

THE SPIDER GENUS *SOSIPPUS* IN NORTH AMERICA,
MEXICO, AND CENTRAL AMERICA
(ARANEAE, LYCOSIDAE)¹

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Introduction. The genus *Sosippus* contains the only spiders in the Nearctic Region of the subfamily Hippasinae, members of which are unique among the Lycosidae in producing a large funnel-web resembling that of the Agelenidae. The posterior spinnerets are more elongate than in other Lycosidae, concomitant with their web building habits. Although similar to the Agelenidae in these respects, they represent typical Lycosidae in other characters. In *Sosippus* the eyes are arranged in three rows: four small eyes on a vertical front form the anterior row; two large posterior median eyes form the second row, and two somewhat smaller posterior lateral eyes form a third row. The trochanters are notched and the egg case is carried attached to the spinnerets. These features are characteristic of all Lycosidae, but are not found in the Agelenidae. The tarsi and metatarsi of leg I and leg II are more densely scopulate in *Sosippus* than in most other lycosids. *Sosippus* is found in tropical and subtropical America from Costa Rica to the southern United States.

Porrina, found in South America, appears to be the closest relative of *Sosippus*. Females of *P. diversa* (O. P.-Cambridge) and the male holotype of *P. harknessi* Chamberlin resemble *Sosippus* in coloration and especially in external genitalia (Figs. 12, 33), but are readily separated by differences in the eye arrangement (Fig. 11). The Hippasinae of the Neotropical Region, in addition to eight described species of *Porrina*, are represented by two species of *Birabenia* and the monotypic genus *Hippasella*. C. F. Roewer (1959) splits *Porrina* into three genera on the basis of the number of posterior cheliceral teeth and slight differences in the eye arrangement. On the basis of great variation of these characters in *Sosippus*, it seems best to maintain the eight species in question in the single genus *Porrina* until further study.

In the Ethiopian, Oriental, and Australian Regions the Hippasinae are represented by 12 genera containing numerous species according to C. F. Roewer (1959). These Lycosidae have in common one feature

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that separates them from other lycosids, namely, the greater length of the posterior pair of spinnerets. If the greater length of the spinnerets is concomitant with web-spinning habits, then it would seem that this assemblage might constitute a natural group deserving subfamilial rank. If, however, the length of the spinnerets does not indicate a web-spinning function, but is simply a structural convergence found in otherwise diverse groups, it should not be used as a criterion to establish a subfamily. It may be that some species of *Euprosthenoops* placed in the Pisauridae also belong to this group since the genitalia are similar to those of Lycosidae and the eye arrangement resembles that of *Porrina*.

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Sosippus Simon

Sosippus Simon, 1888, Ann. Soc. Ent. France, 8 (6) : 206.

Types species: The problem of the type species has been discussed by Bonnet (1958). I follow him for the sake of nomenclatural stability. Simon (1888) established the genus *Sosippus* and designated *Dolomedes oblongus* C. L. Koch as the type. At the same time he described *Sosippus mexicanus* as a new species. In 1898 Simon transferred *D. oblongus* to the genus *Lycosa* (*Diapontia*) and established

S. mexicanus as the type species. *Sosippus mexicanus* has been assumed to be the type for the last 64 years.

Characteristics. Anterior eye row, as seen from in front, procurved. Lateral eyes subequal to the median eyes and mounted on distinct tubercles. Anterior eye row wider than the middle row; the posterior row wider than the anterior row (Fig. 10). Chelicerae robust, with prominent bosses. Anterior cheliceral margin with three teeth on each side. Posterior cheliceral margin with three or four cheliceral teeth on each side, rarely five. Usually constant within a species, but sometimes variable, e. g. *S. mimus*. Labium longer than wide, as long as wide, or slightly wider than long. Endites, heavily scopulate, slightly converging in front of labium, less heavily scopulate. Carapace with conspicuous longitudinal thoracic groove. Carapace of females highest in the cephalic region, of males usually highest in the thoracic region. Sternum always longer than wide. Fourth leg longest. Patella-tibia IV longer than metatarsus (except in males of *S. californicus*, which have the metatarsus longer). Order of length of patellae and tibiae: IV, I, II, III. Tarsi and metatarsi of legs I and II heavily scopulate. Tibia I and II usually scopulate at distal ends. Males with legs longer than those of females and more heavily scopulate.

Female epigynum characterized by a relatively narrow anterior median septum connected to an expansive posterior blade (Fig. 19). Male palpi with numerous sclerites (Fig. 36).

The variable nature of certain morphological characters is emphasized because some earlier authors considered such characters to be diagnostic for the genus. Some are diagnostic at the species level.

Discussion. Spiders of the genus *Sosippus* represent a closely related group of species as evidenced by their structural similarity and web-spinning habits. It is probable that the group has diverged relatively recently in geologic time. Two species groups might be established on the basis of structural similarities and distribution. One group contains *S. floridanus*, *S. mimus*, and *S. texanus*. The other group includes *S. californicus*, *S. mexicanus*, *S. agalenoides*, *S. michoacanus* and *S. plutonus*. The illustrations of the color patterns and the drawings of the genitalia indicate the affinities within these two species groups.

C. F. Roewer, first in the Katalog der Araneae (1954) without giving reasons, and then in 1959 attempted to separate *Sosippus* into two groups, giving each generic rank. This division is based entirely upon the number of teeth on the posterior cheliceral margin. Species with four cheliceral teeth on each side were left in *Sosippus* and those with three on each side were placed in the newly erected genus *Sosip-*

pinus. The division of the genus on this basis alone becomes untenable since the number of teeth on the posterior cheliceral margin is extremely variable within certain species (*S. mimus*). Similarities in color pattern, eye arrangement, spination, relative length of leg segments, and especially the genitalic characteristics indicate that the eight species considered in this paper should be maintained in a single genus.

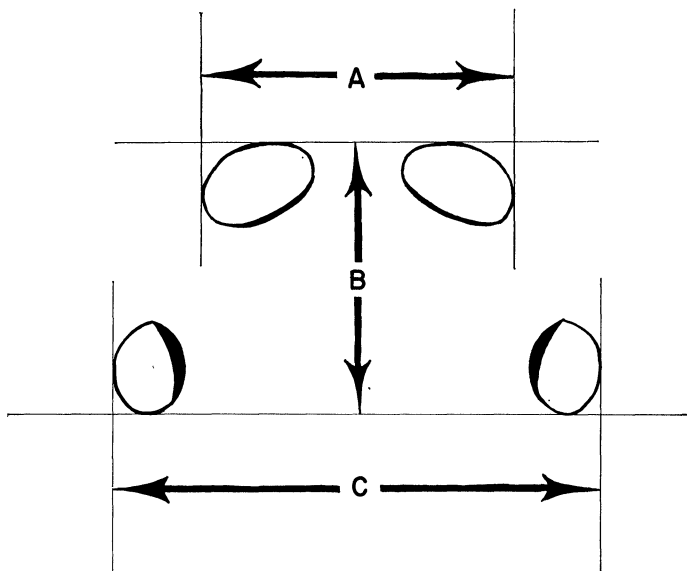
Simon described *S. mexicanus* (type of the genus) as having four posterior cheliceral teeth on each side. F. Pickard-Cambridge (1902) reported that the most abundant species of *Sosippus* in Mexico, which he felt surely was the one described by Simon, had only three cheliceral teeth on each side. Of the two females of *S. mexicanus* examined, one has 4-3 posterior cheliceral teeth. It is very possible that the specimens of *S. mexicanus* that Simon had before him actually had four posterior cheliceral teeth on each side, which, in the case of *mexicanus*, turns out to be the exception rather than the rule. It is also very probable that F. Pickard-Cambridge was describing the same species. Roewer's criterion of the number of posterior teeth of the chelicerae for defining genera is completely artificial in the case of *Sosippus* and probably other lycosid genera as well. J. Buchar (1959) has recently found that the lycosid genus *Trochosa* in Central Europe shows considerable variation within the same species in the number of posterior cheliceral teeth. The similarities among the eight species of *Sosippus* far outweigh any differences that might be used to separate them into two or more genera.

Incorrect Placement. *Sosippus insulanus* Bryant (1923), described from Barbados, is an immature lycosid, evidently at the penultimate stage of development. The coloration, scopulae of the tarsi and metatarsi, and spinnerets are not like those found in *Sosippus*. Although the true identity of this specimen can be ascertained only after association with adult individuals from the same locality, it is best referred to the genus *Lycosa* at the present time.

Measurements. Two sets of oculars with accompanying grids were used in combination with low and high power objectives for making measurements. From measuring a selected set of specimens several times, it was determined that the higher power combination was accurate to 0.02 mm and the lower power combination was accurate to 0.1 mm. In all cases the greatest dimension of the structure was measured, e.g. patella-tibia length was measured as the greatest distance between a line tangent to the most proximal part of the patella to a line tangent to the most distal part of the tibia. Measurements were made under conditions as uniform as possible. Conditions for the most important

measurements are specified below. A series of 20 measurements involving various components of the spider were made for each specimen. The most diagnostic of these measurements are recorded for comparison in Table 1.

The posterior median eyes (PME) and the posterior lateral eyes (PLE), which form two rows in the Lycosidae, are referred to in this



Text Fig. 1. Measurement of the Posterior Ocular Quadrangle.

paper as the *posterior ocular quadrangle* (POQ). The measurement of the POQ is illustrated in Text Figure 1.

The distance A is the width of the anterior row of the POQ, the distance B is the length of the POQ, and the distance C is the width of the posterior row of the POQ. The length of the carapace was measured as the distance from the line tangent to the posterior-most part of the carapace to the line tangent to the anterior-most part of the AME. Total length was measured from the most anterior part of the AME to the tip of the anal tubercle, when this structure was visible, or to the posterior tip of the abdomen. When the specimen was stretched so that the lorum of the pedicel was visible (an abnormal attitude in the living spider), the abdomen was measured and the length of the carapace was added as the distance from the anterior

TABLE 1

MALES:

Species	N	POSTERIOR OCULAR QUADRANGLE			
		Anterior Eye Row	Anterior Row	Posterior Row	Length
<i>S. californicus</i>	22	1.397 ± 0.075	1.190 ± 0.051	1.717 ± 0.069	1.031 ± 0.049
<i>S. mexicanus</i>	1	1.44	1.17	1.80	1.10
<i>S. floridanus</i>	3	1.29	1.12	1.62	1.04
		1.17	1.05	1.52	0.99
		1.24	1.10	1.57	1.04
<i>S. mimus</i>	4	1.47	1.22	1.79	1.00
		1.50	1.25	1.84	1.17
		1.49	1.22	1.84	1.05
		1.50	1.27	1.89	1.14
<i>S. texanus</i>	2	1.75	1.45	2.17	1.25
		1.79	1.42	2.17	1.25

FEMALES:

<i>S. californicus</i>	38	1.615 ± 0.563	1.311 ± 0.129	1.949 ± 0.199	1.171 ± 0.121
<i>S. mexicanus</i>	2	1.35	1.15	1.74	1.05
		1.15	0.99	1.34	0.92
		2.10	1.67	2.59	1.45
<i>S. agalenooides</i>	4	2.00	1.57	2.40	1.42
		2.12	1.65	2.40	1.50
		2.10	1.62	2.45	1.39
		1.64	1.45	2.12	1.25
<i>S. michoacanus</i>	5	1.59	1.39	2.02	1.19
		1.57	1.34	2.00	1.17
		1.54	1.34	1.95	1.19
		1.39	1.24	1.79	1.09
		1.34	1.19	1.70	1.07
<i>S. plutonus</i>	1	1.34	1.19	1.70	1.07
<i>S. floridanus</i>	16	1.434 ± 0.113	1.238 ± 0.090	1.803 ± 0.146	1.144 ± 0.080
<i>S. mimus</i>	4	1.59	1.30	2.12	1.20
		1.54	1.32	2.00	1.22
		1.37	1.17	1.72	1.04
		1.97	1.49	2.29	1.39
<i>S. texanus</i>	10	1.794 ± 0.313	1.459 ± 0.240	2.218 ± 0.381	1.308 ± 0.185

All measurements are in mm with the mean and standard deviation calculated where 10 or more specimens were available.

TABLE 1 (Continued)

MALES:					
Species	CARAPACE		LABIUM		Total Body Length
	Length	Width	Length	Width	
<i>californicus</i>	6.90 ± 0.50	5.01 ± 0.14	1.037 ± 0.065	1.021 ± 0.067	13.92 ± 1.09
<i>mexicanus</i>	6.4	4.6	0.99	0.94	12.0
<i>floridanus</i>	6.3	4.5	0.89	0.84	11.9
	6.0	4.3	0.84	0.75	11.2
	5.8	4.5	0.84	0.78	—
<i>mimus</i>	7.2	5.4	1.07	0.97	13.3
	7.3	4.7	1.12	1.04	13.1
	7.2	5.4	1.15	1.04	14.2
	7.6	5.4	1.14	1.00	14.2
<i>texanus</i>	9.4	6.9	1.40	1.25	20.1
	9.5	7.1	1.40	1.29	18.0
FEMALES:					
<i>californicus</i>	7.34 ± 1.01	5.32 ± 0.74	1.165 ± 0.154	1.20 ± 0.157	16.16 ± 2.46
<i>mexicanus</i>	5.7	4.4	0.99	0.94	13.4
	4.7	3.7	0.78	0.78	12.6
<i>agalenooides</i>	9.8	7.4	1.62	1.39	20.1
	9.7	7.4	1.57	1.50	22.9
	10.6	7.9	1.77	1.62	25.0
	10.0	7.2	1.65	1.50	22.2
<i>michoacanus</i>	7.5	5.4	1.29	1.17	15.1
	6.7	5.0	1.14	1.07	13.5
	6.7	4.8	1.15	1.05	13.2
	6.5	4.7	1.10	1.04	14.3
	5.7	4.1	0.99	0.95	11.4
<i>plutonius</i>	6.1	4.3	0.94	0.95	11.8
<i>floridanus</i>	6.44 ± 0.65	4.59 ± 0.51	1.029 ± 0.124	0.988 ± 0.099	13.25 ± 1.68
<i>mimus</i>	7.5	5.5	1.20	1.12	14.6
	7.3	5.2	1.22	1.14	16.1
	5.7	4.3	0.95	0.97	12.9
	8.8	6.2	1.45	1.35	18.2
<i>texanus</i>	8.61 ± 1.84	6.25 ± 1.33	1.434 ± 0.305	1.327 ± 0.232	17.88 ± 3.25

TABLE 1 (Continued)

MALES:

SEGMENTS OF LEG IV

Species	Femur	Patella-		Tarsus	Total
		Tibia	Metatarsus		
<i>S. californicus</i>	8.02 ± 1.96	9.43 ± 2.31	9.95 ± 2.36	3.76 ± 0.79	31.16 ± 2.28
<i>S. mexicanus</i>	7.6	8.8	8.6	3.7	28.7
<i>S. floridanus</i>	6.4	7.4	6.7	3.3	23.8
	6.1	7.1	6.7	3.0	22.9
	6.2	7.5	7.0	3.2	23.9
<i>S. mimus</i>	7.3	8.4	8.0	3.7	27.4
	7.5	9.0	8.5	4.1	29.1
	7.9	9.4	9.2	4.2	30.7
	7.5	9.2	8.7	4.2	28.6
<i>S. texanus</i>	9.5	11.6	11.0	5.7	37.8
	9.6	11.8	11.0	5.5	37.9
FEMALES:					
<i>S. californicus</i>	7.65 ± 1.06	8.86 ± 1.16	8.26 ± 1.06	3.31 ± 0.37	28.11 ± 3.55
<i>S. mexicanus</i>	6.0	7.0	6.5	2.6	22.1
	5.5	6.3	5.9	2.3	20.0
<i>S. agalenooides</i>	9.8	11.2	9.6	2.7	33.3
	9.7	10.9	9.4	—	—
	10.1	11.5	9.7	—	—
	9.6	10.8	9.4	—	—
<i>S. michoacanus</i>	7.0	8.1	7.5	2.9	25.5
	6.5	7.6	6.9	2.8	23.8
	6.5	7.7	7.0	2.9	24.1
	6.3	7.5	6.9	2.9	23.6
	—	—	—	—	—
<i>S. plutonus</i>	5.7	6.7	5.8	2.7	20.9
<i>S. floridanus</i>	5.72 ± 0.63	6.63 ± 0.69	5.83 ± 0.59	2.84 ± 0.96	21.08 ± 2.12
<i>S. mimus</i>	7.0	7.6	6.9	2.9	25.4
	7.0	7.6	6.9	2.9	24.4
	6.0	7.3	6.2	2.8	22.3
	7.4	8.3	7.0	3.6	26.3
<i>S. texanus</i>	7.43 ± 1.62	8.86 ± 1.79	7.30 ± 1.24	3.74 ± 0.75	27.33 ± 5.38

All measurements are in mm with the mean and standard deviation calculated where 10 or more specimens were available.

part of the indentation in the posterior edge to the tangent of the AME, thus allowing for the abdomen over-hanging the carapace. For measurements of the POQ the specimen was placed in a horizontal attitude such that a definite space was visible between the PME and the AME when viewed from above (as in Fig. 3 and not as in Fig. 4). This gives the greatest length to the POQ. The anterior eye row was measured by placing the specimen vertically in such a position that a face view was obtained. The measurement of the AME was again checked in this position. The measurement of leg segments was taken from the prolateral aspect of the anterior pairs of legs and the retrolateral aspect of the posterior pairs of legs for all segments except the femora. The femora of the anterior pairs of legs were measured from the retrolateral aspect and those of the posterior pairs of legs from the prolateral aspect to avoid breaking legs from specimens.

EXPLANATION OF FIGURES

The color descriptions and illustrations of *S. texanus*, *S. floridanus*, and *S. californicus* were based on fresh specimens and represent these species much as they appear in life. The color description and illustration of *S. mimus* (Fig. 3) is based on the holotype, which is in very good condition. *Sosippus michoacanus*, *S. agalenoides*, *S. mexicanus*, *S. mimus* (Fig. 2), and *S. plutonus* were drawn from specimens that have been in alcohol for some time, but have remained in a good state of preservation. The relative condition of these specimens is indicated by the order in which they are listed above. The description and illustration of the type of *S. plutonus* probably deviates more from that of the living spider than any of the rest since hair appears to have been rubbed from the carapace and the abdomen is shrivelled.

Two drawings of the female genitalia were made for each species: a ventral external view of the epigynum after all the hair had been removed (thus revealing some internal structure through the integument), and a dorsal internal view with the genitalia removed and submerged in clove oil for clearing.

Two views of the male palpi were drawn for each species: a ventral view and a retrolateral view. The left palpi of the males were used after gently scraping them free of hair (quite abundant in the living spider) and spines (one or more at the ventral apex and several along the retrolateral edge of the cymbium). These hairs and spines obstruct the palpal sclerites and since the sclerites of the palpi are of much greater diagnostic value, no attempt was made to indicate hirsuteness or spination in the drawings of the male palpi.

SPECIES DESCRIPTIONS

Before analyzing the individual species a few comments should be made concerning the treatment of certain sections.

Structure. Under this heading follows a description of structural features not covered in the table of measurements and not defined specifically under generic characters. Tibial spination is relatively constant for each sex within a given species and there is a basic pattern throughout the genus. Therefore, two tables are constructed showing the typical patterns of tibial spination in *S. californicus* and subsequent species are compared to these.

When the difference between two dimensions is less than 0.05 mm these dimensions are considered *subequal*.

Color. Color descriptions are based on specimens submerged in alcohol and viewed at low power (10X) under a dissecting scope with illumination from a microscope lamp. In fresh alcoholic specimens the color is much the same as in the living spiders. The contrasting light and dark markings, particularly on the carapace and dorsum of the abdomen, are created by light and dark hairs. When these hairs become rubbed off, the underlying color of the integument no longer provides such marked contrast. All of the figures and descriptions are based on specimens with the hairs present. In some cases, of course, this is very difficult because of damage to the specimen.

Records. Locality records for states are listed geographically, counties alphabetically under states, cities and towns alphabetically under counties. The records are for specimens examined except where noted. The lower case "o" is used to indicate a juvenile specimen in the same manner that the normal ♂ and ♀ signs represent a mature specimen. The oo, ♂♂ and ♀♀ signs indicate more than one specimen collected at a single locality.

KEY TO SPECIES

- 1a. Four posterior cheliceral teeth 2
- 1b. Three posterior cheliceral teeth 3
- 2a. Carapace with a distinct white median stripe beginning at second eye row and continuing to posterior edge; and with two broad white submarginal stripes as in Figure 1. Epigynum as in Figures 18-20. Palp as in Figures 40-43. Found in Florida only. *S. floridanus*
- 2b. Carapace without a distinct median white stripe running length of carapace, and without distinct white submarginal stripes. Three yellowish white stripes converging behind second eye row and spreading posteriorly, but continuing for only a short distance, as

- in Figures 2, 3. Epigynum as in Figures 13-17. Palp as in Figures 34, 35. *S. mimus*
- 3a. Without a conspicuous white median stripe running length of carapace and without distinct submarginal white stripes. Pattern as in Figures 2, 3, 4 or 5. 4
- 3b. With a definite median white stripe beginning behind second eye row and continuing to posterior edge of carapace, and with distinct broad white marginal or submarginal stripes. Pattern as in Figures 6, 7, 8, or 9. 6
- 4a. Black in color without distinct lighter markings as in Figure 5. Epigynum as in Figures 25, 26. Found at high elevations in Mexico. *S. plutonus*
- 4b. Dark brown or gray with distinct white markings on carapace and dorsum of abdomen as in Figures 2-4. 5
- 5a. Epigynum as in Figures 21, 22. Palp as in Figures 37-39. Found in southern Texas. *S. texanus*
- 5b. Epigynum as in Figures 13-17. Palp as in Figures 34, 35. Found from eastern Louisiana to southern Florida. *S. mimus*
- 6a. Abdomen with wide median brown stripe bordered by white lines at the anterior end, these lines broken posteriorly as a series of white dashes. No white chevrons crossing the median brown stripe, as in Figure 6. Epigynum as in Figures 23, 24. Palp as in Figures 46, 47. *S. mexicanus*
- 6b. Abdomen with wide median brown stripe with indentations accented by white spots anteriorly and with a series of white chevrons crossing the median stripe posteriorly. 7
- 7a. Epigynum with broad median septum and greatly expanded blade as in Figures 31, 32. *S. michoacanus*
- 7b. Epigynum with relatively narrow median septum and rounded blade as in Figures 27-30. 8
- 8a. Epigynum as in Figures 27, 28. Palp as in Figures 44, 45. *S. californicus*
- 8b. Epigynum as in Figures 29, 30. *S. agalenooides*

Sosippus californicus Simon
 Figures 8, 27, 28, 43, 44. Map I.

Sosippus californicus Simon, 1898, Ann. Soc. Ent. Belgique, 42:25. Female holotype from Lower California in the Paris Museum. Simon, 1898, Histoire naturelle des Araignées, 2(2):323-325, fig. 331 ♀. Banks, 1913, Proc. Acad. Nat. Sci. Philadelphia, 65:182, pl. 9, fig. 13 ♀. Comstock, 1913, The Spider Book, p. 622; 1940, op. cit., rev. ed., p. 639. Bonnet, 1958, Bibliographia Araneorum, 2(4): 4093.

Sosippus pragmaticus Chamberlin, 1924, Proc. Calif. Acad. Sci., 12:674, fig. 117. Female holotype from San Carlos Bay, 8 Jul. 1921 (J. C. Chamberlin) in Museum of California Academy of Sciences. NEW SYNONYMY. *Sosippinus californicus*: Roewer, 1954, Katalog der Araneae, 2:313; 1959, Exploration du Parc National de l'Upemba, Araneae Lycosaeformia II (Lycosidae), p. 1002.

Structure. For comparison of certain diagnostic measurements of *S. californicus* to other species see Table 1.

Posterior cheliceral margin with three teeth on each side. Of 39 females examined, 36 had 3-3 posterior cheliceral teeth, two 3-4; of 23 males, 22 had 3-3 posterior cheliceral teeth. A female and male from Mecatan, Nayarit had 4-4 teeth on the posterior margin of the chelicerae and two immature specimens from Acaponet, Nayarit have the same number.

In the following table the denotation of tibial spines is from proximal to distal end, e.g. 1-2-2 indicates that there is one proximal spine, one pair midway of the tibia, and one distal pair; 1-1 indicates one spine one-third the length of the leg segment from the proximal end and another the same distance from the distal end. Of the 39 female specimens examined 18 had the following tibial spination:

Tibial Spination	Dorsal	Ventral	Prolateral	Retrolateral
Leg I	0	2-2-2	1-1	0
Leg II	0	2-2-2	1-1	0
Leg III	0	2-2-2	1-1	1-1
Leg IV	0	2-2-2	1-1	1-1

Sixteen females differed from the above only in the ventral spination of leg II which was 1-2-2. The five remaining specimens varied in different respects.

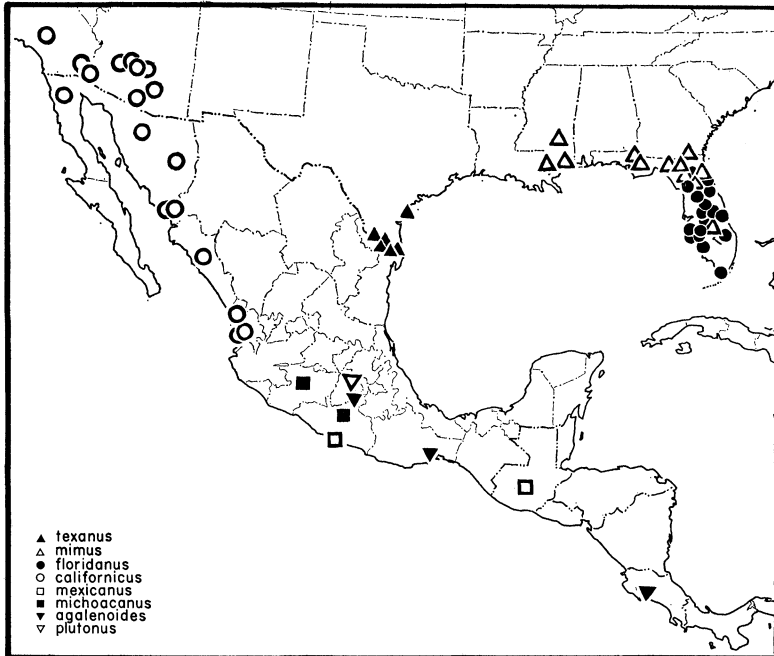
Sixteen of the 23 males examined showed the following arrangement of tibial spines:

Tibial Spination	Dorsal	Ventral	Prolateral	Retrolateral
Leg I	0	2-2-2	1-1	1-1
Leg II	0	2-2-2	1-1	1-1
Leg III	0-1-0	2-2-2	1-1	1-1
Leg IV	0	2-2-2	1-1	1-1

The seven remaining specimens showed variable dorsal spination on leg III and the ventral spination of leg II was 1-2-2 in three specimens, otherwise the spination was constant except for malformities, e. g. regeneration.

On all legs there appear on the dorsal surface of the tibiae, as well

as the metatarsi, and tarsi a series of trichobothria. These are extremely variable on all leg segments. The usual pattern is one or two large proximal trichobothria and then a series of smaller ones decreasing in size distally, although there may be one or two large trichobothria at the distal end of the tibiae. Occasionally the basal trichobothria are spine-like particularly on the tibia of leg III. A spine is distinguished from a trichobothrium by its greater thickness at the base and the



Map. 1. Distribution of *Sosippus* species.

socket within which it articulates. This basal socket leaves a scar whenever the spine is broken off, whereas it is difficult to distinguish an empty socket where a trichobothrium has been broken off.

Of 37 females measured the clypeus height was subequal to the diameter of the AME in 32, in three clypeus height was less than the diameter of the AME, and in two clypeus height was greater than the diameter of the AME. Of 23 males examined the clypeus height

was subequal to the diameter of the AME in 13, and less than the diameter of the AME in ten.

Labium. Of 39 females measured: 26 have length subequal to width, 11 wider than long, and two longer than wide. Of 23 males measured: 19 have length subequal to width, two longer than wide, and two wider than long.

Color. Female. Pattern illustrated in Figure 8. Carapace dark brown with the eye region darkest. Eyes outlined with black. A narrow pale brownish yellow median stripe beginning just behind the second eye row and running the length of the carapace. Broad marginal stripes of the same color. Both the marginal stripes and the median one densely clothed with white hair. Marginal stripes broadening anteriorly and extending to edge of clypeus. Chelicerae dark reddish brown, almost black.

Sternum brownish yellow. Endites darker reddish brown with distal ends brownish yellow. Proximal segments of legs brownish yellow without distinct contrasting markings, metatarsi and tarsi darker brown.

Dorsum of abdomen with a broad dark brown median stripe from base to tip, with two pairs of white spots at lateral indentations of stripe anteriorly, and transverse chevrons clothed with white hair posteriorly. Brownish yellow area adjacent to brown median stripe on each side, thickly clothed with white hair; lateral edges of dorsum darker brown, mottled with tufts of white hair. Venter brownish yellow.

Male. Very similar to the female in coloration.

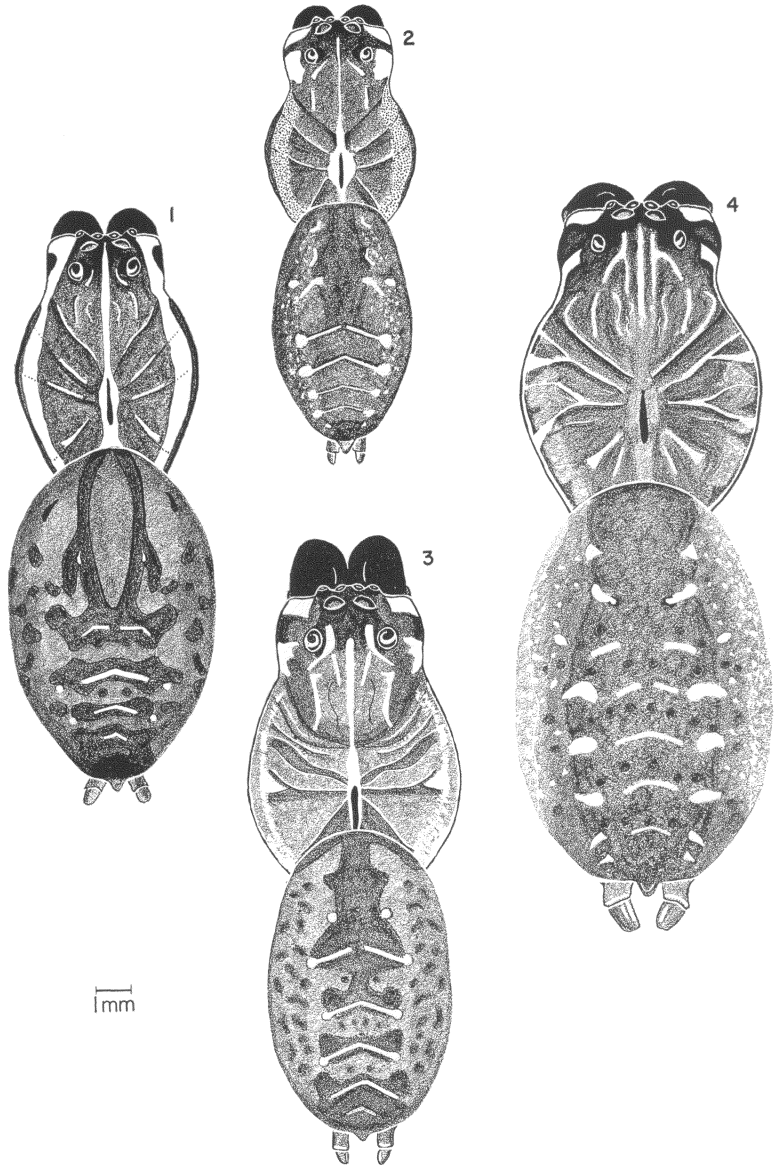
Diagnosis. *Sosippus californicus* resembles *S. agalenoides* and *S. michoacanus* in color pattern. *S. michoacanus* is darker in color, however, and both it and *S. agalenoides* can be separated from *S. californicus* by the form of the epigynum. (compare Figs. 27, 28 with Figs. 29, 30 or 31, 32.) *Sosippus plutonus* is closest to *S. californicus* in the form of the epigynum, but is a very dark, almost black species and smaller than *S. californicus* (compare Fig. 8 with Fig. 5). *Sosippus*

EXPLANATION OF PLATE 8

Fig. 1. *Sosippus floridanus* Simon, ♀ from Highlands Hammock State Park, Highlands Co., Florida, 9 Jun. 1961.

Figs. 2-3. *S. mimus* Chamberlin. 2. Female from Archibold Biological Station, Lake Placid, Highlands Co., Florida, 24 Jan. 1943. 3. Female holotype from Mandeville, Saint Tammany Par., Louisiana, 1 May 1921. Note size of abdomen, due to having recently constructed an egg case.

Fig. 4. *S. texanus* sp. n., ♀ paratype from Goose Island State Park, Aransas Co., Texas, 15 Jun. 1961.



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mexicanus is separated from *S. californicus* by the form of the epigynum and by the dorsal color pattern of the abdomen (compare Fig. 8 with Fig. 6).

Natural History. In southern Arizona, according to J. A. Beatty (unpublished, 1961), *S. californicus* is found primarily in riparian woodland formations. These associations occur in or adjacent to drainageways and their floodplains and are characterized by different vegetation than that of the surrounding non-riparian community. This spider occurs at varying elevations depending upon the amount of vegetation and moisture available. In the Santa Catalina Mountains it was collected at about 850 m.

Sosippus californicus constructs expansive webs with a central funnel-shaped retreat leading to the base of vegetation, into crevices, or under rocks. In El Coyote, Sonora it was collected from webs leading under rocks in a dry stream bed at about 1000 m. A female with egg case was collected from beneath a rock in a canyon filled with Palm trees, 26 km east of Magdalena, about 1300 m elevation.

Distribution. Baja California, southern California, Arizona, south to Nayarit (Map 1).

Records. *Baja California.* ♀ holotype. *California.* Imperial Co.: NE corner ♀ (J. Anderson). Los Angeles Co.: Claremont (Baker). *Arizona.* Maricopa Co.: Buckeye, 19 Feb. 1956 o (T. Barry); Mesa, 21 Mar.-23 May 00, 16 Jul.-11 Nov. ♂ ♂ ♀ ♀ (sev. coll.); Phoenix, 12-23 Feb. 1956 00 (sev. coll.); Santa Cruz River Valley, 9 May 1940 o (R. H. Crandall); Tempe, 14 Feb.-27 Mar., 20 Nov. 1960 00 (sev. coll.). Pima Co.: Baboquivari Mountains, Brown's Canyon, 22 Apr. 1961 00 (J. A. Beatty), 9 Jun. 1952 ♂ ♂ ♀ ♀ with egg cases (M. Cazier, W. J. Gertsch, R. Schrammel), 4 Sep. 1951 ♀ ♀ (W. S. Creighton), Rancho El Mirador, 4 Sep. 1950 ♀ (W. J. Gertsch); Santa Catalina Mountains, Sabino Canyon, 10 Apr. 1959, 26 Sep. 1959, 20 Nov. 1960 00, 26 Jun.-21 Aug. 1960 ♂ ♂ ♀ ♀ (J. A. Beatty), 6 Jun. 1952 ♂ ♂ (M. Cazier, W. J. Gertsch, R. Schrammel). Yuma Co.: Yuma, 12 Feb. 1961 o (J. A. Beatty). *Sonora.* El Coyote, 28 km E of Rio Bavisbee, 1000 m, 19-24 Jul. 1960 ♀ ♀ with egg case, 26 km E of Magdalena, 1300 m, 16 Jul. 1960 ♀ (J. A. Beatty); Minas Nuevas, 8 Aug. 1952 ♀ (P., C. Vaurie); Navajoa, 6 Aug. 1956 ♀ (V. Roth & W. J. Gertsch). *Sinaloa.* Culiacán, 19 Jun. 1939 ♂ (A. M., L. I. Davis). *Nayarit.* Acaponeta, 20 Nov. 1939 00 (C. M. Bogert, H. E. Vokes); Mecatan, 23 May 1949 ♂ (G. M. Bradt); San Blas, 6 Aug. 1947 ♀ (C., M. Goodnight, B. Malkin).

Sosippus mexicanus Simon

Figures 6, 23, 24, 46, 47. Map 1.

Sosippus mexicanus Simon, 1888, Ann. Soc. Ent. France, 8(6):206. Female holotype from Mexico in the Paris Museum. Simon, 1898, Histoire naturelle des Araignées, 2(2):325, 327. F. P.-Cambridge, 1902, Biologia Centrali-Americana, Araneidea, 2:332, p. 31, figs. 30, 31a-c. Banks, 1909, Proc. Acad. Nat. Sci. Philadelphia, 61:217. Bryant, 1948, Psyche, 55(2):55. Roewer, 1954, Katalog der Araneae 2:314. Bonnet, 1958, Bibliographia Araneorum, 2(4):4093. Roewer, 1959, Exploration du Parc National de l'Upemba, Araneae Lycosaeformia II (Lycosidae), p. 1004.

Structure. For comparison of certain diagnostic measurements of *S. mexicanus* to other species see Table 1.

Posterior cheliceral margin with three teeth on each side. Of two females examined one had 3-3 posterior cheliceral teeth, the other 4-3. The male specimen, described by F. Pickard-Cambridge (1902), has 3-3 posterior cheliceral teeth. According to F. P.-Cambridge all the specimens that he examined had 3-3 posterior cheliceral teeth.

Tibial spination in the two females examined was the same as in *S. californicus* with the following exceptions: ventral spines on leg II 1-2-2, dorsal spines on tibia III and IV 1-1. These spines slightly smaller than the lateral spines.

Clypeus height of one female subequal to the diameter of the AME, in the other greater than the diameter of the AME. Clypeus height of the male subequal to the diameter of the AME.

Labium. Length subequal to width in the male and two females.

Color. Female. Pattern illustrated in Figure 6. Carapace brown, darker in the eye region with the eyes circled in black. A thin pale brownish yellow median stripe beginning immediately behind the second eye row and continuing to the posterior edge of the carapace. Broad marginal stripes of the same color starting at the edge of the clypeus and extending the length of the carapace. The marginal stripes, as well as the median stripe, clothed with short white hair. Darker brown lines radiating from the thoracic groove. Chelicerae dark reddish brown.

Sternum brownish yellow. Labium and endites darker reddish brown. Legs brownish yellow without distinct darker markings.

Dorsum of the abdomen with a wide brown median stripe, enclosed by two very light broken lines in the anterior region. Posteriorly the lines are broken-up into a series of dots, the broken lines and dots accented with white hair. Lateral to the light lines and dots the dorsum is brownish yellow mottled with brown. Venter of the abdo-

men with a concentration of white pigment under the integument, overlaid with yellow, producing a cream color.

Male. Median longitudinal stripe of carapace not as distinct as in the female. Dorsum of abdomen with a series of paired white spots outlining wide brown median stripe, otherwise similar to female in coloration.

Diagnosis. This species is similar to *S. agalenoides* in the form of the epigynum. It is separated from *S. agalenoides* most easily on the basis of size in the limited number of specimens examined. *Sosippus mexicanus* does not exceed 15 mm in total body length and *S. agalenoides* is not less than 20 mm. *Sosippus mexicanus* also differs from *S. agalenoides* in the dorsal pattern of the abdomen (compare Fig. 6 to Fig. 9) and tibial spination. *Sosippus agalenoides* is more hairy than *S. mexicanus*, especially on the dorsum of the abdomen. The venter of the abdomen in *S. mexicanus* is characterized by white pigment underlying the integument, which is not found in *S. agalenoides*. If the differences in tibial spination remain consistent upon examination of a larger series of specimens, this will provide an easy method of separation.

Natural History. According to F. Pickard-Cambridge (1902), "The spiders of this genus are very much like *Agelenae*, not only in the shape of their body and the appearance of their legs, but to some extent their markings. Still more do they resemble them in habits, for the web consists of a very large sheet of fine silk spun over the bushes, with a tube-like tunnel running down into some place of safety. Their movements are exceedingly rapid, and one cannot at first sight believe they are not true *Agelenae*."

Distribution. Guerrero to Guatamala.

Records. Guerrero. Acapulco de Juárez, 1 Sep. 1940 ♀♀ (H. E. Frizzell). Guatamala. ♂ (Sarg). N. Banks (1909) reported this species from Costa Rica, but the specimens in question are immature and appear to be *S. agalenoides*, which Banks described from Costa Rica.

Sosippus agalenoides Banks

Figures 9, 29, 30. Map 1.

Sosippus agalenoides Banks, 1909, Acad. Nat. Sci. Philadelphia, 61:217, pl. 6, fig. 33. Three female syntypes and one juvenile from Puntarenas, Costa Rica, in the Museum of Comparative Zoology, examined. Roewer, 1954, Katalog der Araneae, 2:313. Bonnet, 1958, Bibliographia Araneorum, 2(4):4093. Roewer, 1959, Exploration du Parc National de l'Upemba, Araneae Lycosaeformia II (Lycosidae), p. 1004.

Structure. For comparison of certain diagnostic measurements of *S. agalenoides* to other species see Table 1.

Posterior cheliceral margin with three teeth on each side. Of four female and one juvenile specimens examined all have 3-3 posterior cheliceral teeth.

Tibial spination in each of the four females is exactly the same as that shown in the table for *S. californicus*.

Clypeus height is greater than the diameter of the AME in three specimens, in one specimen it is subequal to the diameter of the AME.

Labium longer than wide.

Color. Pattern illustrated in Figure 9. Carapace light orange-brown, darkest in the eye region. A thin median stripe, clothed with white hair, begins slightly in front of the third eye row and continues to the thoracic groove. Broad marginal longitudinal stripes, not as distinct as in *S. californicus*; white hairs along these stripes heaviest laterally just behind the clypeus, more diffuse posterior to this region. The lateral edges of the carapace clothed with fine white hair. Chelicerae dark reddish brown, almost black; boss on each side prominent, with dense white hair surrounding it except at the point of articulation.

Sternum light brownish yellow. Endites and labium darker reddish brown, yellowish at distal ends. Legs light brownish, yellow with metatarsi and trasi darker reddish brown.

Dorsum of the abdomen with a wide brown median stripe beginning at the base and continuing to the spinneretes. The anterior end of this stripe bordered by three white dashlines on each side, and interrupted posteriorly by a series of white chevron markings. These markings clothed with white pubescence. A series of dark brown dots alternate crossing the dorsum with the white chevrons and continue laterally for some distance. Lateral area of abdomen light brownish yellow, venter lighter, almost cream colored.

Diagnosis. *Sosippus agalenoides* is most similar to *S. californicus* in coloration. It is separated from this species by the shape of the epigynum (compare Figs. 29, 30 to Figs. 27, 28). *Sosippus agalenoides* is similar to *S. mexicanus* in the form of the epigynum. It differs from *S. mexicanus* in size and other characters discussed under that species.

Natural History. Banks (1909) does not supply any information concerning the natural history of this species. Presumably it builds the same type of sheet web and tubular retreat as found in *S. californicus*.

Distribution. Morelos, Oaxaca, Costa Rica.

Records. Morelos. Miacatlán, 4 Oct. 1942 o (C. Bolivar). Oaxaca. Tehauantepec, 15 Dec. 1947 o, 6-10 Feb. 1948 o (T. MacDougall); Cerro del Armadillo, 7 Jan. 1948 ♀ (T. MacDougall). Costa Rica. Puntarenas, 1909 ♀♀ (P. Biolley).

***Sosippus michoacanus* sp. n.**

Figures 7, 31, 32. Map 1.

Type. Female holotype from Tzararacua Falls, 11 km from Uruapan, Michoacan, Mexico, 14 Jun. 1948 (A. M., L. I. Davis) in the American Museum of Natural History. The species named after the type locality.

Structure. For comparison of certain diagnostic measurements of *S. michoacanus* to other species see Table 1.

Posterior cheliceral margin with three teeth on each side. Of five females examined, all had this arrangement.

Tibial spination was the same as in *S. californicus* with the exception that four specimens had 1-2-2 ventral spines on tibia II.

Clypeus height subequal to the diameter of the AME. Labium longer than wide.

Color. Pattern illustrated in Figure 7. Carapace reddish brown, overlaid with black pubescence giving it a darker appearance. Eye region dark brown, almost black, with eyes encircled with black. Thin median stripe beginning some distance behind the third eye row, continuing to posterior edge of carapace. This stripe not conspicuous, with white hairs sparsely covering it, densest along the thoracic groove. Broad submarginal stripes extending from clypeus to posterior edge of carapace, clothed with white pubescence. Chelicerae very dark reddish brown, almost black, with intermitent, long black hairs. Conspicuous boss on each side, light brown.

Sternum light brown with gray overtones. Endites and labium reddish brown, yellowish at distal ends. Femora brown with dusky

EXPLANATION OF PLATE 9

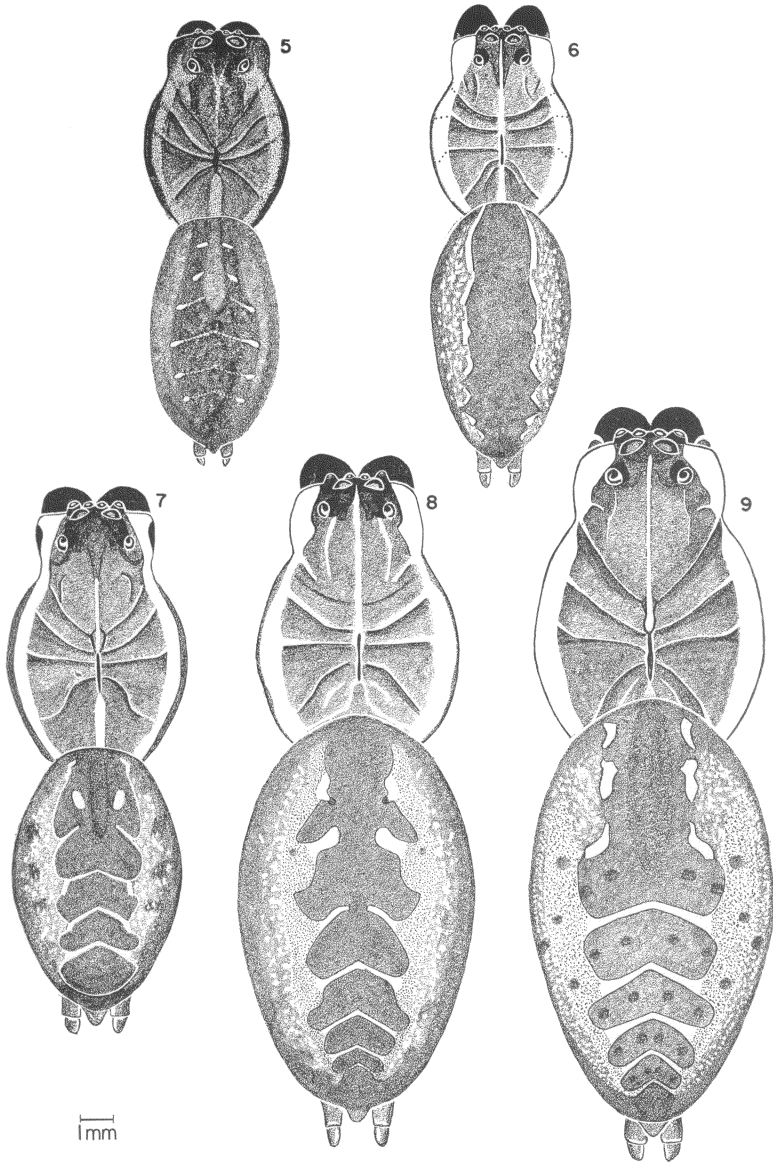
Fig. 5. *Sosippus plutonus* sp. n., ♀ holotype from Tenango del Valle, Mexico, Mexico, 25-26 Aug. 1946.

Fig. 6. *S. mexicanus* Simon, ♀ from Acapulco de Juárez, Guerrero, Mexico, 1 Sep. 1940.

Fig. 7. *S. michoacanus* sp. n., ♀ holotype from Tzararacua Falls, 11 km from Uruapan, Michoacan, Mexico, 14 Jun. 1948.

Fig. 8. *S. californicus* Simon, ♀ from Brown's Canyon, Baboquivari Mtns., Pima Co., Arizona, 9 Jun. 1952 (pattern and color same as specimens from Sabino Canyon, Santa Catalina Mtns., Pima Co., Arizona, 26 Jun. 1960).

Fig. 9. *S. agalenooides* Banks, ♀ syntype from Puntarenas, Costa Rica, 1909.



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markings, uniformly gray on ventral surface, but forming bands on the lateral and dorsal surfaces. Patellae and tibiae of same color, but darker markings form more indefinite pattern. Metatarsi and tarsi yellowish brown, without dusky markings.

Dorsum of abdomen with basal lanceolate reddish brown mark, enclosed by typical wide dark brown stripe heavily pigmented with black. Dark brown median stripe bordered by lighter brown area, with lateral regions again becoming dark brown. Venter light yellowish brown.

Diagnosis. *Sosippus michoacanus* has an abdominal pattern similar to *S. californicus*. It is much darker in color than *S. californicus* and is readily recognized by the female epigynum, which has a wide median septum and greatly expanded blade (Fig. 32).

Natural History. No information concerning the habits is available. It presumably constructs a funnel-web like that of *S. californicus*.

Distribution. Michoacan and Guerrero.

Records. *Michoacan.* Tzararacua Falls, 11 km from Uruapan, 14 Jun. 1948 ♀♀ (A. M., L. I. Davis). *Guerrero.* Mexcala, 2 Jul. 1941 ♀ (L. I. Davis).

***Sosippus plutonus* sp. n.**

Figures 5, 25, 26. Map 1.

Type. Female holotype from Tenango del Valle (Tenango de Arista), 2400 m elev., Mexico, Mexico, 25-26 Aug. 1946 (H. Wagner) in the American Museum of Natural History.

Structure. For comparison of certain diagnostic measurements of *S. plutonus* to other species see Table 1.

Female holotype with 3-3 posterior cheliceral teeth. Of seven immature specimens examined, six had 3-3 posterior cheliceral teeth, one 3-4.

Tibial spination was the same as in *S. californicus* with the following exceptions: ventral spination of leg II 1-2-2, dorsal spination of leg III 0-1-0.

Clypeus height equal to the diameter of the AME. Labium slightly wider than long.

Color. Pattern illustrated in Figure 5. Carapace very dark reddish brown with the eye region black. A few white hairs along the midline might be indicative of a thin median white line once present. Broad submarginal stripes, brownish yellow and covered with white pubescence, beginning about the third eye row and continuing to the

posterior edge of the carapace. Chelicerae black with lighter colored boss on each side.

Sternum brown. Endites and labium dark brown, lighter at distal ends. Coxae dark gray-brown on ventral surface with lighter amber color at basal regions. Other leg segments gray-brown with lighter amber colored stripes as follows: dorsal paired stripes at proximal and distal ends of femora, stripe covering almost entire dorsal surface of patellae, paired stripes at distal end of tibiae.

Abdomen (considerably shrivelled) dark brown, almost black, with a series of paired lighter spots formed from tufts of white hair. Venter brown.

Diagnosis. *Sosippus plutonus* is most similar to *S. californicus* in the shape of the epigynum. The median septum in *S. plutonus* (Fig. 26) is shorter than in *S. californicus* (Fig. 28). *Sosippus plutonus* is much darker than *S. californicus*, being almost black, hence the specific name.

Natural History. *Sosippus plutonus* presumably constructs a funnel web similar to that of *S. californicus*. *Sosippus plutonus* is probably a montane species being found at extremely high altitudes in Mexico.

Distribution. Mexico, Mexico.

Records. *Mexico.* Tenango del Valle (Tenango de Arista), 2400 m elev., 25-26 Aug. 1946 oo ♀ (H. Wagner); Tenancingo, 2050 m elev., 27 Sep.-7 Oct. 1946 oo (H. Wagner).

Sosippus floridanus Simon

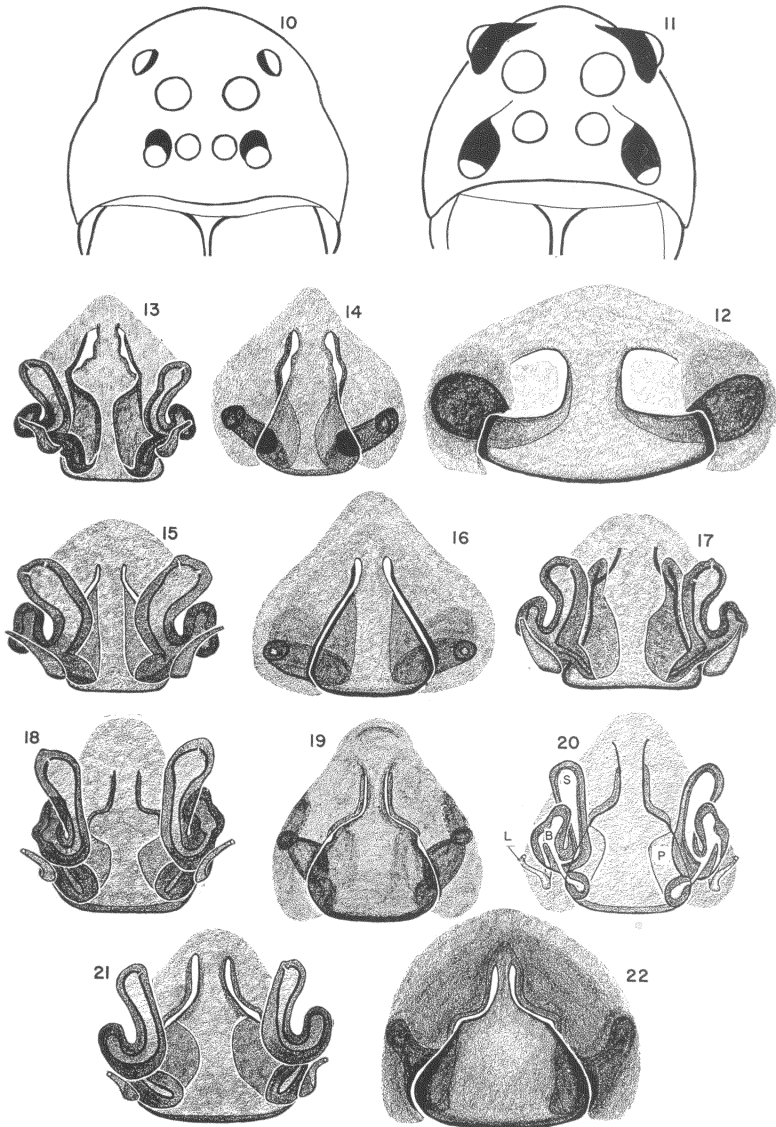
Figures 1, 19, 20, 40-43. Map 1.

Sosippus floridanus Simon, 1898, Ann. Soc. Ent. Belgique, 42:25. Female holotype from Florida in the Paris Museum. Simon, 1898, Histoire naturelle des Araignées, 2(2):323, 325. Comstock, 1913, The Spider Book, p. 622, op. cit. rev. ed., p. 639. Banks, 1904, Proc. Acad. Nat. Sci. Philadelphia, 56:121, 135. Chamberlin, 1908, Proc. Acad. Nat. Sci. Philadelphia, 60:293, pl. 23, fig. 2, pl. 11, figs. 1 ♂, 4 ♀. Wallace, 1950, Florida Ent., 33:76. Roewer, 1954, Katalog der Araneae, 2:314. Bonnet, 1958, Bibliographia Araneorum, 2(4):4093. Roewer, 1959, Exploration du Parc National de l'Upemba, Araneae Lycosaeformia II (Lycosidae), p. 1004.

Structure. For comparison of certain diagnostic measurements of *S. floridanus* to other species see Table 1.

Posterior cheliceral margin with four teeth on each side. Of 37 females examined, 35 had 4-4 posterior cheliceral teeth; two had 4-5 posterior cheliceral teeth. Of 11 males examined 10 had 4-4 posterior cheliceral teeth, one had 4-5 posterior cheliceral teeth.

Tibial spination in 16 females was the same as in *S. californicus* with the exception of ventral spination on leg II. In this position nine



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females had 1-2-2 spines, five had 1-1-2, and two females had 1-2-2 on one leg and 1-1-2 on the other leg. Tibial spination in three males was the same as in *S. californicus* except for 1-1 dorsal spines on leg III and IV in *S. floridanus*.

Clypeus height in nine females is greater than the diameter of the AME, in seven females clypeus height is subequal to the diameter of the AME. In the three males examined clypeus height is subequal to the diameter of the AME.

Labium longer than wide in 14 females, length equal to width in two females. In the three males the labium is longer than wide.

Color. Female. Pattern illustrated in Figure 1. Carapace dark brown, overlaid with black pubescence, black in eye region. Narrow median longitudinal white stripe beginning at second eye row and continuing to the posterior edge of carapace. Broad submarginal white stripes originating at edge of clypeus and running to the posterior edge of carapace. The white color of these stripes is due to presence of short appressed white hairs. The fine white hairs and the black pubescence provide contrasting pattern illustrated. If these hairs become rubbed off the underlying integument is almost unicolorous, the regions of the white stripes may remain somewhat lighter, however.

Chelicerae black with stout black hairs, lighter orange brown boss on each side. Sternum brownish yellow. Endites and labium reddish brown, lighter at distal ends. Coxae light brownish yellow on ventral

EXPLANATION OF PLATE 10

Fig. 10. Frontal view, showing eye arrangement of *Sosippus texanus*, sp. n., ♀ from Goose Island State Park, Aransas Co., Texas, 15 Jun. 1961.

Fig. 11. Frontal view, showing eye arrangement of *Porrima diversa* (O. P.-Cambridge) from Rockstone, British Guiana, 1 July (determined by W. J. Gertsch).

Figs. 13-17. *S. mimus* Chamberlin. 13-14. Female with 3-3 posterior cheliceral teeth from Archibold Biological Station, Lake Placid, Highlands Co., Florida, 24 Jan. 1943. 13. Genitalia, dorsal view. 14. Epigynum. 15-16. Female holotype with 3-3 posterior cheliceral teeth from Mandeville, Saint Tammany Par., Louisiana, 1 May 1921. 15. Genitalia, dorsal view. 16. Epigynum. 17. Genitalia, dorsal view of specimen with 4-4 posterior cheliceral teeth from Alachua Co., Florida, 18 Apr. 1935.

Figs. 18-20. *S. floridanus* Simon, ♀ from Highlands Hammock State Park, Highlands Co., Florida, 9 Jun. 1961. 18. Genitalia, dorsal view. 19. Epigynum. 20. Diagrammatic ventral view showing route of various ducts.

Abbreviations: S, seminal receptacle; B, copulatory bursa; P, copulatory pouch (usually not heavily sclerotized); L, dorsal bursal ligament (difficult to see unless the epigynum is tipped on edge). The route of this ligament is difficult to trace, due to its transparency, and inaccuracy in its placement in the drawings might occur, since it can hardly be seen from a dorsal view.

Figs. 21-22. *S. texanus* sp. n., ♀ paratype from Goose Island State Park, Aransas Co., Texas, 16 Jun. 1961. 21. Genitalia, dorsal view. 22. Epigynum.

surface. Femora gray on ventral surface, gray color continuing around leg segment at proximal and distal ends and toward the center as a pair of wide bands against a brownish yellow background clothed with white pubescence. Remaining leg segments brownish yellow, thickly clothed with black hair.

Dorsum of abdomen with a reddish brown lanceolate mark at the base, enclosed by a wide black median stripe. This broad stripe with tufts of white hair forming two pairs of spots at indentations in the anterior end and with chevrons clothed with white hair crossing it at the posterior end. Lateral to dark median stripe are areas of brown with scattered black spots. Venter of abdomen grayish brown, produced by black hair overlying brownish yellow integument.

Male. The white spots and chevrons on the dorsum of the abdomen are not as conspicuous as in the female, otherwise the coloration and markings are much the same.

Diagnosis. *Sosippus floridanus* is most similar to *S. minus*. The form of the epigynum in these two species is similar but consistently different (compare Figs. 18, 19 to Figs. 13-17). The male palpi are much alike, but in *S. floridanus* the tarsal segment is usually only twice as long as wide, while in *S. minus* the tarsal segment is usually more than twice as long as wide (compare Figs. 40-43 to Figs. 34, 35). The most clear-cut difference between these two species is in the color patterns (compare Fig. 1 to Figs. 2, 3).

Natural History. *Sosippus floridanus* was collected from tubular webs leading under the trunks of Palmetto bushes and into the bases of tufts of high grass in areas of white, sandy soil. The webs were not extensively developed, the tubular portion usually being hidden and the sheet portion of the web consisting of radiating lines of silk forming a very loose meshwork. Additional specimens were collected from holes and ruts along a path of white sand that had once been cleared

EXPLANATION OF PLATE 11

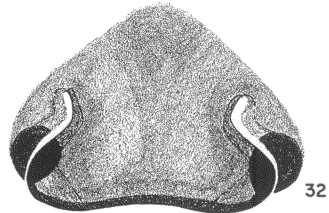
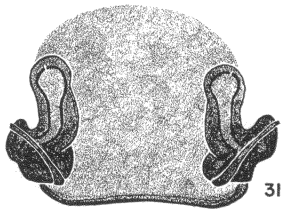
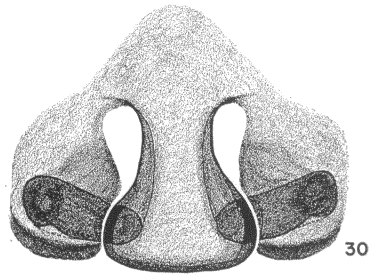
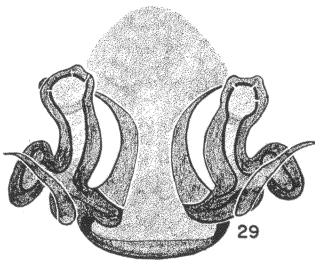
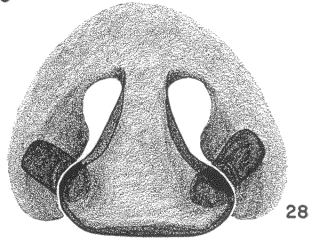
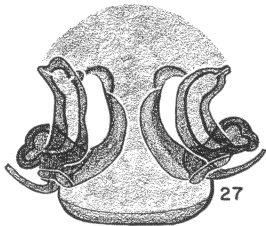
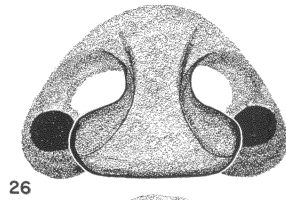
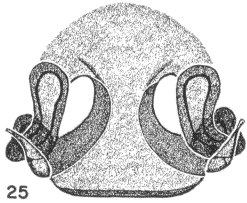
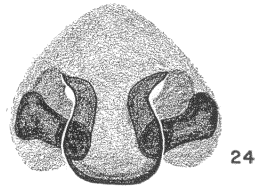
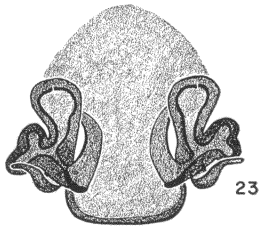
Figs. 23-24. *Sosippus mexicanus* Simon, ♀ from Acapulco de Juarez, Guerrero, Mexico, 1 Sep. 1940. 23. Genitalia, dorsal view. 24. Epigynum.

Figs. 25-26. *S. plutonus* sp. n., ♀ holotype from Tenango del Valle, Mexico, Mexico, 25-26 Aug. 1946. 25. Genitalia, dorsal view. 26. Epigynum.

Figs. 27-28. *S. californicus* Simon, ♀ from Brown's Canyon, Baboquivari Mtns., Pima Co., Arizona, 9 Jun. 1952. 27. Genitalia, dorsal view. 28. Epigynum.

Figs. 29-30. *S. agalenooides* Banks, ♀ syntype from Puntarenas, Costa Rica, 1909. 29. Genitalia, dorsal view. 30. Epigynum.

Figs. 31-32. *S. michoacanus* sp. n., ♀ paratype from Tzararacua 11 km from Uruapan, Michoacan, Mexico, 14 Jun. 1948. 31. Genitalia, dorsal view. 32. Epigynum.



for vehicles. In these situations the webs were not typical funnel webs at all. However, most of these specimens were immature and this may account for their under-developed webs.

Distribution. Florida.

Records. Florida. Alachua Co.: 1-10 May 1934-37 ♂ ♂ ♀ (H. K. Wallace, A. F. Carr); Gainesville, 12 Jun. 1935 ♀ (W. J. Gertsch). Desoto Co.: 29 Jun. 1935 ♂ ♀♀ (H. K. Wallace); 8 mi. W. of Arcadia, 21 Mar. 1938 ♀ (W. J. Gertsch). Flagler Co.: 2 Sep. 1958 (H. K. Wallace). Highlands Co.: 1 Jun. 1958 ♀ (N. Causey); 29 Jun. 1935 ♀ (H. K. Wallace); Highlands Hammock State Park near Sebring, 24 Mar. 1938 ♀ (W. J. Gertsch), 9 Jun. 1961 ♂ ♀♀ (A. R. Brady); Lake Placid, Archibold Biological Station, 25 Jun.-4 Feb. 1943 oo (M. Cazier). Indian River Co.: 17 Mar. 1936, ♂ (H. T. Townsend). Lake Co.: 21 Apr. 1933 ♂ (H. K. Wallace); Emerald Canal, 6 Mar. 1936 ♀ (Bishop coll.); Umatilla, Jul. 1934 ♀ (M. Broyles). Martin Co.: Port Mayaca on Lake Okeechobee, 29 Mar. 1938 ♂ ♀♀ (W. J. Gertsch). Monroe Co.: Flamingo, 13 Mar. 1920 ♀ (W. S. Brooks). Lee Co.: 14 Apr. 1949 o ♀♀ (H. K. Wallace). Levy Co.: 9 Apr. 1937 oo ♀ (H. K. Wallace). Orange Co.: 7 mi. E of Apopka, 29 Aug. 1944 ♀ (M. Nirenberg); Dec. 1934 ♂ (K. Boyer). Osceola Co.: Runnymede ♀ (N. Banks). Polk Co.: Hobbs, 5.6 mi. W of Lake Wales, 13 Mar. 1937 oo ♀; 27 Jun. 1935 ♀♀ (H. K. Wallace). Sarasota Co.: 19 Jul. 1937 ♀ (M., A. Carr); Englewood, 1-5 Apr. 1938 ♀ (W. J. Gertsch). Volusia Co.: Enterprise, 7 Jun. 1946 ♂ ♀ (F. N. Young).

Sosippus mimus Chamberlin

Figures 2, 3, 13-17, 34, 35. Map 1.

Sosippus mimus Chamberlin, 1924, Proc. U. S. Nat. Mus. 63:27, pl. 6, fig. 43. Female holotype from Mandeville, Louisiana, 1 May 1921 (H. E. Hubert) in Museum of Comparative Zoology, examined. Comstock, 1940, The Spider Book, p. 639. Bonnet, 1958, Bibliographia Araneorum, 2(4):4093.

Sosippinus mimus: Roewer, 1954, Katalog der Araneae 2:313; 1959, Exploration du Parc National de l'Upemba, Araneae Lycosaeformia II (Lycosidae), p. 1002.

Structure. For comparison of certain diagnostic measurements of *S. mimus* to other species see Table 1.

Number of cheliceral teeth on posterior margin extremely variable. Of 12 females examined, nine had 4-4 posterior cheliceral teeth, two had 3-3 posterior cheliceral teeth, and one had 3-4 posterior cheliceral teeth. Of nine males examined, two had 3-3 posterior cheliceral teeth,

two had 3-4 teeth, three had 4-4 teeth, one had 3-5 teeth, and one had 4-5 teeth.

Tibial spination in four females examined was the same as in *S. californicus* with the following exceptions: ventral spination of leg II 1-2-2. Tibial spination in four males was the same as in *S. californicus* with the following exceptions: dorsal spination of legs III and IV 1-1, one male lacked the dorsal spines on leg IV.

Clypeus height in three females greater than the diameter of the AME, in one female clypeus height subequal to the diameter of the AME. Clypeus height in two males greater than the diameter of the AME, clypeus height in one male subequal to the diameter of the AME, diameter of the AME greater than the clypeus height in one male.

Labium longer than wide except that in one female it is slightly wider than long.

Color. Female. Pattern illustrated in Figures 2, 3. Carapace dark reddish brown (mahogany), darkest in eye region, with eyes circled in black. Three longitudinal stripes beginning just in front of third eye row and consisting of: one median stripe continuing to thoracic groove, two lateral stripes passing inside of eyes of third row and ending in the cephalic region. These three stripes yellowish white in color. Lateral bands of the same color at anterior edge of carapace and another pair of yellowish white bands below eyes of third row running downward and diagonally backwards. No distinct stripe along margins of carapace, diffuse yellowish white hairs instead. Black lines radiating from thoracic groove, accented by yellowish white pubescence.

Chelicerae black, clothed with large black hairs, with orange brown boss on each side. Sternum yellowish brown. Labium and endites orange-brown, lighter at distal ends. Leg segments yellowish brown without distinct banding. Ventral surface of femora sometimes having a gray appearance due to heavy clothing of black hairs. Dorsal surface of femora clothed with short white hair.

Dorsum of abdomen with a wide brown median stripe from the base of the abdomen to the posterior end, interrupted at intervals. A pair of whitish spots at lateral edges of median stripe anteriorly, followed by a series of five white chevrons crossing the median stripe; the ends of the chevrons merging with white spots at the lateral edges. Bands of brown dots alternately crossing the median stripe with the chevrons. Lateral areas of dorsum yellowish brown mottled with darker brown. Venter of abdomen brownish yellow.

Male. The pattern in the male is very similar to that of the female.

Diagnosis. *Sosippus mimus* resembles *S. floridanus* in male and female genitalia and is much like *S. texanus* in color pattern. *Sosippus mimus* is separated from the former by characters discussed under that species. *Sosippus mimus* is smaller than *S. texanus* (see Table 1). Although the males are difficult to separate by differences in the palpi, the females are easily separated by differences in the epigyna (compare Figs. 13-17 to Figs. 21, 22). It is possible that the specimens considered in this paper under *S. mimus* constitute more than one species. There is considerable variability of certain characters in this species, but these characters do not show geographic variation that would permit separation, e. g. the holotype from Mandeville, Louisiana and specimens from Lake Placid, Florida have 3-3 posterior cheliceral teeth, while some specimens between these two localities have 4-4 posterior cheliceral teeth. The specimens considered under *S. mimus* all agree in color pattern and genitalia. Additional collections and field studies will provide a more definite answer.

Natural History. *Sosippus mimus*, according to R. V. Chamberlin (1924), was collected from a funnel web much like that of other species in the genus.

Distribution. Georgia, south into Florida and along the Gulf Coast to eastern Louisiana.

Records. *Georgia.* Charlton Co.: Chesses Island, Pinebarre, 15 Jun. 1922 ♀ (Wright). *Florida.* Alachua Co.: 13 Apr.-18 May 1935-50 ♂ ♀♀ (H. K. Wallace). Columbia Co.: 27 Apr. 1935 ♂ ♀ (H. K. Wallace). Highlands Co.: Lake Placid, Archibold Biological Station, 24 Jan.-4 Feb. 1943 oo ♀ (M. Cazier). Jackson Co.: 3 Apr. 1953 ♂ (H. K. Wallace). Levy Co.: 20 Apr. 1935 ♂ ♀♀ (H. K. Wallace). Liberty Co.: Blountstown, 17 Apr. 1938 ♀ (W. J.

EXPLANATION OF PLATE 12

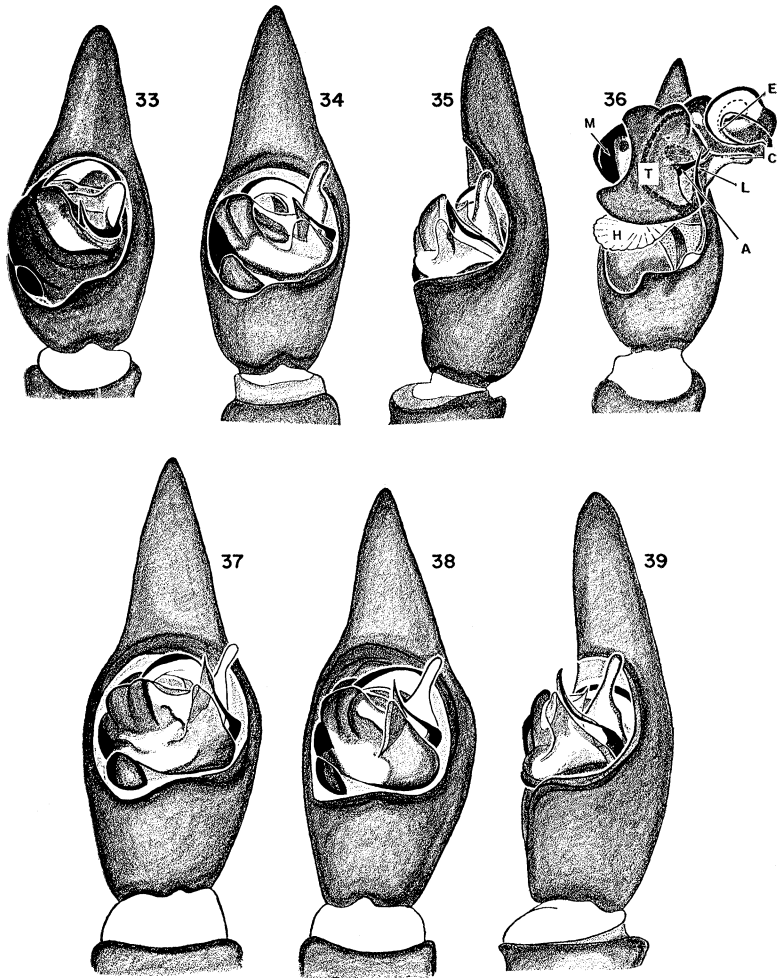
Fig. 33. Left palpus, ventral view of *Porrima harknessi* Chamberlin, ♂ holotype from Huadquina, Peru, July, 1911.

Figs. 34-35. *Sosippus mimus* Chamberlin, ♂ from Blountstown, Liberty Co., Florida, 17 Apr. 1938. 34. Left palpus, ventral view. 35. Left palpus, retrolateral view.

Fig. 36. *S. californicus* Simon, ♂ from Brown's Canyon, Baboquivari Mtns., Pima Co., Arizona, 9 Jun. 1952. Expanded left palpus.

Figs. 37-39. *S. texanus* sp. n., ♂ from Goose Island State Park, Aransas Co., Texas. 37. Palpus, ventral view. 38. Palpus, ventral view (more retrolateral than 37). 39. Palpus, retrolateral view.

Abbreviations: C, conductor; E, embolus; H, basal haematodocha; L, lateral apophysis of conductor; M, median apophysis; A, mesal apophysis of tegulum; T, tegulum.



BRADY — GENUS *SOSIPPUS*

Gertsch). Marion Co.: Kerr Park near Lake Kerr, Oct. 1956 ♀ with egg case (H. K. Wallace). Saint Johns Co.: Hastings, Jul. 1927 ♂ (J. L. Scribner). Suwanee Co.: 25 Mar. 1933 ♂ (H. K. Wallace). *Mississippi*. Forrest Co.: Hattiesburg, 2-6 Jan. 1942 oo (E. L. Bell). Jackson Co.: Ocean Springs, 10 May 1931 ♂ (Dietrich). *Louisiana*. Saint Tammany Par.: Mandeville, 1 May 1921 ♀ with egg case (H. E. Hubert).

Sosippus texanus sp. n.

Figures 4, 21, 22, 37-39. Map 1.

Type. Female holotype from Goose Island State Park, Aransas Co., Texas, 15 Jun. 1961 (A. R. Brady) in the Museum of Comparative Zoology.

Structure. For comparison of certain diagnostic measurements of *S. texanus* to other species see Table 1.

Posterior cheliceral margin with three teeth on each side. Of 11 females examined all have 3-3 posterior cheliceral teeth. Two males also have 3-3 posterior cheliceral teeth.

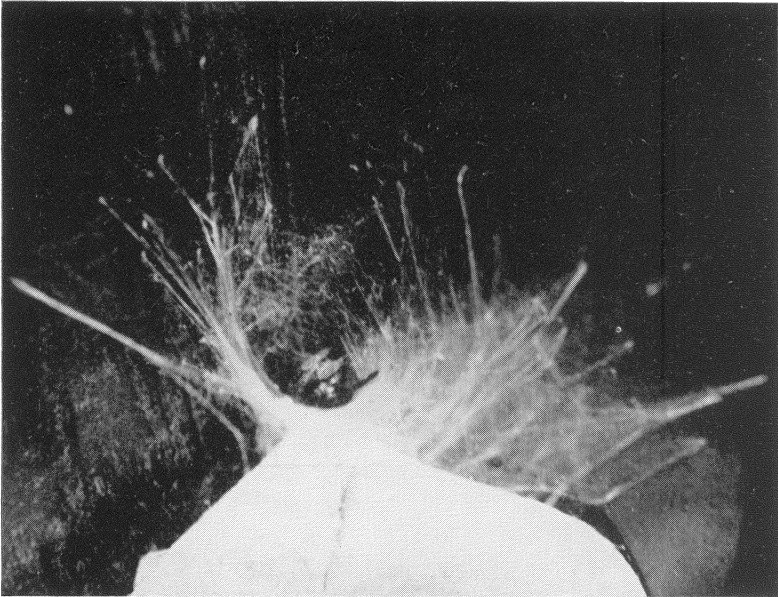
Tibial spination in 10 females is the same as *S. californicus* with the following exceptions in the case of ventral spines on leg II: six females with 1-2-2 spines, three females with 1-2-2 spines on one leg and 1-1-2 spines on the other leg, and one female with 1-1-2 spines. Two males have the same tibial spination as *S. californicus* with the exception of the dorsal spination of legs III and IV which is 1-1 on each leg.

Clypeus height in seven females is greater than the diameter of the AME, in three females the clypeus height is subequal to the diameter of the AME. In the two males clypeus height is subequal to the diameter of the AME.

Labium longer than wide in eight females and length subequal to width in two females. Labium longer than wide in the two males.

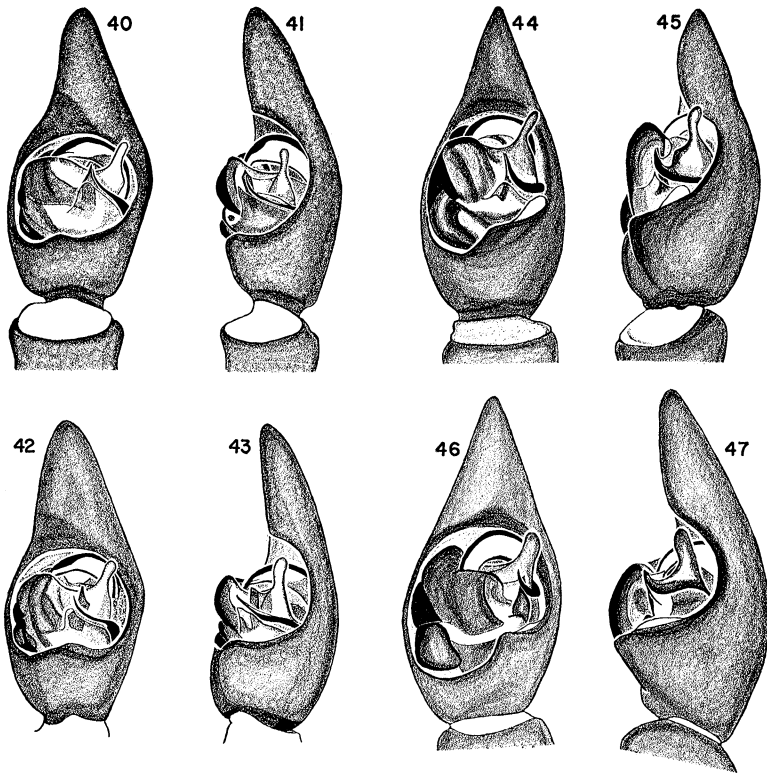
Color. Female. Pattern illustrated in Figure 4. Carapace dark brown, covered with black pubescence, black in eye region. Three longitudinal white stripes beginning behind the second eye row where they are convergent, consisting of one median stripe and two lateral stripes passing on the inside of the eyes of the third row, ending at edge of cephalic region. Marginal areas of carapace lighter, but no definite stripe present. Sides of cephalic region with a white band behind the clypeus, followed by a black band, then another white band below eyes of third row running diagonally backward and downward. Black lines, accented with white hair, radiating from the thoracic groove.

Chelicerae black, clothed with long black hairs, conspicuous orange-brown boss on each side. Sternum yellowish brown. Endites and labium dark reddish brown, brownish yellow at distal ends. Ventral surface of coxae yellowish brown. Femora gray-brown on ventral surface. White hairs on dorsal surface of femora forming alternating bands, consisting of: proximal gray-brown, white, gray-brown, white, and distal gray-brown. Remaining leg segments dark brown with tarsi and metatarsi darker. Heavy scopulae on tarsus and metatarsi of legs I and II dark gray in color.



Text Fig. 2. Funnel web of *S. texanus* constructed in corner of cardboard box with retreat behind large stick.

Dorsum of abdomen with a wide brown median stripe running the length of the abdomen, with diffuse black hairs covering it. Two pairs of white dots at the lateral edges of the stripe anteriorly, posterior to these a series of six paired white spots connected by white chevrons crossing the brown stripe. Usually the first chevron is represented by two dashes and the arms of the second chevron do not quite join at the midline. Alternating with the white chevrons are bands of darker brown dots. The areas on each side of the median stripe are speckled



BRADY — GENUS SOSIPPUS

Figs. 40-43. *Sosippus floridanus* Simon. 40-41. Male from Alachua Co., Florida, 8 May 1934. 40. Left palpus, ventral view, showing lateral apophysis of conductor resting normally against mesal apophysis of tegulum. 41. Left palpus, retrolateral view. 42-43. Male from Port Mayaca, Lake Okeechobee, Martin Co., Florida, 29 Mar. 1938. 42. Palpus, ventral view showing lateral apophysis of conductor lying below median apophysis of tegulum. 43. Palpus, retrolateral view.

Figs. 44-45. *S. californicus* Simon, ♂ from Brown's Canyon, Baboquivari Mtns., Pima Co., Arizona, 9 Jun. 1952. 44. Palpus, ventral view. 45. Palpus, retrolateral view.

Figs. 46-47. *S. mexicanus* Simon, ♂ from Guatamala. 46. Palpus, ventral view. 47. Palpus, retrolateral view.

with tufts of white hair intermixed with dark brown dots on a lighter brown background. Venter light brown.

Male. The pattern in the male is very similar to that of the female. There are fewer black hairs over the body and in over-all appearance the male is more brown than the female, which appears dark gray or even black.

Diagnosis. *Sosippus texanus* is most similar to *S. mimus* in coloration. The white spots and chevrons on the abdomen of *S. texanus* are usually more distinct. *Sosippus texanus* is also larger (see Table 1) and slightly darker than *S. mimus*. The male palpal organs are very similar, but the females are readily separated by differences in the epigyna (compare Figs. 21, 22 to Figs. 14-17).

Natural History. Specimens of *S. texanus* were collected and observed in the field at Goose Island State Park. This is a peninsular area of dry sandy soil, characterized by dense stands of Live Oak (*Quercus virginiana*). *Sosippus texanus* was collected in an area at the edge of a clearing from conspicuous funnel webs with tubular retreats running under logs and holes in the ground. The sheets of these funnel webs were not as extensive as those observed in *Agelenopsis*. *Sosippus texanus* was also collected from funnel webs at the base of the trunks of these trees. Again the sheet portion of the webs was not highly developed. The emphasis upon the tubular portion of the webs may have been due to their situation, especially those webs at the base of trees.

The spider rests at the mouth of the funnel and rushes forth with great speed to grab insects that have touched the sheet portion of the web. The prey consists chiefly of grasshoppers and ground beetles that have fallen upon or run across the lines of radiating silk forming the sheet. Upon grabbing the insect the spider retreats rapidly into the tubular portion of the funnel so that the struggles of the victim are impeded.

Spiders whose retreats dead-end into a hole or crevice construct a second short tube that they utilized for an escape exit. Most spiders seemed to have escape exists running off at angles from the main tube rather than having an exit directly to the rear.

Several spiders from this locality were reared to maturity and were observed for several months. One spider kept in a cardboard box, provided with sand and sticks for a retreat, constructed a funnel web like that found in the field at the base of Live Oak trees. This web is shown in the accompanying photograph (Text Fig. 2).

Distribution. Southern Texas.

Records. Texas. Aransas Co.: Goose Island State Park, 7 Mar. 1959 ♂, 15 Jun. 1961 ♂♂ ♀♀ paratypes (A. R. Brady). Cameron Co.: Brownsville, 30 Nov. 1934 ♀ (S. Mulaik). Hidalgo Co.: Resaca, 5 mi. SE of Brownsville, 26 Sep. 1937 ♀ (L. I. Davis, M. Fones), Edinburgh, Sep.-Dec. 1933 ♀ (S. Mulaik), La Joya, 30 Oct. 1938 ♀♀ (L. I. Davis). Zapata Co.: Lopeno, 15 Apr. 1952 ♀ with egg case (Willie).

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