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Family Atypidae (Araneae, Mygalomorphae)





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## A Revision of the American Spiders of the Family Atypidae (Araneae, Mygalomorphae)

WILLIS J. GERTSCH<sup>1</sup> AND NORMAN I. PLATNICK<sup>2</sup>

### ABSTRACT

The eight known New World species of Atypidae are diagnosed, described, and assigned to two genera on the basis of genitalic and somatic characters. Only one American species, *Atypus snetsingeri* Sarno, belongs to the Holarctic genus *Atypus* Latreille. The nominal species *Atypus abboti* (Walckenaer), *A. rufipes* Latreille, *A. bicolor* Lucas, *A. milberti* (Walckenaer), and *A. niger* Hentz are transferred to the endemic Nearctic

genus *Sphodros* Walckenaer. *Sphodros bicolor* and *S. milberti* are newly synonymized with *S. rufipes*. Four new species are described: *S. paisano* from Texas and Tamaulipas, Mexico; *S. fitchi* from Nebraska, Kansas, Oklahoma, and Arkansas; *S. atlanticus* from Virginia, Illinois, North Carolina, and Georgia; and *S. coylei* from South Carolina.

### INTRODUCTION

The name Atypidae is used here in the sense established by Simon (1903), who restricted the family to a small group of distinctive mygalomorphs with representatives in both hemispheres. The atypids are burrowers that spin a tough tubular web in the soil and prolong and camouflage an aerial segment as a trap for wandering insects. The short aerial tube of the European *Atypus* lies on the soil, whereas the long tube of the American *Sphodros* is usually tied vertically to the side of a tree (figs. 1, 2). The family represents an ancient branch of the infraorder Mygalomorphae still retaining many fea-

tures plesiomorphic for these spiders. Among these are the presence of a large tergite on the dorsum of the abdomen (figs. 3–6), of six spinnerets (fig. 23) still maintained as in most Antrodiaetidae, Mecicobothriidae, and primitive Dipluridae, the doubled nature of the elements of the male palpus, both embolus and conductor being present, the moderately wide separation of the anal tubercle from the spinnerets, and the presence of a swollen palpal tarsus in penultimate males. These features have all been modified in higher mygalomorphs. On the other hand, the quite successful atypids have derived features in

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both their morphology and especially their ingenious technique of capturing prey.

The present systematic account of the Nearctic Atypidae supplants an earlier work (Gertsch, 1936) in which the three species then known were described and illustrated. Since that time, only one additional species, *Atypus snetsingeri* Sarno from Pennsylvania, has been described, but much additional information has accumulated. Important new collections of these relatively rare spiders, which are numerous only in rather restricted habitats, have doubled the size of the American fauna. Our species other than *A. snetsingeri* are now assigned to the genus *Sphodros* in recognition of differences in their male and female genitalia and their greater degree of sexual dimorphism (the males usually being significantly smaller and sometimes brightly colored). In addition, the specific names of two of the previously known species have had to be changed because of new synonymies; both *S. bicolor* and *S. milberti* are now regarded as synonyms of *S. rufipes*, and *S. niger* is recognized as the valid name for our most northern species.

## RELATIONSHIPS

Traditionally, the Atypidae has been divided into two genera, *Atypus* and *Calommata*. However, as Kraus and Baur (1974) have indicated, two very different types of spermathecae and palpi are found among the species previously assigned to *Atypus*. Those authors suggested that only Palaearctic species actually belong to *Atypus*, in which case the generic name *Sphodros* could be revived for the Nearctic species. As shown below, the division is not quite so precise geographically; although *Sphodros* is exclusively Nearctic, one species of *Atypus* is found in America as well. Kraus and Baur (1974, p. 88) also suggested that *Calommata* should not be included in the Atypidae, but they did not indicate whether they believe only that *Calommata* is different from *Atypus* and *Sphodros* or that it is actually more closely related to some other group of spiders than to those genera. At any rate, we believe Simon's (1903) hypothesis of the composition of the Atypidae to be correct,

for there are two apparent synapomorphies uniting the three genera and none (that we are aware of) contradicting that relationship. The first of these synapomorphies is the classical one: the prolongation of the inner portion of the palpal coxa into a distinct lobe comparable to the endite of araneomorphs. As noted by Simon (1892), the few other mygalomorphs (like *Paratropis* and *Actinopus*) that have a coxal lobe at all do not share the extreme prolongation of the lobe found in *Atypus*, *Sphodros*, and especially *Calommata*. The second synapomorphy uniting the atypid genera is the structure of the posterior median spinnerets, which are extremely wide and bear obliquely triangular tips (fig. 23); so far as we are aware, such peculiarly shaped posterior median spinnerets are not found in any other spiders.

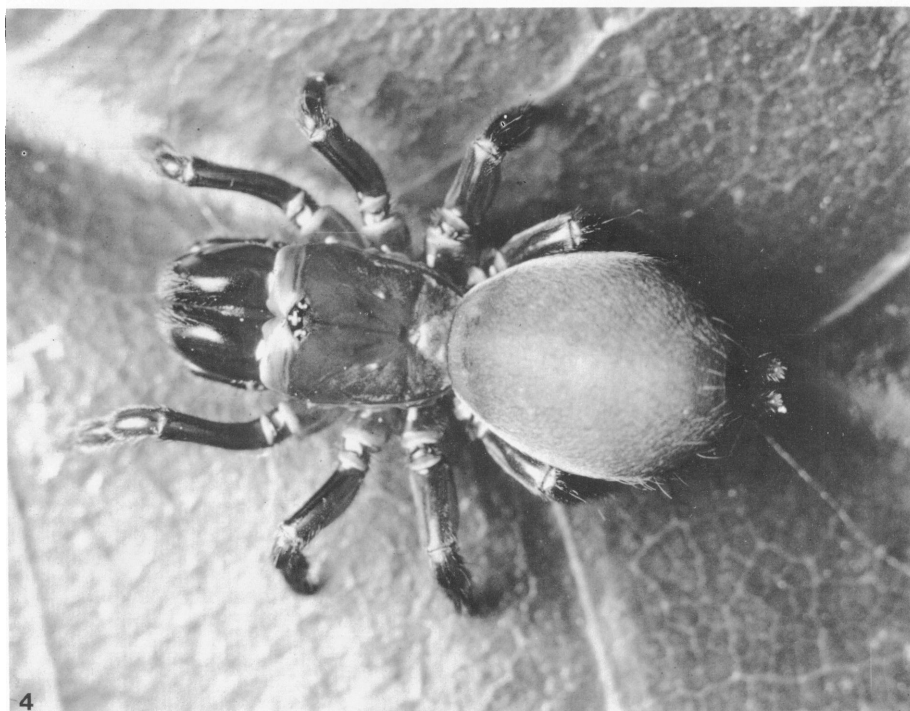
Within the Atypidae, each of the three genera is distinguished by a unique type of spermathecal structure. In *Atypus*, there are two broad plates each bearing two or more small receptacula (fig. 19). In *Calommata*, there are four spermathecae, each bearing several closely packed terminal receptacula positioned in a cauliflower-like arrangement (Kraus, 1978, fig. 13 of *C. simoni*; we have observed the same structure in *C. signatum* and *C. sundaicum*). In *Sphodros*, there are four spermathecae, each highly coiled and without distinct receptacula (figs. 29, 58). There is growing evidence (Kraus, 1978; R. R. Forster, personal commun.) that the plesiomorphic form of the female genitalia for spiders is a single spermatheca bearing numerous receptacula. If so, the spermathecal arrangement of *Atypus* represents the most plesiomorphic form within the Atypidae, but the details of that structure (particularly the two broad plates) argue as strongly for the monophyly of *Atypus* as the unique types of spermathecal morphology of *Calommata* and *Sphodros* do for the monophyly of those groups.

The question thus arises as to the interrelationships of the three atypid genera. An answer is difficult to obtain, both because of the absence of a well-corroborated hypothesis identifying the closest relatives of the Atypidae, and the difficulty of finding homologs of some atypid features in other my-





FIGS. 1, 2. Pursewebs of *Sphodros* from Florida; photographs by H. K. Wallace. 1. *S. abboti*. 2. *S. rufipes*.



FIGS. 3, 4. *Sphodros abboti* from Florida; photographs by H. K. Wallace. 3. Male. 4. Female.





FIGS. 5, 6. *Sphodros rufipes* from Florida; photographs by H. K. Wallace. 5. Male. 6. Female.

galomorphs. The Atypidae has most frequently been associated with the Antrodiaetidae and Mecicobothriidae, but the characters used to define this group (the Atypoidea) have been shown to be plesiomorphic (Platnick, 1977) and the Mecicobothriidae have been hypothesized to be more closely related to the Dipluridae (Gertsch and Platnick, 1979). We are not aware of any derived characters unique to the Atypidae plus Antrodiaetidae, and it may be that the atypids represent the sister group of all other mygalomorphs. *Atypus* is the only mygalomorph genus known to approach the putatively plesiomorphic form of female genitalia described above and found in at least some Mesothelae; other mygalomorph genera have either four separate spermathecae (in the "2+2" arrangement defined by Kraus, 1978) or a more derived arrangement. If the Atypidae is monophyletic, then the change to a 2+2 arrangement is most parsimoniously considered a synapomorphy linking all the non-atypid mygalomorphs (with parallelism within the Atypidae and, of course, the Araneomorphae). This rather tenuous hypothesis is also supported by the work of Yoshikura (1958), who found that the mygalomorphs whose development has been studied share derived features of ontogeny not also found in *Atypus karschi*.

The argument of Kraus and Baur, noted above, for the removal of *Calommata* implies, at the very least, that *Atypus* and *Sphodros* are more closely related to each other than either is to *Calommata*. We are not convinced that this hypothesis is correct, because most of the features in which the three genera differ seem to be autapomorphies of one or another genus rather than synapomorphies linking two of the three. *Calommata*, particularly, is one of the world's most bizarre spider genera, with a probably endless list of features unique to it (for example: the bipartite, longitudinal thoracic groove and basal ledge on the outer surface of the fangs in both sexes; the posteriorly situated ocular tubercle, greatly reduced size of leg [especially femur] I, dorsally expanded chelicerae, enormously elongated endites, and flattened palpal tibia and

tarsus of females; and the dorsally directed chelicerae, elongated palpal trochanter, and greatly elongated posterior tarsi of males). Similarly, the ridged borders of the sternum of male *Atypus* (fig. 14) are unique to that genus.

Among possible synapomorphies, the change to a 2+2 spermathecal arrangement would most parsimoniously link *Sphodros* and *Calommata*, a hypothesis that is also supported by the much greater degree of sexual dimorphism found in those two genera. The palpal structure might be thought to contradict this arrangement, as *Calommata* resembles *Atypus* rather than *Sphodros* in having a short, straight embolus (in *Sphodros*, the embolus is longer and curved, fitting inside an elaborate conductor instead of resting on it). There are few other spiders with palpi similar enough to those of atypids to provide useful outgroup comparisons, and even they suggest no resolution as both conditions occur within the Antrodiaetidae and the Mecicobothriidae. More informative may be the variation within *Sphodros* itself. Most of the species of *Sphodros* are united by the peculiar shape of the male palpal tibia, which is dorsally expanded for the distal four-fifths of its length (fig. 26). However, one species, *Sphodros coylei*, differs in having an almost unmodified tibia (fig. 60), and is therefore considered the sister group of the other *Sphodros*. Interestingly, the embolus and conductor of *S. coylei* (figs. 59, 60) are much more similar to those of *Atypus* and *Calommata* than are those of the other *Sphodros* species. We therefore consider the palpal morphology of *Calommata* and *Atypus* to be plesiomorphic for the Atypidae, and hence as not contradicting a sister-group relationship between *Sphodros* and *Calommata*. Possibly contradictory evidence of a more convincing sort might be found in the fusion of the labium and sternum in *Sphodros* and *Atypus*, which lack the transverse suture found between the labium and sternum in *Calommata* and at least some Mesothelae.

Within *Sphodros*, the species other than *S. coylei* can be placed in three groups. *Sphodros abboti* and *S. paisano* are linked by the postembryonic subdivision of the ter-



minial segment of the posterior lateral spinnerets (which also occurs in some species of *Atypus* and in the mecicobothriid genus *Hexurella*). *Sphodros rufipes*, *S. fitchi*, and *S. atlanticus* are united by the presence of bi-colored legs in males and extremely similar palpi, whereas the remaining species, *S. niger*, has a conductor much more complex than that found in the other species (fig. 54). Relationships among *S. niger* and the *abboti* and *rufipes* groups remain obscure.

### NATURAL HISTORY

Atypids are perennial spiders, with females living seven or more years. Their natural history has been studied by many workers in Europe and America and numerous details are known; only the general patterns are mentioned here, especially those pertinent to their systematics. As early as 1792, J. T. Abbot described the tubes of the American species later to be named *S. abboti*; he was unaware of their prey capturing techniques and imagined that the spiders came out of their tubes at night to capture insects. He called them purseweb spiders (after the long, narrow purses then fashionable) and this common name has been widely adopted by Americans. McCook (1888) did an exhaustive study of the nesting habits of *S. abboti* in Florida. He concluded that the purseweb, usually begun at or under the ground surface with an irregular silking of the area and then continued section by section up the side of a tree as a distinct tough silken tube, was a protective device to isolate the spider from weather and enemies, and at the same time a trap for insects. With some reluctance he agreed that the usual sanding of the outside of the tube (accomplished by pushing sand through the silk from the inside) was in fact a camouflaging technique. The length of the aerial tube varies with the size and age of the spider, averaging about 12 inches in *S. abboti* and 15 to 20 inches in *S. rufipes*. Movement through the narrow tube is facilitated by the relatively narrow bodies and short legs of females and immatures, and perhaps also by the paucity of leg spines and the presence of large, smooth teeth on the

tarsal claws. The longer legs of males appear at a time when they are ready to leave the tube in search of mates; there is some evidence that mature males wander in the daytime and are generalized ant or wasp mimics (F. A. Coyle and W. A. Shear, *in litt.*). Females seem to spend all their life in the purseweb, which grows in size and toughness as the spider ages. The tough silk makes the atypids largely immune to attack by pompilid wasps.

It is not known whether the difference in orientation of the aerial portion of the purseweb is a generic character separating *Sphodros* from *Atypus*. Although Sarno (1973) reported that captive specimens of *Atypus snetsingeri* resemble their European counterparts in building horizontal tubes along the surface of the ground, her description of the tubes in nature does not specify their orientation. Information subsequently received from Mr. S. Tessler indicates that the tubes are horizontal in nature but are found lying about 2 inches above the ground. Some doubt also exists as to whether all *Sphodros* construct vertical tubes. It is possible that *S. niger* does not. The second author has examined sites in Michigan where the species occurs, at times when mature males were being frequently collected in pitfall traps; no trees at those sites had tubes, and any females in the areas would have had to have horizontal tubes hidden under leaf litter. This may be generally true for the species, for although numerous males are in collections, only a handful of females have been collected, as would be expected of spiders that are both cryptic and sedentary.

The remarkable and unique predatory technique of the atypids was first demonstrated by Enock (1885) in England and has been corroborated many times since; insects crawling over the aerial tube are impaled through the silk from the inside by the long, thin fangs and then secured by cutting a rent in the silk large enough to drag the prey through the tube. Once eaten, the remains of the prey, and later the liquid droppings, can be ejected to the outside through an opening at the top of the tube.

Atypid sexual biology has been studied by

several Europeans, most successfully by Gerhardt (1929) in the German species *A. muralis*. After the wandering male finds the aerial web of the female, he drums on it with his legs and palpi, insuring that the waiting female is receptive, and then exudes a large drop of saliva onto the web to soften it. Once entry into the tube is accomplished, the male crawls beneath the female's body and inserts his palpi alternately. The right palpus is applied to the left opening of the female gonopore, and the left palpus into the right side. This is the "*Dysdera-embrace*" generally used by mygalomorphs and haplogynes; in the latter group both palpi are usually applied simultaneously, whereas in entelegynes, the palpi serve the corresponding opening of the female epigynum (the right palpus on the right side and the left one on the left side). Gerhardt discovered that both the conductor and the embolus are introduced into the female epigynum. He suggested that entrance of the flat, lobular conductor aids in opening up the entrances to the receptacula for the embolus, and there is such a close correspondence between the size and shape of the conductor and of the basal plates of the female that there is little doubt that these parts actually interlock during copulation. After mating (in *S. abboti* often during June) the female may kill the male, or he may live peaceably in her tube for many months.

The eggs, in the case of *S. abboti* numbering up to 200, are placed in a sac usually suspended just inside the underground part of the tube. They hatch during the summer months and the young probably disperse during the fall by walking away from the maternal tube to start tiny pursewebs of their own. The larger species *S. rufipes* can produce more eggs (one sac contained 278) and the young disperse in the spring of the following year. In England, *A. affinis* also has a later mating season and the young usually overwinter in their mother's tube. The juveniles have been reported to walk away from the maternal tube in single file, leaving behind a dragline as they follow each other up into bushes or trees. Enock (1885) observed possible ballooning of juveniles, but it is not clear from his description whether the spi-

ders were free-floating in air or still attached by draglines to the twigs from which they were blown off.

#### ACKNOWLEDGMENTS

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 JH, Mr. J. Heiss  
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 SR, Dr. S. E. Riechert  
 ST, Mr. S. Tessler  
 TTU, Texas Tech University, Dr. O. F. Francke  
 WD, Dr. W. A. Drew  
 WS, Mr. W. Sedgwick

All measurements presented are in millimeters and are accurate to  $\pm 0.03$  mm.

#### ATYPIDAE THORELL

*Atypinae* Thorell, 1870, p. 164.  
*Atypidae*: Bertkau, 1878, p. 356.  
*Calommatoidae* Thorell, 1887, p. 23.

**DIAGNOSIS:** *Atypids* can be distinguished from all other mygalomorphs by the development on the prolateral side of the palpal coxae of elongated lobes analogous to the endites of araneomorph spiders (fig. 49) and by the widened posterior median spinnerets bearing obliquely triangular tips (fig. 23).

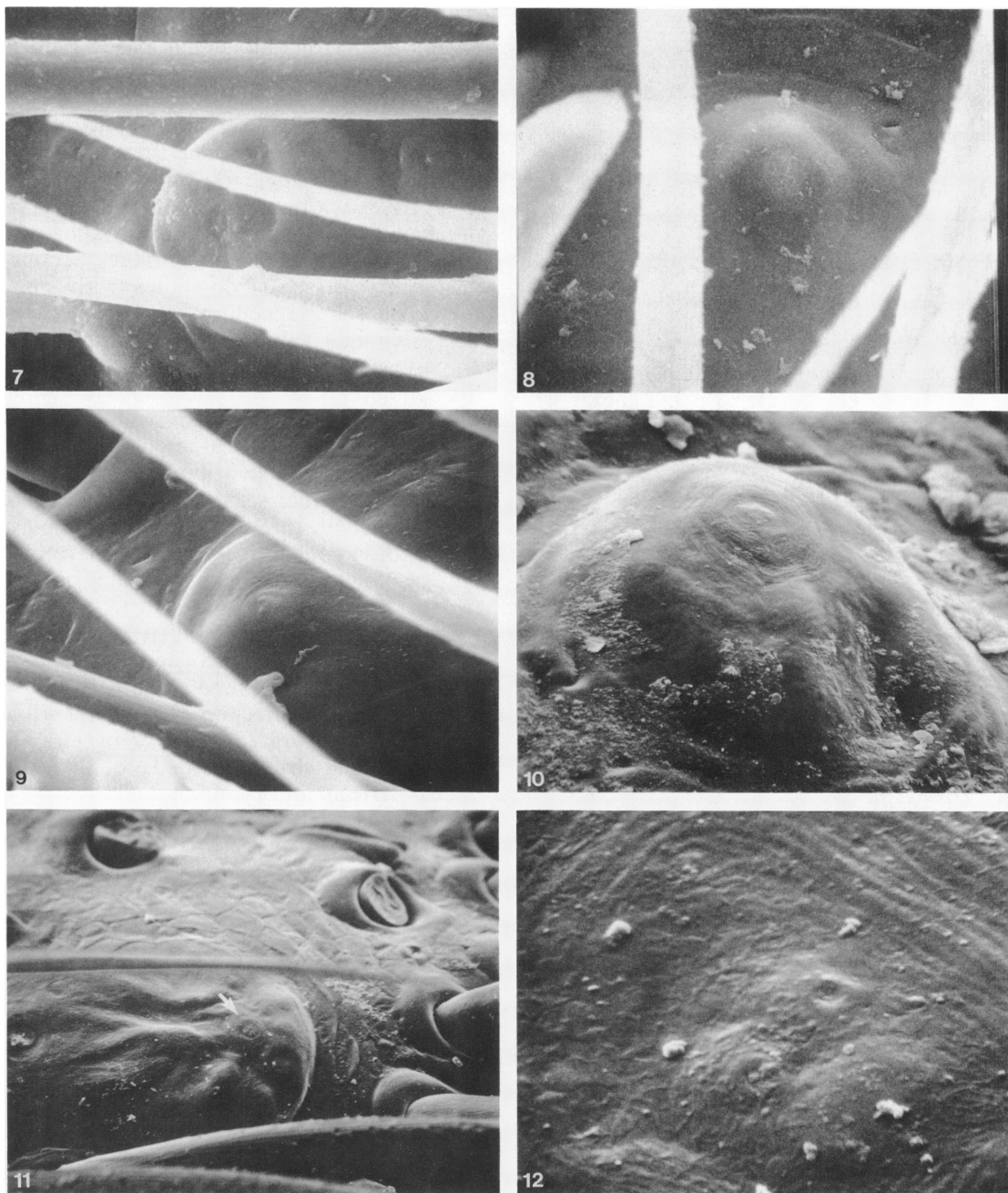
**DESCRIPTION:** Carapace with pars cephalica strongly elevated in front; pars thoracica low, apically narrowed; eyes on compact, transverse tubercle produced forward as nasute lobe over narrow clypeus (except in female *Calommata*, where nearer thoracic groove); thoracic groove short, transverse fissure margining prominent suboval or quadrangular pit on each side (*Atypus* and *Sphodros*) or longitudinal, bipartite (*Calommata*). Sternum with four pairs of sigilla; posterior pair enlarged, approximate; other pairs progressively smaller; usually smallest anterior pair at sides of labium. Labium fused to sternum (*Atypus* and *Sphodros*) or free with well-developed transverse suture (*Calommata*). Coxa of pedipalp with prominent lobular extension as long or longer than basal portion, without serrula. Chelicerae large, horizontal, geniculate, without rastellum; cheliceral groove indistinct, promargin lined with straight row of sharp teeth; fang long, thin rod nearly as long as paturon, with

tubercles (*Atypus* and *Sphodros*) or ledge (*Calommata*) on outside at base. Female palp with dentate claw. Legs weakly spinose, without claw tufts or tarsal scopulae; tarsal claws three, those of female with large smooth teeth, those of male small, variable; trichobothria in single row on tarsi and metatarsi, bases with single smooth ledge; tarsal organ of plesiomorphic form (protruding lobe without series of concentric ridges occupying entire surface), sometimes with small ridges encircling receptor area only (figs. 7–12). Abdomen suboval; single large tergite above base, often forming scutum in males. Six spinnerets: anterior laterals narrow, one-segmented; posterior medians wide, one-segmented, with obliquely triangular tips; posterior laterals elongated, typically three-segmented, rarely four-segmented. Heart (where examined) with three pairs of ostia. Epigynum with large, suboval, weakly sclerotized bursa copulatrix and two basal plates bearing two or more receptacula each (*Atypus*) or with narrow, transverse bursa bearing two coiled (*Sphodros*) or uncoiled (*Calommata*) tubes on each side. Embolus of male palpus thin tube held within curved conductor while in resting position (*Sphodros*) or straight spike crossing straight, broad, lobular conductor (*Atypus* and *Calommata*).

#### ATYPUS LATREILLE

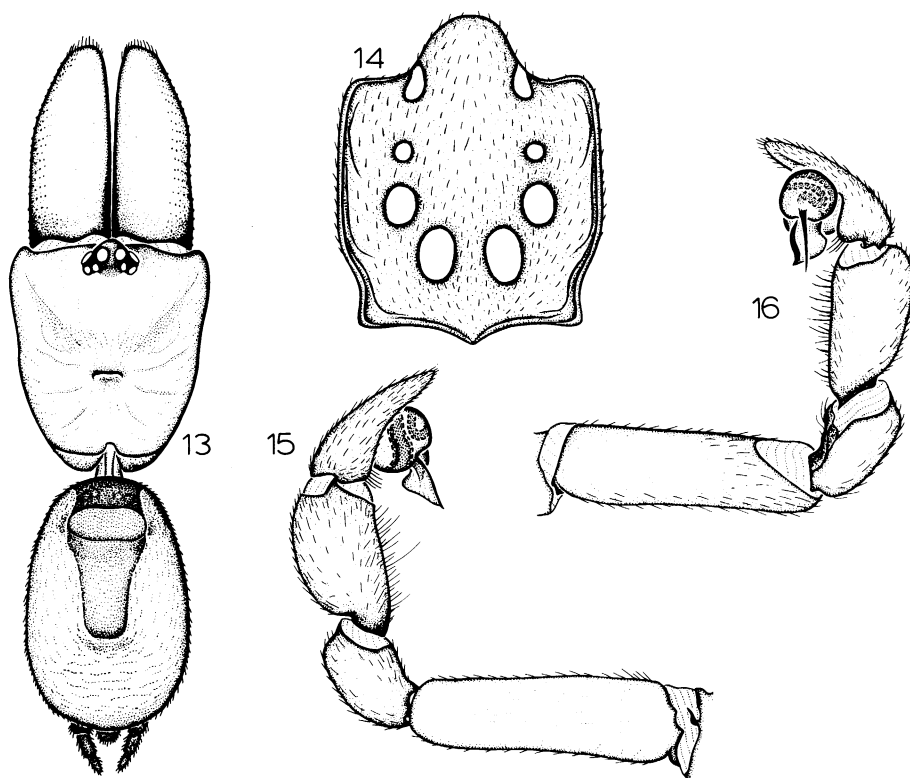
*Atypus* Latreille, 1804, p. 133 (type species by monotypy *Aranea picea* Sulzer). Roewer, 1942, p. 210. Bonnet, 1955, p. 811.  
*Oletera* Walckenaer, 1805, p. 7 (type species by monotypy *Oletera atypus* Walckenaer, = *Atypus affinis*). First synonymized by Dufour, 1820, p. 109.  
*Proatypus* Miller, 1947, p. 52 (type species by original designation *Atypus muralis* Bertkau). First synonymized by Kraus and Baur, 1974, p. 88.

**DIAGNOSIS:** Males of *Atypus* can be distinguished from those of *Sphodros* by the marginal ridges on their sternum (fig. 14) and their straight, spine-shaped embolus and short, broad conductor (fig. 16), females by the epigynum with two heavily sclerotized basal plates bearing receptacula (fig. 19).



FIGS. 7-12. Tarsal organs of tarsi I of females, dorsal views, scanning electron micrographs. 7. *Calommata signatum*, 2000 $\times$ . 8. *Atypus karschi*, 2000 $\times$ . 9. *A. snetsingeri*, 2000 $\times$ . 10. *Sphodros abboti*, 2700 $\times$ . 11. *S. rufipes*, 800 $\times$ ; arrow points to receptor area. 12. *S. rufipes*, receptor area, 16,500 $\times$ .





FIGS. 13–16. *Atypus snetsingeri* Sarno, male. 13. Body, dorsal view. 14. Sternum, ventral view. 15. Palp, prolateral view. 16. Palp, retrolateral view.

*Atypus snetsingeri* Sarno  
Figures 9, 13–20

*Atypus snetsingeri* Sarno, 1973, p. 38, figs. 1–9 (male holotype from Lansdowne, Delaware County, Pennsylvania, in AMNH, examined).

**DIAGNOSIS:** *Atypus snetsingeri* seems most closely related to those Palearctic species, like *A. muralis* and *A. karschi*, which also have the apical segment of their posterior lateral spinnerets subdivided. Based on the limited samples available to us, *A. snetsingeri* differs from these (and other) Palearctic species in having the basal plates of the epigynum broadly triangular (fig. 19) rather than square (Kraus and Baur, 1974, fig. 42).

**MALE (holotype):** Total length, including chelicerae, 16.50; body as in figure 13. Carapace dark reddish brown, bright, lustrous, with narrow marginal black seam; pars cephalica darkest, margined by blackish stripes; pars thoracica with narrow blackish lines radiating from black thoracic groove; eye tubercle black. Sternum, labium, palpal coxae, chelicerae, and legs I and II nearly concolorous, reddish brown; legs III and IV yellowish brown. Abdomen dull dusky brown, with numerous small yellow pits; dorsum with shining brown scutum, enclosing yellowish tergite, running from pedicel to middle of abdomen; lung patches and spinnerets paler brown.

Carapace 4.80 long, 4.80 wide, quite

smooth, shining, but moderately rough along sutures and side margins. Pars cephalica essentially straight along front, strongly elevated, with rounded corners, forming triangle with straight cephalic sutures to thoracic groove. Pars thoracica quite flat, much lower, gently rounded on sides to rounded, emarginated posterior margins bearing conspicuous pleurites; thoracic groove wide, transverse fissure, front margin showing two trivial nodes, placed back two-thirds of carapace length, occupying about one-fifth of carapace width at that point.

Eyes set on small elevated tubercle nearly one-third width of pars cephalica. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 28:31:22:22. Anterior row as wide as posterior, straight as viewed from above; medians separated by less than their diameter (22/31), nearer laterals (10/31). Posterior row recurved; oval medians separated by three diameters (22/70), subcontiguous with laterals. Median ocular quadrangle much wider than long (100/43), narrowed in front (100/80). Lateral eyes of each side contiguous.

Sternum (fig. 14) 3.00 long, 3.20 wide, moderately roughened throughout, with distinct ridges at borders, covered sparsely with inconspicuous short hairs; four pairs of sigilla well defined, oval first pair larger than round second pair, posterior pair suboval, separated by about their width. Labium 0.65 long, 1.15 wide, rounded at apex, with few inconspicuous hairs. Palpal lobes sparsely clothed with fine hairs and band of fine spinules along inner margin. Chelicerae more than twice as long as wide, only slightly narrowed to rounded apex; promargin with about 15 large teeth and minor denticles in straight row.

Leg formula 1423. Legs thin, clothed sparsely with fine black hairs and thin, mostly ventral, spines on distal segments. Tarsi essentially straight, with rings of false sutures from basal fourth to near apices. Unpaired tarsal claws without denticles, paired claws with fine teeth in slightly variable pattern, two-four on proclaws, three-four on retroclaws.

	I	II	III	IV	Palp
Femur	4.80	3.75	3.15	4.20	2.20
Patella	2.00	2.00	1.60	1.70	1.00
Tibia	2.50	2.00	1.80	2.70	1.30
Metatarsus	3.70	3.00	3.00	4.10	—
Tarsus	<u>2.20</u>	<u>2.20</u>	<u>2.25</u>	<u>1.60</u>	<u>1.35</u>
Total	15.20	12.95	11.80	14.30	5.85

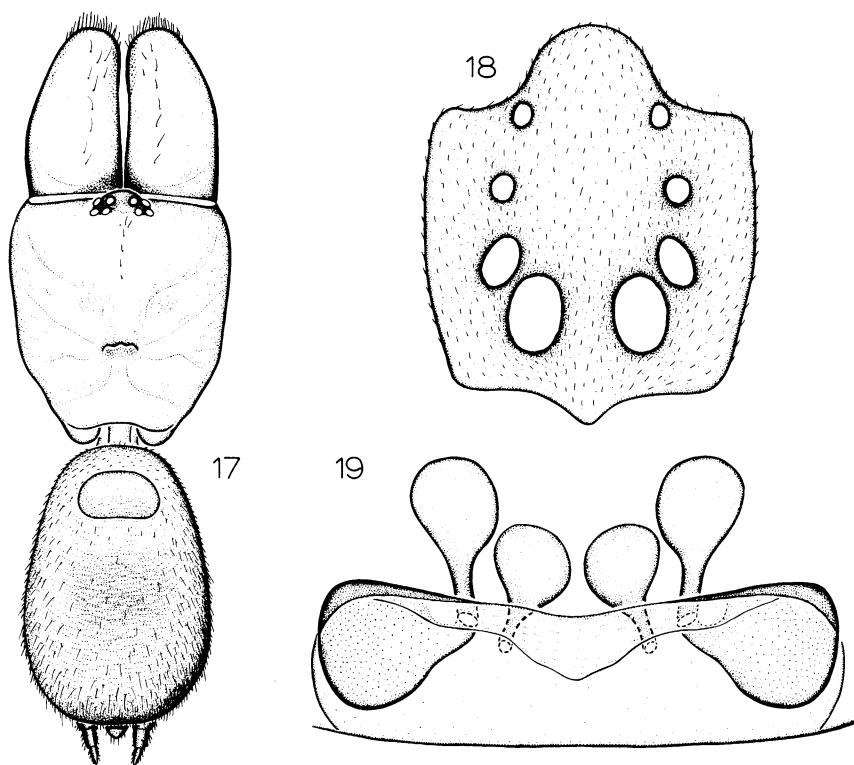
Palp (figs. 15, 16) small, clothed with fine hairs and weak setae. Femur thick at base, less than three times as long as basal width; patella slightly longer than wide; tibia thick, less than twice as long as dorsal width; tarsus twice as long as broad, tapered and rounded at apex; bulb small, with broad apical revolved conductor and thin, straight embolus.

Abdomen 6.50 long, 3.50 wide, roughened and pitted, with thick covering of procumbent blackish hairs; dorsal scutum smooth, shining, with numerous minute hairs outside of tergite. Spinnerets six: anterior laterals 0.40 long, posterior medians 0.80 long, four-segmented posterior laterals with lengths as follows: basal 0.60, median 0.60, subapical 0.55, apical 0.45, total 2.20.

FEMALE (Lansdowne, Pennsylvania): Total length, including chelicerae, 15.50; body as in figure 17. Carapace yellowish to orange-brown, with narrow black marginal seam and blackish sutures, thoracic groove, and eye tubercle. Appendages and underside nearly concolorous. Abdomen dusky brown, covered thickly with small pale spots; dorsal tergite dusky orange.

Carapace 5.50 long, 5.10 wide, bare. Pars cephalica subtriangular, less elevated than in male, straight in front, with distinct cephalic sutures. Pars thoracica low, with trivial radiating grooves, narrowed to about three-fifths of maximum width at widely emarginated posterior margin, where lobed pleurites distinct; thoracic groove placed back nine-fourteenths of carapace length, occupying one-fifth of carapace width at that point.

Eye tubercle as in male. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 6:5:4:4. Anterior row slightly narrower than posterior, procurved from in front, moderately recurved from above, medians separated by their diameter, by their radius from laterals. Posterior row



FIGS. 17–19. *Atypus snetsingeri* Sarno, female. 17. Body, dorsal view. 18. Sternum, ventral view. 19. Epigynum, dorsal view.

moderately recurved, medians separated by more than three diameters (2/7), contiguous with laterals. Median ocular quadrangle wider than long (110/45), narrowed in front (110/75). Lateral eyes of each side contiguous.

Sternum (fig. 18) 3.50 long, 3.70 wide, sparsely clothed with fine black hairs; all sigilla distinct but oval front pair least strongly indicated, large oval posterior pair separated by about their width. Labium 0.75 long, 1.50 wide, clothed with fine hairs, some at apex stouter. Palpal lobes clothed with fine hairs, thickly set with short curved spinules over most of ventral surface. Chelicerae less than twice as long as wide at base, smooth, shining, with reddish hairs and curved setae at apex; promargin with 15 teeth, four reduced to short denticles.

Leg formula 1423. Legs of medium length,

clothed sparsely with rows of dark hairs and some weak spines on distal segments. Palpal claw with five large teeth in curved row. Tarsal claws with stout teeth, unpaired claws usually with five, proclaws with three or four, retroclaws with four or five.

	I	II	III	IV	Palp
Femur	4.00	3.30	3.20	3.50	2.25
Patella	2.00	2.00	1.50	1.65	1.15
Tibia	1.70	1.20	1.10	1.70	1.00
Metatarsus	2.10	1.75	1.70	2.25	—
Tarsus	<u>1.25</u>	<u>1.25</u>	<u>1.00</u>	<u>1.35</u>	<u>1.00</u>
Total	11.05	9.50	8.50	10.45	5.40

Abdomen 6.50 long, 4.50 wide, roughened, pitted, thickly covered with pale subprocumbent hairs; dorsal tergite smooth. Spinnerets six: anterior laterals 0.50 long; posterior medians 1.10 long; four-segmented posterior



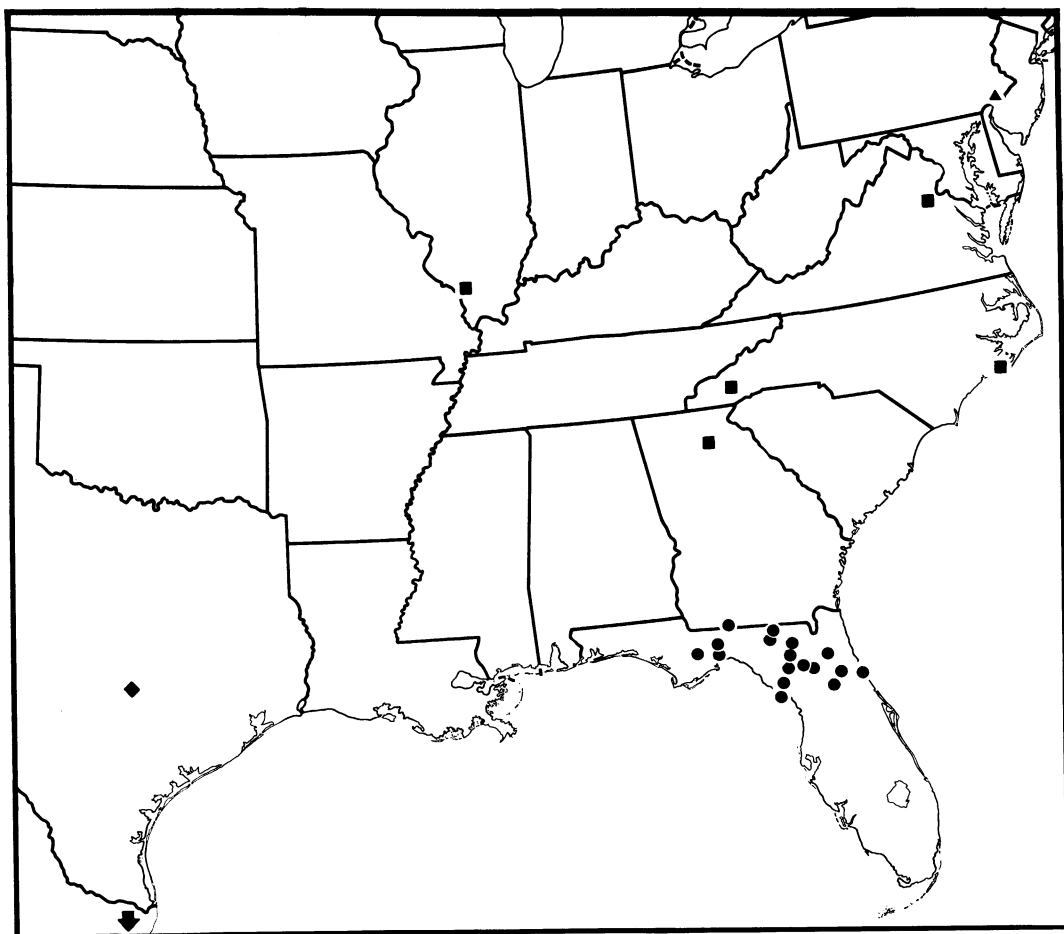


FIG. 20. Southeastern United States, showing records of *Atypus snetsingeri* (triangle), *Sphodros abboti* (circles), *S. paisano* (diamond; arrow points to record from Tamaulipas, Mexico), and *S. atlanticus* (squares).

laterals with lengths as follows: basal 0.80, median 0.70, subapical 0.80, apical 0.50, total 2.80.

Epigynum (fig. 19) with two heavily sclerotized basal plates, each bearing two short bulbous receptacula.

**MATERIAL EXAMINED:** UNITED STATES: **Pennsylvania:** *Delaware Co.:* Lansdowne, June 25, 1969 (R. Snetsinger), 1♂, 1♀; Sept. 12, 1970 (P. A. Sarno), 1♂, 1♀; Naylor Run Park, Upper Darby, Oct. 19, 1979 (S. Tessler, ST), 1♀.

**DISTRIBUTION:** Known only from Delaware County, Pennsylvania (fig. 20).

**NATURAL HISTORY:** A complaint from a home owner about spiders in his swimming pool led to the discovery by Dr. R. Snetsinger of Pennsylvania State University of a large colony of this species in Lansdowne, Pennsylvania. A few wandering males had been caught in the swimming pool filter. Numerous males, females, and immatures were found on the property in pursewebs attached to low stems and roots of bushes and small trees and along a concrete house foundation. The aerial portions of the tubes averaged 150 to 175 mm. long for mature males and somewhat more for the females. Studies of the

habits by Sarno (1973, pp. 50–51) demonstrated that spiders of all ages build purse-webs and capture their insect food in the fashion typical of the family. The species was recently recollected by Steven Tessler of Bryn Mawr College in a park about 1 mile from the type locality. He reports (*in litt.*) that:

The park is typical of the west Philadelphia suburbs, being largely manicured with a preponderance of tennis courts and concrete, but there are still some relatively undisturbed patches of woods. *Atypus* tubes were located this past fall in the woods (mostly oak) on a sloping hill. The tubes were found at the base of small trees on the downhill side, and along a retaining wall at the top of the hill. Some smaller individuals were taken from tubes built in the litter, the aerial portion of the tube lying horizontally about 2 inches above the ground. The specimens I'm sending were from along the retaining wall, the tubes partially camouflaged by litter. Some individuals constructed tubes in a container for me and accepted earwigs (Forficulidae) and German cockroaches, while never attacking isopods or noctuid moths (adults) that were coerced into "walking the tube."

#### SPHODROS WALCKENAER

*Sphodros* Walckenaer, 1835, p. 638 (type species by original designation ["La première espèce"] *Sphodros abboti* Walckenaer); 1837, p. 246.  
*Madognatha* Ausserer, 1871, p. 143 (*nomen novum* for *Sphodros*, erroneously believed preoccupied by *Sphodrus* Clairville).

**NOMENCLATURE:** Although Walckenaer first used the name *Sphodros* in 1833 (p. 438), it did not become available until particular species were associated with it in 1835.

**DIAGNOSIS:** Males of *Sphodros* can be distinguished from those of *Atypus* by their smooth sternum, without marginal ridges (fig. 22) and long, curved embolus lying in a long, curved conductor (fig. 26), females by their epigynum with four long, coiled tubes (fig. 29).

#### KEY TO SPECIES OF *SPHODROS*

1. Males (those of *paisano* unknown) ..... 2
- Females ..... 7

2. Posterior lateral spinnerets four-segmented ..... *abboti*  
 Posterior lateral spinnerets three-segmented ..... 3
3. Labium enlarged, about four-sevenths width of sternum (fig. 43); anterior pair of sigilla obsolete ..... *atlanticus*  
 Labium normal, about one-third width of sternum; anterior pair of sigilla present ..... 4
4. Legs mostly red ..... 5  
 Legs black ..... 6
5. Femora of legs all red; conductor of embolus long, evenly tapered to apex (fig. 36) ..... *rufipes*  
 Femora of legs black except dorsally at distal ends; conductor of embolus shorter, wider (fig. 42) ..... *fitchi*
6. Metatarsi and tarsi of legs bearing many false sutures; conductor of embolus evenly tapered to apex, palpal tibia not incrassate (fig. 60) ..... *coylei*  
 Only tarsi of legs with false sutures; conductor of embolus widened at apex, palpal tibia incrassate (fig. 54) ..... *niger*
7. Posterior lateral spinnerets four-segmented ..... 8  
 Posterior lateral spinnerets three-segmented ..... 9
8. Fourth pair of sigilla oval (fig. 28); spermathecae usually with four coils (fig. 29) ..... *abboti*  
 Fourth pair of sigilla invaginated laterally (fig. 31); spermathecae usually with three coils (fig. 30) ..... *paisano*
9. First pair of sigilla small, near labium (fig. 51); carapace and sternum relatively short, wide (figs. 48, 49) ..... *niger*  
 First pair of sigilla larger, set well back from base of labium (as in fig. 33); carapace and sternum relatively long, narrow (as in figs. 27, 44) ..... 10
10. All sigilla enlarged (figs. 33, 44) ..... 11  
 Second pair of sigilla reduced to thin bands (figs. 39, 57) ..... 12
11. Second pair of sigilla widely separated, a line connecting inner margins of all pairs nearly continuous (fig. 33); spermathecae regularly coiled (fig. 34) ..... *rufipes*  
 Second pair of sigilla approximate, a line connecting inner margins of other pairs bisecting second pair (fig. 44); spermathecae irregularly coiled (fig. 45) ..... *atlanticus*
12. First pair of sigilla widely separated (fig. 39) ..... *fitchi*  
 First pair of sigilla approximate (fig. 57) ..... *coylei*

*Sphodros abboti* Walckenaer

Figures 1, 3, 4, 10, 20–31

- Sphodros abbotii* Walckenaer, 1835, p. 639 (female holotype from Georgia, no specific locality, lost [but discussed and illustrated in Abbot's 1792 manuscript "Drawings of the Insects of Georgia" housed in the British Museum (Natural History), vol. xiv, p. 6, pl. 8, fig. 36], not male [=Actinopodidae]; female neotype designated by Gertsch, 1936, pp. 12, 13, from near Gainesville, Alachua County, Florida, in AMNH, examined); 1837, p. 247, pl. 1, fig. 7.
- Madognatha abbotii*: Ausserer, 1871, p. 143.
- Atypus abbotii*: McCook, 1888, p. 203. Roewer, 1942, p. 212.
- Atypus abboti*: Simon, 1891, p. 308. Gertsch, 1936, p. 9, figs. 1–6, 11, 12, 15–23. Bonnet, 1955, p. 812.

**NOMENCLATURE:** Chamberlin and Ivie (1944, p. 32) treated "Burke County" (now Screven County), Georgia, as the type locality, probably because Abbot lived in that area from approximately 1776–1806. There is nothing, however, in either Abbot's manuscript or Walckenaer's descriptions that indicates any locality more specific than Georgia. No specimens of *S. abboti* are presently known from central or northern Georgia; if Abbot's material was from that area it is possible that he actually collected *S. atlanticus* or *S. coylei* rather than the species here referred to as *S. abboti* and represented by Gertsch's neotype (the possibility that Abbot had *S. rufipes* can be discounted as he collected both sexes and would surely have mentioned the striking colors of male *S. rufipes*).

**DIAGNOSIS:** *Sphodros abboti* seems most closely related to *S. paisano* as adults of both sexes have four-segmented posterior lateral spinnerets (fig. 23), apparently a derived character (very young specimens of *S. abboti* have the three-segmented spinnerets typical of both young and adults of the other species of *Sphodros*). Males of *S. paisano* are unknown, but females of the two species can be distinguished by the characters listed in couplet 8 of the key.

**MALE** (near Gainesville, Florida): Total length, including chelicerae, 9.75; body as in figures 21, 24. Carapace very dark brown

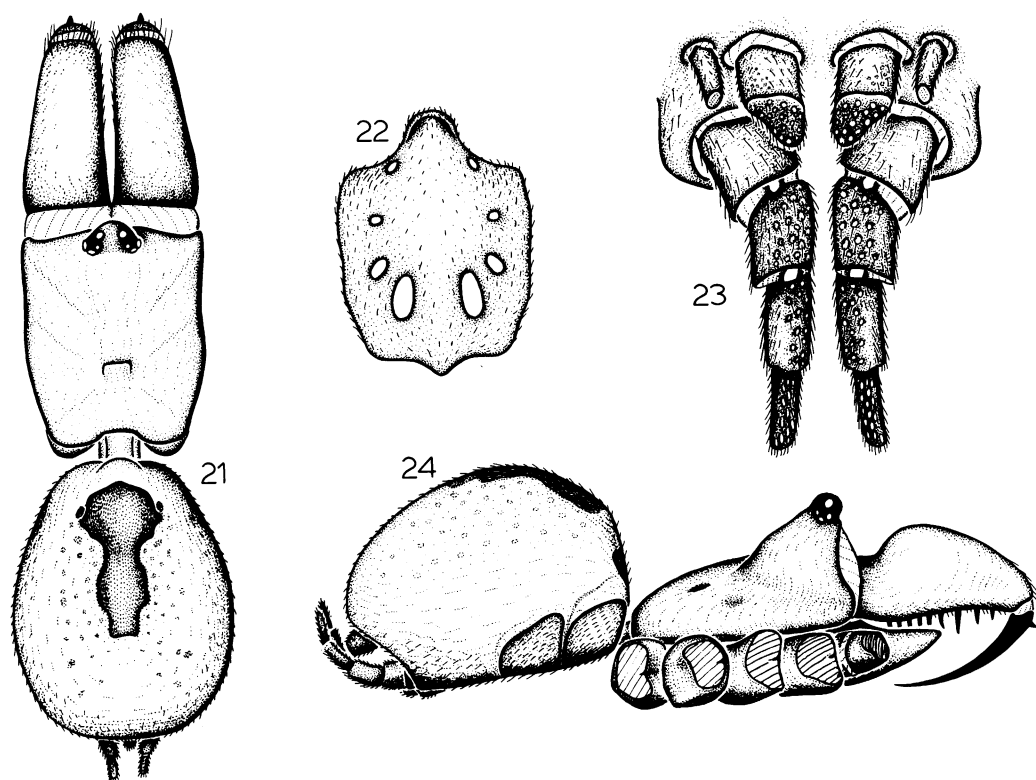
with pars cephalica and margins of pars thoracica darkest; eye tubercle black. Chelicerae very dark brown dorsally, reddish brown ventrally; sternum, labium, and palpal coxae brown with greenish tinge. Legs, except for light brown tarsi, dark brown with greenish tinge. Abdomen iridescent blue to purple dorsally, with long, black, hastate scutum anteriorly and several irregular recurved rows of round, pale spots posteriorly; venter similarly colored except for brown lung covers, yellowish triangle at epigastric area, and laterally blackened spinnerets.

Carapace 3.45 long, 2.85 wide, uniformly pitted and roughened, armed only with few small spines on front face of ocular tubercle, truncated in front, weakly rounded at sides, narrowed between fourth coxae, posterior margin broadly rounded, emarginated above pedicel. Pars cephalica very strongly elevated, convex, forming subequilateral triangle as seen from above, steeply declining behind ocular tubercle, leveled just anterior to thoracic groove. Pars thoracica irregularly flattened; thoracic groove deep suborbicular depression placed back four-sevenths of total length, occupying one-sixth of carapace width at that point.

Eyes on elevated tubercle occupying one-third of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 17:14:14:11. Anterior row slightly wider than posterior, procurved from front, recurved from above; medians separated by more than their diameter (9/7), by their diameter from laterals. Posterior row recurved; medians separated by nearly four times their length, contiguous with laterals. Median ocular quadrangle wider than long (6/3), narrowed in front (6/4). Lateral eyes of each side slightly separated.

Sternum (fig. 22) 2.35 long, 2.00 wide; labium 0.50 long, 0.75 wide; both clothed evenly with short erect black hairs. Sternum with eight sigilla: inconspicuous pair at base of labium; small pair near posterior margins of coxae I; small pair near middle of coxae II; large oval pair between coxae II and III, separated by their length, about as far from margins of sternum. Palpal lobes clothed evenly with erect black hairs, set with two





FIGS. 21–24. *Sphodros abboti* Walckenaer, male. 21. Body, dorsal view. 22. Sternum, ventral view. 23. Spinnerets, ventral view. 24. Body, lateral view.

irregular rows of spinules and several rows of short clavate hairs on inner margin. Chelicerae twice as long as high, three times as long as wide, strongly rounded and roughened above, flat prolaterally, convex retrolaterally, abruptly depressed near base, clothed with short inconspicuous black hairs and set with long, curved spines and stout hairs at distal end; promargin with nine strong teeth, two most distal reduced in size, others subequal; retromargin with thin band of black hairs.

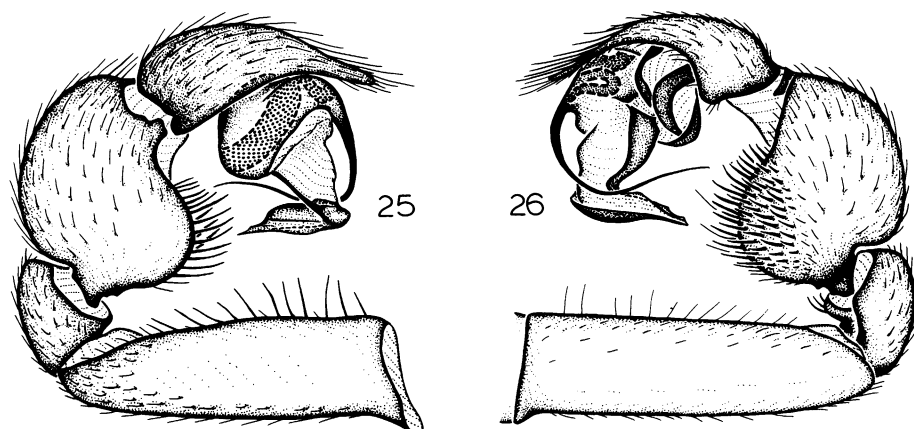
Leg formula 4132. Legs relatively slender, evenly clothed with rows of black hairs, with spines restricted to venter except for few weak dorsal spines on metatarsi (most numerous on legs II and III). Tarsi long, flexible, distal three-fourths marked with numerous false sutures, ventral surfaces with short curved spines at sides. Unpaired tarsal claws

small, armed with single weak tooth; paired claws small, proclaws usually with five, retroclaws with three teeth.

	I	II	III	IV	Palp
Femur	2.80	2.45	2.30	2.80	2.10
Patella	1.25	1.20	1.15	1.30	0.80
Tibia	1.70	1.40	1.35	2.00	1.50
Metatarsus	2.50	2.15	2.30	3.10	—
Tarsus	1.70	1.80	2.00	2.25	1.60
Total	9.95	9.00	9.10	11.45	6.00

Palp (figs. 25, 26) with long, evenly curved conductor moderately widened apically and bearing thin, curved embolus; tibia incrasated, as wide as long, with retrolateral clump of spines.

Abdomen 3.70 long, 2.70 wide, suboval, clothed with black hairs. Spinnerets (fig. 23) six: anterior laterals slender, 0.45 long; posterior medians separated by their width at



FIGS. 25, 26. *Sphodros abbotti* Walckenaer, male palp. 25. Prolateral view. 26. Retrolateral view.

base, 0.65 long; four-segmented posterior laterals with lengths as follows: basal 0.50, median 0.55, subapical 0.45, apical 0.55, total 2.05.

**FEMALE** (near Gainesville, Florida): Total length, including chelicerae, 13.00; body as in figure 27. Carapace light to dark yellowish brown with darker infuscations radiating from thoracic groove; eye tubercle black. Chelicerae dark brown, darkest dorsally; sternum, labium, and palpal lobes yellowish brown posteriorly, becoming darker anteriorly. Legs dusky yellowish brown with tarsi darkest. Abdomen dark brown with lighter triangular scutum and small round pale spots on dorsum as in male; venter similarly colored.

Carapace 4.25 long, 3.50 wide, smooth, subquadrangular, broadly truncated and widest in front, nearly straight at sides, slightly narrowed behind, posterior margin broadly rounded, shallowly emarginated above pedicel. Pars cephalica less elevated than in male, wider in front, forming triangle as seen from above. Pars thoracica flat, thoracic groove deep depression placed back two-thirds of carapace length, occupying one-sixth of carapace width at that point.

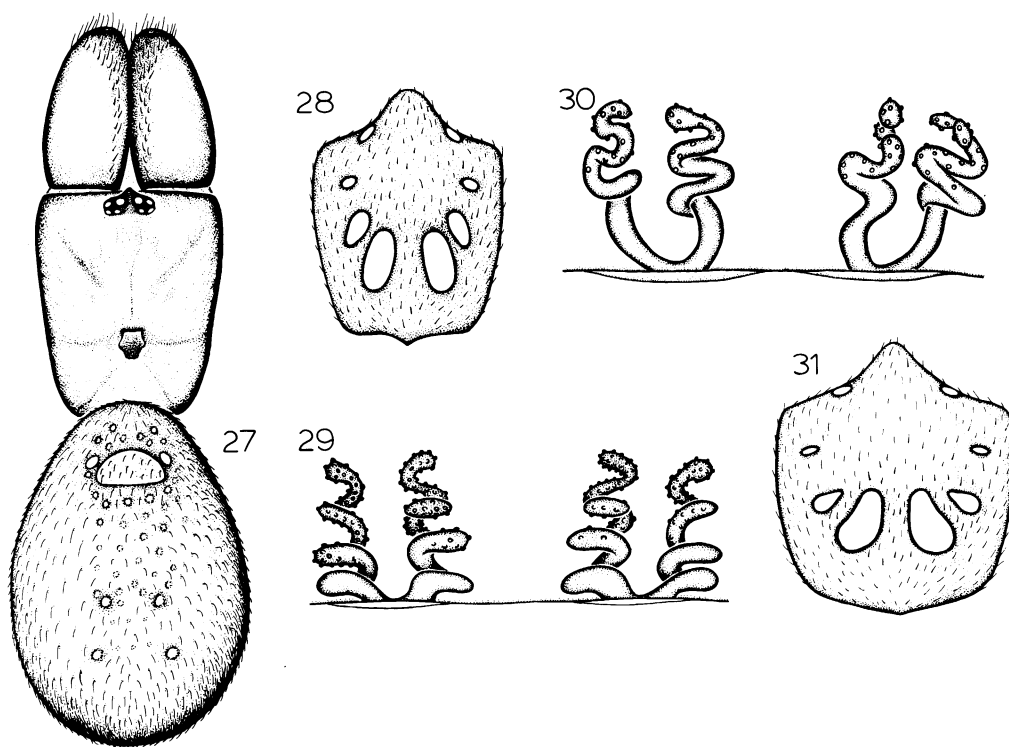
Eye tubercle less elevated behind than in male, two-sevenths of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 25:15:17:13. Anterior row recurved from above, pro-

curved from front, very slightly narrower than posterior row; medians separated by more than their diameter (22/15), almost as far from laterals (20/15). Posterior row recurved; medians separated by four diameters, slightly separated from laterals. Median ocular quadrangle wider than long (77/34), narrowed in front (77/47). Lateral eyes of each side very slightly separated.

Sternum (fig. 28) 3.00 long, 3.00 wide; labium 0.70 long, 1.25 wide; both clothed with short erect black hairs. Eight sigilla present but two anterior pairs poorly defined. Palpal lobes clothed with black hairs, median half set with numerous short spinules. Chelicerae shorter than in male, three-fourths as high as long, promargin with nine subequal teeth and additional denticle retrolateral of most proximal tooth.

Leg formula 1423. Legs stout, clothed with short black and longer dark hairs, some bristle-like, sparsely spinose. Palpal claw with six teeth; tarsal claws very small, unpaired claw usually with three teeth, paired claws usually with four or five teeth.

	I	II	III	IV	Palp
Femur	3.20	2.50	2.20	2.60	1.80
Patella	1.60	1.60	1.40	1.55	0.95
Tibia	1.20	0.95	0.85	1.20	0.80
Metatarsus	1.45	1.25	1.20	1.60	—
Tarsus	1.00	0.85	0.80	1.05	0.95
Total	8.45	7.15	6.45	8.00	4.50



FIGS. 27–31. 27–29. *Sphodros abboti* Walckenaer, female. 30, 31. *S. paisano*, new species, female. 27. Body, dorsal view. 28, 31. Sternum, ventral view. 29, 30. Epigynum, dorsal view.

Abdomen 6.00 long, 5.00 wide, subovate; spinnerets with proportions as in male.

Epigynum (fig. 29) with four tubes, each usually with four coils.

**MATERIAL EXAMINED:** UNITED STATES: **Florida:** *Alachua Co.:* Devil's Millhopper, Feb. 3, 1938, mesic hammock (H. K. Wallace), 1♀; Gainesville, Jan. 7, 1927 (OSU), 2♀, Apr. 1, 1933 (H. K. Wallace, OSU), 9♀, Apr. 19, 1964 (J. F. Anderson, FSCA), 1♀, Apr. 20, 1964 (J. F. Anderson, NH), 2♀, June 14, 1935 (H. K. Wallace, W. Ivie), 2♂, 2♀, June 24, 1918 (C. J. Drake, OSU), 5♀; W Gainesville, Apr. 18, 1938 (W. J. Gertsch), 2♀; NW Gainesville, June 1, 1977, mesic woods (T. Chester, FSCA), 1♂; 2 mi. N Gainesville, Mar. 4, 1966, pine woods (F. J. Moore), 1♂; 8 mi. W Gainesville, June 8 (W. J. Gertsch), 2♀; Newnan's Lake, Feb. 22, 1933, tube on oak tree in climax hammock (H. K. Wallace),

1♀, Mar. 13, 1933, same habitat (H. K. Wallace), 3♀, Nov. 17, 1934 (H. K. Wallace), 3♀; Rattlesnake Branch, May 13, 1937 (H. K. Wallace), 1♀; Sugarfoot Hammock, Apr. 18, 1933 (H. K. Wallace), 2♀, June 14, 1941 (H. K. Wallace, S. C. Bishop), 2♂, 1♀, June 19, 1935 (H. K. Wallace, AMNH, EPC, MCZ), 5♂, 23♀; no specific locality, May 25, 1933 (H. K. Wallace, OSU), 1♂. *Clay Co.:* Roess Gold Head Branch State Park, June 12, 1962 (J. A. Beatty, JB), 1♀. *Columbia Co.:* Ichetucknee River, branch N of Santa Fe River, 15 mi. S Lake City, May 3, 1965 (F. J. Moore), 6♀; Ichetucknee Springs, June 15, 1963 (OSU), 1♂, June 23, 1963 (F. Hurt, FSCA), 1♀; Lake City, Mar. 1903 (J. H. Comstock), 3♀; Lake City at Santa Fe River, Dec. 14, 1975, base of sparkleberry tree (A. E. Graham, FSCA), 1♀; O'Leno State Park, Apr. 19, 1964, hydric hammock (J. F. Anderson, FSCA), 1♀.



*Flagler Co.*: Tomoka, July 1967 (L. Shear, TTU), 1♀. *Gilchrist Co.*: Otter Springs, June 10, 1978, wet woods near springs (R. E. Williams, FSCA), 1♂. *Hamilton Co.*: 6 mi. W Jasper, Feb. 4–5, 1938, tubes on gum trees in mesic hammock (F. N. Young), 2♀. *Leon Co.*: Bellamy, May 11, 1935, 3♀. *Levy Co.*: Manatee Springs State Park, W. of Chief-land, June 3, 1977 (J. A. Beatty, JB), 1♂, 1♀, June 11, 1975 (J. A. Beatty, JB), 2♂, 8♀; Sea Horse Kay, Dec. 6, 1956, tubes against bases of cabbage palms (H. V. Weems, Jr., C. H. Wharton, AMNH, FSCA), 11♀. *Liberty Co.*: Kelly Branch, Dec. 10, 1937 (F. N. Young), 1♀. *Marion Co.*: Ocala National Forest, June 13, 1935 (W. Ivie), 1♀. *Putnam Co.*: Acosta Creek, 2 mi. N Welaka, May 3, 1947 (H. K. Wallace), 1♂, 19♀; Lake Carlton, May 24, 1936, woods (H. K. Wallace, MCZ), 6♀; University of Florida Conservation Reserve, Welaka, May 5, 1973, mud springs (G. B. Edwards, FSCA), 1♀, June 2, 1947, mesic hammock (H. K. Wallace), 1♂, 5♀, Oct. 6, 1973, mud flats (F. Coyle), 1♀. *Suwannee Co.*: Suwannee River State Park, July 19, 1973 (F. Coyle, W. Shear), 3♀. *Wakulla Co.*: Wakulla Springs, 2♀. **Georgia**: *Thomas Co.*: Millpond Plantation, S. Thomasville, Feb. 1, 1968 (W. Sedgwick, MCZ), 1♀, Mar. 1, 1968 (W. Sedgwick, MCZ), 4♀, Apr. 20, 1973 (W. Sedgwick, WS), 2♀, June 15, 1973 (W. Sedgwick, WS), 3♀, July 16, 1973 (F. Coyle, W. Shear), 2♂, 3♀, Sept. 20, 1968, tubes in moist woods (J. A. Beatty, JB), 9♀, Sept. 20, 1972 (W. Sedgwick, WS), 2♀.

**DISTRIBUTION**: Southern Georgia and northern Florida in hammocks and mesic situations (fig. 20).

**NATURAL HISTORY**: The habits of *S. abboti* were explored in depth by McCook (1888), who provided numerous illustrations of the purseweb and burrow; no specimens from McCook's study area (Fairyland, Georgiana, Brevard County, Florida) have been examined, however, and it is possible that McCook's specimens are actually *S. rufipes* (McCook does not mention males or the spinneret structure, either of which would serve to establish the identity of his specimens). Additional contributions based on authenticated specimens have been provided

by Wallace (in Gertsch, 1936, p. 8), Gertsch (1949, pp. 133–136, pl. 15; 1979, pp. 124–125, pl. 7), and Bishop (1950, pp. 121–124).

### ***Sphodros paisano*, new species**

Figures 20, 30, 31

*Atypus abboti* (misidentification): Chickering, 1937, p. 271. Vogel, 1962, p. 250.

**TYPE**: Female holotype from Rancho El Milagro, Cruillas, Tamaulipas, Mexico (1930, Dice and Bartlett), deposited in MCZ.

**ETYMOLOGY**: The specific name is a noun in apposition from the Spanish *paisano* (countryman).

**DIAGNOSIS**: *Sphodros paisano* seems most closely related to *S. abboti* but females can be distinguished by the distinctive pattern of sigilla (fig. 31): the fourth pair are large and kidney-shaped, and the third pair are small and transversely oriented.

**MALE**: Unknown.

**FEMALE** (holotype): Total length, including chelicerae, 17.70. Carapace and chelicerae light yellow to orange-brown, with dusky shadings on side margins and head furrows; eye tubercle black. Sternum, labium, and palpal lobes dusky orange. Legs yellowish brown. Abdomen dull purple to black, with numerous small pale spots; dorsal scutum inconspicuous, brown; spinnerets pale yellow.

Carapace 5.40 long, 5.00 wide, bare except for few black hairs on ocular tubercle and fine hairs around side margins. Pars cephalica strongly elevated, triangular. Pars thoracica flat, shallowly emarginated posteriorly, thoracic groove deep fissure forming essentially square pit placed back two-thirds of carapace length, occupying about one-seventh of carapace width at that point.

Eyes on small tubercle about one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 23:21:18:18. Eye rows subequal in width; anterior row moderately recurved, medians separated by their diameter, nearer front edge of obliquely set laterals. Posterior row moderately recurved, medians separated by about three and one-half diameters, touching laterals. Median ocular quadrangle wider than long (80/33), narrowed in front

(80/52). Lateral eyes of each side slightly separated.

Sternum (fig. 31) 3.70 long, 4.00 wide; labium 0.70 long, 1.25 wide; both covered evenly with fine black hairs, labium with few stiff hairs at tip. Four pairs of sigilla present but first two pairs barely visible; posterior pair large, approximate. Palpal lobes clothed with erect hairs and thick series of spinules along inner margin and covering most of lobe. Chelicerae twice as long as wide, strongly inflated above base; promargin with close-set series of eight subequal teeth and tiny distal denticle, retromargin with single small proximal tooth.

Leg formula 1423. Legs short, clothed with pale hairs and few weak spines; all metatarsi and tarsi with row of spinules in dorsal or prolateral position. Palpal claw with six teeth; paired tarsal claws with three or four teeth, unpaired claws with two or three.

	I	II	III	IV	Palp
Femur	3.60	3.20	2.80	3.10	2.10
Patella	1.70	1.80	1.60	1.80	1.10
Tibia	1.50	1.20	0.90	1.50	0.80
Metatarsus	1.90	1.60	1.40	2.10	—
Tarsus	1.10	1.10	1.00	1.20	1.10
Total	9.80	8.90	7.70	9.70	5.10

Abdomen 8.50 long, 5.00 wide, suboval, thickly covered with fine black hairs; dorsum shriveled, with inconspicuous triangular tergite above base. Spinnerets six, with proportions as in *S. abboti*.

Epigynum (fig. 30) with four slender tubes, each usually with three coils.

**MATERIAL EXAMINED:** The holotype and two females collected at Austin, Travis County, Texas (March 12–18, 1903; J. H. Comstock) and housed in the Cornell University Collection at AMNH.

**DISTRIBUTION:** Southeastern Texas and northeastern Mexico (fig. 20).

*Sphodros rufipes* (Latreille),  
new combination

Figures 2, 5, 6, 11, 12, 32–37

*Atypus rufipes* Latreille, 1829, p. 233 (male holotype from near Philadelphia, Philadelphia County, Pennsylvania, in Muséum National

d'Histoire Naturelle, lost). Bonnet, 1955, p. 815, footnote 560.

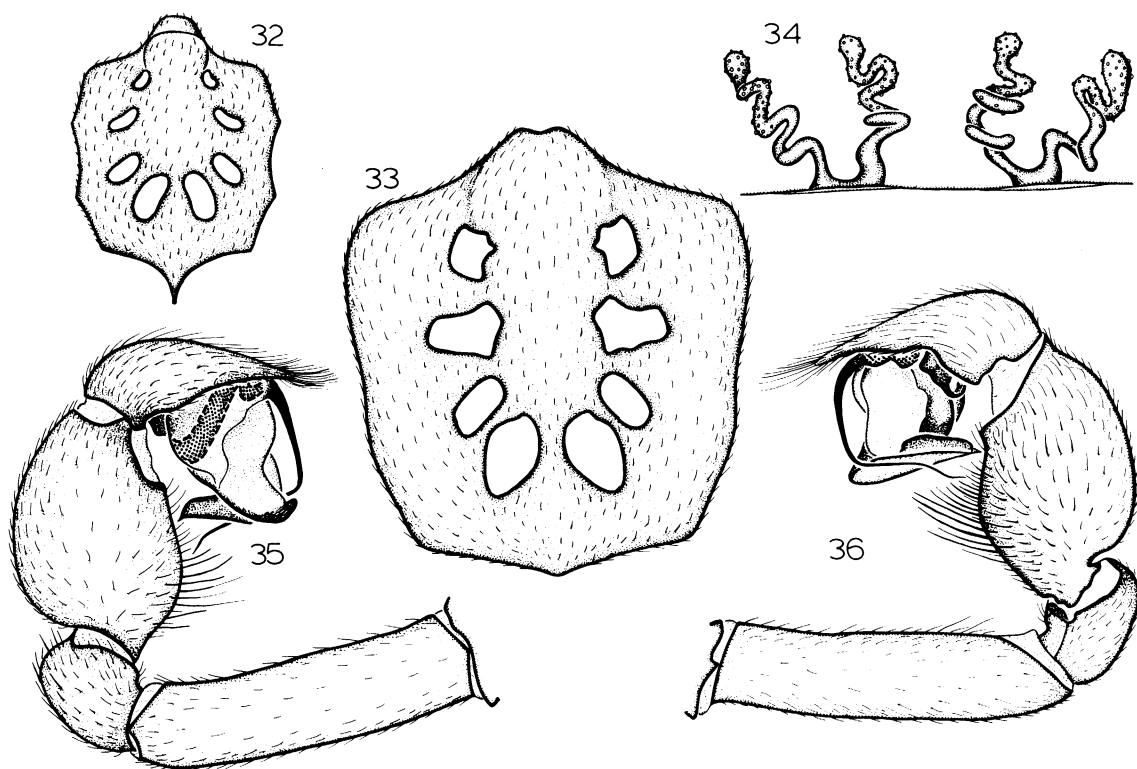
*Atypus bicolor* Lucas, 1836, p. 216, pl. 5, fig. 5a–d (male holotype from North America, no specific locality, in Muséum National d'Histoire Naturelle, lost). Gertsch, 1936, p. 13, figs. 7, 13, 24, 25, 28, 29. Roewer, 1942, p. 212. Bonnet, 1955, p. 815. **NEW SYNONYMY.**

*Oletera bicolor*: Walckenaer, 1837, p. 245.

*Sphodros milberti* Walckenaer, 1837, p. 249 (male holotype from near Philadelphia, Philadelphia County, Pennsylvania, in Muséum National d'Histoire Naturelle, lost). **NEW SYNONYMY.**

*Atypus milberti*: Banks, 1907, p. 736. Roewer, 1942, p. 212. Bonnet, 1955, p. 816.

**NOMENCLATURE:** The first mention of a red-legged purseweb spider from the United States was by Latreille (1829, p. 233), as follows: “M. Milbert, correspondant du Muséum d'Histoire naturelle, a découvert aux environs de Philadelphia une autre espèce (*Atypus rufipes*) toute noire, avec les pattes fauves.” This concise diagnosis fulfilled all the legal requirements for its time, and was better than most in unmistakably identifying the taxon and providing precise locality data. A few years later, Lucas (1834, p. 333) repeated this record almost verbatim (misspelling the name as *rutipes*), but he subsequently (1836) described and illustrated the same species under the name *bicolor*. In a footnote, Lucas (1836, p. 214) mentioned Latreille's *rufipes*, indicated that he did not know whether his species (known only from a single male collected by Milbert) was the same as that of Latreille, and noted some color differences, the legs in his specimen being “rouge vermillon” instead of “fauves.” There can be little doubt that Walckenaer (1837, p. 249) actually had before him Latreille's specimen from near Philadelphia when he, after assigning Lucas's *bicolor* to the genus *Oletera*, described the species again as *Sphodros milberti* (Walckenaer had earlier [1835] used the name *milberti* but provided no characters for the species until 1837). In retrospect, it seems almost certain that the names *rufipes*, *bicolor*, and *milberti* were all based on the same specimen, a male sent as a gift to the Paris Museum by M. Milbert sometime before 1829.



FIGS. 32–36. *Sphodros rufipes* (Latreille). 32. Male sternum, ventral view. 33. Female sternum, ventral view. 34. Epigynum, dorsal view. 35. Male palp, prolateral view. 36. Male palp, retrolateral view.

The name *rufipes* was mentioned by Hentz (1842, p. 224) and later by Banks (1892, p. 147), who suggested that it was probably the same as *bicolor*, but it has been ignored by all subsequent authors and catalogers, with the exception of Bonnet (1955), who tentatively placed *rufipes* as a synonym of *bicolor*. Bonnet suggested in a footnote that if these names were one day found to represent the same taxon, the species should continue to bear the younger name *bicolor*. However, insufficient usage has been made of that name to justify its retention under Article 79(b) of the current version of the International Code of Zoological Nomenclature.

DIAGNOSIS: *Sphodros rufipes*, the largest American atypid, seems most closely related to *S. fitchi* and *S. atlanticus*, which also have males with bicolored legs; males of *S. rufipes* can be distinguished by having the

femora and more distal legs segments all completely colored carmine red, females by the large and widely separated sternal sigilla (fig. 33).

MALE (Camp Roosevelt, Maryland): Total length, including chelicerae, 14.50. Carapace quite uniform reddish brown to black with many tiny yellowish spots; pars cephalica darkest, eye tubercle black; pars thoracica with black marginal seam. Chelicerae, palpi, sternum, and labium dark reddish brown; leg coxae and trochanters paler brown, femora and distal segments bright red, fading to orange or yellow in preserved specimens. Abdomen dull blackish; dorsum with brown scutum; apical segments of spinnerets yellow.

Carapace 5.40 long, 4.70 wide, finely roughened and pitted, bare. Pars cephalica strongly elevated, subtriangular, broadest in

front, sides nearly straight to thoracic groove. Pars thoracica low, thoracic groove deep depression placed back seven-elev-enths of carapace length, occupying one-fifth of carapace width at that point.

Eyes on prominent tubercle equal to one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 22:17:14:12. Anterior row as wide as posterior, procurved from front, weakly recurved from above; medians separated by more than their diameter, nearly as far from laterals. Posterior row recurved; medians separated by five times their diameter, subcontiguous with laterals. Median ocular quadrangle wider than long (90/33), narrowed in front (90/54). Lateral eyes of each side slightly separated.

Sternum (fig. 32) 3.30 long, 3.30 wide, moderately roughened, clothed with fine black hairs; sigilla deeply impressed, lying in straight line, front pair well marked; roughly suboval posterior pair separated by the radius of one. Labium 0.65 long, 1.30 wide, slightly emarginated at apex, clothed with black hairs. Palpal lobes evenly covered with fine suberect black hairs and band of tiny spinules along inner edge. Chelicerae almost three times as long as wide, broad at base, roughened, especially on prolateral side, clothed apically with curved hairs and spines; promargin with 11 teeth in single row, basal two smallest.

Leg formula 4123. Legs slender, with spination as in *S. abboti*; tarsi with false sutures on distal halves only. Unpaired tarsal claws with zero to three minute teeth; paired claws with three or four teeth on proclaws, three to five on retroclaws.

	I	II	III	IV	Palp
Femur	4.65	4.00	3.40	4.25	3.00
Patella	2.00	2.00	1.65	2.00	1.20
Tibia	2.25	1.90	1.65	2.35	1.75
Metatarsus	3.40	3.15	3.35	4.40	—
Tarsus	2.00	1.80	1.70	2.20	2.00
Total	14.30	12.85	11.75	15.20	7.95

Palp (figs. 35, 36) with apex of conductor broad, laterally directed, shallowly grooved process drawn to blunt point; embolus long, thin spike.

Abdomen 5.00 long, 3.50 wide, oval, clothed thickly with black hairs. Spinnerets six: anterior laterals 0.55 long, posterior medians, 0.85 long, three-segmented posterior laterals with lengths as follows: basal 0.50, median 0.75, apical 1.00, total 2.25.

FEMALE (Pelotes Island, Florida): Total length, including chelicerae, 24.00. Carapace dark reddish brown with blackish shading on grooves and depressions; pars cephalica darkest on margins, eye tubercle black; pars thoracica with marginal black seam, black streaks radiating from dark thoracic groove. Appendages and underside of cephalothorax mostly concolorous. Abdomen dark brown to dull black; dorsum with dark brown scutum above base; spinnerets light brown.

Carapace 9.50 long, 8.30 wide, smooth, bare except for few hairs on eye tubercle and along sides of pars thoracica. Pars cephalica well elevated, triangular, wider than long. Pars thoracica low, roughened over most of surface, much narrower than pars cephalica, rounded and widely emarginated behind, with radiating grooves deeply impressed; thoracic groove deep depression placed back two-thirds of carapace length, occupying less than one-fourth of carapace width at that point.

Eye tubercle one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 30:25:32:30. Anterior row narrower than posterior, procurved from front, essentially straight from above; medians separated by more than their diameter, almost as far from laterals. Posterior row slightly recurved; medians separated by more than three times their long diameter, nearly touching laterals. Median ocular quadrangle wider than long (15/6), narrowed in front (15/8). Lateral eyes of each side slightly separated.

Sternum (fig. 33) 5.30 long, 5.30 wide, smooth, with scattered black hairs; sigilla deeply impressed, in slightly curved line, front pair as large as second and third pairs; oval posterior pair much larger, separated by about radius of narrowest width. Labium 1.50 long, 2.50 wide, rounded at apex, with black hairs. Palpal lobes evenly covered with fine black hairs and many spinules concen-



trated on inner side. Chelicerae less than twice as long as wide, broadest at base, smooth but roughened at apex where provided with curved hairs and weak spines; promargin with 11 teeth in straight row, fifth from apex smallest; retromargin with black denticle opposite innermost tooth.

Leg formula 1423. Legs stout, with rows of black hairs and short spines on metatarsi and tarsi. Palpal claw with five large teeth; paired and unpaired tarsal claws with three large teeth.

	I	II	III	IV	Palp
Femur	6.00	4.50	4.10	4.50	3.30
Patella	2.90	2.75	2.25	2.25	1.80
Tibia	2.25	1.60	1.40	1.90	1.50
Metatarsus	2.70	2.30	2.20	2.80	—
Tarsus	1.60	1.50	1.25	1.50	1.60
Total	15.45	12.65	11.20	12.95	8.20

Abdomen 10.00 long, 6.00 wide, oval, thickly covered with fine black hairs. Spinnerets six: anterior laterals 0.90 long, posterior medians 1.50 long, three-segmented posterior laterals with lengths as follows: basal, 1.30, median 1.30, apical 2.50, total 5.10.

Epigynum (fig. 34) consisting of two regularly coiled tubes on each side.

**MATERIAL EXAMINED:** UNITED STATES: **District of Columbia:** Blagdon Field, Washington, June 19, 1937 (I. Fox), 1♂. **Florida:** *Duval Co.:* Cedar Point, 20 mi. from Jacksonville, Jan. 1–26, 1963 (M. Mann), 3♀; Fort George (F. Hurt, FSCA), 1♀; Fort George Island, fall 1962, 3♀; Pelotes Island, Apr. 5, 1967 (F. J. Moore, AMNH, MCZ), 2♀. *Gadsden Co.:* no specific locality, July 7, 1934 (Bellamy), 1♀; Quincy, Apr. 19, 1938 (W. J. Gertsch, AMNH, FMNH), 10♀, June 12, 1935 (J. D. Kolby), 1♀, Nov. 28, 1934 (H. K. Wallace), 1♀. *Jackson Co.:* Florida Caverns State Park, N Marianna, June 6, 1977 (S. Ketzler, JB), 1♂, June 9, 1975 (J. A. Beatty, JB), 1♀, June 24, 1966 (J. A. Beatty, JB), 1♀, July 18, 1973 (F. A. Coyle, W. A. Shear), 1♀, Sept. 19, 1970 (J. A. Beatty, JB), 1♀. *Liberty Co.:* no specific locality, Apr. 8, 1941 (H. K. Wallace), 2♀, June 2–4, 1952 (H. K. Wallace, AMNH, FSCA), 3♂, 1♀; Torreya Ra-

vine State Park, Mar. 31, 1964 (J. A. Beatty, JB), 1♂, 1♀, Apr. 2, 1963 (matured Apr. 19, May 7), in tubes (W. A. Shear), 2♂, Apr. 3, 1968 (J. A. Beatty, JB), 1♀, Apr. 4, 1957 (W. J. Gertsch, R. R. Forster), 1♀, June 20, 1957 (L. and W. Miller, MCZ), 1♀, July 18, 1973 (F. A. Coyle, W. A. Shear), 1♀. *Madison Co.:* 5 mi. NE Madison, Sept. 7, 1967, pine woods (F. J. Moore), 8♀. **Georgia:** *Fulton Co.:* Atlanta, June 19, 1949 (P. W. Fattig), 1♂. **Illinois:** *Union Co.:* near Otter Pond, Pine Hills Area, Oct. 26, 1966, tube on tree base on rocky slope, adult when collected, died Oct. 1971 (J. A. Beatty, JB), 1♀. **Louisiana:** *East Feliciana Par.:* no specific locality, June 1956, burrow on side of cliff (L. Roddy), 1♂. *Evangeline Par.:* Chicot State Park, June 22, 1972, tube on oak tree (R. M. Blaney, DR), 1♂. *Natchitoches Par.:* 2.5 mi. WNW Kisatchie, Nov. 5, 1977, tube on beech tree (D. Rossman, DR), 1♀. *West Feliciana Par.:* 2.75 mi. W Wakefield, May 27, 1977 (M. L. Israel, DR), 1♂. **Maryland:** *Dorchester Co.:* Hudson, June 29, 1967, gravel road in pine woods (C. Porter, MCZ), 1♂. *Montgomery Co.:* Plummer's Island, June 1926 (MCZ), 1♂. *Prince Georges Co.:* Berwyn, Jan. 14, 1945, in tube (M. H. Muma), 1♀; Camp Roosevelt, June 1935 (J. R. Jones), 1♂; College Park, Feb. 14, 1942, in tube (M. H. Muma, FSCA), 1♀, Apr. 23, 1942, on tree (M. H. Muma), 1♀, July 16, 1942, in tube (M. H. Muma, FSCA), 1♀; Hyattsville, Oct. 1, 1950 (L. Ross, FMNH), 1♀. **Mississippi:** *Forrest Co.:* Camp Shelby, near Hattiesburg, June 25, 1943 (C. D. Michener), 1♂. *Hinds Co.:* Clinton, spring 1926 (J. W. Bailey), 1♀. **New York:** *Suffolk Co.:* Northport, Long Island, June 1965 (S. Roman), 1♂. **North Carolina:** *Clay Co.:* Sunday Farm, near Hayesville, June 16, 1978 (M. Engel), 1♂. *New Hanover Co.:* Wilmington, June 12, 1965, on brick wall (Mahaney, EPC), 1♂. **Rhode Island:** *Newport Co.:* road between Crescent Beach and Old Harbor, Block Island, July (S. Macdowall), 1♂. **Tennessee:** *Davidson Co.:* Nashville, Mar. 1949 (R. H. Milton), 1♀, Mar. 11, 1915 (W. S. Cartwright), 1♀, June 28, 1958 (A. R. Laskey), 1♂, July 10, 1955 (A. R. Laskey), 1♀, Sept. 26, 1954 (Mrs. A. R. Laskey), 1♀.



FIG. 37. Southeastern United States, showing records of *Sphodros rufipes* (circles) and *S. fitchi* (squares).

**Knox Co.:** Knoxville, May 1978 (J. Harp, SR), 1♀. **Loudon Co.:** Lenoir City, June 3, 1974, wrapped in theridiid web on house foundation (W. Tolbert), 1♂. **Robertson Co.:** Glenraven, June–July 1904 (W. H. Fox, MCZ), 1♂. **Texas:** **Liberty Co.:** Dayton, Jan. 18, 1920 (Cartwright), 7♀. **Virginia:** **Fairfax Co.:** East Falls Church, Apr. 11, 1909, underground (N. Banks, MCZ), 2♀; Falls Church (N. Banks, MCZ), 5♀, c. 1912, 1♂, 1♀.

**DISTRIBUTION:** Eastern Texas to northern Florida, north to southern Illinois and Rhode Island (fig. 37).

**NATURAL HISTORY:** An excellent study of the habits of *S. rufipes* was published by Muma and Muma (1945) on the basis of ma-

terial from College Park, Maryland. Additional information can be found in Gertsch (1949, pp. 134–136, pl. xiii; 1979, pp. 124–126, pl. 6 [color photographs]).

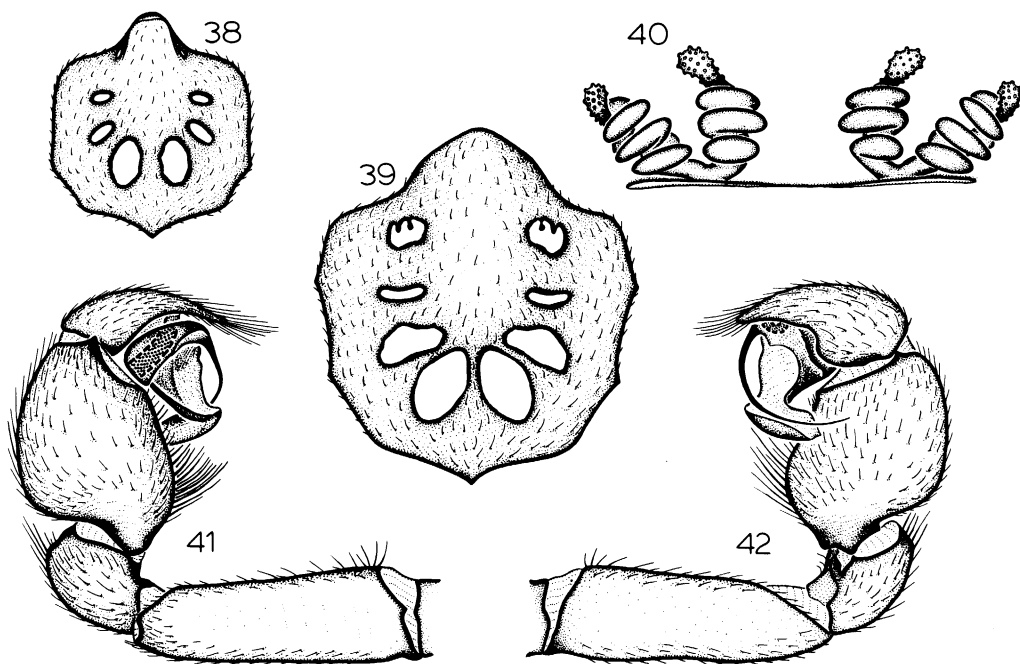
#### ***Sphodros fitchi*, new species**

Figures 37–42

*Atypus* sp.: Muma and Muma, 1949, p. 489. Fitch, 1963, p. 23, fig. 6.

**TYPES:** Male holotype from University of Kansas Natural History Reservation, near Lawrence, Douglas County, Kansas (June 12, 1959; H. S. Fitch), and female paratype from the same locality (August 1961; H. S. Fitch), deposited in AMNH.

**ETYMOLOGY:** The specific name is a noun



FIGS. 38–42. *Sphodros fitchi*, new species. 38. Male sternum, ventral view. 39. Female sternum, ventral view. 40. Epigynum, dorsal view. 41. Male palp, prolateral view. 42. Male palp, retrolateral view.

in apposition in honor of the collector of the type specimens.

**DIAGNOSIS:** This handsome species is only likely to be confused with *S. rufipes*; males of *S. fitchi* also have black bodies and carmine red legs in life, but the red coloration is limited to the dorsal surface of the distal ends of the femora plus all the more distal leg segments. The sternum of the female (fig. 39) is proportionately broader and the second pair of sigilla (usually equal in size to the third pair in *S. rufipes*) are reduced to narrow bands much smaller than the third pair. The sternum of the male (fig. 38) is also broader and the second and third pairs of sigilla are of nearly equal size. The apical part of the male palpal conductor (fig. 42) is a wide, spoon-shaped receptacle bluntly pointed at the apex and far shorter than that of *S. rufipes*.

**MALE (holotype):** Total length, including chelicerae, 12.70. Carapace and chelicerae dark mahogany brown, with dull luster,

probably appearing black in life. Sternum, labium, and palpi dusky brown. Legs with coxae, trochanters, and most of femora dusky brown; tips of femora and rest of legs bright orange, reddish in life. Abdomen dull black, with conspicuous, shining black scutum running from base to middle of length.

Carapace 4.20 long, 3.70 wide, coriaceous, roughened, with structure as in *S. atlanticus*. Thoracic groove placed back seven-tenths of carapace length, occupying about one-sixth of carapace width at that point.

Eye tubercle less than one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 18:18:13:13. Anterior row as wide as posterior, moderately recurved; medians separated by two-thirds their diameter, somewhat nearer laterals. Posterior row gently recurved; oval medians separated by about three times their long diameter, nearly touching laterals. Median ocular quadrangle wider than long (36/16), narrowed in front

(36/23). Lateral eyes of each side separated by almost the radius of front pair.

Sternum (fig. 38) 2.70 long, 2.90 wide; four pairs of sigilla distinct, first pair lying in small grooves at sides of labium, fourth pair sub-oval, separated by nearly their width. Labium 0.60 long, 1.10 wide, narrowed and broadly rounded at apex. Palpal lobes provided along inner edge with mostly doubled line of spinules. Chelicerae more than twice as long as wide; promargin with 11 thin teeth.

Leg formula 4123; legs thin, with setation, spination, and claws as in *S. atlanticus*.

	I	II	III	IV	Palp
Femur	3.50	2.80	2.60	3.30	2.20
Patella	1.70	1.70	1.50	1.70	0.90
Tibia	1.70	1.30	1.30	1.80	1.50
Metatarsus	2.70	2.40	2.60	3.50	—
Tarsus	1.70	1.70	1.70	2.20	1.50
Total	11.30	9.90	9.70	12.50	6.10

Palp (figs. 41, 42) with apex of conductor shorter than in *S. rufipes*, wider than in *S. atlanticus*.

Abdomen 4.70 long, 3.05 wide, coated with short black hairs. Spinnerets six, with proportions as in *S. rufipes*.

FEMALE (paratype): Total length, including chelicerae, 24.50. Carapace dark reddish brown, dusky around margins, with dusky streaks outlining pars cephalica and radiating out from thoracic groove. Chelicerae dark reddish brown, lighter below. Underside of cephalothorax and legs dusky brown; latter with narrow dusky bands above. Abdomen dull black.

Carapace 8.00 long, 7.20 wide, coriaceous, smooth, bare except for bands of short hairs around raised side and posterior margins and few black hairs on ocular tubercle. Pars cephalica large, elevated. Pars thoracica flat, broadly emarginated behind; thoracic groove deep transverse fissure placed back nearly three-fourths of carapace length, occupying about one-sixth of carapace width at that point.

Eye tubercle small, less than one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 5:5:4:4. Anterior row slightly narrower than posterior, gently recurved; me-

dians separated by four-fifths of their diameter, as far from laterals. Posterior row gently recurved; oval medians separated by almost four times their long diameter, nearly touching laterals. Median ocular quadrangle wider than long (22/8), narrowed in front (22/13). Lateral eyes of each side separated by less than radius of front pair.

Sternum (fig. 39) 2.70 long, 2.90 wide, covered evenly with fine black hairs; four pairs of sigilla distinct, second pair reduced to narrow bands, fourth pair oval, set obliquely, narrowly separated in front. Labium 0.60 long, 1.10 wide, broadly triangular, rounded at apex. Palpal lobes with thick series of spinules along inner margins. Chelicerae less than twice as long as wide, inflated at base on inner side; promargin with 11 stout teeth, fourth from apex smallest; retromargin with small denticle in groove near basal tooth.

Leg formula 1423. Legs stout, clothed with fine black hairs and small series of short spines on sides of apical segments. Palpal claw with five large teeth; paired and unpaired tarsal claws with three long teeth.

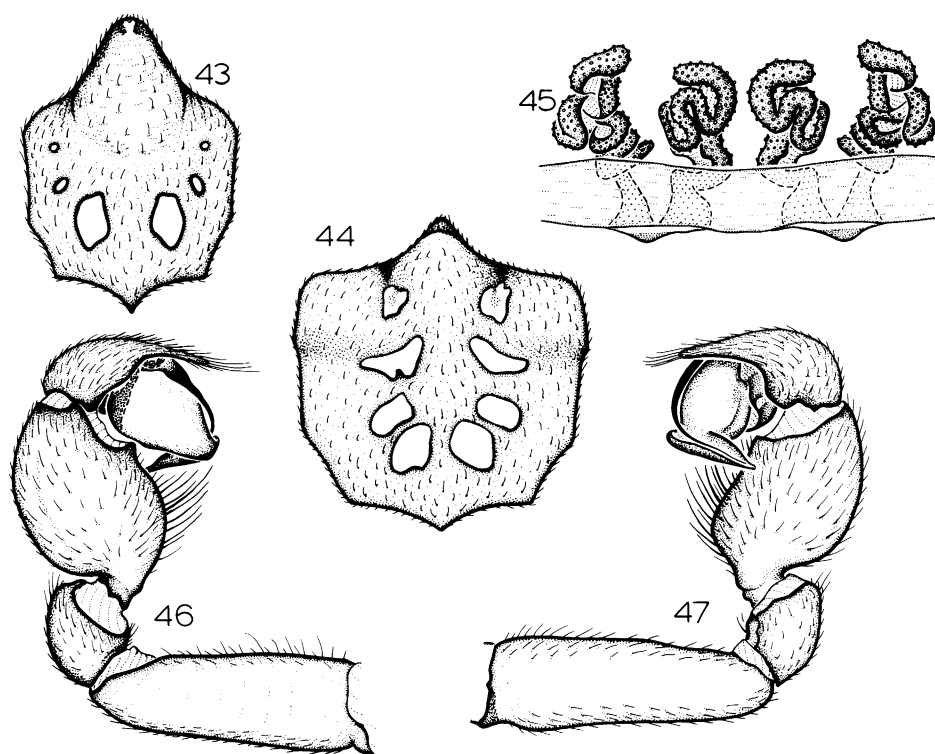
	I	II	III	IV	Palp
Femur	5.50	4.60	4.20	4.70	3.30
Patella	2.70	2.60	2.50	2.60	1.60
Tibia	2.00	1.70	1.30	2.00	1.30
Metatarsus	2.80	2.30	2.30	3.00	—
Tarsus	1.50	1.50	1.20	1.50	1.60
Total	14.50	12.70	11.50	13.80	7.80

Abdomen 5.20 long, 3.40 wide, thickly covered with fine black hairs; dorsum with conspicuous brown tergite above base. Spinnerets six: anterior laterals 1.00 long; posterior medians 1.70 long; three-segmented posterior laterals with lengths as follows: basal 1.00, median 1.00, apical 1.90, total 3.90.

Epigynum (fig. 40) with paired tubes of each side with three basal coils.

MATERIAL EXAMINED: UNITED STATES: **Arkansas:** *Bradley Co.*: 5.5 mi. W Hermitage, June 3, 1974, elevation 60 m. (R. G. Chenowith, J. S. Heiss, R. E. Howard, JH), 1♂. *Washington Co.*: Fayetteville, June 6, 1979, walking over recent excavation (N. Lawler, NL), 1♂. **Kansas:** *Douglas Co.*: University of Kansas Natural History Re-





FIGS. 43–47. *Sphodros atlanticus*, new species. 43. Male sternum, ventral view. 44. Female sternum, ventral view. 45. Epigynum, dorsal view. 46. Male palp, prolateral view. 47. Male palp, retrolateral view.

servation, near Lawrence, June 12, 1959 (H. S. Fitch), 1♂, July–Sept. 1952 (H. S. Fitch), 1♂, Aug. 1961 (H. S. Fitch), 1♀. **Nebraska:** *Lancaster Co.*: Lincoln, June 10, 1939, pit-fall trap (E. Fichter), 1♂. **Oklahoma:** *Cleveland Co.*: Lake Thunderbird, 12 mi. E Norman, May 30, 1971, on ground (J. H. Black), 1♂. *Payne Co.*: Stillwater, May 1, 1972, on front lawn (W. A. Drew, WD), 1♂, May 9, 1967, in greenhouse (C. Clifton, EPC), 1♂, May 18, 1978 (W. A. Drew, WD), 1♂, June 1, 1978 (W. A. Drew, WD), 1♂.

**DISTRIBUTION:** Plains states from Nebraska south to Oklahoma and Arkansas (fig. 37).

**NATURAL HISTORY:** The habitat and tube have been briefly described by Fitch (1963).

***Sphodros atlanticus*, new species**

Figures 20, 43–47

*Atypus bicolor* (misidentification): Barnes, 1953, p. 2.

**TYPE:** Male holotype from Gainesville, Hall County, Georgia (June 15, 1939; B. J. Kaston), deposited in AMNH.

**ETYMOLOGY:** The specific name is an adjective from the Latin *atlanticus* (connected with Mount Atlas), referring to the distribution in Atlantic states.

**DIAGNOSIS:** Males of *S. atlanticus* can be readily separated from others by details of the labium and sternum (fig. 43). The labium, which is two-thirds as wide as the sternum, is greatly enlarged, strikingly elevated, and has a small spur at the apex. The first pair of sigilla is essentially obsolete, being at most represented by a thin groove at each side of the labium. Only the metatarsi and tarsi of the legs are bright orange in color. Females resemble those of *S. rufipes* but can be distinguished by the closely spaced second pair of sigilla (fig. 44) and the irregularly coiled spermathecal tubes (fig. 45).

MALE (holotype): Total length, including chelicerae, 16.00. Carapace dark mahogany brown with dull luster, probably black in life, with narrow black marginal seam and black bands outlining pars cephalica. Sternum and labium dark reddish brown, margined with narrow black seam; sigilla dusky brown to black. Chelicerae dark mahogany brown. Palpi and basal segments of legs dark mahogany brown above, paler below; metatarsi and tarsi of legs bright orange, probably red in life. Abdomen dark gray except for conspicuous blackish scutum on dorsum.

Carapace 5.40 long, 4.80 wide, coriaceous, evenly and finely roughened throughout, bare except for short hairs on ocular tubercle, essentially straight in front, with small rounded angle at each corner, widest just behind ocular tubercle; sides running quite straight to bilobed caudal edge, deeply emarginated above pedicel. Pars cephalica large, triangular, strongly elevated and highest in ocular area. Pars thoracica quite flat, with raised posterior margin; thoracic groove deep transverse fissure placed back more than three-fifths of carapace length, occupying one-seventh of carapace width at that point.

Eye tubercle small, elevated, about one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 20:22:18:15. Anterior row as wide as posterior, gently recurved; medians separated by their radius, by two-thirds of their diameter from laterals. Posterior row gently recurved; oval medians separated by nearly four times their long diameter, nearly touching laterals. Median ocular quadrangle wider than long (80/38), narrowed in front (80/53). Lateral eyes of each side separated by radius of front pair.

Sternum (fig. 43) 3.00 long, 3.40 wide, lightly roughened around margins, evenly covered with fine black hairs; only three pairs of sigilla distinct as front pair represented only by shallow grooves at edge of labium; second and third pairs small, sub-oval; fourth pair large oval depressions separated by their width. Labium 1.20 long, 1.80 wide, greatly enlarged, at base two-thirds of sternal width, elevated, rounded at apex,

bearing small blunt tubercle at tip. Palpal lobes with fine black hairs and rows of small spinules along inner edge. Chelicerae more than twice as long as wide, smooth above, with few black hairs and spines at apex; promargin with 11 thin teeth, two or three at apex reduced in size.

Leg formula 4132. Legs clothed sparsely with fine black hairs and few weak spines. Paired tarsal claws with two to four teeth, unpaired claws with single denticle. All tarsi flexible, marked with transverse false sutures; tarsi III and IV with series of small black spines on prolateral and retrolateral surfaces.

	I	II	III	IV	Palp
Femur	4.20	3.30	3.30	4.00	2.70
Patella	1.90	1.80	1.70	1.70	1.10
Tibia	1.90	1.70	1.50	2.00	1.80
Metatarsus	3.20	2.90	3.30	4.00	—
Tarsus	1.90	2.00	2.00	2.50	1.60
Total	13.10	11.70	11.80	14.20	7.20

Palp (figs. 46, 47) clothed with fine black hairs. Femur three and one-half times as long as broad; patella suboval as seen from above; tibia suboval, deeper than dorsal width; tarsus suboval, drawn to thin point at apex. Bulb subtriangular, white, with thin embolus originating near base and lying in groove of transversè conductor.

Abdomen 6.20 long, 4.00 wide, covered evenly with fine black hairs. Spinnerets six, with proportions as in *S. rufipes*.

FEMALE (North Carolina): Total length, including chelicerae, 20.40. Carapace dark mahogany brown with darker margins and dusky bands leading from thoracic groove to ocular tubercle, outlining pars cephalica, and radiating from thoracic groove to sides and rear. Chelicerae light brown dorsally, darker ventrally. Sternum, labium, and palpi dark brown, sternal sigilla light orange-brown. Legs light brown dorsally, darker ventrally. Abdomen dark gray except for yellowish scutum and numerous small yellow spots anteriorly; spinnerets brown.

Carapace 7.45 long, 6.85 wide, smooth except for roughened, raised margins, bare except for few weak hairs on ocular tubercle and bands of hairs on side margins, straight

anteriorly, gradually narrowing posteriorly, only slightly emarginated behind. Pars cephalica elevated, with paramedian oblique grooves posteriorly. Pars thoracica flat except at folded posterolateral corners; thoracic groove deep fissure placed back seven-tenths of carapace length, occupying more than one-fifth of carapace width at that point.

Eye tubercle one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 14:11:12:9. Anterior row narrower than posterior row, very slightly procurved from above; medians separated by slightly more than their diameter, by almost twice their diameter from laterals. Posterior row recurved; medians separated by four times their diameter, by one-fourth their diameter from laterals. Median ocular quadrangle wider than long (65/23), narrowed in front (65/37). Lateral eyes of each side separated by radius of front pair.

Sternum (fig. 44) 4.70 long, 5.45 wide, roughened only around labium, evenly coated with long black hairs; four large pairs of sigilla, first pair rounded, second pair long, curved, approximate, posterior pairs oval, closely spaced. Labium 1.80 long, 2.15 wide, elevated, with ridge behind pointed apex. Palpal lobes with fine black hairs and spinules scattered over inner halves. Chelicerae almost twice as long as wide, roughened along inner edges, with hairs and spines increasing in number distally; promargin with 11 strong teeth, fifth or sixth most distal smallest.

Leg formula 1423. Legs moderately stout, clothed with fine black hairs but with few spines, mostly dorsal on all metatarsi and tarsi and on patella and tibia III and IV. Palpal claw with four teeth; unpaired tarsal claws usually with three teeth, paired claws with four or five.

	I	II	III	IV	Palp
Femur	5.10	4.45	3.80	4.45	3.25
Patella	2.50	2.45	2.20	2.30	1.45
Tibia	1.85	1.65	1.20	1.80	1.45
Metatarsus	2.55	2.05	2.05	2.75	—
Tarsus	1.50	1.30	1.10	1.20	1.50
Total	13.50	11.90	10.35	12.50	7.65

Abdomen 8.40 long, 5.75 wide, widest posteriorly, covered with fine light hairs. Spinnerets six: anterior laterals 0.90 long; posterior medians 1.20 long; three-segmented posterior laterals with lengths as follows: basal 1.20, median 1.50, apical 1.90, total 4.60.

Epigynum (fig. 45) with paired spermathecal tubes of each side irregularly coiled masses.

**MATERIAL EXAMINED:** UNITED STATES; **Georgia:** *Hall Co.:* Gainesville, June 15, 1939 (B. J. Kaston), 1♂ (holotype). **Illinois:** *Jackson Co.:* Lake Murphysboro State Park, May 13, 1976, walking across road (M. Anderson, JB), 1♂. **North Carolina:** *Carteret Co.:* Beaufort, June 11, 1952 (R. D. Barnes), 1♂. *Jackson Co.:* Coyle Farm, 1.5 mi. S Webster Center, Aug. 23, 1974, tube at base of small holly (W. A. Shear, F. A. Coyle), 1♀. **Virginia:** *Spotsylvania Co.:* Fredericksburg, May 30, 1917, 1♂.

**DISTRIBUTION:** Southeastern United States (fig. 20).

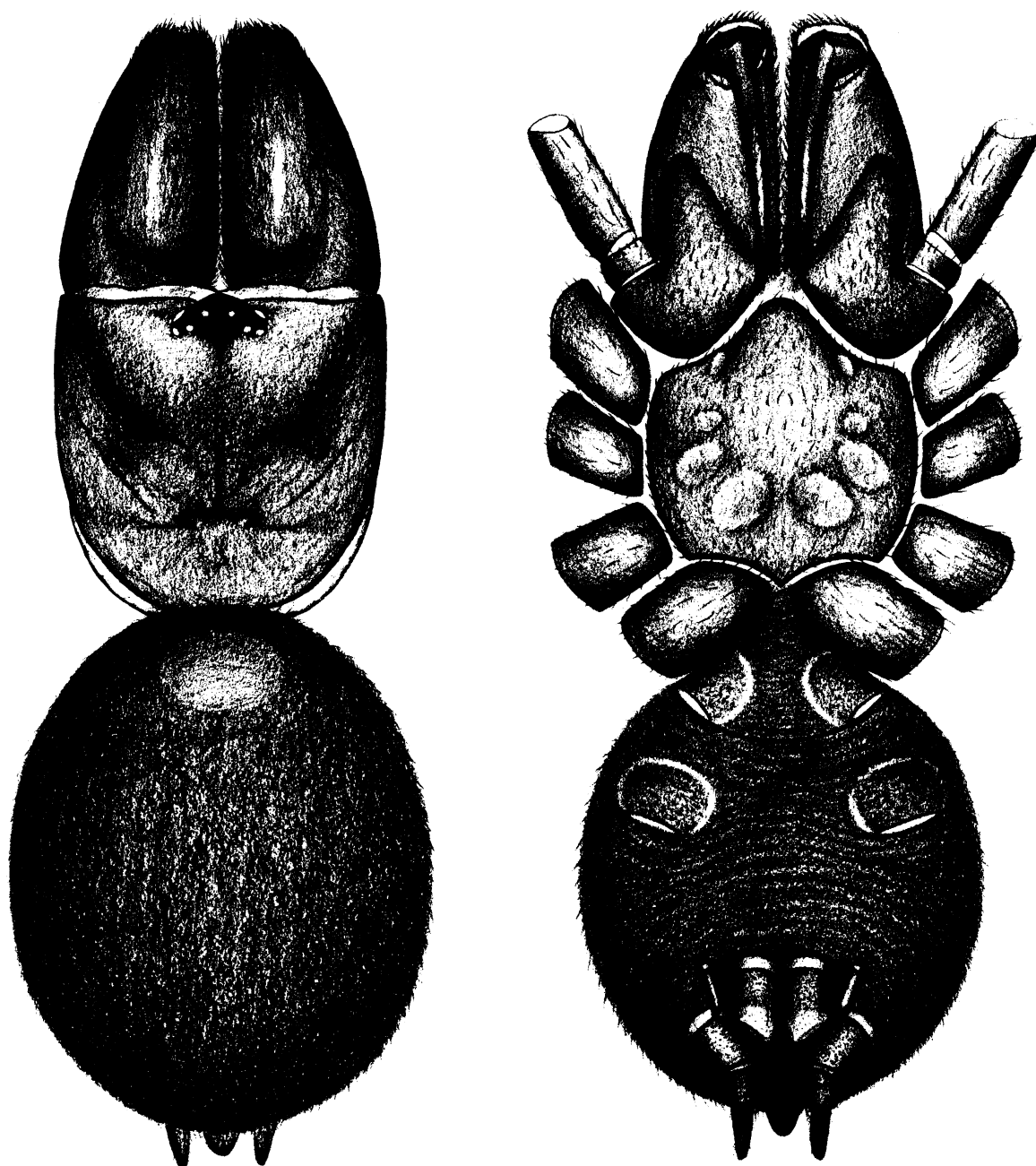
*Sphodros niger* (Hentz),  
new combination  
Figures 48–55

*Atypus niger* Hentz, 1842, p. 224, pl. 8, figs. 1, 1a, 1b (male holotype from Northampton, Hampshire County, Massachusetts, destroyed). Roewer, 1942, p. 212. Bonnet, 1955, p. 816.

*Atypus milberti* (misidentification): Gertsch, 1936, p. 16, figs. 8–10, 26, 27. Chamberlin and Ivie, 1945, p. 550, fig. 7. Kaston, 1948, p. 58, figs. 1, 2; 1953, p. 29, figs. 37, 46, 49, 50.

**DIAGNOSIS:** Males of *S. niger* are small, stout, black, and have a distinctive palpal conductor which is revolved at its apex and terminates in a sharp spine (figs. 53, 54). The sternum of the female (fig. 51) is broad, has well-defined sigilla, and is distinctive in having the first pair of sigilla situated at the anterior border. The epigynum (fig. 52) has spermathecal tubes with fewer coils than in other species.

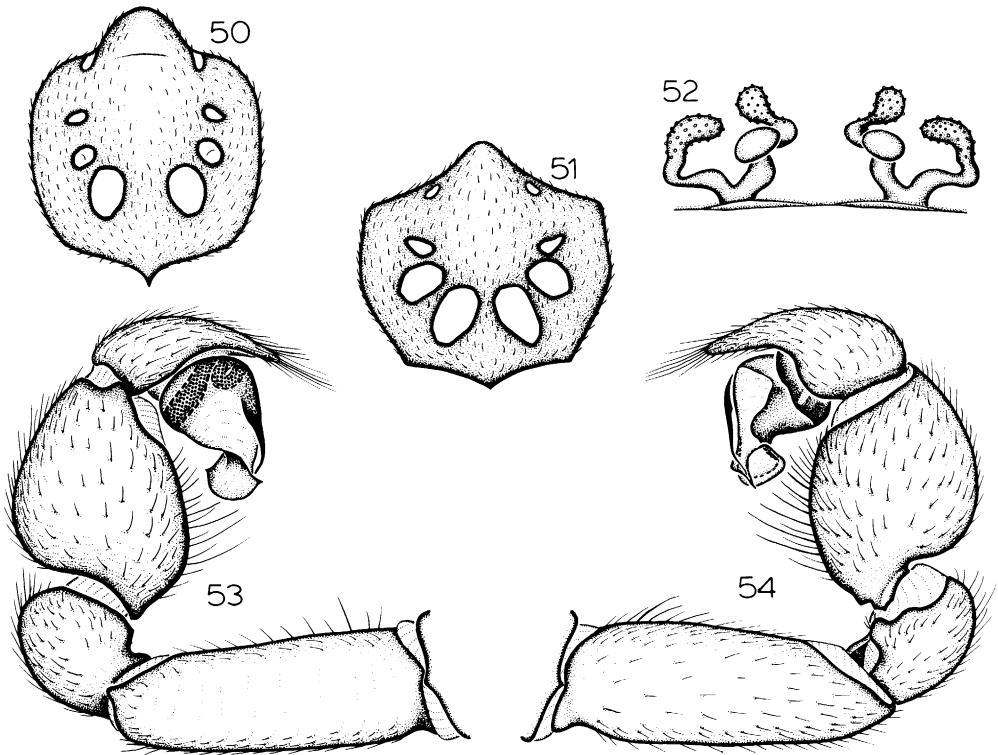
**MALE** (Cornwall on the Hudson, New York): Total length, including chelicerae, 10.50. Carapace dark reddish brown to



FIGS. 48, 49. *Sphodros niger* (Hentz), female body. 48 (left). Dorsal view. 49 (right). Ventral view.

black; pars cephalica darkest in front with blackish grooves outlining head and running laterally across thorax from dark thoracic

groove. Chelicerae dark reddish brown; sternum, labium, palpal lobes, and most of legs dark reddish brown. Abdomen blackish on



FIGS. 50–54. *Sphodros niger* (Hentz). 50. Male sternum, ventral view. 51. Female sternum, ventral view. 52. Epigynum, dorsal view. 53. Male palp, prolateral view. 54. Male palp, retrolateral view.

sides and below, with large brown dorsal scutum from base to beyond middle.

Carapace 3.90 long, 4.05 wide, finely roughened and pitted throughout, bare except for few hairs on ocular tubercle. Pars cephalica strongly elevated in front, about as long as wide, truncated in front. Pars thoracica low, moderately rounded on sides, truncated behind, with narrow pleurites at posterolateral corners; thoracic groove placed back about three-fourths of carapace length, occupying about one-fourth of carapace width at that point.

Eye tubercle prominent, one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 16:11:13:11. Anterior row as wide as posterior, procurved from front, recurved from above; medians separated by twice

their diameter, by their diameter from laterals. Posterior row recurved; medians separated by four times their diameter, nearly touching laterals. Median ocular quadrangle wider than long (63/25), narrowed in front (63/40). Lateral eyes of each side subcontiguous.

Sternum (fig. 50) 4.65 long, 5.30 wide, moderately roughened, covered evenly with short black hairs; four pairs of sigilla present, front pair inconspicuous, posterior pair large, oval, separated by width. Labium 0.50 long, 0.90 wide, rounded at apex, set with inconspicuous black hairs. Palpal lobes with similar setae and rows of spinules on inner side adjacent to fringe of pale hairs. Chelicerae almost twice as long as wide, narrowest apically; promargin with 11 subequal teeth.

Leg formula 4123. Legs relatively stout,



clothed with rows of black hairs and scattered weak spines. Tarsi relatively short, with false sutures on distal two-thirds.

	I	II	III	IV	Palp
Femur	3.30	2.75	2.70	3.00	2.15
Patella	1.55	1.65	1.35	1.40	0.90
Tibia	1.45	1.25	1.20	1.70	1.50
Metatarsus	2.15	2.00	2.25	3.10	—
Tarsus	1.35	1.50	1.50	1.75	1.35
Total	9.80	9.15	9.00	10.95	5.90

Palp (figs. 53, 54) with twisted, distally pointed conductor.

Abdomen 4.50 long, 3.00 wide, covered evenly with subprocumbent black hairs except on smooth scutum. Spinnerets six, with proportions as in *S. rufipes*.

**FEMALE** (Des Plaines, Illinois): Total length, including chelicerae, 22.00; body as in figures 48, 49. Carapace reddish brown, with dark streaks on head and dusky cephalic sutures and thoracic groove. Appendages and underside of cephalothorax concolorous. Abdomen dark brown to blackish, covered with many small pale spots on all surfaces; dorsum with light brown sclerite above base.

Carapace 6.50 long, 6.50 wide, smooth, bare except for few hairs on ocular tubercle. Pars cephalica wider than long, less elevated than in male. Pars thoracica broadly emarginated behind, with narrow pleurites; thoracic groove placed back about two-thirds of carapace length, occupying about one-fifth of carapace width at that point.

Eye tubercle slightly more than one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 27:20:20:21. Eye pattern as in male except anterior medians separated by only slightly more than their diameter.

Sternum (fig. 51) 4.20 long, 5.20 wide, moderately roughened, clothed with suberect black hairs; sigilla smooth, posterior pair suboval, separated by two-thirds of width. Labium 1.00 long, 1.70 wide, set with black hairs. Palpal lobes covered with suberect black hairs and numerous spinules. Chelicerae almost twice as long as wide; promargin with ten equal teeth, retromargin

with single small tooth opposite innermost promarginal tooth.

Leg formula 1423; legs short, thick, with rows of fine black hairs and few weak spines concentrated on apical segments, forming rows on metatarsi and tarsi. Palpal claw with five large teeth; tarsal claws of legs I–III mostly with three large teeth, leg IV with two teeth on unpaired claw, three on proclaw, four on retroclaw.

	I	II	III	IV	Palp
Femur	4.50	3.70	3.00	4.00	2.60
Patella	2.30	2.20	2.25	2.25	1.60
Tibia	1.60	1.20	1.00	1.40	1.20
Metatarsus	1.90	1.70	1.70	2.50	—
Tarsus	1.25	1.15	1.00	1.30	1.30
Total	11.55	9.95	8.95	11.45	6.70

Abdomen 10.00 long, 7.00 wide, broadly oval. Spinnerets six: anterior laterals 1.35 long; posterior medians 1.30 long; three-segmented posterior laterals with lengths as follows: basal 1.00, median 1.00, apical 1.70, total 3.70.

Epigynum (fig. 52) with paired spermathecal tubes of each side with few coils.

**MATERIAL EXAMINED: CANADA: Ontario:** Ancaster, July 15, 1969, grassy bank with goldenrod (A. J. Thomson, RL), 1♀; Belleville, July 6, 1962, pitfall at edge of mixed deciduous woods (A. L. Turnbull, CNC), 1♂; Burlington, June 11, 1964, under board in field (C. Freeman, G. Coombs, FSCA), 1♂; Chatterton, June 6, 1963 (C. D. Dondale, CNC), 1♂, June 22, 1967, hand collected (CNC), 1♂, June 26, 1967, pitfall trap (CNC), 1♂; Grimsby, July 12, 1942 (W. L. Putman), 1♀; Rondeau Provincial Park, May 19–July 6, 1976, pitfall in grass (C. D. Dondale, J. Redner, CNC), 1♂, June 10–July 9, 1975 (C. D. Dondale, J. Redner, CNC), 1♂; Windsor, May 18–July 6, 1976, pitfall in prairie grass-oak (C. D. Dondale, J. Redner, CNC), 1♂. **UNITED STATES: Connecticut: Middlesex Co.:** Clinton, July 28, 1973 (J. Krng), 1♂. **New Haven Co.:** West Haven, June 19, 1978, on wall of building (J. Bruno, LS), 1♂. **New London Co.:** Lyme, June 11, 1977 (J. Pratt), 1♂. **Illinois: Bureau Co.:** Princeton, June 13, 1933, flood plain forest

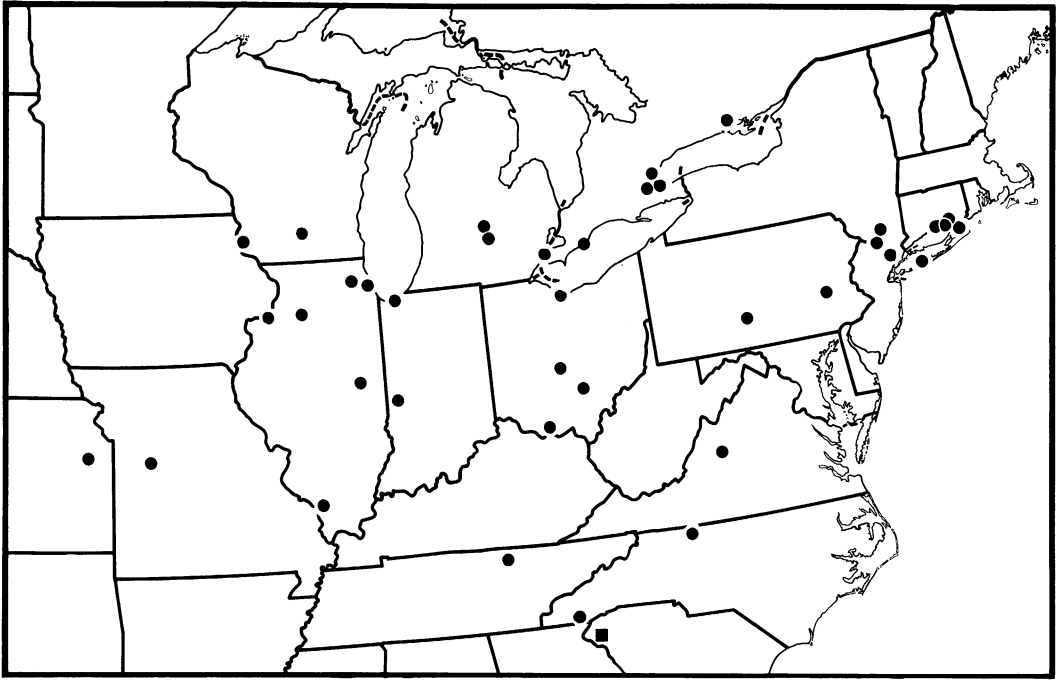
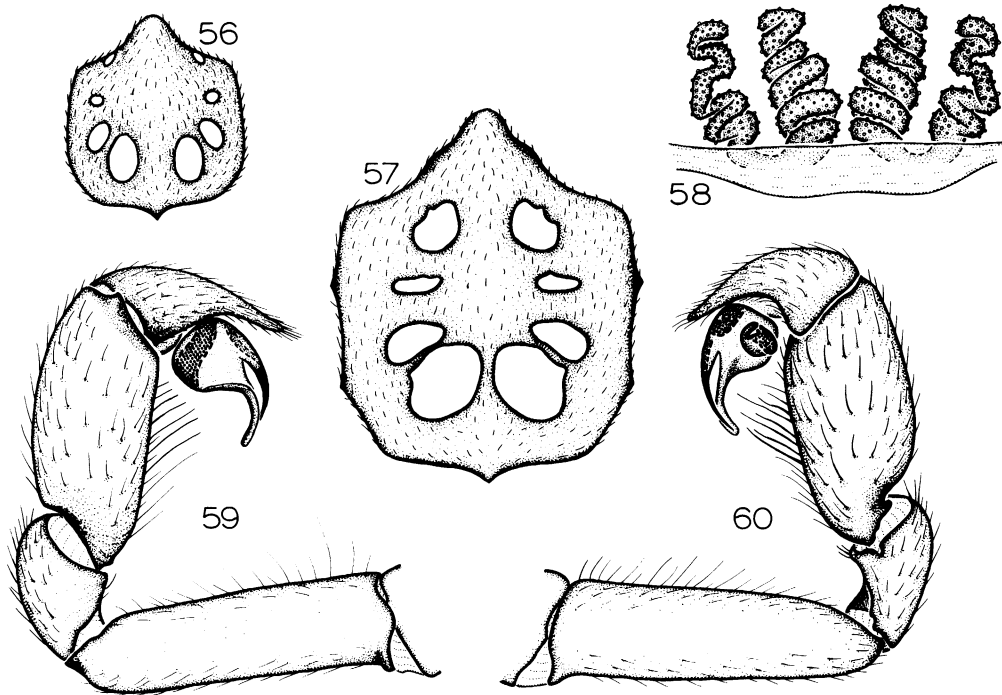


FIG. 55. Eastern United States and Canada, showing records of *Sphodros niger* (circles) and *S. coylei* (square).

(T. H. Hubbell), 1♂. *Champaign Co.*: University of Illinois Woods, June 9, 1937 (MCZ), 1♂. *Cook Co.*: Carle Woods, Des Plaines, May 20, 1950, tube in leaf mould (O. Park, MCZ), 1♀; Riverside, May 30, 1912, 1♂. *Jackson Co.*: Indian Creek, May 24, 1977 (S. Wilson, JB), 1♂. *Rock Island Co.*: Moline, 1942 (M. V. Pyl), 1♂. **Indiana**: *Parke Co.*: Turkey Run State Park, June 14, 1951 (H. S. Dybas, R. L. Wenzel, L. Ross, FMNH), 2♂. *Porter Co.*: Indiana Dunes State Park, June 24, 1950 (L. Ross, FMNH), 1♂. **Kansas**: *Douglas Co.*: University of Kansas Natural History Reservation, near Lawrence, 1963 (H. Fitch), 1♂. **Michigan**: *Clinton Co.*: Burke Lake, June 23, 1969, pitfall in field (J. Hurrell), 1♂. *Ingham Co.*: East Lansing, June 5–12, 1970, pitfall (N. I. Platnick), 1♂. **Missouri**: *Johnson Co.*: Knob Noster State Park, June 5–12, 1978, pitfall in brushy prairie (W. B. Peck, J. Peaslee, EPC), 1♂. **New Jersey**: *Bergen Co.*: Closter, June 29, 1974, in swimming pool (J. Rozen),

1♂. **New York**: *Orange Co.*: Cornwall on the Hudson, May 31, 1913, in road, 1♂; Greenwood Lake, summer 1959 (J. Callan), 1♂. *Suffolk Co.*: Babylon, Long Island, July 27, 1935, in bananas, 1♂; Great Gull Island, July 3–5, 1976 (D. Brody), 1♂. **North Carolina**: *Macon Co.*: Satulah Mountain, 1.5 mi. SW Highlands, June 1, 1975, on wet moss next to spring, elevation 4543 feet (W. H. Parrish), 1♂. *Stokes Co.*: Hanking Peck State Park, June 5, 1951 (E. E. Brown), 1♂. **Ohio**: *Adams Co.*: Long Lick Hollow, June 15, 1962 (F. J. Moore), 1♂; Vastine Hollow, Lower Lick Creek, Apr. 26, 1966 (F. J. Moore), 1♀. *Erie Co.*: Cedar Point, Aug. 15, 1913, from stomach of frog (C. Drake, OSU), 1♀. *Franklin Co.*: Sharon Woods Metropolitan Park, June 5–26, 1963, pitfall (A. J. Penniman, AP), 2♂. *Hocking Co.*: Cantwell Cliffs, near Rockbridge, June 8–11, 1922 (W. M. Barrows, AMNH, OSU), 2♂, 1933 (W. M. Barrows, 1♂. **Pennsylvania**: *Berks Co.*: Virginville, Oct. 1, 1966 (P. Vaurie), 1♀.



FIGS. 56–60. *Sphodros coylei*, new species. 56. Male sternum, ventral view. 57. Female sternum, ventral view. 58. Epigynum, dorsal view. 59. Male palp, prolateral view. 60. Male palp, retrolateral view.

**Huntingdon Co.:** 6 mi. S Pine Grove Hills, June 10, 1977 (T. Henry), 1♂. **Tennessee:** **Fentress Co.:** Jamestown Barrens, May 1979 (R. Noss, SR), 1♂. **Virginia:** **Rockbridge Co.:** 3 mi. S Vesuvius, June 24, 1956 (R. L. Hoffman), 1♂. **Wisconsin:** **Dane Co.:** Shorewood Quarry, Madison, June 6, 1955, running over stone (R. Nero, MCZ), 1♂; University of Wisconsin Arboretum, Madison, May 9, 1954, crossing road (J. L. Kaspar), 1♂. **Grant Co.:** Wyalusing State Park, June 14, 1949, crossing road, maple-basswood forest (H. W. Levi), 1♂.

**DISTRIBUTION:** Northeastern United States and southern Ontario (fig. 55).

**NATURAL HISTORY:** An excellent paper by Poteat (1890), dealing with the habits of *S. niger* and missed by most students, was brought to notice by Bishop (1950). Poteat's study population was from near Raleigh, North Carolina, and as his specimens have

not been seen it is possible that they were actually *S. atlanticus*.

***Sphodros coylei*, new species**  
Figures 55–60

**TYPE:** Male holotype from Clemson, Oconee County, South Carolina (April 14, 1977; F. A. Coyle), deposited in AMNH courtesy of Dr. Coyle.

**ETYMOLOGY:** The specific name is a patronym in honor of Dr. Frederick A. Coyle of Western Carolina University, Cullowhee, North Carolina, student of the mygalomorph spiders, who collected the only known specimens and first recognized the species as new.

**DIAGNOSIS:** Males of this dark species can be distinguished from all others by the presence of false sutures on both the metatarsi and tarsi of the legs and by the non-incras-

sate palpal tibia (figs. 59, 60), females by having the first pair of sternal sigilla enlarged and approximate and the second pair reduced to narrow bands (fig. 57).

**MALE** (holotype): Total length, including chelicerae, 8.50. Carapace dark brown to blackish with black streaks outlining pars cephalica and fanning out from thoracic groove, thin line running from prominent black eye tubercle to posterior margin of carapace; side margins with narrow black seam. Chelicerae blackish above and on sides, paler below. Sternum, labium, and palpal lobes dull brown. Legs with basal segments dark brown; metatarsi and tarsi lighter. Abdomen mostly dull black; dorsum with shining black scutum from base to beyond middle; spinnerets brown.

Carapace 3.00 long, 2.70 wide, smooth, lightly roughened on margins, bare except for weak hairs in front of ocular tubercle. Pars cephalica subtriangular, elevated, highest in ocular area. Pars thoracica low, with straight posterior margin and moderately developed pleurites at corners; thoracic groove deep transverse fissure placed back seven-eighths of carapace length, occupying one-fourth of carapace width at that point.

Eye tubercle prominent, projecting strongly forward, about one-fourth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 22:10:14:19. Anterior row as wide as posterior, slightly recurved; medians separated by three times their diameter, by their diameter from laterals. Posterior row moderately recurved; medians separated by more than twice their diameter, contiguous with laterals. Median ocular quadrangle wider than long (19/9), narrowed in front (19/14). Lateral eyes of each side contiguous.

Sternum (fig. 56) 1.80 long, 2.00 wide, evenly covered with inconspicuous black setae; four pairs of sigilla present, front pair inconspicuous, oval fourth pair separated by their length. Labium 0.30 long, 0.60 wide, rounded in front, with few black hairs. Palpal lobes covered sparsely with black hairs, with rows of small spinules on inner margins. Chelicerae almost twice as long as wide,

smooth at base, with black hairs and larger bristles at apex; promargin with 12 subequal teeth, retromargin with single denticle in groove opposite innermost tooth.

Leg formula 4123. Legs thin, sparsely clothed with fine black hairs and rows of short black spines mostly on distal segments. Tarsi and metatarsi straight, showing little flexibility, but both ringed with false sutures over most of their surface. Unpaired tarsal claws with single denticle; paired claws with three fine teeth (only two on posterior retro-claws).

	I	II	III	IV	Palp
Femur	2.50	2.35	2.15	2.70	1.75
Patella	1.20	1.15	1.10	1.25	0.75
Tibia	1.20	1.10	0.90	1.50	1.30
Metatarsus	1.85	1.80	2.00	2.70	—
Tarsus	1.20	1.00	0.90	1.30	1.00
Total	7.95	7.40	7.05	9.45	4.80

Palp (figs. 59, 60) clothed with fine black hairs. Femur more than three times as long as dorsal width; tibia not fully twice as long as dorsal or lateral widths, not incrassate; tarsus drawn to fine point; bulb small, with thin curved embolus lying in groove of apex of conductor.

Abdomen 3.30 long, 2.30 wide, roughened and pitted, covered with fine black hairs; dorsal scutum smooth. Spinnerets six: anterior laterals 0.35 long; posterior medians 0.60 long; three-segmented posterior laterals with lengths as follows: basal 0.40, median 0.35, apical 0.60, total 1.35.

**FEMALE** (Clemson, South Carolina): Total length, including chelicerae, 26.65. Carapace light brown with darkened margins and dusky streaks radiating from thoracic groove. Chelicerae light reddish brown proximally, darker distally. Sternum, labium, and palpal lobes dark brown, sternal sigilla lighter. Legs olive brown, darkest dorsally. Abdomen very light purplish brown with small white spots anteriorly; tergite and lung covers yellowish; spinnerets darkened laterally.

Carapace 8.65 long, 7.05 wide, roughened along deep grooves radiating from thoracic groove, smooth elsewhere, well supplied

with short black hairs along front and sides, on ocular tubercle, on midline of pars cephalica, and scattered on pars thoracica. Pars cephalica elevated, particularly at and behind ocular tubercle. Pars thoracica with five raised portions between six deep radiating grooves; posterior margin almost straight, with small pleurites at corners; thoracic groove deep transverse fissure placed back two-thirds of carapace length, occupying slightly more than one-fifth of carapace width at that point.

Eye tubercle extended posteriorly, about one-fifth of front width. Ratio of eyes, anterior lateral: anterior median: posterior lateral: posterior median, 12:11:6:13. Anterior row almost as wide as posterior, almost straight from above; medians separated by twice their diameter, by their diameter from laterals. Posterior row almost straight; medians separated by four times their diameter, by their radius from laterals. Median ocular quadrangle wider than long (75/27), narrowed in front (75/47). Lateral eyes of each side separated by radius of front pair.

Sternum (fig. 57) 4.70 long, 5.10 wide, coated with long black hairs; four pairs of sigilla present but second pair reduced to narrow bands; first pair enlarged, closer to each other than are second pair; posterior pairs large, oval, closely spaced. Labium 1.40 long, 2.10 wide, gently rounded anteriorly, with few black hairs. Palpal lobes with few black hairs, with spinules sparse over inner half, abundant in rows along inner margins. Chelicerae twice as long as wide, with narrow band of dorsal hairs proximally, expanded distally to cover entire surface; promargin with 11 large teeth, fifth most distal reduced in size, retromargin with single small tooth opposite most proximal promarginal tooth.

Leg formula 1423. Legs relatively narrow for body size, with rows of long dark hairs and few spines, mostly dorsal on all metatarsi and tarsi and on patella IV. Palpal claw with three large teeth; paired tarsal claws of anterior legs with four, of posterior legs with three teeth; unpaired claws of anterior legs with three, of posterior legs with two teeth.

	I	II	III	IV	Palp
Femur	5.00	4.55	4.30	4.45	3.00
Patella	2.55	2.10	2.00	2.25	1.45
Tibia	1.70	1.55	1.35	1.80	1.40
Metatarsus	2.40	2.20	1.85	2.60	—
Tarsus	1.35	1.15	1.05	1.25	1.35
Total	13.00	11.55	10.55	12.35	7.20

Abdomen 11.75 long, 7.90 wide, with pro-curved dorsal ridges posteriorly, covered with fine black hairs and longer bristles; tergite indistinct, covered with hairs. Spinnerets six: anterior laterals 0.75 long; posterior medians 1.35 long; three-segmented posterior laterals with lengths as follows: basal 0.95, median 1.35, apical 2.25, total 4.55.

Epigynum (fig. 58) with paired spermathecal tubes of each side with about five coils, narrowed distally.

**MATERIAL EXAMINED:** Only the holotype, plus one female taken in a lot beside 109 Lakeview Drive, Clemson, Pickens County, South Carolina, on April 15, 1977, and kept alive in captivity until Aug. 1, 1979, by F. A. Coyle.

**DISTRIBUTION:** Known only from Clemson, South Carolina (fig. 55).

**NATURAL HISTORY:** Both known specimens were taken in a mixed hardwood-pine forest in a residential area. The male was found walking over leaf litter at the base of a tree in daytime, and looked like a large ant. An attempt by H. Douglass and F. A. Coyle to re-collect the species in August 1979, was unsuccessful; only a couple tubes of juveniles were located. The grove of trees where females had previously been observed has been destroyed by the construction of a sewer line.

## LITERATURE CITED

- Ausserer, Anton  
 1871. Beiträge zur Kenntniss der Arachniden-Familie der Territelariae. Verh. Zool.-Bot. Ges. Wien, vol. 21, pp. 117-224.  
 Banks, Nathan  
 1892. Our Atypidae and Theraphosidae. Ent. News, vol. 3, pp. 147-150.  
 1907. A preliminary list of the arachnids of Indiana with keys to families and



- genera of spiders. Rep. Indiana Geol. Surv., vol. 31, pp. 715-747.
- Barnes, Robert D.  
1953. Report on a collection of spiders from the coast of North Carolina. Amer. Mus. Novitates, no. 1632, pp. 1-21, figs. 1-19.
- Bertkau, Philip  
1878. Versuch einer natürlichen Anordnung der Spinnen. Arch. Naturg., vol. 44, pp. 351-410.
- Bishop, Sherman C.  
1950. The purse-web spider, *Atypus abbotii* (Walckenaer), with notes on related species (Arachnida: Atypidae). Ent. News, vol. 61, pp. 121-124.
- Bonnet, Pierre  
1955. Bibliographia araneorum. Toulouse, vol. 2, pt. 1, pp. 1-918.
- Chamberlin, Ralph V., and Wilton Ivie  
1944. Spiders of the Georgia region of North America. Bull. Univ. Utah, vol. 35, no. 9, pp. 1-267, figs. 1-217.  
1945. On some Nearctic mygalomorph spiders. Ann. Ent. Soc. Amer., vol. 38, pp. 549-558, pls. 1-3.
- Chickering, Arthur M.  
1937. Arachnida from the San Carlos Mountains. In The geology and biology of the San Carlos Mountains, Tamaulipas, Mexico. Ann Arbor, pp. 271-283.
- Dufour, Léon  
1820. Observations sur quelques arachnides quadripulmonaires. Ann. Gén. Sci. Phys., vol. 5, pp. 96-116.
- Enock, F.  
1885. The life-history of *Atypus piceus* Sulz. Trans. Ent. Soc. London, pp. 389-420.
- Fitch, Henry S.  
1963. Spiders of the University of Kansas Natural History Reservation and Rockefeller Experimental Tract. Univ. Kansas Mus. Nat. Hist. Misc. Publ. No. 33, 202 pp., 104 figs.
- Gerhardt, Ulrich  
1929. Zur vergleichenden sexualbiologie primitiver Spinnen. Zeits. Morph. Ökol. Tiere, vol. 14, pp. 699-764.
- Gertsch, Willis J.  
1936. The Nearctic Atypidae. Amer. Mus. Novitates, no. 895, pp. 1-19, figs. 1-29.  
1949. American spiders. New York, 285 pp., 64 pls.  
1979. American spiders, second ed. New York, 274 pp., 32 pls., 8 figs.
- Gertsch, Willis J., and Norman I. Platnick  
1979. A revision of the spider family Meci-cobothriidae (Araneae, Mygalomorphae). Amer. Mus. Novitates, no. 2687, pp. 1-32, figs. 1-91.
- Hentz, Nicholas Marcellus  
1842. Descriptions and figures of the Araneides of the United States. Boston Jour. Nat. Hist., vol. 4, pp. 54-57, pl. vii, pp. 223-231, pl. viii.
- Kaston, Benjamin J.  
1948. Spiders of Connecticut. Bull. State Geol. Nat. Hist. Survey Connecticut, vol. 70, pp. 1-874, figs. 1-2144.  
1953. How to know the spiders. Dubuque, 220 pp., 552 figs.
- Kraus, Otto.  
1978. *Liphistius* and the evolution of spider genitalia. Symp. Zool. Soc. London, no. 42, pp. 235-254, figs. 1-22.
- Kraus, Otto, and Helga Baur  
1974. Die Atypidae der West-Paläarktis. Abh. Verh. Naturwiss. Ver. Hamburg, vol. 17, pp. 85-116, figs. 1-46.
- Latreille, Pierre A.  
1804. Tableau méthodique des Insectes. Nouv. Dict. Hist. Nat., vol. 24, pp. 129-200.  
1829. Les Arachnides. In Cuvier, G., Le Règne Animal, Nouvelle ed. Paris, pp. 206-291.
- Lucas, Hippolyte  
1834. *Atype*, *Atypus*. Dict. Pitt. Hist. Nat. Guerin, vol. 1, p. 333.  
1836. Quelques observations sur le genre *Atype*. Ann. Soc. Ent. France, vol. 5, pp. 213-217.
- McCook, Henry C.  
1888. Nesting habits of the American purse-web spider. Proc. Acad. Nat. Sci. Philadelphia, pp. 203-220, figs. 1-9.
- Miller, František  
1947. Pavouči zvířena hadcových stepí u Mohelna. Acta Publ. Soc. Cogn. Cons. Nat. Moraviae Silesiaeque, vol. 7, pp. 1-107, pls. 1-16.
- Muma, Martin H., and Katherine E. Muma  
1945. Biological notes on *Atypus bicolor* Lucas (Arachnida). Ent. News, vol. 56, pp. 122-126.  
1949. Studies on a population of prairie spiders. Ecology, vol. 30, pp. 485-503.
- Platnick, Norman I.  
1977. The hypochiloid spiders: A cladistic analysis, with notes on the Atypoidea (Arachnida, Araneae). Amer. Mus.

- Novitates, no. 2627, pp. 1–23, figs. 1–31.
- Poteat, W. L.  
1890. A tube-building spider. Jour. Elisha Mitchell Sci. Soc., vol. 2, pp. 137–147.
- Roewer, Carl F.  
1942. Katalog der Araneae. Bremen, vol. 1, 1040 pp.
- Sarno, Patricia A.  
1973. A new species of *Atypus* (Araneae, Atypidae) from Pennsylvania. Ent. News, vol. 84, pp. 37–52, figs. 1–9.
- Simon, Eugène  
1891. Liste des espèces de la famille Aviculariides qui habitent l'Amérique du Nord. Act. Soc. Linnéenne Bordeaux, vol. 44, pp. 307–326.  
1892. Histoire naturelle des Araignées. Paris, vol. 1, pt. 1, pp. 1–256, figs. 1–215.  
1903. Histoire naturelle des Araignées. Paris, vol. 2, pt. 4, pp. 669–1080, figs. 793–1117.
- Thorell, Tamerlan  
1870. On European spiders. Nova Acta Regiae Soc. Sci. Upsaliensis, ser. 3, vol. 7, pp. 1–108.
1887. Viaggio di L. Fea in Birmania. Ann. Mus. Civ. Stor. Nat. Genova, ser. 2, vol. 5, pp. 5–417.
- Vogel, Beatrice  
1962. Supplementary bibliography of North American tarantulas, 1939–1959 (Araneida, Suborder Mygalomorphae). Ent. News, vol. 73, pp. 246–250.
- Walckenaer, Charles A.  
1805. Tableau des Aranéides. Paris, 88 pp., 9 pls.  
1833. Mémoire sur une nouvelle classification des Aranéides. Ann. Soc. Ent. France, vol. 2, pp. 414–446.  
1835. Mémoire sur une nouvelle espèce de Mygale. *Ibid.*, vol. 4, pp. 637–651.  
1837. Histoire naturelle des insectes aptères. Paris, vol. 1, 682 pp.
- Yoshikura, Makoto  
1958. On the development of a purse-web spider, *Atypus karschi* Donitz. Kumamoto Jour. Sci., ser. B, vol. 3, pp. 73–86, figs. 1–12.







