (these structures appear to be outgrowths of the truncus, they do not appear to have sockets at their bases) and alate portion (which is membranous, not highly sclerotized) of the penis do not appear homologous with those of the Old World *Opilio saxatilis* C. L. Koch (see Spoek, 1963: figs. 12h-12j; Martens, 1978: figs. 429, 430). The penis stylus is short and thick as in some species of European *Lacinius* Thorell (see Šilhavý, 1956: figs. 347, 348, 357, 359; Martens, 1978: figs. 620, 621). The sclerotized "horns" of the glans are un-

known in any other species of phalangiid. The "alate" portion is also unlike those of any other species known. It resembles the alate portions of some *Leiobuninae* in that it is not sclerotized and is inflatable. Unfortunately, none of the unusual features of the new genus are shared by other genera, making comparisons difficult. Even under higher magnifications, it could not be determined if the glans was rigidly fixed to the truncus. New material which has not been in alcohol since 1905, may give new clues to the exact nature of the glans-truncus junction. Some trouble might exist in the separation of juvenile specimens of *Metopilio* from *Lanthanopilio*. Assuming juveniles of *Lanthanopilio* have the same number of tibiae II pseudosegments as adults (as do *Metopilio* spp.), the juveniles of *Lanthanopilio* should be easily recognised. Specimens with a single pseudosegment will be *Lanthanopilio*, whereas those with two to four will be *Metopilio*.

Description: Medium sized (6.0-7.5 mm in length) harvestmen with leathery exoskeletons; cephalothorax and abdomen fused, junction indicated only by folds in exoskeleton; anterior abdominal tergites and sternites fused, borders indistinct; abdomen with

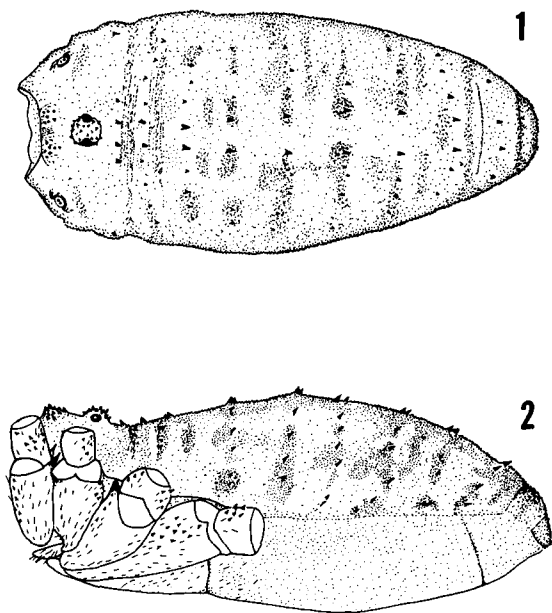
rows of large pointed tubercles, increasing in size anteriorly and medially (Figs. 1,2). Preocular region with small paired humps, covered with about 15 or 16 pointed tubercles on each side; supracheliceral lamellae smooth. Ocular tubercle low, covered with many pointed tubercles. Scent pores with two darkly pigmented central spots (Fig. 1); openings oval, easily observed from dorsal view, on slightly raised protuberances. Chelicera with small rounded notch on basal segment (Fig. 11); male fingers lacking apophyses. Palpi lacking patellar and tibial apophyses; male tarsi with two rows of denticles ventrally; claws smooth (Fig. 8). Legs short and robust, round in cross section; all femora lacking pseudoarticulatory nodules, shorter than body length; femora I and III shorter than body width; tibiae II with single pseudosegment; all metatarsi lacking segments. Endites of coxae II slanted anteriorly at about 45° to the lip of the genital operculum. Penis with proximal half of truncus with many long trichoid "setae", a median alate portion (Figs. 3-5), sclerotized "horns" on the glans (Fig. 7), and a short thick stylus (Fig. 6). Ovipositor with 2-2 slit sensilla per side on second furca joint (Fig. 9); seminal receptacle with single large basal lobe (Fig. 10).

***Lanthanopilio chickeringi* (Roewer) comb. nov.**
(Figs. 1-11)

Opilio chickeringi Roewer, 1956:278, 285, 287, fig. 112.
Metopilio ornatipes, Goodnight & Goodnight, 1942:19 (in part).

Material examined: Holotype ♀ (SMF-RII/3707/178), pre-1955 collection, La Palma, Costa Rica. ♂ (AMNH-A-3265), 23 March 1905, F. C. Paulmeier, San José, Costa Rica.

Type locality: The U.S. Board on Geographic Names (1956) lists five settlements by the name La Palma: Puntarenas Province 8°40'N-83°27'W; San José Province 9°22'N-83°45'W; Guanacaste Province 10°08'N-85°28'W, 10°17'N-85°04'W, 10°32'N-85°02'W. Selander & Vaurie (1962) list one additional locality in Costa Rica as La Palma: Cartago Province 10°03'N-83°58'W. Roewer (1956) gives no details on the collection and the labels accompanying the holotype do not indicate from which of the settlements the type was collected. The only other collection site is San José. Unfortunately, the U.S. Board on Geographic Names (1956) lists five populated areas in

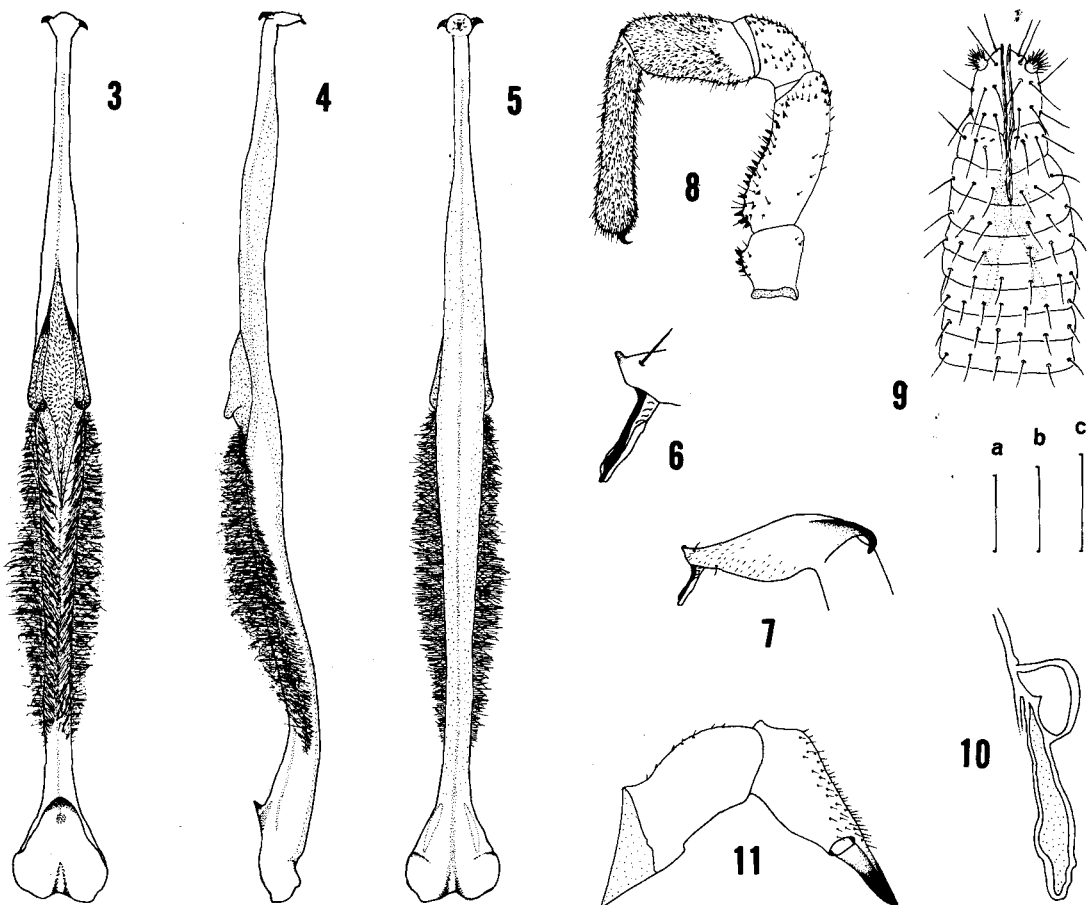


Figs. 1-2: *Lanthanopilio chickeringi* (Roewer) male.
1 Dorsal view; 2 Lateral view.

Costa Rica by the name of San José: San José Province 9°56'N-84°05'W; Alajuela Province 10°01'N-84°24'W, 10°02'N-84°30'W, 10°08'N-84°24'W, 10°57'N-85°14'W. As the San José collection was made in 1905, we are assuming it was from the largest city and capital: San José, 9°56'N-84°05'W, 1100 m elevation. If we are correct in our assumption regarding San José, then the type locality probably is the locality nearest the capital city: La Palma, Cartago Province (about 15 km NE of San José), 10°03'N-83°58'W, 1500 m elevation. Further collections from 1000-1500 m elevation around the Cordillera Central should provide definitive data.

Male (Figs. 1-8, 11): Total length 6.09, greatest width 2.70, maximum height (excluding abdominal

tubercles) 2.60. Ocular tubercle length 0.32, width 0.35, height 0.15, distance from anterior edge of cephalothorax 0.32; covered with 19 scattered pointed tubercles; light rusty-brown colour with dark brown rings around eyes. Body leathery, coarsely granulated; granules sharply pointed on dorsum, short and rounded on venter and more widely spaced (granule interdistance about diameter of granule); sides with considerable reduction in granules, leathery, sclerite borders indistinct (Figs. 1, 2). Cephalothorax and abdomen fused, junction indicated only by folds in exoskeleton, granules evenly spaced throughout junction. Abdominal tergites 1-7 fused, 8 free; sternites 1-6 fused, borders indistinct, sternite 7 and anal operculum free; dorsum with nine rows of large



Figs. 3-11: *Lathanopilio chickeringi* (Roewer). 3 Ventral view of penis; 4 Lateral view of penis; 5 Dorsal view of penis; 6 Penis stylus; 7 Lateral view of penis glans; 8 Lateral view of male palpus; 9 Ovipositor; 10 Seminal receptacle; 11 Lateral view of male chelicera. Scale lines: a = 0.05 mm for fig. 10, 0.2 mm for fig. 9; b = 0.5 mm for figs. 3-5, 0.1 mm for fig. 7; c = 0.05 mm for fig. 6, 0.5 mm for figs. 8 and 11.

pointed tubercles. Genital operculum length 1.78, width at base 1.67, width at neck 0.69; finely granulate ventrally, middle portions of lateral sides coarsely granulate; with few scattered setae, no spines. Palpi with few scattered tubercles (Fig. 8); tibiae ventrolaterally with slightly irregular row (distal 3/4 of tibiae) of eight teeth; tarsi ventrally with 25 teeth in mesal row and 14 teeth in lateral row. Palpal segment lengths: femur 0.64, patella 0.44, tibia 0.56, tarsus 1.00. Chelicerae smooth except for few scattered setae (Fig. 11). Leg coxae finely granulate with few scattered pointed tubercles on distolateral borders, tubercles not forming distinct rows; anterior of all coxae distally and posterior of coxae I with short rounded apophysis; coxae I, II, and III dorsally with strong pointed central spine (lacking on IV). All femora with well developed pointed tubercles; tubercles irregularly spaced over most femora, forming longitudinal rows in some places. Patellae and tibiae of all legs (much less on II) with similarly pointed tubercles. Femora I-IV lengths (respectively): 1.74, 3.76, 1.93, 3.00; tibiae I-IV lengths (respectively): 1.53, 3.00, 1.45, 1.92. Body and legs light rusty brown; dorsal abdominal pattern dark brown with abdominal tubercles light creamy brown at tips; some creamy yellowish-brown markings on lateral surface of abdomen and tibiae II pseudosegment. Penis dark (transparent) brown, setae slightly lighter in colour (Figs. 3-7).

Female (Figs. 9, 10): Body more robust, abdomen not as pointed as in male; total length 7.12, greatest width 3.70, maximum height (excluding abdominal tubercles) 3.25; patterns more distinct than on male, colours clearer more amber (probably owing to age and better state of preservation of female). Pedipalps more slender with fewer tubercles, no teeth on tibiae or tarsi. Ocular tubercle centrally creamy white, concolourous with the dorsal abdominal tubercle tips, length 0.36, width 0.34, height 0.25, distance from anterior edge of cephalothorax 0.37. Genital operculum length 1.93, width at base 2.00, width at neck 0.81; with strongly depressed groove at neck. Depression possibly an abnormality, externally setae face into depression, dorsal surface of genital operculum above depression with group of irregular sclerotized nodes. Posterior edge of last sternite noticeably indented to receive anal operculum lip. Palpal segment lengths: femur 0.68, patella 0.44,

tibia 0.60, tarsus 1.17. Femora I-IV lengths (respectively): 1.80, 3.78, 1.93, 2.96; tibiae I-IV lengths (respectively): 1.54, 2.95, 1.41, 2.00. Ovipositor (Fig. 9) of 24+ rings (proximal end broken) and 3-segmented furca; furca segment II with 2-2 slit sensilla per side; first eight segments (counting from furca) covered with relatively long appressed setae, segments 9 to 24 with 4-6 short ($\frac{1}{2}$ length of other setae) erect setae per segment. Seminal receptacle as in Fig. 10.

Acknowledgements

We would like to thank Dr Manfred Grasshoff, Senckenberg Natur-Museum und Forschungs-Institut (SMF) and Dr Norman I. Platnick, American Museum of Natural History (AMNH) for the loan of specimens. Srta Gisella Mora M. kindly searched for additional examples of *Lanthanopilio* in the Museo de Zoologia, Universidad de Costa Rica. We would also like to express our sincere thanks to Dr Jürgen Gruber (Naturhistorisches Museum Wien) for his discussions on taxonomy of the Phalangidae and to Dr Clarence J. and Mrs Marie L. Goodnight (Western Michigan University) for their reviews of the manuscript.

References

- BELL, R. T. 1974: A European harvestman in North America (Phalangida, Phalangidae). *Ent.News* **85**: 154.
- BRAGG, P. D. & HOLMBERG, R. G. 1975: *Platybunus triangularis* and *Paroligolophus agrestis*: two phalangids introduced to North America (Arachnida, Opiliones). *J. Arachnol.* **2**: 127.
- COKENDOLPHER, J. C. 1981a: Revision of the genus *Trachyrhinus* Weed (Opiliones, Phalangioidea). *J. Arachnol.* **9**: 1-18.
- COKENDOLPHER, J. C. 1981b: The harvestman genus *Liopilio* Schenkel (Opiliones: Phalangidae). *J. Arachnol.* **9**: 309-316.
- COKENDOLPHER, J. C. 1984: A new genus of North American harvestmen (Arachnida: Opiliones: Palpatores). In N. V. Horner (ed.), *Festschrift for Walter M. Dalquest in honor of his 66th Birthday*: 27-43. Midwestern State Univ., Wichita Falls.
- GOODNIGHT, C. J. & GOODNIGHT, M. L. 1942: Phalangids from Central America and the West Indies. *Am.Mus.Novit.* **1184**: 1-23.
- GRUBER, J. 1969: Bemerkungen zur Genitalmorphologie und systematischen Stellung von *Metopilio australis* (Banks) (Phalangidae: Opiliones, Arachnida). *Annln naturh.Mus.Wien* **78**: 271-274.
- GRUBER, J. & HUNT, G. S. 1973: *Nelima doriae* (Canestrini), a South European harvestman in Australia and New

- Zealand (Arachnida, Opiliones, Phalangiidae). *Rec. Aust.Mus.* **28**: 383-392.
- LINDROTH, C. H. 1957: *The Faunal connections between Europe and North America*. 1-344. John Wiley & Sons, Inc., New York.
- MARTENS, J. 1978: Spinnentiere, Arachnida. Weberknechte, Opiliones. *Tierwelt Dtl.* **64**: 1-464.
- PICKARD-CAMBRIDGE, F. O. 1905: Arachnida. Opiliones. *Biologia cent.-am.* (Zool). **2**: 546-610.
- ROEWER, C. F. 1911: Übersicht der Genera der Subfamilie der Phalangiini der Opiliones Palpatores nebst Beschreibung einiger neuer Gattungen und Arten. *Arch. Naturgesch.* **77**: (1 suppl.2): 1-106.
- ROEWER, C. F. 1923: Die Weberknechte der Erde. Systematische Bearbeitung der bisher bekannten Opiliones. 1-1116. Gustav Fischer, Jena.
- ROEWER, C. F. 1956: Über Phalangiinae (Phalangiidae, Opiliones Palpatores) (Weitere Weberknechte XIX). *Senckenberg.biol.* **37**: 247-318.
- SELANDER, R. B. & VAURIE, P. 1962: A gazetteer to accompany the "Insecta" volumes of the "Biologia Centrali-Americana". *Am.Mus.Novit.* **2099**: 1-70.
- ŠILHAVÝ, V. 1956: Sekáči-Opilionidea. *Fauna ČSR* **7**: 1-272.
- ŠILHAVÝ, V. 1970: Nouvelles recherches sur la famille des Neopilionidae Lawrence. *Bull.Mus.natn.Hist.nat.,Paris* (2) **41**: 171-175.
- SPOEK, G. L. 1963: The Opilionida (Arachnida) of the Netherlands. *Zool.Verh., Leiden* **63**: 3-70.
- UNITED STATES BOARD ON GEOGRAPHIC NAMES. 1956: *Costa Rica Gazetteer No. 18. Official Standard Names approved by the United States Board on Geographic Names*. 1-48. U.S. Gov.Print.Off., Washington.

Bull.Br.arachnol.Soc. (1984) **6** (4), 172-177

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