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**STUDIES ON THE
CAVERNICOLE FAUNA OF MEXICO**

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A REPORT ON SOME MEXICAN CAVE SPIDERS¹

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The rich spider fauna of Mexican caves has been little exploited by arachnologists. In 1867 Dominik Bilimek described two species, as yet not identified with certainty by subsequent workers, from a miscellaneous series of cave animals from Las Grutas de Cacahuamilpa in Guerrero. A study of considerable arachnid material from twenty-one caves in Yucatán (Chamberlin and Ivie, 1938) represents so far the most important contribution to the arachnid cave fauna of Mexico. Most of the twenty-five species of this report show no special cave adaptation and some are known from or expected to occur in suitable habitats outside as well as in caves. A few of these spiders are cave adapted as shown by their pallid coloration and the partial or complete loss of eyes. Most interesting of these latter are the eyeless oonopid, *Wanops coecus*, and pholcid, *Anopsicus pearsei*, the first troglobitic spiders known to Mexico. Since that time only a few scattered references are available on this interesting fauna. Earlier this year all the known published records were summarized by James Reddell (1971) in a preliminary checklist and bibliography of Mexican cave biology. Of the 58 taxa of this report, some were represented only by generic names and comprise more than single species. One of

the aims of the present study is to make available specific names for many of these inadequately known taxa.

The cave habitat provides a variety of conditions attractive to many kinds of spiders. Some are transients that take temporary refuge but are more at home in outside situations. Most of the species considered in this paper are troglophiles that, although in various degrees partial to caves, find their needs met in suitable outside situations. Relatively few are obligative cavernicoles isolated in single caves or cave systems. These troglobites have been able to or forced to accommodate to the special conditions of cave existence, have been changed in various ways, and are now entirely committed to cave living. Although eyeless spiders are known from special habitats outside of caves, eyeless cave spiders are presumed to be obligate cavernicoles. The list of such troglobites from Mexico has been enlarged to the following thirteen species from six families:

Dipluridae:

Euagrus cavernicola, new species

Caves of Tamaulipas

Theraphosidae:

Aphonopelma stygia, new species

Cueva de los Potrerillos, San Luis

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Potosí

Onopidae:

- Wanops coecus* Chamberlin and Ivie
Balaam Canche Cave, Yucatán
Matta, new species
Cueva de Ojo de Agua de Tlilapan,
Veracruz
- Leptonetidae:
- Leptoneta isolata*, new species
Grutas de García, Nuevo León
Leptoneta capilla, new species
Cueva de la Capilla, Tamaulipas

Pholcidae:

- Pholcophora (Anopsicus) pearsei*
Chamberlin and Ivie
Oxolodt Cave, Yucatán
Pholcophora gruta, new species
Grutas de Juxtlahuaca, Guerrero
Metagonia tlamaya, new species
Sótano de Tlamaya, San Luis Potosí
Metagonia pura, new species
Cueva de la Capilla, Tamaulipas
Metagonia atoyacae, new species
Grutas de Atoyac, Veracruz

Agelenidae:

- Cicurina mina*, new species
Caves of Tamaulipas
Cicurina coahuila, new species
Cueva de los Lagos, Coahuila

The following preliminary report on the cave spiders of Mexico was prompted by the need for use of specific names in work being carried on by others dealing with taxonomic and other phases of research. Some of the material was given to me many years ago by Drs. C. Bolívar y Pieltain and Federico Bonet of the Instituto Politécnico in Mexico City. During the past few years intensive survey work has been done on Mexican caves by Mr. James Reddell of Austin, Texas, and Professor Robert Mitchell of Texas Tech University in Lubbock. I am indebted to these workers and to the many colleagues and students who have contributed to the project. All the material is deposited in the collection of the American Museum of Natural History in New York.

Suborder Mygalomorphae

Although many mygalomorph spiders live in cave entrances and even in their deeper recesses, few have become cave adapted types. Simon (1892) described two diplurids (*Accola caeca* and *cavicola*) from caves in the Philippines, where he found them spinning their webs among the stalactites. One of these, *caeca*, was reported as being blind—"les yeux sont tout à fait obliterés." These tiny six-eyed diplurids shun the light, live in ground litter in humid tropical regions, and often show eye modifications. In 1929 Fage described a new eyeless spider of the family Barychelidae from Gruta Bellamar in Cuba under the name *Troglothele coeca*. In both these spiders the lack of eyes would seem to be good evidence for regarding them as troglobites.

Two additional mygalomorph spiders are described below from Mexican caves.

Family Dipluridae

Species of *Euagrus* are the most abundant mygalomorph spiders of Mexico and many live in caves where they are darkly pigmented and have the eyes fully developed. It is perhaps not surprising that the following one of these sedentary spinners of sheet webs should have become adapted to a cave existence.

Euagrus cavernicola, new species

Diagnosis. Totally blind troglobite representative of genus without trace of eye tubercle or eyes, readily differentiated from other species as follows: coloration whitish to amber, with brown pigment present only in fangs of chelicerae; legs much longer and thinner than usual with fourth leg 4.5 times as long as carapace; greatly elongated, flexible lateral spinnerets much longer than abdomen (5.9 mm/3.3 mm); promargin of chelicera with 15 teeth.

Etymology. Specific name from Latin *cavernicola*, living in caves.

Subadult female from Cueva de la Capilla. Total length, 6 mm. Carapace, 3.3 mm long, 2.7 mm wide. Abdomen, 4.2 mm long, 2.6 mm wide.

Entire spider whitish, with faint yellowish cast, covered with dusky setae and spines. Fangs of chelicerae brown.

Carapace elongate oval, evenly rounded on sides, narrowly truncated in front and behind, covered evenly with subprocumbent dusky hairs. Pars cephalica elongate, triangular, with faintly marked cephalic grooves; cervical groove an inconspicuous pit situated back about three-fifths distance to posterior margin. Eyes and eye tubercle completely lacking, without trace of original position. Sternum subcordate, 1.75 mm long, 1.5 mm wide, covered evenly with erect dark setae, with only faint traces of marginal sigilla opposite coxae. Endite, 1.1 mm long, 0.75 mm wide, with erect setae and few scattered cuspules. Labium, 0.25 mm long, 0.75 mm wide. Chelicerae about 1.5 mm long, moderately geniculate, as seen from above about one-third as long as carapace; promargin of furrow with even row of 15 brown teeth of which five are larger; retromargin unarmed, flanked by line of hairs.

Leg formula, 4312. Legs longer and thinner than usual in genus: first leg 3.5 times, fourth leg 4.5 times as long as carapace; fourth tibia slightly longer than carapace. Legs clothed with fine setae and few longer spines except on posterior pairs. Paired claws of tarsi with single straight row of eight to 10 fine teeth; unpaired claws with single denticle at base. Palpal claw with row of about 12 fine teeth.

Abdomen suboval, covered evenly with fine dusky hairs and long suberect setae. Spinnerets four, subapical in position; median spinnerets one-segmented, 0.75 mm long; lateral spinnerets three-segmented, with measurements from base to apical segments, 1.8 mm, 1.9 mm, and 2.2 mm, respectively, totalling 5.9 mm; lateral spinnerets thin and flexible and much longer than abdomen.

Type Data. Subadult female holotype from Cueva de la Capilla, El Porvenir, 13½ km NW of Gómez Farías, Tamaulipas, México, May 16, 1971 (R. Mitchell, F. Abernathy, A. Sturdivant, S. Wiley).

Distribution. Known only from caves of La Sierra de Guatemala, Tamaulipas.

Other Records. *Tamaulipas:* Harrison Sink-hole, Rancho del Cielo, 5 km NW of Gómez Farías, January 12, 1971 (J. Cooke, M. Brownfield, W. Elliott), seven immature.

	I	II	III	IV	Palp
Femur	3.10	3.00	3.00	3.70	2.10
Patella	1.60	1.50	1.35	1.45	1.10
Tibia	2.60	2.35	2.60	3.50	1.65
Metatarsus	2.35	2.50	3.00	4.00	—
Tarsus	1.85	1.90	1.90	2.20	1.25
Total	11.50	11.25	11.80	14.85	7.60

Cueva de la Mina, 7 km NW of Gómez Farías, March 9, 1969 (J. Reddell), one immature. Cueva de la Capilla, January 13, 1971 (J. Reddell, R. Mitchell, and group), one immature; January 28, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George), two immature.

Family Theraphosidae

Aphonopelma stygia, new species

Diagnosis. Essentially blind, presumably troglobite species, first in family, with eye tubercles obsolete and eyes represented by trivial corneal projections, differentiated from

other species by these features and pale amber coloration.

Etymology. Specific name from Latin *stygius*, stygean, infernal.

Immature female holotype. Total length, 6 mm. Carapace, 2.5 mm long, 2.25 mm wide. Abdomen, 3.3 mm long, 2.1 mm wide.

Carapace oval, widely rounded in front and on sides, smooth, shining, with scattered dusky hairs and thick bands of fine setae on frontal margin. Pars cephalica triangular, with faintly marked cephalic grooves; cervical groove a trivial transverse depression situated back two-thirds distance to posterior margin. Ocular area smooth, without evident tubercle, with trivial indication of lateral eyes forming

wide group near clypeal margin. Sternum, 1.25 mm long, 1.35 mm wide, suboval, with erect dark hairs and faint trace of marginal sigilla. Labium, 0.45 mm long, 0.65 mm wide. Endite, 1 mm long, 0.7 mm wide, subparallel, with suberect hairs and patch of about 25 cusuples at base. Labium with 10 similar cusuples at apex. Chelicerae, 1.5 mm long, more than half as long as carapace; promargin of furrow with eight sharp subequal teeth; retromargin with five denticles near tip of fang and flanked by line of hairs.

Fourth legs missing but leg formula probably 4132. Legs clothed with fine hairs and setae and with one to five short, bulbous setae

	I	II	III	IV	Palp
Femur	2.50	1.90	2.30	—	1.80
Patella	1.35	1.00	1.10	—	1.00
Tibia	2.35	1.65	2.30	—	1.60
Metatarsus	1.90	1.40	1.70	—	—
Tarsus	1.75	1.50	1.50	—	1.50
Total	10.85	7.45	9.40	—	5.90

on dorsa of tarsi. First tarsus and half of metatarsus scopulate below; second and third tarsi scopulate and few scopular hairs on ends of their metatarsi. Paired claws essentially smooth, without obvious denticles at base. Retrolateral surface of palpal endite and facing prolateral surface of first coxa essentially smooth.

Abdomen suboval covered thickly with coarse dusky hairs. Four spinnerets apical in position; median spinnerets one-segmented, 0.2 mm long; lateral spinnerets three-segmented, with measurements of base to apical segments, 0.5 mm, 0.3 mm, and 0.4 mm, respectively, totaling 1.2 mm.

Type Data. Immature holotype of uncertain sex from Cueva de los Potrerillos, 1½ km W of Ahuacatlán, San Luis Potosí, México, July 12, 1967 (J. Reddell, J. Fish, W. Russell).

Suborder Araneomorphae

Family Leptonetidae

Genus *Leptoneta* Simon

This family of pale, minute spiders with fine, long legs, more than any other one, is identified with cave habitats and most of the known species have been described from caves. Some species are known to live outside of caves in ground detritus of many types in mesic situations. Most European species have the eyes reduced in size and, even though none seems to be eyeless, several are regarded as being restricted to caves. The following species are the first to be described from Mexico and include eyeless forms and others with eyes reduced in size. Although some seem to share some characters of the genus *Paraleptoneta*, here all are referred to the typical genus *Leptoneta*. The males are readily recognized by features of the eyes, comparative leg lengths and the details of the

palpus, which present numerous characters of shape, size and spination. The females offer differences in the first two categories of features but are more difficult to separate. The epigynum is of the haplogyne type with a simple bursa on each side leading by way of a coiled tube to a small oval terminal receptacle placed near the midline.

Leptoneta isolata, new species

FIGURES 9-11

Diagnosis. Pale, essentially eyeless troglobite with legs of medium length; epigynum (fig. 11); tarsus of male palpus (fig. 10) with rounded accessory lobe on retrolateral side.

Etymology. Specific name from Latin *isolatus*, separated, isolated.

Female. Total length, 2.7 mm. Carapace, 1 mm long, 0.8 mm wide. Abdomen, 1.7 mm long, 1 mm wide.

Cephalothorax and appendages dull to bright orange in color, without contrasting markings except for dark cervical groove and thin brown seam around sternum and brown chelicerae. Abdomen whitish.

Structure typical: carapace elongate oval, only moderately narrowed in front to demark scarcely apparent pars cephalica, highest in front of cervical groove; clypeus broad 0.15 mm high, essentially straight in front, declining steeply forward; eyes obsolete except for trivial corneal indications of anterior four; cheliceral armature: promargin with nine, retromargin with three denticles; abdomen suboval, as high as broad.

First leg: femur, 2.35 mm, patella, 0.3 mm, tibia, 2.5 mm, metatarsus, 2.1 mm, tarsus, 1.25 mm; total, 8.5 mm. First femur 2.3 times, first leg 8.5 times as long as carapace. First metatarsus with 2-2-0 ventral spines.

Epigynum (fig. 11) with openings on each corner to coiled tube ending in elongate oval receptacle.

Male. Total length, 2.5 mm. Carapace, 1 mm long, 0.8 mm wide. Abdomen, 1.5 mm long, 0.9 mm wide.

Coloration and structure like those of female.

First leg: femur, 2.3 mm, patella, 0.3 mm, tibia, 2.6 mm, metatarsus, 2.2 mm, tarsus, 1.2 mm; total 8.6 mm. First femur 2.3 times, first leg 8.6 times as long as carapace. Palpus: femur, 0.4 mm, patella, 0.12 mm, tibia, 0.29 mm, tarsus, 0.3 mm.

Male palpus (figs. 109-110) of typical design as follows: femur about four times as long as broad; patella oval, with erect spine at apex; tibia not fully three times as broad as long, widest at apex and drawn out to spur bearing thin spine on retrolateral side; tarsus pinched at center, with slender principal branch and short retrolateral lobe; bulb large, suboval, its ventral depth twice depth of tarsus.

Type Data. Male holotype and three males, six females and immature from Grutas de García, Nuevo León, México, June 14, 1942 (C. Bolívar, F. Bonet, Maldonado, Osorio, Peláez).

Distribution. Known only from above cave.

Other Record. Nuevo León: Grutas de García, September 19, 1942 (C. Bolívar), three males, four females.

Leptoneta pecki, new species

FIGURES 7-8

Diagnosis. Small, pale, short-legged species related to *isolata*; tarsus of male palpus (fig. 7) with small accessory lobe.

Etymology. Named for Dr. Stewart A. Peck.

Female. Total length, 1.6 mm. Carapace, 0.7 mm long, 0.52 mm wide. Abdomen, 0.9 mm long, 0.6 mm wide.

Cephalothorax and legs pale yellow; eyes very narrowly ringed with black and with black pigment behind anterior median eyes; abdomen white.

Structure typical: eyes present, reduced in size, with front eyes contiguous and posterior eyes separated from anterior lateral by one diameter of latter; clypeus sloping, 0.15 mm high, equal to three diameters of anterior median eye; cheliceral armature: promargin with seven, retromargin with four denticles.

First leg: femur, 1.3 mm, patella, 0.21 mm,

tibia, 1.4 mm, metatarsus, 1.3 mm, tarsus, 0.72 mm; total, 4.93 mm. First femur 1.8 times, first leg seven times as long as carapace. First femur with single median spine on pro-lateral surface; first tibia with 1-2-1-2 ventral spines.

Male. Total length, 1.5 mm. Carapace, 0.6 mm long, 0.5 mm wide. Abdomen, 0.8 mm long, 0.6 mm wide.

Coloration and structure like those of female.

First leg: femur, 1.1 mm, patella, 0.21 mm, tibia, 1.2 mm, metatarsus, 0.95 mm, tarsus, 0.64 mm; total, 4.10 mm. First femur 1.8 times, first leg about seven times as long as carapace. Palpus: femur, 0.3 mm, patella, 0.11 mm, tibia, 0.16 mm, tarsus, 0.21 mm.

Male palpus (figs. 7-8): femur four times as long as wide; patella suboval; tibia slightly more than twice as long as broad, with pro-lateral spur bearing straight spine; tarsus nearly three times as long as broad, pinched at center, with pointed principal branch and rounded accessory spur on pro-lateral side; bulb oval, twice as deep as depth of tarsus.

Type Data. Male holotype and male and two females from Grutas de San Bartolo, 16 km SW of Monterrey, Nuevo León, México, June 21, 1969 (S. and J. Peck).

Distribution. Known only from above cave.

Leptoneta capilla, new species

FIGURES 1-2

Diagnosis. Pale, eyeless troglobite with long legs and elongated elements of male palpus; tarsus of male palpus (fig. 1) with simple, apically rounded principal branch without accessory lobe.

Etymology. Specific name from Spanish *capilla*, a hood; named for Cueva de la Capilla.

Female. Total length, 2 mm. Carapace, 0.85 mm long, 0.65 mm wide. Abdomen, 1.2 mm long, 0.8 mm wide.

Coloration and structure like those of *isolata*. Ocular area without trace of eyes; linear cervical groove only faintly apparent; midline of carapace with row of about six suberect hairs; cheliceral armature: promargin with

nine, retromargin with four close-set denticles.

First leg: femur, 2.2 mm, patella, 0.25 mm, tibia, 2.3 mm, metatarsus, 1.8 mm, tarsus, 1.25 mm; total, 7.8 mm. First femur 2.6 times, first leg about 9.2 times as long as carapace. Palpus: femur, 0.5 mm, patella, 0.2 mm, tibia, 0.36 mm, tarsus, 0.26 mm; total, 1.32 mm.

Male. Total length, 1.85 mm. Carapace, 0.85 mm long, 0.7 mm wide. Abdomen, 1 mm long, 0.7 mm wide.

Coloration and structure essentially like those of female.

First leg: femur, 2.5 mm, patella, 0.25 mm, tibia, 2.6 mm, metatarsus, 2.1 mm, tarsus, 1.3 mm; total, 8.75 mm. First femur about three times, first leg about eight times as long as carapace. Palpus: femur, 0.8 mm, patella, 0.4 mm, tibia, 0.4 mm, tarsus, 0.4 mm; total, 2 mm.

Male palpus (figs. 1-2) longer than that of *isolata* with following features: femur about eight times as long as wide; patella nearly four times as long as wide, narrow at base; tibia four times as long as broad, with pointed lobe bearing thin spine on retrolateral side; tarsus four times as long as broad, narrowed at middle, with apically rounded principal branch lacking accessory lobe; bulb elongated, its depth about three times that of tarsus.

Type Data. Male holotype, four males and five females from Cueva de la Capilla, 13½ km NW of Gómez Farías, El Porvenir, Tamaulipas, México, January 13, 1971 (J. Reddell, R. Mitchell, and group).

Distribution. Known only from above cave.

Other Records. *Tamaulipas:* Cueva de la Capilla, 7,100 feet, El Porvenir, 13½ km NW of Gómez Farías, July 2, 1969 (S. Peck, R. Norton), male, female; January 28, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George), penultimate male.

Leptoneta delicata, new species

FIGURES 3-4

Diagnosis. Pale species resembling *capilla* but with eyes present but reduced in size and

with legs of medium length; male palpus with enlarged, laterally directed tibial spur and elongated tarsus without lateral enlargement (figs. 3-4).

Etymology. Specific name from Latin *delicatus*, dainty.

Female. Total length, 1.9 mm. Carapace, 0.8 mm long, 0.7 mm wide. Abdomen, 1.1 mm long, 0.85 mm wide.

Cephalothorax and appendages pale yellow; eyes of female narrowly ringed with black; abdomen white.

Structure typical: like that of *isolata*; eyes on moderately elevated tubercle, reduced in size, with those of anterior row subcontiguous and posterior pair elongate, separated from anterior lateral eye by more than diameter; clypeus broad, 0.17 mm high, equaling three full diameters of anterior lateral eye; cheliceral armature: promargin with eight, retromargin with three denticles; abdomen suboval, as high as broad.

First leg: femur, 1.9 mm, patella, 0.22 mm, tibia, 1.95 mm, metatarsus, 1.4 mm, tarsus, 1.2 mm; total, 6.67 mm. First femur 2.4 times, first leg eight times as long as carapace. First femur with weak spine in distal half on prolateral side; first tibia with 1-1-1-1 ventral spines.

Male. Total length, 2 mm. Carapace, 0.8 mm long, 0.7 mm wide. Abdomen, 1.2 mm long, 0.8 mm wide.

Coloration and structure like those of female. Eyes evanescent, without pigment, smaller than those of female, with posterior pair separated from larger anterior lateral by nearly two diameters of posterior eye.

First leg: femur, 1.88 mm, patella, 0.22 mm, tibia, 2 mm, metatarsus, 1.45 mm, tarsus, 1.25 mm; total, 6.8 mm. First femur 2.3 times, first leg 8.5 times as long as carapace. Palpus: femur, 0.72 mm, patella, 0.31 mm, tibia, 0.32 mm, tarsus, 0.45 mm; total, 1.8 mm.

Male palpus (figs. 3-4) with elements elongated: femur about seven times as long as wide, slightly enlarged at distal end; patella two and one-half times as long as wide; tibia three times as long as wide, broadened and provided at apex with conspicuous, laterally

directed process bearing short spine; tarsus about four times as long as wide, pinched to rounded element at middle and gradually narrowed to apex, without accessory lobe; bulb suboval, with long embolus.

Type Data. Male holotype and female from Iron Mine at road, 2 km E of Pinal de Amoles, Querétaro, México, July 17, 1969 (S. Peck).

Distribution. Known only from above specimens.

Leptoneta reclusa, new species

FIGURES 12-13

Diagnosis. Pale species related to *capilla* but readily separated by shorter legs and presence of reduced eyes; tarsus of male palpus (fig. 12) with prominent, laterally directed process.

Etymology. Specific name from Latin *recludere*, to close off, a recluse.

Male. Total length, 2.2 mm. Carapace, 0.82 mm long, 0.72 mm wide. Abdomen, 1.2 mm long, 0.85 mm wide.

Cephalothorax and legs dusky yellow, without contrasting markings; eyes with faint outline of dark pigment; abdomen gray.

Structure like that of *isolata*; carapace typical with cervical groove a trivial linear depression and line of fine setae going forward to eyes; eyes present but reduced in size, with anterior cluster of four strongly recurved and separated from posterior pair by diameter of anterior lateral; clypeus broad and high, 0.2 mm, equaling about three times length of front eye cluster; cheliceral armature: promargin with nine, retromargin with seven denticles; abdomen suboval, covered with fine, procumbent hairs.

First leg: femur, 2.25 mm, patella, 0.25 mm, tibia, 2.2 mm, metatarsus, 1.7 mm, tarsus, 0.6 mm; total, 7 mm. First femur 2.7 times, first leg 8.5 times as long as carapace. First femur with seven procumbent spines along prolateral surface; first tibia with four paired or single ventral spines. Palpus: femur, 0.55 mm, patella, 0.2 mm, tibia, 0.23 mm, tarsus, 0.33 mm; total, 1.41 mm.

Male palpus (figs. 12-13) with following

features: femur five times as long as wide, slightly thickened toward apex; patella two and one-half times as long as broad; tibia slightly more than twice as long as broad, broader at apex and produced to angle bearing thin spine; tarsus about four times as long as broad, essentially straight, apically rounded, without accessory lobes, set with fine bristles on prolateral side; bulb suboval, twice as high as height of tarsus.

Type Data. Male holotype from Cueva de Chorros de Agua, 20 km W of Montemorelos, Nuevo León, México, June 19-25, 1969 (S. and J. Peck), from bait trap in dark zone at guano.

Distribution. Known only from above specimen.

Leptoneta rainesi, new species

FIGURES 5-6

Diagnosis. Small, dusky, stocky species with short legs; tarsus of male palpus (fig. 6) slender, rounded at apex and without accessory lobe.

Etymology. Named for Mr. Terry Raines.

Female. Total length, 1.6 mm. Carapace, 0.55 mm long, 0.5 mm wide. Abdomen, 1 mm long, 0.8 mm wide.

Cephalothorax and appendages dusky yellow; eyes narrowly ringed with black and anterior four eyes enclosing black patch; abdomen gray, with purplish cast.

Structure typical: carapace broadly oval, only moderately longer than broad, with cervical groove faintly apparent; eyes large, well

pigmented, set on moderate elevation, with oval posterior pair separated from anterior lateral by narrow diameter of posterior eye; clypeus broad, 0.11 mm high, equaling slightly more than two diameters of lateral eye; cheliceral armature: promargin with seven, retromargin with four denticles; abdomen suboval.

First leg: femur, 0.85 mm, patella, 0.15 mm, tibia, 0.9 mm, metatarsus, 0.75 mm, tarsus, 0.55 mm; total, 3.20 mm. First femur 1.5 times, first leg 5.8 times as long as carapace. First femur with two weak spines at middle on prolateral side; first tibia with single, weak submedian spine.

Male. Total length, 1.6 mm. Carapace, 0.65 mm long, 0.52 mm wide. Abdomen, 0.9 mm long, 0.7 mm wide.

Coloration and structure essentially like those of female. Carapace darker and dusky on margins; abdomen mostly purple.

First leg: femur, 0.98 mm, patella, 0.19 mm, tibia, 1 mm, metatarsus, 0.9 mm, tarsus, 0.6 mm; total, 2.32 mm. First femur 1.5 times, first leg 3.5 times as long as carapace. Palpus: femur, 0.4 mm, patella, 0.2 mm, tibia, 0.15 mm, tarsus, 0.26 mm; total, 1.01 mm.

Male palpus (figs. 5-6) with following features: femur four times as long as wide; patella thin, cylindrical segment two and one-half times as long as wide; tibia twice as long as wide, with short retrolateral spur bearing thin spine; tarsus three and one-half times as long as broad, pinched at middle, narrowly rounded at apex, without accessory lobes; bulb large, suboval, more than half as deep as

Figs. 1-2. *Leptoneta capilla*, new species. 1. Male palpus, retrolateral view. 2. Tibia and tarsus of male palpus, dorsal view.

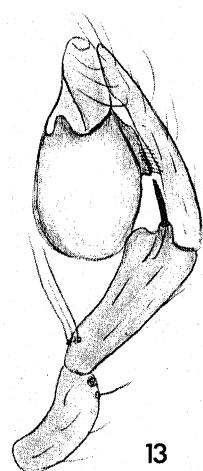
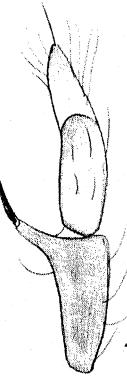
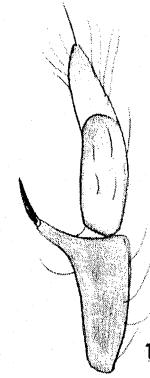
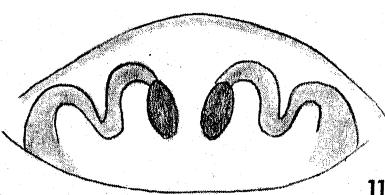
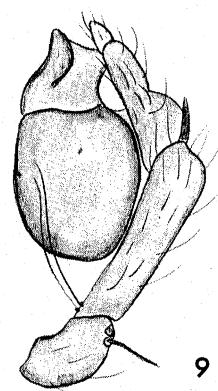
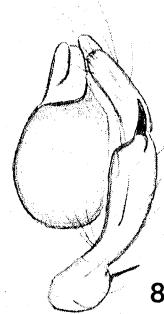
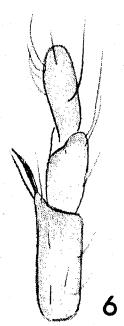
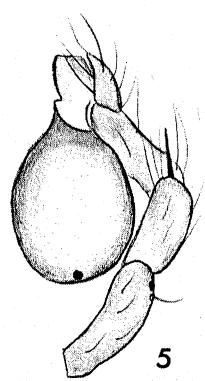
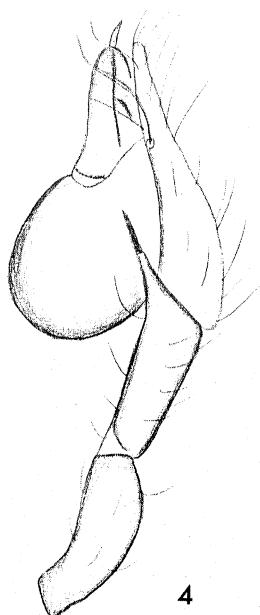
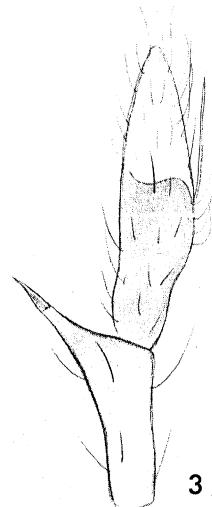
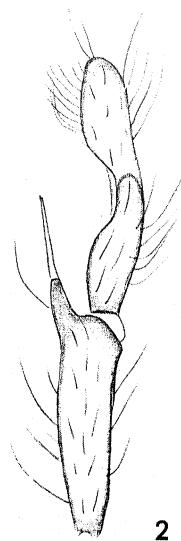
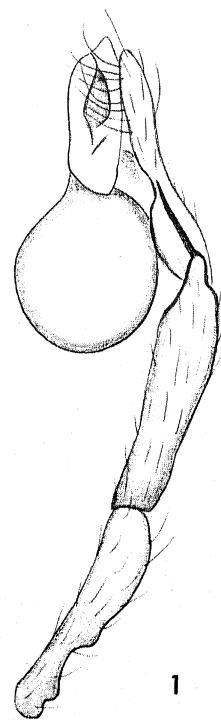
Figs. 3-4. *Leptoneta delicata*, new species. 3. Tibia and tarsus of male palpus, dorsal view. 4. Male palpus, retrolateral view.

Figs. 5-6. *Leptoneta rainesi*, new species. 5. Male palpus, retrolateral view. 6. Tibia and tarsus of male palpus, dorsal view.

Figs. 7-8. *Leptoneta pecki*, new species. 7. Tibia and tarsus of male palpus, dorsal view. 8. Male palpus, retrolateral view.

Figs. 9-11. *Leptoneta isolata*, new species. 9. Male palpus, retrolateral view. 10. Tibia and tarsus of male palpus, dorsal view. 11. Epigynum, ventral view.

Figs. 12-13. *Leptoneta reclusa*, new species. 12. Tibia and tarsus of male palpus, dorsal view. 13. Male palpus, retrolateral view.



depth of tarsus.

Type Data. Male holotype and female from Cueva de El Pachón, 7½ km NE of Antiguo Morelos, Tamaulipas, México, July 10, 1969 (S. and J. Peck, R. Norton).

Distribution. Caves of Tamaulipas.

Other Records. *Tamaulipas*: Cueva de los Vampiros, 20 km NW of Limón, May 27, 1968 (J. Reddell), male. Cueva Bonita, 36 km SW of Victoria, July 18, 1967 (J. Fish), male.

Family Oonopidae

Genus *Wanops* Chamberlin and Ivie

Wanops coecus Chamberlin and Ivie

Wanops coecus Chamberlin and Ivie, 1938, p. 125, figs. 1, 2.

Record. *Yucatán*: Balaam Canche Cave, Chichén Itzá, June 10, 1936, one male taken 95 m inside cave.

Genus *Matta* Crosby

Record. *Veracruz*: Cueva de Ojo de Agua de Tlilapan, Tlilapan, immature female (J. Reddell).

Family Pholcidae

The pholcids are generalized, haplogyne spiders with long legs, that spin irregular webs in dark places under ground detritus, in openings in the ground, in caves and buildings. The cave habit seems to be an especially attractive one inasmuch as many pholcids live in the entrance areas and some penetrate deep into areas of total darkness. The Mexican fauna is large and consists mainly of undescribed species of which about 50 are considered here from Mexican caves. A few of these species are blind troglobites and others have eye and body modifications that suggest they may be obligative cavernicole. Most of the species, however, must be classified as troglophiles.

Genus *Coryssonemis* Simon

This American genus of large, strongly marked species is well represented in Mexican caves. One of the species, *Coryssocnemis simoni* O.P.-Cambridge, with its type locality at Omilteme, Guerrero, occurs in caves and outside situations from Hidalgo and Querétaro into southern Mexico as recorded below. All the species are classified as troglophiles. Three of the new species described below are atypical in having much longer, thinner legs than other species and show eye and palpal distinctions that set them apart from the norm. Until the limits of the pholcid genera are more explicitly defined, they are kept in *Coryssocnemis*.

Coryssocnemis simoni O. P.- Cambridge

Coryssocnemis simoni O.P.-Cambridge, 1898, p. 237. F.P.-Cambridge, 1902, p. 371.

Records. *Quéretaro*: Sótano de Tejamanil, Tejamanil, August 9, 1966 (J. Fish), female; August 9, 1966 (D. McKenzie, J. Reddell), female, immature. Iron mine at road, 2 km E of Pinal de Amoles, July 17, 1969 (S. Peck), female. Sótano de El Tigre, 25 km SW of Jalpan, July 11, 1967 (J. Fish), female. Sótano de la Lagunita, 1½ km E of Río Blanco, July 9, 1967 (J. Reddell), female. Cueva del Puerto del León, 6½ km SE of Río Blanco, July 9, 1967 (J. Reddell, J. Fish, W. Russell), immature. *Hidalgo*: Cueva de Puerto de la Zorra, August 11, 1966 (J. Reddell, J. Fish), female, immature.

Coryssocnemis abernathyi, new species

FIGURES 19-22

Diagnosis. Large, strongly marked species related to *simoni*, separated by following features: femora and tibiae of legs with many brown rings; male chelicera (fig. 20) with projection of distinctive shape; epigynum (fig. 22) with three rounded angles at apex; male palpus as shown in fig. 21.

Etymology. Named for Mr. Miles Aber-

nathy.

Female. Total length, 8.5 mm. Carapace, 3 mm long, 2.5 mm wide. Abdomen, 5.5 mm long, 4 mm wide.

Carapace pale yellow, with median longitudinal dark brown stripe from eye area to posterior margin and continued forward but paler to clypeal margin, and pair of brown spots on each side of pars thoracica; sternum light brown, with narrow dark brown marginal seam; chelicerae, endites and labium dark brown; legs yellowish, with femora and tibiae marked with many brown rings, about 10 on each segment, and metatarsi and tarsi unmarked light brown; abdomen bluish.

Structure similar to that of *simoni*. Eye tubercle of medium height; anterior eye row slightly procurved, with four eyes nearly touching and median eyes about half diameter of lateral eyes; posterior eye row moderately procurved, with median eyes separated by full diameter and touching lateral eyes. Clypeus, 1.1 mm, as high as nearly four diameters of anterior lateral eye. Abdomen large, produced behind spinnerets to rounded, conical projection like that of *simoni*.

First leg: femur, 12 mm, patella, 1.3 mm, tibia, 12 mm, metatarsus, 15 mm, tarsus, 5 mm; total, 45.3 mm. First femur four times, first leg 15 times as long as carapace.

Epigynum (fig. 22) large, protruding process with three slight, rounded angles at apex.

Male. Total length, 7 mm. Carapace, 3.3 mm long, 3 mm wide. Abdomen, 4.5 mm long, 3.2 mm wide.

Coloration and structure like those of female. Chelicera (fig. 20) with prominent, outwardly projecting lobe below base, otherwise smooth and set with fine black hairs.

First leg: femur, 17.5 mm, patella, 1.3 mm, tibia, 15.7 mm, metatarsus, 23 mm, tarsus, 6.5 mm; total, 64 mm. First femur 5.3 times, first leg about 20 times as long as carapace.

Male palpus (fig. 21) with small femoral spur at base and apically thin tarsal process bearing small lateral appendage.

Type Data. Male holotype and female from Sótano de Abernathy, W of Valle de los Fantasmas, San Luis Potosí, México, January 30, 1969 (W. Elliott, D. Honea, M. Abernathy).

Distribution. Caves of San Luis Potosí and Tamaulipas.

Other Records. *San Luis Potosí:* Sótano de la Golondrina, Valle de los Fantasmas, November 29, 1968 (W. Elliott, J. Jarl, S. Cathey, M. Burk), male, two females. Unnamed 30-foot-long cave, 1 km S of San Francisco, November 28, 1968 (W. Elliott, J. Jarl), two males. *Tamaulipas:* Cueva Chica de la Perra, 13½ km NW of Gómez Farías, January 15, 1971 (J. Reddell, W. Elliott), male.

Coryssocnemis placidus, new species

FIGURES 28-29

Diagnosis. Near relative of *abernathyi* but readily distinguished as follows: carapace with submarginal, broken band instead of spots; femora and tibiae of legs with single subapical ring instead of series; legs shorter with first femur 3.3 times as long as carapace; epigynum (fig. 28) with apical corners prominent.

Etymology. Specific name from Latin *placidus*, placid.

Female. Total length, 6.5 mm. Carapace, 3.5 mm long, 3 mm wide. Abdomen, 5 mm long, 4 mm wide.

Coloration and structure like that of *abernathyi* except as follows: pars cephalica with submarginal band of spots; legs reddish brown, with femora and tibiae with single broad, subapical dark ring. Abdomen with rounded, conical projection.

First leg: femur, 11.7 mm, patella, 1.2 mm, tibia, 10 mm, metatarsus, 14 mm, tarsus, 3.7 mm; total, 40.6 mm. First femur 3.3 times, first leg 11.6 times as long as carapace.

Epigynum (figs. 28-29) with apical corners larger than those of *abernathyi*.

Type Data. Female holotype from Cueva de Agua de Tlilapan, Tlilapan, Veracruz, México, August 8, 1967 (J. Reddell).

Distribution. Caves of Veracruz.

Other Records. *Veracruz:* Sótano de Sphodrini, Tequila, August 8, 1967 (J. Reddell, T. R. Evans), one immature. Cueva de Opilionida, 1½ km N of Tequila, August 5, 1967 (J. Reddell, T. R. Evans),

immature female. Sótano de Oztautalichaloa, 1 km NW of Tequila, June 1963 (D. McKenzie), one immature from 700-foot-deep shaft.

Coryssocnemis pecki, new species

FIGURES 14-18

Diagnosis. Large species with high, globose abdomen, related to *simoni*, separated by following features: legs uniform in color; epigynum (figs. 15, 17) of distinctive form; male chelicerae (fig. 14) with sharp, inwardly directed spurs; male palpus (fig. 16) like that of *abernathyi* but with tip of tarsal process of different form.

Etymology. Named for Dr. Stewart Peck.

Female. Total length, 7 mm. Carapace, 3 mm long, 2.7 mm wide. Abdomen, 4 mm long, 3.3 mm wide.

Carapace orange brown but pars thoracica somewhat dusky and with whitish margins; chelicerae, endites and labium dusky brown; sternum yellowish brown with narrow brown seam; legs yellowish to orange brown, with faint pale rings at end of femora and tibiae; abdomen whitish to pale blue.

Structure similar to that of *simoni*. Posterior eye row essentially straight. Abdomen subglobose, without prominent projecting lobe.

First leg: femur, 16 mm, patella, 1.3 mm, tibia, 14.5 mm, metatarsus, 20 mm, tarsus, 5.5 mm; total, 57.3 mm. First femur 5.3 times, first leg 19 times as long as carapace.

Epigynum (figs. 15, 17) with small, rounded lobe in front and truncated behind at genital groove.

Male. Total length, 8 mm. Carapace, 3.5 mm long, 3 mm wide. Abdomen, 4.5 mm

long, 4 mm wide.

Coloration and structure like those of female. Chelicerae (fig. 14) widely rounded in lateral view and with sharp, curved, inwardly directed spurs on frontal face in distal half of segment.

First leg: femur, 18 mm, patella, 1.5 mm, tibia, 16 mm, metatarsus, 23 mm, tarsus, 5.5 mm; total, 64 mm. First femur 5.4 times, first leg 18 times as long as carapace.

Male palpae (fig. 16) similar to that of *abernathyi*, with tiny femoral spur at apex and tarsal process drawn to fine point.

Type Data. Male holotype and two males and six females from Cueva de Arcote, 6 km E of San Cristobal, Chiapas, México, August 15, 1969 (S. and J. Peck).

Distribution. Caves of Chiapas.

Other Record. *Chiapas:* Cueva Rancho Nuevo, 10 km E of San Cristobal, August 13, 1969 (S. and J. Peck), three immature.

Coryssocnemis facetus, new species

FIGURE 27

Diagnosis. Atypical member of genus with simple epigynum (fig. 27) consisting of semi-circular plate and longer, thinner legs than other species.

Etymology. Specific name from Latin *facetus*, elegant, fine.

Female. Total length, 5.3 mm. Carapace, 2.3 mm long, 2.3 mm wide. Abdomen, 3.2 mm long, 2.5 mm wide.

Cephalothorax and appendages bright orange; carapace with dusky longitudinal stripe from eyes to posterior margin, pale on sides, and eye group black; sternum light brown with dark seam; legs without rings or contrasting markings.

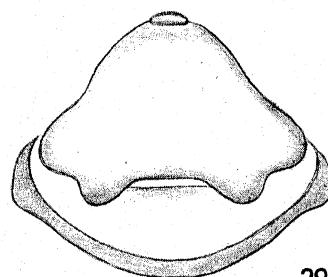
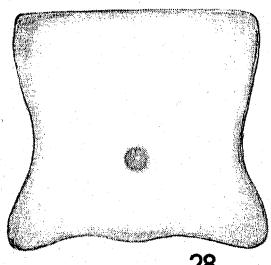
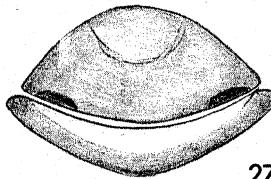
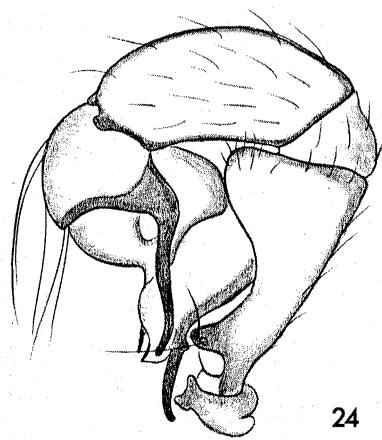
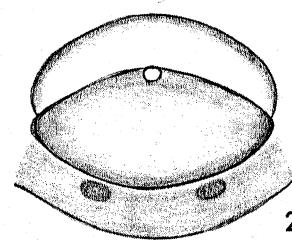
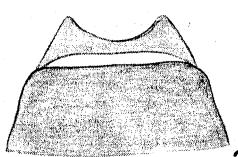
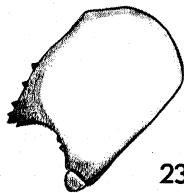
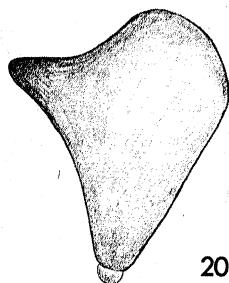
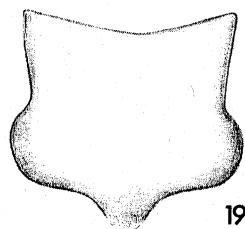
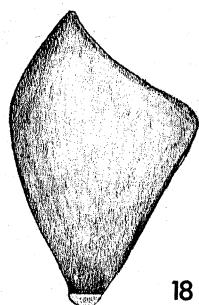
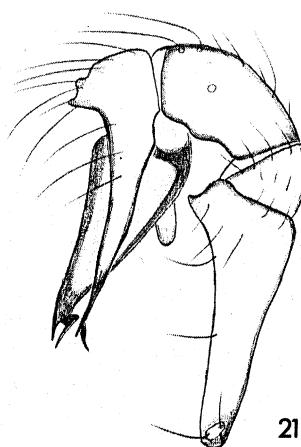
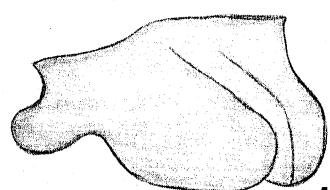
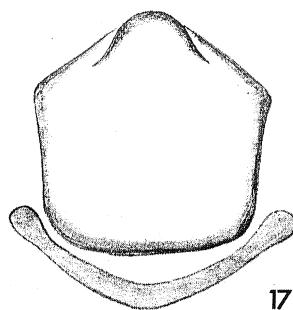
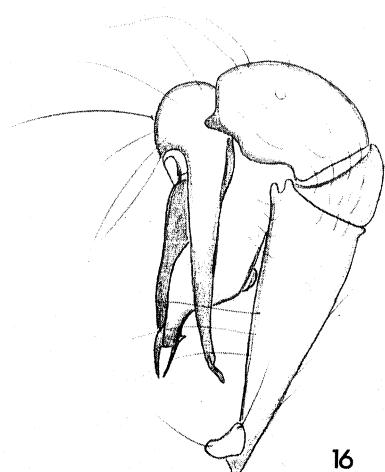
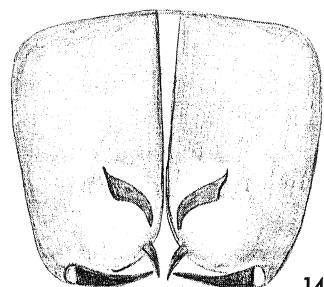
Figs. 14-18. *Coryssocnemis pecki*, new species. 14. Male chelicerae, frontal view. 15. Epigynum, retrolateral view. 16. Left male palpus, retrolateral view. 17. Epigynum, ventral view. 18. Male chelicera, retrolateral view.

Figs. 19-22. *Coryssocnemis abernathyi*, new species. 19. Epigynum, frontal view. 20. Left male chelicera, retrolateral view. 21. Left male palpus, retrolateral view. 22. Epigynum, ventral view.

Figs. 23-26. *Coryssocnemis clarus*, new species. 23. Left male chelicera, retrolateral view. 24. Left male palpus, retrolateral view. 25. Epigynum, posterior view. 26. Epigynum, dorsal view.

Fig. 27. *Coryssocnemis facetus*, new species. Epigynum, ventral view.

Figs. 28-29. *Coryssocnemis placidus*, new species. 28. Epigynum, frontal view. 29. Epigynum, ventral view.



Anterior median eyes one-third diameter of anterior lateral eyes; posterior eye row moderately procurved, with median eyes separated by long diameter; clypeus, 0.9 mm, as high as nearly five diameters of anterior lateral eye. Abdomen elongate oval, of medium height.

First leg: femur, 17 mm, patella, 1 mm, tibia, 16.5 mm, metatarsus, 28 mm, tarsus, 4.5 mm; total, 67 mm. First femur seven times, first leg 29 times as long as carapace.

Epigynum as shown in fig. 27.

Type Data. Female holotype from Cueva Chica del Camino, at Kilometer 1112 on Tuxtla Guttiérez Highway, Chiapas, México, August 19, 1967 (J. Reddell, J. Fish, T. R. Evans).

Coryssocnemis clarus, new species

FIGURES 23-26

Diagnosis. Atypical, long-legged species with ovate abdomen, readily distinguished as follows: epigynum (fig. 25) with rounded angle on each side; chelicera of male (fig. 23) with toothed spur; male palpus (fig. 24) with rounded lobe at apex of femur and thin tarsal process.

Etymology. Specific name from Latin *clarus*, clear.

Female. Total length, 4.2 mm. Carapace, 1.7 mm long, 1.7 mm wide. Abdomen, 3.5 mm long, 2.7 mm wide.

Carapace pale yellow, with dusky central stripe from eyes to posterior declivity and eye tubercles black; labium and endites dusky; sternum with dusky patch in middle but pale on margins; chelicerae dark brown; legs yellowish brown with faint pale apical rings on femora and tibiae.

Eye turret of medium height; front eye row recurved with lower edges of large lateral eyes cutting top edge of contiguous median eyes, which are separated by nearly two diameters from lateral eyes; posterior eye row straight with median eyes separated by two narrow diameters from contiguous lateral eyes; clypeus, 0.8 mm, as high as six diameters of anterior lateral eyes.

First leg: femur, 12.3 mm, patella, 0.7 mm, tibia, 13.2 mm, metatarsus, 16 mm, tarsus, 2 mm; total, 44.2 mm. First femur seven times, first leg 26 times as long as carapace.

Epigynum (figs. 25-26) of distinctive form.

Male. Total length, 3.2 mm. Carapace, 1.75 mm long, 1.75 mm wide. Abdomen, 1.8 mm long, 1.3 mm wide.

Coloration and structure like those of female. Chelicera (fig. 23) with curved spur above middle of face, armed with short spinules.

First leg: femur, 13.2 mm, patella, 0.7 mm, tibia, 13 mm, metatarsus, 21.5 mm, tarsus, 3 mm; total, 51.4 mm. First femur 7.5 times, first leg 29 times as long as carapace.

Male palpus (fig. 24) atypical, with rounded lobe at apex of femur similar to that of *pecki* and thin tarsal process lightly curved at end.

Type Data. Male holotype from Cueva del Nacimiento del Río Frio, 7 km S of Gómez Farías, Tamaulipas, México, February 17, 1970 (J. A. L. Cooke), on soil in twilight zone.

Distribution. Known only from above cave.

Other Records. *Tamaulipas:* Cueva del Nacimiento del Río Frio, March 11, 1969 (J. Reddell, S. Fowler), male; April 18, 1965 (J. Fish, J. Reddell), female, two immature.

Coryssocnemis iviei, new species

FIGURES 30-33

Diagnosis. Atypical member of genus readily distinguished by following features: epigynum (fig. 33) with truncate or rounded process in front, often showing extruded globular elements; male chelicera (fig. 31) with sharp spur near distal end of segment; male palpus (fig. 30) with rounded lobe at distal end of femur.

Etymology. Named for the late Mr. Wilton Ivie.

Female. Total length, 3 mm. Carapace, 1.2 mm long, 1.2 mm wide. Abdomen, 1.8 mm long, 1.4 mm wide.

Cephalothorax and appendages dusky yel-

low; eyes ringed with black and with dusky shadings on entire carapace and clypeus; sternum dusky; abdomen bluish gray.

Anterior median eyes small, one-third diameter of large anterior lateral eyes; posterior median eyes separated by one and one-half diameters.

First leg: femur, 6.8 mm, patella, 0.5 mm, tibia, 6.8 mm, metatarsus, 9.5 mm, tarsus, 1.7 mm; total, 25.3 mm. First femur 5.6 times, first leg 21 times as long as carapace.

Epigynum (fig. 33) with short, rounded or truncated lobe projecting forward and sometimes with pair of bulbous elements (eggs?) extruded in front of genital groove as shown in figure 32.

Male. Total length, 2.8 mm. Carapace, 1.4 mm long, 1.4 mm wide. Abdomen, 1.4 mm long, 1 mm wide.

Chelicera (fig. 31) with sharp spur near apex of segment. Eyes of posterior row essentially straight; anterior median eyes smaller than those of female, one-fourth diameter of anterior lateral eyes.

First leg: femur, 8.3 mm, patella, 0.6 mm, tibia, 8.3 mm, metatarsus, 11.5 mm, tarsus, 1.7 mm; total, 30.4 mm. First femur six times, first leg 22 times as long as carapace.

Male palpus (fig. 30) similar to that of *clarus*, with broad lobe at apex of femur and thin tarsal process, ended in small side point.

Type Data. Male holotype from Cueva de El Ocote, 3 km N of El Ocote, Hidalgo, Mexico, April 20, 1963 (W. J. Gertsch, W. Ivie).

Distribution. Caves of northeastern Mexico.

Other Records. *Hidalgo:* Cueva de El Ocote (small roadside cave), 3 km N of El Ocote (24 km NE of Jacala), August 18, 1964 (J. and W. Ivie), two males, two females, immature; August 11, 1966 (J. Fish, J. Reddell), female, immature; July 16, 1969 (S. and J. Peck), male. *San Luis Potosí:* Cueva de Potrerillos, 1½ km W of Ahuacatlán, July 12, 1967 (J. Reddell, J. Fish, P. Russell), four males, six females; November 25, 1967 (J. Fish, T. R. Evans), female. *Querétaro:* Cueva de Tejamanil, Tejamanil, August 9, 1966 (D. McKenzie, J. Reddell), male. Cueva del Judío, 1½ km S of Pinal de Amoles, July 10, 1967 (J. Reddell, J. Fish, P. Russell),

female. Sótano de El Tigre, 25 km SW of Jalpan, July 11, 1967 (J. Fish), female.

Genus *Physocyclus* Simon

This genus has many species in Mexico and they are common in caves. For the most part they seem to be little modified by the cave habitat and all are classified as troglophiles. Most are quite large pholcids with globose abdomens and fairly long legs.

The coloration and structure of the species described below are typical of the genus. The base color varies from whitish to yellow and the carapace usually has the grooves dusky and small dusky submarginal spots on each side of the pars thoracica. The legs are pale with dark rings of varying distinctness on the femora and tibiae. The abdomen is usually grayish and may be plain or marked with a pattern of bluish spots on the dorsum. The carapace is of medium height, has the cephalic grooves and linear median groove deeply impressed and the pars cephalica is moderately elevated above the pars thoracica. The eye group occupies about half the width of the carapace at that point. The anterior median eyes are fairly large and the triads are moderately separated. The first eye row is gently procurved; the posterior eye row is moderately recurved; and the median ocular quadrangle is broader than long and narrowed in front with the anterior median eyes much smaller. The clypeus is inclined steeply downward and equals about twice the length of the ocular group. The legs are long and thin, are longer in males, but not excessively long for the family. The males resemble the females closely except for the cheliceral modifications, which present spurs, or horns, on the side of each and have the front face set with a pattern of conical elevations, each bearing a fine hair. The side of each chelicera has a stridulatory apparatus, a band of fine grooves, presumed to be sound producing and activated by a rounded process at the base of the femur in position to rub the grooves. The male palpi are of distinctive form for the genus and present differences in the embolus,

which assumes different shapes in most of the species. The female epigynum consists of a series of sclerotized bands and has in front a pair of processes usually distinctive for each species. Identification in the genus *Physocyclus* is largely a study of the genital structure of each sex, and the following descriptions exclude the common features of all species.

Physocuclus tanneri Chamberlin

Physocyclus tanneri Chamberlin, 1921, p. 245.

Records. Sonora: Cueva del Tigre, 22 km E of Carbo, June 22, 1966 (V. Roth), male, two females. Cueva Higuera, 13 km SE of San Miguel de Horcasitas, October 4, 1966 (V. Roth), males, females, immature.

Physocyclus enaulus Crosby

Physocyclus enaulus Crosby, 1926, p. 1.

Records. Coahuila: Cueva de los Muchachos, July 30, 1966 (J. Fish, T. Raines, J. Reddell), male, female, immature. Cueva de los Lagos, November 15, 1964 (J. Reddell, B. Martin), male, female. Cueva del León, 48 km NW of Musquiz, December 28, 1967 (J. Reddell, W. Russell, W. Calvert), numerous males, females.

Physocyclus hoogstraali Gertsch

Physocyclus hoogstraali Gertsch, 1942, p. 7, fig. 45.

Records. Nuevo León: Grutas de García, September 19, 1942 (C. Bolívar), male.

Grutas de San Bartolo, 16 km S of Santa Catarina, February, 1966 (W. Russell, D. McKenzie), immature. Cueva de la Herradura, 8 km E of Hermanas, July 18, 1965 (J. Fish, T. Raines, J. Reddell), male, female, immature. Cueva de las Animas, 56 km E of Monclova, February 21, 1966 (J. Reddell, W. Bell), two males, immature. Cueva del Diablo (Bat Cave), Sabinas Hidalgo, June 14, 1940 (Hoogstraal), female holotype, two females (Gertsch, 1942).

Physocyclus globosus (Taczanowski)

Pholcus globosus Taczanowski, 1873, p. 105.

Physocyclus globosus: F.P.-Cambridge, 1902, p. 368. Chamberlin and Ivie, 1938, p. 130.

Record. Yucatán. San Bulha Cave, Merida, July 13 (Chamberlin and Ivie, 1938), two lots from stones and debris on floor and walls.

Physocyclus reddelli, new species

FIGURES 34-38

Diagnosis. Typical species with shorter cheliceral spurs on male than those of *hoogstraali* and distinctive epigynum (fig. 37) and male palpus (fig. 36).

Etymology. Named for Mr. James Reddell.

Female. Total length, 5.3 mm. Carapace, 2.2 mm long, 2 mm wide. Abdomen, 3.7 mm long, 3.3 mm wide.

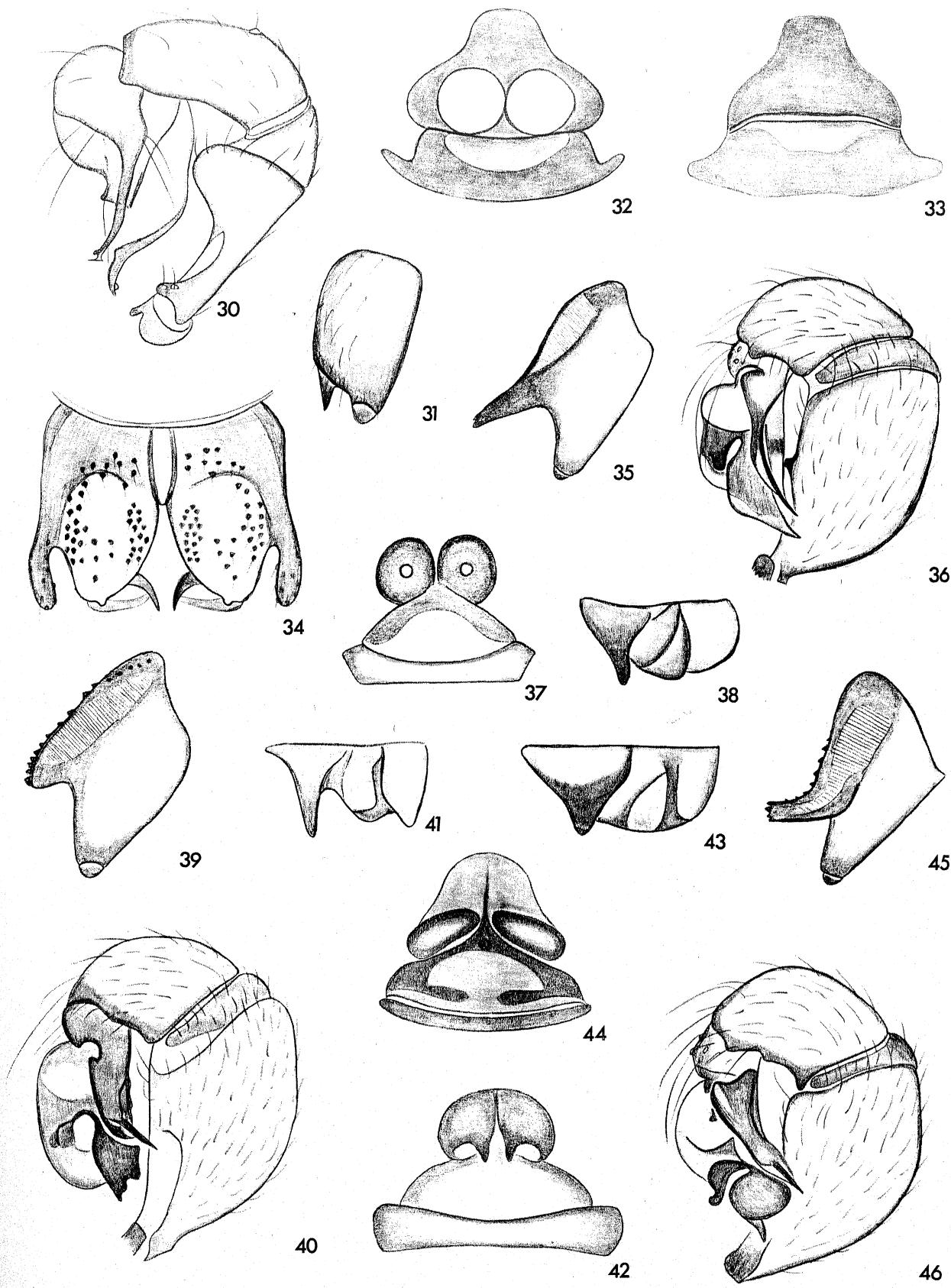
Carapace and appendages mostly dull yellow; pars cephalica, depressed grooves and middle of clypeus dusky brown; pars thoracica with three small dusky submarginal spots on each side; sternum, labium and endites with dusky pattern; legs pale yellow, with faint dusky rings at apices of femora and

Figs. 30-33. *Coryssocnemis iviei*, new species. 30. Left male palpus, retrolateral view. 31. Left male chelicera, retrolateral view. 32. Epigynum, ventral view, with extruded eggs? 33. Epigynum, ventral view.

Figs. 34-38. *Physocyclus reddelli*, new species. 34. Male chelicerae, frontal view. 35. Left male chelicera, retrolateral view. 36. Left male palpus, retrolateral view. 37. Epigynum, ventral view. 38. Epigynum, retrolateral view.

Figs. 39-42. *Physocyclus merus*, new species. 39. Left male chelicera, retrolateral view. 40. Left male palpus, retrolateral view. 41. Epigynum, retrolateral view. 42. Epigynum, ventral view.

Figs. 43-46. *Physocyclus pedregosus*, new species. 43. Epigynum, retrolateral view. 44. Epigynum, ventral view. 45. Left male chelicera, retrolateral view. 46. Left male palpus, retrolateral view.



at bases and apices of tibiae; abdomen gray, with pattern of bluish spots on middle of dorsum and dusky patch below at base.

First leg: femur, 9 mm, patella, 0.75 mm, tibia, 9.5 mm, metatarsus, 14 mm, tarsus, 2.2 mm; total, 35.45 mm. First femur four times, first leg 16 times as long as carapace.

Epigynum as shown in ventral and lateral views (figs. 37-38).

Male. Total length, 4.7 mm. Carapace, 2.5 mm long, 2.2 mm wide. Abdomen, 2.5 mm long, 2.2 mm wide.

Chelicerae of male in frontal and lateral views (figs. 34-35).

First leg: femur, 10.7 mm, patella, 0.8 mm, tibia, 11 mm, metatarsus, 16 mm, tarsus, 2.2 mm; total, 50.7 mm. First femur four times, first leg 25 times as long as carapace.

Male palpus (fig. 36) with embolus a flat pointed blade.

Type Data. Male holotype, female and immature specimens from Grutas de Xoxafi, 5 km N of Lagunillas, Hidalgo, México, August 19, 1965 (J. Reddell, J. Fish, W. Bell).

Distribution. Caves of eastern Mexico.

Other Records. Querétaro: Sótano de Dos Arañas Grandes, 1½ km E of Río Blanco, July 9, 1967 (J. Reddell, J. Fish), male, female, immature. San Luis Potosí: Cueva Segunda, El Guayalote, July 17, 1967 (J. Reddell, W. Russell, J. Fish), female.

Physocyclus merus, new species

FIGURES 39-42

Diagnosis. Typical, well marked species with rounded cheliceral spur of male near middle of segment, related to *enaulus* but readily recognized by epigynum (fig. 42) with sharp, brown horns and male palpus (fig. 40) with distinctive embolus.

Etymology. Specific name from Latin *merus*, pure, unmixed.

Female. Total length, 5.3 mm. Carapace, 2 mm long, 2 mm wide. Abdomen, 3.3 mm long, 2.5 mm wide.

Epigynum (figs. 41-42) as shown in ventral and lateral views.

Male. Total length, 5.7 mm. Carapace,

2.7 mm long, 2.7 mm wide. Abdomen, 3.2 mm long, 2.8 mm wide.

Chelicera of male (fig. 39) with rounded, toothed spur placed near middle of segment.

Male palpus (fig. 40) with embolus of distinctive shape.

Type Data. Male holotype and male and two females from Sumidero de Matehuala, 5 km E of Matehuala, San Luis Potosí, México, August 3, 1966 (D. McKenzie, J. Reddell).

Distribution. Known only from above specimens.

Physocyclus pedregosus, new species

FIGURES 43-46

Diagnosis. Typical species with shorter cheliceral spurs on male than those of *hoogstraali*, distinctive epigynum (fig. 44) and male palpus (fig. 46).

Etymology. Specific name from Spanish *pedregosus*, stony.

Female. Total length, 6.7 mm. Carapace, 2.7 mm long, 2.8 mm wide. Abdomen, 4.5 mm long, 3.8 mm wide.

Base color of carapace pale yellow, without distinctive darker pattern; legs yellowish to light brown, with usual dusky rings scarcely apparent; abdomen gray.

Epigynum (fig. 44) as shown in ventral and lateral views.

Male. Total length, 5.8 mm. Carapace, 2.7 mm long, 2.7 mm wide. Abdomen, 3.3 mm long, 2.8 mm wide.

Chelicera of male (fig. 45) curved upward as seen in lateral view.

Male palpus (fig. 46) with embolus a rounded sclerite and thin apical spur.

Type Data. Male holotype and five females from Pedregosa Circle Cave, 32 km SE of Cuatro Ciénegas, Coahuila, México, December 30, 1967 (J. Reddell, W. Russell).

Physocyclus bicornis, new species

FIGURES 66-69

Diagnosis. Small, well marked species with

two spurs on each chelicera of male (fig. 66), distinctive epigynum (fig. 68) and male palpus (fig. 67) as shown.

Etymology. Specific name from Latin *bis*, twice, *cornu*, horn, two horned.

Female. Total length, 4.4 mm. Carapace, 1.4 mm long, 1.4 mm wide. Abdomen, 3 mm long, 2.5 mm wide.

Base color of cephalothorax and appendages dull orange, with typical dusky pattern distinct; abdomen gray, with faint dusky spots and epigynal ridges dark brown.

Epigynum (fig. 68) with small sharp horns in front.

Male. Total length, 3.8 mm. Carapace, 1.5 mm long, 1.5 mm wide. Abdomen, 3.2 mm long, 2.5 mm wide.

Chelicera (fig. 66) with prominent, apically pointed apophysis at middle and below it small, sharp secondary spur; frontal face without conical elevations.

Male palpus (fig. 67) with broad embolus as shown.

Type Data. Male holotype, four females and immature from Grutas de Juxtlahuaca, 6½ km N of Colotlipa, Guerrero, January 16, 1941 (C. Bolívar, F. Bonet).

Distribution. Known only from above cave.

Other Record. Guerrero: Grutas de Juxtlahuaca, August 15, 1966 (J. Fish, J. Reddell), two males, female, immature.

Physocyclus modestus, new species

FIGURES 47-49

Diagnosis. Strongly marked, near relative of *bicornis* with single small subapical spur on male chelicera; epigynum (fig. 49) with small apical horns and male palpus with quadrate embolus of distinct form.

Etymology. Specific name from Latin *modestus*, moderate.

Female. Total length, 3.2 mm. Carapace, 1.3 mm long, 1.3 mm wide. Abdomen, 1.8 mm long, 1.5 mm wide.

Base color of carapace and appendages orange, with typical dusky pattern well marked; abdomen gray, with pattern of blue spots covering most of dorsum and sides.

Epigynum as shown in figure 49.

Male. Total length, 3.4 mm. Carapace, 1.6 mm long, 1.6 mm wide. Abdomen, 1.8 mm long, 1.5 mm wide.

Chelicera (fig. 48) with prominent, dark brown apophysis on side margin drawn apically to small spur and lacking conical elevations on front.

Male palpus (fig. 47) with quadrate embolus of distinctive form.

Type Data. Male holotype, female and immature from Grutas de Cacahuamilpa, Guerrero, México, September 2, 1966 (J. and W. Ivie).

Distribution. Caves and outside stations in Guerrero.

Other Record. Guerrero: Grutas de Cacahuamilpa, March 4, 1963 (W. J. Gertsch, W. Ivie), penultimate male in entrance zone; 11 km S of Chilpancingo, July 29, 1956 (W. J. Gertsch, V. Roth), males and females.

Physocyclus validus, new species

FIGURES 50-52

Diagnosis. Near relative of *bicornis* with single, prominent median spur on male chelicera (fig. 54), epigynum (fig. 52) without horns in front and male palpus (fig. 51) with long, curved embolus.

Etymology. Specific name from Latin *validus*, strong.

Female. Total length, 4.5 mm. Carapace, 1.7 mm long, 1.7 mm wide. Abdomen, 3.2 mm long, 2.5 mm wide.

Epigynum (fig. 52) with brown band in front of genital groove and central impressed spot but lacking horns.

Male. Total length, 3.7 mm. Carapace, 1.7 mm long, 1.7 mm wide. Abdomen, 2.2 mm long, 1.5 mm wide.

Chelicera (fig. 50) with prominent, toothed horn at center of segment but without accessory horn below.

Male palpus (fig. 51) with unusually thin tarsal process and long, curved embolus.

Type Data. Male holotype, males, females and immature from Cueva de la Finca, Coquimatlán, Colima, México, January 20, 1943

(F. Bonet).

Distribution. Caves and outside situations from Colima to Puebla.

Other Records. *Colima*: 14½ km S of Colima, July 29, 1964 (W. J. Gertsch, J. Woods), males, females. *Guerrero*: 19 km S of Iguala, July 29, 1956 (V. Roth, W. J. Gertsch), males, females. *Puebla*: Matamoros de Izúcar, September 1, 1966 (J. and W. Ivie), male.

Physocyclus laetus, new species

FIGURE 61

Diagnosis. Small relative of *bicornis* with distinctive epigynum (fig. 61).

Etymology. Specific name from Latin *lautus*, elegant.

Female. Total length, 2.85 mm. Carapace, 1.35 mm long, 1.2 mm wide. Abdomen, 1.5 mm long, 1.25 mm wide.

Cephalothorax and appendages dull yellow, with typical dusky pattern well marked; abdomen gray, with many small dusky spots.

Epigynum (fig. 61) with inconspicuous, barely discernible horns in front and behind on genital margin a pair of rounded projections.

Type Data. Female holotype from Cueva de la Finca, Coquimatlán, Colima, January 20, 1943 (F. Bonet).

Distribution. Known only from above specimen.

Genus *Modisimus* Simon

This distinctive American genus is usually

Figs. 47-49. *Physocyclus modestus*, new species. 47. Left male palpus, retrolateral view. 48. Left male chelicera, retrolateral view. 49. Epigynum, ventral view.

Figs. 50-52. *Physocyclus validus*, new species. 50. Left male chelicera, retrolateral view. 51. Left male palpus, retrolateral view. 52. Epigynum, ventral view.

Figs. 53-55. *Modisimus reddelli*, new species. 53. Epigynum, ventral view. 54. Left male palpus, retrolateral view. 55. Male chelicerae, frontal view.

Fig. 56. *Modisimus pusillus*, new species. Epigynum, ventral view.

Figs. 57-60. *Modisimus mitchelli*, new species. 57. Male chelicerae, frontal view. 58. Epigynum, ventral view. 59. Left male chelicera, retrolateral view. 60. Left male palpus, retrolateral view.

Fig. 61. *Physocyclus laetus*, new species. Epigynum, ventral view.

Figs. 62-63. *Modisimus mckenziei*, new species. 62. Epigynum, ventral view. 63. Left male palpus, retrolateral view.

easily recognized by the prominently elevated eye turret. The anterior median eyes are minute in most species and obsolete in many. The curvature of the posterior eye row is variable, rarely recurved, and most often with a degree of procurvature. The epigyna of the females are rounded, truncated, transverse plaques that present few characters except vague color patterns. The chelicerae of the males bear short spinules that sometimes are grouped in distinctive fashion. The male palpi are all of similar design but present differences in the size and position of the femoral spurs and differences in the tarsal processes.

Modisimus boneti, new species

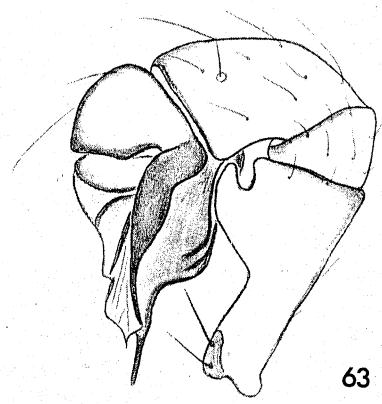
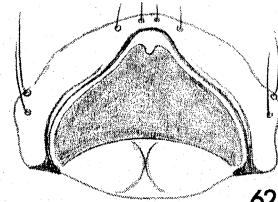
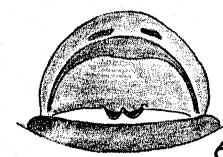
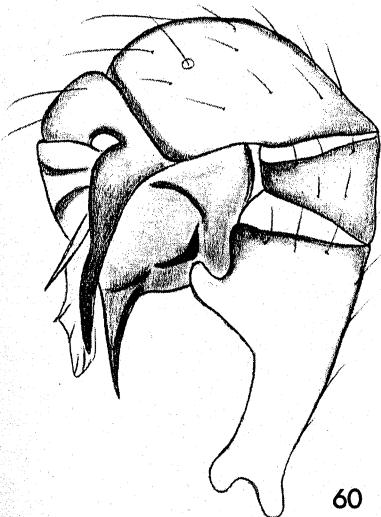
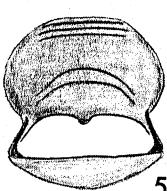
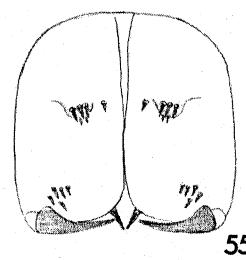
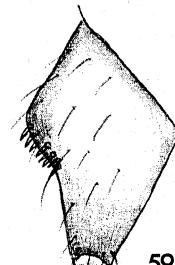
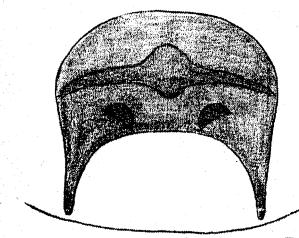
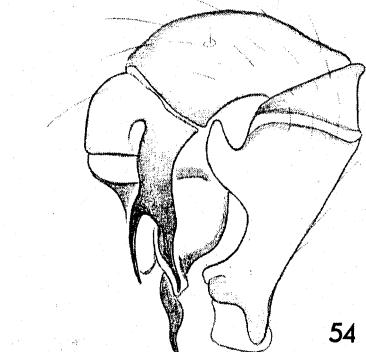
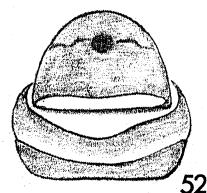
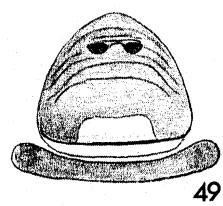
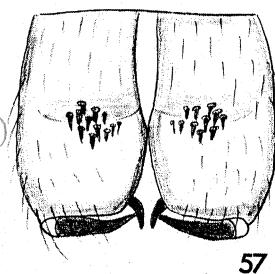
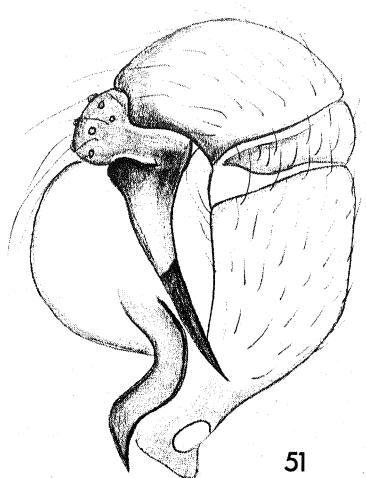
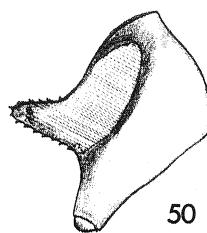
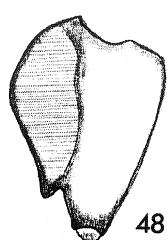
FIGURES 74-76

Diagnosis. Typical species of genus with elevated ocular turret, readily separated by following characters: anterior median eyes minute, placed between upper edges of large lateral eyes; epigynum (fig. 74) drawn to weak point behind; chelicera of male with thin spinules scattered over front face; male palpus as shown in figure 76.

Etymology. Named for Dr. Federico Bonet of the Instituto Politécnico in Mexico City.

Female. Total length, 3.7 mm. Carapace, 1.3 mm long, 1.2 mm wide. Abdomen, 2.6 mm long, 2 mm wide.

Cephalothorax dull yellow, with dusky clypeus, blackish cervical and cephalic grooves; eye turret dusky brown and eye tubercles ringed with black; sternum and coxae dusky brown; labium and endites blackish; legs brown, with pale rings at ends of



femora and tibiae. Abdomen pale green, reticulated in gray, with pale median longitudinal narrow stripe and lateral stripe.

Carapace subtriangular; clypeus wide, produced forward and rounded at apex; cephalic sutures deep and cervical groove a deep linear depression running back nearly to posterior margin. Eye turret prominent, as high as rest of carapace; front eye row procurved, with lateral eyes separated by radius and tiny middle eyes present above upper edges of lateral eyes; posterior eye row moderately procurved, with median eyes separated by diameter. Clypeus very high, 0.7 mm, equal to about six diameters of anterior lateral eye.

First leg: femur, 8.5 mm, patella, 0.6 mm, tibia, 9 mm, metatarsus, 13.8 mm, tarsus, 1.7 mm; total, 33.6 mm. First femur 6.5 times, first leg 25 times as long as carapace.

Epigynum (fig. 74) a broad, transverse plate drawn to small point behind.

Male. Total length, 3.1 mm. Carapace, 1.3 mm long, 1.3 mm wide. Abdomen, 2 mm long, 1.6 mm wide.

Structure like that of female. Front face of chelicera covered thickly with short, fine spinules.

First leg: femur, 9.5 mm, patella, 0.65 mm, tibia, 0.5 mm, metatarsus, 14.7 mm, tarsus, 1.7 mm; total, 36.05 mm. First femur seven times, first leg 28 times as long as carapace.

Male palpus (fig. 76) typical of genus, with principal distinctions in the tarsal process.

Type Data. Male holotype from Cueva Chica, 2½ km NE of El Pujal, San Luis Potosí, México, June 5, 1967 (R. Mitchell).

Distribution. Caves of San Luis Potosí and Tamaulipas.

Other Records. *San Luis Potosí:* Cueva

Chica, El Pujal, April 4, 1942 (C. Bolívar, F. Bonet), males, females, immature; March 12, 1940 (W. Bridges), males, females; March 20, 1940 (Bishop), female from deepest point in cave; March 26, 1964 (T. Raines, D. McKenzie, B. Bell), female; May 23, 1971 (W. Elliott), female; June 5, 1967 (R. Mitchell), male, four females; July 22, 1969 (S. and J. Peck), two males, immature. *Tamaulipas:* Cueva de la Florida, 7½ km NE of Antiguo Morelos, May 28, 1968 (J. Reddell), male and female from main passage and bat domes; March 10, 1969 (J. Reddell, S. Fowler, B. Cook), immature.

Modisimus rainesi, new species

FIGURES 70-72

Diagnosis. Slightly smaller, near relative of *boneti* with lower ocular turret and shorter legs, easily recognized by following features: Epigynum (fig. 72) with posterior margin straight; chelicera of male with small comb of setae on frontal face; male palpus as shown in figures 70-71.

Etymology. Named for Mr. T. Raines.

Female. Total length, 2.7 mm. Carapace, 1.1 mm long, 1.2 mm wide. Abdomen, 1.8 mm long, 1.6 mm wide.

Coloration and structure like those of *boneti*. Abdomen quite uniform green. Ocular turret of medium height; anterior lateral eyes separated by full diameter; anterior median eyes present or obsolete; posterior eye row essentially straight, with median eyes separated by diameter; clypeus of medium height, 0.55 mm, equal to about five diameters of anterior lateral eye.

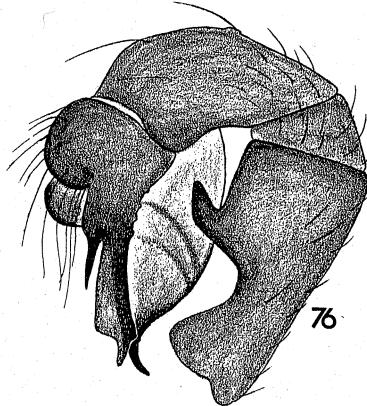
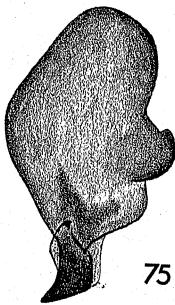
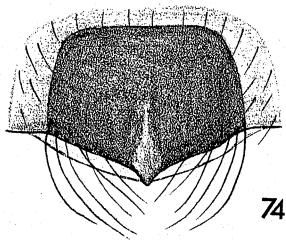
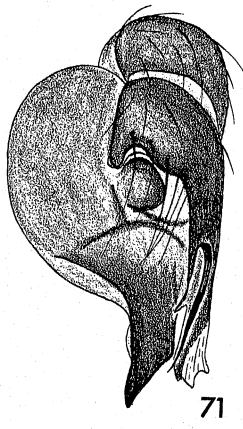
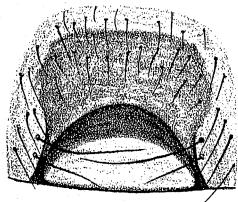
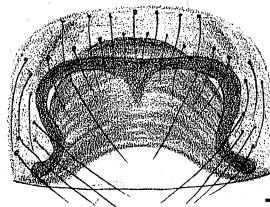
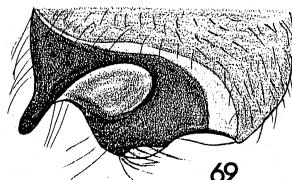
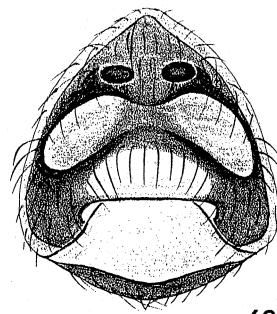
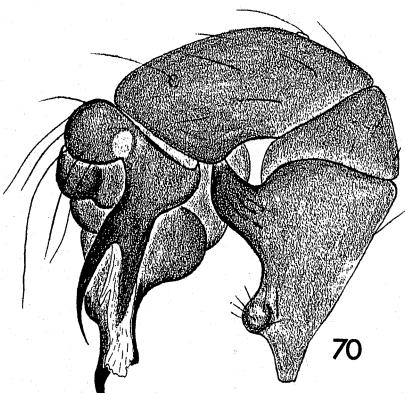
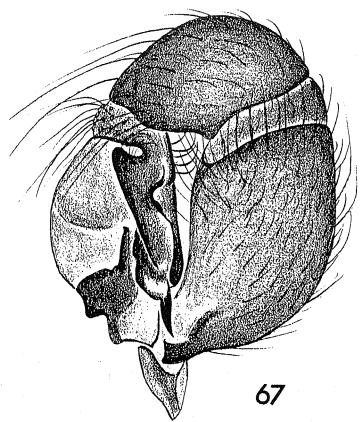
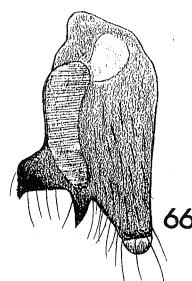
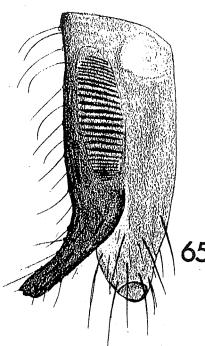
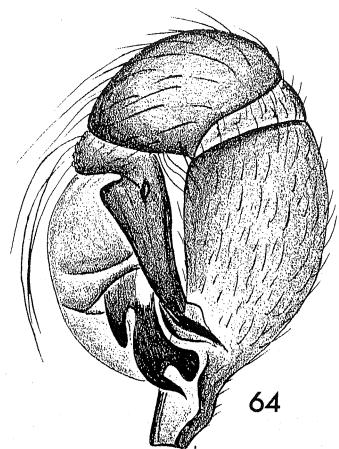
Figs. 64-65. *Physocyclus hoogstraali* Gertsch and Davis. 64. Left male palpus, retrolateral view. 65. Left male chelicera, retrolateral view.

Figs. 66-69. *Physocyclus bicornis*, new species. 66. Left male chelicera, retrolateral view. 67. Left male palpus, retrolateral view. 68. Epigynum, ventral view. 69. Epigynum, retrolateral view.

Figs. 70-72. *Modisimus rainesi*, new species. 70. Left male palpus, retrolateral view. 71. Left male palpus, frontal view. 72. Epigynum, ventral view.

Fig. 73. *Modisimus pusillus*, new species, Epigynum, ventral view.

Figs. 74-76. *Modisimus boneti*, new species. 74. Epigynum, ventral view. 75. Bulb of left male palpus, frontal view. 76. Left male palpus, retrolateral view.



First leg: femur, 6.5 mm, patella, 0.5 mm, tibia, 6.8 mm, metatarsus, 9.2 mm, tarsus, 1.7 mm; total, 24.7 mm. First femur six times, first leg 22 times as long as carapace.

Epigynum (fig. 72) with posterior edge straight and with sclerotized pattern as shown.

Male. Total length, 2.7 mm. Carapace, 1.1 mm long, 1.2 mm wide. Abdomen, 1.8 mm long, 1.5 mm wide.

Chelicera with thin scattered spinules on frontal face but with series of four or five forming small but conspicuous black comb at middle. Ocular turret of medium height; clypeus, 0.62 mm high, equal to about six diameters of an anterior lateral eye; posterior eye row gently recurved.

First leg: femur, 8.5 mm, patella, 0.6 mm, tibia, 8.5 mm, metatarsus, 11.5 mm, tarsus, 1.8 mm; total, 30.9 mm. First femur about eight times, first leg 28 times as long as carapace.

Male palpus (fig. 70) differing from that of *boneti* as shown.

Type Data. Male holotype from Cueva de la Boca, 5 km NE of Santiago, Nuevo León, México, January 27, 1967 (T. Raines).

Distribution. Known only from Cueva de la Boca.

Other Records. *Nuevo León:* Cueva de la Boca, July 13, 1942 (C. Bolívar, Maldonado, B. Osorio, D. Peláez), five males, female; May 1, 1966 (J. Fish, E. Alexander), male, two females, immature; December 4, 1969 (T. Raines), two males, two females; June 17, 1944 (F. Bonet), three females; June 20, 1969 (S. and J. Peck), male, female.

Modisimus reddelli, new species

FIGURES 53-55

Diagnosis. Pallid species related to *boneti*, readily separated by following features: ocular turret of medium height; anterior median eyes obsolete; epigynum (fig. 53) as shown; chelicera of male (fig. 55) with small comb of few spinules at middle of frontal face.

Etymology. Named for Mr. James Reddell.

Female. Total length, 2 mm. Carapace,

1.1 mm long, 1.15 mm wide. Abdomen, 1.7 mm long, 1.5 mm wide.

Cephalothorax and appendages uniform yellowish brown; eye tubercles black; abdomen whitish.

Structure similar to that of *boneti*. Eye turret of medium height; anterior lateral eyes separated by radius; anterior median eyes obsolete, represented by single pale vestige; posterior eye row moderately procurved with median eyes separated by diameter. Clypeus high, 0.58 mm, equal to about five diameters of anterior lateral eye.

First leg: femur, 7 mm, patella, 0.5 mm, tibia, 7.3 mm, metatarsus, 10.8 mm, tarsus, 1.7 mm; total, 27.3 mm. First femur about six times, first leg 25 times as long as carapace.

Epigynum as shown in figure 53.

Male. Total length, 2.7 mm. Carapace, 1.1 mm long, 1.15 mm wide. Abdomen, 1.7 mm long, 1.5 mm wide.

Front face of chelicera (fig. 55) with small, rounded process at middle set with three black spinules.

First leg: femur, 7.3 mm, patella, 0.5 mm, tibia, 7.7 mm, metatarsus, 11.5 mm, tarsus, 1.7 mm; total, 28.7 mm. First femur 6.7 times, first leg 26 times as long as carapace.

Male palpus (fig. 54) with thick femoral spur near base and bifid tarsal process.

Type Data. Male holotype and female from Cueva Bonita, 3 km SW of Victoria, Tamaulipas, México, June 19, 1967 (J. Fish).

Distribution. Known only from above material.

Modisimus mitchelli, new species

FIGURES 57-60

Diagnosis. Near relative of *boneti* with prominently elevated ocular turret, readily separated by following features: epigynum (fig. 58) truncated behind; chelicera of male (fig. 57) with rounded enlargement at middle of frontal face armed with patch of black spinules; male palpus (fig. 60) with distinctive femoral spur.

Etymology. Named for Professor Robert

W. Mitchell of Texas Tech University.

Female. Total length, 2.75 mm. Carapace, 1.15 mm long, 1.2 mm wide. Abdomen, 1.7 mm long, 1.5 mm wide.

Coloration and structure similar to those of *boneti*. Abdomen bright green, reticulated with gray. Ocular turret prominent; anterior lateral eyes close together, separated by less than radius; anterior median eyes present or obsolete, represented by pair of or single black points; posterior eye row moderately procurved, with median eyes separated by about their diameter; clypeus high, 0.7 mm, equal to about seven diameters of anterior lateral eye.

First leg: femur, 6.3 mm, patella, 0.5 mm, tibia, 6.7 mm, metatarsus, 9.7 mm, tarsus, 2.1 mm; total, 25.3 mm. First femur 5.5 times, first leg 22 times as long as carapace.

Epigynum (fig. 58) a sclerotized plaque with dusky pattern.

Male. Total length, 2.8 mm. Carapace, 1.2 mm long, 1.2 mm wide. Abdomen, 1.7 mm long, 1.3 mm wide.

Chelicera (figs. 57, 59) with rounded enlargement at middle of front face bearing cluster of about 15 black spinules. Eye triads more widely separated; anterior lateral eyes separated by two-thirds their diameter; posterior median eyes separated by one and one-half diameters.

First leg: femur, 8.5 mm, patella, 0.6 mm, tibia, 8.7 mm, metatarsus, 14 mm, tarsus, 2.5 mm; total, 34.3 mm. First femur seven times, first leg 28 times as long as carapace.

Male palpus (fig. 60) of typical design, with distinctive features on tarsal process.

Type Data. Male holotype from Cueva de la Capilla, 13½ km NW of Gómez Farías, El Porvenir, Tamaulipas, January 13, 1971 (J. Reddell, R. Mitchell, and group).

Distribution. Caves of Tamaulipas.

Other Records. *Tamaulipas*: Cueva de la Capilla, El Porvenir, January 13, 1971 (J. Reddell, R. Mitchell, and group), three males, four females, immature; January 28, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George), male, two females. Cueva de la Miná, 7 km NW of Gómez Farías, June 3, 1967 (R. Mitchell), female; March 24, 1967

(R. Mitchell), two males; June 3, 1967 (R. Mitchell), male, two females; July 1, 1969 (S. Peck, R. Norton), female, immature; March 9, 1969 (J. Reddell), female; January 27, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George), female, immature. Harrison Sinkhole, Rancho del Cielo, March 25, 1967 (R. Mitchell), male, female, immature; January 12, 1971 (J. Cooke, M. Brownfield, W. Elliott), male, three females, immature. Crystal Cave, Rancho del Cielo, January 10, 1971 (J. Reddell, J. Cooke, S. Wylie, V. Tipton), female, immature. Cueva del Infernillo, San José, June 4, 1967 (R. Mitchell), three females, immature. Cueva Chica de la Perra, 7,000 feet, 13½ km NW of Gómez Farías, July 2, 1969 (S. Peck, R. Norton), male immature. Sótano de la Joya de Salas, 21 km W of Gómez Farías, January 23, 1965 (D. McKenzie), four males, female; November 25, 1966 (O. Knox, E. Alexander), two males, two females. Cueva de Rancho del Cielo #3, Rancho del Cielo, July 4, 1967 (S. and J. Peck), male, immature. Sótano de El Porvenir, El Porvenir, January 13, 1971 (W. Elliott, J. Cooke), two males, two females. Sótano de El Refugio, 20 km SW of Gómez Farías, July 14, 1967 (J. Fish), male, two females, immature.

Modisimus mckenziei, new species

FIGURES 62-63

Diagnosis. Small, dusky species related to *boneti*, separated by following features: eye turret of medium height and anterior median eyes obsolete; epigynum (fig. 62) of distinctive form; male palpus as shown in figure 63.

Etymology. Named for Mr. David McKenzie.

Female. Total length, 2.3 mm. Carapace, 0.8 mm long, 0.84 mm wide. Abdomen, 1.6 mm long, 1.1 mm wide.

Cephalothorax and appendages dusky brown; eye tubercles black; abdomen gray, marked thickly with dusky spots.

Eye turret of medium height; anterior lateral eyes separated by about third of their diameters; anterior median eyes obsolete; posterior eye row moderately procurved, with

median eyes separated by nearly their diameter; clypeus, 0.6 mm, about as high as six diameters of anterior lateral eye.

First leg: femur, 4.2 mm, patella, 0.3 mm, tibia, 4.3 mm, metatarsus, 6.4 mm, tarsus, 1.4 mm; total, 16.6 mm. First femur five times, first leg 20 times as long as carapace.

Epigynum (fig. 62) subtriangular in form.

Male. Total length, 1.6 mm. Carapace, 0.75 mm long, 0.75 mm wide. Abdomen, 0.9 mm long, 0.6 mm wide.

Chelicera with small patch of black spinules just above middle of frontal face, longer than those of *mitchelli* and nearer inner margin. Abdomen greenish.

First leg: femur, 4.3 mm, patella, 0.3 mm, tibia, 4.6 mm, metatarsus, 6.4 mm, tarsus, 1.3 mm; total, 16.9 mm. First femur about six times, first leg 22 times as long as carapace.

Male palpus (fig. 63) with heavy femoral spur and distinctive tarsal process.

Type Data. Male holotype and female from Sótano del León, Gómez Farías, Tamaulipas, México, May 20, 1971 (W. Elliott).

Modisimus pusillus, new species

FIGURE 56

Diagnosis. Small, pale species related to *boneti*, readily recognized by following features: eyes close together, with anterior lateral eyes separated by their radius; epigynum (fig. 56) constricted on sides.

Etymology. Specific name from Latin *pusillus*, tiny, puny.

Female. Total length, 1.8 mm. Carapace, 0.65 mm long, 0.73 mm wide. Abdomen, 1.3 mm long, 1.1 mm wide.

Cephalothorax and appendages dull orange; carapace with faint radiating dusky streaks and eyes ringed with black; abdomen whitish.

Eye turret of medium height; anterior lateral eyes separated by radius and anterior median eyes vestigial, represented by trivial black specks; posterior eye row faintly procurved, with median eyes separated by their diameter; clypeus of medium height, 0.4 mm, equal to about five diameters of an anterior

lateral eye.

First leg: femur, 3.5 mm, patella, 0.3 mm, tibia, 3.7 mm, metatarsus, 5 mm, tarsus, 1.4 mm; total, 13.9 mm. First femur 5.2 times, first leg 21 times as long as carapace.

Epigynum as shown in figure 56.

Type Data. Female holotype from Grutas de García, Nuevo León, México, June 14, 1942 (F. Bonet, B. Osorio, D. Pelaez).

Distribution. Known only from above specimen.

Genus *Psilochorus* Simon

This is the largest pholcid genus of North America and comprises many mostly small, eight-eyed, long-legged spiders that always have the anterior median eyes present. In cave adapted species all the eyes are reduced in size.

The typical structural features for the species described below are the following: The carapace is subround, convex, with the clypeus prominent and rounded at apex. The cervical groove is a deep linear depression and the cephalic grooves are prominent. The eight eyes are in a close-set group on an elevation of medium size and consist of two triads of large eyes and the pair of small anterior median eyes. The front eye row is slightly procurved or essentially straight and the posterior row is moderately recurved or straight. The epigyna of the females are often of distinctive form but some species present trivial sclerotized bands in front and behind the genital orifice offering little for separating the species. In *diablo* and *tellezi* the sternum is produced behind to a pointed spur possibly associated with the mating process. Identification of males is made easy by presence of distinctive spurs on the chelicerae and by details of the male palpus.

Psilochorus cordatus (Bilimek)

Pholcus cordatus Bilimek, 1867, p. 907.

Pholcus cacahuamilpensis Herrera, 1892, p. 41.

Discussion. The species described as *cordatus* by Bilimek is of quite uncertain position but the name is tentatively assigned to a *Psilochorus* known from Grutas de Cacahuamilpa.

Records. *Guerrero:* Grutas de Cacahuamilpa, September 2, 1966 (J. and W. Ivie), two males, 10 females; October 24, 1942 (C. Bolívar, D. Peláez), male; August 24, 1965 (J. Reddell, J. Fish, W. Bell), immature.

Psilochorus diablo, new species

FIGURES 77-81

Diagnosis. Small, pale species, with eyes reduced in size, possibly troglobite, with following features: sternum of female (fig. 79) with prominent process projecting downward from between posterior coxae; male chelicera (fig. 78) with sharp spur near apex; male palpus (fig. 77) with tarsal process of distinctive form.

Etymology. Specific name from Spanish *diablo*, devil, named for Cueva del Diablo.

Female. Total length, 2 mm. Carapace, 0.8 mm long, 0.8 mm wide. Abdomen, 1.2 mm long, 1.2 mm wide.

Cephalothorax and appendages pale yellow; eyes narrowly ringed with black; abdomen whitish.

Front eye row moderately recurved, with lower edges of four eyes touching; anterior median eyes small, about one-third diameter of anterior lateral eye; posterior eye row gently recurved; posterior median eyes separated by long diameter. Sternum (fig. 79) with prominent, downwardly projecting process set at apex with stiff hairs, placed between posterior coxae, somewhat variable in length among the specimens.

First leg: femur, 3 mm, patella, 0.3 mm, tibia, 2.7 mm, metatarsus, 3.2 mm, tarsus, 0.7 mm; total, 9.9 mm. First femur 3.7 times, first leg 12 times as long as carapace.

Epigynum (fig. 80) a broad, downwardly projecting process.

Male. Total length, 1.6 mm. Carapace, 0.7 mm long, 0.7 mm wide. Abdomen, 0.9 mm long, 0.75 mm wide.

Posterior eye row essentially straight. Cheli-

cera (fig. 78) with small, sharp spur near apex of segment. Sternum without projection.

First leg: femur, 4 mm, patella, 0.3 mm, tibia, 4.2 mm, metatarsus, 4.6 mm, tarsus, 0.9 mm; total, 14 mm. First femur about six times, first leg 20 times as long as carapace.

Male palpus (fig. 77) with slender femoral spur and distinctive bulbal features.

Type Data. Male holotype from Cueva del Diablo, 1 km W of Salaices, 35 km N of Parral, Chihuahua, México, July 17, 1956 (V. Roth, W. J. Gertsch).

Distribution. Known only from Cueva del Diablo.

Other Records. *Chihuahua:* Cueva del Diablo, July 23, 1947 (W. J. Gertsch), male, two females from mouth of cave, two females from total darkness inside entrance; July 17, 1956 (V. Roth, W. J. Gertsch), male, two females, immature; September 21, 1965 (J. Reddell, J. Fish), male, three females.

Psilochorus fishi, new species

FIGURES 84-86

Diagnosis. Small, pale species similar to *russelli* but distinguished as follows: legs shorter, with first femur only 3.7 times as long as carapace; epigynum (fig. 86) distinctly trilobed behind; chelicera of male (fig. 85) with sharp spur above middle of front face.

Etymology. Named for Mr. John Fish.

Female. Total length, 2 mm. Carapace, 0.85 mm long, 0.9 mm wide. Abdomen, 1.2 mm long, 1 mm wide.

Cephalothorax and appendage pale orange; eyes ringed with black and grooves on carapace and face of clypeus dusky; abdomen dull white.

Anterior median eyes small, one-third diameter of large anterior lateral eyes; posterior median eyes separated by nearly one and one-half diameters.

First leg: femur, 3.2 mm, patella, 0.35 mm, tibia, 3.3 mm, metatarsus, 3.7 mm, tarsus, 1.1 mm; total, 11.65 mm. First femur 3.7 times, first leg 13.7 times as long as carapace.

Epigynum (fig. 86) a transverse, sclerotized band with three weak lobes at genital groove.

Male. Total length, 1.8 mm. Carapace, 0.8 mm long, 0.8 mm wide. Abdomen, 1.1 mm long, 0.9 mm wide.

Chelicera (fig. 85) with sharp spur projecting out of face just above middle.

First leg: femur, 3 mm, patella, 0.35 mm, tibia, 2.7 mm, metatarsus, 3.1 mm, tarsus, 1 mm; total, 10.15 mm. First femur 3.7 times, first leg 12.7 times as long as carapace.

Male palpus (figs. 84-84a) with tarsal process turned to right angle.

Type Data. Male holotype, and three males and 18 females, from Grutas de Xoxafi, 5 km N of Lagunillas, Hidalgo, México, August 19, 1965 (J. Reddell, J. Fish, W. Bell).

Distribution. Known only from above collection.

Psilochorus tellezi, new species

FIGURES 82-83

Diagnosis. Small long-legged species readily recognized by lobate epigynum (fig. 83) and presence on sternum (fig. 82) of short, conical process.

Etymology. Named for Mr. C. Tellez of Mexico City.

Female. Total length, 1.5 mm. Carapace, 0.7 mm long, 0.7 mm wide. Abdomen, 1 mm long, 0.8 mm wide.

Cephalothorax and appendages dusky yellow; eyes ringed with black; abdomen whitish.

Anterior median eyes small, one-third diameter of large lateral eyes; posterior median eyes separated by their diameter. Sternum with small conical projection on posterior margin (fig. 82), set with several long hairs.

Figs. 77-81. *Psilochorus diablo*, new species. 77. Left male palpus, retrolateral view. 78. Left male chelicera, retrolateral view. 79. Sternum of female, ventral view. 80. Epigynum, posterior view. 81. Epigynum, retrolateral view.

Figs. 82-83. *Psilochorus tellezi*, new species. 82. Sternum of female, ventral view. 83. Epigynum, ventral view.

Figs. 84-86. *Psilochorus fishi*, new species. 84. Left male palpus, retrolateral view. 84a. Left male palpus, frontal view. 85. Left male chelicera, retrolateral view. 86. Epigynum, ventral view.

Figs. 87-89. *Psilochorus russelli*, new species. 87. Left male palpus, retrolateral view. 88. Left male chelicera, retrolateral view. 89. Epigynum, ventral view.

Figs. 90-91. *Psilochorus delicatus*, new species. 90. Epigynum, posterior view. 91. Epigynum, ventral view.

First leg: femur, 5.8 mm, patella, 0.3 mm, tibia, 6 mm, metatarsus, 7.7 mm, tarsus, 1.5 mm; total, 2.13 mm. First femur eight times, first leg 30 times as long as carapace.

Epigynum as shown in figure 83.

Type Data. Female holotype from Resumidero del Río San Gerónimo, Michapa, Guerrero, México, October 18, 1942 (C. Bolívar, C. Tellez).

Psilochorus russelli, new species

FIGURES 87-89

Diagnosis. Small, pale species, readily distinguished by following features: first femur of female 5.3 times as long as carapace; epigynum (fig. 89) a simple structure; chelicera of male (fig. 88) a small rounded spur bearing trivial spine located near apex of segment; male palpus (fig. 87) with thin tarsal process.

Etymology. Named for Mr. William Russell.

Female. Total length, 2 mm. Carapace, 0.75 mm long, 0.8 mm wide. Abdomen, 1.2 mm long, 0.9 mm wide.

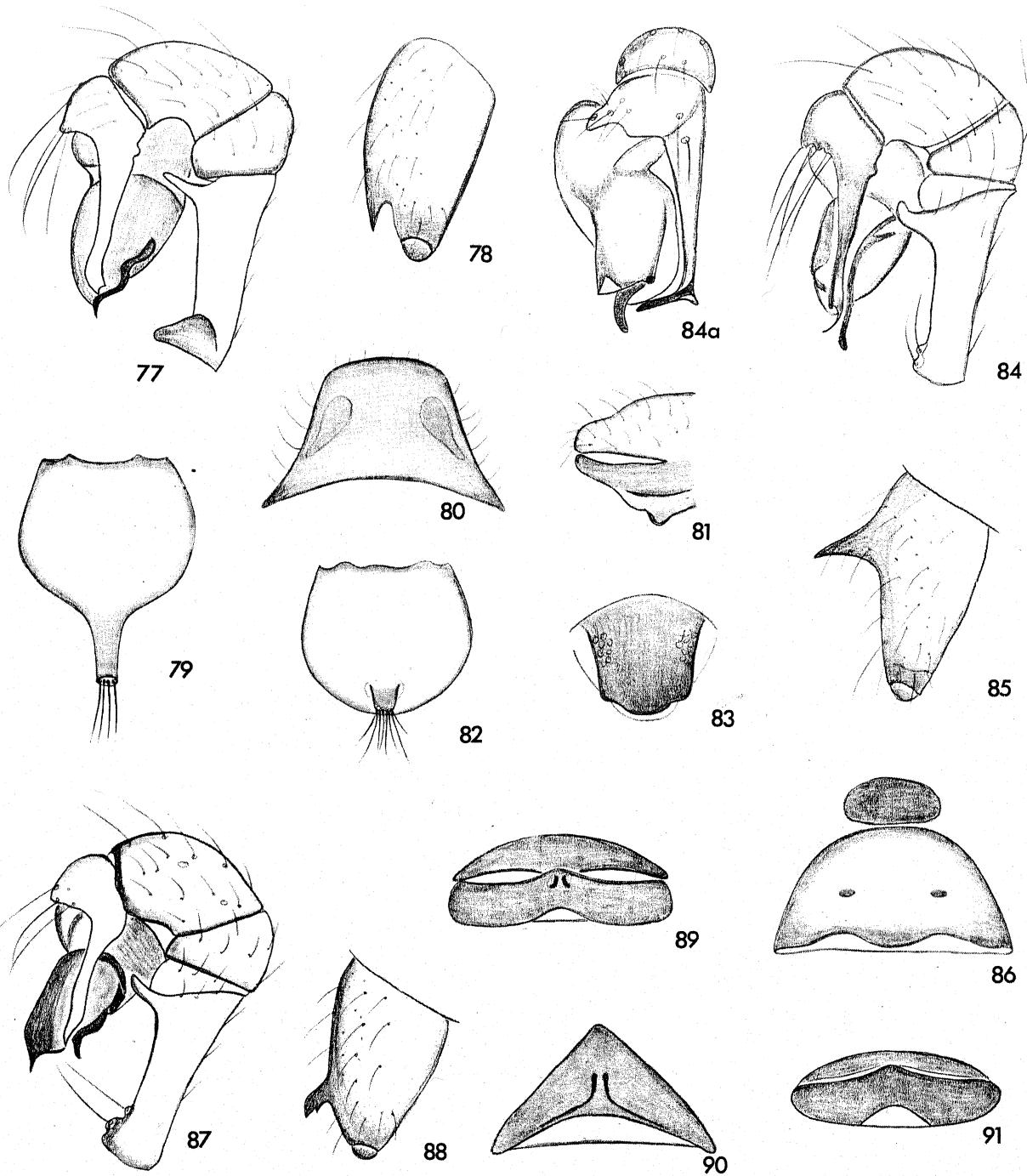
Cephalothorax and appendages pale yellow; eyes ringed with black and clypeus with dusky smudge; abdomen dull white.

Anterior median eyes very small, one-fourth diameter of large lateral eyes; posterior median eyes separated by about long diameter.

First leg: femur, 4 mm, patella, 0.6 mm, tibia, 4 mm, metatarsus, 4.7 mm, tarsus, 0.8 mm; total, 14.1 mm. First femur 5.3 times, first leg 18 times as long as carapace.

Epigynum (fig. 89) broadly rounded, sclerotized band without external features.

Male. Total length, 1.7 mm. Carapace, 0.75 mm long, 0.75 mm wide. Abdomen,



1.1 mm long, 0.9 mm wide.

Chelicera (fig. 88) with small rounded spur near distal end of segment provided with small spine.

First leg: femur, 5 mm, patella, 0.7 mm, tibia, 5.3 mm, metatarsus, 6.3 mm, tarsus, 1.3 mm; total, 18.6 mm. First femur about seven times, first leg about 25 times as long as carapace.

Male palpus (fig. 87) with thin femoral spur and slender, apically slightly curved tarsal process.

Type Data. Male holotype, and eight males and 16 females, from Cueva del Pedregoso, 32 km SE of Cuatro Ciénegas, Coahuila, México, December 30, 1967 (J. Reddell, W. Russell, W. Calvert).

Distribution. Caves of Coahuila.

Other Records. *Coahuila*: Pedregoso Circle Cave, 32 km SE of Cuatro Ciénegas, December 30, 1967 (J. Reddell, W. Russell), male. Pedregoso Pipe Cave, 32 km SE of Cuatro Ciénegas, December 29, 1967 (J. Reddell, W. Russell, W. Calvert), three females.

Psilochorus delicatus, new species

FIGURES 90-91

Diagnosis. Small, pale species, probable troglobite, readily distinguished by epigynum (fig. 90).

Etymology. Specific name from Latin *delicatus*, dainty.

Female. Total length, 1.7 mm. Carapace, 0.7 mm long, 0.68 mm wide. Abdomen, 1 mm long, 0.7 mm wide.

Cephalothorax and appendages whitish, with yellowish tinge; eye tubercles black; abdomen white.

Structure typical: anterior eye row moderately procurred, with upper edges of eyes forming straight line; anterior median eyes small, equal in size to radius of lateral eye, touching each other, separated from lateral eyes by two-thirds their diameter; posterior eye row straight, with median eyes separated by long diameter. Clypeus, 0.21 mm, equal in height to three diameters of anterior lateral eye.

First leg: femur, 3.4 mm, patella, 0.25 mm, tibia, 3.6 mm, metatarsus, 4 mm, tarsus, 1 mm; total, 12.25 mm. First femur about five times, first leg 17.5 times as long as carapace.

Epigynum (figs. 90-91) a simple, transverse elevation produced to subtriangular shape in posterior view.

Type Data. Female holotype and two immature from Cueva de los Riscos, Sierra de India, 6.5 km S of Mapimí, Durango, México, August 1964 (W. Russell).

Distribution. Known only from above specimens.

Genus *Pholcophora* Banks

The generic name *Pholcophora* is tentatively used for the shorter-legged and often six-eyed pholcids related to *Psilochorus*, heretofore placed in *Spermophora*, *Pholcophorina* and *Anopsicus*. In this series the legs are typically of medium length but they grade downward to very short. The eight eyes are all present in the genotype of *Pholcophora americana* of the northwestern United States, but in Mexico many species have lost the anterior median eyes. In addition to losing these eyes, the curvature of the posterior row is often strongly affected to form straight or strongly procurred rows. The six-eyed *Spermophora speophila* and the blind *Anopsicus pearsei* described by Chamberlin and Ivie from Yucatán caves seem clearly to belong in this genus. The species of *Pholcophora* are characterized by their small size, by global to oval abdomens, and differ little from those of *Psiolchorus*, of which they may ultimately be regarded merely as a subgenus. The epigyna of the females are simple sclerotized bands or plaques with little to distinguish the species. The chelicerae of the males bear distinctive spurs and their palpi present differences in the various elements.

Pholcophora texana Gertsch

Pholcophora texana Gertsch, 1935, p. 12.

Record. Nuevo León: Grutas de San Bartolo, 16 km S of Santa Catarina, February 1963 (W. Russell, D. McKenzie), female.

Pholcophora speophila (Chamberlin and Ivie)

Spermophora speophila Chamberlin and Ivie, 1938, p. 130, figs. 15, 16.

Records. Yucatán: Chac Mol Cave, Tohil, June 27, 1936, female holotype; Gongora Cave, Oxkutzcab, immature females from mouth and interior.

Pholcophora pearsei (Chamberlin and Ivie)

Anopsicus pearsei Chamberlin and Ivie, 1938, p. 130, figs. 17, 18.

Record. Yucatán: Oxolotl Cave, Kaua, June 18, 1936, female holotype, female and immature paratypes.

Pholcophora troglodyta, new species

FIGURES 92-94

Diagnosis. Small species with legs of medium length and small eyes, readily separated by following features: epigynum (fig. 94) a short plate; chelicera of male (fig. 93) with fairly long, sharp spur; male palpus (fig. 92) with tarsal process rounded at apex.

Etymology. Specific name from Latin *troglodyta*, cave dweller, used in apposition.

Female. Total length, 2.1 mm. Carapace, 0.9 mm long, 0.8 mm wide. Abdomen, 1.25 mm long, 1.1 mm wide.

Cephalothorax and appendages dull yellow; eyes narrowly ringed with black; abdomen whitish.

Carapace round, with cervical groove distinct linear depression and pars cephalica low; eye tubercle of medium height occupying one-half width of carapace at that point; six small eyes in two well separated triads, with posterior eye row straight; anterior lateral eyes separated by slightly more than long diameter; posterior median eyes separated by one

and one-half diameters.

First leg: femur, 2.5 mm, patella, 0.25 mm, tibia, 3 mm, metatarsus, 3.3 mm, tarsus, 0.8 mm; total, 9.85 mm. First femur 2.8 times, first leg about 11 times as long as carapace.

Epigynum (fig. 94) a small, sclerotized plaque, narrowed and rounded behind.

Male. Total length, 1.6 mm. Carapace, 0.7 mm long, 0.65 mm wide. Abdomen, 0.9 mm long, 0.7 mm wide.

Coloration and structure like those of female except as noted. Eyes smaller, with space between triads wider. Chelicera (fig. 93) with sharp spur projecting outward from middle of frontal face.

First leg: femur, 2.3 mm, patella, 0.25 mm, tibia, 2.4 mm, metatarsus, 3.2 mm, tarsus, 0.8 mm; total, 8.95 mm. First femur about three times, first leg 12.6 times as long as carapace.

Male palpus (fig. 92) with short femoral spur and broad, apically enlarged and rounded tarsal process.

Type Data. Male holotype from Grutas de Atoyac, Atoyaç, Veracruz, México, August 6, 1969 (S. and J. Peck).

Distribution. Known only from Grutas de Atoyac.

Other Records. Veracruz: Grutas de Atoyac, Atoyaç, November 13, 1941 (C. Bolívar, F. Bonet), two females; May 30, 1941 (C. Bolívar, F. Bonet), male, two females; August 22, 1965 (J. Reddell, J. Fish, W. Bell), three females; August 6, 1969 (S. and J. Peck), eight females.

Pholcophora mitchelli, new species

FIGURE 98

Diagnosis. Small species with legs of medium length, small eyes on well separated triads, readily separated from other species by following features: first femur 2.7 times as long as carapace; epigynum (fig. 98) of distinctive form.

Etymology. Named for Professor Robert Mitchell of Texas Tech University.

Female. Total length, 2.3 mm. Carapace,

0.9 mm long, 0.8 mm wide. Abdomen, 1.4 mm long, 1.1 mm wide.

Cephalothorax and appendages dull yellow; eyes narrowly ringed with black; abdomen whitish.

Structure like that of *troglodyta*. Anterior lateral eyes separated by slightly more than long diameter; posterior median eyes separated by about two diameters; posterior eye row essentially straight.

First leg: femur, 2.4 mm, patella, 0.35 mm, tibia, 2.7 mm, metatarsus, 2.7 mm, tarsus, 0.7 mm; total, 8.85 mm. First femur 2.7 times, first leg 9.8 times as long as carapace.

Epigynum (fig. 98) a simple transverse plaque in front and behind genital groove.

Type Data. Female holotype and five females from Cueva de la Virgén de Guadalupe, 48 km SW of Soto de la Marina, Tamaulipas, México, October 31, 1970 (W. Russell, G. and J. Ediger).

Pholcophora gruta, new species

FIGURES 95-96, 137-138

Diagnosis. Pale, eyeless species readily separated by following features: female with small, curved spur on each side of pars thoracica, epigynum (fig. 138) a simple transverse band; chelicera of male (fig. 95) with thin spur at middle of chelicera; male palpus (fig. 96) with heavy femoral spur and wide, apically truncated tarsal process.

Etymology. Specific name from Spanish *gruta*, grotto, cave.

Female. Total length, 2 mm. Carapace, 1 mm long, 0.8 mm wide. Abdomen, 1.1 mm long, 0.9 mm wide.

Cephalothorax and appendages pale yellow; abdomen whitish, with pale hairs.

Structure typical of genus as shown in figure 137. Ocular tubercle rounded, of medium distinctness, occupying half width of carapace; eyes essentially obsolete, scarcely visible as pale vestiges on each side; posterior margin of pars thoracica with small curved spur on each side. Abdomen subglobose.

First leg: femur, 4 mm, patella, 0.35 mm, tibia, 4.2 mm, metatarsus, 5.3 mm, tarsus,

1.2 mm; total, 15.05 mm. First femur four times, first leg 15 times as long as carapace. Tibia and patella of fourth leg, 3.7 mm.

Epigynum (fig. 138) a small, sclerotized, transverse band above genital groove.

Male. Total length, 1.9 mm. Carapace, 0.95 mm long, 0.85 mm wide. Abdomen, 1 mm long, 0.8 mm wide.

Coloration and structure essentially like those of female. Ocular tubercle narrower, occupying half width of carapace; eyes larger, with convex lenses more apparent. Posterior margin of pars cephalica broadly rounded, without side angles. Legs mostly lost; tibia and patella of fourth leg, 3.6 mm. Chelicera (fig. 95) with sharp spur at middle of frontal face.

Male palpus (fig. 96) of distinctive form.

Type Data. Female holotype and other female from Grutas de Juxtlahuaca, 6½ km N of Colotlipa, Guerrero, México, January 16, 1941 (C. Bolívar, F. Bonet).

Distribution. Known only from above cave.

Other Records. *Guerrero:* Grutas de Juxtlahuaca, August 15, 1966 (J. Fish, J. Reddell), male.

Pholcophora bolivari, new species

FIGURE 97

Diagnosis. Near relative of *troglodyta* but distinct in following features: legs longer and thinner, with first femur 3.5 times as long as carapace; epigynum (fig. 97) of distinctive form.

Etymology. Named for Dr. C. Bolívar y Pieltain of the Instituto Politécnico in Mexico City.

Female. Total length, 2.4 mm. Carapace, 0.9 mm long, 0.9 mm wide. Abdomen, 1.5 mm long, 1.1 mm wide.

Cephalothorax and appendages dusky orange; eyes narrowly ringed with black; abdomen whitish.

Structure like that of *troglodyta*. Anterior lateral eyes separated by slightly more than long diameter; posterior median eyes separated by slightly more than long diameter; posterior eye row gently recurved.

First leg: femur, 3.2 mm, patella, 0.35 mm, tibia, 3.5 mm, metatarsus, 3.6 mm, tarsus, 0.7 mm; total, 11.35 mm. First femur 3.5 times, first leg 12.6 times as long as carapace.

Epigynum (fig. 97) an inconspicuous plate with groove at each corner near genital groove.

Type Data. Female holotype from Cueva de los Cuarteles, Aldama, Tamaulipas, México, December 6, 1945 (C. Bolívar, F. Bonet, J. Alvarez).

Distribution. Known only from Cueva de los Cuarteles.

Other Record. *Tamaulipas*: Cueva de los Cuarteles, Aldama, December 1948 (C. Bolívar), female.

Pholcophora elliotti, new species

FIGURE 101

Diagnosis. Small, short-legged species with triads of small eyes close together, separated by following features: first femur only 1.6 times as long as carapace; epigynum (fig. 101) of distinctive form.

Etymology. Named for Mr. William Elliott.

Female. Total length, 2 mm. Carapace, 0.7 mm long, 0.6 mm wide. Abdomen, 1.3 mm long, 0.8 mm wide.

Cephalothorax and appendages dusky yellow; eyes narrowly ringed with black; abdomen whitish.

Structure like that of *troglodyta*. Anterior lateral eyes separated by two-thirds their diameter; posterior median eyes separated by slightly more than long diameter; posterior eye row gently procurved.

First leg: femur, 1.1 mm, patella, 0.21 mm, tibia, 1.2 mm, metatarsus, 1.1 mm, tarsus, 0.45 mm; total, 4.06 mm. First femur 1.6 times, first leg 5.8 times as long as carapace.

Epigynum as shown in figure 101.

Type Data. Female holotype from Sótano de las Piedras, northeast of Ciudad Valles, San Luis Potosí, México, July 15, 1969 (S. Peck, W. Elliott).

Distribution. Caves of San Luis Potosí.

Other Records. *San Luis Potosí*: Cueva de Taninul #1, June 5, 1967 (R. Mitchell),

female; March 17, 1967 (R. Mitchell), two females.

Pholcophora bispinosa, new species

FIGURES 105-107

Diagnosis. Near relative of *troglodyta* but distinct in following features: epigynum (fig. 105) of distinctive form; chelicera of male with short spur on frontal face below principal spur; male palpus (fig. 107) with small femoral spur in apical position and broad, apically truncated tarsal process.

Etymology. Specific name from Latin *bispinosus*, with two spines.

Female. Total length, 2.9 mm. Carapace, 1.2 mm long, 1.1 mm wide. Abdomen, 1.9 mm long, 1.6 mm wide.

Cephalothorax and appendages dusky orange; eyes narrowly ringed with black; abdomen whitish.

Structure in close agreement with that of *troglodyta*. Anterior lateral eyes separated by their diameter; posterior median eyes separated by one and one-half diameters; posterior eye row gently procurved.

First leg: femur, 2.75 mm, patella, 0.45 mm, tibia, 2.85 mm, metatarsus, 2.8 mm, tarsus, 1 mm; total, 9.85 mm. First femur 2.3 times, first leg eight times as long as carapace.

Epigynum (fig. 105) an oval, transverse band.

Male. Total length, 2.1 mm. Carapace, 1 mm long, 0.9 mm wide. Abdomen, 1.3 mm long, 1 mm wide.

Coloration and structure like those of female. Chelicera (fig. 106) with sharp, outwardly directed principal spur just below base of segment and below in apical half a small, sharp spur.

First leg: femur, 2.7 mm, patella, 0.4 mm, tibia, 2.7 mm, metatarsus, 2.9 mm, tarsus, 0.8 mm; total, 9.5 mm. First femur 2.7 times, first leg 9.5 times as long as carapace.

Male palpus (fig. 107) of distinctive form as shown.

Type Data. Male holotype from Cueva de Arcotete, 6 km S of San Cristóbal, Chiapas,

México, August 15, 1969 (S. and J. Peck).

Distribution. Caves of Chiapas.

Other Records. *Chiapas*: Cueva de Arcotete, August 15, 1969 (S. and J. Peck), three males, 15 females, immature. Cueva Rancho Nuevo, 10 km E of San Cristobal, August 13, 1969 (S. and J. Peck), male, two females; July 16-August 3, 1969 (S. and J. Peck), male.

Pholcophora evansi, new species

FIGURES 102-104

Diagnosis. Near relative of *troglodyta* but distinct in following features: eye triads more widely spaced and posterior row moderately procurved; epigynum (fig. 102) a narrowly oval plaque with dark markings at each corner; chelicera of male with long, sharp spur placed well above middle of segment; male palpus (fig. 103) of distinctive form.

Etymology. Named for Mr. T. R. Evans.

Female. Total length, 2 mm. Carapace, 1 mm long, 0.95 mm wide. Abdomen, 1.2 mm long, 1 mm wide.

Cephalothorax and appendages dusky orange; eyes narrowly ringed with black; abdomen whitish.

Structure in close agreement with that of *troglodyta*. Triads of eyes more widely separated; anterior lateral eyes separated by one and one-half diameters; posterior median eyes separated by two diameters; posterior eye row moderately procurved.

First leg: femur, 2.8 mm, patella, 0.35 mm,

tibia, 3 mm, metatarsus, 3.3 mm, tarsus, 0.75 mm; total, 10.2 mm. First femur 2.8 times, first leg 10 times as long as carapace.

Epigynum (fig. 102) an oval, transverse plate, broadly rounded behind and with dark markings at each corner.

Male. Carapace, 1 mm long, 0.9 mm wide.

Coloration and structure like those of female. Eye triads somewhat closer together. Chelicera (fig. 104) with sharp spur projecting outward from above middle of frontal face.

First leg: femur, 2.35 mm, patella, 0.35 mm, tibia, 2.4 mm, metatarsus, 2.75 mm, tarsus, 0.7 mm; total, 8.55 mm. First femur 2.3 times, first leg 8.5 times as long as carapace.

Male palpus as shown in figure 103.

Type Data. Male holotype from Grutas de Zapaluta, 6½ km SE of Zapaluta, Chiapas, México, August 20, 1967 (J. Reddell, J. Fish, T. R. Evans).

Distribution. Caves of Chiapas.

Other Records. *Chiapas*: Grutas de Zapaluta, August 20, 1967 (J. Reddell, J. Fish, T. R. Evans), nine females. Cueva del Tío Ticho, 1½ km S of Comitán, August 21, 1967 (J. Reddell, J. Fish, T. R. Evans), two females.

Pholcophora exigua, new species

FIGURES 99-100

Diagnosis. Tiny, white, cave-adapted species with appearance of juvenile, probable troglobite, with following features: epigynum

Figs. 92-94. *Pholcophora troglodyta*, new species. 92. Left male palpus, retrolateral view. 93. Left male chelicera, retrolateral view. 94. Epigynum, ventral view.

Figs. 95-96. *Pholcophora gruta*, new species. 95. Left male chelicera, retrolateral view. 96. Left male palpus, retrolateral view.

Fig. 97. *Pholcophora bolivari*, new species, epigynum, ventral view.

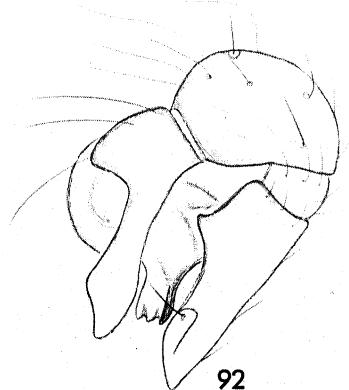
Fig. 98. *Pholcophora mitchelli*, new species, epigynum, ventral view.

Figs. 99-100. *Pholcophora exigua*, new species. 99. Left male palpus, retrolateral view. 100. Epigynum, ventral view.

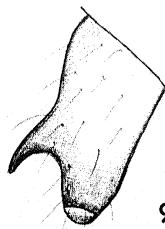
Fig. 101. *Pholcophora elliotti*, new species, epigynum, ventral view.

Figs. 102-104. *Pholcophora evansi*, new species. 102. Epigynum, ventral view. 103. Left male palpus, retrolateral view. 104. Left male chelicera, retrolateral view.

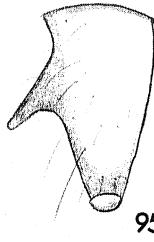
Figs. 105-107. *Pholcophora bispinosa*, new species. 105. Epigynum, ventral view. 106. Left male chelicera, retrolateral view. 107. Left male palpus, retrolateral view.



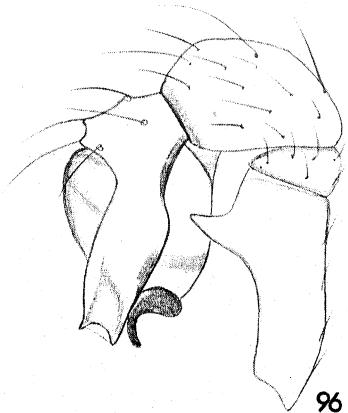
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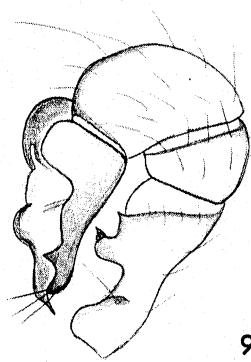
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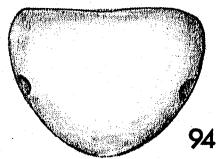
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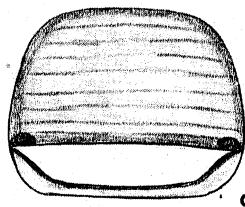
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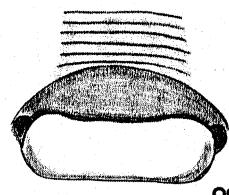
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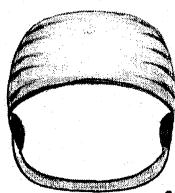
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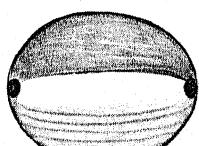
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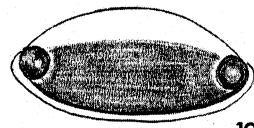
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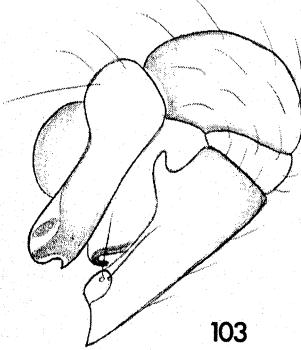
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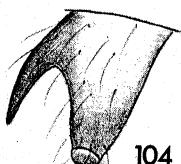
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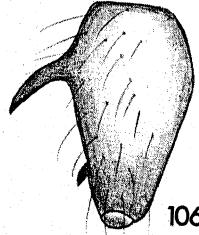
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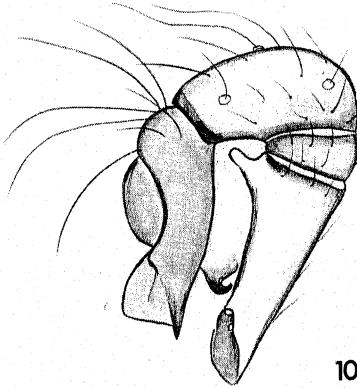
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107

(fig. 100) a simple plaque widely rounded behind; chelicera of male without distinctive spur; male palpus (fig. 99) with distinctive design as shown.

Etymology. Specific name from Latin *exiguis*, small.

Female. Total length, 1.5 mm. Carapace, 0.65 mm long, 0.7 mm wide. Abdomen, 1 mm long, 0.7 mm wide.

Cephalothorax and appendages whitish, with faint yellowish tinge; eye tubercles black; abdomen white.

Structure somewhat atypical; eye triads on low, rounded elevation only 0.1 mm above pars thoracica; anterior lateral eyes separated by their radius; anterior median eyes obsolete; posterior median eyes moderately procurved, with median eyes separated by their diameter. Clypeus, 0.27 mm, equal in height to four diameters of anterior lateral eye.

First leg: femur, 2.5 mm, patella, 0.25 mm, tibia, 2.5 mm, metatarsus, 3 mm, tarsus, 0.7 mm; total, 8.95 mm. First femur 3.8 times, first leg about 14 times as long as carapace.

Epigynum as shown in figure 100.

Male. Total length, 1.2 mm. Carapace, 0.5 mm long, 0.5 mm wide. Abdomen, 0.7 mm long, 0.63 mm wide.

Coloration and structure like those of female. Chelicera without distinctive spur.

First leg: femur, 2.6 mm, patella, 0.25 mm, tibia, 3.2 mm, metatarsus, 3.5 mm, tarsus, 0.7 mm; total, 10.25 mm. First femur five times, first leg 20 times as long as carapace.

Male palpus (fig. 99) with sharp femoral spur near base of segment and tarsal process armed with pointed extension near end.

Type Data. Male holotype and three females from Cueva de los Riscos, Sierra de la India, 6½ km S of Mapimí, Durango, México, August 1964 (W. Russell).

Genus *Metagonia*

The American genus *Metagonia*, comprising small, lucifugous six-eyed pholcids lacking the anterior median eyes, is strongly represented in Mexican caves with a few described and

numerous undescribed species. The cave habitat has strongly affected these pale, long-legged spiders and produced several eyeless troglobites and other prospective ones. Two species from Yucatán caves (*Metagonia maya* and *viabilis* of Chamberlin and Ivie) are closely allied to the following series but their third species, *yucatana*, with apically conical abdomen, belongs in a different group. The species described below are closely allied types, probably derived from a single stock, that share many characters and differ mainly in the genital structures of both sexes.

The typical structures for the series described below are the following: a general pallid coloration with darker pattern entirely absent or consisting of trivial spotting of carapace or ringing of legs, the same in both sexes unless otherwise noted; the carapace is sub-round, convex, with prominent, projecting, rounded clypeus and the cervical groove is a trivial linear depression; the general structure of both sexes is similar and there are few secondary sexual characters; the chelicerae of the males are provided with a curved row of about eight to 20 small spinules on the front face and there is weak development of a basal lobe in some species; the posterior row of eyes is quite strongly recurved to lie nearly in a transverse line with the anterior median eyes; the eyes are sometimes absent but usually present in two separated triads and the eyes are most often of small size; the legs are very long and thin, especially the apical segments, and the first leg is 17 or more times as long as the carapace; in this series the abdomen is elongate oval, quite high, but not produced behind into a rounded or pointed projection. The genitalia deserve special mention because of various unique features. The male palpi feature a voluminous bulb with long, pale, finger-like embolus with a tiny pore near the apex adjacent to the long spine at the tip; the tarsus is quite remarkably developed into a complicated appendage consisting of a hinged process lying at rest in a groove on the femur and a principal process bearing at apex a series of spurs forming an apical fringe. The details of this fringe provide the prime characters for separating the

species. The epigynum of the female is of the haplogyne type with genital groove behind and more or less apparent pattern of internal features of constant form visible from the ventral aspect.

The following species are most readily diagnosed by close comparison of the features of the epigyna and male palpi. The epigyna are illustrated in ventral view and show patterns distinctive for every species. In resting state the epigynum is a quite prominent rounded lobe but it contains erectile tissue that allows it to swell to an inflated protuberance. The left palpus of the male is illustrated in retro-lateral view and in a few cases a prolateral view of the tarsal process is given.

Metagonia tinaja, new species

FIGURES 119-121

Diagnosis. Typical species with pallid coloration and small eyes; posterior median eyes separated by two diameters; prolateral fringe of tarsal process with coarse teeth; epigynum as shown in figure 121.

Etymology. Specific name from Spanish *tinaja*, an earthen jar, used in apposition; named for Sótano de la Tinaja.

Female. Total length, 2.6 mm. Carapace, 1 mm long, 0.9 mm wide. Abdomen, 1.6 mm long, 1.2 mm wide.

Cephalothorax and appendages whitish to pale yellow; pars thoracica with faint dusky smudge; eyes narrowly ringed with black; abdomen white.

Ocular tubercle of medium development, bearing two triads of small eyes occupying two-thirds width of carapace at that point; anterior lateral eyes separated by about three diameters; posterior median eyes separated by two diameters.

First leg: femur, 5.3 mm, patella, 0.45 mm, tibia, 5.5 mm, metatarsus, 8.5 mm, tarsus, 1.5 mm; total, 21.25 mm. First leg 21 times as long as carapace. Tibia and patella of fourth leg, 4.25 mm.

Epigynum as shown in figure 121.

Male. Total length, 2.7 mm. Carapace, 1.1 mm long, 1 mm wide. Abdomen, 1.6 mm

long, 1.1 mm wide.

First leg: femur, 8.3 mm, patella, 0.5 mm, tibia, 8.5 mm, metatarsus, 14.5 mm, tarsus, 2 mm; total, 33.8 mm. First leg 33 times as long as carapace, much longer than in other species. Tibia and patella of fourth leg, 6 mm.

Palpus as shown in figures 119-120.

Type Data. Male holotype from Sótano de la Tinaja, 10½ km NE of Valles, San Luis Potosí, México, February 18, 1970 (J. A. L. Cooke).

Distribution. Caves near Valles in San Luis Potosí.

Other Records. *San Luis Potosí:* Sótano de la Tinaja, 10½ km NE of Valles, September 1, 1966 (R. Mitchell), one immature; April 1, 6, 1946 (B. Dontzin, E. Ruda), male, female, immature; March 13, 1969 (J. Reddell), two immature; November 30, 1968 (T. Evans, G. Ediger), female; December 24, 1963 (D. McKenzie), female; April 9, 1966 (J. Fish, D. McKenzie), male, female, immature; February 18, 1970 (J. A. L. Cooke), two males, four females, immature, from flood debris on mud slope 1,500 feet from entrance. Sótano del Arroyo, 12 km NE of Valles, November 26, 1963 (J. Reddell), female; September, 1966 (R. Mitchell), immature; November 26, 1965 (J. Reddell, J. Fish), two females, two immatures; December 25, 1962 (J. Reddell), two males, seven females, immature. Cueva de Los Sabinos, 12½ km NE of Valles, May 21, 1944 (F. Bonet), immature; April 3, 1942, female. Sótano de Yerbaniz, 21 km N of Valles, January 31, 1969 (D. Honea, T. Mollhagen), female, immature; February 17, 1970, female, immature; January 9, 1971 (W. Elliott, J. Sheppard), three females, immature. Sótano del Tigre, 14 km NE of Valles, November 28, 1964 (D. McKenzie), female; February 1, 1963 (J. Reddell, R. Mitchell), 10 females, immature; February 18, 1960, male.

Metagonia tlamaya, new species

FIGURES 110-111, 125

Diagnosis. Pale, eyeless species related to *tinaja*; prolateral fringe of tarsal process with straight line of coarse teeth; epigynum as

shown in figure 125.

Etymology. Specific name from Sótano de Tlamaya, used in apposition.

Female. Total length, 2 mm. Carapace, 0.9 mm long, 0.8 mm wide. Abdomen, 1.2 mm long, 0.8 mm wide.

Eye tubercle reduced in size and eyes completely obsolete.

First leg: femur, 5 mm, patella, 0.3 mm, tibia, 5.3 mm, metatarsus, 8 mm, tarsus, 1.3 mm; total, 20.1 mm. First leg about 22 times as long as carapace. Tibia and patella of fourth leg, 5.7 mm.

Epigynum as shown in figure 125.

Male. Total length, 1.8 mm. Carapace, 0.8 mm long, 0.75 mm wide. Abdomen, 1 mm long, 0.8 mm wide.

First leg: femur, 4.7 mm, patella, 0.3 mm, tibia, 4.7 mm, metatarsus, 7 mm, tarsus, 1.5 mm; total, 18.2 mm. First leg 22.7 times as long as carapace.

Male palpus as shown in figures 110-111.

Type Data. Male holotype from Sótano de Tlamaya, San Luis Potosí, México, November 25, 1964 (T. Raines, B. Bell).

Distribution. Known only from Sótano de Tlamaya.

Other Records. *San Luis Potosí*: Sótano de Tlamaya, November 25, 1964 (T. Raines, B. Bell), two females; July 2, 1965 (T. Raines, J. Fish), male, female.

distinct in having three curved hooks on pro-lateral face of fringe of tarsal process.

Etymology. Specific name from Spanish *capilla*, hood, church, used in apposition, named for Cueva de la Capilla.

Male. Total length, 4 mm. Carapace, 1.7 mm long, 1.7 mm wide. Abdomen, 2.5 mm long, 1.7 mm wide.

Dorsal view of carapace and abdomen as shown in figure 113. Carapace gray, with dusky patches on clypeus and near posterior margin of pars thoracica; eyes ringed with black; legs pale yellow, with brown patellae and brown rings at ends of tibiae; sternum with narrow brown seam on sides; abdomen gray, with dusky subintegumental spots.

Eyes large, with triads occupying two-thirds width of carapace at that point; front eyes separated by about two diameters; posterior median eyes separated by their short diameter.

First leg: femur, 12.5 mm, patella, 0.7 mm, tibia, 12 mm, metatarsus, 20 mm, tarsus, 2.5 mm; total, 47.7 mm. First leg 28 times as long as carapace. Tibia and patella of fourth leg, 7.75 mm.

Male palpus as shown in figures 112, 114.

Type Data. Male holotype from Cueva de la Capilla, 13½ km NW of Gómez Fariás, Porvenir, Tamaulipas, México, January 13, 1971 (J. Reddell, R. Mitchell, and group).

Metagonia capilla, new species

FIGURES 112-114

Diagnosis. Well marked, large-eyed species (fig. 113) related to *tinaja*; posterior median eyes separated by short diameter; male palpus

Metagonia amica, new species

FIGURES 115-116, 136

Diagnosis. Similar to *tinaja*; posterior median eyes separated by long diameter; epigynum (fig. 136) with oval plate near posterior edge; prolateral fringe of tarsal process with fine teeth.

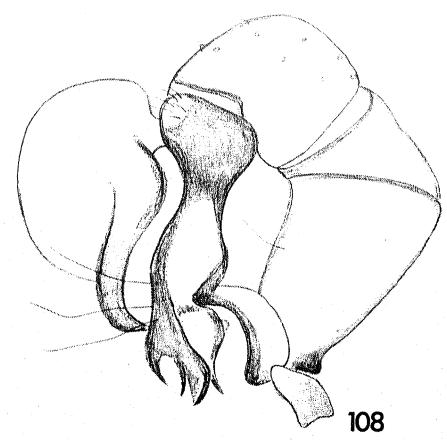
Figs. 108-109. *Metagonia pura*, new species. 108. Left male palpus, retrolateral view. 109. Tip of tarsal process, prolateral view.

Figs. 110-111. *Metagonia tlamaya*, new species. 110. Left male palpus, retrolateral view. 111. Tip of tarsal process, prolateral view.

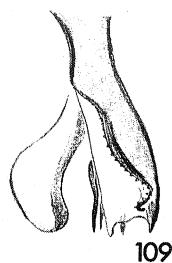
Figs. 112-114. *Metagonia capilla*, new species. 112. Left male palpus, retrolateral view. 113. Carapace and abdomen, dorsal view. 114. Left male palpus, prolateral view.

Figs. 115-116. *Metagonia amica*, new species. 115. Left male palpus, retrolateral view. 116. Tip of tarsal process, prolateral view.

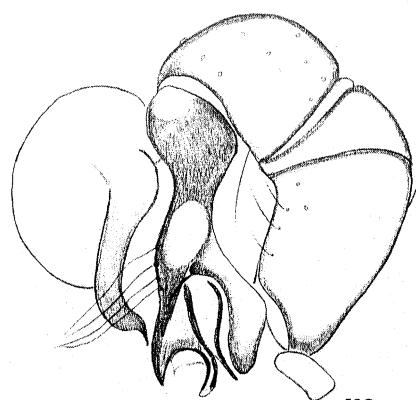
Fig. 117. *Metagonia pachona*, new species, left male palpus, retrolateral view.



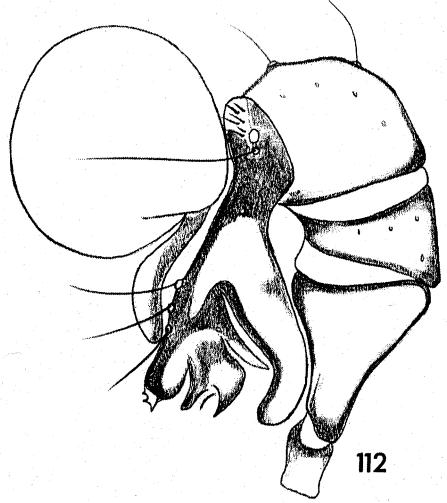
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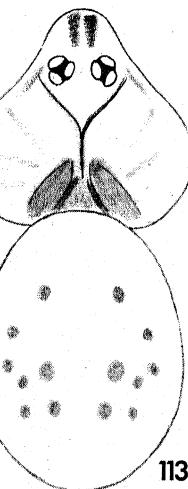
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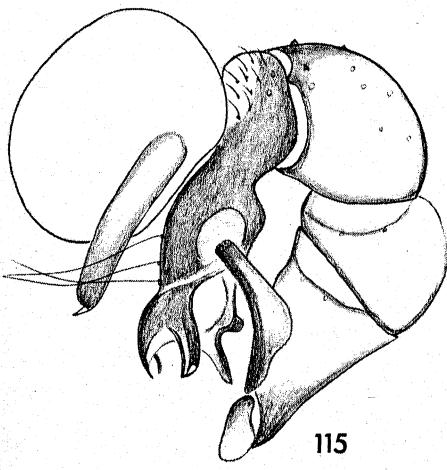
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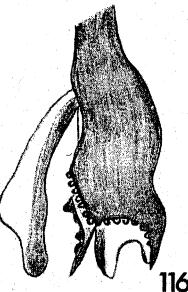
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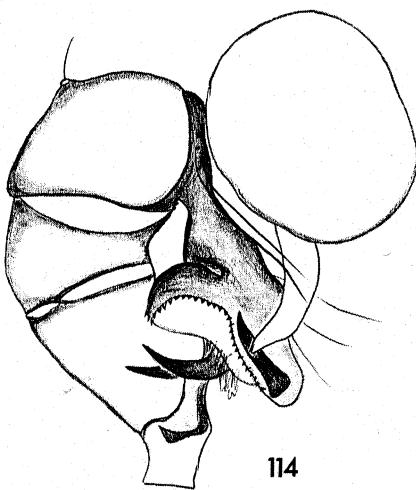
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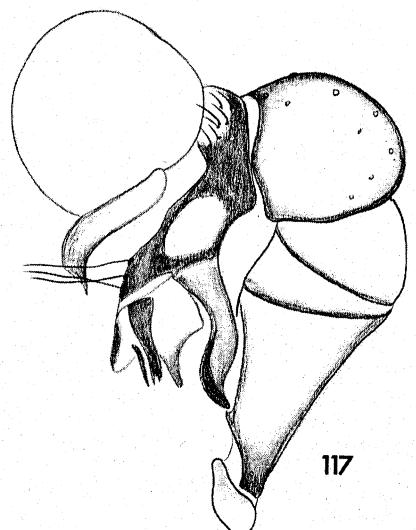
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114



117

Etymology. Specific name from Latin *amicus*, friendly.

Female. Total length, 2.3 mm. Carapace, 0.9 mm long, 0.8 mm wide. Abdomen, 1.4 mm long, 0.9 mm wide.

Cephalothorax and appendages white to pale yellow; carapace with dusky smudge on pars thoracica; eyes distinctly ringed with black; abdomen whitish.

Anterior lateral eyes separated by not fully two diameters; posterior median eyes separated by about long diameter.

First leg: femur, 4.3 mm, patella, 0.3 mm, tibia, 4.6 mm, metatarsus, 7 mm, tarsus, 1.4 mm; total, 17.6 mm. First leg 19 times as long as carapace. Tibia and patella of fourth leg, 3.2 mm.

Epigynum as shown in figure 136.

Male. Total length, 2 mm. Carapace, 0.8 mm long, 0.75 mm wide. Abdomen, 1.2 mm long, 0.9 mm wide.

First leg: femur, 4.8 mm, patella, 0.3 mm, tibia, 5.2 mm, metatarsus, 8 mm, tarsus, 1.5 mm; total, 19.8 mm. First leg 24 times as long as carapace.

Male palpus as shown in figures 115-116.

Type Data. Male holotype from Cueva de El Jobo, E. Jobo, San Luis Potosí, México, December 8, 1945 (C. Bolívar, F. Bonet).

Distribution. Caves in San Luis Potosí.

Other Record. *San Luis Potosí*: Cueva de Poca Ventana, 1 km W of Xitlitla, January 1969 (T. Raines), female arbitrarily assigned to this species.

Metagonia punctata, new species

FIGURES 118, 127

Diagnosis. Well marked species related to *tinaja* with large eyes; posterior median eyes separated by diameter; epigynum with pair of small, dark spurs on posterior margin; distal fringe of tarsal process squared, with enclosed semilunar lamina.

Etymology. Specific name from Latin *punctatus*, with small spots.

Female. Total length, 2.9 mm. Carapace,

1.1 mm long, 1 mm wide. Abdomen, 1.7 mm long, 1.1 mm wide.

Cephalothorax and appendages white to pale yellow, marked as follows: carapace with pale brown, round maculation on pars thoracica and eye tubercles blackish; patellae of legs brown and junctures of coxae, tibiae and metatarsus with brown rings or flecks; sternum all pale. Abdomen whitish, with three pairs of dark spots usually visible through integument on dorsum.

Eyes large, on elevated tubercles, group occupying full width of head; anterior lateral eyes separated by two diameters; posterior median eyes separated by their diameter.

First leg: femur, 6 mm, patella, 0.5 mm, tibia, 6.3 mm, metatarsus, 8.7 mm, tarsus, 1.5 mm; total, 23 mm. First leg 21 times as long as carapace. Tibia and patella of fourth leg, 4.3 mm.

Epigynum as shown in figure 127.

Male. Total length, 2.8 mm. Carapace, 1.2 mm long, 1 mm wide. Abdomen, 1.6 mm long, 1.2 mm wide.

First leg: femur, 8.6 mm, patella, 0.5 mm, tibia, 9.2 mm, metatarsus, 13 mm, tarsus, 1.3 mm; total, 32.6 mm. First leg 27 times as long as carapace. Tibia and patella of fourth leg, 5.3 mm.

Male palpus as shown in figure 118.

Type Data. Male holotype, and two females, from Cueva de Carnicerías, San Francisco, San Luis Potosí, México, August 4, 1966 (J. Reddell, D. McKenzie).

Distribution. Known only from caves in San Luis Potosí.

Other Records. *San Luis Potosí*: Cueva de las Rusias, August 5, 1966 (J. Reddell, J. Fish), female, immature. Cueva de Entrada Chica, Valle de los Fantasmás, August 4, 1966 (J. Fish), female. Sótano de Valle de los Fantasmas, November 1966 (J. Fish, J. Davis), female.

Metagonia secreta, new species

FIGURE 139

Diagnosis. Pale species similar to *tinaja*; epigynum (fig. 139) with distinctive pattern of

suboval inner receptacle and marginal marking near posterior edge.

Etymology. Specific name from Latin *secretus*, secret.

Female. Total length, 2.2 mm. Carapace, 0.8 mm long, 0.9 mm wide. Abdomen, 1.4 mm long, 1.05 mm wide.

Cephalothorax and appendages whitish to pale yellow; carapace with fine dusky smudge on pars thoracica; eyes narrowly ringed with black; abdomen white.

Ocular tubercle of medium size occupying two-thirds of width of carapace at that point; anterior eyes separated by three diameters; posterior median eyes separated by about two diameters. Tibia and patella of fourth leg, 3.75 mm; other legs mostly missing.

Epigynum as shown in figure 139.

Type Data. Female holotype from Cueva del Nacimiento del Río Frío, 7 km S of Gómez Fárias, Tamaulipas, México, April 18, 1965 (J. Fish, J. Reddell).

Distribution. Known only from above specimen.

Metagonia pura, new species

FIGURES 108-109, 122

Diagnosis. Pale, eyeless species related to *tlamaya* and *tinaja*; prolateral fringe of tarsal process with curved line of fine teeth; epigynum small (fig. 122) with lightly curved posterior margin and distinctive pattern of internal features.

Etymology. Specific name from Latin *purus*, pure, clean.

Female. Total length, 2.9 mm. Carapace, 0.8 mm long, 0.7 mm wide. Abdomen, 1.1 mm long, 0.85 mm wide.

Cephalothorax whitish; legs with faint yellow tinge; abdomen white.

Eye tubercle reduced and eyes completely obsolete.

First leg: femur, 4.7 mm, patella, 0.35 mm, tibia, 5 mm, metatarsus, 7.8 mm, tarsus, 1.5 mm; total, 19.35 mm. First leg 24 times as long as carapace. Tibia and patella of fourth leg, 4.1 mm.

Epigynum as shown in figure 122.

Male. Total length, 1.85 mm. Carapace, 0.8 mm long, 0.7 mm wide. Abdomen, 1.15 mm long, 0.95 mm wide.

First leg: femur, 4.7 mm, patella, 0.3 mm, tibia, 5 mm, metatarsus, 8 mm, tarsus, 1.5 mm; total, 19.5 mm. First leg about 24 times as long as carapace. Tibia and patella of fourth leg, 3.7 mm.

Male palpus as shown in figures 108-109.

Type Data. Male holotype from Cueva de la Capilla, 13½ km NW of Gómez Fárias, El Porvenir, Tamaulipas, México, January 28, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George).

Distribution. Known only from Cueva de la Capilla.

Other Records. *Tamaulipas*: Cueva de la Capilla, El Porvenir, January 13, 1971 (J. Reddell, R. Mitchell, and group), three females, immature; May 16, 1971 (R. Mitchell, F. Abernathy, A. Sturdivant, S. Wiley), male, female; July 2, 1969 (S. Peck, R. Norton), female.

Metagonia atoyacae, new species

FIGURES 123, 129

Diagnosis. Pale, eyeless species related to *tlamaya*, *pura* and others of the *tinaja* group; epigynum (fig. 123) small, with curved posterior margin; fringe of tarsal process of male palpus very broad, with complicated design (fig. 129).

Etymology. Named for Grutas de Atoyac.

Female. Total length, 2.2 mm. Carapace, 0.85 mm long, 0.8 mm wide. Abdomen, 1.4 mm long, 1.1 mm wide.

Cephalothorax whitish; legs with faint yellow tinge; abdomen white.

Ocular tubercle a prominent transverse ridge half as wide as head at that point but eyes completely obsolete, without trace of pigment or eye position.

First leg: femur, 4.75 mm, patella, 0.35 mm, tibia, 4.85 mm, metatarsus, 8 mm, tarsus, 1.5 mm; total, 19.45 mm. First leg 23 times as long as carapace. Tibia and patella of fourth leg, 3.75 mm.

Epigynum as shown in figure 123.

Male. Total length, 2.4 mm. Carapace, 0.9 mm long, 0.85 mm wide. Abdomen, 1.5 mm long, 1 mm wide.

First leg: femur, 5.5 mm, patella, 0.4 mm, tibia, 5.7 mm, metatarsus, 9.7 mm, tarsus, 1.5 mm; total, 22.8 mm. First leg 25 times as long as carapace.

Male palpus as shown in figure 129.

Type Data. Male holotype from Grutas de Atoyac, Atoyac, Veracruz, México, November 13, 1941 (C. Bolívar, F. Bonet).

Distribution. Known only from Grutas de Atoyac.

Other Records. Veracruz: Grutas de Atoyac, Atoyac, April 30, 1944 (J. Alvarez, C. Tellez), female; July 19, 1953 (C. J. Goodnight), five females; August 22, 1965 (J. Reddell, J. Fish, W. Bell), four females; August 6, 1969 (S. and J. Peck), four females, immature.

Metagonia pachona, new species

FIGURES 117, 124

Diagnosis. Pale species with very small eyes, possible troglobite, related to *tinaja*; posterior median eyes separated by two and one-half diameters; epigynum (fig. 124) with V-shaped figures; male palpus as shown in figure 117.

Etymology. Specific name from Spanish *pachon*, used in the feminine, a kind of dog.

Female. Total length, 2.6 mm. Carapace, 1 mm long, 0.95 mm wide. Abdomen, 1.6 mm long, 1.4 mm wide.

Cephalothorax and appendages whitish to pale yellow; eyes narrowly ringed with black; abdomen white.

Ocular tubercle of medium development

and eyes small; anterior lateral eyes separated by about three diameters; posterior median eyes separated by two and one-half diameters.

First leg: femur, 5.3 mm, patella, 0.45 mm, tibia, 5.6 mm, metatarsus, 10.3 mm, tarsus, 1.7 mm; total, 23.35 mm. First leg 23 times as long as carapace. Tibia and patella of fourth leg, 4.15 mm.

Epigynum as shown in figure 124.

Male. Total length, 2 mm. Carapace, 0.8 mm long, 0.75 mm wide. Abdomen, 1.3 mm long, 1 mm wide.

First leg: femur, 8.2 mm, patella, 0.35 mm, tibia, 5.7 mm, metatarsus, 9.3 mm, tarsus, 1.7 mm; total, 25.25 mm. First leg 31 times as long as carapace. Tibia and patella of fourth leg, 4.1 mm.

Male palpus as shown in figure 117.

Type Data. Male holotype from Cueva de El Pachón, 7½ km NE of Antiguo Morelos, Tamaulipas, September 1, 1946 (C. J. Goodnight).

Distribution. Known only from Cueva de El Pachón.

Other Records. Tamaulipas: Cueva de El Pachón, March 12, 1969 (J. Reddell, S. Fowler), two females, immature; July 10, 1969 (S. and J. Peck, R. Norton), female, immature; June 8, 1967 (J. Reddell), male, two females; November 25, 1967 (J. Reddell, S. Fowler), female; December 7, 1945 (C. Bolívar, F. Bonet), four males, immature.

Metagonia serena, new species

FIGURES 128, 130

Diagnosis. Well marked species with large eyes related to *tinaja*; posterior median eyes

Fig. 118. *Metagonia punctata*, new species, left male palpus, retrolateral view.

Figs. 119-121. *Metagonia tinaja*, new species. 119. Tip of tarsal process, prolateral view. 120. Left male palpus, retrolateral view. 121. Epigynum, ventral view.

Fig. 122. *Metagonia pura*, new species, epigynum, ventral view.

Fig. 123. *Metagonia atoyacae*, new species, epigynum, ventral view.

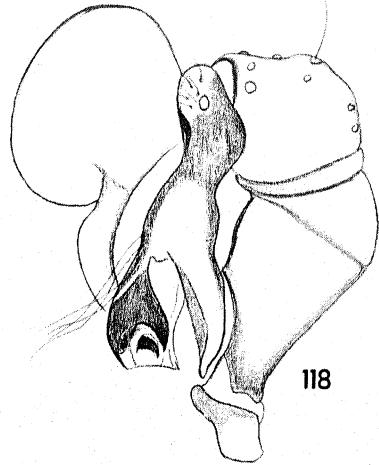
Fig. 124. *Metagonia pachona*, new species, epigynum, ventral view.

Fig. 125. *Metagonia tlamaya*, new species, epigynum, ventral view.

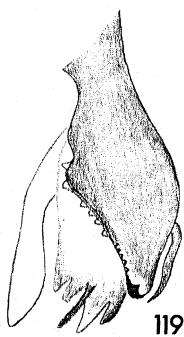
Fig. 126. *Metagonia coahuila*, new species, epigynum, ventral view.

Fig. 127. *Metagonia punctata*, new species, epigynum, ventral view.

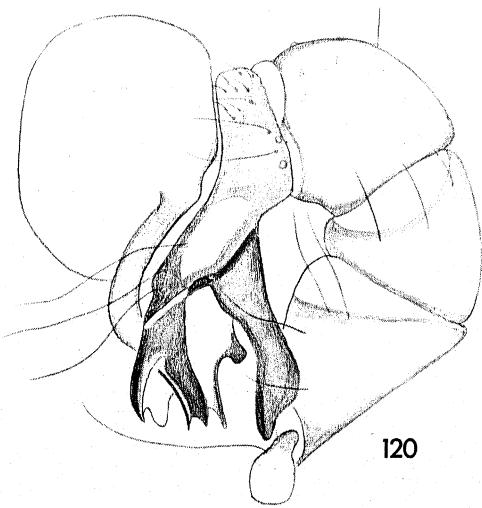
Fig. 128. *Metagonia serena*, new species, left male palpus, retrolateral view.



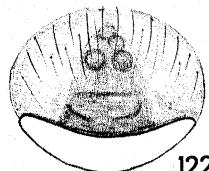
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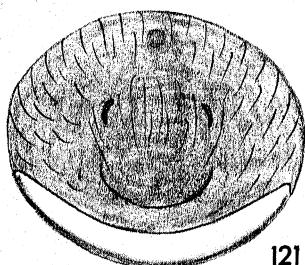
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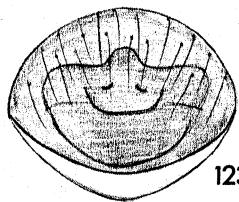
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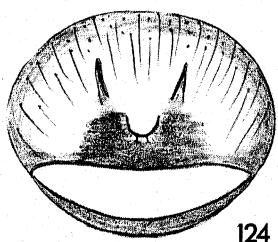
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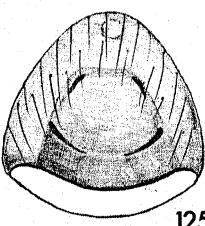
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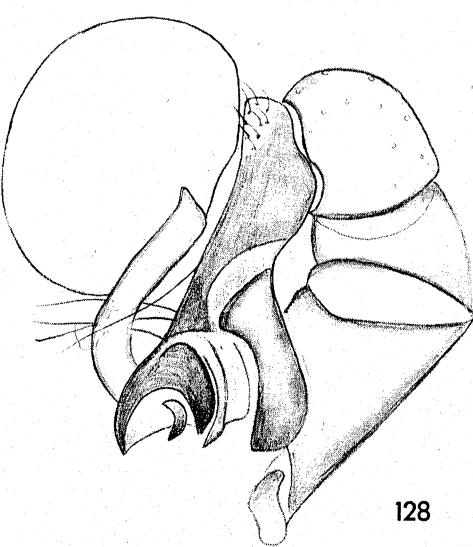
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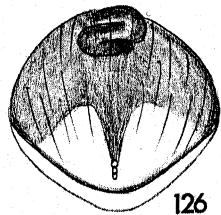
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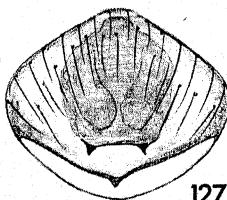
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128



126



127

separated by slightly more than diameter; epigynum as shown in figure 130; retrolateral fringe of tarsal process broad (fig. 128).

Etymology. Specific name from Latin *serenus*, clear, serene.

Female. Total length, 3.1 mm. Carapace, 1.2 mm long, 1.1 mm wide. Abdomen, 1.9 mm long, 1.4 mm wide.

Cephalothorax and legs pale to bright yellow; carapace with pale brown patch on pars cephalica; eyes narrowly ringed with black; patellae pale brown; joints of coxae and legs with dusky lines; abdomen whitish to pale yellow.

Ocular tubercle of medium development, bearing large eyes and occupying two-thirds width of carapace at that point; anterior lateral eyes separated by about two and one-half diameters; posterior median eyes separated by slightly more than long diameter.

First leg: femur, 6.5 mm, patella, 0.6 mm, tibia, 7 mm, Metatarsus, 10.6 mm, tarsus, 1.7 mm; total, 26.4 mm. First leg 22 times as long as carapace. Tibia and patella of fourth leg, 5.2 mm.

Epigynum as shown in figure 130.

Male. Total length, 2.4 mm. Carapace, 1 mm long, 0.9 mm wide. Abdomen, 1.4 mm long, 1 mm wide.

Chelicera with distinct, rounded lobe at base and series of about 15 spinules from base to apex on frontal face.

First leg: femur, 6.8 mm, patella, 0.55 mm, tibia, 7.5 mm metatarsus, 11.3 mm, tarsus, 1.7 mm; total, 27.85 mm. First leg 28 times as long as carapace. Tibia and patella of fourth leg, 5 mm.

Male palpus as shown in figure 125.

Type Data. Male holotype from Grutas de García, Nuevo León, México, September 19, 1942 (C. Bolívar).

Distribution. Known only from Grutas de García.

Other Records. *Nuevo León:* Grutas de García, September 19, 1942 (C. Bolívar), female; June 19, 1942 (C. Bolívar, F. Bonet), five females, immature; June 6, 1966 (J. Reddell, A. Smith), female.

Metagonia candela, new species

FIGURES 131-132

Diagnosis. Well marked species with large eyes, related to *tinaja*; posterior median eyes separated by their long diameter; epigynum (fig. 132) with narrowly pointed projection over genital groove; male palpus (fig. 131) with distinctive tarsal process.

Etymology. Specific name from Spanish *candela*, a candle, used in apposition.

Female. Total length, 3.1 mm. Carapace, 1.1 mm long, 1 mm wide. Abdomen, 2 mm long, 1.6 mm wide.

Cephalothorax and legs pale yellow; carapace with pale brownish patch on pars thoracica; eyes narrowly ringed with black; patellae of legs pale brown; abdomen whitish.

Ocular tubercle of medium prominence; anterior lateral eyes separated by two full diameters; posterior median eyes separated by their long diameter.

First leg: femur, 6.5 mm, patella, 0.5 mm, tibia, 7 mm, metatarsus, 10 mm, tarsus, 1.8 mm; total, 25.8 mm. First leg 23 times as long as carapace. Tibia and patella of fourth leg, 4.7 mm.

Epigynum as shown in figure 132.

Male. Total length, 2.6 mm. Carapace, 1.1 mm long, 1 mm wide. Abdomen, 1.5 mm long, 1.2 mm wide.

First leg: femur, 7.2 mm, patella, 0.5 mm, tibia, 7.3 mm, metatarsus, 10.3 mm, tarsus, 1.7 mm; total, 27 mm. First leg about 25 times as long as carapace. Tibia and patella of fourth leg, 4.7 mm.

Male palpus as shown in figure 131.

Type Data. Male holotype from Cueva del Carrizal, near La Candela, Nuevo León, México, July 16, 1942 (C. Bolívar, F. Bonet).

Distribution. Known only from Gruta del Carrizal.

Other Records. *Nuevo León:* Cueva del Carrizal, July 16, 1942 (C. Bolívar), two males, six females, immature; July 13, 1963 (W. Russell), female, immature.

Metagonia placida, new species

FIGURES 133-134

Diagnosis. Well marked species with fairly large eyes, related to *tinaja*; posterior median eyes separated by long diameter; epigynum (fig. 134) produced into rounded lobe overhanging genital groove; male palpus (fig. 133) with complicated fringe on tarsal process.

Etymology. Specific name from Latin *placidus*, placid, quiet.

Female. Total length, 3.2 mm. Carapace, 1.2 mm long, 1.1 mm wide. Abdomen, 2 mm long, 1.5 mm wide.

Cephalothorax and appendages pale yellowish; carapace with faint brownish patch on pars thoracica; eyes narrowly ringed with black; patellae brownish; abdomen whitish, with occasional indistinct dusky spots on dorsum.

Ocular tubercle of medium prominence; anterior lateral eyes separated by nearly two and one-half diameters; posterior median eyes separated by long diameter.

First leg: femur, 5.2 mm, patella, 0.5 mm, tibia, 5.35 mm, metatarsus, 8.2 mm, tarsus, 1.6 mm; total, 20.9 mm. First leg 17 times as long as carapace. Tibia and patella of fourth leg, 4.3 mm.

Epigynum as shown in figure 134.

Male. Total length, 2.8 mm. Carapace, 1.2 mm long, 1.1 mm wide. Abdomen, 1.8 mm long, 1.4 mm wide.

First leg: femur, 7.3 mm, patella, 0.5 mm, tibia, 7.5 mm, metatarsus, 11.5 mm, tarsus, 1.7 mm; total, 28.5 mm. First leg about 24 times as long as carapace.

Male palpus as shown in figure 133.

Type Data. Male holotype from Cueva de la Boca, 6 km SE of Villa Santiago, Nuevo León, México, July 13, 1942 (C. Bolívar).

Distribution. Known from two Nuevo León caves.

Other Records. *Nuevo León:* Cueva de la Boca, May 1, 1966 (J. Fish, E. Alexander), male, immature; June 17, 1944 (F. Bonet), immature female; July 13, 1942 (C. Bolívar), 11 males, seven females, immature. Cueva de Chorros de Agua, 3 km W of Montemorelos, April 10, 1966 (W. Russell), female.

Metagonia coahuila, new species

FIGURE 126

Diagnosis. Small, relatively short legged species with dusky pattern on carapace, readily separated by details of epigynum (fig. 126).

Etymology. Specific name from Mexican state Coahuila, used in apposition.

Female. Total length, 2.1 mm. Carapace, 0.9 mm long, 0.85 mm wide. Abdomen, 1.3 mm long, 1.1 mm wide.

Cephalothorax and legs pale yellow; carapace with pair of dusky bands on clypeus and pair of linear stripes at center of pars thoracica; eyes ringed with black; patellae of legs pale brown; abdomen white, plain or with dusky subintegumental spots.

Eyes large, with triads occupying somewhat more than two-thirds width of carapace at that point; front eyes separated by two full diameters; posterior median eyes separated by long diameter.

First leg: femur, 4 mm, patella, 0.35 mm, tibia, 4.5 mm, metatarsus, 5.7 mm, tarsus, 1.2 mm; total, 15.75 mm. First leg 17 times as long as carapace. Tibia and patella of fourth leg, 3.2 mm.

Epigynum as shown in figure 126.

Type Data. Female holotype, and four females, from Cueva de Cuevacillas, 16 km NE of Arteaga, Coahuila, México, July 26, 1965 (J. Reddell, J. Fish).

Distribution. Known from two caves in Coahuila.

Other Record. *Coahuila:* Cueva de las Vigas, 23 km E of Arteaga, June 3, 1966 (J. Reddell), two females found hanging from webs along wall.

Metagonia mcnatti, new species

FIGURE 135

Diagnosis. Well marked species with large eyes and pattern of brownish spots and rings on carapace and legs; epigynum (fig. 135) broadly rounded behind, with pair of marks on each side margin.

Etymology. Named for Mr. Logan McNatt.

Female. Total length, 3 mm. Carapace, 1.15 mm long, 1 mm wide. Abdomen, 2 mm long, 1.3 mm wide.

Cephalothorax and appendages white to pale yellow, marked as follows: carapace with two triangular black spots at middle; eye tubercles tinged with black; patellae of legs and distal ends of tibiae with brown rings and coxae flecked with brown; sternum with scalloped brown stripe along side margins. Abdomen gray.

Eyes in two triads on rather prominently elevated tubercles occupying full width of head; anterior lateral eyes separated by three diameters; posterior row of four eyes in recurved line, with middle eyes separated by one and one-half diameters.

Second leg: femur, 4.75 mm, patella, 0.5 mm, tibia, 4.15 mm, metatarsus, 6.5 mm, tarsus, 1.15 mm; total, 17.05 mm. Second leg about 14 times as long as carapace. First leg missing. Tibia and patella of fourth leg, 4.5 mm.

Epigynum as shown in figure 135.

Type Data. Female holotype from Cueva de los Pinos, Tuxtla Gutiérrez, Chiapas, México, August 19, 1967 (J. Reddell, J. Fish, T. R. Evans).

Distribution. Known from two caves in Chiapas.

Other Record. Chiapas: Cueva Cerro Hueco, 3 km SE of Tuxtla Gutiérrez, August 18, 1967 (J. Reddell, J. Fish, M. Tandy), immature female.

Family Symphytognathidae

The only Mexican genus of this family so far identified with the cave habitat is *Maymena*, established by me in 1960 (Gertsch, p. 30) for three well marked species. Three additional species are described below, and the male of *Maymena misteca* Gertsch is described for the first time. Although few examples of these tiny spiders have come from outside habitats, it is clear that they must be classified as troglophiles. Reduction in eye size of some of the species is the only discernible evidence of cave adaptation.

Genus *Maymena* Gertsch

Maymena mayana (Chamberlin and Ivie)

Nesticus mayanus Chamberlin and Ivie, 1938, p. 134, figs. 12-13. Gertsch, 1960, p. 31, figs. 49-51, 60-64.

New Records. Veracruz: Cueva de Ojo de Agua de Tlilapan, Tlilapan, August 4, 1967 (J. Reddell, J. Fish, T. Evans), two males, five females. Grutas de Atoyac, Atoyac, August 6, 1969 (S. and J. Peck), two males, seven females. Chiapas: Cueva de San Juan de Arco, Comitán, August 17, 1969 (S. Peck), male, female. Cueva de Sala de Agua Grande, 10 km W of Yanga, August 9, 1967 (J. Reddell, J. Fish, T. Evans), four males, five females. Hoyo de Don Nicho, 13 km W of

Fig. 129. *Metagonia atoyacae*, new species, left male palpus, retrolateral view.

Fig. 130. *Metagonia serena*, new species, epigynum, ventral view.

Figs. 131-132. *Metagonia candela*, new species. 131. Left male palpus, retrolateral view. 132. Epigynum, ventral view.

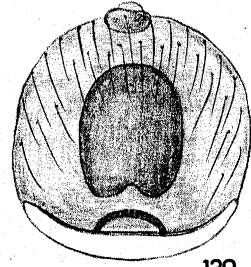
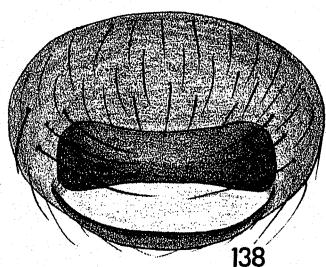
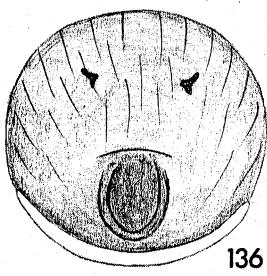
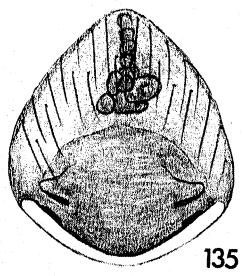
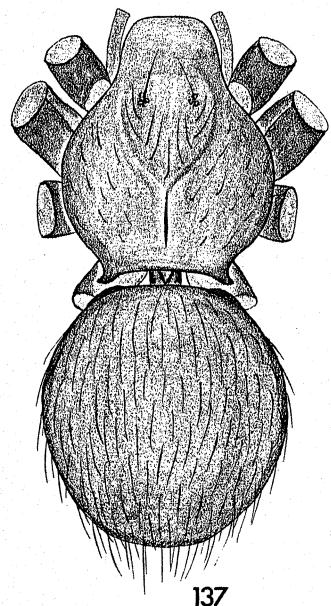
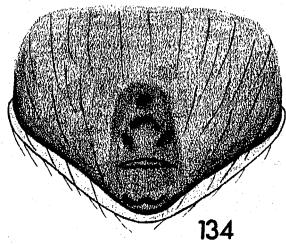
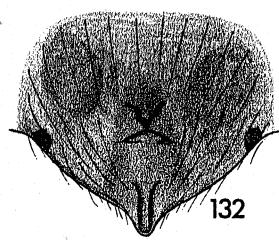
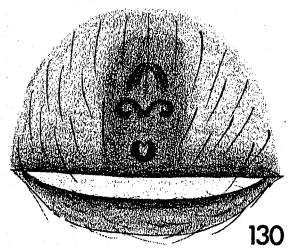
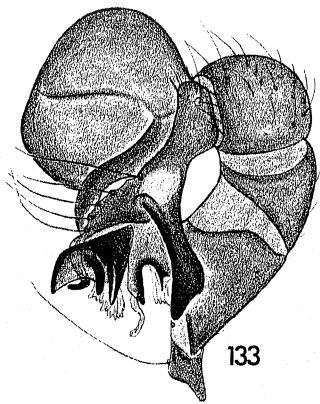
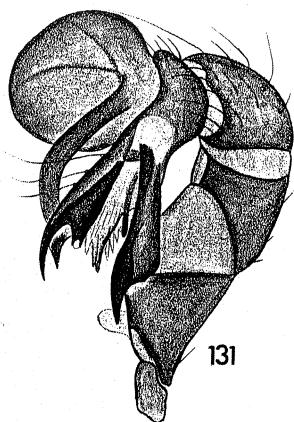
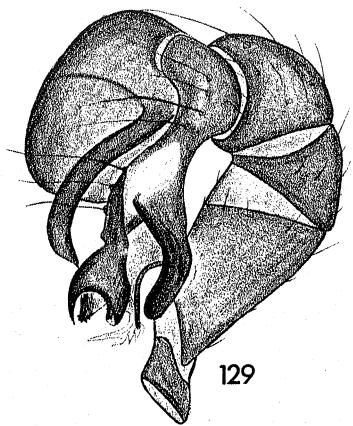
Figs. 133-134. *Metagonia placida*, new species. 133. Left male palpus, retrolateral view. 134. Epigynum, ventral view.

Fig. 135. *Metagonia mcnatti*, new species, epigynum, ventral view.

Fig. 136. *Metagonia amica*, new species, epigynum, ventral view.

Figs. 137-138. *Pholcophora gruta*, new species. 137. Carapace and abdomen of female, dorsal view. 138. Epigynum, ventral view.

Fig. 139. *Metagonia secreta*, new species, epigynum, ventral view.



Ocozocoautla, August 16, 1967 (J. Reddell, J. Fish, T. Evans), male, 10 females.

Maymena chica Gertsch

Maymena chica Gertsch, 1960, p. 35, figs. 56-58, 69, 70.

New Records. *Tamaulipas*: Cueva de los Vampiros, 20 km NW of El Limón, May 27, 1968 (J. Reddell), female. *San Luis Potosí*: Cueva Pinta, 14 km NE of Valles, January 31, 1969 (J. Reddell, W. Russell), four females. Sótano de la Tinaja, 10½ km NE of Valles, February 18, 1970 (J. A. L. Cooke), female from ground debris 1,500 feet from entrance. Cueva de Taninul #4, 12½ km SE of Ciudad Valles, July 11, 1969 (S. and J. Peck), male. Cueva de la Puente, 21 km S of San Francisco, November 30, 1968 (J. Sumbera, W. Ramsey, D. Faith, J. McIntire), female. Sótano del Tigre, 14 km NE of Valles, November 24, 1967 (J. Reddell, J. Fish), female. Sótano de Pichijumo, 8 km NE of Valles, June 1, 1968 (J. Reddell), female; April 12, 1969 (T. Raines), male.

Maymena cascada, new species

FIGURES 142-143, 145

Diagnosis. Related to *Maymena chica* but readily separated by following features: epigynum (fig. 145) simple, gently rounded lobe with two internal receptacles; cymbium of male palpus drawn out to slender tube (figs. 142-143).

Etymology. Specific name from Spanish *cascada*, cascade, used in apposition, named for Cueva de la Cascada.

Female. Total length, 2.1 mm. Carapace, 0.9 mm long, 0.8 mm wide.

Coloration and structure typical, like those of *chica* and *mayana*. Carapace and appendages dusky yellow to light brown; eye tubercles blackish; legs with few black hairs and setae. Abdomen uniform gray to bluish gray.

Clypeus subvertical, equal in height to three diameters of anterior lateral eye. First eye row straight; dark anterior median eyes

separated by radius, about as far from slightly larger lateral eyes (9/8). Posterior eye row moderately procurved; oval median eyes separated by their diameter, about as far from lateral eyes. Median ocular quadrangle as broad as long; front eyes smaller (10/8).

First leg: femur, 1.5 mm, patella, 0.45 mm, tibia, 1.1 mm, metatarsus, 0.82 mm, tarsus, 0.27 mm; total, 4.14 mm. Tibia and patella of fourth leg, 1 mm.

Epigynum (fig. 145) without projecting lobe, presenting small pattern of internal receptacles.

Male. Total length, 1.5 mm. Carapace, 0.8 mm long, 0.77 mm wide.

Coloration and structure like those of female but posterior eye row straight.

First leg: femur, 1.45 mm, patella, 0.5 mm, tibia, 1.2 mm, metatarsus, 0.7 mm, tarsus, 0.57 mm; total, 4.42 mm. Tibia and patella of fourth leg, 0.9 mm. First tibia with black clasping spur at apex below on prolateral side, pointing between two similar spines at base of adjacent metatarsus on prolateral side.

Male palpus (figs. 142-143) similar to that of *chica* in having cymbium drawn out to thin trough but this ended in narrow point.

Type Data. Male holotype, 16 females and immatures, from Cueva de la Cascada, Tequila, Veracruz, México, August 6, 1967 (J. Reddell, J. Fish, T. Evans).

Maymena delicata, new species

FIGURES 140-141, 144

Diagnosis. Related to *Maymena chica* but readily separated by following features: epigynum with small, truncated lobe and distinctive pattern of receptacles (fig. 144); male palpus with elongated cymbium and embolus twisted apically to distinctive form (figs. 140-141).

Etymology. Specific name from Latin *delicatus*, dainty.

Female. Total length, 2.15 mm. Carapace, 0.95 mm long, 0.8 mm wide.

Coloration and structure typical, like those of *chica* and *mayana*. Cephalothorax and appendages pale yellowish brown; eye tuber-

cles black; legs with dusky shading and set with blackish hairs and spines. Abdomen gray to bluish, without contrasting pattern.

Clypeus sloping forward, equal in height to three diameters of anterior lateral eye. Front eye row faintly recurved; dark median eyes separated by two-thirds their diameter, about as far from larger lateral eyes (10/8). Posterior eye row slightly procurved; oval median eyes separated by long diameter, about same distance from lateral eyes. Median ocular quadrangle about as broad as long; front eyes smaller (10/8).

First leg: femur, 1.78 mm, patella, 0.55 mm, tibia, 1.52 mm, metatarsus, 0.92 mm, tarsus, 0.70 mm; total, 5.47 mm. Tibia and patella of fourth leg, 1.13 mm.

Epigynum (fig. 144) with small posterior lobe and internal pattern of receptacles.

Male. Total length, 1.7 mm. Carapace, 0.9 mm long, 0.8 mm wide.

Coloration and structure essentially like those of females, but eyes of front row subequal in size.

First leg: femur, 1.65 mm, patella, 0.52 mm, tibia, 1.5 mm, metatarsus, 1 mm, tarsus, 0.7 mm; total, 5.37 mm. Tibia and patella of fourth leg, 1.12 mm. First legs with stout clasping spine and supporting spines on metatarsus like those of *chica* and *cascada*.

Male palpus (figs. 140-141) with cymbium drawn out to elongated trough, twisted at apex to distinctive form.

Type Data. Male holotype and three females from Cueva de Ojo de Agua Grande, 10 km N of Potrero Viejo, Veracruz, México (J. Reddell, J. Fish, W. Bell).

Maymena grisea, new species

FIGURE 148

Diagnosis. Similar to *Maymena chica* Gertsch but separated from all known species by the epigynum (fig. 148) which bears two sharp spurs beside small rounded lobe overhanging genital groove.

Etymology. Specific name from Latin *griseus*, gray.

Female. Total length, 2.2 mm. Carapace,

1.1 mm long, 0.97 mm wide.

Coloration and structure typical, like those of *chica* and *mayana*. Carapace pale yellow, shaded with dusky; eye tubercles black; sternum blackish; coxae and femora of legs pale yellow but apical segments brownish. Abdomen gray, dusky on sides.

Clypeus sloping forward, equal in height to two and one-half diameters of anterior lateral eyes. Front eye row weakly procurved; dark anterior median eyes smaller than anterior lateral eyes (10/12), separated by third of diameter, nearly full diameter from anterior lateral eyes. Posterior eye row gently procurved; oval posterior median eyes separated by long diameter, about as far from subequal lateral eyes. Median ocular quadrangle as broad as long; front eyes smaller (10/12).

First leg: femur, 1.3 mm, patella, 0.45 mm, tibia, 0.90 mm, metatarsus, 0.94 mm, tarsus, 0.55 mm; total, 4.14 mm. Tibia and patella of fourth leg, 1.2 mm.

Epigynum (fig. 148) broad sclerotized plate bearing behind small lobe flanked by distinct, sharp spur on each side and small median pit near posterior coxae.

Type Data. Female holotype from Cueva de la Capilla, 13½ km 000 of Gómez Farías El Porvenir, Tamaulipas, México, January 13, 1971 (J. Reddell, R. Mitchell, and group).

Maymena misteca Gertsch

FIGURES 146-147

Maymena misteca Gertsch, 1960, p. 36, fig. 68.

Diagnosis. Similar to *Maymena chica* but readily distinguished by following features: epigynum with moderately prominent, rounded posterior lobe and distinctive pattern of internal structures and inconspicuous pit between receptacles; first leg of male without clasping spine at apex of tibia but with single long spine at base of metatarsus; male palps (figs. 146-147) with elongated cymbium and distinct apical process as shown.

Type Data. Female holotype from Gruta de Acuitlapán, Guerrero, México, in the American Museum of Natural History.

Distribution. So far known only from caves in Guerrero.

New Records. *Guerrero*: Cueva Chica del Mogote, August 25, 1965 (J. Reddell, J. Fish, W. Bell), male, four females. Grutas del Mogote, 16 km N of Cacahuamilpa, August 25, 1965 (J. Reddell, J. Fish, W. Bell), male, three females.

6½ km S of Bustamente, December 26, 1963 (W. Russell), female; July 13, 1963 (W. Russell), female in entrance room; December 30, 1964 (W. Russell), female. *Guerrero*: Cueva del Chevrón, 3 km E of Pinal de Amoles, July 17, 1969 (S. Peck), female.

Family Nesticidae

The nesticids are sedentary spiders that have long been identified with the cave habitat and a high percentage of the species live in caves, many as blind troglobites. The Mexican fauna includes half a dozen species of which none at present can be classified as an obligate cavernicole.

Genus *Gaucelmus* Keyserling

Gaucelmus augustinus Keyserling

Gaucelmus augustinus Keyserling, 1884, p. 99.

Type Data. Female type from cellars of Fort St. Augustine, Florida.

Distribution. Caves and outside situations from Florida to Texas and south through Mexico into Central America.

Records. *Tamaulipas*: Cueva del Nacimiento del Río, Frío, 7 km S of Gómez Farías, June 29, 1969 (S. Peck), two females. Cueva de los Cuarteles, Aldama, December 1948 (C. Bolívar), female. *San Luis Potosí*: Cueva de Llanura, 3 km W of Micos, July 31, 1970 (W. Russell, D. McKenzie), two females, immature. *Nuevo León*: Grutas de Palmito,

Gaucelmus calidus, new species

FIGURES 149-150

Diagnosis. Relative of *augustinus* readily separated by following features: epigynum with large accessory lobes and distinct dark septum on margin of genital groove; conductor of male palpus (fig. 149) with deep groove in apical half to form rounded lobe and curved retrolateral process with divided spur at apex.

Etymology. Specific name from Latin *calidus*, warm or hot.

Female. Total length, 7 mm. Carapace, 2.75 mm long, 2.35 mm wide. Abdomen, 4.3 mm long, 3.5 mm wide.

Cephalothorax and legs dull to bright orange brown; legs plain or faintly marked with reddish annulae; abdomen dull white to yellowish, in some specimens with dusky dorsal pattern.

Structure similar to that of *augustinus*; retromargin of chelicera with small lobe covered with denticles.

First leg: femur, 7.35 mm, patella, 1.25 mm, tibia, 6.65 mm, metatarsus, 6.6 mm, tarsus, 2.5 mm; total, 24.35 mm. First leg about nine times, first femur 2.6 times as long as carapace.

Epigynum (fig. 150) larger than that of *augustinus* with following features: seminal receptacles large, oval, separated by half their

Figs. 140-141. *Maymena delicata*, new species. 140. Left male palpus, ventral view. 141. Left male palpus, dorsal view.

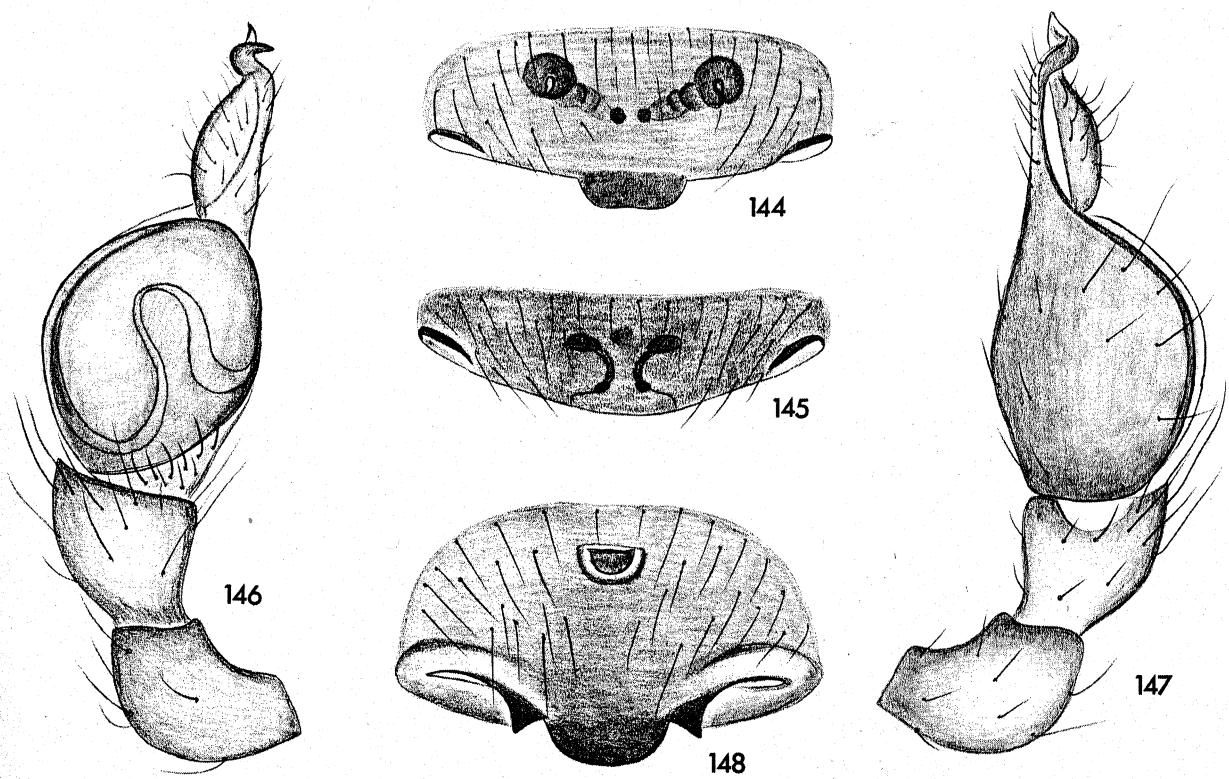
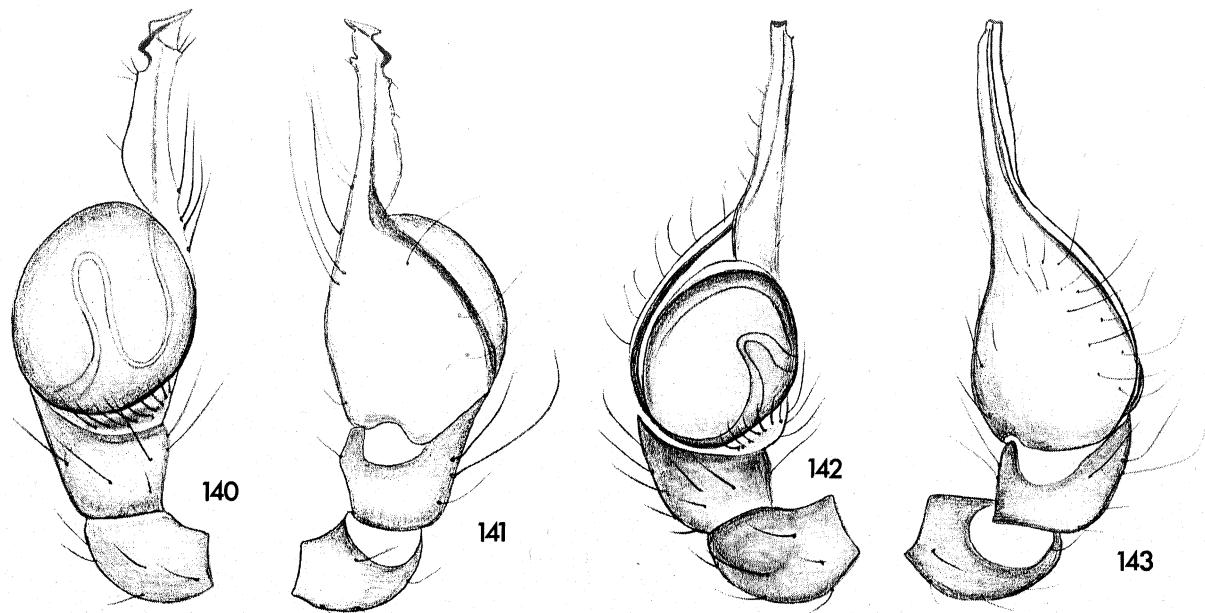
Figs. 142-143. *Maymena cascada*, new species. 142. Left male palpus, ventral view. 143. Left male palpus, dorsal view.

Fig. 144. *Maymena delicata*, new species, epigynum, ventral view.

Fig. 145. *Maymena cascada*, new species, epigynum, ventral view.

Figs. 146-147. *Maymena misteca* Gertsch. 146. Left male palpus, ventral view. 147. Left male palpus, dorsal view.

Fig. 148. *Maymena grisea*, new species, epigynum, ventral view.



width and bearing large accessory lobe at base outside; posterior margin with distinctive, sclerotized pattern and conspicuous dark median septum.

Male. Total length, 4.65 mm. Carapace, 2.35 mm long, 2.15 mm wide. Abdomen, 2.3 mm long, 1.6 mm wide.

Coloration and structure like those of female. Chelicerae stouter than those of *augustinus*; promargin with three teeth but distal one enlarged, slightly sinuous, and basal pair reduced in size; retromargin with denticulate compound tooth; fang with typical bulbous enlargement at base.

First leg: femur, 7.8 mm, patella, 1.15 mm, tibia, 8.1 mm, metatarsus, 7.5 mm, tarsus, 2.75 mm; total, 27.3 mm. First leg 11.6 times, first femur 3.4 times as long as carapace.

Male palpus (fig. 149) like that of *augustinus* except as follows: conductor deeply divided to form rounded lobe and longer curved process bifid at apex.

Type Data. Male holotype from Grutas de Zapaluta, 6½ km S of Zapaluta, Chiapas, México, July 19, 1950 (C. and M. Goodnight).

Distribution. Caves of Hidalgo, Veracruz, Chiapas and Oaxaca, and Guatemala.

Records. *Hidalgo:* Cueva de El Tenango, 6½ km S of Chapulhuacán, August 18, 1965 (J. Reddell, J. Fish, W. Bell), five females on walls above stream passage. *Veracruz:* Cueva de Ojo de Agua de Tlilapan, Tlilapan, August 1967 (J. Reddell, J. Fish, T. R. Evans), three males, many females; August 3, 1967 (J. Reddell), four females; August 8, 1969 (S. and J. Peck), male, seven females. Cave at Fortín de las Flores, June 27, 1963 (R. E. Woodruff), six females; April 28, 1944 (C. Bolívar, I. Pina), two females. Sótano de Sphodrini, Tequila, August 6, 1967 (J. Reddell, T. R. Evans), immature. Cueva del Ojo de Agua Grande, 10 km N of Potrero Viejo, August 22, 1965 (J. Reddell, J. Fish, W. Bell), female. *Chiapas:* Grutas de Zapaluta, July 19, 1950 (C. and M. Goodnight), two males, females; August 20, 1967 (J. Reddell, J. Fish, T. R. Evans), females, immature. Cueva del Tío Ticho, 1½ km S of Comitán,

August 21, 1967 (J. Reddell, J. Fish, T. R. Evans), two females, immature. Sumidero del Camino, 16 km NE of Comitán, August 22, 1967 (J. Reddell, J. Bishop), females. Cueva Chica de Hunchabien, 1½ km N of Comitán, August 21, 1967 (J. Reddell), female. *Oaxaca:* Cueva Bonita del Presidente, 1½ km N of Huautla, August 12, 1967 (J. Reddell, J. Fish, T. R. Evans), female. Milliped Cave, 8 km N of Huautla, June 1965 (W. Russell), male, two females. Cueva del Camino, Puente de Fierro, August 13, 1967 (J. Reddell), two females.

Nesticus pallidus Emerton

Genus *Nesticus* Thorell

Nesticus pallidus Emerton, 1875, p. 275.

Distribution. Common North American species widespread in Mexico in caves and in outside situations.

Cave Records. *Tamaulipas:* Cueva de la Capilla, El Porvenir, January 13, 1971 (J. Reddell, R. Mitchell), penultimate male. Bee Cave, 19 km NW of El Limón, January 29, 1968 (J. Reddell), three females. Cueva de la Mina, 9½ km NW of Gómez Farías, July 1, 1969 (S. Peck, R. Norton), female, immature; March 24, 1967 (R. Mitchell), female. Sótano de los Pinos, Joya de Salas, June 5, 1965 (D. McKenzie), male, female. Cueva de la Virgén, 19 km W of Hidalgo, April 10, 1966 (W. Russell), three females, immature. Cueva de El Pachón, 7½ km NE of Antiguo Morelos, November 24, 1967 (J. Reddell, S. Fowler), small female. *San Luis Potosí:* Cueva Chica, 2½ km NE of El Pujal, March 13, 14, 1940 (W. Bridges), males, females, immature; April 2, 1942 (C. Bolívar), female; June 5, 1967 (R. Mitchell); two males, three females; July 22, 1969 (S. and J. Peck), female. Cueva de Los Sabinos, 12½ km NE of Valles, August 14, 1942 (C. Bolívar, F. Bonet, B. Osorio, D. Peláez), two females; April 3, 1942 (C. Bolívar), two males, two females; March 30, 1946 (B. J. Dontzin, E. Ruda), male, female; May 21, 1944 (F. Bonet), two females; January 27, 1969 (J. Reddell, T. Mollhagen, T.

Albert, R. Smith), females, immature. Sótano de Yerbaniz, 21 km N of Valles, February 17, 1970, females, immature. Sótano de Pichijumo, 8 km NE of Valles, January 26, 1969 (J. Reddell, T. Mollhagen, T. Albert, R. Smith), two males, three females, immature; June 1968 (J. Reddell), males, females. Sótano del Tigre, 14 km NE of Valles, February 1, 1968 (J. Reddell, W. Russell), female. Sótano del Valle de los Fantasmas, November 24, 1969 (J. Fish, J. Davis), female. Cueva de la Puente, 1 km S of San Francisco, November 30, 1968 (J. Sumera, W. Ransel, D. Faith, J. McIntire), three females. Ventana Jabalí, 20 km NE of Valles, March 26, 1964 (T. Raines, D. McKenzie, W. Bell), female; July 12, 1969 (S. and J. Peck), four females, immature. Sótano de la Tinaja, 10½ km NE of Valles, December 24, 1963 (D. McKenzie), female, immature; February 18, 1970 (J. A. L. Cooke), female, immature from flood debris on mud slope 500 m from entrance. Sótano del Arroyo, 12 km NE of Valles, November 25, 1962 (J. Reddell), females, immature. Coahuila: Sumidero de Alicante, 16 km W of Cuatro Ciénegas, November 8, 1964 (W. Russell), female. Querétaro: Sótano de El Tigre, 24 km SW of Jalpan, July 11, 1967 (J. Fish), female. Michoacán: Cueva de la Calera, Tuxpán, April 1941 (C. Bolívar, F. Bonet, Velo, B. Osorio), two females, immature. Chihuahua: Cueva del Diablo, Salaises, July 23, 1947 (W. J. Gertsch), male, female. Guerrero: Grutas de Cacahuamilpa, June 2, 1940 (D. Peláez), male, female, immature; October 24, 1942 (C. Bolívar, D. Peláez), males, females, immature; May 5, 1963 (J. Hendrichs), females, immature; August 24, 1965 (J. Reddell, J. Fish, W. Bell), female, immature; September 2, 1966 (J. and W. Ivie), many males and females; August 15, 1969 (J. Fish, J. Reddell), female, immature. Oaxaca: Cueva Puente de Fierro, 8 km N of Huautla, August 13, 1967 (J. Reddell, J. Fish, T. R. Evans), female. Veracruz: Cueva de Ojo de Agua Grande, 11 km N of Potrero Viejo, August 3, 1967 (J. Reddell, J. Fish, T. R. Evans), females, immature. Cueva de la Cascada, 1 km W of Tequila, June 1963 (D. McKenzie), female. Cueva de Sala de Agua

Grande, 10 km E of Yanga, August 9, 1967 (J. Reddell, J. Fish, T. R. Evans), male, many females, immature. Sótano de Oztautlitztaloa, ½ km NW of Tequila, June 1963 (D. McKenzie), female. Chiapas: Hoyo de Don Nicho, 13 km W of Ocozocautla, August 16, 1967 (J. Reddell, J. Fish, T. R. Evans), male, female. Cueva Cerro Hueco, 3 km SE of Tuxtla Gutiérrez, August 8, 1967 (J. Reddell, J. Fish, M. Tandy), male, females, immature. Cueva del Tío Ticho, 1½ km S of Comitán, August 21, 1967 (J. Reddell, J. Fish, T. R. Evans), females, immature. Grutas de Zapaluta, 6½ km SE of Zapaluta, August 20, 1967 (J. Reddell, J. Fish, T. R. Evans), females. Cueva del Tempisque, 13 km W of Ocozocoautla, August 17, 1967 (J. Reddell, J. Fish, T. R. Evans), females, immature. Sumidero del Camino, 16 km NE of Comitán, August 22, 1967 (J. Reddell, J. Fish), females, immature. Yucatán: Cenote Hebia, near Hoctún, July 5, 1948 (C. M. Goodnight), males, females, immature.

Nesticus nahuanus, new species

FIGURES 151, 156

Diagnosis. Large species with stout body and appendages, readily separated from all known species by features of the genitalia: Epigynum (fig. 156) with central pale sclerite; paracymbium of male palpus (fig. 151) with thin lamina at apex and three small processes on inner margin.

Etymology. Specific name from Mexican *nahua*, the Nahuatl people.

Female from Cueva de la Boca. Total length, 5.6 mm. Carapace, 2.5 mm long, 2 mm wide. Abdomen, 3.7 mm long, 2.7 mm wide.

Cephalothorax and appendages bright yellow to orange, without contrasting markings; eye tubercles without dark pigment; abdomen gray, without pattern.

Structure typical: clypeus broad, sloping, equal in height to four diameters of anterior lateral eye. Eyes evanescent, small and widely separated, set on inconspicuous pale tubercles; first eye row slightly recurved, with

anterior median eyes separated by full diameter, nearly twice as far from anterior lateral eye; posterior eye row moderately procurved, with posterior median eyes separated by more than two diameters (9/21), nearer lateral eyes (9/13). Chelicera with three large teeth on promargin and line of about 12 small denticles on retromargin.

First leg: femur, 4.5 mm, patella, 1.1 mm, tibia, 4.5 mm, metatarsus, 4.5 mm, tarsus, 1.75 mm; total, 16.35 mm. First femur 1.8 times, first leg 6.5 times as long as carapace.

Epigynum as shown in figure 156.

Male. Total length, 5.5 mm. Carapace, 2.7 mm long, 2.3 mm wide. Abdomen, 3.2 mm long, 2 mm wide.

Coloration and structure essentially like those of female. Posterior eye row more weakly recurved.

First leg: femur, 5 mm, patella, 1.25 mm, tibia, 5.2 mm, metatarsus, 5.3 mm, tarsus, 1.9 mm; total, 18.65 mm. First femur 1.8 times, first leg about seven times as long as carapace.

Male palpus (fig. 151) with following features: paracymbium large, curved, with thin spatulate lamina at apex and with three small processes on inner margin; tegular spurs two small triangular processes; median apophysis a short sclerite with thick hook at apex; conductor a heavy triangular sclerite; embolus of average length, thick at base, with small apical curve to conductor.

Type Data. Male holotype, three males and seven females from Cueva de la Boca, 6 km SE of Santiago, Nuevo León, México, July 13, 1942 (C. Bolívar, Maldonado, B. Osorio, D. Peláez).

Distribution. Caves of Nuevo León.

Other Records. *Nuevo León:* Cueva de la Boca, June 17, 1944 (F. Bonet), two males; May 1, 1966 (J. Fish, E. Alexander), female; January 22, 1967 (T. Raines), male, penultimate male; December 4, 1966 (T. Raines), female; June 20, 1969 (S. and J. Peck), female. Resumidero de Pablillo, Pablillo, June 4, 1966 (J. Reddell, D. McKenzie), immature female. Small caves, Chipinque Mesa, Monterrey, June 24, 1969 (S. and J. Peck, R. Norton), male, two females, immature.

Nesticus hoffmanni, new species

FIGURES 152, 157

Diagnosis. Relative of *nahuanus* with larger eyes and well marked dark pattern on abdomen and longer legs, readily separated by features of genitalia: epigynum (fig. 157) a simple rounded elevation with openings on genital margin; paracymbium of male palpus (fig. 152) a short, thick, curved spur without conspicuous processes.

Etymology. Named for the late Dr. Carlos Hoffmann of Mexico City.

Female. Total length, 6 mm. Carapace, 2.7 mm long, 2.3 mm wide. Abdomen, 4 mm long, 2.5 mm wide.

Cephalothorax and appendages dull to bright orange; carapace with dusky shadings on pars cephalica and black eye tubercles; abdomen gray to yellow, with pattern of black chevrons thickly covering dorsum and with pale venter; legs with dusky rings as follows: distal one on femora, and basal and subdistal ones on tibiae.

Structure like that of *nahuanus* except as noted. Front eye row slightly recurved; anterior median eyes separated by nearly diameter, as far from lateral eye. Posterior eye row weakly procurved; posterior median eyes separated by narrow diameter, slightly closer to lateral eye. Eyes larger, darkly pigmented and closer together than those of *nahuanus*.

First leg: femur, 5.25 mm, patella, 1.2 mm, tibia, 5.15 mm, metatarsus, 5.15 mm, tarsus, 1.8 mm; total, 18.35 mm. First femur 1.9 times, first leg about seven times as long as carapace.

Epigynum as shown in figure 157.

Male. Total length, 4.5 mm. Carapace, 2.2 mm long, 2.1 mm wide. Abdomen, 2.6 mm long, 1.7 mm wide.

Coloration and structure like those of female except as noted. Posterior eye row straight.

First leg: femur, 5.35 mm, patella, 1.1 mm, tibia, 5.7 mm, metatarsus, 5.5 mm, tarsus, 1.8 mm; total, 19.45 mm. First femur 2.4 times, first leg about nine times as long as carapace.

Male palpus (fig. 152) with following fea-

tures: paracymbium a short, thick, curved spur without conspicuous processes; two tegular apophyses, a rounded spur and curved blade; median apophysis a narrow sclerite with small apical hook; embolus thick at base, with distinctive coil at center, and from there becoming thin and making wide turn to conductor.

Type Data. Male holotype, another male, six females and immature from Cueva de El Ocote, 7 km N of Kilometer 295, 1½ km N of Palomas (small roadside cave), July 20, 1956 (V. Roth, W. J. Gertsch).

Distribution. Caves of Hidalgo and San Luis Potosí.

Other Records. *Hidalgo*: Cueva de El Ocote, August 18, 1964 (J. and W. Ivie), female, immature; August 11, 1966 (J. Fish, J. Reddell), three females, immature; July 16, 1969 (S. and J. Peck), female, immature. *San Luis Potosí*: Cueva del Llano de Conejo, Xilitla, April 3, 1969 (T. R. Evans), female.

Nesticus vazquezae, new species

FIGURE 153

Diagnosis. Near relative of *hoffmanni* with smaller, more widely spaced eyes, longer legs and distinct epigynum (fig. 153).

Etymology. Named for Dr. Leonila Vazquez of the Instituto de Biología of Mexico City.

Female. Total length, 6.8 mm. Carapace, 2.9 mm long, 2.35 mm wide. Abdomen, 4 mm long, 2.75 mm wide.

Cephalothorax and appendages bright orange; eyes narrowly ringed with black; legs without dusky rings; abdomen gray, without pattern.

Structure like that of *hoffmanni* except as noted. Eyes of medium size and farther apart. First eye row moderately recurved; anterior median eyes separated by full diameter, as far from lateral eye. Posterior eye row moderately procurved; posterior median eyes separated by more than diameter (16/20), a narrow diameter from posterior lateral eye.

First leg: femur, 6.2 mm, patella, 1.35 mm, tibia, 6 mm, metatarsus, 5.75 mm, tarsus,

2.15 mm; total, 21.45 mm. First femur 2.1 times, first leg 7.4 times as long as carapace.

Epigynum as shown in figure 153.

Type Data. Female holotype and two females from Sótano del Gobernador, Pinal de Amoles, Querétaro, México, March 10, 1967 (J. Reddell, J. Fish).

Distribution. Caves of Querétaro.

Other Records. *Querétaro*: Cueva del Mercurio, Tejamanil, July 10, 1967 (J. Reddell), female. Sótano de Tejamanil, Tejamanil, August 9, 1966 (J. Fish), seven females, immature.

Family Ctenidae

The ctenids are often common in caves and live on the walls and floors, usually in plain sight. Although some of the species are paler than those found in outside situations, all of these active, vagrant spiders are classed as troglophiles.

Ctenus mitchelli, new species

FIGURES 154-155

Diagnosis. Large, typical species of genus readily recognized by distinctive features of male and female genitalia as follows: epigynum (fig. 155) a longer than broad, apically rounded lobe with long brown spur on each side; male palpus (fig. 154) with elongated median apophysis nearly as long as bulb.

Etymology. Named for Dr. Robert Mitchell.

Female. Total length, 25.5 mm. Carapace, 10.5 mm long, 8.7 mm wide. Abdomen, 15 mm long, 10 mm wide.

Cephalothorax and appendages uniform light to dark reddish brown, without contrasting pattern; eyes ringed with black and linear cervical groove dusky; legs darker red at apices; abdomen gray to blackish, covered with dusky hairs, with median pale streak on dorsum from base to middle and sometimes dusky band on venter.

Structure typical: pars cephalica five-ninths

width of carapace; sternum, 4.3 mm long, 4 mm wide, rounded behind and narrowed to trivial point between posterior coxae; first eye row narrower than second, strongly recurved, with anterior median eyes separated by radius, full diameter from subequal lateral eyes; posterior eye row recurved, with median eyes separated by one-third diameter, about diameter from subequal lateral eyes; median ocular quadrangle as broad as long, narrowed in front (62/45), with front eyes smaller (60/35); clypeus equal in height to diameter of large posterior median eyes.

First leg: femur, 13 mm, patella, 5.2 mm, tibia, 13.3 mm, metatarsus, 12.3 mm, tarsus, 4 mm; total, 47.8 mm. First femur 1.2 times, first leg 4.7 times as long as carapace. First tibia with five pairs, first metatarsus with three pairs of stout ventral spines.

Epigynum (fig. 155) an elongated lobe, narrowed at base, rounded behind, with long spur on each posterior corner.

Male. Total length, 20.5 mm. Carapace, 10 mm long, 8 mm wide. Abdomen, 10.5 mm long, 6 mm wide.

Coloration and structure like those of female except as noted. Pars cephalica narrower, in ratio 7:16.

First leg: femur, 13.5 mm, patella, 4.5 mm, tibia, 14.5 mm, metatarsus, 13.5 mm, tarsus, 5.3 mm; total, 51.3 mm. First femur 1.3 times, first leg five times as long as carapace.

Male palpus (fig. 154) with strong, outwardly directed spur on tibia; embolus a short pointed process; median apophysis an elongated, oval sclerite nearly as long as bulb. Fourth metatarsus straight.

Type Data. Male holotype from Cueva de la Mina, 7 km NW of Gómez Farías, Tamaulipas, México, March 24, 1967 (R. Mitchell).

Distribution. Common in caves of Tamaulipas and San Luis Potosí.

Selected Records. *Tamaulipas*: Cueva de la Mina, March 24, 1967 (R. Mitchell), female; March 9, 1969 (J. Reddell, G. Tucker), male. Crystal Cave, Rancho del Cielo, March 24, 1967 (R. Mitchell), female. Grutas de Quintero, 13 km SW of Mante, June 6, 1967 (R. Mitchell), female, two immature; November 28, 1964 (J. Reddell), female. Cueva de El Pachón, 7½ km NE of Antiguo Morelos, no date available (R. Remington), three females. *San Luis Potosí*: Cueva Mosca, 24 km NE of Ciudad del Maíz, July 16, 1967 (J. Reddell, J. Fish), female, five immature. Sótano de Pichijumo, 8 km NE of Valles, January 31, 1968 (R. Mitchell, F. Rose), female. Cueva de Valdosa, 10½ km SE of Valles, November 26, 1967 (M. Collins, T. R. Evans, M. Meredith), two females. Cueva de la Selva, Xilitla, April 10, 1966 (T. Raines), female. Cueva Chica, 2½ km NE of El Pujal, November 23, 1967 (T. Raines), two females. Cueva del León, 8 km NE of Valles, June 1, 1968 (J. Reddell), female.

Family Agelenidae

The family Agelenidae has contributed a small number of cave-adapted species to the world fauna. Probably most notable are *Hadites tegenerioides* Keyserling of Yugoslavia and *Cicurina buwata* Chamberlin and Ivie of Texas, both of which are completely blind. Two genera in Mexico have good representation in caves, *Cicurina*, with two blind species described below and *Tegenaria*, with some species showing reduction of eyes and general loss of dark pigment, in these respects

Figs. 149-150. *Gaucelmus calidus*, new species. 149. Left male palpus, ventral view. 150. Epigynum, posterior view.

Fig. 151. *Nesticus nahuanus*, new species, left male palpus, ventral view.

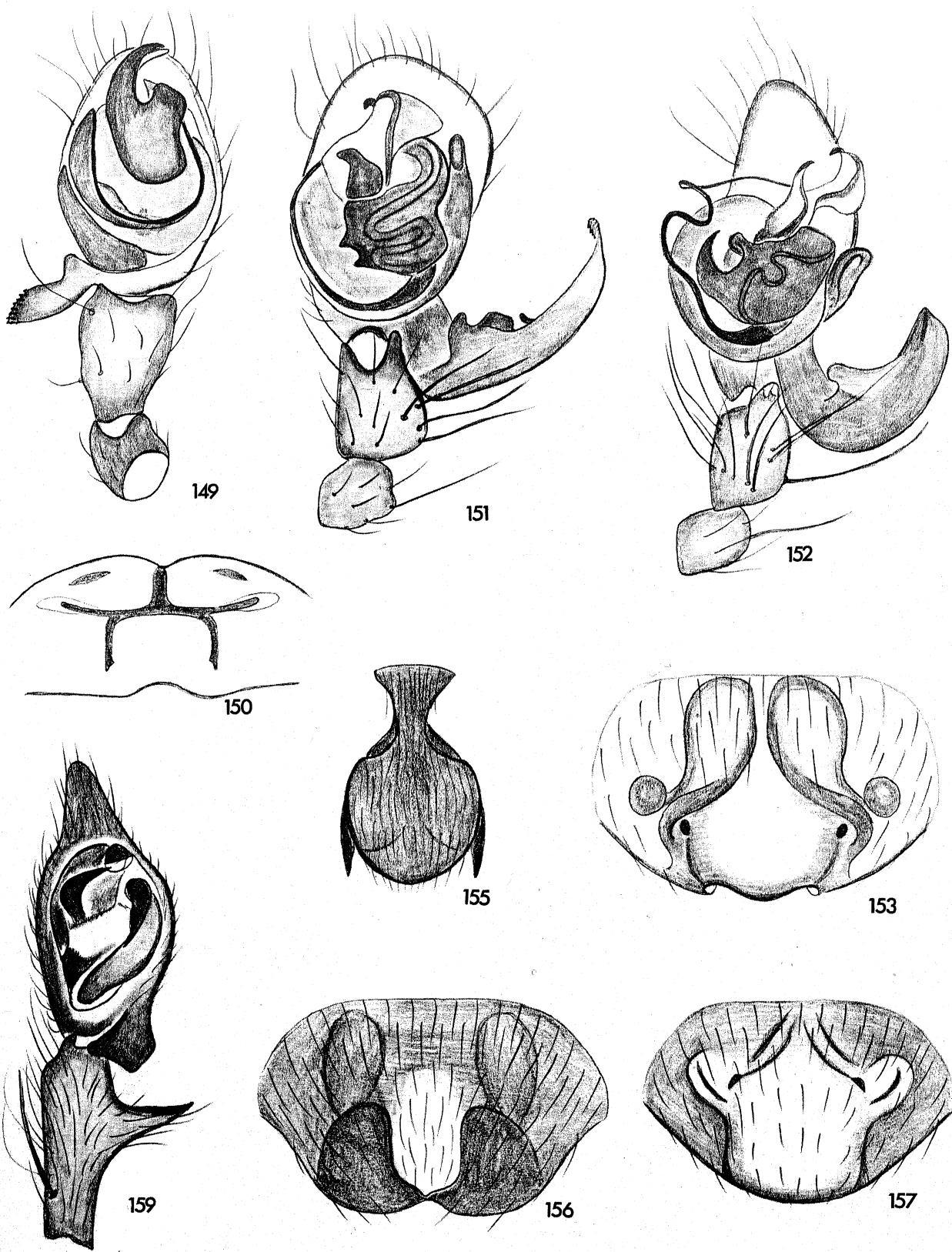
Fig. 152. *Nesticus hoffmanni*, new species, left male palpus, ventral view.

Fig. 153. *Nesticus vazquezae*, new species, epigynum, ventral view.

Figs. 154-155. *Ctenus mitchelli*, new species. 154. Left male palpus, ventral view. 155. Epigynum, ventral view.

Fig. 156. *Nesticus nahuanus*, new species, epigynum, ventral view.

Fig. 157. *Nesticus hoffmanni*, new species, epigynum, ventral view.



comparable to *Tegenaria herculea* Fage and *hispanica* Fage of Spain.

The taxa of the *Tegenaria mexicana* group as recently established by Roth (1968, pp. 15-25) are now known to be widespread in Mexican caves. The close similarity among the species of the epigyna and male palpi prompted Roth to regard the various populations as representing only subspecies of a single polytypic species called *mexicana*. Substantial differences in color pattern, size and relationships of the eyes and in the comparative lengths of legs and spinnerets were noted but not considered of specific import. In this paper the complex is considered to represent a superspecies, with at least some of the elements narrowly sympatric, and the taxa are given specific status. Only those species identified with caves are considered here and various new cave records are cited.

Genus *Tegenaria* Latreille

Tegenaria mexicana Roth

Tegenaria mexicana mexicana Roth, 1968, p. 21, figs. 21, 22, 25.

New Records. Guerrero: Grutas de Acuitlapán, 16 km E of Taxco, April 9, 1968 (W. Calvert), male, Grutas de las Granadas, 16 km E of Taxco, April 9, 1968 (W. Calvert), two immature.

Tegenaria decora, new species

FIGURES 164-165

Diagnosis. Small dusky species related to *selva* and occurring within its general distri-

bution, distinguished by following features: small size, 7 to 9 mm; eyes of median quadrangle subequal; median apophysis of male palpus a shallow, semilunar lamina with short curved tip.

Etymology. Specific name from Latin *decorus*, graceful, comely.

Female. Total length, 8 mm. Carapace, 3.7 mm long, 2.7 mm wide. Abdomen, 4.35 mm long, 3 mm wide.

Base color of cephalothorax and appendages dull orange; eye tubercles black; carapace with spotted band on each side, pale median stripe and quite wide submarginal pale band margined by black seam; sternum light brown, with faint pale spot in front of middle; chelicerae dark reddish brown; legs with faint dusky rings. Abdomen gray, with irregular median pale stripe on dorsum.

Structure typical: pars cephalica truncated in front, its width about two-thirds that of pars thoracica. Clypeus vertical, 0.18 mm, about as high as long diameter of anterior lateral eye. Ratio of eyes: ALE:AME:PLE:PME = 30:24:30:24. Front eye row faintly procurved; anterior median eyes separated by their radius, nearer lateral eyes. Posterior eye row slightly procurved; posterior median eyes separated by their diameter, as far from lateral eyes. Median ocular quadrangle as broad as long, narrowed in front (70/60); eyes subequal in size. Chelicera moderately geniculate at base; promargin with four teeth; retromargin with seven teeth. Sternum, 1.8 mm long, 1.75 mm wide.

Leg formula, 4123. First femur 1.6 times, first leg six times as long as carapace.

Posterior spinneret: basal segment, 0.6 mm, apical segment, 0.85 mm. Colulus three times as broad as long.

	I	II	III	IV	Palp
Femur	6.00	5.10	5.00	6.15	1.80
Patella	1.50	1.35	1.25	1.25	0.65
Tibia	5.50	4.65	3.90	5.25	1.30
Metatarsus	6.00	5.35	5.25	7.00	—
Tarsus	3.30	2.70	2.35	3.10	2.00
Total	22.30	19.15	17.75	22.75	5.75

Epigynum (fig. 164) similar to those of other species of *mexicanus* group.

Male. Total length, 7.3 mm. Carapace, 3.3 mm long.

Coloration and structure like those of female except as noted. Posterior eye row straight; posterior median eyes slightly larger than anterior median eyes.

First leg: femur, 6.7 mm, patella, 1.4 mm, tibia, 6.6 mm, metatarsus, 7.0 mm, tarsus, 3.7 mm; total, 25.4 mm. First femur twice as long, first leg 7.7 times as long as carapace. Tibia and patella of fourth leg, 7.5 mm.

Posterior spinneret: basal segment, 0.43 mm, apical segment, 0.55 mm.

Male palpus (fig. 165) with narrow median apophysis.

Type Data. Male holotype, and six females and immature, from Cueva de Potrerillos, 1½ km W of Ahuacatlán, San Luis Potosí, México, July 12, 1967 (J. Reddell, J. Fish, P. Russell).

Tegenaria selva Roth

Tegenaria mexicana selva Roth, 1968, p. 23, figs. 28, 29.

New Records. *San Luis Potosí:* Sótano de Araña, west of Valle de los Fantasmas, January 29, 1969 (R. Harmon, J. Cepeda), female. Sótano de la Golondrina, Valle de los Fantasmas, November 29, 1968 (W. Elliott, J. Jarl, S. Cathey, M. Burk), male, female, immature. Sótano de Abernathy, west of Valle de los Fantasmás, January 30, 1969 (W. Elliott, D. Honea, M. Abernathy), female. Sótano del Puerto de los Lobos, San Francisco, September 14, 1968 (W. Elliott), two females. Sótano de Ojo de Agua, 4 km S of San Francisco, November 30, 1968 (W. Elliott, J. Jarl), two females, immature. *Tamaulipas:* Cueva de la Mina, Rancho del Cielo, January 10, 1971 (J. Reddell), female; June 3, 1967 (R. Mitchell), female, immature; January 27, 1968 (J. Reddell, R. Mitchell, F. Rose, J. George), immature female; March 9, 1969 (J. Reddell, C. Tucker), two females. Cueva de El Rey Molino, 8½ km W of Gómez Farías, June 4, 1967 (R. Mitchell), male.

Cueva de Rancho del Cielo n. 3, 5 km NW of Gómez Farías, July 5, 1969 (S. and J. Peck), immature.

Tegenaria blanda, new species

Diagnosis. Uniformly pale orange, long-legged species with small eyes, possible troglobite, similar to *caverna* but distinguished by following features: both eye rows essentially straight; eyes larger and closer together; apical segment of posterior spinnerets shorter than basal one.

Etymology. Specific name from Latin *blandus*, bland.

Female from Cueva de la Capilla. Total length, 11 mm. Carapace, 4.6 mm long, 3.45 mm wide. Abdomen, 5.6 mm long, 3.7 mm wide.

Cephalothorax and appendages of quite uniform dull orange color; eyes narrowly ringed with black; spines dusky; chelicerae orange brown; sternum clear in center, margined with narrow brown seam. Abdomen whitish, clothed thinly with inconspicuous pale hairs.

Structure typical: pars cephalica prominently elevated, strongly convex; front truncated, equal at margin to more than half of width of rounded pars thoracica. Clypeus vertical, equal in height to about two diameters of anterior lateral eye. Ratio of eyes: ALE:AME:PLE:PME = 21:19:23:21. Front eye row straight; dark anterior median eyes separated by less than diameter (19/13), from lateral eyes by full diameter. Posterior eye row faintly recurved; suboval median eyes separated by more than diameter (21/26), farther from lateral eyes (21/30). Median ocular quadrangle slightly longer than wide (65/63), narrowed in front (65/45); anterior median eyes slightly smaller. Sternum, 2.2 mm long, 2.1 mm wide. Chelicerae moderately geniculate at base; promargin with three teeth, middle one largest; retromargin with eight teeth, distal ones larger.

Leg formula, 4123. First femur about 1.9 times, first leg 6.6 times as long as carapace.

Posterior spinneret: basal segment,

	I	II	III	IV	Palp
Femur	8.60	8.00	7.00	8.70	2.80
Patella	1.70	1.65	1.65	1.65	0.85
Tibia	7.65	6.15	6.15	7.25	1.95
Metatarsus	8.75	8.35	8.35	10.52	—
Tarsus	4.00	3.50	3.50	4.10	2.80
Total	30.70	27.65	26.65	32.20	8.20

0.75 mm, apical segment, 0.65 mm long.
Colulus about four times as broad as long.

Epigynum similar to that of *decora*.

Type Data. Female holotype and female from Cueva de la Capilla, 13½ km NW of Gómez Fariás, El Porvenir, Tamaulipas, México, January 28, 1969 (J. Reddell, R. Mitchell, F. Rose, J. George).

Distribution. Known only from Cueva de la Capilla.

Other Record. *Tamaulipas*: Cueva de la Capilla, El Porvenir, January 13, 1971 (J. Reddell, R. Mitchell, and group), one subadult female, probably this species.

Tegenaria caverna, new species

FIGURES 158-161

Diagnosis. Orange-brown species without dark pattern, possible troglobite, with eyes greatly reduced in size, readily separated from relatives by following features: both eye rows recurved; anterior and posterior median eyes separated by more than twice their diameter; median ocular quadrangle narrowed in front and anterior eyes smaller.

Etymology. Specific name based on Latin *caverna*, cavern, used in apposition.

Female. Total length, 14 mm. Carapace, 5.5 mm long, 3.8 mm wide. Abdomen, 8.5 mm long, 6.5 mm wide.

Cephalothorax and appendages mostly dull orange; eyes very narrowly ringed with black; sternum clear but narrowly margined with brown; chelicerae, labium and endites dark reddish brown; hairs and spines blackish. Abdomen gray, covered with inconspicuous hairs and blackish setae.

Structure typical: pars cephalica truncated in front, its width there five-eighths that of pars thoracica. Clypeus vertical, 0.45 mm, equal in height to about three diameters of anterior lateral eye. Ratio of eyes: ALE:AME:PLE:PME = 20:12:30:14. Front eye row moderately recurved; anterior median eyes separated by more than two diameters (12/25), as far from lateral eyes. Posterior eye row moderately recurved; suboval median eyes separated by more than three diameters (14/50), nearer lateral eyes (14/35). Median ocular quadrangle broader than long (75/62), narrowed in front (75/50); dark front eyes much smaller. Sternum, 2.55 mm long, 2.55 mm wide. Chelicerae moderately geniculate at base; promargin with four teeth; retro-

	I	II	III	IV	Palp
Femur	8.35	7.60	7.60	9.35	3.35
Patella	2.00	2.00	1.90	2.00	1.00
Tibia	8.15	7.60	6.60	8.25	2.40
Metatarsus	9.50	8.80	9.35	11.90	—
Tarsus	4.20	3.75	3.65	4.50	3.00
Total	32.20	29.75	29.10	36.00	9.75

margin with seven teeth, two inner ones small.

Leg formula, 4123. First femur 1.5 times, first leg about six times as long as carapace.

Posterior spinneret: basal segment, 1 mm, apical segment, 1.4 mm. Colulus about four times as broad as long.

Epigynum like that of other species of group.

Male. Total length, 12 mm. Carapace, 5.4 mm long.

Coloration and structure like those of female except as follows: eyes of median quadrangle subequal in size; anterior median eyes separated by not fully two diameters;

posterior median eye on left side obsolete.

Leg formula, 4123. First femur 1.6 times, first leg seven times as long as carapace.

Posterior spinnerets: basal segment, 0.75 mm, apical segment, 1 mm.

Male palpus (figs. 158-160) with relatively thick tibia and spur of characteristic form; median apophysis a long, semilunar lamina.

Type Data. Male holotype, two females and two immature, from Cueva del Puerto del León, 6½ km SE of Río Blanco, Querétaro, México, July 9, 1967 (J. Reddell, J. Fish, P. Russell).

Distribution. Known only from above cave.

	I	II	III	IV	Palp
Femur	9.70	9.00	8.50	10.00	3.00
Patella	2.10	2.00	1.90	2.00	1.00
Tibia	9.70	8.70	7.80	9.20	1.75
Metatarsus	11.00	10.70	10.80	14.25	—
Tarsus	4.70	4.35	4.00	5.15	2.25
Total	37.20	34.75	33.00	40.60	8.10

Tegenaria rothi, new species

FIGURES 161-163

Tegenaria mexicana tlaxcala Roth, 1968, p. 24 (Part: records from Hidalgo).

Diagnosis. Well marked species with dusky pattern and ringed legs of moderate length, found inside caves (troglophile) and outside, readily separated from relatives by following features: eyes large, close together, both rows procurred; anterior median eyes as large as or larger than anterior lateral; median ocular quadrangle as broad in front as behind; anterior median eyes larger than anterior lateral.

Etymology. Distinctive species named for Mr. Vincent Roth, Southwestern Research Station, Portal, Arizona, principal student of this and other agelenid spiders.

Female from Cueva de El Ocote. Total length, 11.5 mm. Carapace, 5.25 mm long, 3.75 mm wide. Abdomen, 6.50 mm long, 4 mm wide.

Base color of cephalothorax and append-

ages dull yellow, marked by dusky pigment; carapace with irregular dusky stripes on each side, leaving median and sublateral pale bands and with narrow dusky marginal seam; legs with dusky rings; sternum dusky brown, with faint, pale linear streak in front of middle of some specimens; chelicerae dark reddish brown. Abdomen mostly dusky, with indistinct pale median stripe on dorsum.

Structure typical: pars cephalica broadly truncated in front and equal to about two-thirds of width of pars thoracica. Clypeus vertical, 0.4 mm, equal in height to about 1.3 diameters of anterior lateral eye. Ratio of eyes: ALE:AME:PLE:PME = 40:40:38:30. Front eye row moderately procurred; median eyes separated by third of diameter (40/14), as far from lateral eye. Posterior eye row moderately procurred; posterior median eyes separated by more than diameter (30/35), as far from lateral eyes. Median ocular quadrangle longer than broad (100/96), as broad in front as behind; anterior median eyes larger.

	I	II	III	IV	Palp
Femur	7.25	6.60	5.70	7.25	2.75
Patella	2.00	2.00	1.75	1.75	0.80
Tibia	7.00	5.50	4.50	6.25	1.75
Metatarsus	7.35	6.30	6.00	8.10	—
Tarsus	3.35	2.40	2.50	3.25	2.75
Total	26.95	22.80	20.45	26.60	8.05

Chelicerae moderately geniculate at base; promargin with four teeth; retromargin with six to eight teeth.

Leg formula, 1423. First femur about 1.4 times, first leg five times as long as carapace.

Posterior spinneret: basal segment, 0.8 mm, apical segment, 1.2 mm.

Epigynum similar to that of *decora*.

Male. Total length, 10.5 mm. Carapace, 5 mm long.

Coloration and structure like those of female except as noted below: Ratio of eyes: ALE:AME:PLE:PME = 35:40:35:35. Eyes closer together: anterior median eyes separated by one-fourth diameter; posterior median eyes separated by diameter. Anterior median eyes clearly larger than lateral eyes.

First leg: femur, 8.5 mm, patella, 2 mm, tibia, 8.3 mm, metatarsus, 9.3 mm, tarsus, 4.5 mm; total, 32.6 mm. First femur 1.7 times, first leg 6.5 times as long as carapace.

Posterior spinneret: basal segment, 0.6 mm, apical segment, 0.85 mm.

Male palpus: femur, 2.6 mm, patella, 0.7 mm, tibia, 1.35 mm, tarsus, 2.25 mm; total, 6.9 mm. See figs. 161-163 for details.

Type Data. Male holotype, and males, females and immature from Cueva de El Ocote, 7 km N of Kilometer 295, 1½ km N of

Palomas, Hidalgo, México, July 20, 1956 (V. Roth, W. J. Gertsch).

Distribution. Known only from Hidalgo and southern San Luis Potosí.

Other Records. Hidalgo: 5 km N of Chapulhuacán, April 20, 1963 (W. J. Gertsch, V. Roth), female. San Luis Potosí: Tamazunchale, April 19, 1963 (W. J. Gertsch, W. Ivie), two females.

Genus *Cicurina*

Cicurina mina, new species

FIGURES 166-167

Diagnosis. Small, pale, essentially blind troglobitic species of subgenus *Cicurusta*, similar to *arcuata* and related species, readily distinguished by small size (3.5 mm), reduction of eyes to vestiges, complicated epigynum with five coils on each side and details of palpus.

Etymology. Specific name from Spanish *mina*, with reference to Cueva de la Mina.

Female from Cueva de la Capilla. Total length, 3.6 mm. Carapace, 1.75 mm long, 1.2 mm wide. Abdomen, 1.85 mm long, 1.3 mm wide.

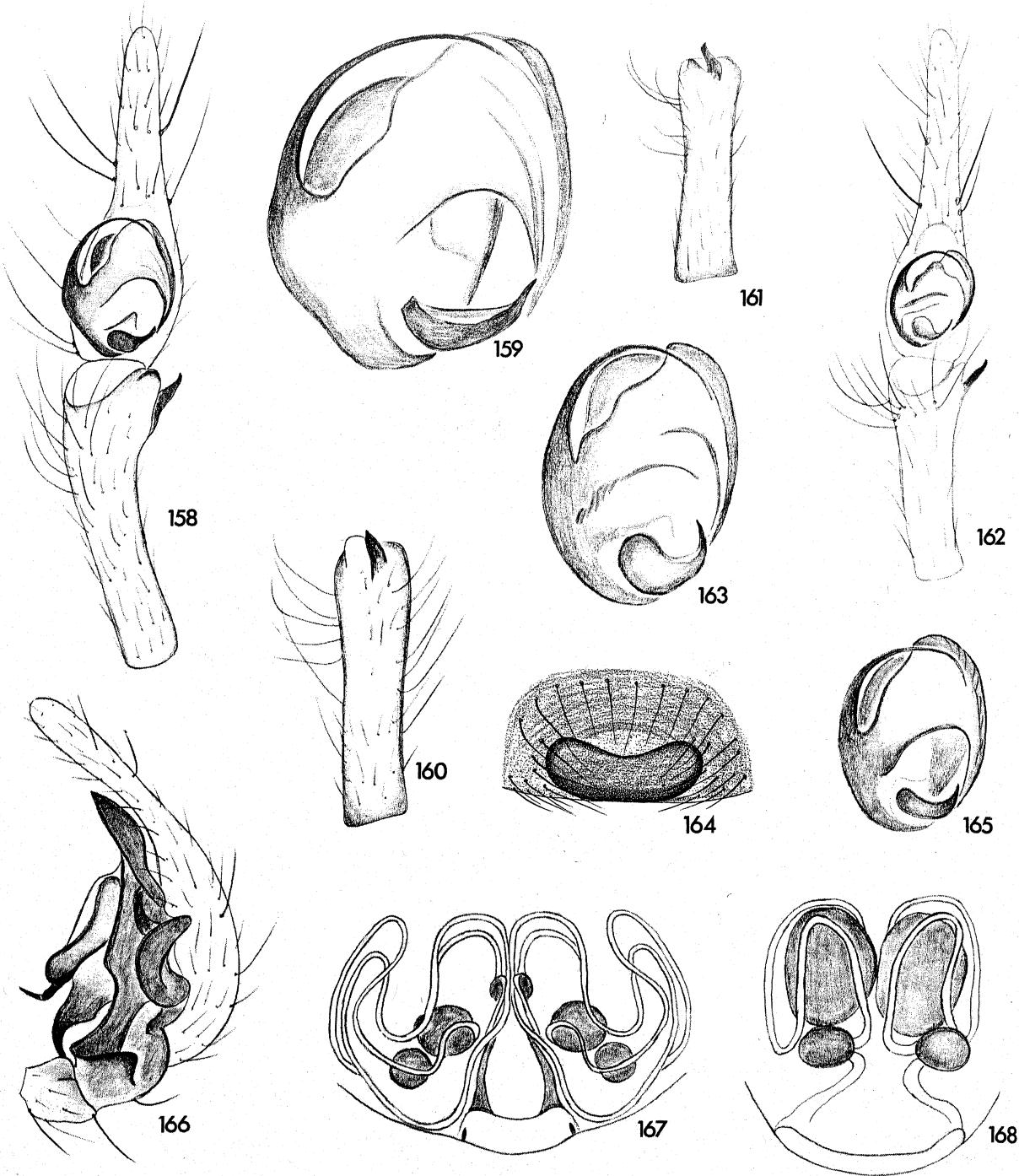
Figs. 158-160. *Tegenaria caverna*, new species. 158. Left male palpus, ventral view. 159. Bulb of left male palpus, enlarged. 160. Tibia of left male palpus, retrolateral view.

Figs. 161-163. *Tegenaria rothi*, new species. 161. Tibia of left male palpus, retrolateral view. 162. Left male palpus, ventral view. 163. Bulb of left male palpus, enlarged.

Figs. 164-165. *Tegenaria decora*, new species. 164. Epigynum, ventral view. 165. Bulb of left male palpus.

Figs. 166-167. *Cicurina mina*, new species. 166. Left male palpus, retrolateral view. 167. Epigynum, ventral view.

Fig. 168. *Cicurina coahuila*, new species, epigynum, ventral view.



Cephalothorax and appendages pale amber, with faint brownish shadings; hairs and spines dusky; linear cervical groove brown. Abdomen whitish, covered with dusky hairs.

Structure typical but size small. Eye group occupying less than half the width of head; eyes reduced to four small, well separated unpigmented spots; anterior and posterior median eyes obsolete. Chelicera slightly geniculate at base; promargin with three teeth, large middle tooth with small one on each side; retromargin with line of seven or eight teeth of which apical ones are larger. Sternum, 0.8 mm long, 0.75 mm wide. Tibia and patella of first leg, 2.2 mm, of fourth leg, 2.15 mm long.

Epigynum (fig. 167) typical of subgenus *Cicurusta* with primary and secondary spermathecae and complicated pattern of thin tubules; primary spermathecum much larger than secondary one; thin tubules with five distinct coils on each side.

Male from Cueva de la Mina. Tamaulipas: total length, 3.4 mm.

Structure much like that of female. Pars cephalica narrower. Legs proportionately longer: tibia and patella of first and fourth legs, 2.3 mm.

Male palpus (fig. 166) like that of *arcuata*; tip of conductor a short, curved spine; tibial apophysis a slightly curved, prominent blade drawn to a point.

Type Data. Female holotype and two females from Cueva de la Capilla, 13½ km NW of Gómez Farías, El Porvenir, Tamaulipas, México, January 13, 1971 (J. Reddell, R. Mitchell, and group).

Distribution. Known only from caves in La Sierra de Guatemala, Tamaulipas, Mexico.

Other Records. *Tamaulipas:* Cueva de la Mina, 7 km NW of Gómez Farías, March 24, 1961, two immature, June 3, 1967, female, and March 26, 1967, male (R. Mitchell); March 9, 1969 (J. Reddell), two females; July 1, 1969 (S. Peck, R. Norton), female.

Cicurina iviei, new species

Diagnosis. Small, dusky, six-eyed, troglo-

philic species of subgenus *Cicurusta*, related to *arcuata* and *mina*, readily distinguished by following features: size small, about 3 mm; six eyes in close-set triads, with anterior median eyes missing; legs short, with tibia and patella of fourth leg shorter than carapace.

Etymology. Named for the late Wilton Ivie, responsible for most of the systematic work on this difficult spider genus.

Female. Total length, 2.8 mm. Carapace, 1.03 mm long, 0.73 mm wide. Abdomen, 1.75 mm long, 0.90 mm wide.

Cephalothorax and appendages dull yellowish, with dusky shadings; eye tubercles and linear cervical groove black; hairs and spines blackish; abdomen uniform gray, covered with inconspicuous hairs.

Structure typical but size very small. Eye group near frontal margin, occupying half width of head. Eyes six, close together; anterior lateral eyes only slightly separated at the midline and no trace of median eyes; posterior eye row gently procurved with median eyes separated by their diameter and half as far from larger lateral eyes. Sternum, 0.6 mm long, 0.55 mm wide. Chelicerae slightly geniculate at base; promargin with three teeth of which middle one is larger; retromargin with six teeth. Legs short; tibia and patella of first leg, 0.87 mm, of fourth leg, 0.90 mm long, each shorter than carapace.

Epigynum similar to that of *mina*.

Type Data. Female holotype and female from Harrison Sinkhole, Rancho del Cielo, Tamaulipas, México, January 12, 1971 (J. Cooke, M. Brownfield, W. Elliott).

Distribution. Known only from above material.

Cicurina coahuila, new species

FIGURE 168

Diagnosis. Small, pale, blind species of subgenus *Cicurella*, without trace of eyes, related to *buvata* and various six-eyed species of Texas, readily separated by details of epigynum (fig. 168).

Etymology. Specific name based on Mexican state of Coahuila.

Female. Total length, 3.8 mm. Carapace, 1.6 mm long, 1 mm wide. Abdomen, 2.2 mm long, 1.5 mm wide.

Cephalothorax and appendages pale amber, with faint brownish shadings; hairs and spines dusky; linear cervical groove and fangs brownish. Abdomen chalky white, with inconspicuous hairs.

Structure typical but size small. Carapace smooth, shining, with sparse covering of dusky hairs. Ocular area smooth, without trace of eyes. Chelicerae slightly geniculate at base; promargin with two teeth; retromargin with five subequal teeth. Sternum, 0.8 mm

long, 0.65 mm wide. Tibia and patella of first leg, 1.6 mm, of fourth leg, 1.75 mm long.

Epigynum (fig. 168) typical of subgenus *Cicurella*, with large oval spermathecum, small basal lobe, and single large tube forming loop on each side.

Type Data. Female holotype, and female and immature, from Cueva de los Lagos, 24 km W of Ciudad Acuña, Coahuila, México, January 23, 1964 (J. Reddell, D. McKenzie, J. Porter).

Distribution. Known only from above cave.

Other Records. *Coahuila:* Cueva de los Lagos, November 15, 1964 (J. Reddell, B. Martin), female, immature.

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