GEOLOGICAL SURVEY OF ALABAMA
WALTER B. JONES, STATE GEOLOGIST (ON LEAVE)

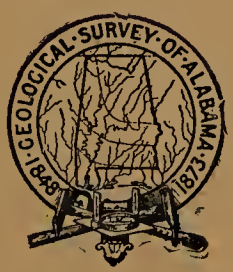
MUSEUM PAPER 18

ALABAMA MUSEUM OF NATURAL HISTORY

SUPPLEMENT TO THE ARGIOPIDAE OF ALABAMA

BY

ALLAN F. ARCHER



UNIVERSITY, ALABAMA

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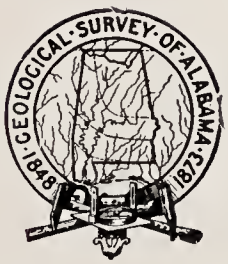

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1941

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LETTER OF TRANSMITTAL

University, Alabama

July 10, 1941

Honorable Frank M. Dixon,

Governor of Alabama,

Montgomery, Alabama.

Sir:

I have the honor to transmit herewith the manuscript of a report entitled "Supplement to the Argiopidae of Alabama", by Allan F. Archer. It is requested that this be printed as Museum Paper 18 of the Geological Survey of Alabama.

Respectfully,

STEWART J. LLOYD,

Asst. State Geologist.

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SUPPLEMENT TO THE ARGIOPIDAE OF ALABAMA

by

Allan F. Archer

INTRODUCTION

The purpose of this report is to extend the scope of Museum Paper 14, "The Argiopidae or Orb-Weaving Spiders of Alabama", dated 1940, but released in May, 1941. New and significant data have accumulated since that paper went to press. It is intended that the cataloguing of the Argiopidae may be extended nearer to the total species that actually exist within the boundaries of Alabama, and that the categories of ecological communities pertinent to these spiders may be more complete. The plan of the report includes the following items: 1. The extension of locality data for species briefly treated in the previous report. 2. The addition of species and genera new to the state. 3. The presentation of such data on species, distribution, and ecology in Florida as may have any bearing on Alabama problems, and may incidentally add to our present knowledge of the neighboring state. 4. The presentation of a key to all genera of Argiopidae in Alabama.

Additions to the fauna. The Argiopidae probably constitute roughly 10 percent of the spider fauna of Alabama. To the already sizeable list, 67 species of Argiopidae, the following species new to Alabama bring the number up to 71 species: *Tetragnatha pinea* Seeley, *Colphepeira catawba* (Banks), *Aranea solitaria* (Emerton), *A. foliata* Fourcroy. These will be discussed in the body of the text.

Ecology. In the extreme southern part of Alabama the ecological communities listed below deserve attention, as these were not listed in the previous report. They are more or less subtropical in character, and occur in the southern parts of Mobile and Baldwin Counties, in addition to which they are found in northwest Florida, extending to the western portion of the peninsular division of that state at least as far as Dixie County.

1. Evergreen Swamp Woods (bay, red maple, red bay, black pine, and evergreen shrubs). Small streams may be present.

Theridiosoma argentatum
Theridiosoma radiosum
Allepeira conferta
Leucauge venusta
Azilia vagepicta
Nicholasia pentagona
Nephila clavipes
Argiope aurantia
Gea heptagon
Cyclosa turbinata
Wagneriana tauricornis (S)
Wixia ectypa
Aranea miniata
Aranea pegnia
Neoscona domiciliorum
Mangora gibberosa
Mangora placida
Gasteracantha cancriformis

2. Hammock Woods (live oak, white oak occasionally, magnolia, beech, pignut hickory, loblolly pine, holly, sweet Illicium, Spanish moss). *Serenoa serrulata* (saw palmetto) may be present.

Theridiosoma argentatum
Tetragnatha pinea
Allepeira conferta
Leucauge venusta
Azilia vagepicta
Nicholasia pentagona
Nephila clavipes
Argiope aurantia
Cyclosa caroli
Singa rubens
Verrucosa arenata
Wixia ectypa
Aranea miniata
Aranea detrimentosa (S)
Aranea pegnia
Neoscona domiciliorum
Mangora placida
Eustala anastera emertoni
Gasteracantha cancriformis
Micrathena gracilis
Micrathena sagittata

3. Stationary Dunes (*Quercus myrtifolia, Q. geminata,* holly, yaupon, saw palmetto, huckleberry).

Colphepeira catawba (L)
Argiope aurantia
Aranea miniata
Aranea detrimentosa (S)
Aranea pegnia
Neoscona minima
Neoscona benjamina

Ecological communities in southern Florida. A great many species of Argiopidae that occur in subtropical communities in south Alabama are also found in equivalent communities in southern Florida. It is probable that there are both similarities and parallels between the communities described below and those already described from Alabama. It is with this purpose in mind as well as intention of publishing factual data on tropical Florida that the subsequent material is presented.

There are a few species, such as *Aranea juniperi,* known in Florida, which may turn up in future collections made in Alabama. The ecology of these possible residents is, therefore, of interest. Moreover, it has been necessary to turn to Florida material now in the Alabama Museum of Natural History in order to throw additional light on certain tropical species that occur in Alabama.

One of the most comprehensive treatments of the ecological communities in southern Florida is contained in the following report: R. M. Harper, Natural Resources of Southern Florida, Eighteenth Annual Report, Florida Geological Survey, 1928. For full data on the plant life of each community see the pages cited from the before-mentioned publication.

1. Scrub communities (*Pinus clausa, Quercus myrtifolia, Q. geminata, Hicoria floridana,* saw palmetto, *Ceratiola ericoides,* plum, huckleberry). Harper, pp. 79-81. This community is located on rather barren sand, mostly inland from the coast. There is some similarity between this associaiton and sandy scrub areas in lower Alabama. Recorded locality: Boca Raton, Palm Beach County.

Cyclosa bifurca McC.
Metepeira labyrinthea Htz.
Aranea juniperi Em.
Aranea pegnia Walck.
Eriophora balaustina McC.

2. Miami Pinelands (*Pinus caribaea,* saw palmetto, silver palm, live oak, wax myrtle). Harper, pp. 90-91. This community is equivalent to the slash-pine woods of Florida and south Alabama except that unlike the latter (which has a sandy soil) this has a rocky substratum. The ground is paved with marine limestone, and the ground cover is partly composed of wiry grasses. Recorded locality: Homestead, Dade County.

Leucauge argyra Walck.
Nephila clavipes L.
Argiope trifasciata Forsk.
Cyclosa bifurca McC.
Aranea floridensis Banks
Neoscona minima F. Cambr.
Mangora gibberosa Htz.
Eustala anastera Walck.
Gasteracantha cancriformis gertschi Archer

3. Palm Savannas (Cabbage palm, live oak, saw palmetto, bamboo vine, wax myrtle, Spanish moss, *Muhlenbergia*). Harper, pp. 100-103. These savannas have divided into wet and dry types, and there are some differences between the two types. The palms

tend to be scattered, although sometimes in clumps, a good deal like the arrangement of pines in open woodland further to the north. Recorded locality: Murdock, Charlotte County.

Tetragnatha pallescens F. Cambr.
Tetragnatha lacerta Walck.
Leucauge venusta Walck.
Nicholasia pentagona Htz.
Nephila clavipes L.
Gea heptagon Htz.
Acanthepeira venusta Banks
Acanthepeira moesta Keys.
Aranea pegnia Walck.
Neoscona minima F. Cambr.
Mangora placida Htz.
Eustala anastera Walck.
Gasteracantha cancriformis gertschi Archer
Micrathena sagittata Walck.

4. Low Hammocks (cabbage palm, live oak, red maple, red bay, *Ulmus floridana,* saw palmetto, wild coffee, Viburnum, Lantana, Spanish moss). Harper, pp. 103-105. These hammocks are tropical in aspect, and often occur along streams. The substratum may be composed of shells (compare the shell hammocks of Alabama) or else may be sandy in nature. Localities: Sarasota, Sarasota County; Micco, Brevard County.

Tetragnatha limnocharis Seeley (Micco)
Leucauge venusta Walck. (Sarasota; Micco)
Nicholasia pentagona Htz. (Sarasota; Micco)
Scoloderus tuberculiferus Cambr. (Sarasota)
Cyclosa caroli Htz. (Sarasota)
Cyclosa bifurca McC. (Micco)
Aranea miniata Walck. (Sarasota)
Aranea juniperi Em. (Sarasota)
Aranea pegnia Walck. (Sarasota)
Neoscona minima F. Cambr. (Sarasota)
Neoscona domiciliorum Htz. (Sarasota; Micco)
Acacesia folifera Marx (Sarasota)
Eustala anastera Walck. (Sarasota; Micco)
Gasteracantha cancriformis gertschi Archer (Sarasota; Micco)

5. Tropical Hammocks (gumbo limbo, cabbage palm, royal palm, live oak, *Lysiloma bahamensis,* pigeon plum, mastic, wild fig, red bay, wild coffee, Hercules' club, pineapple air plant, Spanish moss). Harper, pp. 106-109. Localities: Royal Palm State Park (Paradise Key); Cox Hammock; Brickell Hammock—Dade County.

Theridiosoma argentatum Keys. *Common.* (Royal Palm; Cox)
Tetragnatha seneca Seeley (Royal Palm)
Tetragnatha lacerta Walck. (Royal Palm)
Leucauge argyra Walck. *Common.* (Royal Palm; Cox; Brickell)
Leucauge venusta Walck. *Frequent.* (Royal Palm; Cox)
Nicholasia pentagona Htz. *Common.* (Royal Palm)
Nephila clavipes L. *Common.* (Royal Palm; Cox; Brickell)
Scoloderus tuberculiferus Cambr. (Cox)
Cyclosa caroli Htz. Common. (Royal Palm; Brickell)
Cyclosa walckenaeri Cambr. (Brickell)
Acanthepeira stellata Walck. (Cox)
Acanthepeira venusta Banks (Royal Palm)
Wagneriana tauricornis F. Cambr. *Common.* (Royal Palm)
Metepeira labyrinthea Htz. (Cox)
Verrucosa arenata Walck. (Royal Palm)
Aranea floridensis Banks Frequent. (Royal Palm)
Aranea pegnia Walck. (Brickell).
Neoscona minima F. Cambr. *Frequent.* (Royal Palm; Cox)
Neoscona domiciliorum Htz. (Royal Palm; Cox)
Eriophora balaustina McC. (Royal Palm; Brickell)
Mangora placida Htz. (Royal Palm)
Eustala anastera Walck. (Cox)
Eustala anastera emertoni Banks (Royal Palm)
Gasteracantha cancriformis gertschi Archer (Royal Palm; Cox; Brickell)
Micrathena sagittata Walck. *Occasional.* (Royal Palm)

SYSTEMATIC CATALOGUE

General discussion. As indicated in my previous publication the Argiopidae of Alabama are divisible into seven subfamilies. The exact limits of this family are debatable. Bristowe[1] follows Thorell and Dahl in suggesting a provisional separation of the Tetragnathinae as a family, the Tetragnathidae. There are a number of points in favor of this treatment, particularly the simplicity of the male palp, the lack of a definite epigynum in the female, as well as the mating habits. However, it is my view that such characters as the lack of a boss (lateral condyle), mentioned by Bristowe,

[1]Bristowe, W. S., The Classification of Spiders; Proc. Zool. Soc. London 1938, Series B, 108 (2): 314.

are not significant, since they are not confined to this division of orb-weaving spiders. Until more conclusive proof is forthcoming I prefer to adhere to the *status quo.*

The distribtution and habitats of certain species. The bulk of this publication will deal with species new to Alabama, as well as with additional data on species already known for the state, one new genus, and various items pertaining to Florida.

Theridiosoma argentatum Keyserling, Plate 1, Fig. 1.

The palpus of the male, figured in Plate 1, differs from that of *T. radiosum* (McCook), the common and widespread species, in the structure of the embolus and other features of the genital bulb. Adult females from Alabama and Florida have a total length of 1.2-1.5 mm.

ADDITIONAL RECORDS: Females, Hog Creek, Baldwin County; 1 male, Big Creek, Houston County; immature, Mon Louis Island, Mobile County. Ten females, Royal Palm State Park, Dade County, Florida.

Mimognatha foxi (McCook).

W. M. Barrows, Ohio Journal of Science, 1919, 19; 211-212, makes detailed observations on the habits of this species: " . . . it builds a delicate orb web in grass or weeds in rather hot dry situations. Usually the web is placed horizontally about two inches above the ground. The strands are so delicate that it is usually entirely overlooked. Near sunset, however, on finding the proper angle, the rays of the sun will reflect from its surface and make it easy to determine that the web is about four and one-half inches in diameter." In mating the male and female stand venter to venter, and lock the chelicerae, a position also assumed by all species of **Tetragnatha** that I have chanced to observe.

ADDITIONAL RECORDS: Auburn, Lee County; females, Tuscaloosa, Tuscaloosa County, May and June.

Tetragnatha pinea Seeley, Plate 1, Fig. 2.

Tetragnatha pinicola Emerton, Trans. Conn. Acad. Sci., 1915, 6: 139, Pl. 1, Figs. 7, 7a (not *Tetragnatha pinicola* L. Koch).

Tetragnatha pinea Seeley, N. Y. State Mus. Bull. 278, 1928: 133-134, Pl. 2, figs. 21-24.

NEW TO ALABAMA.

DISTRIBUTION: Immature female, Jackson's Oak, Baldwin County; males, University Woods, Tuscaloosa, Tuscaloosa County, May 13, 1941.

ECOLOGY: On the limb of a shrub, hammock woods,; swept from tall shrubs, on slopes at the head of a large ravine having pine, beech, oaks, maple, and sweetgum.

Tetragnatha limnocharis Seeley.

It is more than likely that *Tetragnatha marianna* Archer (Argiopidae, pp. 20-21) should be regarded as an ecological form of *T. limnocharis*. Dr. W. J. Gertsch, American Museum of Natural History, believes that there is no significant difference between the male palpi of the two forms. *T. marianna* differs mainly in the fact that the chelicerae are proportionately longer than those of *limnocharis;* the upper border of the fang groove is armed with seven denticles instead of six, in addition to the blunt apical cone; the first slender denticle is not as long as that of *limnocharis;* the lower border of the fang groove has four denticles instead of three. Neither my figure nor that of Seeley is satisfactory in bringing out all the details of the denticles. *T. marianna* inhabits dark shady ravines, whereas *limnocharis* occurs in other types of situations. The specimens that I have collected in southern Florida are typical of *limnocharis*.

ADDITIONAL RECORDS: Male, Micco, Brevard County; 3 females, 1 male, Royal Palm State Park, Dade County, Florida. These records are of interest, since this species was not known to Seeley from lower Florida.

Tetragnatha straminea Emerton.

ADDITIONAL RECORD: Male, Orange Beach, Baldwin County, collected by H. P. Loding. This is the first record from southwest Alabama.

Allepeira conferta (Hentz).

ADDITIONAL RECORDS: Gulf State Park, Baldwin County; Georgetown Cave, Colbert County; Big Creek, Houston County; Satsuma, Mobile County.

ECOLOGY: This species is found in abundance in old gullies in central Alabama. The gullies in question have reached a stage

of stability, and have a fair amount of arboreal cover. Most of the species are weedy. The plant cover consists of such species as loblolly pine, hackberry, black locust, honey locust, sycamore, paper mulberry, pin oak, roses, and honeysuckle. In the gullies in Tuscaloosa *Allepeira conferta* places its webs on locusts and suspended vines, especially in sunlit areas and on the borders of the woods. In early June males were commonly found in the webs of the females.

Colphepeira, new genus.

Carapace short, not elevated. Chelicerae about ¾ as long as the carapace, no boss, rather narrow, conical, convex, denticles on either margin of the fang groove, at least in the female. Labium wide and with anterior margin curved. Maxillae wide. Posterior row of eyes recurved; lateral eyes closely approximated, widely separated from median eyes. Abdomen very wide and short, higher and wider at the apex than at the base; the apex bilobate, truncate; each lobe formed of tubercles; spinnerets located mesally; epigastric plates smooth. Legs short. Epigynum having an elongate, hairless scape.

Genotype: *Epeira* catawba Banks.

This genus is very distinct in certain characteristics. The shape of the abdomen and the arrangement of the abdominal tubercles serve to distinguish *Colphepeira* from other North American metine Argiopidae. It seems to belong to the Metinae in spite of the fact that scape of the epigynum bears a strong resemblance to that found in certain genera of Araneinae. The following metine characteristics are to be noted: 1. There are no transverse furrows on the epigastric plates. 2. The epigastric furrow is straight. 3. There is no boss on the chelicera. 4. The metatarsi and tarsi taken together are not noticeably longer than the combined length of the femur and patella. The scape is fleshy and elongate as is the case in another metine, *Leucauge argyra* (Walckenaer), but unlike the latter it is not hairy. In spite of the morphological differences between this genus and *Leucauge* and *Meta* I tentatively assign it to a position following the former on the basis of the epigynum and the male palpus. It approaches *Nicholasia* in the small size, the character of the web, and the abdominal tubercles, but nevertheless is quite different in the greater complexity of the genitalia as well as in the close approximation of the lateral eyes.

Colphepeira catawba (Banks), Plate 1, figs. 3-4, Plate 2, figs. 1-3.

Epeira catawba Banks, Proc. Acad. Nat. Sci. Phila., 1911, 63: 450, Pl. 34, Fig. 4.

NEW TO ALABAMA.

FEMALE. Total length 2.3 mm. Legs, I, 3.0 mm., II, 2.9 mm., III, 1.7 mm., IV, 1.9 mm.

Carapace dusky except for black on posterior lateral borders and two ivory patches behind the middle. Sternum mottled with ivory on deep rufous, brown and black. Legs having brown bands. Dorsum of abdomen black except for pale patches on basal half and dirty white on the tubercles; venter densely mottled with black except for dirty white on the tubercles and a patch between the spinnerets and the epigastric groove; hairs on the vault of the epigynum white.

Morphology as shown in the figures, but the following points to be noted: Pars cephalica scarcely elevated above thoracic region. Clypeus convex, shallower than ocular region. A. m. e. larger and further apart than p. m. e. Sternum wide anteriorly and medially, but tapering between coxae IV, and anterior border curved caudad behind labium. Fang groove bordered on each side by three small denticles. Maxillae wide, irregularly oblong, barely diverging. Abdomen very slightly indented at the base and on each shoulder; each outer posterior corner having three horizontal tubercles beneath a dorsal one; a pair of tubercles beneath the posterior elevation.

MALE. Length of carapace 1 mm. (abdomen missing). Leg, I, 2.9 mm.

Carapace dusky except for small ivory patches on either side of the mid line (anterior to the cervical grooves) and the large ivory patch on the posterior portion. Legs as in the female except for one band on each patella and two on each metatarsus.

Pars cephalica less elevated than thoracic region, prominent above the clypeus; cervical grooves present, and a short longitudinal groove extending caudad from their junction. Eyes as figured; a. l. e. scarcely separated from p. l. e. and located on the most prominent part of the ocular tubercle, the eye being scarcely

visible from above. Sternum having less curvature behind the labium than in the female. Chelicerae conical, tapering, strongly retreating from base to tip; fang groove apparently lacking denticles. Maxillae short, wide, slightly convergent. Legs similar to those of the female. Abdomen (lost in the field) darker, smaller, and slenderer than that of the female, but otherwise similar. Palpus having a simple terminal apophysis; paracymbium much reduced; tibia transversely flattened and with a dorsal apophysis.

The females collected in south Alabama were of the dimensions mentioned above, but one found in north-central Alabama has a total length of 3.0 mm. like the specimen described by Mr. Banks from the type locality, Asheville, Buncombe County, North Carolina. In the Alabama specimens the color of the abdomen is darker than the North Carolina specimen; none of them show as pronounced basal humps.

DISTRIBUTION: Male, 2 females, Gulf State Park, Baldwin County, August 23, 1940; 2 females, 6 immatures, Warrior, Jefferson County, May 28, 1941. Also known from central Louisiana (14 females, Grant Parish).[2]

ECOLOGY: In irregularities on the under surfaces of charred wood (oak) lying on white sand of old stationary dunes some distance from the shore; horizontal webs between the roots of pines (*Pinus echinata*) and oaks (*Quercus alba, Q. rubra*) thin, open, second-growth woods with considerable grassy undergrowth; also in grooves of old-field pine. In both plant communities some distance from permanent water. The egg-sacs are enclosed in a mass of debris, and are suspended from a horizontal thread just above the web. In the Jefferson County locality the webs were disposed of much the same fashion as those of *Nicholasia pentagona* (Hentz). Each web was 3 to 3½ inches in diameter. The hub is very small and poorly defined, and there are approximately sixty spirals. There is no nest, but each spider has a retreat under a loose tag of bark. The spiders prey on small ants. In this same habitat complex (oak-pine) the following orb-weavers also occur: *Leucauge venusta, Argiope trifasciata, Mangora gibberosa, Acacesia folifera, Micrathena sagittata.*

[2]This species has also been found at Berryville, Carroll County, Arkansas, by Miss Christine Wilton.

Azilia vagepicta Simon.

ADDITIONAL RECORDS: Elba, Coffee County; male, Wolf Den Cave, Maud, Colbert County, September 20, 1940; Luverne, Crenshaw County; male, Omussee Creek, Houston County, September 1, 1940; immatures, 4 miles east of Fort Deposit, Lowndes County; female, immatures, Mon Louis Island, Mobile County, January 9, 1941. Wacissa River, Jefferson County, Florida.

ECOLOGY: Horizontal webs in fissures on the faces of walls of canyon-like stream valleys, beech-magnolia bluffs; web in hollow stumps or in holes in the ground, deep ravines and hammock woods; swamp woods.

Nicholasia pentagona (Hentz)

The following citation should be added to the bibliography of Alabama Argiopidae: Bryant, E. B. and Archer, A. F., Notes on *Epeira pentagona* Hentz, Psyche, 1940, **47**: 60-65, text figure.

ADDITIONAL RECORDS: Females, Gallymore Hollow, Maud, Colbert County; females, Collinsville, DeKalb County. This species, although nearly state-wide, is conspicuously absent from three well investigated areas in the northeastern and northwestern quarters of the state, viz. Cypress Creek, Lauderdale County; DeSoto State Park, DeKalb County; May's Gulf, Cherokee County. Not much is known of the northward extent of this species beyond the limits of Alabama. The absences cited above may correlate with some limiting ecological factor, which in the last two localities may tie up with the higher elevations of montane areas.

Gea heptagon (Hentz)

ADDITIONAL RECORDS: Hog Creek, Baldwin County; male, Hatchet Creek, Coosa County, June, 1940.

Scoloderus tuberculiferus (Cambridge), Plate 2, figs. 4-5.

ADDITIONAL RECORDS: Magnolia Springs, Baldwin County. Marianna, Jackson County, Florida. The male is figured from the locality at Sarasota, Florida, cited in the introduction.

MORPHOLOGY: The male is figured in Plate 2. The carapace, like that of the female is as high as long. Total length 2.5 mm.

Kaira alba (Hentz)

ADDITIONAL RECORD: DeSoto State Park, DeKalb County. Taken from a young maple on a dry, open slope above DeSoto river.

Wagneriana tauricornis F. Cambridge.

ADDITIONAL RECORDS: Female, Thomasville, Clarke County, February, 1941; Hatchet Creek, Coosa County; Alaga, Houston County; female, immatures, Big Creek, Houston County, August 31, 1940. Six females, many immatures. Royal Palm State Park, Dade County, Florida, December 27-28, 1940. In the latter locality one adult female had a light-bordered folium on the dorsum of the abdomen; others were much darker.

ECOLOGY: In the tropical hammocks in Florida this species is very common. On shrubs a foot or two off the ground; in open areas under the shade of palms and palmettoes; around ponds; on low vegetation in the zone between the edge of the hammock and the wet prairie; common under benches in picnic areas. At the northern edge of its range in Alabama (e. g. Hatchet Creek) this species seems to coincide with the range of *Illicium floridanum*.

Singa maura (Hentz), Plate 3, fig. 1.

FEMALES. Total length 4.0-6.5 m.

This is apparently the largest species of *Singa* in North America. Carapace and legs predominantly orange. Dorsum of abdomen deep crimson or sepia except for light yellow lateral and dorsal patches; a pair of black apical spots, each bordered with white; four pairs of brown muscle scars on the dorsum. The aggregate pattern suggests a type of mask used by secret societies of the Iroquois tribes, eyes, nose, and ornamentation all being discernible.

MALE. Total length 4.0-4.7 mm.

The abdomen more narrowly oval than that of the female: dorsum pale, the base sooty with a conspicuous white patch in the center; sides deep crimson; apical patches and muscle scars as in the female. Carapace as usual in *Singa*. Legs armed with numerous spines on the femora, patellae, and tibiae, the spines being in longitudinal rows. There are fewer and shorter spines on the legs of the female.

The palpus of the male is figured from a neotype from Cheaha State Park.

ADDITIONAL RECORDS: Six females, Gallymore Hollow, Maud, Colbert County, September 25, 1940; 11 females, Fivemile Creek, Hale County, October 28, 1940. The only dates recorded for the seasonal appearance of males are June 4-7 in central Alabama.

Singa van-bruyselli Becker, Plate 1, fig. 5.

Singa van bruyselli Becker, Ann. Soc. Entom. Belgique, 1879, 22: 78, Pl. 1, Figs. 4-6.

The discovery of adult females of this species in Louisiana and latterly in Alabama proves it to be *van-bruyselli* and not *Singa variabilis* Emerton as listed on pages 13 and 37 of Museum Paper 14, Argiopidae of Alabama. This species is unusually dark for the genus. There are practically no light markings except for the white patches bordering the venter. The abdomen resembles that of dark specimens of *S. variabilis*, but unlike the latter there are no orange markings on the carapace. Specimens before me resemble Becker's species more than any other, although Becker's description is not as full as it might be. Moreover, it fits best into the geographical region from which *van-bruyselli* comes. The epigynum differs from that of *variabilis*, as illustrated in Plate 1.

TYPE LOCALITY: Pascagoula, Jackson County, Mississippi

ECOLOGY: As previously indicated, this occurs in slash-pine woods (Dauphin Island) with such species of Argiopidae as *Leucauge venusta*, *Nephila clavipes*, *Aranea pegnia*, and *Eustala anastera emertoni*. In Grant Parish, Louisiana, it was found in June 1941 nearly everywhere that longleaf pine occurs on uplands, hills, and summits. Adult females were frequent under loose tags of bark. At night or immediately after rains they are found on the hub of the web. Argiopidae associated with *van-bruyselli* in Louisiana are *Colphepeira catawba*, *Argiope trifasciata*, *Cyclosa turbinata*, *Mangora gibberosa*, *Acacesia florifera*, *Micrathena gracilis*, *M. sagittata*.

Singa rubens (Hentz)

ADDITIONAL RECORDS: Columbia, Houston County.

ECOLOGY: This species occurs in live oak and other types of hammock vegetation near permanent water in extreme south

Alabama and Florida. This is probably the species that Dr. Marx designated as *Singa maculata* Emerton[3] as coming from Florida.

Key to the Angulate Araneas of Alabama and Florida.

The angulate Araneas of the subgenus *Aranea* comprise some interesting members of the genus in Alabama and Florida, but members about which less is known than in the case of the round-shouldered Araneas (subgenus *Epeira*). There is no sharp line of demarcation between these two groups, since in the southeast *Aranea nivea* (Hentz) and further north *A. attestor* (Petrunkevitch) are clearly intermediate between the angulate and round-shouldered groups. In the males the second coxa has a spur on the base, at least in some cases. The following key will deal with the epigyna of the females. One feature that has apparently been overlooked is the presence of scleritic processes in the atriolum. These are not visible in some preservations, but can be seen when everted. Three of the species keyed below have these structures.

1. Scape of the epigynum distinctly tapering from base to cochlear; atriolum furrowed. (2)

2. Lateral halves of atriolum bordering vault-like furrows and not nearly divided by them; a pair of horns on the base of the abdomen. A large species; length 23-25 mm. ..... *Aranea cavatica*

2. A deep longitudinal furrow in each half of the atriolum, nearly dividing each half in two; base of the abdomen having elevated, hump shoulders. A rather small species about 11 mm. long. ..... *Aranea corticaria*

1. Scape of epigynum not tapering from base to cochlear; chitinous processes or masses present on either side of the base of the epigynum. (3)

3. Scape very long and slender; a pair of black, indented chitinous masses on either side of the scape at the base of the epigynum. A large species about 23 mm. long ..... *Aranea solitaria*

3. Scape proportionately short; chitinous processes on either side near the base of the epigynum. (4)

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[3]Banks, N., the Arachnida of Florida, Proc. Acad. Nat. Sci. Phila., 1904, 56; 130.

4. Species having a pair of shoulder horns on the base of the widely triangular abdomen; black scleritic processes projecting from the atriolum; scape slender. (5)

5. Scleritic processes bifurcate anteriorly and extending posteriorly from the curved thickened ridge of the atriolum. A small species; length 3.5-5.0 mm. ..... *Aranea miniata*

5. Scleritic processes simple, not bifurcate, extending diagonally backward from an oval atriolum; atriolum having two pairs of interconnected, circular holes. A small species; length 2.8-3.5 mm. ..... *Aranea floridensis*

4. A species having an oval abdomen with a pair of weakly defined shoulder humps on the base. A pair of brown scleritic processes projecting as diagonal indentations on either side of the atriolum; atriolum having a wide, unthickened posterior strip, abruptly wide in the anterior half. A small species; length 3.0-3.8 mm. ..... *Aranea nivea*

Aranea cavatica (Keyserling).

ADDITIONAL RECORDS: Females, May's Gulf, Cherokee County, September 14, 1940. A number of females were found deep down in the gorge of Little River, all beneath high undercut ledges below vertical walls.

Aranea solitaria (Emerton), Plate 3, fig. 2.

Epeira solitaria Emerton, Trans. Conn. Acad. Sci., 1884, 6: 299, Pl. 33, fig. 11, Pl. 35, fig. 3.

NEW TO ALABAMA.

DISTRIBUTION: One female, 1250 feet elevation, May's Gulf, Cherokee County, September 14, 1940. Taken within a few feet of the DeKalb County line, NW¼, SE¼, T. 7 S., Sec. 30, R. 10 E.

ECOLOGY: The vertical web was five feet off the ground, at least 2½ feet in diameter, and had 31 spirals beyond the hub, and was suspended from the projecting limb of a red cedar. The spider was not in a nest, but was located on the under side of the limb at the upper angle of the web nearest the trunk of the tree. The locality consists of a rather open area along a road above the gorge.

The Alabama specimen is larger than any northern specimens that I have seen, and the coloration is more vivid. The spider is nearly ebony except for dark reddish brown markings on the legs, an olivaceous green shield on the dorsum with a bordered folium inside, and white markings on the posterior surfaces of the large, stout shoulder humps.

Aranea miniata (Walckenaer), Plate 4, fig. 1.

ADDITIONAL RECORDS: Twenty females, 5 males, Gulf State Park, Baldwin County, August 21-23, 1940; DeSoto State Park, DeKalb County; Flomaton, Escambia County; females, Alberta City, Tuscaloosa County, June, 1941. Wacissa River, Jefferson County; 3 males, Sarasota, Sarasota County, Florida, December 26, 1940.

ECOLOGY: In south Alabama and Florida this species is especially common along the borders of swamp woods, slash-pine, and low hammocks. It traps mosquitoes in large numbers. *A. miniata* appears to mature in the mid summer in lower Alabama, whereas it is mature in June further to the north. On the basis of the adult males collected in lower Florida it appears that the season of maturity comes some time during the winter as we approach the tropics. Moreover, the bodily size is smaller (approaching that of *A. floridensis*) than that of spiders in upper Alabama, and coloration tends towards green and bright hues.

Aranea floridensis (Banks), Plate 4, fig. 2.

Epeira floridensis Banks, Proc. Acad. Nat. Sci. Phila., 1904, 56: 129-130, Pl. 7, fig. 5.

LOWER FLORIDA. On tall shrubs at the borders of hammocks.

Although this species seems to be an unlikely resident of Alabama, it is useful for comparison with *A. miniata* a species which, in lower Alabama at least, is much like it in size and appearance. New locality records were indicated in the introduction under *ecological communities in lower Florida.* Both the key to the angulate Araneas and the figure in Plate 4 amplify the description of the epigynum over and above that given by Mr. Banks.

Aranea nivea (Hentz), Plate 3, figs. 3-4, Plate 4, fig. 4.

ADDITIONAL RECORDS: Magnolia Springs, Baldwin County; Pea River Project, Dale County; Arcola, Hale County.

This species is known to be widespread in central Louisiana (Grant and Rapides parishes).

ECOLOGY: This species inhabits hammock woods and rather open shrubby country.

MORPHOLOGY: In two localities specimens taken had a chamois tinge that faded in alcohol.

A. nivea seems rather close to *A. attestor* (Petrunkevitch) in size and other characteristics. In both species the eyes are pale; the legs have colorless hairs and numerous long gray spines. In the latter the abdomen is as broad as long, triangular, and with bluntly angulate shoulders, instead of being oval as in the Alabama species. The folium, if present, is a triangular patch. The epigynum differs from that of the Alabama species (see Plate 3) in having a wide basal plate which expands anteriorly, without lateral indentations, and with helicoid openings near each anterior lateral border. The male palpus (Plate 4) is figured from a specimen collected near Fishville, Grant Parish, Louisiana, June 1941. There is no spur on the second coxa.

Aranea detrimentosa (Cambridge).

ADDITIONAL RECORDS: Gulf State Park, Jackson's Oak, Baldwin County. This species is now known from the mainland.

ECOLOGY: Inhabiting sand-oak dunes and the inner recesses of hammock woods.

Aranea thaddeus (Hentz).

ADDITIONAL RECORDS: Female, 2000 feet elevation, Mount Cheaha, Cheaha State Park, October, 1940, W. B. Jones; female 1650 feet elevation, DeSoto State Park, DeKalb County, September 15, 1940; Columbia, Houston County; North Sauty Creek, Jackson County; Oak Mountain State Park, Shelby County.

Aranea raji Scopoli.

ADDITIONAL RECORD: Female, Ray's, Sepulga River, Conecuh County, January 10, 1941. This is a southerly extension

of the range of this species in Alabama. One live female was found in dead leaves. The abdomen was greatly shrunken.

Aranea undata Olivier.

ADDITIONAL RECORDS: May's Gulf, Cherokee County; Georgetown Landing, Colbert County; DeSoto State Park, DeKalb County; Cypress Creek, Lauderdale County; Wheeler Dam, Lawrence County; Huntsville Spring, Huntsville, Madison County.

Aranea foliata Fourcroy.

Aranea foliata Fourcroy, Entomologia Parisiensis, 1785, II.

NEW TO ALABAMA.

DISTRIBUTION: Numerous females and males, Wheeler Dam, Lawrence County, October 5, 1940.

ECOLOGY: Vertical webs on guard rails and fences on top of the dam. The webs were often two or three deep, and the top of the dam seemed to be overrun with these spiders. It is noticeable that this species has not established itself on the neighboring shores where instead occurs the related species, *A. undata*. It is probably a recent introduction from some other portion of the watershed of the Tennessee River.

Neoscona domiciliorum (Hentz)

ADDITIONAL RECORDS: Female, Jackson's Oak, Baldwin County, January 17, 1941; female, Hatchet Creek, Swamp Creek, Coosa County, September 9, 1940; 1 female, Omussee Creek, Houston County, September 1, 1940. Female, Micco, Brevard County, December 30, 1940; female, Royal Palm State Park, Dade County, December 27, 1940; 2 females, Sarasota, Sarasota County, December 26, 1940; female, Wellborn, Suwannee County, Florida, December 31, 1940.

MORPHOLOGY: Total length of females, 14.5-18.0 mm.

Neoscona vulgaris (Hentz)

ADDITIONAL RECORDS: Female, Dothan, Houston County, August 31, 1940; female, Mobile, Mobile County, November 4, 1940.

MORPHOLOGY: Total length of females, 10.0-12.0 mm.

Eriophora balaustina (McCook).

ADDITIONAL RECORDS: Male, Orange Beach, Baldwin County, collected by H. P. Loding. Immatures, Murdock, Charlotte County; Punta Gorda, Charlotte County, N. Banks; female, Brickell Hammock, Dade County, December 29, 1940; Miami, Dade County; Altoona, Lake County, N. Banks; female, Boca Raton, Palm Beach County, December 29, 1940; Benson Springs, Volusia County, Florida. In general this summarizes the available data which I have on hand in regard to the distribution of this species in Florida and Alabama.

ECOLOGY: The vertical webs are suspended from shrubs and trees along the borders of hammock woods. The webs are apparently not as large as those of *Neoscona domiciliorum* but much larger than those of *Aranea floridensis,* both species occurring with it on the borders of woods. In addition to being present on palmettoes in palm savannas its vertical webs are placed on palmettoes about three feet off the ground in barren, sandy scrub areas some distance from the shore line. Here the spider hides on the ribs of palmettoes not far from the habitat of the palmetto-inhabiting form of the black-widow spider, *Latrodectus mactans bishopi* Kaston. It is also present under the ceilings of buildings having open fronts, South Miami. In Alabama, on the other hand, this spider is not known from urban localities.

Gasteracantha cancriformis (Linnaeus), Plate 4, figs. 3, 5.

Plectana ellipsoides Walckenaer, Ins. Apt., 1837, 2: 135.

Gasteracantha rufospinosa Marx, Entom. Amer., 1886, 2: 25.

Females with red spines instead of black have been taken at Wellborn, Suwannee County, Florida, and Hilton, Early County, Georgia.

This species is decidedly polymorphic, as suggested by Dr. W. J. Gertsch. In a letter dated June 13, 1941, he states that the extreme forms intergrade with what is regarded as the typical species. The name, *cancriformis,* will probably be applied to some West Indian spider. If this situation should obtain, then *ellipsoides* Walckenaer may be applied to the subspecies occurring in a wide area of the southern United States. Walckenaer described *ellipsoides,* a black-spined form from Georgia, while *rufospinosa* Marx was described

from Crescent City, Putnam County, Florida. The latter is the form with the red-spined abdomen, and occurs in northern Florida and south Georgia. Dr. Gertsch says, "In northern Florida there is some mixture of the black- and red-spined forms, but the red is probably dominant, and the spines themselves are proportionately slightly longer than in the Alabama specimens." Marx' *rufospinosa* from Putnam County is probably transitional from *ellipsoides* to the very long-spined form further south, although nearer the former. The available data based on observations by Dr. Gertsch and myself sums up the situation as it applies to the subspecies in North America: *Gasteracantha cancriformis ellipsoides* (Walckenaer). This evidently includes both Hentz' *Epeira cancer* and Marx' *rufospinosa*. North Carolina west to Texas.

Subspecies *gertschi* Archer. Southern Florida.

Subspecies *maura* McCook. California eastward probably as far as west Texas.

In general the tendency is for the abdominal spines to increase in length as we proceed southward into peninsular Florida, and to decrease in length from west Texas to California, where they are very short and black.

Gasteracantha cancriformis gertschi, new subspecies.

FEMALE. Total length, 11.0 mm. Width of the abdomen, 14.0 mm. Carapace, sternum, and appendages black. Dorsum of abdomen having a predominately white or bright creamy yellow ground-color; four rows of blackish dots, the two outer ones curved, all arranged about as in *G. cancriformis;* spinose processes brilliant red. Venter black, mottled with yellow, white and red spots, extending towards the center from the base of the spinose processes. Knob anterior to the spinnerets dark red.

Epigynum as illustrated in Plate 4, fig. 6.

MALE. Total length, 2.0 mm. The abdomen is paler than that of the male *G. cancriformis.*

TYPE LOCALITY.—Female holotype from slash-pine woods, outskirts of Homestead, Dade County, Florida, December 27, 1940, A. F. Archer. Female paratypes from the same locality. Types in the collection of the American Museum of Natural History, New York, and the Archer Collection, Alabama Museum of Natural History, Tuscaloosa.

In the epigynum of *gertschi* the pair of openings to the spermathecae are three times the diameter of one of them apart, whereas in *cancriformis* they are about twice the diameter of one of them apart (as far as has been observed). In the females of *gertschi* the marginal spines (spinose processes), especially the second and caudal pairs are longer[4]. The following table shows comparisons in the spines:

	Total Length	Width of Abdomen	Length of right spine No. 2	Right caudal spine
Gasteracantha cancriformis gertschi.	10.0-13.0 mm.	11.0-14.0 mm.	2.0-2.8 mm.	2.4-3.0 mm.
Gasteracantha cancriformis.	10.0-11.0	10.0-11.0	1.5	1.4-1.9

DISTRIBUTION: Florida Counties; Brevard, Charlotte, St. Lucie, Sarasota.

ECOLOGY: This spider places very large webs (like those of *G. cancriformis*) between pines and hardwood trees; Miami pine woods, palm savannas, low hammocks, tropical hammocks, citrus groves, ornamental shrubs in urban gardens. It is very abundant in sunlit situations, and therefore favors pine woods and citrus orchards. The web is often placed some distance from the ground. As usual it is ornamented with flocculent tufts.

KEY TO THE GENERA OF ALABAMA ARGIOPIDAE

This key is designed to cover all known genera of Argiopidae found in Alabama. For all practical purposes it also applies to the genera of Georgia and Florida with the exception of *Cercidia* and possibly *Pachygnatha*.

To those who are familiar with the external anatomy of insects or spiders the terms used in the key present no mystery. Comstock's "Spider Book" (now available in a new edition) is to be recommended to those who are unfamiliar with the terms employed. In that book, pages 95-134 are especially useful. In certain parts of the key I have suggested familiar equivalents to the

[4]Almost certainly figure 556[1] in Comstock's "Spider Book", page 526, new edition, is a specimen of *gertschi* from lower Florida.

terms employed, placing the equivalents immediately afterwards in parentheses. In all cases the term carapace (fused head and thorax) is substituted for the more cumbersome one, cephalothorax. *Pars cephalica* is used in many places instead of *head,* a rather inexact term.

The key, unless otherwise specified, pertains to females, for they are better known, and more commonly observed. The size or total length mentioned in the key is the combination of the carapace and abdomen, and does not include the span of the legs. In many instances it was impossible to improve on the characters used by Comstock in keying out the Argiopidae. However, the key to the Alabama Argiopidae departs from his plan in certain cases. Here more emphasis is placed on the genitalia and other special structures, and his arrangement of abdominal characters is considerably modified.

All page references will pertain to Museum Paper 14, unless marked (Supplement), in which case they refer to this publication.

The Argiopidae are spiders having eight eyes, three pairs of eyes symmetrically grouped. The tarsi of the legs are hirsute, but lack the comb like arrangement of serrated bristles found in the Theridiidae, a related family. If serrated bristles are present, they lack any serial arrangement. The legs also lack the series of long spines regularly spaced together with the series of shorter spines between each two long spines, a condition found in the related family, the Mimetidae. The external surface of the chelicerae lacks a stridulating organ. The three claws on the tips of the legs are either similar or dissimilar and pectinate in a single row.

1. Eyes dissimilar in color, distinctly heterogeneous; tarsi of fourth legs clothed with serrated bristles. Very small spiders (1.5-3 mm.) with a rounded, high abdomen and very short legs. ---------- **Theridiosoma,** p. 17

1. Eyes similar in color, homogeneous; tarsi of fourth legs not clothed with serrated bristles. Spiders of all sizes, very small to very large. (2)

2. Epigastric plates not marked by transverse furrows. Boss (lateral condyle) lacking on the chelicerae (jaws), or very rudimentary. (3)

3. Epigynum (vulva) a mere slit lacking a scape (ovipositor) or atriolum (basal plate of vulva). Epigastric furrow between the spiracles procurved. (4)

4. Maxillae (endites) convergent, not dilated at the distal end. Chelicerae small. Tarsi lacking accessory claws. Very small spiders (2 mm.) with a rounded abdomen and short legs ..... **Mimognatha**, p. 18

4. Maxillae parallel, dilated at the distal end; tarsi with accessory claws. Chelicerae large. Spiders of medium size or less (7-14 mm.) with very long, slender legs and a long, slender abdomen ..... **Tetragnatha**, p. 19

3. Epigynum (vulva) either having a chitinized margin with visible dots behind or else complex, sometimes having a scape (ovipositor), but never a mere slit. Epigastric furrow between the spiracles straight. (5)

5. Anterior and posterior lateral eyes very closely approximated. (6)

6. A single or double fringe of hairs on the external face of the posterior femora. Epigynum provided with a more or less prominent tubercle or scape. Spiders of barely medium size (8 mm.), brilliantly colored with green, silver, red, and ebony **Leucauge**, p. 25

6. Posterior femora not fringed. (7)

7. Abdomen possessing one or more pairs of tubercles. (8)

8. A distinct hump on the shoulders of the narrow abdomen. Legs fairly long. Epigynum lacking an elongate scape; its edge merely elevated. Spiders of less than medium size (8 mm.); abdomen brightly colored with green, white, black, and brown **Allepeira**, p. 24

8. Abdomen as wide as long; truncated behind; each posterior corner having tubercles. Legs short and stout. Epigynum having an elongate, fleshy scape. Spider very small (3 mm. or less); dark colored. ..... **Colphepeira**, p. 12 (Supplement)

7. Abdomen oval and without humps or tubercles. Epigynum with a thick fleshy scape. Medium-sized spiders (10 mm.); dark brown with abdomen mottled ..... **Meta**, p. 25

5. Anterior and posterior lateral eyes well separated. (9)

9. Abdomen having two pairs of dorsal tubercles, very short, higher than long. Epigynum rather simple, having a heavily chitinized margin with small dots on each outer corner. Very small spiders (3 mm.) ..... **Nicholasia**, p. 27

9. Abdomen oval, lacking tubercles, and not greatly elevated. Atriolum (basal plate of vulva) heavily chitinized and perforated by a pair of holes. Spiders below medium size (7 mm.) **Azilia**, p. 26

2. Epigastric plates marked by transverse furrows. Boss (lateral condyle) on the chelicerae present and distinct. (10)

10. Spinnerets not tubulated nor elevated on a projection bordered by a flange-like ring. (11)

11. Labium longer than broad. Legs armed with brush-life tufts. Females very large (23-34 mm.) and with a rather long, parallel-sided abdomen. Legs very long. Abdomen brownish, spotted. Males slender and very dwarfish. ..... **Nephila**, p. 28

11. Labium broader than long. Legs not armed with brush-life tufts. (12)

12. Posterior row of eyes strongly procurved; anterior lateral eyes much smaller than posterior lateral eyes. (13)

13. Anterior median eyes nearer to each other than to anterior lateral eyes. Epigynum either divided by a septum or raised and convex anterior to a vault-like opening. Females large (19-26 mm.); males dwarfish. Conspicuously colored spiders ..... **Argiope**, p. 31

13. Eyes of anterior row about equidistant from each other. Epigynum having a vault-like opening anteriorly and convex posteriorly. Both sexes small (4-5 mm.) ..... **Gea**, p. 31

12. Posterior row of eyes recurved, straight or very slightly procurved; anterior lateral eyes not much smaller than posterior lateral eyes. (14)

14. Carapace with a pair of horns on the thorax, and covered with numerous conical points. Epigynum a simple pair of holes. Females barely medium-sized (9-11 mm.), and having the abdomen elevated above the thoracic region, sometimes surmounted with a pair of humps. Males very tiny, about the size of young spiderlings ..... **Mastophora**, p. 31

14. Carapace without conical points or horny outgrowths. Epigynum more elaborate. (15)

15. Thoracic portion of carapace elevated, as high as long. Small, brown spiders with the abdomen very elevated.... **Scoloderus** p. 31, p. 13 (spplement)

15. Carapace more or less elevated, but never as high as long. (16)

16. Abdomen having humps on shoulders, or cones, horns, tubercles with or without apical protruberances. (17)

17. Abdomen having shoulder humps only. (18)

18. Shoulder humps broken up into a mass of irregular tubercles. Spiders having an arched carapace, triangular-ovate; abdomen subglobose, chalky white, mottled with black; 21 mm. long. **Kaira**, p. 32

18. Shoulder humps not broken up into irregular tubercles. (19)

19. Shoulder humps enormously elevated, nearly consolidated; abdomen about as high as long. Posterior median eyes larger than anterior median eyes, elevated; median ocular area wider behind than in front, and wider behind than long. Spiders barely medium-sized (8 mm.) ..... **Wixia**, p. 40

19. Shoulder humps widely separated; not enormously elevated; abdomen not as high as long. Anterior and posterior median eyes little contrasting in size; median ocular area not much longer than wide. The scape is usually fleshy. Second coxa of male having a spur on the base, at least in many cases. Spiders very small to large (2.3-25 mm.); sometimes conspicuously colored. Subgenus *Aranea*; the angulate Araneas ..... **Aranea**, pp. 41-43, p. 18 (Supplement)

17. Abdomen with or without shoulder humps, but always having apical protrusions, tubercles, cones, or humps; accessory cones or tubercles on sides or dorsum of the abdomen *may or may not be present.* (20)

20. Cones, humps, or horns occurring all the way from the base of the abdomen to the apex. (21)

21. Tibiae of first and second pairs of legs without spines above. Base of abdomen having horns on the shoulders but no median cone. Sides of abdomen ornamented with erect cones. Apex of

abdomen with four or five cones. Rather small spiders (5 mm.) with pars cephalica convex behind the eyes..... **Wagneriana**, p. 35

21. Tibiae of the first and second pairs of legs armed with spines above. A median cone on the base of the abdomen. Sides and apex of abdomen armed with flaring cones or spinose processes. Medium-sized spiders (12 mm.)..... **Acanthepeira**, p. 35

20. No cones or horns on the base of the abdomen. Apical tubercles, cones or protrusions always present, with or without marginal or dorsal tubercles. (22)

22. Females. Abdomen subtriangular. Scape of epigynum elongated and tapering. Pars cephalica and thorax not nearly separated by a deep cervical (transverse) groove. (23)

23. Females. Scattered tubercles from shoulders, on margin of abdomen behind, and on apex. No median longitudinal furrow present on thoracic portion of carapace. Scape of epigynum directed caudally almost to the spinnerets. Medium-sized spiders (11 mm.) with a large, triangular, light-colored shield on the dorsum of the abdomen ..... **Verrucosa**, p. 39

23. Females. No tubercles on the sides of the abdomen. Apex of the abdomen having a raised keel or cone. Thoracic region having a deep longitudinal furrow joining the cervical (transverse) groove. Scape of the epigynum directed anteriorly. Spiders of barely medium size (8 mm.); dorsum of abdomen having a variable folium ..... **Eustala**, p. 54

22. Females. Abdomen more or less elongated. Epigynum lacking an elongate scape. Pars cephalica and thorax nearly divided by a deep cervical groove. Apex of abdomen having a cone or protrusion, with or without one or more pairs of dorsal tubercles. The apical (caudal) protrusion may be simple or divided. Small or rather small spiders (7 mm. or less) with spinnerets located mesally ..... **Cyclosa**, p. 33

22a. Males (never having pars cephalica and thorax separated by a deep cervical groove). Distal portion of the tibia of the second pair of legs bearing a long, forked spine. Ventral faces of first and second pairs of legs having very long spines. Spiders of less than medium size (6 mm.) with very long legs and tubercles on the lateral margins of the abdomen behind the shoulders..... **Verrucosa**, p. 39

22a. Males. No forked spine present on the tibia of the second pair of legs. Ventral faces of femora of first and second pairs of legs lacking very long spines. (23a)

23a. Males. A row of erect, short, stout spines (at least three) on the ventral face of the tibia of the second pair of legs. Abdomen oval or elongate, and having either a blunt or elongate apical cone. Small spiders (3 mm. or less); short-legged ..... **Cyclosa**, p. 33

23a. Males. Spines, if present on ventral face of tibia of second pair of legs, a distal and medial one, moderately, long, not erect or forming a row. Abdomen nearly subtriangular, and with a blunt apical cone. Spiders small or at least under medium size (7 mm. or less) with long legs ..... **Eustala**, p. 54

16. Abdomen lacking humps or protrusions of any sort; apex rounded off, or at most very bluntly angular. (24)

24. Median furrow of thoracic region either a pit with transverse extensions, or if longitudinal, very slight, and not joining the cervical groove (except males of *Aranea* and *Eriophora*). (25)

25. Abdomen elliptical, sometimes broader behind the middle than at the base, and as high behind the middle as at the base. Small or rather small spiders (3-7 mm.) with relatively short legs; dorsum of abdomen shiny, and sometimes with variable patterns ..... **Singa**, p. 36

25. Abdomen highest near the base and widest at the base. Spiders of various sizes. (26)

26. Tibiae of the first and second pairs of legs without spines above. Medium-sized spiders (10 mm.) with the abdomen oval, and the scape of the epigynum recurved between heavily scleritized openings ..... **Metazygia**, p. 36

26. Tibiae of first and second pairs of legs with spines above, at least one. (27)

27. Scape of the epigynum recurved. Metatarsus and tarsus together longer than the combined length of the tibia and patella. Boss on the chelicera reduced, although distinct. Patella of the male palpus lacking spines. Medium-sized spiders (10 mm.) in which the openings of the epigynum are not heavily scleritized (conf. *Metazygia* above) ..... **Metepeira**, p. 38

27. Scape of the epignum directed more or less backwards, at least not recurved; sometimes absent. Metatarsus and tarsus together not longer than the combined length of the tibia and patella. Boss on the chelicera distinct and not reduced. (28)

28. Openings in the atriolum (basal plate of the vulva) exposed, visible from below, not cryptic; anterior portion of atriolum without anteriorly directed protruberances. Scape of the epigynum broad or slender, but neither extending to the base of the spinnerets nor nearly to them. Embolus of male palpus not elbow-shaped. No spur on the second coxa. Spiders of various sizes, small, medium, large (3-20 mm.); sometimes conspicuously colored. Subgenus *Epeira;* the round-shouldered Araneas ..... **Aranea,** pp. 43-46

28. Openings in the atriolum cryptic, not visible from below; when seen from the caudal view, appearing as a pair of semicircular rings. Anterior portion of atriolum having anteriorly directed protruberances. Scape of the epigynum (sometimes lost) very long and slender, extending to the base of the spinnerets, or nearly so. Embolus of the male palpus elbowed and long. Large spiders (19 mm.) with a large abdomen and a pale dorsum; resembling large species of *Neoscona* (q. v.) in appearance .. **Eriophora,** p. 51, p.23 (Supplement)

24. A deep longitudinal, median furrow in the thoracic region, extending forward to meet the cervical groove. (29)

29. Abdomen elongate, two or three times as long as broad. Scape of epigynum very short and simple. Yellowish, elongate, slender spiders of medium size (12 mm.) ..... **Larinia,** p. 53

29. Abdomen oval, ovate, or triangular-ovate, less than twice as long as broad. Scape somewhat more complex than in *Larinia.* (30)

29. Tibia of third legs having a cluster of pinnate cilia on the anterior face. Second row of eyes nearly straight or very slightly procurved. Small spiders (2.5-4 mm.) having an elongate, oval abdomen, the anterior end frequently projecting over the carapace ..... **Mangora,** p. 52

30. Tibia of the third legs without a cluster of pinnate cilia on the anterior face. Second row of eyes recurved. (31)

31. Scape projecting anteriorly, long, wedge-shaped, and with a black, horseshoe-shaped sclerite at the base. One spine on the

patella of the male palpus. Spiders less than medium-sized, often small (less than 8 mm.); abdomen widely triangular-ovate ..... **Eustala**, p. 54

31. Scape projecting downward or posteriorly, either chitinous or fleshy, varying from long to short and wide. One or two spines on the patella of the male palpus. (32)

32. Scape of the epigynum fleshy, short and broad; openings of the spermathecae exposed in the atriolum, not cryptic. Males having the tibiae of the second pair of legs thickened, and with long, scattered spines. Patella of male palpus having one spine. Anterior coxae of the male having apical teeth. Spiders below medium size (8 mm.) with the abdomen ovate; folium of the abdomen in the form of a leaf with a similar pattern inside ..... **Acacesia**, p. 54

32. Scape spoon-shaped, chitinous, more or less elongate; openings of the spermathecae cryptic, hidden in the dorsal wall at the base of the scape; atriolum elongate or circular, more or less fused with the scape. Patella of male palpus having a pair of spines. Tibiae of second pair of legs not thickened, having crowded, stout spines. Lateral eyes of the male not situated on a prominent tubercle, or if on a prominent tubercle, then (33). Spiders rather small to large (7-19 mm.) having the abdomen triangular-ovate; legs dusky to reddish brown; abdomen of various shades and patterns ..... **Neoscona**, p. 47

33. Males only. Lateral eyes, each pair situated on a prominent tubercle. (34)

34. Embolus of male palpus long and elbow-shaped ... **Eriophora**, p. 51.

35. Embolus of male palpus not long or elbow-shaped **Aranea**, p. 41

10. Spinnerets tubulated, elevated on a very large projection, and bordered by a flange-like ring. Abdomen always hard or leathery. (36)

36. Abdomen wider than long. Carapace of female as wide as long. Epigynum lacking a scape. Medium-sized spiders (12 mm.) having three pairs of spines on the abdomen, two on the lateral margins and a pair on the apex; dorsum of the abdomen yellow or

white with black dots; each spine black or red; the short legs and carapace black ..... **Gasteracantha**, p. 57

36. Abdomen longer than wide. Carapace longer than wide. Epigynum having a short scape. Abdomen having at least a pair of conical spines on each posterior corner at the apex; additional spines on the lateral margins, dorsum, and base may be present. Spiders with relatively short legs; rather small to medium-sized (5-12 mm.); coloration black, ivory, white, or varied with red ..... **Micrathena**, p. 58

PLATE I

Fig. 1. *Theridiosoma argentatum* Keyserling. Right male palpus. Big Creek, Houston County, Alabama

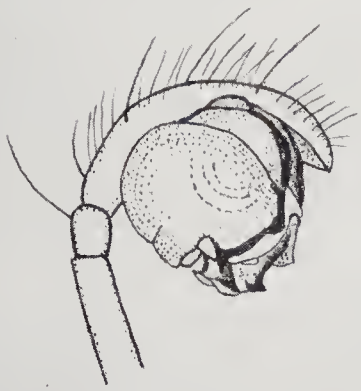
Fig. 2. *Tetragnatha pinea* Seeley. Right male palpus. Tuscaloosa, Tuscaloosa County, Alabama.

Fig. 3. *Colphepeira catawba* (Banks). Right male palpus. Gulf State Park, Baldwin County, Alabama.

Fig. 4. *Colphepeira catawba* (Banks). Epigynum. Gulf State Park, Baldwin County, Alabama.

Fig. 5. *Singa van-bruyselli* Becker. Epigynum. Kistachie National Forest, Grant Parish, Louisiana.

Drawn by the author.



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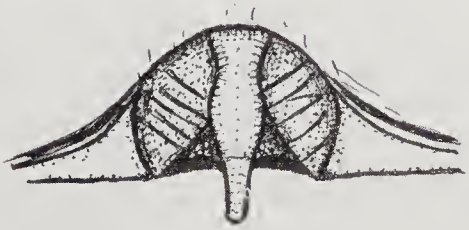

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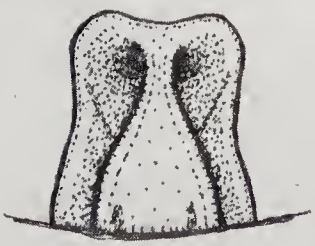

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PLATE II

Fig. 1. *Colphepeira catawba* (Banks). Ventral view of the abdomen of the female. Gulf State Park, Baldwin County, Alabama. X 18.7.

Fig. 2. *Colphepeira catawba* (Banks). Female. Gulf State Park, Baldwin County, Alabama. X 18.7.

Fig. 3. *Colphepeira catawba* (Banks). Carapace of the male. Gulf State Park, Baldwin County, Alabama. X 32.

Fig. 4. *Scoloderus tuberculiferus* (Cambridge). Right male palpus. Sarasota, Sarasota County, Florida.

Fig. 5. *Scoloderus tuberculiferus* (Cambridge). Male. Sarasota, Sarasota County, Florida. X 14.8.

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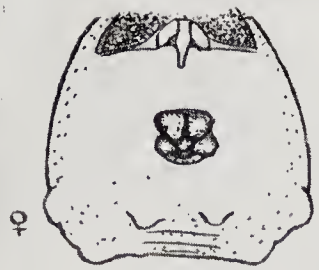

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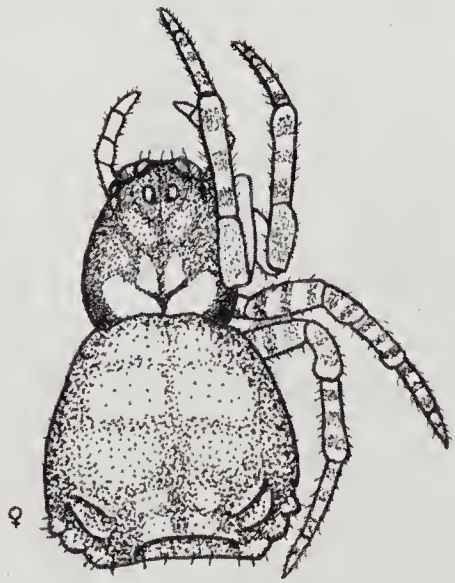

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PLATE III

Fig. 1. *Singa maura* (Hentz). Right male palpus. Cheaha State Park, Alabama.

Fig. 2. *Aranea solitaria* (Emerton). Epigynum. May's Gulf, Cherokee County, Alabama.

Fig. 3. *Aranea nivea* (Hentz). Female. Oak Mountain State Park, Shelby County, Alabama. X 18.7.

Fig. 4. *Aranea nivea* (Hentz). Epigynum. Oak Mountain State Park, Shelby County, Alabama.

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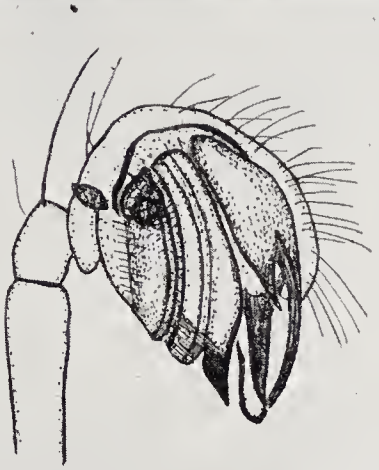

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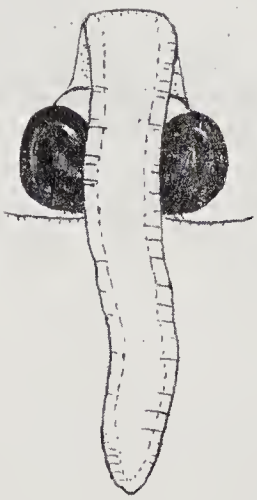

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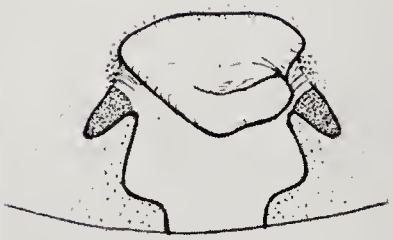

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PLATE IV

Fig. 1. *Aranea miniata* (Walckenaer). Epigynum. Gulf State Park, Baldwin County, Alabama.

Fig. 2. *Aranea floridensis* (Banks). Epigynum. Royal Palm State Park, Dade County, Florida.

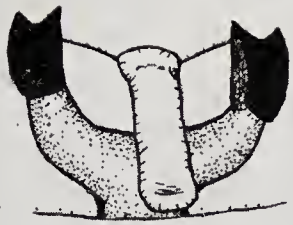
Fig. 3. *Gasteracantha cancriformis* (Linnaeus). Right male palpus. Andalusia, Covington County, Alabama.

Fig. 4. *Aranea nivea* (Hentz). Right male palpus. Kisatchie National Forest, Fishville, Grant Parish, Louisiana.

Fig. 5. *Gasteracantha cancriformis* (Linnaeus). Epigynum. Omussee Creek, Houston County, Alabama.

Fig. 6. *Gasteracantha cancriformis gertschi* Archer. Epigynum. Homestead, Dade County, Florida.

Drawn by the author.



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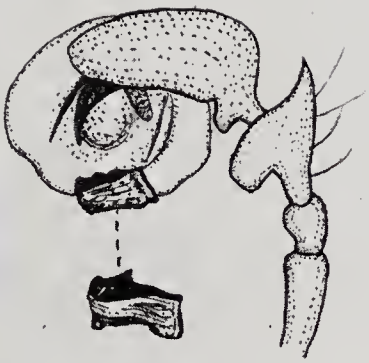

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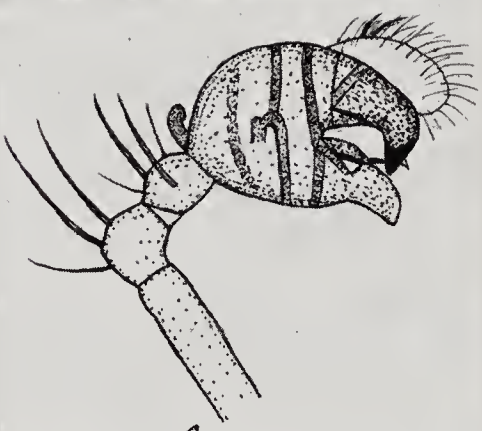

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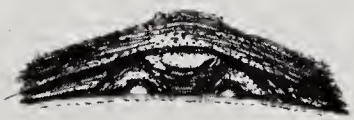

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