

# American Museum Novitates

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PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY  
CENTRAL PARK WEST AT 79TH STREET, NEW YORK 24, N.Y.

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NUMBER 2196

SEPTEMBER 29, 1964

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## The Spider Family Uloboridae in North America North of Mexico

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The spider family Uloboridae is primarily of tropical and subtropical distribution and has only modest representation in temperate areas. The present paper is largely a systematic résumé of the 15 species and four genera occurring in the United States and Canada. Our small fauna is for the most part confined to the southern states. The genus *Hyptiotes* ranges farther north, and one of our species reaches southern Alaska.

The uloborids are also known as the hackled-band orbweavers. They are the only cribellate spiders that spin capturing webs in the form of orbs or portions of orbs. The species of *Uloborus* hang their orbwebs in horizontal position and often embellish them with distinctive silken ribbons called stabilimenta. *Hyptiotes* uses a sector of an orbweb which is strung in vertical position to form a triangular snare. *Miagrammopes* spins a single line, on which sticky cribellar threads are laid down. Both the triangle and single-line snare are derived as simplifications from the basic orb structure. The common name of hackled-band orbweavers comes from the fact that the spiral portion of the web is constructed of an unusual type of silk thread known as hackled band. The spinning of this composite band and its incorporation into the webs of various genera and species are discussed by Comstock ("1912" [1913], p. 190) and Gertsch (1950, p. 137). Excellent accounts of the web-building, feeding, and com-

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munal habits of the uloborids are given in these two works and need not be repeated here.

Only basic and important synonymies and bibliographic references are given for the various genera and species. The reader is referred to Pierre Bonnet's "Bibliographia araneorum" (1957, 1959) for a complete résumé of all published references up to 1940.

This study is based primarily on the large collection of the American Museum of Natural History in New York City, and on the collection of the first author. To the following institutions and individuals who made important materials available to us we proffer our sincere thanks: Dr. H. W. Levi, Museum of Comparative Zoölogy, Cambridge, Massachusetts; the Florida Department of Agriculture, Division of Plant Industry, Gainesville, Florida; Dr. B. J. Kaston, New Britain, Connecticut; Dr. H. K. Wallace, University of Florida, Gainesville, Florida; Mr. Vincent Roth, Southwestern Research Station, Portal, Arizona; Mr. Joseph Beatty, Cambridge, Massachusetts; and Dr. Harriet Exline Frizzell, Rolla, Missouri.

A substantial portion of the material on which this paper is based was collected on field trips of the second author that were sponsored by the National Science Foundation (G-9036 and G-24384).

#### FAMILY ULOBORIDAE

Uloboridae: SIMON, 1892, pp. 205-222, figs. 157-167. COMSTOCK, "1912" (1913), pp. 261-272, figs. 235-248. KASTON, 1948, pp. 512-514.

Cribellate spiders of superfamily Dictynoidea. Respiratory system consisting of pair of book lungs at base of abdomen and single, median, tracheal spiracle near cribellum. Spinnerets of average size, set close together, six in number; front and hind pairs two-segmented, but apical segments small. Cribellum large, broad, with spinning field entire. Chelicerae with or without lateral condyle; furrows with or without teeth. Poison glands lacking. Carapace variable, quadrate, oval or round in outline, moderately elevated, typically quite flat above, with thoracic groove usually shallow, rounded or transverse depression. Eyes usually eight, of moderate size, all dark, typically in two transverse rows; front row of four eyes minute or obsolete in *Miagrammopes*. Labium free, slightly longer than broad. Legs variable in length, with few spines. All tarsi with three claws and accessory claw-like spines; paired claws usually small but stout, with several teeth in single series; unpaired claw quite long, curved, with one or two small basal denticles. Calamistrum well developed in females, in some cases obsolete in males. Palpus of female with terminal,

toothed claw. Abdomen variable, often with tubercles accompanied with stiff hair tufts, clothed with squamose and plumose hairs in addition to typical covering hairs. Anal tubercle quite long, distinctly segmented. Heart with three pairs of ostia.

TYPE OF FAMILY: *Uloborus* Latreille.

KEY TO GENERA OF NORTH AMERICAN ULOBORIDAE

- 1. Clypeus vertical, equal to diameter or less of anterior median eye; calamistrum occupying half to two-thirds of length of fourth metatarsus.....3  
Clypeus horizontal, broad, equal to two to several diameters of anterior or posterior median eye; calamistrum occupying most of length of fourth metatarsus .....2
- 2. Sternum elongated, divided into two sternites; carapace quadrate, with anterior margin broadly obtuse; only four eyes present..*Miagrammopes* Simon  
Sternum a simple, longer than broad sclerite; carapace ovate, narrowed in front and behind; eight eyes present.....*Hyptiotes* Walckenaer
- 3. Epigynum either simple open pit, or shallow atrium covered by pair of lobes or spurs attached in front; conductor of embolus small, curved, lying close to tegulum.....*Uloborus* Latreille  
Epigynum with single hood attached at front of transverse atrium; conductor of embolus large, loosely coiled, mainly free of tegulum.....  
.....*Ariston* O. Pickard-Cambridge

GENUS *MIAGRAMMOPES* O. PICKARD-CAMBRIDGE

*Miagrammopes* O. PICKARD-CAMBRIDGE, 1869, p. 400. SIMON, 1892, p. 220.

Carapace (fig. 5) usually longer than broad, low, weakly convex above; pars cephalica broad, obtusely rounded in front; pars thoracica typically with nearly subparallel sides, truncated behind. Eyes unequal in size and arranged in two unequal transverse rows; eyes of front row minute or obsolete; posterior row recurved, with median eyes widely separated. Clypeus broad, sloping, equal in width to two or more diameters of posterior median eye. Sternum elongated, divided into two unequal sternites seemingly joined to carapace between second and third coxae by narrow sclerites. Leg formula, 1423; legs quite long and unequal, with second and third pairs short and thin; fourth pair long, laterally compressed, and first pair stoutest and longest, with apical segments laterally compressed; trochanters of first and fourth legs strongly developed, exceeding coxae in length. Fourth metatarsus laterally compressed, with ventral comb of short spines; calamistrum occupying most of length of compressed fourth metatarsus and consisting of single, sinuous series of curved bristles set on thin keel on dorsum of segment. Front tibiae of males often with rows of stout spines. Abdomen elongated, often tubular. Calamistrum broad lobe, with spinning field entire.

TYPE SPECIES: *Miagrammopes thwaitesi* O. Pickard-Cambridge.

BIOLOGY: The single known species from within the limits of the United States presumably shares the snaring habits of other members of the genus.

The single-line snare of *Miagrammopes* represents an even greater simplification of the orbweb than does the triangular snare of *Hyptiotes*. It is a single horizontal line often 4 feet or more in length and strung from branches across open spaces in the forest. Along the middle half of the

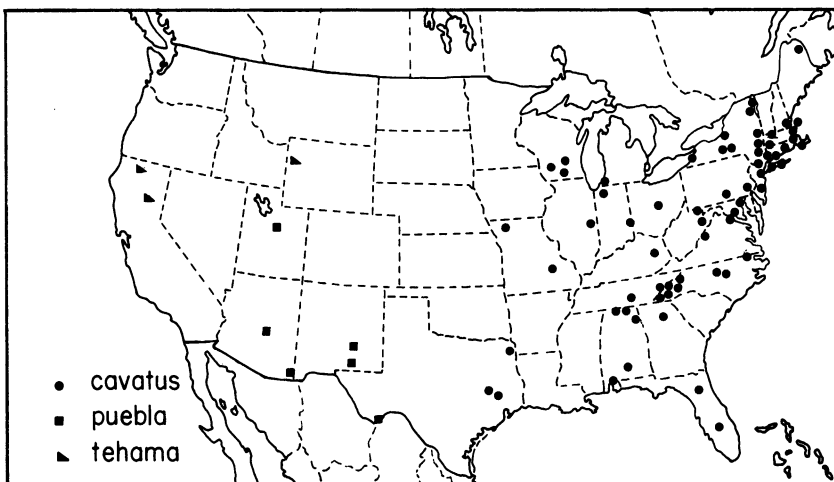


FIG. 1. Distribution of *Hyptiotes cavatus* (Hentz), *puebla*, new species, and *tehama*, new species.

line the spider lays down a thick band of viscid silk and then takes up a position upside down near a point of attachment. The line is kept under tension and released with a snap when an insect alights on the inviting line and becomes entangled.

*Miagrammopes mexicanus* O. Pickard-Cambridge

Figures 5, 12

*Miagrammopes mexicanus* O. PICKARD-CAMBRIDGE, 1894 (1889–1902), p. 116, pl. 15, figs. 7–7d. F. O. PICKARD-CAMBRIDGE, 1902 (1897–1905), p. 364, pl. 34, figs. 13–13a.

*Miagrammopes lineatus* O. PICKARD-CAMBRIDGE, 1894, p. 137, pl. 17, fig. 12. BRYANT, 1933, vol. 74, pl. 171. New synonymy.

DIAGNOSIS: This curious spider (fig. 12) has a much longer body and

thinner legs than do other Central American species, notably *alboguttatus* F. O. Pickard-Cambridge. The carapace is much longer than broad instead of being essentially equilateral. The fourth metatarsus is only half as long as the tibia, whereas that of *alboguttatus* is only a little shorter.

FEMALE: Total length, 9 mm.; carapace, 2.4 mm. long, 1.4 mm. wide; abdomen, 7 mm. long, 2.4 mm. wide.

Carapace dusky brown to black, with paler markings behind eyes and at middle near caudal margin; eye tubercles black. Chelicerae dull

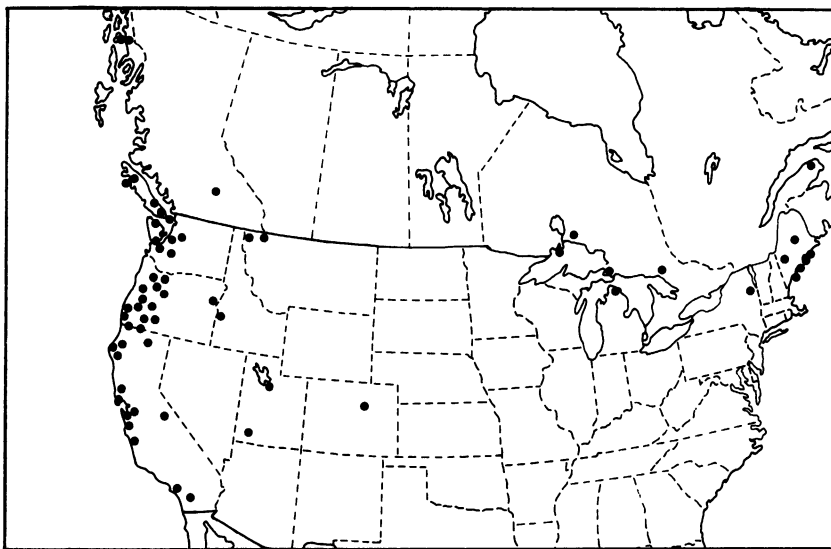


FIG. 2. Distribution of *Hyptiotes gertschi* Chamberlin and Ivie.

yellow. Sternum dusky brown. Legs dusky brown, darker above; first pair blackish brown. Abdomen dusky brown to black above and on sides, with narrow, median, thin black line the length; dorsum with series of small white side spots or more distinct pale, median stripe; venter white, with pair of narrow dusky lines on center.

Structural features typical except as follows: Carapace (fig. 5) much longer than broad, widest at second eye row, very widely rounded in front; sides of pars thoracica parallel. Eyes of first row obsolete; four eyes of posterior row recurved, subequal in size; median eyes four and one-half diameters apart, not fully three diameters from lateral eyes. Clypeus flat, front edge four diameters from posterior median eye. Legs long, thin, with spines beneath fourth metatarsus short and inconspicuous. First leg:

femur, 4 mm.; patella, 1.1 mm.; tibia, 3 mm.; metatarsus, 2.8 mm.; tarsus, 0.7 mm.; total length, 11.6 mm. Fourth metatarsus, 1.5 mm. long, laterally compressed, half as long as fourth tibia, with calamistrum occupying most of length of segment. Abdomen more than twice as long as carapace, narrow at base, with rounded elevation in basal half, then tapered to apex. Epigynum small, slightly convex elevation, with small transverse posterior emargination, beneath which lie pair of orifices leading into heavy convoluted tube on each side.

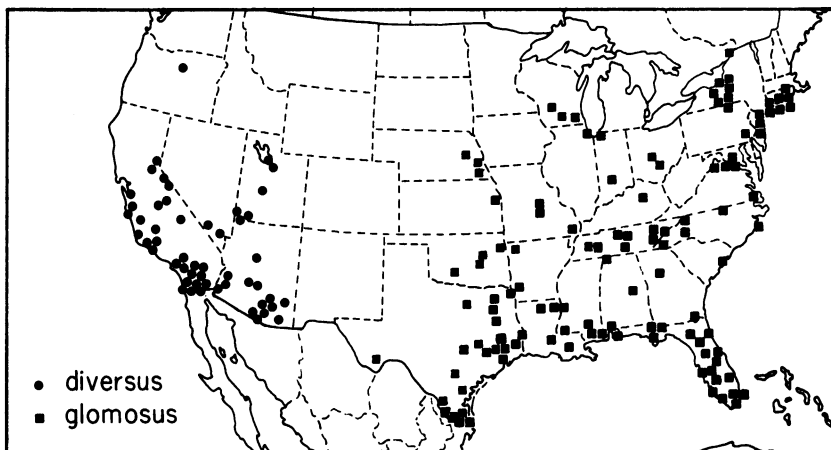


FIG. 3. Distribution of *Uloborus glomosus* Walckenaer and *diversus* Marx.

TYPE DATA: Female type of *mexicanus* from Amula, Guerrero, Mexico; immature female type of *lineatus* from Teapa, Tabasco, Mexico; both in British Museum (Natural History).

DISTRIBUTION: Southern Mexico, north to southern Texas.

RECORDS: *Texas*: Brownsville (C. Schaeffer), female. *Tamaulipas*: Rio Gualolejo, near Forlon, April 16, 1938 (L. I. Davis and Brice Brown). *Chiapas*: Ocosingo Valley, July 4, 1950 (C. and M. Goodnight; L. Stannard), female, immature.

#### GENUS *HYPTIOTES* WALCKENAER

*Uptiotes* WALCKENAER, "1837" (1842), pp. 202, 277, 299. ROEWER, 1954, p. 1346.

*Mithras* KOCH, 1837, p. 6.

*Cyllopodia* HENTZ, 1847, p. 465.

*Hyptiotes*: ERICHSON, 1845, p. 14 (emendation of *Uptiotes*). SIMON, 1892, p. 219. BONNET, 1957, p. 2269.

Carapace (fig. 7) about as broad as long, quite low, weakly convex above, highest and broadest at second eye row, with pars cephalica narrowed and rounded in front and widely rounded pars thoracica deeply emarginated behind. Eight eyes present, arranged in two unequal, transverse rows; short anterior row procurved as seen from in front, nearly straight in dorsal view, with median eyes close together and very small lateral eyes widely separated from median; much wider posterior eye row recurved, with large median eyes as widely separated as anterior

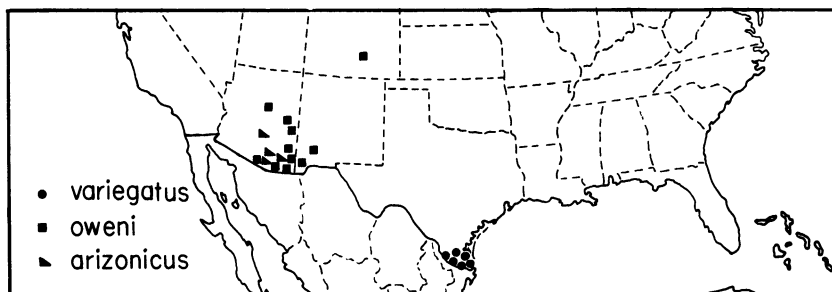


FIG. 4. Distribution of *Uloborus variegatus* O. Pickard-Cambridge, *oweni* Chamberlin, and *arizonicus* Gertsch.

lateral eyes, half as far from subequal posterior lateral eyes which lie on conspicuous, angled tubercles. Median ocular quadrangle about twice as wide as long, about one-fourth as wide in front, with front eyes smaller. Clypeus broad, sloping, equal in width to two to four diameters of anterior median eyes. Labium free, triangular, half as long as broad maxillae, which are expanded at tips. Sternum triangular, considerably longer than wide, truncated and widest in front, quite evenly tapering behind to blunt point between slightly separated posterior coxae. Cheliceral bases triangular, with two small teeth on lower and three on upper margin of furrow; fangs small. Leg formula, 4123; legs short, stout, with fourth pair longer than others. Legs of females unspined, except for few on ventral surface of metatarsi; legs of males longer, with dorsal and lateral spines. Calamistrum occupying most of length of flattened fourth metatarsus and consisting of single series of curved bristles. Abdomen of females suboval, moderately to strongly arched; abdomen of males more slender, rarely much elevated. Anterior spinnerets much larger than posterior, which are larger than median.

TYPE OF GENUS: *Hyptiotes paradoxus* C. Koch.

This small genus of fewer than a dozen known species is found mostly

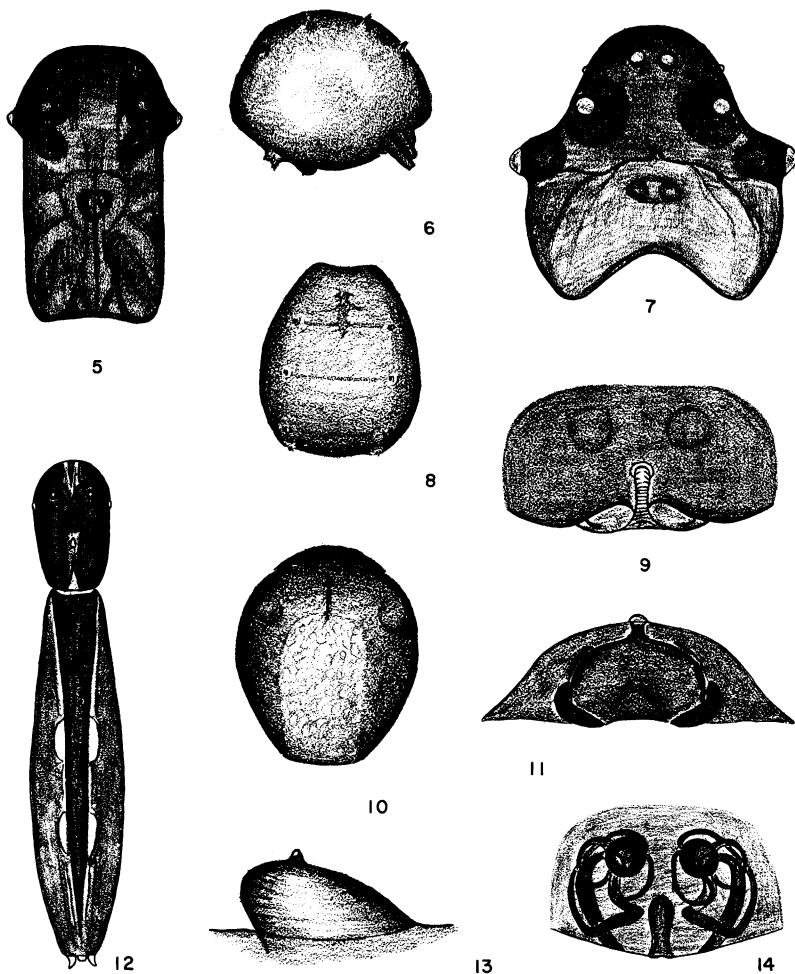


FIG. 5. *Miagrammopes mexicanus* O. Pickard-Cambridge, carapace of female.

FIGS. 6-11. *Hyptiotes cavatus* (Hentz), female. 6. Abdomen, side view. 7. Carapace. 8. Abdomen, dorsal view. 9. Epigynum, ventral view. 10. Abdomen of atypical female from Alabama, dorsal view. 11. Epigynum, posterior view.

FIG. 12. *Miagrammopes mexicanus* O. Pickard-Cambridge, carapace and abdomen of young male.

FIGS. 13, 14. *Hyptiotes cavatus* (Hentz), female. 13. Epigynum, side view. 14. Epigynum, internal view.

in the north temperate zone of both hemispheres. In Palearctica three species are European, one or two are Japanese, and two others are reported from India and Ceylon. The North American fauna is shown



herein to have four species. The species from Argentina described as *Hyptiotes zenzezi* Mello-Leitão (1945, p. 229, fig. 5) obviously does not belong to *Hyptiotes* and must be assigned to another genus.

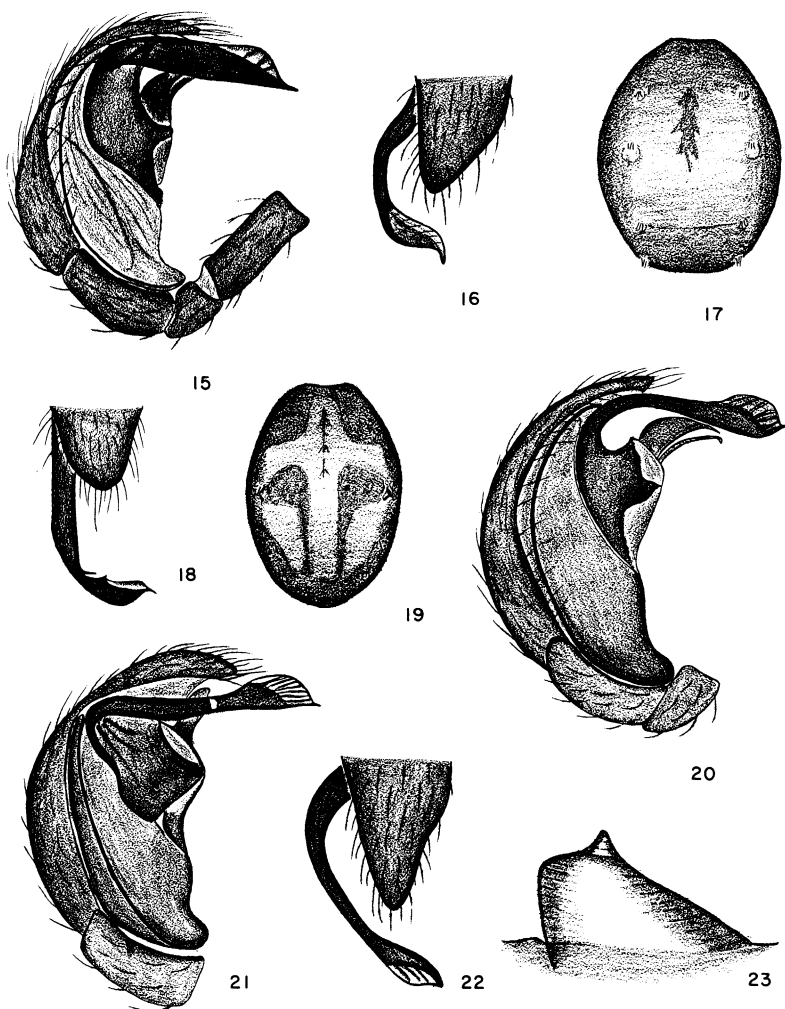
The four American species are closely similar in size and structure and are presumably derivatives of a single basic stock. They are also smaller than the European *paradoxus* and other species known to us.

The genitalia of both sexes are very constant in the genus. In the male the appendages of the bulb are all strongly modified. The bulb and its apophyses form an expansive, flattened, oval element which occupies the large concavity of the cymbium and extends as a rounded lobe over the tibia which is flattened and excavated to fit it. The embolus originates as a quite thin tube at the base of the cymbium, near the articulation of the tibia. It continues throughout its length as a fine tube which makes one turn in clockwise fashion around the bulb, where it then enters the flattened membranous conductor and ends in the groove formed by the sclerotized conductor on the prolateral side, completing about one and one-half turns altogether. The conductor is produced at its tip into a darkened curved process and lies adjacent to a similar curved spur, the radix. The median apophysis is the conspicuous element of the bulb and in the American species (fig. 15) is an elongated, curved blade, with a terminal membranous enlargement. In the European *paradoxus* the median apophysis is a short, broad spur.

The external epigynum is a broad, rounded lobe covered with fine setae, which is produced at the middle of the ventral surface into a rounded or angled process. The posterior surface bears a conspicuous sclerotized plate which is continued ventrad as a narrow band which reaches the apex of the ventral process. Near the base of the posterior plate is the narrow orifice which leads into the bursa copulatrix of its side. The bursa is a much convoluted tube which forms four coils before reaching the round seminal receptacle. The internal epigynum was similar in all the species examined (see fig. 14).

**BIOLOGY:** Information on the webs and habits of *Hyptiotes cavatus*, quite pertinent to all our species, is available in excellent studies by Wilder (1875), McCook (1894), and Comstock ("1912" [1913]). Wiehle (1927) has given an excellent account of the common European *paradoxus*.

These curious uloborids take the common name "triangle spider" from the form of their web. This is a 45-degree to 60-degree sector of an orb and is strung in a vertical position on trees, shrubs, or other foliage. The triangular snare, which varies from 10 to 20 inches in length, invariably consists of four rays of dry silk across which are laid down 10 or more viscid lines of hackled-band silk. The four rays converge to form



FIGS. 15-17. *Hyptiotes cavatus* (Hentz). 15. Male palpus, retrolateral view. 16. Tip of embolus of palpus. 17. Abdomen of atypical female from New York, dorsal view.

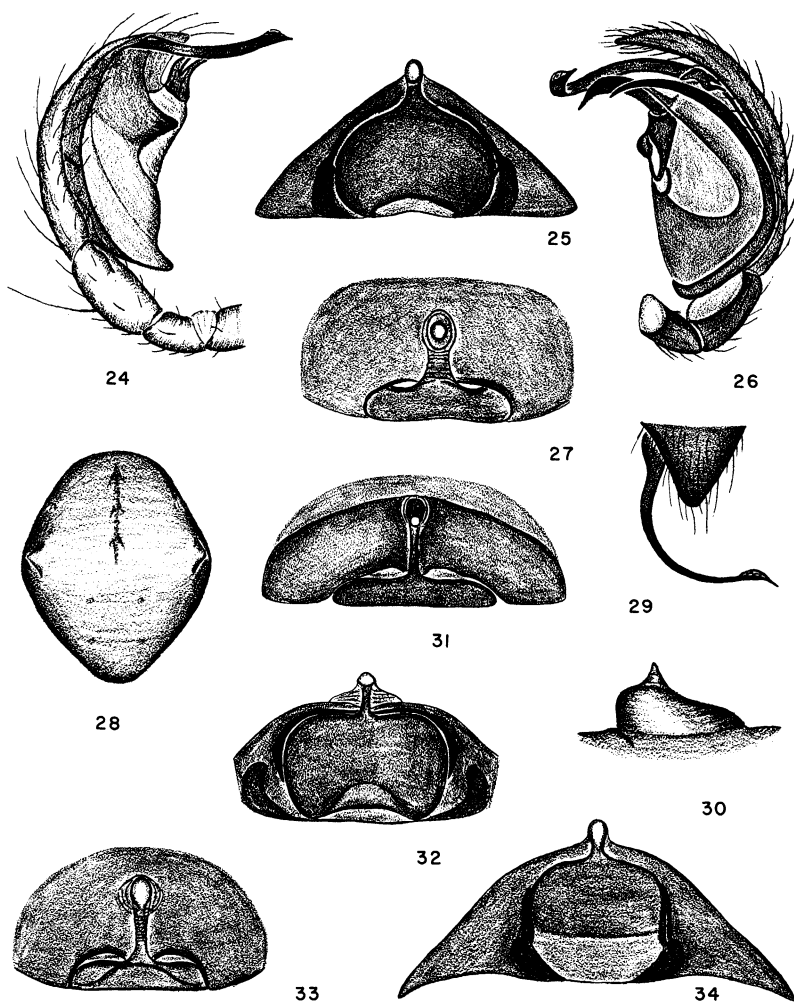
FIG. 18. *Hyptiotes puebla*, new species, tip of embolus of male palpus.

FIG. 19. *Hyptiotes gertschi* Chamberlin and Ivie, female abdomen, dorsal view.

FIG. 20. *Hyptiotes puebla*, new species, male palpus, retrolateral view.

FIGS. 21, 22. *Hyptiotes tehama*, new species. 21. Male palpus, retrolateral view. 22. Tip of embolus of male palpus.

FIG. 23. *Hyptiotes puebla*, new species, epigynum, side view.



FIGS. 24-30. *Hyptiotes gertschi* Chamberlin and Ivie. 24. Male palpus, retro-lateral view. 25. Epigynum, posterior view. 26. Male palpus, prolateral view. 27. Epigynum, ventral view. 28. Female abdomen, dorsal view. 29. Tip of embolus of male palpus. 30. Epigynum, side view.

FIGS. 31, 32. *Hyptiotes tehama*, new species. 31. Epigynum, ventral view. 32. Epigynum, posterior view.

FIGS. 33, 34. *Hyptiotes puebla*, new species. 33. Epigynum, ventral view. 34. Epigynum, posterior view.

a single bridge line, which is attached to a twig or other object and on which the spider hangs upside down. The spider draws the web taut by

pulling on the bridge line and then releases it with a snap when an insect strikes the lines.

The snare of *Hyptiotes* is quite often found on the lower branches of coniferous trees. The dry bare branches are usually chosen, but webs may also be placed on living foliage. *Hyptiotes cavatus* lives in deciduous trees and underbrush as well as in its favored pine woods habitats. *Hyptiotes gertschi* is abundant on dead branches of pines and other conifers in southern Ontario, and in the western United States it uses these habitats as well as suitable stations on cliffs, in ravines, and under bridges.

The species of *Hyptiotes* are presumed to be annual spiders that replace themselves each year. Both males and females are mature in the summer and fall. In the northeast males have been collected from July to September 12 and females until November.

These spiders are known to assume position I during mating in which the slightly smaller male lies against the venter of the female. Such a position was assumed by a pair of *gertschi* collected by the second author in Piercy, Mendocino County, California. They were dropped into preservative still in coitus and have remained in fixed, seemingly natural position. The embolus of the left palpus is inserted into the left bursa of the female epigynum, which seems to be the conventional practice of all higher spiders. The radix is pressed flat against the upper edge of the posterior plate of the epigynum. The long, thin, median apophysis is applied to a groove on the surface of this plate, and the membranous tip is inserted into a fissure along the dorsal side of the epigynum. The presence of flocculent whitish material in the membranous tip of the median apophysis may be an indication that the male has mated.

#### KEY TO NORTH AMERICAN *Hyptiotes*

1. Females .....2  
Males .....5
2. Epigynum a relatively small, rounded tubercle which in ventral view exposes little of small posterior plate, which is narrower than width of sternum (figs. 9, 11).....*cavatus* Hentz  
Epigynum higher, more strongly angled at middle; posterior plate more visible in ventral view, broader than width of sternum .....3
3. Posterior plate of epigynum subcordate (fig. 25); second pair of abdominal tubercles usually greatly enlarged.....*gertschi* Chamberlin and Ivie  
Posterior plate of epigynum rectangular; abdominal tubercles nearly equal in size .....4
4. Posterior plate of epigynum subquadrate.....*puebla*, new species  
Posterior plate broader than long.....*tehama*, new species
5. Median apophysis a long, slender, widely curved process (figs. 24, 29).....  
.....*gertschi* Chamberlin and Ivie

- Median apophysis of different form .....6
6. Median apophysis broad, not much enlarged at apex (figs. 15, 16).....  
     .....*cavatus* Hentz
- Median apophysis enlarged at apex .....7
7. Median apophysis shorter, bent sharply at apex (figs. 18, 20). *puebla*, new species
- Median apophysis longer, not much bent at apex (figs. 21, 22).....  
     .....*tehama*, new species

*Hyptiotes cavatus* (Hentz)

Figures 1, 6–11, 13–17

*Cylopodia cavata* HENTZ, 1847, p. 466, pl. 30, fig. 3.

*Hyptiotes americanus* WILDER, 1875, pp. 641–655, figs. 1–10.

*Hyptiotes cavatus*: EMERTON, 1888, p. 456, pl. 11, figs. 2–2k; 1902, pp. 218–220, figs. 498, 499. McCook, 1894, p. 276, pl. 27, figs. 7, 7a. COMSTOCK, "1912" (1913), p. 270, figs. 245–248; 1940, p. 269, figs. 245–248. KASTON, 1948, p. 514, pl. 105, figs. 1959–1963, pl. 106, figs. 1980–1984, pl. 138, fig. 2078.

Fifteen females vary from 2.3 mm. to 3.8 mm. in length and average 3.3 mm.; 10 males vary from 2.0 mm. to 2.6 mm. and average 2.3 mm.

Coloration of both sexes variable, pale yellow or gray to dark brown or even black, without strongly marked pattern. Carapace brown, with indistinct pale median stripe which becomes more distinct in median eye quadrangle; clothing consisting of short, semi-erect, black, brown, and white scales and hairs. Abdomen variable in base color, typically marked above with dark spots over small tubercles, dark lines connecting each pair of tubercles, interrupted, dark, median, dorsal stripe; sides with indistinct dark bars and darker shading around spinnerets. Abdomen covered densely with stiff, dark, semi-erect, black, brown, and white hairs partially covering tubercles. Labium, endites, coxae, sternum, and venter brown; sternum usually darker. Legs and palpi brown, somewhat darker on upper surface and clothed with mixed light and dark hairs. Pale specimens frequently lacking darker markings, and dark specimens with indistinct markings.

Structure typical for genus in both sexes. Carapace of female (fig. 7) more broadly rounded in front and with narrower clypeus equaling about two diameters of anterior median eye. Carapace of male more narrowed in front, with wider clypeus nearly four diameters of anterior median eye. Abdomen evenly arched in female, highest near middle of length (fig. 6), with five pairs of dorsal tubercles of which second pairs somewhat larger (fig. 8). Second pair of tubercles on rare occasions much enlarged as in *gertschi* as shown in specimens from New York and Alabama (figs. 17, 10). Abdomen of male smaller, less arched, only rarely with dorsal tubercles well defined. Legs of female short and stout, without

strong spines except for several short ones beneath fourth metatarsi; third femur with three or four trichobothria at base. Legs of male more slender, with thin spines on most segments; first tibia with numerous spines on dorsal and prolateral surfaces; third femur with a linear series of nine long trichobothria running from dorsal to prolateral side of segment.

Epigynum (figs. 9, 11) rounded, with small ventral tubercle; posterior plate much narrower than width of sternum, with ventral extension short and thin; internal epigynum as shown in figure 14.

Male palpus (figs. 15, 16) with relatively short, broad, median apophysis.

TYPE DATA: Female of *Cylopodia cavata* Hentz from Alabama, October (Hentz), now lost; Hentz's painting is in the Boston Society of Natural History.

DISTRIBUTION: This common species is widespread in the eastern United States from northern New England to southern Florida and westward to eastern Texas and Missouri (see fig. 1). The lack of records from some Plains states and southern Canada probably does not reflect the true range of the species, which presumably includes all states east of the Rocky Mountains as well as some Canadian provinces. Our records show that *H. cavatus* is replaced in southern Canada by *gertschi*, but a wider zone of sympatry for the two species will probably be demonstrated by more intensive collecting.

RECORDS: The map of the distribution of *Hyptiotes cavatus* and the maps of that of other uloborid species in this paper are based on a wealth of exact locality records brought together for this study. The publication of this voluminous data seems unnecessary, since it would contribute little more to our understanding of the distributions of the species concerned. These data are available to students interested in state and regional problems by application to the authors. All pertinent data are given for the less well-known species.

### ***Hyptiotes puebla*, new species**

Figures 1, 18, 20, 23, 33, 34

Seven females vary from 3.5 mm. to 5 mm. in length and average 4 mm.; five males average 2.8 mm.

Coloration of both sexes like that of *cavatus* except as follows: dark abdominal markings more diffuse; light median stripe on carapace faintly indicated or absent; in general, color more somber, quite uniform, with few aberrant markings.

Structure typical, differing little from that of *cavatus*. Abdomen of

females somewhat intermediate between that of *cavatus* and that of *gertschi*, moderately arched, with second pair of tubercles enlarged, but not so prominent as those in *gertschi*, and other dorsal tubercles weakly developed. Abdomen of males quite flat, with little indication of tubercles.

Epigynum (figs. 33, 34) large, produced into prominent ventral tubercle; posterior plate subquadrangular, widest at top, as broad as sternum.

Male palpus (figs. 18, 20) with heavy median apophysis with apically enlarged, sharply angled, terminal process.

TYPE DATA: Male holotype and eight females from Camp Mary White, Otero County, New Mexico, August, 1934 (S. Mulaik), in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States from New Mexico and west Texas to Arizona and Utah (see fig. 1).

OTHER RECORDS: *Texas*: The Basin, Big Bend National Park, September 28, 1950 (W. J. Gertsch), female. *New Mexico*: Lincoln County (C. Hoff), female. *Arizona*: Southwestern Research Station, 5 miles west of Portal, Cochise County, September 15, 1956 (M. A. Cazier), female. Tonto Creek, 22 miles east of Payson, Gila County, November, 1936 (W. L. Chapel), two females. Six miles north of Sedona, Coconino County, September 11, 1962 (V. Roth), one immature male. Santa Catalina Mountains, Pima County: Sykes Knob, 8000 feet, September 17, 1962 (J. A. Beatty), two females, immature; Hitchcock Picnic Area, 6000 feet, August 18, 1962 (J. A. Beatty), four males, female.

### *Hyptiotes gertschi* Chamberlin and Ivie

Figures 2, 19, 24-30

*Hyptiotes gertschi* CHAMBERLIN AND IVIE, 1935, p. 12, figs. 38-39. VAN RIFER, 1951, p. 21, pls. 15-18.

Fifteen females vary from 3.1 mm. to 4.4 mm. and average 3.6 mm.; 10 males vary from 2.1 mm. to 2.8 mm. and average 2.3 mm.

Females variable but general color somewhat lighter and brighter than that of *cavatus*. Dark markings on abdomen frequently more distinct and dorsum often bordered with white stripe which expands to cover slope in front of prominent second tubercles. Pale median stripe on carapace more distinct in median ocular quadrangle. Albinic, melanic, and contrastingly striped and spotted specimens common. Males paler than females, often quite uniform yellowish brown, but some also with aberrant stripes and spots.

Structure similar to that of *cavatus*. Abdomens of females variable, most

often strongly arched, with second pair of tubercles prominent (fig. 28), occasionally greatly enlarged to make abdomen subtriangular; more rarely little developed as in typical *cavatus*. Specimens from eastern Canada somewhat smaller, with less development of second pair of tubercles.

Epigynum (figs. 27, 30) large, strongly produced into heavy ventral tubercle; posterior plate broader than width of sternum, with ventral extension larger.

Male palpus (figs. 24, 26, 29) with long, thin, curved, median apophysis.

TYPE DATA: Female holotype from Salt Lake City, Utah, in collection of University of Utah.

DISTRIBUTION: This species is widespread in the western United States and Canada and ranges eastward across southern Canada to Quebec and New England (see fig. 2). It is especially abundant in the California region and occurs from near the Baja California border northward to southern Alaska. It seems less abundant in the Rocky Mountain states, and we have no records bridging the western populations through central Canada with those of eastern Canada and the adjacent United States. This discrepancy will probably be corrected by more assiduous collecting.

BIOLOGY: *Hyptiotes gertschi* has much the same habitus as does *cavatus* and was considered under that species. The specimen figured by Van Riper (1951) from Colorado is somewhat atypical but is presumed to be *gertschi*.

### ***Hyptiotes tehama*, new species**

Figures 1, 21, 22, 31, 32

Female, 4.1 mm., male, 3 mm., in length.

Coloration and structure like those of *gertschi*. Abdomen of two known females strongly arched, with second pair of tubercles of medium size.

Epigynum (figs. 31, 32) large, strongly produced into heavy ventral tubercle; posterior plate broader than long, about as wide as width of sternum, widely rounded on side margins, with thin, quite long ventral extension.

Male palpus (figs. 21, 22) with long, heavy, curved, median apophysis with quite straight apical enlargement.

TYPE DATA: Male holotype and female from Deer Creek, Tehama County, California, September 19, 1961 (W. Ivie; W. J. Gertsch), in the collection of the American Museum of Natural History.

DISTRIBUTION: Northern California and Wyoming (see fig. 1).

OTHER RECORDS: *California*: Deer Creek, Tehama County, male holotype, female. Ney Springs, Siskiyou County, September 2, 1959



(W. J. Gertsch; V. Roth), female. *Wyoming*: Hidden Falls, Cascade Canyon, Grand Teton National Park, August 25, 1950 (D. C. Lowrie), male.

GENUS *ARISTON* O. PICKARD-CAMBRIDGE

*Ariston* O. PICKARD-CAMBRIDGE, 1896 (1889–1902), p. 216.

Small species with carapace about as broad as long in both sexes, with broad pars cephalica and well-rounded pars thoracica of about equal height. Eyes of medium size, with group large and occupying half of length of pars cephalica; posterior eye row quite strongly recurved so that line on front edges of lateral eyes just touches posterior edges of median eyes; median eyes separated by two diameters, somewhat nearer lateral eyes or widely separated and much nearer lateral eyes (*albicans*). Median ocular quadrangle slightly broader than long and narrowed in front, or considerably broader than long (*albicans*). Legs of females not ornamented with fringes or contrastingly marked. Abdomen moderately elevated at middle and in some species provided with single angle or hump at middle. Epigynum presenting transverse atrium covered by rounded hood. Male palpal features: embolus a heavy flat spine originating at apex and nearly encircling bulb; conductor a conspicuous, coiled spine apically free of tegulum; median apophysis a heavy grooved spur lying below conductor.

TYPE SPECIES: *Ariston albicans* F. O. Pickard-Cambridge.

The genus *Ariston* comprises a small series of American uloborids held separate from *Uloborus* on the basis of pronounced differences in the genitalia. The males of the three known species have the bulbs of the palpi reduced in size and the median apophyses developed to considerable size. The epigyna feature a rounded or emarginated hood that covers the transverse atrium. O. Pickard-Cambridge noted the quite large area occupied by the eyes and the great separation of the posterior median eyes, with the consequently very much broader than long median ocular quadrangle. This feature is not shared by *Ariston reticens* Gertsch and Davis or the new species described below. In both of these the eyes differ little from those of the *Uloborus geniculatus* group. Nothing is known about the spinning habits of this group of spiders.

***Ariston referens*, new species**

Figures 36–39

DIAGNOSIS: This small species is closely related to *Ariston reticens* of northeastern Mexico. It can be distinguished only on the basis of differ-

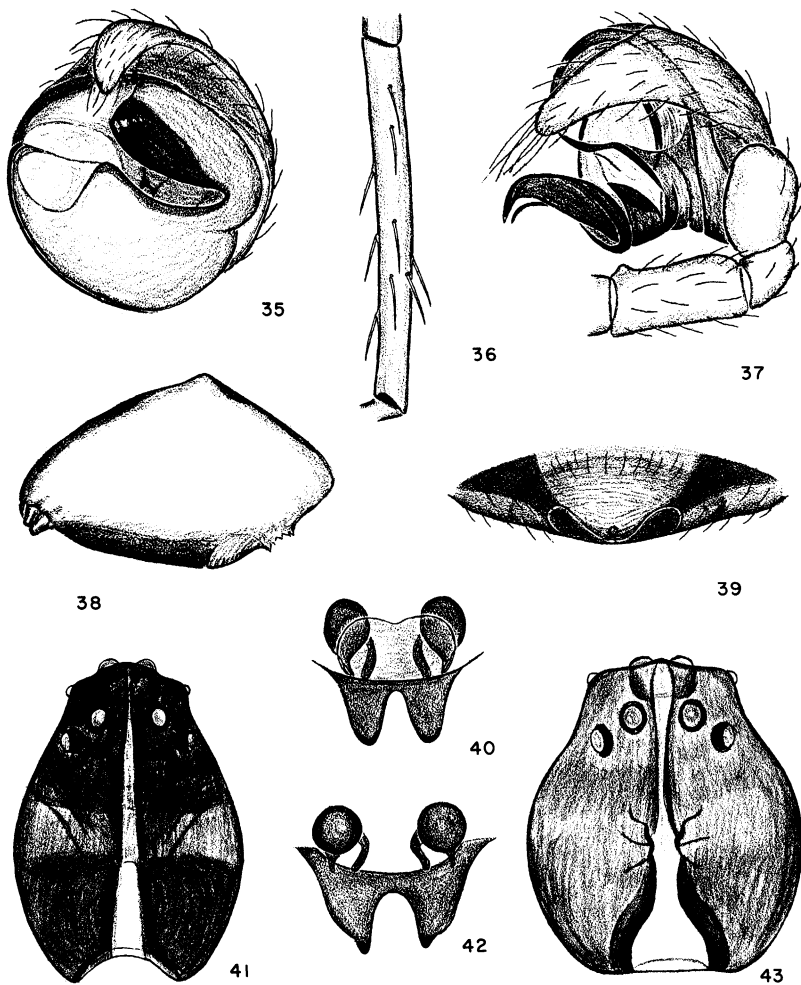


FIG. 35. *Uloborus octonarius* Muma, male palpus, apical view.

FIGS. 36–39. *Ariston referens*, new species. 36. First tibia of male, mesial view. 37. Male palpus, prolateral view. 38. Abdomen of female, side view. 39. Epigynum, ventral view.

FIGS. 40, 41. *Uloborus glomosus* Walckenaer, female. 40. Internal epigynum, ventral view. 41. Carapace.

FIGS. 42, 43. *Uloborus diversus* Marx, female. 42. Internal epigynum, dorsal view. 43. Carapace.

ences in the genitalia which are illustrated. The conductor of *referens* is somewhat heavier, is developed into a broad lamina which lies in a deep

depression in the bulb near the base and then forms a much shorter curl than that of *reticens*. The hood on the female epigynum is broadly rounded and much wider behind than that of *reticens*.

Male holotype, 2.5 mm. long; female, 2.8 mm.

Carapace light brown, with dusky shadings forming series of radiating lines from dark median spot at obsolete median groove. Eyes on black spots. Labium and maxillae dark brown, paler apically; sternum black, with pale center in female. Legs quite uniform yellowish brown, without contrasting markings except for narrow, dark, intersegmental seams. Abdomen white above and on sides, reticulated with fine dusky lines, with dusky line from base to median hump; venter nearly black, with narrow yellow median stripe. Carapace and abdomen clothed with fine hairs.

FEMALE: Carapace, 1.1 mm. long, 0.9 mm. wide. Median ocular quadrangle slightly wider than long, moderately narrowed in front. Posterior median eyes farther apart than distance to lateral eyes (20/13). First leg: femur, 1.6 mm.; patella, 0.7 mm.; tibia, 1.42 mm.; metatarsus, 1.53 mm.; tarsus, 0.6 mm.; total length, 5.85 mm. First leg 5.3 times as long as carapace. Abdomen elongate oval, in lateral view a flattened triangle produced at middle to pointed angle (fig. 38). Calamistrum occupying more than half of length of fourth metatarsus.

Epigynum (fig. 39) presenting quite large rounded hood overhanging transverse atrium.

MALE: Carapace, 0.9 mm. long, 0.87 mm. wide. First leg: femur, 1.6 mm.; patella, 0.45 mm.; tibia, 1.43 mm.; metatarsus, 1.5 mm.; tarsus, 0.52 mm.; total length, 5.5 mm. First leg 6.1 times as long as carapace. Structure like that of female except as follows: Median eye quadrangle much wider than long, moderately narrowed in front. Calamistrum obsolete. Spination of first tibia as shown in figure 36. Abdomen strongly angled, as in female.

Palpus as shown in figure 37.

TYPE DATA: Male holotype from Cochise Stronghold, Dragoon Mountains, Arizona, September 7, 1950 (W. J. Gertsch), in the American Museum of Natural History.

DISTRIBUTION: Arizona.

OTHER RECORD: *Arizona*: Douglas, August 27, 1939 (R. H. Crandall), female.

#### GENUS *ULOBORUS* LATREILLE

*Uloborus* LATREILLE, 1806, p. 109. SIMON, 1892, p. 214. ROEWER, 1954, p. 1337. BONNET, 1959, p. 4756.

*Phillyra* HENTZ, 1850, p. 25.

*Orithya* BLACKWALL, 1858, p. 331.

*Zosis* SIMON, 1864, p. 244.

*Philoponella* MELLO-LEITÃO, 1917, p. 8.

Carapace suboval, usually broadest at middle, rather low or of medium height, quite evenly convex; pars cephalica narrowed in front to squared clypeal margin; pars thoracica rounded and narrowed behind, with caudal emargination; median and cephalic grooves indistinct. Eight eyes present, arranged in two subequal transverse rows; both rows slightly to strongly recurved; eyes of both rows mostly subequal in size, but anterior lateral eyes smallest, subequidistantly spaced or median eyes of posterior row more widely separated. Median ocular quadrangle not much broader than long, narrowed in front, eyes subequal. Clypeus narrow, vertical, less than full diameter of anterior median eye. Labium free, slightly longer than broad, pointed at apex; maxillae broadly rounded at apex. Sternum much longer than broad, subtriangular, widest between first and second coxae, evenly narrowed behind to blunt point at subcontiguous posterior coxae.

Leg formulas, 1243 or 1423; legs quite long, thin; first pair longer and heavier than others, often with brushes of hairs on tibiae. Legs of females with or without spines; legs of males with weak spines on posterior legs, but first legs with stout, mainly dorsal series of spines on first tibiae. Calamistrum consisting of single series of curved setae occupying from half to three-fourths of length of fourth metatarsus. Abdomen variable, typically suboval, moderately to strongly arched, provided with paired dorsal tubercles. Cribellum a large transverse lobe with wide, undivided spinning field.

TYPE SPECIES: *Uloborus walckenarius* Latreille.

This large genus, noted for great variability of eye patterns and abdominal forms, is represented in warm areas of the world by scores of species of which relatively few reach very far into the temperate zones. In Palearctica *Uloborus walckenarius* Latreille ranges from western Europe to central Asia, and *Uloborus plumipes* Lucas is widespread in the Mediterranean region. Most Nearctic species live in the warm parts of Mexico and Central America and range northward more or less deeply into the United States. Two of our species of *Uloborus* (*glomosus* and *diversus*) are found in northern states, and only the former is at present known to reach southern Canada. One species (*geniculatus*) is tropicopolitan and has been introduced in Florida and other Gulf states.

The species from our region can be assigned to the three distinct species groups defined by Simon (1892, p. 215).

KEY TO GROUPS OF *Uloborus* IN THE  
UNITED STATES

1. Posterior eye row strongly recurved (so that line along front edges of lateral eyes does not touch median eyes); epigynum covered by contiguous, finger-like processes.....*plumipes* group  
Posterior eye row at most moderately recurved (so that line along front edges of lateral eyes touches or cuts through portion of median eyes).....2
2. Eyes smaller (posterior median eyes separated by two or more diameters); epigynum an oval pit without frontal processes; median apophysis of male palpus trifid .....*variegatus* group  
Eyes larger (posterior median eyes usually separated by less than two full diameters); epigynum a shallow atrium with pair of well-separated processes; median apophysis of male palpus simple.....*geniculatus* group

THE *plumipes* GROUP

Small species with suboval carapace (figs. 41, 43), quite narrow, low pars cephalica and well-elevated, rounded pars thoracica. Eyes of medium size; posterior row strongly recurved, with median eyes well in front of lateral eyes; median eyes well separated by nearly two diameters, slightly more than full diameter from lateral eyes. Median ocular quadrangle slightly broader than long and slightly narrowed in front, with eyes subequal in size. Legs of females usually with brushes of hairs on front tibiae. Abdomen variable, usually well elevated in basal third, subtriangular, with pair of small humps at highest point. Epigynum similar in our species, consisting of shallow atrium covered by pair of large, finger-like processes; atriobursal openings widely separated on each side margin of rounded plate; bursa copulatrix short tube joining oval or round seminal receptacle; fertilization canal short tube on inner side of receptacle. Male palpal features: embolus a thin tube originating at apex and encircling bulb; conductor a grooved sclerite without ventral enlargement at apex; median apophysis a short curved spur.

This species group includes several American species related to *Uloborus plumipes* Lucas of the Palearctic Region. The genus *Phillyra* of Hentz (1850; type: *Phillyra mammeata* Hentz), based on the common American representative now known as *glomosus* Walckenaer, was subsequently synonymized with *Uloborus* by Simon (1892).

The name *Uloborus americanus* Walckenaer came into general use after 1911 for the common American species of the *plumipes* group found in the eastern United States. Until that time most American authors used the name *plumipes* in the belief that our species was the same as one widespread in the Old World. The name *americanus* was unchallenged for a period of about 30 years, and it appears in Comstock ("1912" [1913]) and

larger works by other authors even to the present date. In 1944 Chamberlin and Ivie substituted the name *glomosus* of Walckenaer for this species and pointed out that *Uloborus americanus* Walckenaer was a distinct spider belonging to another family, the Pisauridae. They indicated that the name would probably supplant *Thanatidius tenuis* Hentz. A study of Abbot's figure (MS, fig. 229) and of the verbal description based on it by Walckenaer has convinced us that this synonymy is correct. The specific name *americanus*, therefore, cannot be used in the old sense, unless it is made available through successful petition to the International Commission on Zoological Nomenclature. Inasmuch as the name *glomosus* already has gained wide usage by authors since 1944, it does not seem necessary to us to attempt to reinstate the erroneous name.

Four well-marked species of this group occur in the area north of Mexico, and all of these have wide ranges in Mexico. Our species are similar in general appearance but can be readily separated by differences in the proportions of the carapace and legs.

#### KEY TO SPECIES OF *plumipes* GROUP

1. Females .....2  
Males .....5
2. Carapace clearly longer than broad (17/13); first metatarsus much longer than first tibia (21/17).....*glomosus* Walckenaer  
Carapace nearly as broad as long.....3
3. First tibia shorter than carapace (10/12).....*cinereus* O. Pickard-Cambridge  
First tibia slightly longer than carapace (17/16).....4
4. First metatarsus with dark ring at apex; western United States and adjacent Mexico.....*diversus* Marx  
First metatarsus usually pale at apex; lower Rio Grande Valley of Texas.....*segregatus* Gertsch
5. First tibia much longer than carapace (18/13).....*glomosus* Walckenaer  
First tibia slightly longer than carapace, at most in ratio 11/10.....5
6. Eye group occupying third of length of carapace; southeastern United States.....*cinereus* O. Pickard-Cambridge  
Eye group occupying fourth of length of carapace; western United States.....7
7. Femur of palpus 2.5 times as long as broad.....*segregatus* Gertsch  
Femur of palpus 4.5 times as long as broad.....*diversus* Marx

#### *Uloborus glomosus* (Walckenaer)

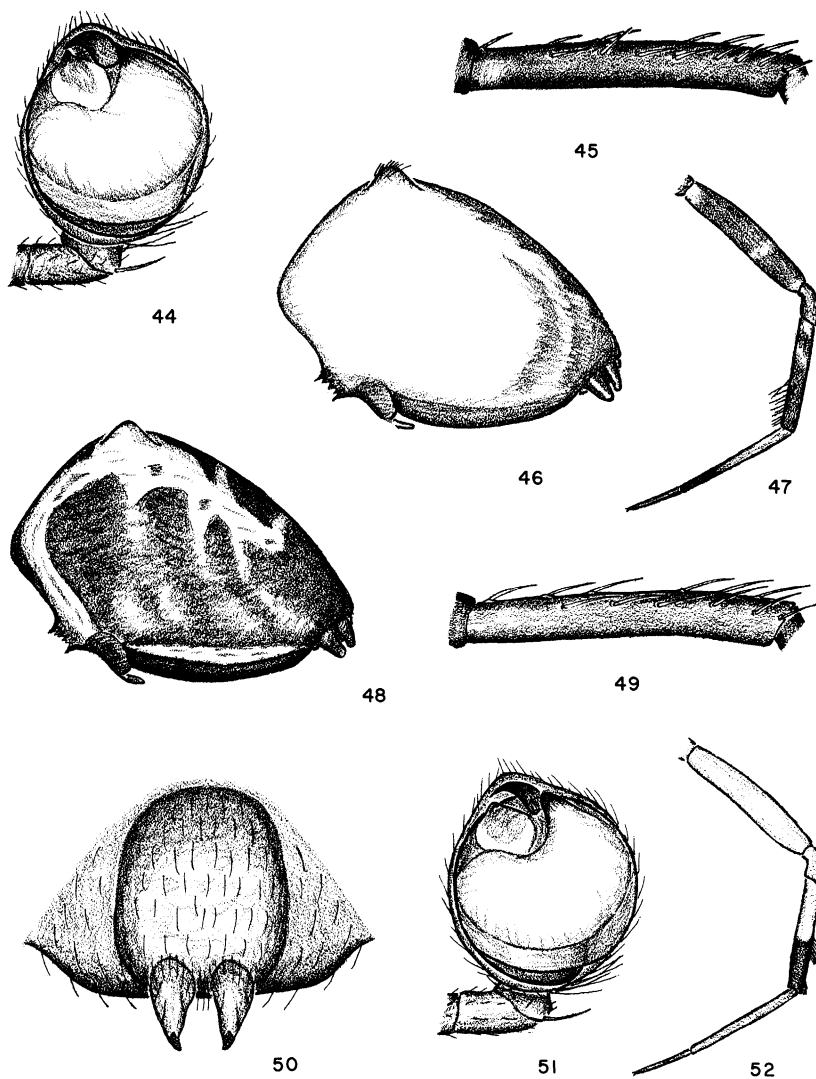
Figures 3, 40, 41, 44, 45, 66-70

*Epeira glomosa* WALCKENAER, "1837" (1842), p. 143.

*Phillyra mammeata* HENTZ, 1850, p. 25, pl. 3, fig. 16.

*Phillyra riparia* HENTZ, 1850, p. 26, pl. 3, fig. 17.

*Uloborus plumipes*: EMERTON, 1888, p. 454, pl. 11, figs. 1-1f. McCook, 1894, p. 274, pl. 27, figs. 4-5a, pl. 28, figs. 6-6c. EMERTON, 1920, p. 324.



FIGS. 44, 45. *Uloborus glomosus* Walckenaer. 44. Male palpus, ectal view. 45. First tibia of male, mesial view.

FIGS. 46-51. *Uloborus diversus* Marx. 46. Female abdomen of common form, side view. 47. First leg of female, mesial view. 48. Female abdomen of dark form, side view. 49. First tibia of male, mesial view. 50. Epigynum, ventral view. 51. Male palpus, ectal view.

FIG. 52. *Uloborus cinereus* O. Pickard-Cambridge, first leg of female, ectal view.

*Uloborus americanus*: COMSTOCK, "1912" (1913), p. 264, figs. 237-242. KASTON, 1948, p. 513, pl. 105, figs. 1956-1958, pl. 106, figs. 1976-1979, pl. 137, figs. 2076-2077.

*Uloborus glomosus*: CHAMBERLIN AND IVIE, 1944, p. 34.

Fifteen females vary from 2.8 mm. to 4.3 mm. and average 3.8 mm.; 10 males vary from 2.3 mm. to 3.2 mm. and average 2.7 mm. long.

Coloration and markings variable, with base color white, yellow, gray, brown, or even black. Carapace dusky brown to black in well-marked examples, varied with following markings: longitudinal pale stripe from clypeus to posterior margin, usually narrow, linear, enlarged on posterior declivity to width at most equal to width of posterior median eyes; linear stripe frequently missing altogether, missing in ocular area, often accented behind by dark side bars in paler specimens; pale marginal band usually present on each side but occasionally absent. Carapace more or less densely covered with light and dark reclining hairs. Abdomen quite variable, commonly light on sides, with fine longitudinal dusky line running length above and pale or dusky venter. Variations (figs. 66, 69, 70) include all white, spotted, blotched, mottled, and nearly black abdomens. Coxae, maxillae, and labium usually paler than sternum which frequently bears central black spot. Legs of female variable, most often strongly marked in dark specimens. First leg (fig. 68) usually well marked as follows: femur dark, often black, except for faint or distinct basal and median pale areas or rings; patella dark; tibia dark except for pale basal area; metatarsus pale, in some cases dark at apex; tarsi pale. First leg of male usually uniform dusky brown.

Carapace of female (fig. 41) ovate in outline, longer than broad (17/13); pars cephalica narrowed, rather low, with truncated front half as wide as total width; pars thoracica high, convex, leaving quite prominent transverse trough across carapace at obsolete median groove. Clypeus narrower than diameter of anterior median eye. Eye arrangement typical for group. Front tibia with light to dense dorsal and ventral brushes of hairs (fig. 68). Abdomen suboval in dorsal outline, variable, most often triangular in lateral view, with highest point in anterior third and bearing there pair of prominent tubercles (fig. 66); hair tufts present in some specimens to indicate obsolete tubercles, usually one pair on anterior slope and two or three on posterior slope. Female from Mississippi: carapace, 1.7 mm. long; first leg: femur, 2.4 mm.; patella, 0.75 mm.; tibia, 1.7 mm.; metatarsus, 2.1 mm.; tarsus, 0.8 mm.; total length, 7.75 mm. First leg 4.5 times as long as carapace.

Epigynum (fig. 67) with shallow atrium covered by pair of stout processes; internal details of epigynum as shown in figure 40.

Structure of male like that of female except as follows: carapace flatter;



abdomen flat, without tubercles; first tibia with numerous spines (fig. 45). Male from Mississippi: carapace, 1.35 mm. long; first leg: femur, 2 mm.; patella, 0.6 mm.; tibia, 1.8 mm.; metatarsus, 1.9 mm.; tibia, 0.8 mm.; total length, 7.1 mm. First leg 5.3 times as long as carapace.

Male palpus as shown in figure 44. Femur 2.5 times as long as wide.

TYPE DATA: *Epeira glomosa* Walckenaer from Burke County, Georgia, based on a drawing by Abbot (MS, vol. 15, fig. 77). Types of *Phillyra mammeata* Hentz and *P. riparia* Hentz from Alabama, lost.

DISTRIBUTION: Widespread in the eastern United States, north into southern Canada, south into Mexico, Central America, and the West Indies. See figure 3 for the range north of Mexico.

### *Uloborus diversus* Marx

Figures 3, 42, 43, 46-51

*Uloborus diversus* MARX, in Banks, 1898, p. 234, pl. 15, fig. 17.

*Uloborus albineus* MARX, in Banks, 1898, p. 235, pl. 15, fig. 18. New synonymy.

*Uloborus californicus* BANKS, 1904, p. 351, pl. 39, fig. 35. New synonymy.

*Uloborus utahensis* CHAMBERLIN, 1919, p. 244. New synonymy.

*Uloborus saphes* CHAMBERLIN, 1924, p. 581, fig. 6. New synonymy.

*Uloborus crepedinis* CHAMBERLIN, 1924, p. 580, fig. 5. New synonymy.

Fifteen females vary from 3.2 mm. to 4.7 mm. and average 4 mm.; 10 males vary from 2.1 mm. to 2.7 mm. and average 2.4 mm. in length.

Coloration and markings variable, like those of *glomosus*, but pale specimens far more common than melanic ones. Carapace with longitudinal pale stripe wider on posterior declivity. Leg markings distinct; anterior tibiae with basal and subbasal pale areas or rings; anterior tibiae most often dark in apical half (fig. 47); tibial brushes variable, weakly or strongly developed, with dorsal brush often lacking. Abdomen like that of *glomosus*, with pattern variations as shown in figures 46 and 48.

Structure like that of *glomosus* except as follows: carapace (fig. 43) proportionately broader (14/13), with transverse groove separating pars thoracica and pars cephalica less marked. Female from California: carapace, 1.4 mm.; first leg: femur, 2.2 mm.; patella, 0.7 mm.; tibia, 1.6 mm.; metatarsus, 1.7 mm.; tarsus, 0.7 mm.; total length, 7.3 mm. Legs proportionately shorter and stouter, with first leg 4.2 times as long as carapace.

Epigynum as shown in figure 50; internal details of epigynum as shown in figure 42.

Structure of male like that of female except as follows: carapace flattened; abdomen flat, without tubercles; first tibia armed with numerous spines (fig. 49). Male from California: carapace, 1.1 mm. long; first leg:

femur, 1.5 mm.; patella, 0.45 mm.; tibia, 1.15 mm.; metatarsus, 1.3 mm.; tarsus, 0.52 mm.; total length, 4.92 mm. First leg 4.5 times as long as carapace.

Male palpus (fig. 51) proportionately larger than that of *glomosus*; femur 4.5 times as long as wide; tibia as broad as long.

TYPE DATA: Female type of *diversus* Marx from Guaymas, Sonora, and female type of *albineus* Marx from Hermosillo, Sonora, originally in the California Academy of Sciences, now destroyed; paratypes presumed to be in the Museum of Comparative Zoölogy at Harvard College. Female type of *californicus* Banks from St. Helena, Napa County, California, presumably in the California Academy of Sciences. Female type of *crepidinus* Chamberlin from San Esteban Island, Baja California, April 19, 1921 (J. C. Chamberlin), and *saphes* Chamberlin, from Santa Catalina Island, Baja California, June 12, 1921 (J. C. Chamberlin), both in the California Academy of Sciences (Nos. 1364, 1365). Immature female cotypes of *utahensis* Chamberlin from Fillmore, Utah, in the Museum of Comparative Zoölogy.

DISTRIBUTION: Widespread in the western United States from Oregon, Utah, and eastern Arizona south into western Mexico. See map (fig. 3) for distribution north of Mexico.

### *Uloborus segregatus* Gertsch

Figures 57-61

*Uloborus segregatus* GERTSCH, 1936, p. 4, fig. 7.

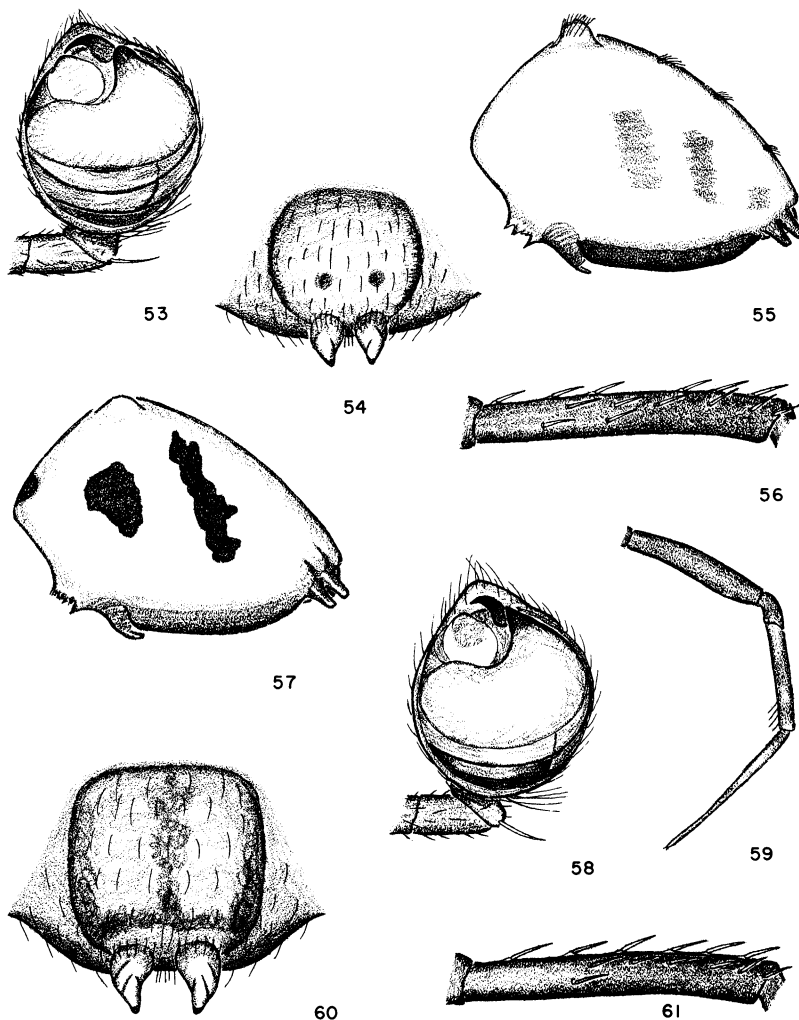
Fifteen females vary from 3.3 mm. to 5.1 mm., and average 4.1 mm.; four males vary from 1.9 mm. to 2.8 mm. and average 2.3 mm.

Coloration and markings variable, similar to those of *glomosus* and *diversus*. Base color often pale yellow to pale brown; carapace with broad median pale band like that of *diversus* (fig. 42); abdomen often with one or two slanting spots on sides of abdomen (fig. 57); legs uniform in color, with faint dark bands fading on apical segments; first leg as shown in figure 59.

Structure like that of *diversus*: Female from Texas: carapace, 1.6 mm. long, 1.45 mm. wide; first leg: femur, 2.3 mm.; patella, 0.9 mm.; tibia, 1.7 mm.; metatarsus, 2.08 mm.; tarsus, 0.75 mm.; total length, 7.73 mm. First leg 4.8 times as long as carapace.

Epigynum as shown in figure 60.

Structure of male like that of female except as follows: carapace evenly convex, not much elevated behind; abdomen evenly convex, without tubercles; first tibia armed with numerous spines (fig. 61). Male from



FIGS. 53–56. *Uloborus cinereus* O. Pickard-Cambridge. 53. Male palp, ectal view. 54. Epigynum, ventral view. 55. Female abdomen, side view. 56. First tibia of male, mesial view.

FIGS. 57–61. *Uloborus segregatus* Gertsch. 57. Female abdomen, side view. 58. Male palp, ectal view. 59. First leg of female, ectal view. 60. Epigynum, ventral view. 61. First tibia of male, mesial view.

Texas: carapace, 1.15 mm. long, 0.94 mm. wide; first leg: femur, 1.5 mm.; patella, 0.54 mm.; tibia, 1.2 mm.; metatarsus, 1.35 mm.; tarsus, 0.54 mm.; total length, 5.15 mm. First leg 4.5 times as long as carapace.

Male palpus (fig. 58) similar to that of *diversus* but segments all somewhat shorter; femur 2.5 times as long as wide; tibia broader than long.

TYPE DATA: Male holotype from Edinburg, Texas, September 16, 1935 (S. Mulaik), in the American Museum of Natural History.

DISTRIBUTION: Lower Rio Grande Valley of Texas and adjacent Mexico.

NEW RECORDS: *Texas*: Flood plain of Rio Grande River, San Juan, March 29, 1936, male, females. Bentsen, Rio Grande State Park, June 29, 1962 (J. Beatty), male, female.

This species could well be *Uloborus spermax* O. Pickard-Cambridge (1898 [1889–1902], p. 265) or *Uloborus formosus* Marx (*in* Banks, 1898, p. 234), described from Teapa, Tabasco, and Orizaba, respectively, in Mexico. The type of the former is in the British Museum (Natural History). The type of the latter, originally in the California Academy of Sciences, was destroyed in the San Francisco earthquake and fire. In neither instance is the description sufficient to permit definite placement. Until the species makeup of the *plumipes* group in tropical Mexico has been clarified, the status of *segregatus*, which comes from an area of very different climate, must remain doubtful.

*Uloborus cinereus* O. Pickard-Cambridge

Figures 52–56

*Uloborus cinereus* O. PICKARD-CAMBRIDGE, 1898 (1889–1902), p. 34, figs. 13–13d.

Fifteen females vary from 2.2 mm. to 3.4 mm. and average 3 mm. long; four males vary from 1.9 mm. to 2.8 mm. and average 2.3 mm.

Coloration and markings variable, like those of *glomus* but many specimens chalk white with distinct dark spots. Carapace dark on sides, with pale marginal bands and central longitudinal pale stripe widened in front often to include most of eye area and greatly widened behind on posterior declivity; pale chalky white spot present on obsolete median groove. Leg markings variable, with dark bands usually confined to first and fourth legs; apical ends of femora, tibiae, and metatarsi in some cases dark; basal end of metatarsi often dark. Tibial brushes variable, usually small, dense black dorsal brush present (fig. 52).

Structure like that of *diversus*: carapace about as broad as long (12/11), with pars cephalica not much lower than and not strikingly separated from pars thoracica by deep groove. Female from Mississippi: carapace, 1.2 mm. long; first leg: femur, 1.45 mm.; patella, 0.55 mm.; tibia, 1 mm.; metatarsus, 1.33 mm.; tarsus, 0.55 mm.; total length, 4.88 mm. First leg quite short, only four times as long as carapace; first tibia shorter

than carapace. Abdomen (fig. 55) typically well elevated, subtriangular, with large, rounded, dorsal tubercles accompanied by hair tufts; additional hair tufts on abdomen common and distinct.

Epigynum as shown in figure 54.

Structure of male like that of *diversus* except as follows: carapace nearly as broad as long (1 mm./0.9 mm.). First leg: femur, 1.43 mm.; patella, 0.45 mm.; tibia, 1.1 mm.; metatarsus, 1.3 mm.; tarsus, 0.45 mm.; total length, 4.73 mm. First leg 4.7 times as long as carapace. Anterior tibia with mesial series of six spines and occasionally one or two ventral spines as shown in figure 56.

Male palpus as shown in figure 53. Femur about three times as long as broad.

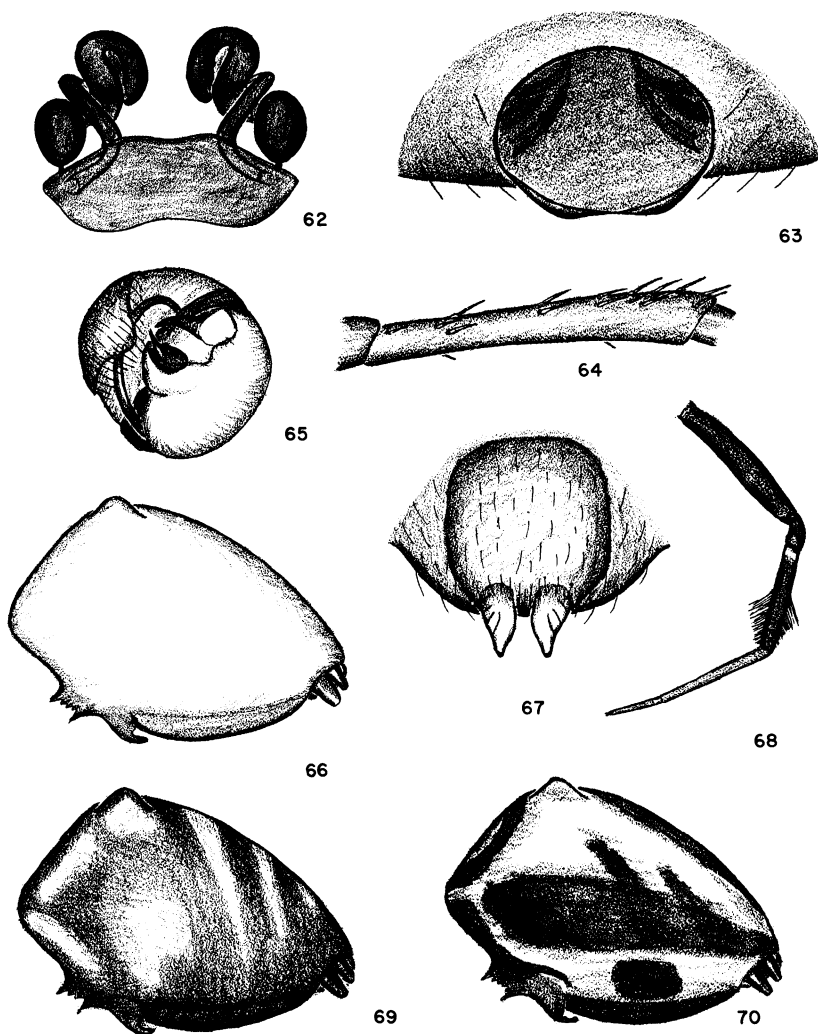
TYPE DATA: Female type from Teapa, Chiapas, Mexico (H. H. Smith), in British Museum (Natural History).

DISTRIBUTION: Florida and Gulf states of United States, eastern and southern Mexico. This species, which has not heretofore been reported from the United States, is commonly found on citrus trees in Florida and in hammock woods in Alabama.

NEW RECORDS: *Florida*: Dundee, August 8, 1952 (M. H. Muma), male and females; Lake Alfred, October 18, 1951 (H. Mongello), young female; Lake Weir, March 25, 1952 (M. H. Muma), female; Clearwater, July 8, 1952 (K. Townsend), females; Tampa, May 19, 1953 (M. H. Muma), female; Highlands Hammock, November 22, 1952 (A. M. Nadler), female; Winter Haven, August 14, 1952 (M. H. Muma), female. Most of above specimens from webs on citrus trees. *Alabama*: Dothan, Houston County, August 31, 1940 (A. F. Archer), female; shell banks, Gasque, Baldwin County, 1950 (A. F. Archer), female; hammock woods, Baldwin County, March 25–28, 1950 (A. F. Archer), male and females, October 29, 1949 (A. F. Archer), male and female; Bear Point, Baldwin County, March 25, 1950 (A. F. Archer), females.

#### THE *republicanus* GROUP

Small to large species (2 to 10 mm.), with broadly oval carapace of females about 1.25 times as long as broad and of moderate height throughout, with broad pars cephalica and well-rounded pars thoracica. Carapace of males quite broadly oval or round. Eyes rather small; posterior row slightly recurved so that line along front edge of lateral eyes cuts posterior third or half of median eyes; median eyes separated by somewhat less than two to more than two diameters, somewhat nearer lateral eyes. Median ocular quadrangle about as broad as long and slightly narrowed



FIGS. 62-65. *Uloborus arizonicus* Gertsch. 62. Internal epigynum, ventral view. 63. Epigynum, ventral view. 64. First tibia of male, mesial view. 65. Male palpus, apical view.

FIGS. 66-70. *Uloborus glomosus* Walckenaer, female. 66. Abdomen of pale form, side view. 67. Epigynum, ventral view. 68. First leg, ectal view. 69. Abdomen of common form, side view. 70. Abdomen of dark form, side view.

in front, with front eyes usually larger. Legs typically annulated with black and yellow in females but lacking fringes of hairs. Abdomen moderately to well elevated in basal third, surmounted with more or less distinct series of five pairs of humps. Epigynum variable, transversely oval, quite deep atrium, with posterior margin high and in some cases developed into rounded or angled processes; atriobursal openings widely separated on each side of atrium, leading into thick convoluted tubes which join small oval receptacle on each side. Male palpal features: embolus originating at apex and forming thin tube encircling bulb; conductor a grooved sclerite with rounded basal lobe and apical sharp spur; median apophysis a short, triramous spur.

This distinctive group includes the well-known social uloborid, *Uloborus republicanus* Simon, of northern South America, which Mello-Leitão made the type of the genus *Philipponella* in 1917, and a series of similar species from the Americas. All species are social and usually live in large colonies of scores or hundreds of individuals. The two Arizona species place their large communal webs in dark or shaded spots under overhanging rocks, cliffs, culverts, bridges, and in cave entrances and buildings. Small colonies and webs containing single individuals of either sex are sometimes found.

The three closely related species of our fauna are quite variable in size and coloration. *Uloborus variegatus* is a tropical species from southern Texas, whereas *oweni* and *arizonicus* range widely in the arid mountain and foothill country of the Sonoran Region from southern Colorado to Arizona and Sonora.

#### KEY TO SPECIES OF *republicanus* GROUP

1. Females .....2  
Males .....4
2. First leg 6.5 times as long as carapace; epigynum (fig. 63) large, obovate, with thin posterior rim; large pale species from Arizona and Sonora.....  
.....*arizonicus* Gertsch  
First leg 5 times as long as carapace; epigynum smaller.....3
3. Epigynum (fig. 72) with thin posterior rim; small dark species from southern Texas.....*variegatus* O. Pickard-Cambridge  
Epigynum (fig. 78) typically with thick posterior rim; larger, variable species from southwestern United States and northwestern Mexico.....  
.....*oweni* Chamberlin
4. First tibia clearly exceeding carapace in length.....*arizonicus* Gertsch  
First tibia about as long as carapace.....5
5. First tibia with few dorsal and lateral spines (fig. 76); small dark species from southern Texas.....*variegatus* O. Pickard-Cambridge  
First tibia with numerous dorsal and lateral spines (fig. 81); pale species from southwestern United States and northwestern Mexico.....*oweni* Chamberlin

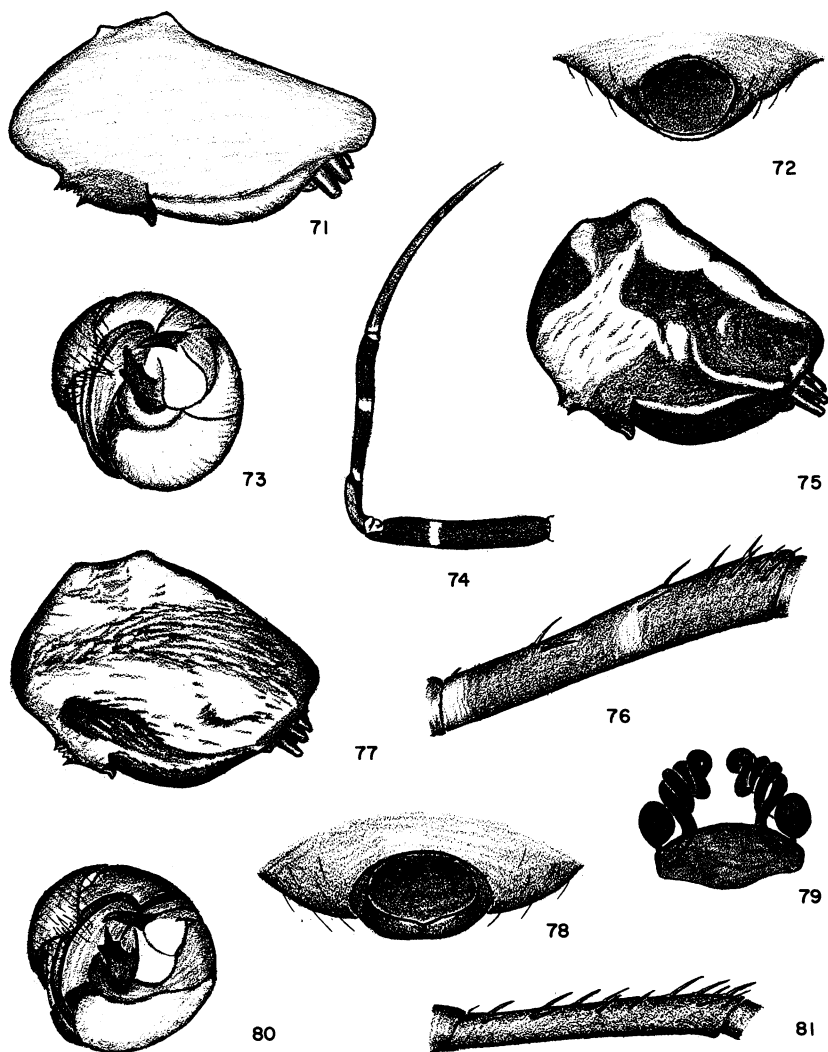


FIG. 71. *Uloborus arizonicus* Gertsch, female abdomen, side view.

FIGS. 72-76. *Uloborus variegatus* O. Pickard-Cambridge. 72. Epigynum, ventral view. 73. Male palpus, apical view. 74. First leg of female, ectal view. 75. Female abdomen, side view. 76. First tibia of male, mesial view.

FIGS. 77-81. *Uloborus oweni* Chamberlin. 77. Female abdomen, side view. 78. Epigynum, ventral view. 79. Internal epigynum, ventral view. 80. Male palpus, apical view. 81. First tibia of male, mesial view.



*Uloborus variegatus* O. Pickard-Cambridge

Figures 4, 72-76

*Uloborus variegatus* O. PICKARD-CAMBRIDGE, 1898 (1889-1902), p. 266, pl. 38, figs. 11-11g. F. O. PICKARD-CAMBRIDGE, 1902 (1897-1905), p. 362, pl. 34, figs. 8-8a.

Ten females vary from 2.7 mm. to 4.1 mm. and average 3.1 mm.; four males vary from 2.3 mm. to 2.8 mm. and average 2.5 mm.

Color variable, brown to black, with black specimens more common. Carapace dark, covered with fine light and dark reclining hairs, faintly to distinctly marked with white as follows: thin median stripe over eye area which expands to sagittate spot just in front of median furrow; pair of irregularly elongate markings united behind on pars thoracica. Abdomen (fig. 75) mottled with white spots and bars on brown to black base; pale markings often obsolete. Sternum and labium black; labium and maxillae black at base; chelicerae yellow. Pedipalp white except for dusky tarsus. Legs light, with conspicuous brown to black bands as follows: coxae and trochanters with median band or spot; femora with basal, median, and apical bands; patellae all dusky; tibiae with basal and apical band; metatarsi with basal and apical band but first metatarsi all dark; tarsi pale.

Structure quite typical in both sexes. Carapace of female oval; pars cephalica moderately narrowed, with truncate front three-fifths as wide as carapace; pars thoracica broadly rounded behind. Clypeus about equal to diameter of anterior median eye. Both eye rows lightly recurved as viewed from above. Posterior eyes subequal in size, with median eyes separated by two full diameters, one and one-half diameters from lateral eyes. Anterior median eyes elevated on connate tubercles, separated by diameter, twice as far from only half as large lateral eyes. Median ocular quadrangle slightly longer than wide, slightly narrowed in front, with front eyes larger. Sternum shield shaped, one-fourth longer than wide, with undulate lateral margins and quite abruptly narrowed at third coxae to end in point between slightly separated posterior coxae. Legs elongate, quite slender; first femora stouter than other segments; first legs as shown in figure 74, with few weak lateral spines. Female from Texas: Carapace, 1.2 mm.; first leg: femur, 1.7 mm.; patella, 0.6 mm.; tibia, 1.4 mm.; metatarsus, 1.3 mm.; tarsus, 0.8 mm.; total length, 5.8 mm. Abdomen greatly arched in basal third of length (fig. 75) and surmounted with four pairs of tubercles as follows: on anterior slope a poorly defined pair; distinct pair just in front of apex; prominent pair at apex; small pair on posterior slope one-third of distance to anal tubercle.

Epigynum (fig. 72) a simple, transverse atrium with little modification of posterior margin.

Males similar in structure to female except as follows: carapace nearly round, only slightly longer than broad; abdomen low, narrow, without dorsal tubercles; legs with numerous weak spines on many segments and series of stouter spines on front tibiae (fig. 76). Male from Texas: Carapace, 1.3 mm.; first leg: femur, 1.5 mm.; patella, 0.4 mm.; tibia, 1.2 mm.; metatarsus, 1.2 mm.; tarsus, 0.8 mm.; total length, 5.1 mm.

Male palpus as shown in figure 73.

TYPE DATA: Female type from Omilteme, Guerrero, Mexico, in British Museum (Natural History).

DISTRIBUTION: Tropical and subtropical Mexico, Central America, and West Indies. In the United States known only from Rio Grande Valley of southern Texas (see fig. 4).

NEW RECORDS: *Texas*: Rio Grande State Park, Bentsen, June 30, 1962 (J. A. Beatty), female, immature. Lake Corpus Christi, June 28, 1902 (J. A. Beatty), female, immature.

### *Uloborus oweni* Chamberlin

Figures 4, 77-81

*Uloborus oweni* CHAMBERLIN, 1924, p. 579, fig. 1.

Fifteen females vary from 3.7 mm. to 5.7 mm. and average 4.6 mm.; 10 males vary from 3.4 mm. to 4.2 mm. and average 3.7 mm.

Color variable, with pattern like that of *variegatus* except as follows: pale areas more extensive; dark areas more diffuse; carapace with white marginal stripe behind posterior lateral eyes in addition to median stripe and spots; completely unmarked specimens common.

Structure like that of *variegatus* except as follows: size larger as indicated in measurements; eyes proportionately smaller, more widely separated, with posterior row lightly recurved; abdomen of female (fig. 77) not so strongly elevated. Female from Arizona: Carapace, 2 mm. long; first leg: femur, 3 mm.; patella, 1 mm.; tibia, 2.6 mm.; metatarsus, 2.4 mm.; tarsus, 1.3 mm.; total length, 10.3 mm.; first leg five times as long as carapace, about as long as that of *variegatus*.

Epigynum (figs. 78, 79) relatively small, transverse atrium with posterior margin typically quite thick, slightly emarginated at center; bursa copulatrix long, thin, convoluted tube entering small piriform receptacle.

Male from Arizona: Carapace, 1.7 mm. long; first leg: femur, 2.2 mm.; patella, 0.7 mm.; tibia, 1.8 mm.; metatarsus, 2 mm.; tarsus, 1 mm.; total length, 7.7 mm.; legs slightly longer than those of *variegatus* and front tibiae with more spines in mesial series (fig. 81).

Male palpus as shown in figure 80.

TYPE DATA: Female type from Marquer Bay, Carmen Island, Gulf of California, Baja California, May 23, 1921 (J. C. Chamberlin), in the California Academy of Sciences, San Francisco, California.

DISTRIBUTION: Northwestern Mexico and southwestern United States (see fig. 4).

RECORDS: *Colorado*: Junction of Lytel Road and State Route 115, El Paso County, September, 1961 (S. Sutton), females, immature. *New Mexico*: Eight miles southeast of Rodeo, June 30, 1955 (M. Statham), female. Ten miles northeast of San Lorenzo, Sierra County, May 2, 1963 (V. Roth), immature in communal webs on rocks in creek. *Arizona*: Showlow, July 31, 1949 (W. J. and J. W. Gertsch), females. Oak Creek Canyon, July 22, 1949 (W. J. and J. Gertsch), females. Mt. Graham, near Safford, July 14, 1956 (W. J. Gertsch and V. Roth), male, females. Six miles southwest of Whiteriver, August 21, 1936 (H. H. Poor), immature. Lower Carr Canyon, Huachuca Mountains, July 21, 1955 (W. J. Gertsch), male, females. Brown Canyon, Baboquivari Mountains, July 19, 1959 (V. Roth), females. Santa Catalina Mountains, Pima County: Molino Basin, 9300 feet, August 18, 1962, female; Bear Canyon, June 4, 1961, males, females; Cherry Valley Ranch, 4650 feet, August 27, 1960, female; Hitchcock Pines Area, 6000 feet, May 20, 28, 1961, males, females (all J. A. Beatty). Madera Canyon, Santa Rita Mountains: June to October 25, many males, females, immature (W. J. Gertsch; M. A. Cazier; J. A. Beatty; and others). Chiricahua Mountains, Cochise County: Cave Creek Canyon, June to November, many males, females, immature (W. J. Gertsch; M. A. Cazier; V. Roth; J. A. Beatty).

### *Uloborus arizonicus* Gertsch

Figures 4, 62–65, 71

*Uloborus arizonicus* GERTSCH, 1936, p. 2, fig. 3.

Fifteen females vary from 4.6 mm. to 8.2 mm., and average 6.4 mm.; four males vary from 3.8 mm. to 4.1 mm. and average 3.9 mm.

Color and pattern like those of *oweni*, but dark markings usually obsolescent. Many specimens quite white, with faint, dusky spots on prominent abdominal tubercles, slightly dusky venter, pale carapace with broad dusky side stripes, and pale legs.

Structure like that of *oweni* except as follows: size larger as indicated in measurements; eyes somewhat smaller and posterior row almost straight; abdomen more flattened, with front anterior tubercles distinct, posterior tubercles less distinct, and apex of abdomen nearly in middle of length (fig. 71). Female from Arizona: carapace, 2.6 mm. long; first

leg: femur, 4.8 mm.; patella, 1.4 mm.; tibia, 4.1 mm.; metatarsus, 4.2 mm.; tarsus, 2 mm.; total length, 16.6 mm.; first leg 6.5 times as long as carapace.

Epigynum (figs. 62, 63) large, obovate atrium, with posterior margin produced into quite thin rim shallowly emarginated at middle; bursa copulatrix heavy, convoluted tube joining piriform receptacle.

Male from Arizona: carapace, 2.5 mm. long; first leg: femur, 4 mm.; patella, 1.1 mm.; tibia, 3.2 mm.; metatarsus, 3.2 mm.; tarsus, 1.7 mm.; total length, 13.2 mm.; legs slightly longer than those of *oweni* and first tibia (fig. 64) with more mesial spines.

Male palpus (fig. 65) with larger elements than those of other species.

TYPE DATA: Male holotype from Sabino Basin, Santa Catalina Mountains, Arizona, July 8–12, 1916 (F. E. Lutz), in the American Museum of Natural History.

DISTRIBUTION: Southern Arizona and Sonora, Mexico (see fig. 4).

RECORDS: *Arizona*: Forestry Cabin, Baboquivari Mountains, July 18–29, 1951 (W. S. Creighton), males, females. Phoenix (R. H. Crandall), females. Sabino Canyon, Santa Catalina Mountains, October 16, 1939 (R. H. Crandall), females; June 18, 1961 (J. A. Beatty), males. Molino Basin, 4300 feet, Santa Catalina Mountains, June–November (J. A. Beatty), males, females. Garden Canyon, Huachuca Mountains, July 8–12, 1950 (C. M. Bogert), female. Pena Blanca Lake, northwest of Nogales, May 19, 1963 (W. J. Gertsch; W. Ivie), male, immature.

#### THE *geniculatus* GROUP

Medium to large species, 4–10 mm., with broadly oval carapace of both sexes about 1.2 times as long as broad, evenly convex, with pars cephalica and pars thoracica evenly rounded and of about equal height. Eyes of average size; posterior row slightly recurved so that line along front edges of lateral eyes cuts posterior third or half of median eyes; median eyes separated by one to two diameters, somewhat nearer lateral eyes. Median ocular quadrangle as long as broad, narrower in front, with eyes subequal in size. Legs typically annulated with black and yellow but lacking fringes of hairs. Abdomen moderately elevated in basal third, with central hump in our species. Epigynum variable, transversely oval, shallow atrium, with pair of small, separated spurs or tubercles. Male palpal features: embolus originating at apex and narrowed to thin spine largely encircling bulb; conductor a thin grooved lamina free at apex; median apophysis a short spur.

This species group is represented by the well-known tropicopolitan

*Uloborus geniculatus*, which has been widely disseminated into tropical and subtropical areas of most of the world from an original center presumably in the New World. This is a gregarious spider, abundant in the West Indies and parts of South America. It shows strong preference in Florida and elsewhere for dry situations of buildings, caves, and hollow trees. In buildings used for grain or cereal storage this domestic spider may exercise some control of pest insects.

The second species of this group, *Uloborus octonarius*, is readily separated from *geniculatus* by many features. It also is a domestic species and inhabits houses, barns, sheds, and caves. Since it belongs to a group poorly represented in the Americas, there is some possibility that it has also been introduced into the United States from another region.

KEY TO THE *geniculatus* GROUP

- Epigynal processes broadly triangular, divergent; terminal process of male palpus a slender, straight spur.....*geniculatus* Olivier
- Epigynal processes short, subparallel spurs; terminal process of male palpus a broad, curved lobe.....*octonarius* Muma

*Uloborus geniculatus* (Olivier)

Figures 82-86

*Araneus geniculatus* OLIVIER, 1789, p. 214.

*Uloborus geniculatus*: COMSTOCK, "1912" (1913), p. 268, figs. 243-244.

Fifteen females vary from 5.2 mm. to 8.3 mm. and average 6.9 mm.; five males vary from 4.2 mm. to 5.5 mm. and average 4.7 mm. long.

Color and markings primarily yellows and browns. Carapace grayish brown to brown, with narrow, pale, marginal stripe and median pale stripe wide at anterior end, covering eye region, wide at posterior end and narrowed or interrupted in middle at level of median furrow. Eyes distinctively outlined with black. Uneven clothing of fine, light, and dark reclining hairs on carapace. Abdomen most commonly pale yellow, with diffuse dusky blotches on sides, dusky areas around spinnerets and dark venter narrowly margined with white. Bases of chelicerae pale, with dusky basal margin and two short, basal dusky stripes on exposed faces. Labium and endites dusky basally, pale apically. Pedipalpi pale, with patellae dusky above and tibiae dusky above at apical ends. Sternum dusky on dark specimens and dusky marginally on light specimens. Coxae pale, narrowly margined with black. Legs pale yellow marked with dark spots and bands. Legs marked as follows: coxae pale; femora pale, with dark band on apical fourth and dark spots over indistinct shading dorsally and laterally on basal half; patellae dark at each end

and on posterior lateral faces; tibiae pale, with dark band on apical fourth and dark dorsal and lateral spots on basal fourth; metatarsi and tarsi dusky, with metatarsi dark at extreme ends. First leg marked like other legs, except metatarsi dark at both ends (fig. 85).

Structure typical for group. Posterior eye row narrower than anterior, moderately recurved; line along front edges of lateral eyes cutting nearly to center of median eyes; posterior median eyes somewhat farther apart than distance to lateral eyes; median ocular quadrangle about as broad as long, narrowed in front. Leg spines short, weak, seldom more than one or two per segment. Anterior tibia of female (fig. 85) without brush of hairs. Female from Florida: carapace, 2.4 mm. long, 2.2 mm. wide; first leg: femur, 4.2 mm.; patella, 1.2 mm.; tibia, 3.3 mm.; metatarsus, 3.7 mm.; tarsus, 1.4 mm.; total length, 13.8 mm. First leg 5.7 times as long as carapace. Abdomen ovate in dorsal outline, subtriangular in profile, highly arched in basal third (fig. 86), clothed with prone hairs, without hair tufts.

Epigynum (fig. 82) presenting white, shallow atrium, with side margin revolved into rounded tubercles.

Males like females except as follows: size smaller; abdomen flatter; tibia of first leg (fig. 83) with series of thin spines. Male from Florida: carapace, 2.1 mm. long, 1.9 mm. wide; first leg: femur, 3.4 mm.; patella, 1 mm.; tibia, 2.7 mm.; metatarsus, 2.8 mm.; tarsus, 1.2 mm.; total length, 11.1 mm. First leg 5.3 times as long as carapace.

Male palpus as shown in figure 84.

TYPE DATA: Guadeloupe, French West Indies; original material lost.

DISTRIBUTION: A widespread tropicopolitan species introduced into Florida, where it is often abundant, and other Gulf coast states.

NEW RECORD: *Mississippi*: Gloster, Amity County (A. F. Archer), female.

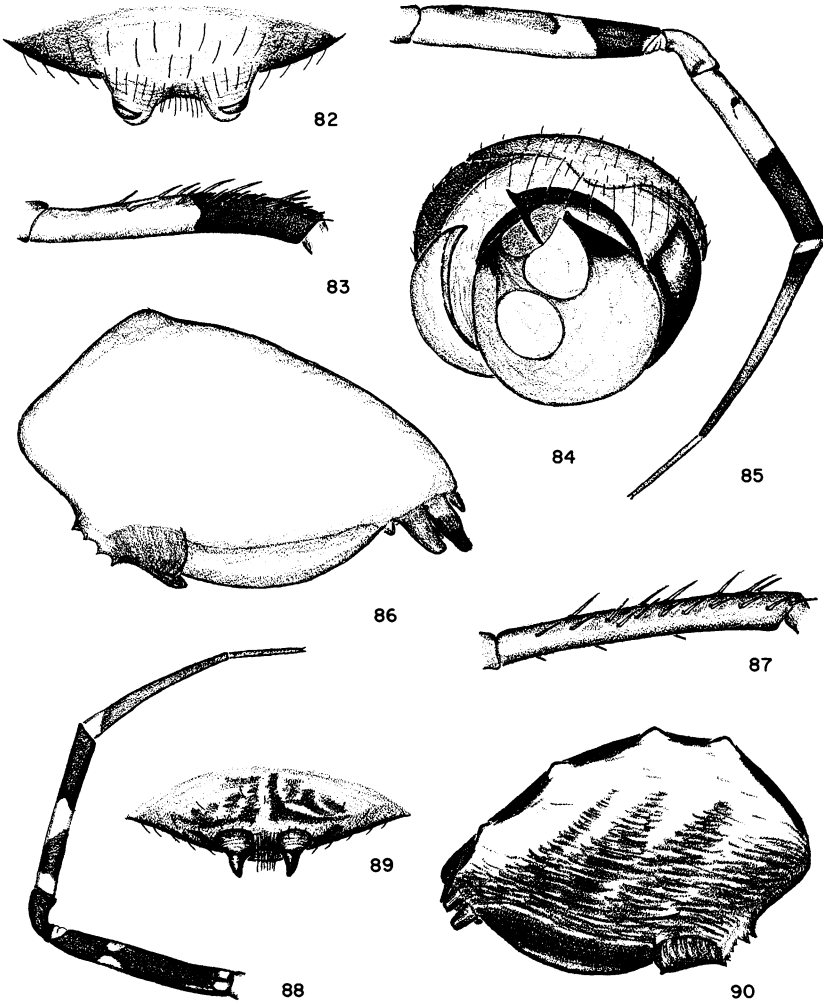
### *Uloborus octonarius* Muma

Figures 35, 87–90

*Uloborus octonarius* MUMA, 1945, p. 91, figs. 1, 2.

Fourteen females vary from 3 mm. to 5.8 mm. and average 4 mm.; three males vary from 2.8 mm. to 3.3 mm. and average 3.1 mm. long.

Color and markings quite variable; base color yellow to off-white, with markings pale brown to nearly black. Carapace grayish brown, with thin, pale, marginal stripes and median light area that extends anteriorly from posterior margin to median furrow; eyes margined with black or dark brown. More or less dense clothing of fine, light and dark reclining



FIGS. 82-86. *Uloborus geniculatus* (Olivier). 82. Epigynum, subventral view. 83. First tibia of male, mesial view. 84. Male palpus, apical view. 85. First leg of female, ectal view. 86. Female abdomen, side view.

FIGS. 87-90. *Uloborus octonarius* Muma. 87. First tibia of male, mesial view. 88. First leg of female, ectal view. 89. Epigynum, subventral view. 90. Female abdomen, side view.

hairs on carapace. Abdomen pale brown to near white, with dorsum marked with broad, dark, irregularly margined stripe, sides lightly to heavily marked with small, dark, irregular spots and lines and venter

dusky, outlined with a narrow pale area. Spinnerets dusky yellow, margined with a dusky area. Abdomen clothed with fine light and dark reclining hairs. The labium and endites dusky except at apical ends. Palpi pale except patellae dark above; tibiae dark above at apical ends and tarsi dark apically. Sternum dusky brown. Coxae dusky, with one to three pale blotches. Posterior legs pale, with trochanters dusky, femora with three wide dark bands, patellae dusky, tibiae with two wide dark bands and metatarsi and tarsi pale brown except at extreme basal ends. First leg colored and marked like the other legs, except femora dark with ring of pale spots at the base and in apical third (fig. 88).

Structure like that of *geniculatus*. Posterior eye row more recurved than that of *geniculatus*; line along front edges of lateral eyes cutting slightly into posterior edges of median eyes; median ocular quadrangle slightly broader than long, narrowed in front. Female from Maryland: carapace, 1.8 mm. long, 1.6 mm. wide; first leg: femur, 3.3 mm.; patella, 1 mm.; tibia, 3.4 mm.; metatarsus, 2.8 mm.; tarsus, 1.2 mm.; total length, 11.7 mm. First leg 6.5 times as long as carapace. Leg spines short, weak; first tibia with three or four prolateral and retrolateral and two weak dorsal spines. First tibia without brush of hairs. Abdomen ovate in dorsal outline, suboval in lateral view, highest in basal third, with four pairs of small tubercles (fig. 90).

Epigynum as is shown in figure 89.

Males like females except as follows: size smaller; abdomen low, convex, with only faint traces of tubercles; tibia of first leg (fig. 87) with series of strong spines. Male from Maryland: carapace, 1.8 mm. long, 1.5 mm. wide; first leg: femur, 3.1 mm.; patella, 0.8 mm.; tibia, 2.7 mm.; metatarsus, 2.6 mm.; tarsus, 1.2 mm.; total length, 10.4 mm. First leg 5.7 times as long as carapace.

Male palpus as shown in figure 35.

TYPE DATA: Male holotype from College Park, Maryland, July 7, 1943 (W. F. Jeffers and M. H. Muma), in the American Museum of Natural History.

DISTRIBUTION: Maryland to Tennessee and Alabama.

NEW RECORDS: *Tennessee*: Cedars of Lebanon State Park, Wilson County, August, 1943 (A. F. Archer), males and females; east of Jackson, 1959 (A. F. Archer), female. *Alabama*: Decatur, Morgan County, June 28, 1947 (A. F. Archer and A. F. Archer, Jr.), male and females; August 9, 1950 (A. F. Archer), female. *South Carolina*: Clemson, August 17, 1962 (J. A. Payne), females.



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