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## Nearctic Genera of the Spider Family Agelenidae (Arachnida, Araneida)

BY VINCENT D. ROTH<sup>1</sup> AND PATRICIA L. BRAME<sup>2</sup>

### ABSTRACT

The objective of the present paper is to provide a means of identifying the genera of Nearctic agelenids. An illustrated key is provided with a description of the family and groups within the family. Each genus is diagnosed and described, and typical male and female genitalia are illustrated. Notes are provided for each genus on the number of species, distribution, and habitats.

### INTRODUCTION

The intent of the present paper is to provide students of spiders a readily available means of recognizing and identifying Nearctic agelenids through well-tested illustrated keys and descriptions of genera.

The absence of workable keys to genera in most families is a major problem in the study of spiders. A notable exception is the key to the genera of Theridiidae (Levi and Levi, 1962) which, in part, provided the stimulus for the present study. It is to be hoped that specialists will be encouraged to publish similar keys to other groups of spiders.

The descriptions of the genera are brief but include the main differentiating characters of the Nearctic species. References are given only to original descriptions and important Nearctic revisions. The bibliography is not complete. References are given only to those papers that are useful in determining agelenids to genus and species.

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<sup>1</sup> Southwestern Research Station, Portal, Arizona.

<sup>2</sup> Whittier Narrows Nature Center, South El Monte, California.

The family Agelenidae contains about 75 genera and almost 700 described species. In the region covered by this paper there are 24 genera and 251 species. Another approximately 175 undescribed species are known from collections from the Nearctic Region and Mexico.

Most of the illustrations were made by the junior author. Many were based on drawings by Ivie in Chamberlin and Ivie publications (1937, 1940, 1941, 1942a, and 1942b). A few were based on drawings by Muma (1946, 1947) or preserved specimens. The drawings are provided to illustrate generic characters and were not made for species identification, although, in many cases, species are indicated.

The key originally was designed to complement the senior author's key to South American agelenids (Roth, 1967) and to include Mexican and Central American species. Unfortunately, this was not practical as many of the described species are known from only one sex and are not congeneric with the polyphyletic genera *Melpomene*, *Rualena*, and *Novalena* in which they are presently placed. There are seven described and several undescribed genera known from mainland Mexico and Central America. Four of these, *Tegenaria*, *Cicurina*, *Tortolena*, and *Agelenopsis*, will key out satisfactorily in the key below; the other three genera, *Melpomene*, *Novalena*, and *Rualena*, will not.

The Nearctic Region refers, in the present paper, to that part of the Western Hemisphere north of mainland Mexico. Baja California is included in the key because its agelenid fauna is more similar to that of southern California than to mainland Mexico.

Several genera and species previously listed from Mexico and Central America do not belong in the Agelenidae and have been discussed elsewhere (Roth, 1965; Lehtinen, 1967). The genus *Thaida* Karsch was erroneously listed from Costa Rica by Petrunkevitch (1911). *Ishania* Chamberlin from Costa Rica is a zodariid, *Barrisca* Chamberlin from Panama is a pisaurid of the subfamily Rhoicininae, and *Coelotes exaptus* Banks of Baja California represents an unidentified clubionid genus. Three agelenid records from Baja California listed by Chamberlin (1924, p. 670) refer to other species. Specimens representing the records of "*Agelena* sp." and "*Coelotes* sp." are no longer in the California Academy of Sciences collections but "*Agelena* sp." probably represents the genera *Agelenopsis* and *Rualena*, and "*Coelotes* sp." unidentified clubionids. "*Agelena naevia* Walckenaer" has been questionably identified by the senior author as a female of *A. potteri* (Blackwall).

The family Agelenidae as considered here includes the Ageleninae (Simon's groups Ageleneae and Cryphoeceae) and Cybaeinae but excludes the Hahniidae. Lehtinen's (1967) radical classification is not used mainly

because of the extreme difficulty experienced in using his grouping of genera, the inadequacy of his tables for separating genera and higher categories, and general lack of acceptance of his proposals by arachnologists.

Common terms for various groups are: "agelenids" for all representatives of the family Agelenidae; "cybaeines" for spiders of the subfamily Cybaeinae, which includes the four genera *Cybaeus*, *Cybaeota*, *Cybaeina*, and *Cybaeozyga*, and "agelenines" for spiders of the subfamily Ageleninae and the groups Ageleneae and Cryphoeceae. The Ageleneae contains the genera *Agelenopsis*, *Barronopsis*, *Calilena*, *Hololena*, *Melpomene*, *Novalena*, *Rualena*, and *Tortolena*. The Cryphoeceae contains the remaining genera with the exception of *Tegenaria*. The latter is intermediate, having the plumose hair of the Ageleneae and the eye arrangement of the Cryphoeceae. For these reasons it is treated as *incertae sedis*.

#### DEFINITIONS

Illustrations are provided for most of the terms in the key. Other terms in the text are well known to students of spiders and can be found in Kaston's glossary (1948, 1953, 1972). A few terms are more fully defined and several new terms and methods of measurements are explained below.

**EYES:** The eyes of soil- and cave-inhabiting agelenids are represented by the following stages of diminution from the normal eight-eyed state: (a) reduction in size of the anterior median eyes (many genera, but extreme reduction in some *Blabomma*, *Cybaeus*, and *Cybaeozyga heterops* Chamberlin and Ivie); (b) loss of the anterior median eyes (*Blabomma* and *Cicurina* in part, and *Yorima*); (c) reduction of the size of all eyes with a retention of pigment (*Tegenaria caverna* Gertsch); (d) reduction of the size of all eyes with a loss of pigment except in the anterior median eyes (*Cybaeus*, new species); (e) reduction in size of all eyes, loss of pigment and loss of anterior median eyes (*Cybaeozyga*, new species, *Cicurina* sp., and *Blabomma*, new species); and (f) complete loss of eyes (*Blabomma*, new species, and *Cicurina* sp.).

The term eye spots is used for the intermediate stage when the eye pigment is lost but the cornea is still present. The eye spots are usually visible as a lighter area underneath the transparent cornea.

**EYE CURVATURE:** The method of measuring the curvature of the eye row was proposed by Roth (1967, pp. 300-301) in which the amount of curvature is indicated by a fraction. The lateral eyes are divided into sixths and the curvature is measured by the amount (in sixths) that the lateral eyes are advanced ahead or behind an imaginary line through the center of the median eyes. Thus, a straight eye row would have the imaginary line extending through the middle of the lateral eyes and would be

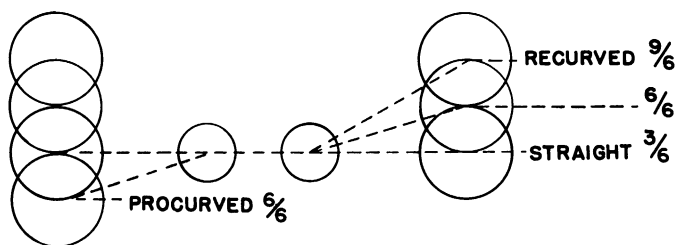


FIG. 1. Schematic sketch showing method of measuring curvature of the eyes.

indicated as 3/6. A recurved or procurved eye row (6/6) would have the imaginary line touching the anterior or posterior edge of the lateral eye. Figure 1 illustrates the method of measuring curvature.

**CHELICERAL TEETH:** There are no absolute means of defining the difference between teeth and denticles. The terms refer to the large and tiny teeth (fig. 2) of the cheliceral retromargin. When both are present, the dividing line between the two is usually distinct but occasionally there is a gradual reduction in size, and the student must use his own judgment in determining the line of demarcation. When all teeth are about the same size (fig. 3), whether large or small, they are referred to as teeth even though in some cases (small *Blabomma*) they are minute and appear as denticles.

**SETAE:** The types of setae commonly found on agelenid spiders are illustrated in figure 4. They range from the slender flexible "hairs" to the stiffer "setae" to the large spines referred to below. Plumose and simple hairs are usually visible with 36× magnification. Observation of other setae usually requires a compound microscope. The term plumose hair is used in the traditional way. Lehtinen's (1967, pp. 286, 410) synonymous

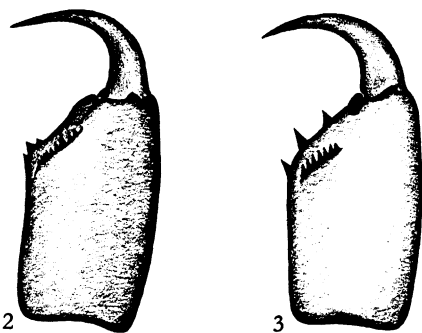


FIG. 2. Chelicera with teeth and denticles (*Cicurina*).

FIG. 3. Chelicera lacking denticles, with tiny teeth only (*Cybaeozyga*).

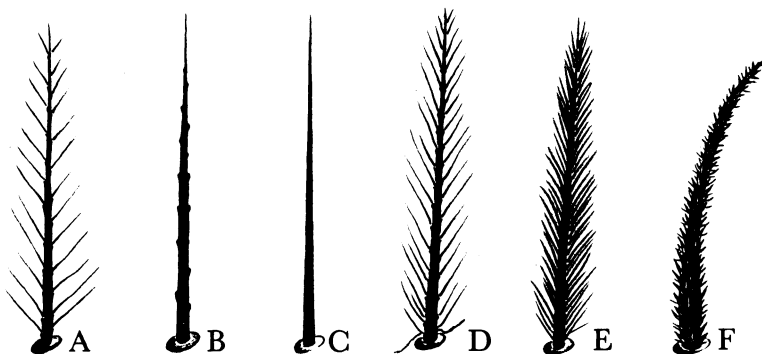


FIG. 4. Types of setae. A. Plumose. B. Simple serrate. C. Simple. D. Pilose. E. Densely pilose. F. Bristly.

terms plumose and feathery are not practical, especially when his use of plumose differs from that which is traditionally used.

**SPINATION:** The ventral spines (macrosetae of Coyle, 1968, p. 162) of tibia I and metatarsus I are in many cases more lateral than ventral at the tip (fig. 5) but are counted herein as ventral. Metatarsus I is in many cases terminated by a ventral spine and two somewhat lateral spines, all of which are considered ventral and which are designated as "metatarsi I, ventral 2-2-3." The first two numbers indicate pairs of spines; the third, the group of three spines. When any pair of spines is lacking, the absence is indicated by a zero, e.g., tibia I, ventral 2-2-0 (fig. 6). When one spine is missing from a normal pair, e.g., 2-2-1p, the position of the remaining spine is designated by "p" (prolateral) or "r" (retrolateral).

**SPINNERETS:** Occasionally in dehydrated specimens the spinnerets telescope and appear shorter than they really are or the abdomen contracts causing the spinnerets to appear contiguous. On the contrary, specimens poorly preserved become bloated and the spinnerets become extended and more widely separated than is normal. In these cases it is necessary



FIG. 5. Ventral spination of tibia I showing lateral position of distal spines (*Cybaeota*).

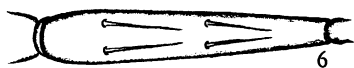


FIG. 6. Ventral spination of tibia I, distal spines missing (*Cybaeus*).

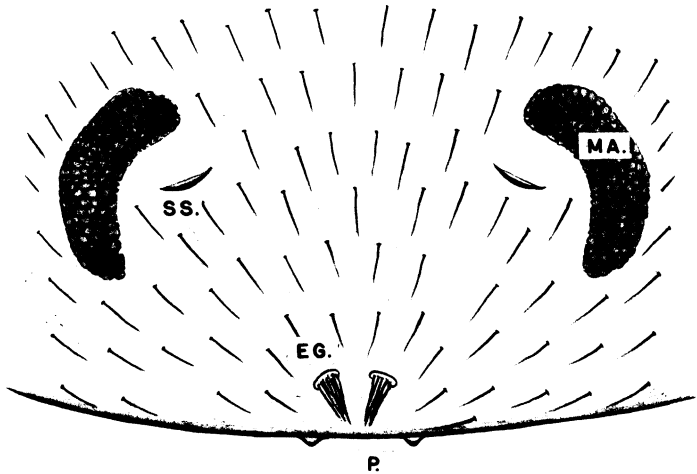


FIG. 7. Epigastric area of a male *Hololena hola* (Gertsch).

Abbreviations: EG., epiandrous glands showing fusules; MA., muscle attachment; P., papillae; SS., single slit sensilla.

to use judgment in making measurements or determining whether the anterior spinnerets are contiguous or separated.

**COLULUS:** Consists of a low setose swelling, often divided or reduced to a few or two setae situated on the membranous area between the base of the anterior spinnerets and the tracheal spiracle.

**EPIGASTRIUM OF MALES:** This median area between the book lungs and anterior of the epigastric furrow contains an array of microscopic structures, hairs, setae, fusules, and slits that are not usually noted. The most consistent structures are the single slit sensilla (Machado, 1951, p. 29; Marples, 1955, p. 462), a pair of single slits (fig. 7) positioned at a 30- to 45-degree angle anterior to the epigastric furrow. They are separated from each other by once to twice their distance from the epigastric furrow. Anterior and lateral to these slits are smooth muscle impressions that are in many cases granulated at the attachment point.

Between the single slit sensilla and the epigastric furrow is an area, sometimes membranous, toward which the surrounding setae are directed. In this area may be found the clear spicule-like fusules of the epiandrous glands (fig. 7) noted by Machado (1951, pp. 35, 36), Melchers (1964, pp. 517-536), and Marples (1967, pp. 219-221) in other families of spiders. These structures may be present or absent in the Agelenidae. On the anterior median border of the male epigastric furrow a pair of minute,

transparent membranous papillae often can be seen. The "papillae" noted by Marples (1955, pp. 462, 464) are the fusules of the epiandrous glands which he noted later (1967, p. 219).

**MALE GENITALIA:** Gering's (1953) definitions and terminology of the agelenid palpus have been followed for the most part. Exceptions have been the substitution of the terms "tegular median process" and "tegular lateral process," known collectively as "tegular processes," for Gering's "median apophysis" and the use of the latter for the "mammar-like tubercle" of Gering. These changes were prompted partially by a recent letter from R. R. Forster (1970) in which he indicated that he and C. L. Wilton consider the "tubercle" of the palpus to be the median apophysis, and partially by Lehtinen's (1967, p. 412) usage.

The agelenid palpus is relatively simple. The least complicated type is found in the cybaeines and most Cryphoeceae which bear a simple, usually whiplike embolus, occasionally short, stout, spurlike (*Dirksia*, *Ethobuella*), sometimes large and coiled (*Agelenopsis*, *Barronopsis*), which arises mesally or proximally (*Coras*, *Wadotes*) from the tegulum. In *Agelenopsis* a short segment (radix) joins the embolus to the tegulum. The base of the embolus usually tapers gradually (*Cybaeus*) from the tegulum or is swollen at the base, tapering distally (*Cicurina*), occasionally with a small process (embolic process) solidly or closely attached to the base (*Rualena*, *Cryphoecca*) or with one or more large processes arising from the base (*Tortolena*, *Melpomene*, *Coras*, and *Wadotes*).

The conductor is a sclerotized structure that in many cases is more or less T-shaped with one or more processes. It is attached by a membrane to the tegulum between the base of the embolus and the median apophysis and is situated ectally or distally. It is lacking in *Coras* and *Wadotes*, where it is replaced by the large complicated embolic process. This conclusion is based on the fact that *Tortolena* and *Melpomene* have a similar embolic process as well as a conductor.

The functional conductor is any structure that supports the embolus. It is usually the conductor, occasionally the fulcrum, or parts of the embolic process. The fulcrum is a membranous structure that arises at the base of the conductor. It is especially large in *Hololena*. The median apophysis is a cusplike, clamlike, teatlike, or finger-like partially or wholly membranous process attached to an ectal membranous area on the face of the bulb. It is large and conspicuous in some genera (*Coras*, *Wadotes*, *Tegenaria*) or exists only as a membranous spot in some *Agelenopsis* or is absent in the cybaeines and most Cryphoeceae.

The tegulum is usually a thickened, heavily sclerotized, disklike segment, membranous distally, which supports the conductor, fulcrum, median

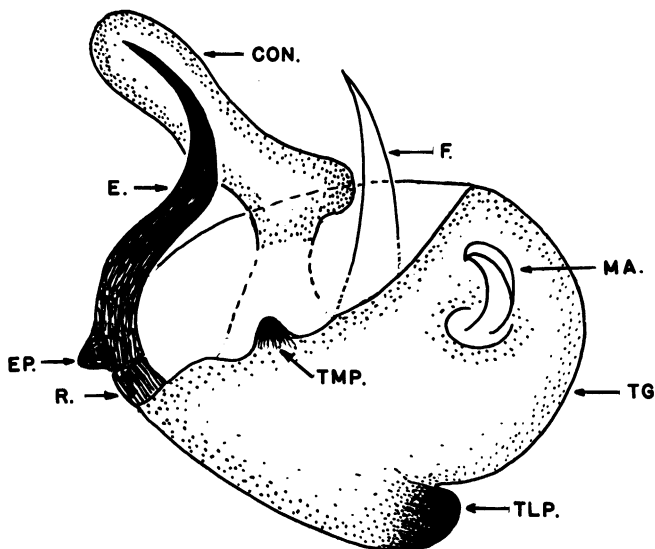


FIG. 8. Composite schematic sketch of the tegulum and processes.

Abbreviations: CON., conductor; E., embolus; EP., embolic process; F., fulcrum; MA., median apophysis; R., radix; TG., tegulum; TLP., tegular lateral process; TMP., tegular median process.

apophysis, and the embolus. It is occasionally produced along the lateral edge to form the "tegular lateral process" (*Melpomene*, *Barronopsis*) or is more or less produced along the distal membranous edge to form the "tegular median process" (*Blabomma*, *Agelenopsis*, some *Novalena*, and others). These structures are not invariably distinct from one or the other but both occur in *Melpomene* and *Tortolena*.

A schematic sketch is given (fig. 8) of a composite agelenid palpal bulb showing only the tegulum and distal parts.

#### ACKNOWLEDGMENTS

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FIG. 9. Trichobothria on tarsus (*Agelenopsis*).

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#### FAMILY AGELENIDAE

**DIAGNOSIS:** Many agelenid spiders have the appearance of amaurobiids but can be separated from them by the absence of a cribellum and calamistrum. The related Hahniidae can be separated by the arrangement of their spinnerets in a transverse row. The agelenids can be separated from all other spiders by the presence of three tarsal claws and a single row of two or more trichobothria on the dorsal surface of the tarsi, increasing in length toward the tip, and by the absence of notches on trochanters I and II.

Color, yellowish white to orange in smaller species to orange-brown, brown or gray in larger species. Abdomen of darker specimens with pale chevrons.

Eyes, eight or six in two rows (one species of cave *Cybaeozyga* has six eyes in three rows) or absent. Thoracic furrow longitudinal. Chelicerae free at base; boss present; fringe of hairs overlapping fang; promargin normally with three contiguous teeth (except *Saltonia* and *Cybaeozyga*), occasionally with four or five (*Tegenaria* and *Blabomma*). Labium not rebordered, about as wide as long, occasionally slightly longer than wide. Endites slightly to moderately convergent; serrula present. Legs moderately to heavily spined. Tibia-patella slightly shorter than carapace to twice as long. Tarsi three-clawed, lacking scopulae and claw tufts, with a single row of two to nine trichobothria (fig. 9) increasing in length toward tip. Trochanters I and II not notched, III and IV occasionally slightly notched. Tracheal spiracle near base of spinnerets (slightly advanced in *Saltonia*). Abdomen with only simple hairs (most of the Cybaeinae and Cryphoeceae), and a few setose hairs (*Dirksia*, *Ethobuella*), or densely covered with setose hairs (*Saltonia*), with bristly hairs (*Cybaeota*), or plumose hair (*Tegenaria* and Ageleneae).

Epiandrous glands present or absent in males. Single pair of epigastric single slit sensilla present.

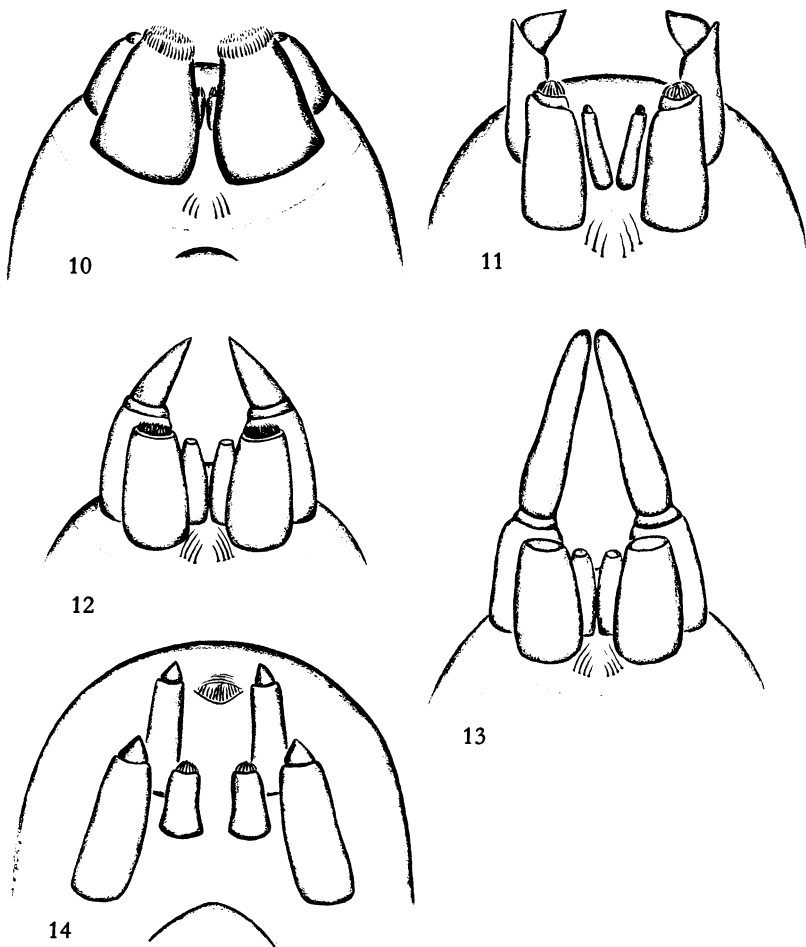


FIG. 10. Contiguous spinnerets (*Cybaeus*).

FIG. 11. Slightly separated spinnerets (*Cicurina*).

FIG. 12. Widely separated spinnerets with short distal segments (*Hololena*).

FIG. 13. Widely separated spinnerets with long distal segments (*Agelenopsis*).

FIG. 14. Spinnerets of *Saltonia incerta* (Banks).

Colulus present, occasionally divided. Cribellum and calamistrum absent. Spinnerets grouped together.

DISTRIBUTION: All parts of North America from Alaska and Canada to Panama.

HABITATS: The subfamily Cybaeinae is richest in species in the dense

damp forests and caves of western United States with the greatest concentration of species in the northern half of California and Oregon. The subfamily Ageleninae is distributed throughout the Nearctic Region from the high forests to the low dry deserts.

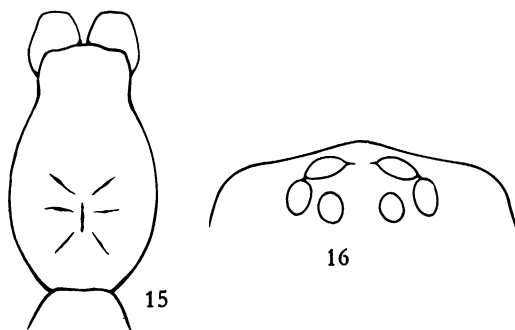
The larger species of Agelenidae form distinctive funnel webs in houses and caves under bark and rocks (*Tegenaria*, *Coras*), under bark of trees, on houses (*Novalena*, *Hololena*), in bushes (*Hololena*), in open grass and at the base of bushes (*Agelenopsis*), under loose rocks, boards, and cow chips (*Calilena*), gopher holes in soil (*Rualena*), under rocks, and in leaf mold of damp forests (all the cybaeines and many of the Cryphoeceae). *Dirksia* and *Ethobuella* have been mainly swept from bushes and trees in dense forests. *Calymmaria* are found on buildings in forested areas, in loose grass, and debris in shaded damp areas. All species seem to be active at night.

**COLLECTIONS:** Smaller cybaeine spiders are collected mainly by sifting leaf mold or treating this material in a Berlese funnel. The larger specimens are collected by turning over wood, rocks, and loose bark and breaking open rotten wood but are also found in deep caves. The Cryphoeceae are found in the same way but also in shallow caves and in loose debris in dense woods. The Ageleneae and larger Cryphoeceae are best collected at night using a headlamp for illumination and long forceps. In the daytime the spiders can be lured out of their funnels by the use of live insects. They may then be grabbed off the web by hand. Sometimes it is better to close the base of the funnel first so that the spider cannot retreat. This requires fast movement on the part of the collector. A small shovel is handiest for closing the funnel with the ground-inhabiting forms.

Because many of the spiders are immature it is worthwhile to try to rear some to maturity. The cybaeines and smaller Cryphoeceae must be kept in damp vials for rearing but do not rear easily. The Ageleneae do well in large, dry vials plugged with cotton, and the majority mature if obtained when at least half-grown.

#### KEY TO AGELENID GENERA OF NEARCTIC AND BAJA CALIFORNIA SPIDERS

1. Eight eyes. Both eye rows strongly procurved (9/6, 12/6), appearing to be in three rows of 2-4-2 eyes. PME distinctly posterior to PLE (fig. 17). (Group Ageleneae) . . . . . 23
- Eight eyes, six or none. Both eye rows almost straight, in two rows, occasionally procurved (6/6 or less). PME lateral to PLE (figs. 15, 16, 18-20) . . . . . 2
2. Tibia I with three or fewer pairs of ventral spines (fig. 6) . . . . . 6
- Tibia I with four (occasionally one distal spine missing) or five pairs of ventral spines (fig. 5) . . . . . 3
3. Cheliceral retromargin with one to five teeth (fig. 3), no denticles, occasionally mesial tooth smaller, denticle-like . . . . . 4

FIG. 15. Cephalothorax of blind *Cicurina*.FIG. 16. Eyes in two rows (six-eyed *Blabomma*).

- Cheliceral retromargin with three to seven teeth and six to eight denticles (fig. 2). Distribution western Washington south to northwestern California . . . . . *Cybaeina*<sup>1</sup>
4. Tibia I with five pairs of ventral spines . . . . . 5  
Tibia I with four pairs of ventral spines, occasionally one missing . . . . . *Ethobuella*
5. Metatarsus I with three pairs of ventral spines. Length 1.4 mm.–2.5 mm. . . . . *Cybaeota*  
Metatarsus I with four pairs of ventral spines. Length 2.3 mm.–4.4 mm. . . . . *Dirksia*
- 6(2). Eyes present, occasionally eye spots or only cornea remaining on some cave spiders . . . . . 9  
Eyes absent. No eye spots nor cornea remaining (fig. 15) . . . . . 7
7. Legs short and stout; tibia-patella I about as long as carapace. Anterior spinnerets slightly separated (fig. 11) . . . . . 8  
Legs long and slender; tibia-patella I at least one and one-half times as long as carapace. Anterior spinnerets contiguous (fig. 10) . . . . . *Cybaeozyga*, in part
8. Distribution California . . . . . *Blabomma*  
Distribution Texas and Alabama . . . . . *Cicurina*
- 9(6). Eight eyes, anterior median eyes often minute . . . . . 13  
Six eyes or eye spots . . . . . 10
10. Eyes closely grouped in two triads (fig. 16). Cheliceral teeth of promargin closely grouped (fig. 2) . . . . . 11  
Eye spots widely separated in three rows (fig. 18). Cheliceral teeth of promargin widely separated (fig. 3) . . . . . *Cybaeozyga*, in part
11. Distribution Oregon and California . . . . . 12  
Distribution Texas . . . . . *Cicurina*, in part
12. Posterior eye row recurved to straight. Distal segment of posterior spin-

<sup>1</sup> One *Cybaeus* from an Alabama cave keys out here. Known only from an immature specimen.

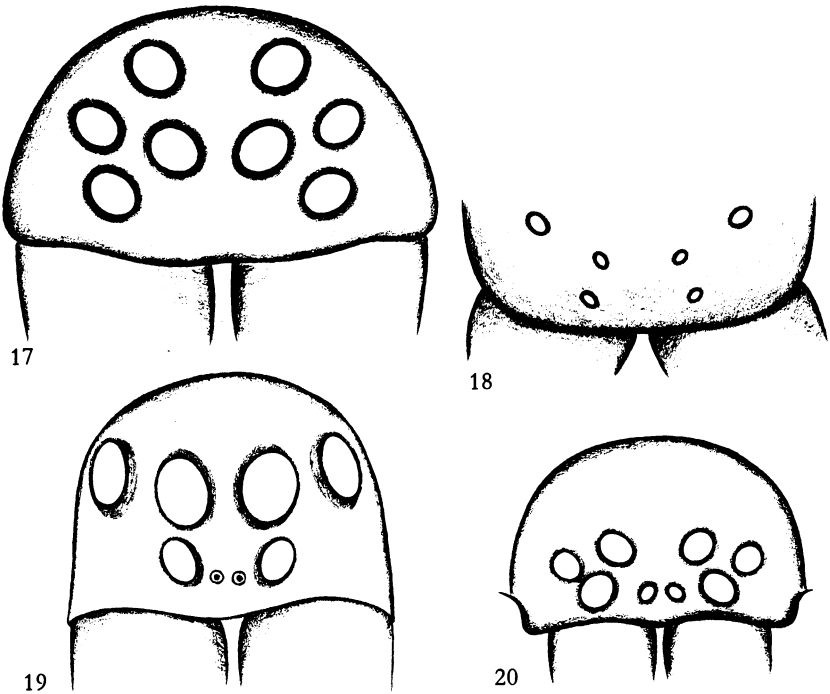


FIG. 17. Eyes in three rows (*Agelenopsis*).  
FIG. 18. Eyes of six-eyed *Cybaeozyga* sp.  
FIG. 19. Eyes of *Cybaeozyga heterops* Chamberlin and Ivie.  
FIG. 20. Eyes of *Cybaeus*.

nerets one-half to five-sixths as long as basal segment. Bulb of male palpus lacking tegular process (fig. 50). Distribution central and southern coastal mountains of California and Baja California Norte . . . . .

*Yorima*

Posterior eye row procurved to almost straight (fig. 16). Distal segment of posterior spinnerets one-third as long as basal segment. Bulb of male palpus with tegular process (fig. 50). Distribution Oregon and California.

*Blabomma*, in part

- 13(9). Anterior spinnerets contiguous or moderately separated by diameter of basal segment of anterior spinneret (figs. 10-13) . . . . . 14
- Anterior spinnerets widely separated, equal to two and one-half times diameter of basal segment of anterior spinneret (fig. 14) . . . . . *Saltonia*
- 14. Posterior spinnerets longer than anterior, consisting of two distal segments, distal one conical, wedge-shaped to finger-like, ranging from one-fourth to two times as long as basal segment. Anterior spinnerets slightly to distinctly separated (figs. 11-13) . . . . . 16

- Posterior spinnerets shorter than anterior, appearing to consist of one segment, distal segment indistinct, hemispherical. Anterior spinnerets contiguous (fig. 10) . . . . . 15
15. Cheliceral retromargin with several equal teeth, no denticles (fig. 3) . . . . . *Cybaeozyga*, in part  
Cheliceral retromargin with teeth and denticles (fig. 2) . . . . . *Cybaeus*
- 16(14). Plumose hairs absent on legs . . . . . 17  
Plumose hairs present on legs (fig. 4A), visible at 36× magnification . . . . . *Tegenaria*
17. Cheliceral retromargin with six or more equal teeth or denticles, or with three or four teeth and one to 10 denticles (fig. 2) . . . . . 21  
Cheliceral retromargin with two to five equal teeth, no denticles (fig. 3) . . . . . 18<sup>1</sup>
18. Cheliceral retromargin with three to five teeth . . . . . 19  
Cheliceral retromargin with two teeth . . . . . *Wadotes*
19. Length less than 5 mm. . . . . 20  
Length 6 to 13 mm. . . . . *Coras*<sup>2</sup>
20. Length 2.0 to 2.3 mm. Colulus with two setae. Distribution Arizona . . . . . *Neocryphoea*  
Length 2.5 to 4.5 mm. Colulus with about 10 setae. Distribution southern Alaska and Labrador south to northern United States, North Carolina, and Northern California. . . . . *Cryphoea*
- 21(17). Legs short, stout; tibia-patella I shorter than length of carapace or as long . . . . . 22  
Legs long, slender; tibia-patella I, one and one-quarter times as long or longer than carapace . . . . . *Calymmaria*
22. Male palpus with a tegular process, conductor not hooklike; tibia and often femur and patella modified (fig. 30). Epigynum with single pair of subcircular spermatheca and short connecting canals visible through the chitinous covering; openings usually separate or removed from posterior border of epigynum (fig. 29). Distribution Pacific coast states only, including Baja California Norte . . . . . *Blabomma*  
Male palpus lacking tegular process, usually with hooklike conductor, patella unmodified, tibia usually with broad flattened ectal process (fig. 34). Epigynum usually with long, winding connecting canals (fig. 33A, B) and one or two pairs of spermatheca. If one pair present, opening situated on posterior border of epigynum and spermatheca are elongate or occasionally circular. Distribution Nearctic Region and Baja California Norte . . . . . *Cicurina*
- 23(1). Males . . . . . 24  
Females . . . . . 31
24. Embolus large and conspicuous, coiled or forming a figure "8" across face of bulb (figs. 54, 56, 69) . . . . . 25

<sup>1</sup> Some small *Cicurina* (1.65–3.0 mm.) from Texas may key out here but are smaller than the genera in couplets 18–20.

<sup>2</sup> Some *Tegenaria domestica* (Clerck) may key out here but can be separated from *Coras* by the presence of one instead of two mesal distal spines on femur I.

- Embolus small and inconspicuous, sinuate or simply curved, occasionally almost forming circle (figs. 58, 60, 62, 65, 67) . . . . . 27
25. Embolus forming single or multiple coils (fig. 54) . . . . . 26
26. Embolus forming figure "8" across face of bulb (fig. 69) . . . . . *Tortolena*
26. Embolus with several tight coils at base (fig. 56) . . . . . *Barronopsis*
- Embolus lacking tight coils at base (fig. 54) . . . . . *Agelenopsis*
- 27(24). Tegular lateral process absent . . . . . 28
- Tegular lateral process large, stout, at base of bulb (fig. 62) . . . . . *Melpomene*
28. Embolus forming simple curve, sometimes almost forming circle, not resting in fulcrum (figs. 58, 65, 67). . . . . 29
- Embolus sinuate, resting in fulcrum (fig. 60) . . . . . *Hololena*
29. Ectal tibial apophyses projecting laterally and distally . . . . . 30
- Ectal tibial apophyses projecting distally (fig. 67) . . . . . *Rualena*
30. Distal segment of posterior spinnerets twice as long as basal segment (fig. 58) . . . . . *Calilena*
- Distal segment of posterior spinnerets as long as basal segment (fig. 65) . . . . . *Novalena*
- 31(23). Epigynum lacking median stylus . . . . . 32
- Epigynum with median stylus projecting posteriorly from anterior border (fig. 57) . . . . . *Calilena*
32. Epigynum lacking lateral spurs, occasionally with spurs on anterior border (figs. 53, 55, 63, 64, 68) . . . . . 33
- Epigynum with lateral spurs (figs. 59, 66) . . . . . 37
33. Epigynum with large oval opening or with large paired openings (figs. 53, 55, 68) . . . . . 34
- Epigynum with inconspicuous openings (figs. 63, 64) . . . . . 38
34. Epigynum lacking coupling cavity along posterior border (figs. 55, 68) . . . . . 35
- Epigynum with coupling cavity along posterior border (fig. 53) . . . . . *Agelenopsis*
35. Epigynum lacking spiral lines in bottom of paired openings . . . . . 36
- Epigynum with spiral lines in bottom of paired openings (fig. 68). Distribution southern tip of Texas . . . . . *Tortolena*
36. Anterior edge of epigynum notched or bearing pair of spurs (fig. 55). Distribution Maryland to Florida and west to central Texas including southern tip . . . . . *Barronopsis*
- Anterior edge of epigynum not notched and lacking spurs (fig. 61). Distribution southern Arizona to southwestern Texas . . . . . *Melpomene*
- 37(32). Epigynum usually consisting of large, undivided oval depression with ridge present across posterior end, angulate laterally.<sup>1</sup> Cheliceral retro-margin with two or three teeth. Distal segment of posterior spinnerets two-thirds to twice as long as basal segment. Distribution central California south through Baja California and parts of Mexico (fig. 66) . . . . . *Rualena*
- Epigynum consisting of large oval depression, more or less divided by

<sup>1</sup> One undescribed *Rualena* from southern California might be confused with *Hololena* but it can be recognized by its black distal segment of the posterior spinnerets.

- median ridge; no ridge across posterior edge of depression. Cheliceral retromargin with two teeth. Distal segment of posterior spinnerets two-thirds as long as basal segment. Distribution western United States south to extreme northern part of Baja California (fig. 59). . . . *Hololena*
- 38(33). Epigynal plate longer than wide. (fig. 63) . . . . . *Melpomene*
- Epigynal plate wider than long. (fig. 64). . . . . *Novalena*

#### SUBFAMILY CYBAEINAE

Anterior spinnerets contiguous, posterior spinnerets shorter than anterior, appearing one-segmented (fig. 10).

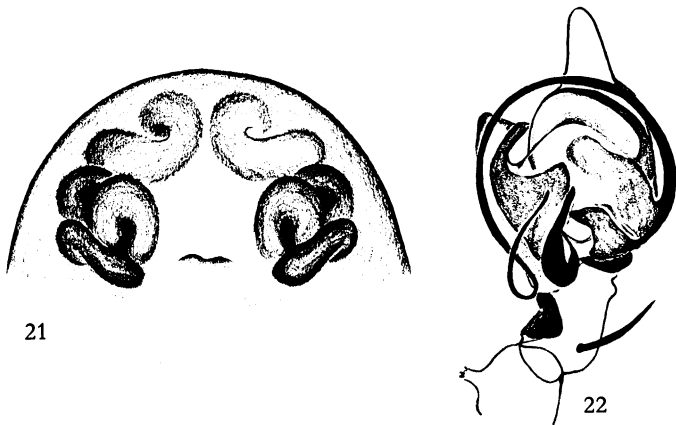
#### GENUS *CYBAEINA* CHAMBERLIN AND IVIE

Figures 21, 22

*Cybaeina* CHAMBERLIN AND IVIE, 1932, p. 28. ROTH, 1952c, pp. 195-201.

DIAGNOSIS: *Cybaeina* is a small genus containing four described species and as many more undescribed. It differs from most other cybaeines by the presence of four or five pairs of ventral spines on tibia I and from *Cybaeota* and *Dirksia* by the presence of both teeth and denticles on the cheliceral retromargin.

DESCRIPTION: Medium-sized spiders ranging in length from 2.8 to 5.6 mm. Eyes eight, almost equally spaced in two straight to slightly curved rows; lateral eyes closer to each other by less than half their diameter; AME about one-half to one-quarter diameter of ALE; edges of eyes often pink. Cheliceral promargin with three contiguous teeth; retromargin



FIGS. 21, 22. *Cybaeina confusa* Chamberlin and Ivie. 21. Epigynum. 22. Palpus.



with three to seven teeth and six to eight denticles, totaling 10 to 15 teeth and denticles. Sternum produced to a point between almost contiguous hind coxae. Spination: Femur I with 1 distal mesal spine; tibia I, ventral 2-2-2-2-0 or 2-2-2-2-2-0; metatarsus I, ventral 2-2-2-0. Tarsus with five to seven trichobothria, longest one-third as long as tarsus. Abdomen with simple setae, lacking epiandrous glands. Colulus divided with four to six setae.

Female genitalia (fig. 21) with long twisting canals similar to those of *Cicurina* but lacking bulbous spermatheca. Male palpus (fig. 22) with slender lateral patellar apophysis, terminated by several stout black teeth and lateral tibial carina; bulb with slender whiplike embolus, and large ectal conductor terminated by apophysis.

DISTRIBUTION: Western parts of Washington, Oregon, and northern California. The center of distribution occurs at the Oregon-California line.

HABITATS: Under rotting bark or wood or in fallen rotten logs, in moss, loose duff, and under rocks in and on the edge of damp coniferous forests.

#### GENUS *CYBAEOTA* CHAMBERLIN AND IVIE

Figures 5, 23, 24

*Cybaeota* CHAMBERLIN AND IVIE, 1933, pp. 3-7; 1937, pp. 226-229.

DIAGNOSIS: *Cybaeota* is a small genus with seven species described and several others known. The absence of denticles on the cheliceral retro-margin separates this genus from other cybaeines. The presence of five pairs of spines on tibia I (fig. 5) separates it from the related genus *Cybaeozyga* and the presence of three pairs of ventral spines on metatarsus I

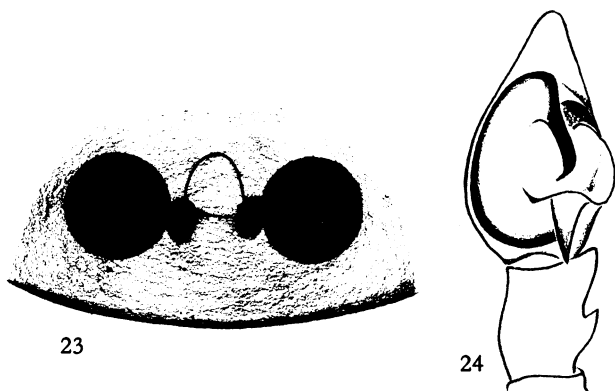
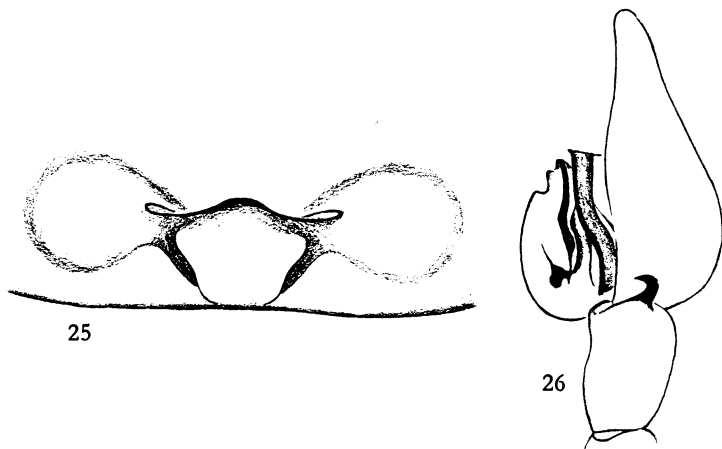


FIG. 23. Epigynum of *Cybaeota shastae* Chamberlin and Ivie.

FIG. 24. Palpus of *C. nana* Chamberlin and Ivie.



FIGS. 25, 26. *Cybaeozyga heterops* Chamberlin and Ivie. 25. Epigynum. 26. Palpus.

and its smaller size usually separates it from the similar *Dirksia* which has four pairs of ventral spines on metatarsus I and is usually larger, being 2.3 to 4.4 mm. in length.

**DESCRIPTION:** Small spiders ranging in length from 1.40 to 2.55 mm. Eyes eight, closely grouped, both rows slightly curved; eyes relatively large; AME one-half diameter of ALE; interstices and edge of eyes darkly pigmented. Cheliceral promargin with three slightly separated teeth; retromargin with two to five similar-sized, equally separated teeth, no denticles. Sternum narrowly to broadly rounded or truncate between widely separated hind coxae. Spination: Femur I with two stout distal mesal spines; tibia I, ventral 2-2-2-2-0; metatarsus I, ventral 2-2-2-0. Tarsus with two trichobothria, distal one, one-half as long as tarsus. Abdomen with thick curved bristly setae, lacking epiandrous glands. Colulus consisting of two setae.

Female genitalia simple, with median opening, one pair of round spermatheca. Male palpus lacking patellar apophysis; tibia with ectal and distal apophysis; embolus short, curved, almost spinelike, conductor projecting proximally toward tibia, bearing lateral and distal apophyses.

**DISTRIBUTION:** One species is recorded from Ontario, Canada, New England, New York, and Michigan. Six other species plus some undescribed ones are known from southern Alaska south to southern California and Utah.

**HABITATS:** Because of the small size and cryptic nature of these spiders, they are seldom collected except by sifting leaf mold or by means of a

Berlese funnel. They are rare in any event but can be found in a wide range of habitats, mainly in the debris of damp forests from the high mountains to sea level.

GENUS *CYBAEOZYGA* CHAMBERLIN AND IVIE

Figures 3, 18, 19, 25, 26

*Cybaeozyga* CHAMBERLIN AND IVIE, 1937, p. 226.

DIAGNOSIS: Four species are known, one is described, and three from caves are undescribed. The presence of three widely spaced, rather than closely grouped, teeth on the cheliceral promargin will separate *Cybaeozyga* from all other agelenids except *Saltonia*, from which it can be separated by its compact spinnerets.

DESCRIPTION: Small spiders ranging in length from 2.7 to 2.9 mm. Eyes eight, six tiny eyes in three rows, or lacking eyes. Eyes relatively large on eight-eyed species except for minute AME about one-sixth diameter of ALE. When eyes present, posterior eye row strongly recurved; edges of eyes black. Cheliceral promargin with three widely spaced teeth (fig. 3), retromargin with five to seven equal minute teeth. Sternum produced to dull point between widely separated hind coxae. Spination: Femora lacking distal-mesal spines; tibia I, ventral 2-2-0 (ventral and prolateral spines run together appearing as 3-2-1-1-0); metatarsi I, ventral 2-2-2-0, pairs not opposite each other, prolateral spine of each pair slightly advanced. Tarsus with two or three trichobothria. Abdomen with single setae, lacking epiandrous glands. Colulus represented by pair of setae.

Female genitalia simple (fig. 25), apparently only one pair of round spermatheca similar to *Cybaeota*. Male palpus (fig. 26) lacking patellar apophysis; tibia with two distal apophyses; embolus slender, curved, forming half-circle, conductor with apophysis.

DISTRIBUTION: Western Oregon and northwestern California.

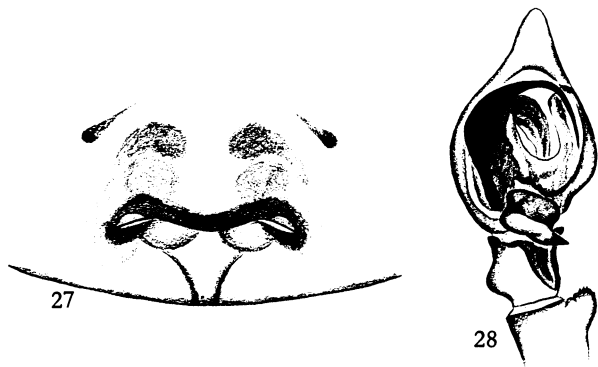
HABITATS: Caves and in leaf mould among Douglas fir.

GENUS *CYBAEUS* L. KOCH

Figures 6, 10, 20, 27, 28

*Cybaeus* L. KOCH, 1868, p. 46. CHAMBERLIN AND IVIE, 1932, pp. 1-28, 30-43. ROTH, 1952a, pp. 205-219.

DIAGNOSIS: *Cybaeus* is a large genus with 36 species described and as many undescribed. Differs from other cybaeines by the presence of two or three pairs of ventral spines on tibia I and from *Cybaeozyga* by the presence of teeth and denticles on the cheliceral retromargin.

FIG. 27. Epigynum of *Cybaeus multnoma* Chamberlin and Ivie.FIG. 28. Palpus of *C. cascadius* Roth.

**DESCRIPTION:** Adults ranging in length from 2.3 to 14 mm. Eyes eight (small and unpigmented in some cave species), darkly pigmented at edges, almost equally spaced; lateral eyes closer to each other by less than one-half their diameter, in two slightly curved rows; AME range from one-third to almost diameter of an ALE; other eyes similar in size. Cheliceral promargin with three closely grouped teeth, basal two contiguous; cheliceral retromargin with three to six teeth and four to seven denticles. Spination: Femur I with one distal mesal spine; tibia I, ventral 2-2-0-2 or 2-2-0 (one cave spider from Alabama has four ventral pairs on one tibia); metatarsus I, ventral 2-2-2 or 2-2-3. Tarsus with five to eight trichobothria, distal one about one-third length of tarsus. Abdomen with simple setae, lacking epiandrous glands. Colulus with two clumps of four setae to single group of 20 setae.

Female genitalia (fig. 27) variable, with paired openings, sometimes appearing as single opening with one to three pairs of variously shaped spermatheca. Male palpus (fig. 28) with distal lateral patellar apophysis (except for one undescribed species) and tibial apophysis. Bulb with whiplike embolus; conductor and apophysis of conductor of a pattern similar to figure 28.

**DISTRIBUTION:** Mountainous regions of the western part of North America from the Aleutian Islands south through Alberta, Canada, Idaho, Montana, Oregon south to the northern part of Baja California Norte. Two eastern populations, one in Ohio and the other from New York south to North Carolina, are known with one record from Alabama and one questionable record from Minnesota. Five species are known from Europe, one from

Asia and 30 from Japan, some under the generic names *Heterocybaeus* and *Dolichocybaeus*, both of which represent species groups.

**HABITATS:** *Cybaeus* are usually found in damp forests under bark, in rotting logs, under downed timber, and under rocks at the edge of streambeds. The web is inconspicuous; often absent. When present, it consists of a tube or flat panel several times as wide as the spider attached by several strands of silk to adjacent supports.

#### SUBFAMILY AGELENINAE

Anterior spinnerets separated, posterior spinnerets longer than anterior. Distal segment distinct, shorter than to twice as long as basal segment (figs. 11-14).

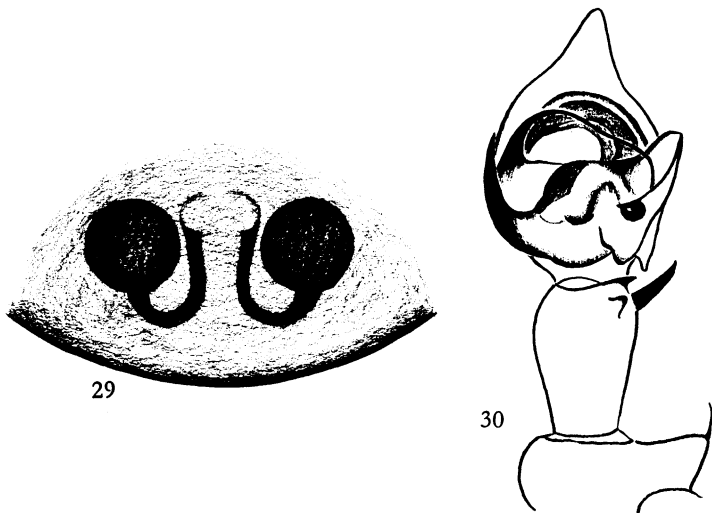
#### GROUP CRYPHOECEAE

**DIAGNOSIS:** Spiders of the Cryphoeceae Group are separated from cybaeines by the separated anterior spinnerets and by having the posterior spinnerets longer than the anterior. From all other agelenids they are separated by the lack of plumose hair.

**DESCRIPTION:** Adults ranging in length from 1.65 to 13.0 mm. Eyes eight, six, or lacking (some *Circurina* and *Blabomma*), in two straight or slightly curved rows, occasionally anterior row strongly curved when AME minute; eye area broad, never projecting; AME usually much smaller. Clypeus narrow, about diameter of ALE or less. Cheliceral promargin with three teeth, rarely four; retromargin with two to four teeth and none to 10 denticles. Sternum about as wide as long, acuminate to dull behind; hind coxae slightly to widely separated. Spination variable: Femur I with two, one, or no mesal distal spines; tibia I, ventral, one to five pairs; metatarsus I, ventral 2-2-2 or 2-2-3 to 2-2-2-2-0. Tarsi with two to eight trichobothria. Carapace and legs with simple hairs, abdomen with simple hairs and in two genera with scattered pilose hair (*Dirksia*, *Ethobuella*) or densely covered with pilose hair (*Saltonia*). Epiandrous glands lacking or present (*Coras*, *Wadotes*). Colulus present, variable. Tracheal spiracle near colulus (except *Saltonia*), usually minute to wide as colulus. Anterior spinnerets stout, separated, shorter than posterior spinnerets; latter slender, two-segmented; distal segment very short.

Epigyna and palpi variable.

**REMARKS:** The Cryphoeceae is a heterogenous group of genera varying considerably in size and structure. They do not differ so radically, however, that they warrant being separated into three families and four subfamilies (Lehtinen, 1967). For convenience, a conservative course is taken herein and the genera are left in the Cryphoeceae group.

FIG. 29. Epigynum of *Blabomma flavipes* Chamberlin and Ivie.FIG. 30. Palpus of *B. foxi* Chamberlin and Ivie.

**DISTRIBUTION:** Widespread throughout Newfoundland, southern Alaska south to Mexico (*Cicurina* is the only genus that extends far into Mexico) with the main concentration of species in western United States.

**HABITATS:** The smaller species are common in damp leaf litter, under rocks and rotting logs in dense forests. The larger species form conspicuous funnel webs in caves, under shaded river banks, cliffs, under loose bark, in cellars, and in shaded corners of buildings.

#### GENUS *BLABOMMA* CHAMBERLIN AND IVIE

Figures 16, 29, 30

*Blabomma* CHAMBERLIN AND IVIE, 1937, pp. 219–223.

*Chorizommoides* CHAMBERLIN AND IVIE, 1937, pp. 218–219.

**DIAGNOSIS:** Nine species are described and 30 to 40 are undescribed in collections. Two genera of six-eyed agelenids occur within the range of *Blabomma*: *Torima*, which has the posterior eye row slightly recurved rather than procurved and slightly longer posterior spinnerets, and *Cybaeozyga* which has the eyes widely spaced in three rows rather than two triads. The eight-eyed species are difficult to characterize, being similar to *Cybaeus* in appearance but having the typical spinnerets of the Cryphoeceae. Other sympatric genera with fewer than three pairs of spines and only teeth on the chelical retromargin are *Cicurina* and *Calymmaria*. The latter differs

by its longer and more slender legs, tibia-patella I being one and one-quarter times as long or longer than the carapace, whereas *Blabomma* has short legs, tibia-patella I barely as long as the carapace. *Cicurina* can be separated only by the general pattern of the male and female genitalia.

**DESCRIPTION:** Adults ranging in length from 2.0 to 7.0 mm., the majority ranging from 2.5 to 5.5 mm. Eyes eight or six (fig. 16), or only eye spots on one cave species; AME usually minute or absent. Posterior eye row slightly procurved; anterior eye row recurved. Chelicera geniculate, promargin with three, occasionally four teeth, retromargin usually with two or three teeth and three or four denticles (totaling at least six). Larger specimens with three teeth and up to six denticles; smaller species with five or six equal-sized minute teeth. Sternum pointed behind, sometimes blunt, hind coxae sometimes separated by their own diameter. Tibia-patella I slightly shorter than, to as long as carapace. Spination: Femur I with one mesal-distal spine; tibia I, ventral 2-2-0 or 2-2-1; metatarsus I, ventral 2-2-2 or 2-2-3. Tarsus with three to six trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus vestigial, humplike, sparsely covered with setae or by two groups of several setae. Tracheal spiracle minute, less than width of colulus. Anterior spinnerets slightly separated, shorter than posterior; latter more widely separated, longer, distal segment about one-third as long as basal segment, directed inward.

Female genitalia (fig. 29) simple, consisting of paired spermathecae with single or paired median openings near center of epigynum. Male palpus (fig. 30) with or without patellar apophysis, with ectal distal tibial apophysis, slender whiplike embolus, large conductor, and tegular median process.

**REMARKS:** There is an almost direct correlation between the reduction in size of the species and a reduction in color, size of eyes, number of ventral tibial and metatarsal spines, number of trichobothria, and in number of setae that occur on the colulus. The smaller species also tend to be found in correspondingly deeper layers of debris.

**DISTRIBUTION:** Coastal mountains from British Columbia south into northern Baja California Norte. The center of speciation is central to northern California.

**HABITATS:** These spiders are usually found in deep leaf mould and are easiest obtained by means of sifting or by using a Berlese funnel. They are also collected under rocks, logs, and leaves.

#### GENUS *CALYMMARIA* CHAMBERLIN AND IVIE

Figures 31, 32

*Calymmaria* CHAMBERLIN AND IVIE, 1937, pp. 211-216.

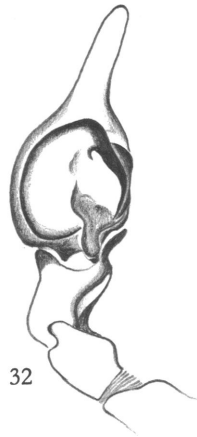
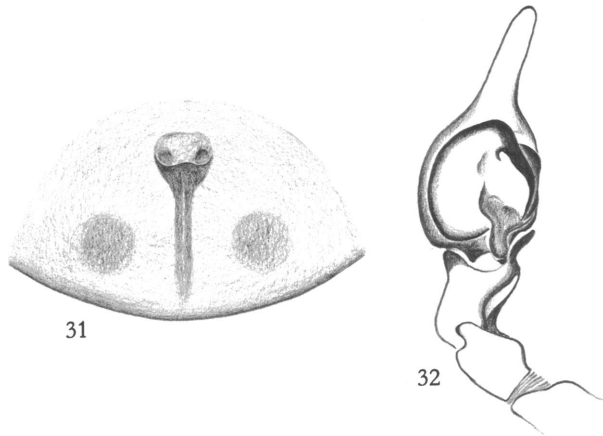


FIG. 31. Epigynum of *Calymmaria monicae* Chamberlin and Ivie.

FIG. 32. Palpus of *C. suprema* Chamberlin and Ivie.

**DIAGNOSIS:** Eight species are described and about 20 are undescribed. *Calymmaria* differs from *Tegenaria* and *Ageleneae* by the absence of plumose hair on the carapace and legs and from other Cryphoeceae by slender legs, tibia-patella I being at least one and one-quarter times as long as the carapace.

**DESCRIPTION:** Adults ranging in length from 3.1 to 7.8 mm. Eyes eight, relatively large; AME smallest, others similar in size; both eye rows almost straight. Chelicera vertical; promargin with three teeth, retromargin with three or four teeth, one to several denticles. Sternum pointed behind, coxae IV narrowly separated. Tibia-patella I, one and one-quarter times as long or longer than carapace. Spination: Spines slender, weak, femora I with no distal mesal spines; tibia I, ventral 0-2-0; metatarsus I, ventral 2-2-2. Tarsus with six trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus one and one-half times to twice as broad as long, covered with about 20 setae. Tracheal spiracle as wide as colulus or slightly smaller. Distal segment of posterior spinneret about one-half to three-quarters as long as basal segment, wedge-shaped.

Female genitalia (fig. 31) simple, convex, with median opening, one pair of round spermatheca. Male palpus (fig. 32) with distal mesal patellar apophysis, tibia heavily sculptured ectally; cymbium narrowed abruptly, with slender tip; bulb with spinelike embolus directed proximally toward tibia, supported on strongly sculptured conductor; lacking tegular processes and median apophysis.

**DISTRIBUTION:** Southern British Columbia south along the western half



of the United States into extreme northern Baja California. One species (or more?) is found in the East from Maryland south and west to Virginia, North Carolina, Indiana, Alabama, and Georgia.

**HABITATS:** *Calymmaria* are usually found in damp Douglas fir-oak habitats near the ground in cavities sufficiently open for their sheet webs or where they can hide and have their webs partially protected. Near Berkeley, California, three species occur in a narrow 10-foot-wide wooded canyon. The largest species occurs among large rocks and logs at the bottom of the canyon, a medium-sized species occurs on the sides of the bank, and a third and smaller species occurs among leaves on the ground. These spiders often are found on outside corners of buildings in forested areas.

#### GENUS *CICURINA* MENGE

Figures 2, 11, 15, 33A, B, 34

*Cicurina* MENGE, 1871, p. 271. CHAMBERLIN AND IVIE, 1940, pp. 1-108.

**DIAGNOSIS:** Fifty species of *Cicurina* are described and about 30 are undescribed. The large flattened tibial process (fig. 34) of the male palpus and the two typical forms (figs. 33A, B) of female genitalia serve as the best diagnostic characters.

**DESCRIPTION:** Adults ranging in length from 1.65 to 15 mm., normally about 4 to 6 mm. Eyes eight, six, or none (fig. 15); when present, normal to relatively small, occupying about one-half width of head; AME variable in size, sometimes largest; both eye rows straight to slightly curved. Chelicera (fig. 2) geniculate, promargin with three teeth; retromargin with four to 10 teeth, usually first three largest, remaining considered denticles. Sternum pointed behind, hind coxae slightly separated. Tibia-patella I slightly shorter to as long as carapace. Spinination: Femur I with two distal mesal spines; tibia I, ventral 2-2-2, or 2-2-0, or 2-2-1; metatarsus I, ventral 2-2-3 or 2-2-2. Tarsi with five or six trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus low swelling with two groups of two to several setae. Tracheal spiracle more than one-half as wide as diameter of anterior spinneret. Anterior spinnerets (fig. 11) separated by slightly less than their diameter, shorter than posterior; distal segment of latter very short, about one-third as long as basal segment.

Epigynum variable (fig. 33A, B), opening single, near epigastric furrow, with one or two oval or globular spermatheca; connecting canals in many cases long and winding. Male palpus short, patella unmodified; tibia with usually large ectal process extending forward along side of cymbium; bulb simple, lacking median apophysis and tegular processes;

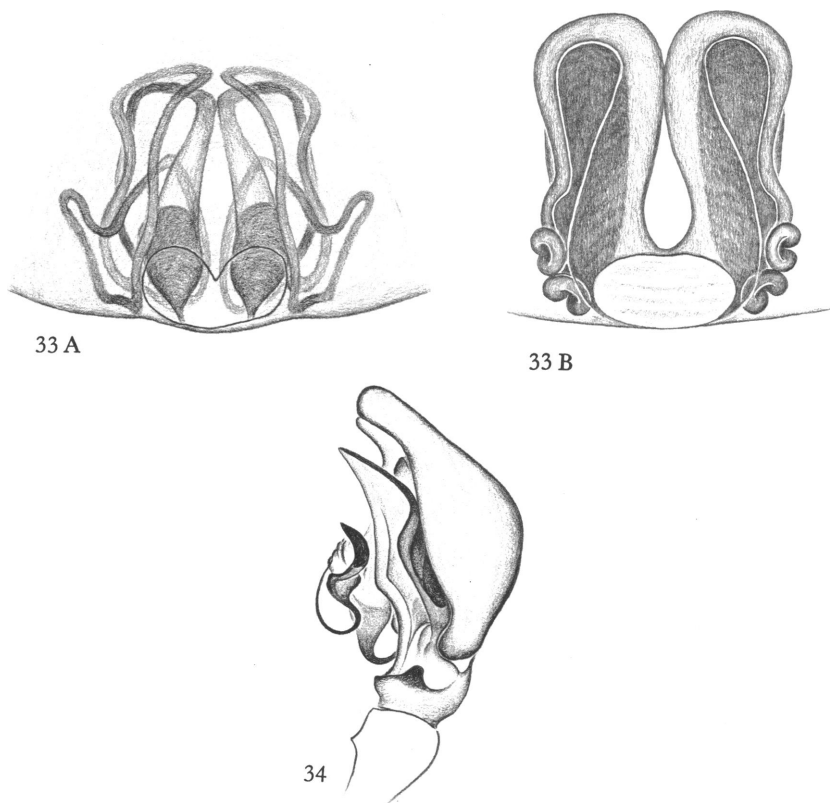


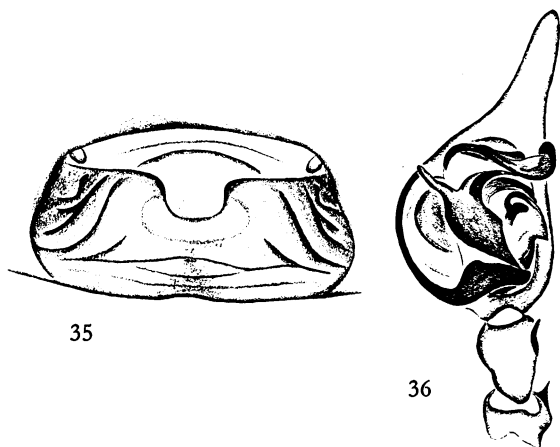
FIG. 33. A. Epigynum of *Cicurina arcuata* Chamberlin and Ivie. B. Epigynum of *C. brevis* (Emerton).

FIG. 34. Palpus of *C. sierra* Chamberlin and Ivie.

embolus whiplike, conductor large, often slender, hooklike at tip.

**DISTRIBUTION:** Southern Alaska, Canada south to southern Mexico. Three species are known from Europe and two from Japan.

**HABITATS:** Usually found under bark, logs and rocks, and rotting leaves in forested areas. Many are found in caves. Some species are found in dry areas under rocks, and one specimen was collected in Baja California under a rock at the edge of a palm oasis. The six-eyed and most of the blind *Cicurina* are found in Texas caves, although a few occur in Alabama and one is known from Mexico.



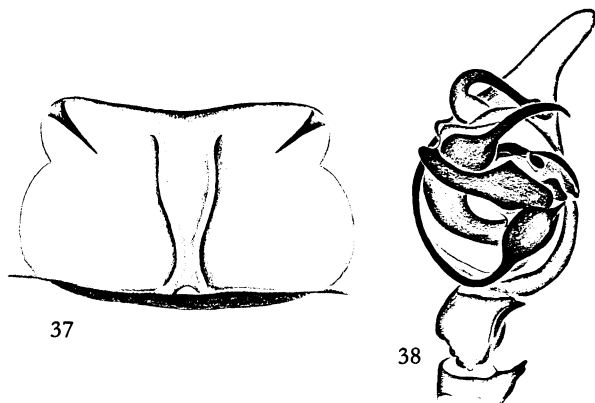
FIGS. 35, 36. *Coras montanus* (Emerton). Group A. 35. Epigynum. 36. Palpus.

#### GENUS *CORAS* SIMON

Figures 35-38

*Coras* SIMON, 1898b, p. 258. MUMA, 1946, pp. 1-20. LEHTINEN, 1967, pp. 225, 350. *Coelotes*: LEHTINEN, 1967, pp. 223-225, 350 (in part).

DIAGNOSIS: Fourteen species are known in *Coras*. The widely spaced spinnerets, lack of plumose hair on the thorax, and the presence of three or four teeth on the cheliceral retromargin separate this genus from most



FIGS. 37, 38. *Coras juvenilis* (Keyserling). Group B. 37. Epigynum. 38. Palpus.

other agelenines. It differs from *Cryphoea* and *Neocryphoea* by its much larger size.

**DESCRIPTION:** Robust spiders ranging in length from 6 to 13 mm. Eyes eight, relatively small, PME smallest, AME equal to ALE, closer to ALE than each other; posterior eyes nearly equidistant; lateral eyes separated from each other by less than their diameter; both eye rows slightly procurved. Chelicera strongly geniculate; promargin with three teeth, retromargin with three or four. Sternum pointed behind, hind coxae narrowly separated. Tibia-patella I shorter than carapace in female, longer in male. Spination: Femur I with two mesal distal spines; tibia I, ventral 2-2-2; metatarsus I, ventral 2-2-3. Tarsi with seven or eight trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus low, swollen, broader than long, notched on posterior edge. Tracheal spiracle minute. Anterior spinnerets separated, shorter than basal segment of posterior spinnerets; distal segment of latter almost as long to long as basal segment, slender, tapering along inner edge to tip.

Epigynum (figs. 35, 37) large, almost filling space between book lungs, usually with pair of anterior spurs, widely separated. Palpus short (figs. 36, 38), cymbium large, patella and tibia bearing ectal apophyses; cymbium with ectal carina, with or without basal projection; bulb with half-shell median apophysis; embolus whiplike, conductor large, consisting of one to several parts attached at base of embolus.

**REMARKS:** Lehtinen (1967, pp. 224) placed Muma's (1946, p. 10) Group B in the genus *Coelotes* leaving Group A in *Coras*. Until a revision of *Coelotes* is available it seems preferable to retain *Coras* to represent these two closely related groups of North American spiders.

**DISTRIBUTION:** Eastern United States west to Louisiana and Minnesota and northeastern Canada to Newfoundland. The western distribution recorded by Muma (1946) is based on mislabeled specimens.

**HABITATS:** *Coras* is usually found in webs in forested areas under loose bark, stones, ledges, and occasionally in cellars.

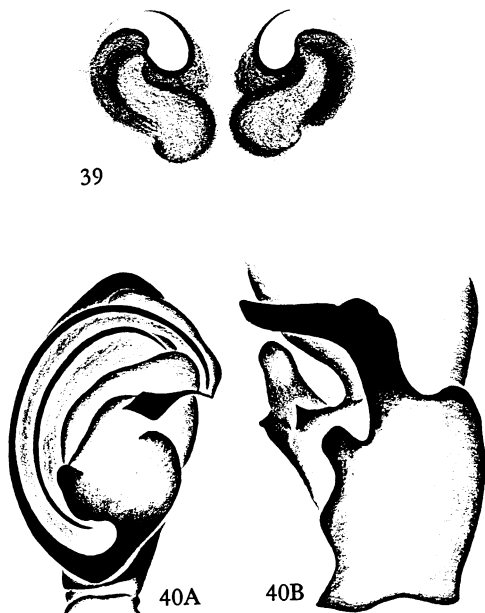
#### GENUS *CRYPHOECA* THORELL

Figures 39, 40

*Cryphoea* THORELL, 1870, pp. 120, 131.

**DIAGNOSIS:** Two species are known in *Cryphoea*. The genus differs from other agelenids by the ventral spine pattern in tibia I, 2-2-1p-1p-0.

**DESCRIPTION:** Adults ranging in length from 2.9 to 4.5 mm. Eyes eight, almost contiguous; PME separated by less than half their diameter; AME smallest, half as large as ALE, separated from each other by half their

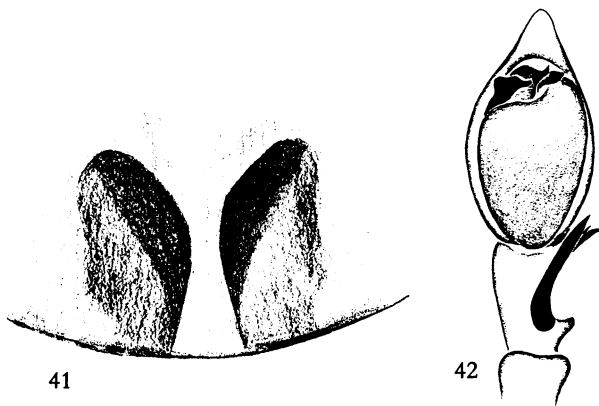


FIGS. 39, 40. *Cryphoecca peckhami* Simon. 39. Epigynum. 40A. Palpus. 40B. Tibial process, ectal view.

diameter; anterior eye row procurved (5/6); posterior eye row slightly procurved (4/6). Chelicerae almost vertical; promargin with three teeth, retromargin with three or four slightly separated teeth. Inner margins of chelicerae of male produced, toothlike near base. Sternum narrowly pointed between hind coxae, latter separated by three-fourths of their diameter. Tibia-patella I as long as carapace. Spination: Femur I with one distal prolateral spine, stout on female, weak on male; tibia-patella I, ventral-lateral 2-2-1p-1p-0; metatarsus I, ventral-lateral 2-2-2-0. Tarsus with three trichobothria. Abdomen with simple setae; lacking epiandrous glands. Colulus low, swollen, broader than long with about 10 setae. Tracheal spiracle almost diameter of basal segment of anterior spinneret. Anterior spinnerets separated by space equal to their diameter; posterior spinnerets slightly longer than anterior, distal segment conical, half as long as basal segment.

Female genitalia (fig. 39) large, with separate openings, pear-shaped spermatheca leading into stout, lightly coiled tubes. Male palpus (fig. 40) very short, cymbium not produced at tip; patella lacking apophysis, tibia with dorsal and ectal apophysis; bulb simple, lacking tegular processes and median apophysis; embolus long, whiplike, resting on spatulate conductor.

DISTRIBUTION: Eastern North America from Labrador south to Con-



FIGS. 41, 42. *Dirksia anyphaenoides* (Chamberlin and Ivie). 41. Epigynum. 42. Palpus.

necticut west to Michigan and western North America from southern Alaska south to mid-California. Three species are known from Europe and one from Japan.

**HABITATS:** The spiders are usually found in dense, damp woods under bark and moss.

#### GENUS *DIRKSIA* CHAMBERLIN AND IVIE

Figures 41, 42, 70

*Dirksia* CHAMBERLIN AND IVIE, 1942a, pp. 24-25.

**DIAGNOSIS:** Only one Nearctic species of *Dirksia* is known, *Dirksia cinctipes* (Banks). It differs from other agelenids by the presence of five pairs of ventral spines on tibia I, from *Cybaeota*, which is much smaller, 1.4 to 2.5 mm. in length, and *Cybaeina*, which has three to seven teeth and six to eight denticles on the cheliceral retromargin.

**DESCRIPTION:** Adults ranging in length from 2.3 to 4.4 mm. Eyes eight, covering entire anterior dorsal edge of carapace. AME slightly larger than diameter of ALE; posterior eyes larger than anterior, distinctly separated; posterior eye row slightly recurved; anterior eye row slightly procurved. Chelicera vertical; promargin with three slightly separated teeth; retromargin with two teeth, two or three denticles slightly separated to contiguous. Sternum pointed behind, hind coxae narrowly separated. Tibia-patella I as long as carapace. Spination: Femur I with one stout mesal distal spine; tibia I, ventral to lateral 2-2-2-2-2-0, spines stout,

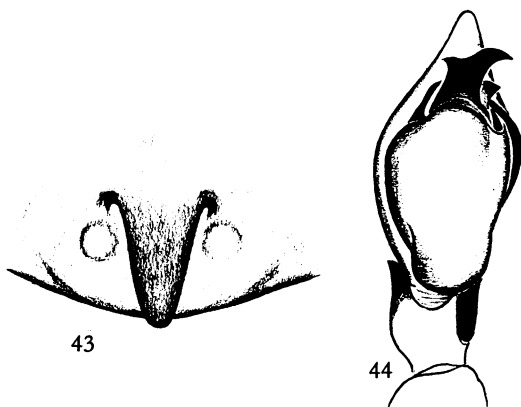


FIG. 43. Epigynum of *Ethobuella hespera* Chamberlin and Ivie.

FIG. 44. Palpus of *E. tuonops* Chamberlin and Ivie.

longest half as long as tibia; metatarsus I, ventral to lateral 2-2-2-2-0. Tarsi with two to three trichobothria. Abdomen with simple hairs and a few dorsal pale pilose hairs; lacking epiandrous glands. Colulus as wide as long, rounded distally with about 12 setae. Tracheal spiracle equal in width to colulus. Posterior spinnerets as long as anterior, distal segment short as that of anterior spinnerets, similar to that of *Cybaeus* but anterior spinnerets distinctly separated.

Epigynum simple (fig. 41) divided longitudinally with paired oval spermatheca. Male palpus (fig. 42) with unmodified patella; tibia heavily sculptured ectal-ventrally; cymbium not elongated distally; bulb simple, short, stout, truncated embolus projecting distally to side of short conductor; tegular processes and median apophysis absent.

DISTRIBUTION: Southern Alaska, coastal mountains of Washington and Oregon. One species has been recorded from Europe.

HABITATS: Most collections have been made by sweeping shrubs and hemlock trees.

#### GENUS *ETHOBUELLA* CHAMBERLIN AND IVIE

Figures 43, 44

*Ethobuella* CHAMBERLIN AND IVIE, 1937, pp. 223-224.

DIAGNOSIS: Two uncommon species are known. They differ from other agelenids by the presence of four pairs of ventral spines (occasionally one spine missing) on tibia I and from *Cybaeina* by the presence of only three

or four teeth and denticles on the cheliceral retromargin.

**DESCRIPTION:** Adults ranging in length from 2.5 to 3.0 mm. Eyes eight, AME minute, less than one-half diameter of ALE; remaining eyes equal in size, very large, contiguous, covering entire anterior dorsal edge of carapace; posterior eye row slightly recurved to straight; anterior eye row procurved (6/6). Chelicera vertical, promargin with two or three contiguous teeth plus a smaller separated mesal tooth; retromargin with three or four contiguous to slightly separated teeth, decreasing in size mesally. Sternum forming dull point behind, hind coxae moderately separated. Tibia-patella I as long as carapace. Spination: Femur I with one weak distal prolateral spine; tibia I, ventral-lateral 2-2-2-2-0, longest spines about one-third as long as tibia, occasionally one spine missing; metatarsus I, ventral-lateral 2-2-2-0. Tarsus with two to three trichobothria. Abdomen with simple hairs and few dorsal densely pilose pale hairs; lacking epiandrous glands. Colulus inconspicuous, low, swollen, with four setae. Tracheal spiracle slightly wider than colulus. Posterior spinnerets distinctly longer than anterior, distal segment conical, one-half to two-thirds as long as basal segment.

Female genitalia (fig. 43) with broad scape directed backward. Male palpus (fig. 44) relatively simple, patella lacking apophysis, tibia strongly sculptured ectally; cymbium gradually narrowed distally with depressed area near base from which emerge several curved parallel hairs directed toward tibia; bulb simple, embolus curved, short, spurlike, projecting distally to side of truncated conductor; median apophysis present; tegular processes absent.

**DISTRIBUTION:** Found along the coast of British Columbia south to mid-California.

**HABITATS:** One pair was collected by sifting leaves, and three collections were made by beating hemlocks, 75–85 feet high.

#### GENUS *NEOCRYPHOECA* ROTH

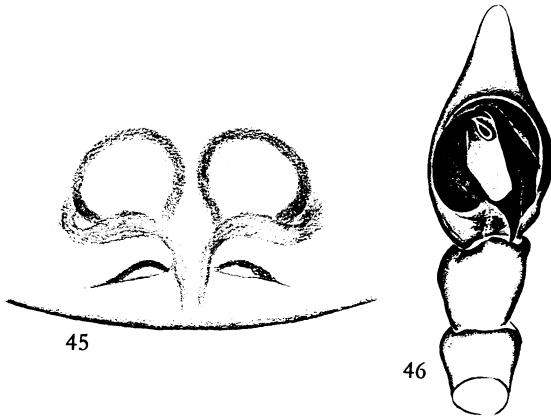
Figure 45

*Neocryphoea* ROTH, 1970, pp. 114–116.

**DIAGNOSIS:** Two species of *Neocryphoea* are known from females. This genus differs from all other agelenines by the ventral armature of tibia I and from *Cryphoea* by its smaller size.

**DESCRIPTION:** Adults tiny, ranging in length from 2.0 to 2.3 mm. Eyes eight, relatively large, compact; lateral eyes almost contiguous, PME separated slightly farther from each other than from PLE. AME two-fifths diameter of ALE, almost contiguous with each other and with



FIG. 45. Epigynum of *Neocryphoea gertschi* Roth.FIG. 46. Palpus of *Saltonia incerta* (Banks).

ALE; posterior eye row slightly procurved; anterior eye row straight. Cheliceral promargin with three contiguous teeth; retromargin with three to five equal teeth, almost contiguous. Sternum rounded posteriorly, coxae IV separated by their diameter. Tibia-patella I about as long as carapace. Spination: Femur I with one distal-mesal spine of normal size; tibia I, ventral 2-2-0; one lateral spine makes spination appear 2-2-1-0; metatarsus I, ventral 2-2-2-0, distal pair somewhat lateral. Tarsus with two trichobothria, longest half as long as tarsus. Abdomen with simple hair. Colulus represented by two setae. Tracheal spiracle near colulus, about as wide as diameter of basal segment of an anterior spinneret. Anterior spinnerets separated by twice width of basal segment, distal segment conical; posterior spinnerets slightly longer than anterior, distal segment about one-third as long as basal, median spinnerets conspicuous, exposed.

Female genitalia simple (fig. 45), consisting of two bulbous or oval spermathecae. Males unknown.

DISTRIBUTION: Santa Catalina Mountains, Arizona.

HABITATS: These spiders have been taken from under rocks and wood from 4300 to 8300 feet, from riparian zones with sycamore trees to oak-grasslands up to damp pine-fir forests.

#### GENUS *SALTONIA* CHAMBERLIN AND IVIE

Figures 14, 46

*Saltonia* CHAMBERLIN AND IVIE, 1942a, pp. 23-24.

**DIAGNOSIS:** Only a single species is known, *Saltonia incerta* (Banks). The combination of widely spaced anterior spinnerets, lack of plumose hair, and only two teeth on the cheliceral retromargin separate *Saltonia* from other agelenids.

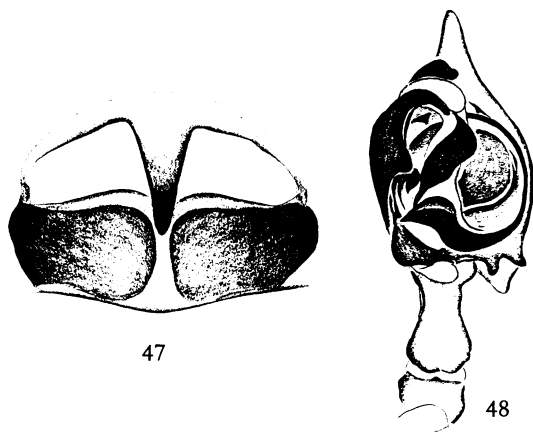
**DESCRIPTION:** Adults ranging in length from 3.3 to 4.5 mm. Eyes eight, those of posterior row equally separated; of anterior row similar, but separated slightly less than posterior eyes; AME slightly smaller than others, lateral eyes separated by half their diameter; both rows straight to slightly curved. Chelicera geniculate, promargin with three teeth, separated by distance equal to height of teeth; retromargin with two widely separated teeth. Sternum bluntly pointed; hind coxae separated by two-thirds diameter of hind coxa. Tibia-patella I about as long as carapace. Spination: Femur I with two distal-mesal spines. Tibia I, ventral 2-2-1p; metatarsus I, ventral 2-2-3, two lateral spines flank basal pair forming transverse row of four spines. Tarsus with four or five short trichobothria, largest situated near tip. Abdomen with few long simple setae and densely covered with short pilose setae, lacking epiandrous glands. Colulus low, broad, advanced slightly forward of anterior spinnerets (fig. 14). Tracheal spiracle advanced seven-thirty-seconds of the distance from the spinnerets to the epigastric furrow; openings large, separated by diameter of trachea. Anterior spinnerets advanced forward on abdomen, slender, basal segment almost three times as long as wide, widely separated, twice as wide as diameter of basal segment of anterior spinnerets. Posterior spinnerets shorter than anterior, distal segment of all spinnerets short, inconspicuous.

Female genitalia, according to Banks (1898, pp. 185-188), "shows a short, spoon-shaped septum, leaving each side a curved reddish mark." Male palpus (fig. 46) lacking patellar apophysis; ectal tibial apophysis thickened distally; cymbium flattened ectally at base, opposite tibial apophysis; bulb simple, lacking median apophysis and tegular processes; embolus whiplike; conductor acuminate, directed toward base of cymbium.

**REMARKS:** The large openings of the tracheal spiracles and the broad colulus of *Saltonia* indicates a close relationship to an undescribed genus found in barnacle shells in the Gulf of California.

**DISTRIBUTION:** Extreme southern California and northern part of the Gulf of California.

**HABITATS:** *Saltonia* is a drimophilus (salt-loving) species found under salt crusts or near salt water. Rare, only three specimens known. Collecting trips to salt-encrusted areas along the Salton Sea have produced no sign of *Saltonia*. There is nothing about the spider to indicate that it burrows, or that it lives in the sea (the short life of the Salton Sea could preclude



FIGS. 47, 48. *Wadotes hybridus* (Emerton). 47. Epigynum. 48. Palpus.

this possibility). It may live deep in the crevices of dried mud emerging to the surface at night or only at certain times of the year. The fact that two males were collected and only one female over a 70-year period attests to its cryptic habits.

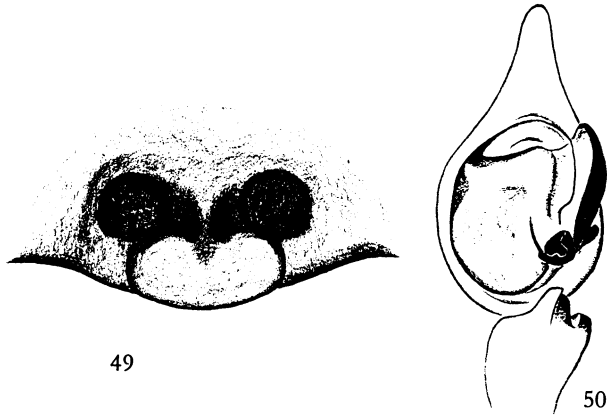
#### GENUS *WADOTES* CHAMBERLIN

Figures 47, 48

*Wadotes* CHAMBERLIN, 1925, p. 120. MUMA, 1947, pp. 1-12.

**DIAGNOSIS:** Seven species are known in this genus. *Wadotes* differs from other agelenines by having two teeth on the cheliceral retromargin, by the absence of plumose hair, and from *Saltonia* by its distribution, compact spinnerets, and large size.

**DESCRIPTION:** Adults ranging in length from 5.8 to 12.4 mm. Eyes eight, relatively small, in two almost parallel and almost straight rows. All anterior and lateral eyes equally separated; PME closer to each other than to PLE; AME smallest. Chelicera strongly geniculate; promargin with three teeth, retromargin with two. Sternum produced acutely behind; hind coxae narrowly separated. Tibia-patella I slightly shorter than carapace. Spination: Femur I with one mesal distal spine; tibia I, ventral 2-2-2; metatarsus I, ventral 2-2-3. Tarsus with seven or eight trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus consisting of two distinctly separated clumps of five to eight setae. Tracheal spiracle minute. Anterior spinnerets separated, as long as but stouter than



FIGS. 49, 50. *Yorima angelica* Roth. 49. Epigynum. 50. Palpus.

basal segment of posterior spinnerets; distal segment of posterior spinnerets as long as basal segment, tapered along inner margin to tip.

Epigynum (fig. 47) broad, with slender, flattened median scape directed backward. Male palpus stout (fig. 48); patella with ectal apophysis, tibia sculptured ectally, cymbium produced along basal ectal edge with longitudinal ectal carina; bulb with whiplike embolus, half-shell median apophysis, no tegular process, complicated several-part conductor attached at base of embolus.

DISTRIBUTION: Quebec, New England states, west to Michigan and south to Georgia. Western records of Muma (1946, p. 4) are based on mislabeled specimens. One species is recorded from Japan.

HABITATS: *Wadotes* is usually found under loose bark and rocks in forested areas.

#### GENUS *YORIMA* CHAMBERLIN AND IVIE

Figures 49, 50

*Yorima* CHAMBERLIN AND IVIE, 1942a, pp. 19–22. ROTH, 1956, pp. 1–10.

DIAGNOSIS: *Yorima* is a small genus of six described species, one undescribed. It can be separated from most of the other Cryphoeceae by the presence of six eyes and from six-eyed spiders of the genus *Blabomma* by its recurved posterior eye row and its longer posterior spinnerets. It is very similar to the six-eyed spiders of the genus *Cicurina* but these are found only in Texas.

DESCRIPTION: Adults ranging in length from 2.8 to 5.5 mm. Pale

spiders, occasionally with markings on abdomen. Eyes six; posterior eye row slightly to moderately recurved. Cheliceral promargin with three teeth; retromargin with three teeth and three to six denticles. Sternum pointed behind, hind coxae narrowly separated. Legs stout, tibia-patella I shorter than carapace. Spination: Femur I with two normal distal mesal spines; tibia I, ventral 2-2-0; metatarsus I, ventral 2-2-3. Tarsus with four or five trichobothria. Abdomen with simple hairs; lacking epiandrous glands. Colulus vestigial, two almost contiguous groups of setae totaling five to eight. Tracheal spiracle as wide as colulus. Distal segment of posterior spinnerets one-half to five-sixths as long as basal segment.

Epigynum (fig. 49) with two separate openings, single pair of round spermathecae. Palpus with femur and patella unmodified, tibia modified distally into carina and two spurlike processes; bulb simple (fig. 50) lacking median apophysis and tegular process with whiplike embolus, crooked distally, terminating ectally in conductor.

DISTRIBUTION: Central California along the coast south into extreme northern Baja California.

HABITATS: Usually found in duff in dense forests of redwood and deciduous tree leaf mould in densely vegetated narrow canyons of the southern coastal mountains.

#### INCERTAE SEDIS

The Tegenariae take an intermediate position between the groups Agelenae and Cryphoeceae. They have the plumose hair characterizing the Agelenae but the eyes are straight to moderately procurved as in the Cryphoeceae. Because of the present controversial state of the suprageneric classification of the Agelenidae it seems preferable to leave this genus in *incertae sedis* rather than to establish a new group.

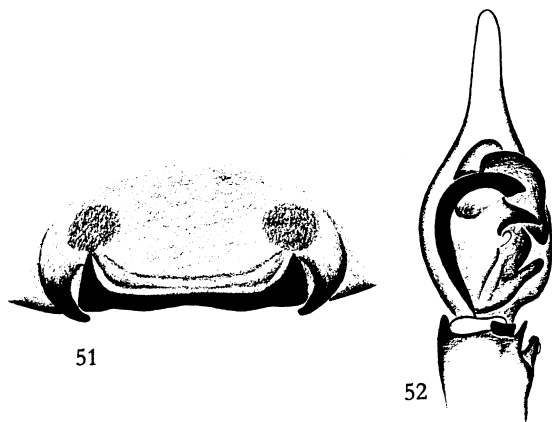
#### GENUS *TEGENARIA* LATREILLE

Figures 51, 52

*Tegenaria* LATREILLE, 1804, p. 134. ROTH, 1952b, pp. 283-288; 1968, pp. 1-33.

DIAGNOSIS: Five species and several subspecies of *Tegenaria* are known. Four of the species are introduced. The *Tegenaria* can be separated from other agelenids by the presence of plumose hair and straight to moderately procurved eye rows.

DESCRIPTION: Adults ranging in length from 5.6 to 15.0 mm. Eyes eight, subequal, in some species AME may be half diameter of ALE; anterior and posterior eye rows straight to procurved (6/6). Clypeus about one and one-half times as wide as ALE. Chelicera slightly to moderately geniculate;



FIGS. 51, 52. *Tegenaria domestica* (Clerck). 51. Epigynum. 52. Palpus.

promargin with three or four teeth, occasionally five; retromargin with three to five teeth, none to three denticles. Sternum produced to a point behind. Tibia-patella I slightly longer than to 2.6 times as long as carapace. Spination: Femur I with one mesal distal spine; tibia I, ventral no spines to three pair; metatarsus I, ventral 2-2-3 or 2-2-2-3. Tarsus with six to nine trichobothria. Abdomen, leg, and carapace with plumose hairs. Epian-drous glands present. Colulus two and one-half to six times as wide as long, with setose lobes laterally, joined in middle by glabrous area. Spiracular opening less than, to half, width of colulus. Anterior spinnerets moderately separated; posterior spinnerets more widely separated, distal segment slightly shorter than, to almost twice as long as, basal segment.

Epigynum variable (fig. 51), lateral spurs present (except *T. chiricahuae* Roth). Male palpus (fig. 52) slim to stout, patella lacking apophysis; tibia with two distal apophyses; bulb with slender to moderately stout embolus terminating on or in conductor; median apophysis present or apparently absent (*T. flexuosa* F. O. Pickard-Cambridge).

**DISTRIBUTION:** Introduced species have been found from Ellesmere Island in Northern Canada south to Panama. Two endemic species and several subspecies are known from near the Mexican borders of Arizona and New Mexico and south in Mexico to the state of Chiapas. Some androphilous species are known from all parts of the world but most endemic species are found in Europe and Japan with a few questionable species elsewhere.

**HABITATS:** Introduced species are found in and near human habitations

and man-made structures or cavities. The endemic species are found in mine tunnels, shallow and deep caves, and occasionally under bark and logs in forests.

#### GROUP AGELENEAE

**DIAGNOSIS:** Spiders of the Ageleneae Group are easily identified by the presence of eight eyes, by having both eye rows strongly procurved (9/6 to 12/6), by the presence of plumose hair on the carapace, legs, and abdomen and by the presence of only two to five teeth on the retromargin of the chelicera and no denticles.

**DESCRIPTION:** Adults ranging in length from 5.0 to 17.3 mm. Eyes eight, both rows strongly procurved, almost appearing to be in three rows of two, four, and two eyes (fig. 17). Eye area compact, sometimes slightly projecting. Eyes similar in size. Clypeus wide (fig. 17) opposite AME, about three times diameter of AME. Cheliceral promargin with three teeth, retromargin with two to four stout teeth, occasionally five. Sternum acuminate behind, hind coxae slightly separated. Spination: Femur I, two mesal-distal spines; tibia I, ventral 2-2-0 or 2-2-3; metatarsus I, ventral 2-2-3. Tarsi with six to eight trichobothria. Carapace, legs, and abdomen with plumose hair. Epiandrous glands present (fig. 7). Colulus divided into two sclerotized setose patches. Spiracular opening minute, about one-third diameter of basal segment of anterior spinnerets. Latter stout, cylindrical, single segmented, separated by almost their diameter at base; posterior spinnerets more slender, slightly longer than anterior, separated slightly more than anterior; distal segment ranging from about one-half to twice length of basal segment.

Epigyna and palpi variable but males invariably lacking patellar apophyses.

**REMARKS:** The Ageleneae (or tribes Agelenini and Agelenopsini of Lehtinen, 1967, p. 344) are a homogenous group of agelinines. They are similar in shape, size, and color pattern but differ in the number of teeth on the cheliceral retromargin and in the length of the distal segment of the posterior spinnerets although these last two characters show much overlapping in some genera. They do differ consistently in the general pattern of the genitalia.

For these reasons it seemed most expedient to describe the group as a whole and to point out their differences from one another under the individual generic descriptions.

**DISTRIBUTION:** Widespread, from Alaska and Canada to Panama.

**HABITATS:** These spiders make large and usually conspicuous funnel webs, usually considered typical of the family. The webs are almost hori-

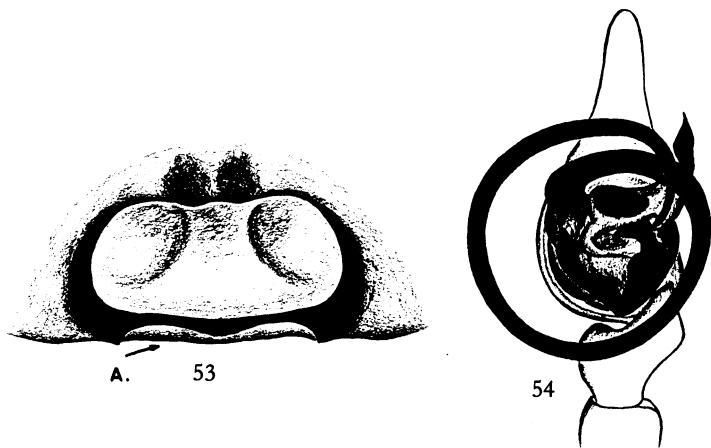


FIG. 53. Epigynum of *Agelenopsis potteri* (Blackwall). A. Coupling cavity.

FIG. 54. Palpus of *A. naevia* (Walckenaer).

zontal, triangular with a tubular retreat at the lower and narrower end which is usually hidden in grass, leaves, under bark, in holes in the ground, or in inside corners of buildings.

#### GENUS *AGELENOPSIS* GIEBEL

Figures 13, 17, 53, 54

*Agelenopsis* GIEBEL, 1869, p. 250. CHAMBERLIN AND IVIE, 1941, pp. 587-588.  
LEHTINEN, 1967, pp. 209-345.

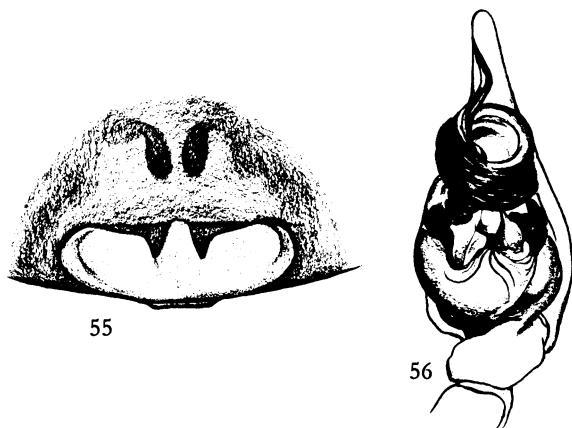
**DIAGNOSIS:** *Agelenopsis* is a small genus of 14 species. Males can be easily differentiated by the large coiled embolus (fig. 54) lying parallel across the face of the palpus. Females are differentiated from similar genera by the presence of three or four teeth on the cheliceral retromargin, by the long distal segment of the posterior spinnerets, and by the general shape of the epigynum with the presence of a coupling cavity along the posterior edge.

**DESCRIPTION:** Adults ranging in length from 5.50 to 17.35 mm. Cheliceral retromargin with three or four teeth. Distal segment of posterior spinnerets almost twice as long as basal segment.

Epigynum (fig. 53) with a transversely oval cavity, anterior rim smooth or slightly notched anteriorly, with coupling cavity along posterior edge, lateral teeth lacking.

Male palpus (fig. 54) with moderately slender cymbium, apex slightly less than half as long as the basal part; radix present, fused basally to



FIG. 55. Epigynum of *Barronopsis* sp.FIG. 56. Palpus of *B. floridensis* Roth.

tegulum; embolus stout, forming large circle lying parallel across face of bulb; tip free, not resting on conductor; latter simple with broad base, directed distally; tegular median apophysis simple, with small to rudimentary median apophysis at base.

**DISTRIBUTION:** All of North America from Alaska and Canada to central Mexico, and northern Baja California Norte.

**HABITATS:** Usually found in large funnel webs with the retreats extending down into grass. For this reason spiders of this genus are commonly called "Grass Spiders."

#### GENUS *BARRONOPSIS* CHAMBERLIN AND IVIE

Figures 55, 56

*Agelenopsis* (subgenus *Barronopsis*) CHAMBERLIN AND IVIE, 1941, pp. 601-602. ROTH, 1954, pp. 1-7.

*Barronopsis*: LEHTINEN, 1967, pp. 218, 345.

**DIAGNOSIS:** *Barronopsis* is a small genus of four species. This genus differs from the other Ageleneae (except *Agelenopsis* and *Tortolena*) by its distribution (east Texas to Maryland). From *Agelenopsis* it is differentiated by the absence of a coupling cavity on the posterior edge of the female epigynum and the presence of two distinct median projections on the anterior margin. The males differ from other Ageleneae by the unusual embolus with three or four tight coils at the base followed by one or more loose coils and by the concavity on the cymbium opposite the embolus. Both *Tortolena* and *Barronopsis* are found at the southern tip of Texas but

the former has four teeth on both cheliceral retromargins, whereas the latter has three, or occasionally four on one side.

A good, but not absolute character, is the presence of black spots encircling the base of the larger setae on the integument which gives the spider a peppered appearance.

**DESCRIPTION:** Adults ranging in length from 4.35 to 10.30 mm. Cheliceral retromargin with three teeth, occasionally four on one side. Distal segment of posterior spinnerets almost twice as long as basal segment.

Epigynum (fig. 55) with a transversely oblong opening with pair of more or less arcate projections along anterior rim; similar to *Agelenopsis* but lacking coupling cavities along posterior rim.

Male palpus (fig. 56) with tibia having stout and blunt ectal-distal apophysis; cymbium slender, tip about as long as base; concave opposite coiled embolus; bulb with well-developed, pointed membranous median apophysis, obliquely truncated chisel-edged tegular lateral process, conductor with subtriangular base, terminated by single stout spur; embolus consisting of three or four tightly fused basal coils, terminating in one to two and one-quarter loose coils extending distally to tip of cymbium.

**DISTRIBUTION:** Found in the maritime states from Maryland south to Florida, Bimini in the Bahama Islands, and west to 100° longitude in Texas.

**HABITATS:** The genus *Barronopsis* consists of typical funnel-web spiders, usually found in dense groves of palm-hardwood, hardwood, pine-hardwood or pine-palmetto. The spiders select niches above ground with their retreats protected by hollow stems, bromeliads, folds of palm and palmetto leaves, or bunches of dried leaves. *Barronopsis barrowsi* (Gertsch) places its retreats in contact with the ground or in grass clumps. *Barronopsis jeffersi* Muma has been collected off the sides of houses in Maryland.

#### GENUS *CALILENA* CHAMBERLIN AND IVIE

Figures 57, 58

*Calilena* CHAMBERLIN AND IVIE, 1941, p. 603. LEHTINEN, 1967, pp. 209, 347.

**DIAGNOSIS:** Sixteen species and several subspecies of *Calilena* are known from western North America and Baja California. Females can be differentiated from related genera by the presence of a median stylus (fig. 57) extending posteriorly from the anterior rim of the epigynum. Males can be separated from others with two teeth on the cheliceral retromargin by the long slender distal segment of the posterior spinnerets and from *Rualena* by the general structure of the male palpus (fig. 58), especially the tibial apophysis which is distal in *Rualena* and both lateral and distal in *Calilena*.

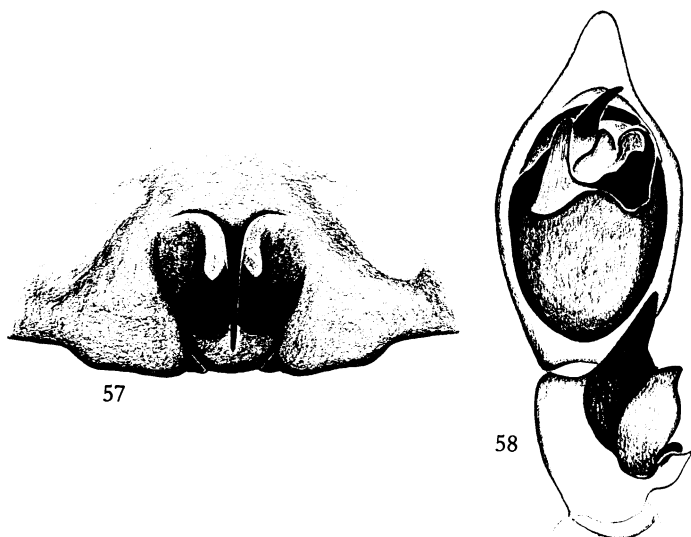


FIG. 57. Epigynum of *Calilena stylophora* Chamberlin and Ivie.

FIG. 58. Palpus of *C. arizonica* Chamberlin and Ivie.

**DESCRIPTION:** Adults ranging in length from 6.2 to 13 mm. Cheliceral retromargin with two teeth. Distal segment of posterior spinnerets almost twice as long as basal segment.

Epigynum (fig. 57) with narrow stylus attached to anterior rim extending posteriorly over shallow depression.

Male palpus (fig. 58) with tibia having lateral and distal ectal apophyses; cymbium stout, with tip about one-quarter of total length; bulb compact; embolus short, resting in double-ended conductor; fulcrum transparent, large to very small, at base of embolus; median apophyses shell-shaped; tegular processes absent.

**DISTRIBUTION:** Found throughout western United States east to Idaho, south to New Mexico and the northern part of Sonora and Baja California Norte. One record from the tip of Baja California Sur.

**HABITATS:** These spiders are most commonly found in relatively inconspicuous webs on the ground under cow droppings, boards, and loose rocks.

#### GENUS *HOLOLENA* CHAMBERLIN AND IVIE

Figures 7, 9, 12, 59, 60

*Agelena* (subgenus *Hololena*) CHAMBERLIN AND GERTSCH, 1929, p. 105.

*Hololena*: CHAMBERLIN AND IVIE, 1935, p. 31; 1942b, pp. 203–224. LEHTINEN, 1967, pp. 239, 347.

**DIAGNOSIS:** This is a moderately large genus of 30 closely related species with many others undescribed. It differs from other Agelenae by the short distal segment of the posterior spinnerets that is only two-thirds as long as the basal segment and the presence of only two teeth on the cheliceral retromargin. The genitalia are usually similar to those in figures 59, 60. Some female *Rualena* with short spinnerets may be confused with *Hololena* in southern California but the genitalia usually are ridged posteriorly in *Rualena* (fig. 66).

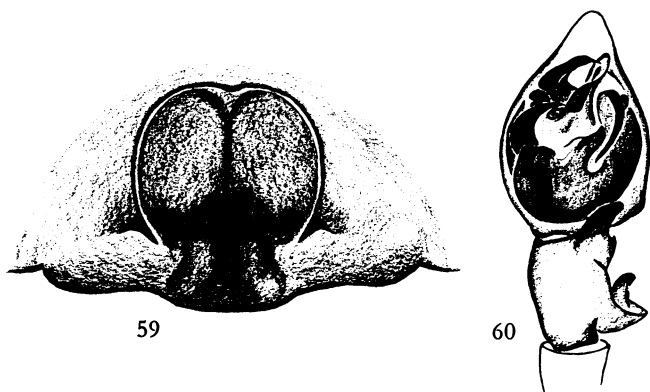


FIG. 59. Epigynum of *Hololena nedra* Chamberlin and Ivie.

FIG. 60. Palpus of *Hololena* sp.

**DESCRIPTION:** Adults ranging in length from 7.0 to 13.5 mm. Cheliceral retromargin with two teeth. Distal segment of posterior spinnerets about two-thirds as long as basal segment.

Epigynum with broad shallow cavity in most cases divided by median septum, with pair of short, stout lateral spurs similar to those in figure 59; posterior rim of epigynum not bordered by thickened ridge.

Male palpus (fig. 60) with tibia having stout lateral thumblike process and distal process; cymbium short, tip about one-quarter of total length; embolus stout, sinuate, resting in transparent fulcrum; conductor double-ended, median apophysis shell-like, tegular processes absent.

**DISTRIBUTION:** Western United States from Idaho, Colorado, and New Mexico south to the northern part of Baja California Norte.

**HABITATS:** Usually found in webs off the ground in inside corners of buildings and among leaves of bushes. One species was noted under clods of dirt in a freshly disked orchard.

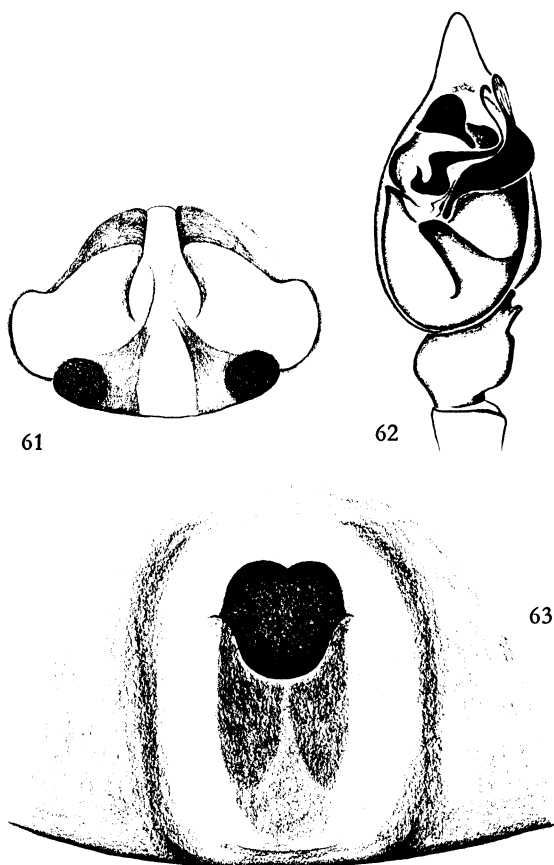


FIG. 61. Epigynum of *Melpomene* sp. from Texas.

FIG. 62. Palpus of *M. bicavata* (F. O. Pickard-Cambridge).

FIG. 63. Epigynum of *M. rita* (Chamberlin and Ivie).

GENUS *MELPOMENE* O. PICKARD-CAMBRIDGE

Figures 61-63

*Melpomene* O. PICKARD-CAMBRIDGE, 1898, p. 285. CHAMBERLIN AND IVIE, 1942b, p. 237. LEHTINEN, 1967, pp. 247, 345.

*Ritalena* CHAMBERLIN AND IVIE, 1941, p. 613.

DIAGNOSIS: Two species (one undescribed) are known from southern Arizona and western Texas and 10 species plus many undescribed from Mexico to Panama. The two species from the United States can be separated from other Ageleninae with three or four teeth on the cheliceral

retromargin and long posterior spinnerets by the absence of a coiled embolus and the presence of an embolic process on the embolus of the male palp. Females can be differentiated by the absence of lateral spurs on the epigynal plate and the absence of a coupling cavity along the posterior edge of the epigynum.

This genus appears to be a catchall for several unrelated species which evidently represent several genera.

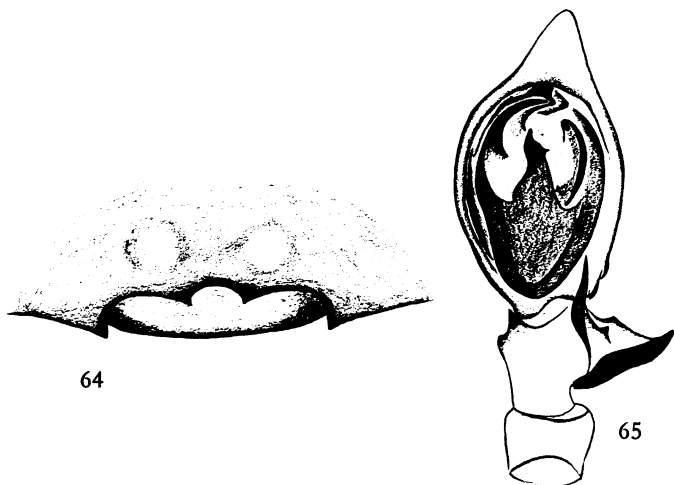


FIG. 64. Epigynum of *Novalena pima* Chamberlin and Ivie.

FIG. 65. Palpus of *N. intermedia* (Chamberlin and Gertsch).

**DESCRIPTION:** Adults ranging in length from 7.0 to 8.5 mm. Cheliceral retromargin with three or four teeth. Distal segment of posterior spinnerets about twice as long as basal segment.

Epigyna as illustrated (figs. 61, 63). Mexican and Central American species vary widely from these.

Male palpus (fig. 62) with short distal-ectal apophysis on tibia of palpus; cymbial apex about one-quarter of total length; embolus slender, with two large processes at base; bulb with large tegular lateral process, minute tegular median process; median apophysis present, cusplike; conductor present, large variable.

**DISTRIBUTION:** Southern Arizona, northern Sonora to western Texas south to Panama.

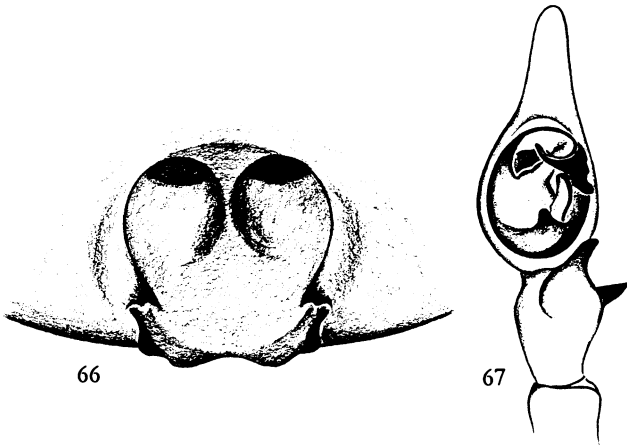
**HABITATS:** Unknown, most likely in wooded areas.

GENUS *NOVALENA* CHAMBERLIN AND IVIE

Figures 64, 65

*Novalena* CHAMBERLIN AND IVIE, 1942b, pp. 224-225. LEHTINEN, 1967, pp. 253, 347.

DIAGNOSIS: *Novalena* is a moderately large genus of 19 described species, only six of which are known from the Nearctic Region. At least 10 undescribed species are known. This genus differs from the other Ageleninae by



FIGS. 66, 67. *Rualena cockerelli* Chamberlin and Ivie. 66. Epigynum. 67. Palpus.

having short posterior spinnerets short, slightly curved embolus, and in the lateral and distal ectal apophyses in males and the typical broad female epigyna lacking a broad oval depression.

DESCRIPTION: Adults ranging in length from 7.1 to 11.4 mm. Cheliceral retromargin with two to four teeth. Distal segment of posterior spinnerets two-thirds as long to as long as basal segment.

Epigynum (fig. 64) broader than long with inconspicuous openings, usually appearing dark, slightly convex, lacking lateral spurs, occasionally anterior rim notched to form median spurs.

Male palpus (fig. 65) with tibia having both lateral and distal ectal apophyses; cymbium short and stout, tip less than one-quarter of total length; bulb compact, embolus short, stout, resting in simple conductor; tegular median process present at anterior part of bulb or absent; median apophysis distinct, shell-shaped.

DISTRIBUTION: Western half of North America from Washington and

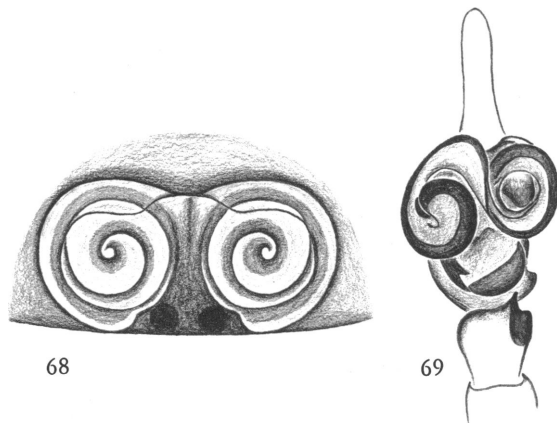


FIG. 68. Epigynum of *Tortolena dela* Chamberlin and Ivie.

FIG. 69. Palpus of *T. glaucopis* (F. O. Pickard-Cambridge) of Mexico.

Montana south through New Mexico and Mexico to Trinidad and French Guiana in South America.

**HABITATS:** Usually found in webs under loose bark of standing trees and stumps in dense coniferous forests, occasionally in webs on ground in shaded areas.

#### GENUS *RUALENA* CHAMBERLIN AND IVIE

Figures 66, 67

*Rualena* CHAMBERLIN AND IVIE, 1942b, p. 232. LEHTINEN, 1967, pp. 263, 347.

**DIAGNOSIS:** Eleven described and 24 undescribed species of *Rualena* are known from southern California and Baja California. This genus can be separated from the other Ageleneae by the general shape of the epigynum and palpus (figs. 66, 67). The female genitalia of some species are similar to *Hololena* but these specimens usually have longer posterior spinnerets, the distal segment being as long or longer than the basal segment, and the cheliceral retromargin usually bear three teeth rather than two.

**DESCRIPTION:** Adults ranging in length from 5.3 to 9.5 mm. Cheliceral retromargin with two or three teeth. Distal segment of posterior spinnerets ranging from two-thirds as long to twice as long as basal segment.

Epigynum (fig. 66) consisting of large cavity, flanked by short spur on either side, sometimes partially divided by median septum, usually bordered posteriorly by thickened area forming ridge with lateral corners.



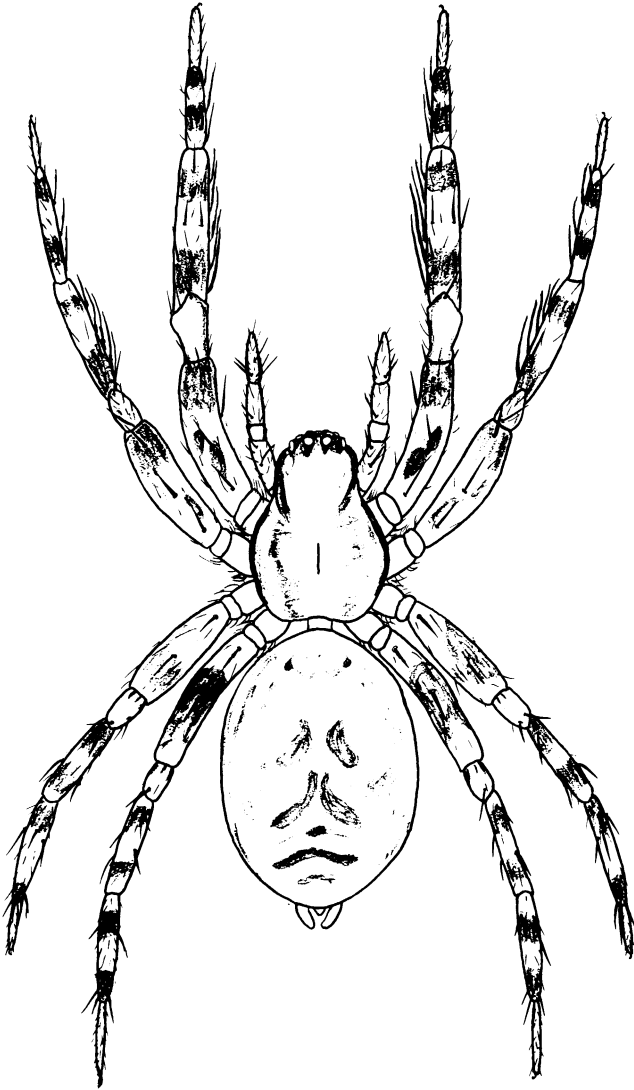


FIG. 70. *Dirksia cinctipes* (Banks), adult female.

Male palpus (fig. 66) with a moderately slender to stout cymbium with apex slightly less than one-third to one-half total length; embolus whiplike, forming a slight curve or double curve terminating on a short, simple or double-ended conductor; median apophysis shell-like; tegular lateral

process absent, tegular median process present or absent; fulcrum tiny or absent.

DISTRIBUTION: Mainly found on west coast of California south of latitude 37° N and through Baja California. One species is also known from Guerrero, Mexico, and one from Guatemala.

#### GENUS *TORTOLENA* CHAMBERLIN AND IVIE

Figures 68, 69

*Tortolena* CHAMBERLIN AND IVIE, 1941, p. 614. LEHTINEN, 1967, pp. 271, 345.

DIAGNOSIS: One species of *Tortolena* occurs at the southern tip of Texas. Differs from all other Agelenae by the pair of parabolic spirals in the epigynal cavity and by the "8" curvature of the embolus.

DESCRIPTION: Adults ranging in length from 6.5 to 7.3 mm. Cheliceral retromargin with four teeth. Distal segment of posterior spinnerets longer than basal segment.

Epigynum (fig. 68) consisting of broad depression with pair of parabolic spirals in bottom; lateral spurs and coupling cavities lacking.

Male unknown for Texas species. Male palpus (fig. 69) of Mexican species with simple distal ectal apophysis on tibia, cymbium slender, apex half total length; embolus forming two loops in shape of figure "8" lying across face of bulb; median apophysis absent; both tegular processes absent.

DISTRIBUTION: Southern tip of Texas, Mexico, and Costa Rica.

HABITAT: One pair was collected in a shallow cave in Mexico also inhabited by *Tegenaria mexicana tlaxcala* Roth.

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