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REVISION OF THE NEARCTIC SPIDER GENUS *CALYMMARIA* (ARANEAE, HAHNIIDAE)

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ABSTRACT. Thirty-one species of *Calymmaria* are described or redescribed and illustrated. Twenty-two species are described as new: *Calymmaria alleni, C. bifurcata, C. carmel, C. farallon, C. gertschi, C. humboldt, C. iviei, C. minuta, C. monterey, C. orick, C. rosario, C. rothi, C. scotia, C. sequoia, C. sierra, C. similaria, C. siskiyou, C. sueni, C. tecate, C. tubera, C. virginica* and *C. yolandae*. A key to all thirty-one species is provided. *Calymmaria quadrata* (Exline 1938) is synonymized with *C. emertoni* (Simon 1897), and *C. cavicola* (Banks 1896) and *C. montavencis* (Bishop & Crosby 1926) are synonymized with *C. persica* (Hentz 1847). *Tegenaria modesta* Banks 1898 and the replacement name *T. modestella* Roewer 1944 are treated as *nomina dubia.* The male palpus of *C. lora* (Chamberlin & Ivie 1942) and *C. emertoni* (Simon) are illustrated for the first time along with the internal structure of the female epigynum of *C. californica* (Banks 1896) and *C. shastae* (Chamberlin & Ivie 1937). Information is provided on habitat and web structure in the genus. A cladogram of the species of *Calymmaria* is presented based on a cladistic analysis of characters. The presence of a dorsal patellar fracture line is hypothesized to be an apomorphic character state that relates *Calymmaria* to five other agelenoid genera: *Willisus, Blabomma, Yorima, Cybaeota,* and *Cybaeina.*

Keywords: Taxonomy, phylogeny, new species, North America

The genus *Calymmaria* comprises 31 described species of Nearctic spiders traditionally placed in the family Agelenidae, but currently placed in Hahniidae. Twenty-nine species occur west of the Rocky Mountains in the Sierra Nevada, Coast and Cascade ranges from Baja California north to British Columbia. Two species are known from the Appalachian region of the eastern United States. There are currently no records of the genus from Central or South America.

Individuals of *Calymmaria* range in size from approximately 2 mm in *C. minuta* new species to nearly 10 mm in *C. suprema* Chamberlin & Ivie 1937 and *C. persica* (Hentz 1847). Most specimens of *Calymmaria* are yellow, gray or brown with darker markings on the carapace and dorsum of the abdomen. Species of *Calymmaria* often closely resemble one another making separation, especially of the females, difficult.

Within its range *Calymmaria* is locally abundant. In the mountainous regions of western North America, species inhabit cool, damp forests and have been collected at elevations from 50 m (*C. nana* (Simon 1897)) to 3300 m (*C. monicae* Chamberlin & Ivie 1937). They are common in forests of Ponderosa Pine (*Pinus ponderosa*), Jeffrey Pine (*Pinus jeffreyi*), White Fir (*Abies concolor*), Douglas-fir (*Pseudotsuga menziesii*), Sequoia (*Sequoia gigantea*), Redwood (*Sequoia sempervirens*), California White Oak (*Quercus lobata*), and Incense-cedar (*Libocedrus decurrens*). Webs are placed beneath and between bark, beneath moss on rocks and living trees, beneath fallen tree trunks, in caves and especially along streams. Chamberlin & Ivie (1937) reported that *Calymmaria* is common under boards and other objects near buildings, and there are a few records from inside houses. A specimen of *C. iviei* was collected from an old packrat nest.

In the Appalachian Mountains of the eastern United States, *Calymmaria* has not been collected below 200 m. *Calymmaria*'s normal

[1] Deceased.

habitats are in leaf litter, in dirt cavities, among mossy rocks along streams, beneath overhanging rocks and beneath *Rhododendron* roots. Many specimens have been collected from caves as far back as 23 m from the entrance (Blatchley 1896). Some specimens of *C. persica* in cave habitats show marked loss of pigment but no blind specimens are known. Another particularly favorable location for *Calymmaria* in the East is around and behind waterfalls.

Calymmaria usually places its unusual web beneath some object such as an overhanging rock. The thick sheet is formed into a conical basket (Figs. 1, 2), anchored above and below by thick supporting lines. The spider spins the basket in a circular path parallel to the ground. Above the basket, *Calymmaria* constructs a thin platform parallel with and very close to the object to which the basket is suspended from above. Beneath the platform, the spider hangs in an inverted position. Occasionally, specimens kept in the laboratory were observed on the outside of the basket. No significant intraspecific differences in web structure have been observed. *Calymmaria* apparently feeds on minute insects, particularly small Diptera. They readily accepted *Drosophila* spp. in the laboratory, capturing their prey by biting, retreating, and biting again. Usually the prey is dragged to the platform but occasionally the spider was observed feeding on the inside or outside of the basket.

Nothing is known of the life cycle of *Calymmaria*. Immature specimens are virtually impossible to identify without associated adults. In western North America, mature specimens can be collected during any month of the year. In eastern North America, specimens taken from habitats outside of caves tend to mature in mid to late summer.

This paper includes 31 species of *Calymmaria*, 22 described as new. All previously described species have been redescribed in an effort to provide consistent and adequate descriptions for all species. Several species are illustrated for the first time.

The genera *Calymmaria* and *Tegenaria* (Agelenidae) have many similar characteristics. Between 1847 and 1937, seven species of spiders had been described in the genus *Tegenaria* that eventually were placed in the genus *Calymmaria*. It was not until 1937 that six species of *Tegenaria* were recognized as a distinct group and removed from *Tegenaria* to form the new genus *Calymmaria*, along with three new species (Chamberlin & Ivie 1937). The name apparently is derived from the Greek root *Calymm* = veil (Borror 1971), no doubt referring to the shape of the web.

In 1938, Exline published a paper on Washington Agelenidae and Hahniidae, and provided a key, illustrations, and distribution records to three species of *Calymmaria*. In 1942, Chamberlin & Ivie described two additional species. In 1944, Roewer renamed *C. modesta* (Banks) as *Tegenaria modestella* Roewer since the specific epithet *modesta* was preoccupied by Keyserling (1879). *Tegenaria modestella* is considered to be a *nomen dubium* in the present paper. Roth (1952) reviewed the status of the four *Calymmaria* species listed as *Tegenaria* in Roewer (1944) and transferred them back to *Calymmaria*. This was reflected in Roewer's revision of his *Katalog* in 1954. In this later catalogue, Roewer (1954) recognized 13 species in the genus *Calymmaria*, and one species here placed in *Calymmaria* was listed as *Cybaeus montavencis* Bishop & Crosby 1926.

In 1956, Roth discussed name changes in the Agelenidae and reviewed the status of *C. californica* (Banks) noting this species' past inclusion in *Tegenaria*. In 1968, Roth revised the genus *Tegenaria* and reviewed the present disposition of species listed in *Tegenaria* in western hemisphere literature. The list included the six species of *Calymmaria* previously placed in *Tegenaria*. In 1972, Roth & Brame reviewed the genus *Calymmaria*, briefly discussing distribution and habitats. Finally, in 1981, Roth discussed the relationship of *Calymmaria* and *Willisus* based on the presence of a patellar fracture line in both genera.

Lehtinen (1967) moved *Calymmaria* from Agelenidae to Hahniidae, where they are currently (and perhaps unsatisfactorily) placed. Lehtinen argued that *Calymmaria* has a close relationship with two genera he placed in Hahniidae, *Dirksia* and *Ethobuella*.

METHODS

Approximately 2300 specimens were examined for this study. The senior author collected specimens throughout the known range of the genus and reared many juvenile specimens to adulthood in captivity. The majority of the specimens were obtained through loans

Figures 1–2.—Webs of *Calymmaria*. 1. *Calymmaria* sp. from Lake Tahoe area of California; 2. *C. persica* from North Carolina.

from museums and universities. The following is a list of institutions and individuals who provided specimens of *Calymmaria*, along with acronyms used to designate the origin of the material assigned to each species:

American Museum of Natural History (AMNH); Andrew J. Penniman Collection (AJPC); Burke Museum of Natural History (University of Washington) (BMSC); California Academy of Sciences Collection (CASC); Canadian National Collection (CNC); Darrell Ubick Collection (DUSC); Essig Museum Collection (University of California, Berkeley) (EMSC); Florida State Collection of Arthropods (FSCA); Frederick A. Coyle Collection (FACC); Illinois Natural History Survey (INHS); Museum of Comparative Zoology (MCZC); Museum National d'Histoire Naturelle (MNHN); Ohio State University Collection (OSUC); Oregon State University Collection (ORSC); Peck-Exline Collection (PESC); William A. Shear Collection (WASC); University of Arkansas Collection (UAIC); University of Vermont Collection (UVSC).

The species descriptions are based on holotypes or representative specimens of each species. Where the word ''typical'' is used refers to the generic description. Spination is so variable that it proved to be of little diagnostic use, although most species will generally fit the pattern given in the generic description. Only diagnostic characters and characters used in constructing the cladogram are included in the descriptions.

The anatomy of individual specimens was studied using a Wild Heerbrugg M-3 dissecting microscope equipped with a 20 × 20 grid micrometer. The total length, carapace length, carapace width, and length of femur I were measured in millimeters (range, with mean in parentheses) for five specimens of each sex, where possible and unless otherwise noted. Because size is highly variable in *Calymmaria*, more measurements were deemed unnecessary. The left palpi of male specimens were removed, embedded in fine sand, and illustrated utilizing the grid micrometer and gridded paper. The ventral and lateral aspect of each palpus was illustrated, along with the dorsal view of the palpal tibia. The epigyna of female specimens were dissected using a sharp-pointed scalpel, slicing from the forward margin backward. Tissue was removed from the epigyna by a fine needle. All genitalia were placed in plastic microvials filled with alcohol and returned to the original vial after study.

For comparison, genitalia were placed in numbered 10 mm glass dishes. These dishes were filled with fine sand in order to anchor the genitalia. A number of these small dishes were placed in a larger 9 cm petri dish. In this manner, genitalia could be easily compared side by side, without confusion.

Following identification, each vial (with neoprene stopper) was permanently labelled with the correct name and specimens were sorted to species. For additional information on methods (including field methods), see Heiss (1982).

TAXONOMY

Family Hahniidae

Genus *Calymmaria* Chamberlin & Ivie 1937

Calymmaria Chamberlin & Ivie 1937: 211.

Type species.—*Calymmaria monicae* Chamberlin & Ivie 1937, by original designation.

Diagnosis.—*Calymmaria* can be separated from similar spiders in North America (except *Willisus* and *Tegenaria*) in having the length of patella + tibia I at least one and one-quarter the length of the carapace. It can be separated from *Willisus* by the presence of denticles on the cheliceral retromargin and the general pattern of the genitalia. *Calymmaria* can be separated from *Tegenaria* in possessing a patellar fracture line and the absence of plumose setae.

Description.—Length: 2–10 mm. Cephalothorax: eyes eight, anterior median eyes smallest, others equal, secondary eyes with a canoe-shaped tapetum, eye rows nearly straight; chelicerae with three promarginal teeth and three or four retromarginal teeth and one to five denticles; carapace two-thirds as wide as long with scattered simple setae, usually light yellow to orange or red and marked with gray marginal and submarginal stripes and a V-shaped mark at the base of the cephalic region, eyes ringed with black; sternum nearly as long as wide, pointed behind, with apex of posterior margin extending between hind coxae. Abdomen: oval covered with fine simple setae, markings variable but usually with a dorsal basal lanceolate mark followed by spots or chevrons, venter usually gray with white or yellow lateral longitudinal stripes;

lacking obvious epiandrous glands (although they may be present but small; anonymous reviewer, pers. observ.); colulus twice as wide as long with 15 to 20 setae; posterior spinnerets longer than anterior, with distal segment of posterior spinneret one-half as long as basal segment and wedge-shaped. Legs: annulate to unmarked; relative length 4, 1, 2, 3; patella—tibia I at least one and one-quarter as long as carapace; patella I-IV with dorsal fracture line (Fig. 3); tarsi with six to eight trichobothria, paired lateral claws with 14 teeth, median claw with three teeth, semicircular setae and accessory claws present. Spination highly variable. The following formulas summarize variation in the number of spines found on spine-bearing surfaces of each segment, divided into thirds or fourths, beginning with the proximalmost and ending with the distalmost portion (after Platnick & Shadab 1975): femur I—prolateral 0-1-0; dorsal 0-1-0; femur II—dorsal 0-1-0; femur III—dorsal 0-1-0; femur IV—dorsal 0-1-0; patella I-IV—dorsal 1-0-1; tibia I—prolateral 0, 0-0-1, 0-1-0-1; dorsal 1-0-1; ventral 0-2-2-0; tibia II—prolateral 0-0-1, 0-1-1; retrolateral 0, 0-0-1; dorsal 0-2-2-0; ventral 0-2-2-0; tibia III-IV—prolateral 0-1-1; retrolateral 0-0-1, 0-1-1; dorsal 0-2-2-0; ventral 0-2-0, 0-2-2-0; metatarsus I—prolateral 0, 0-0-1; retrolateral 0, 0-0-1; ventral 0-2-2-3; metatarus II—prolateral 0, 0-1-0, 0-0-1; retrolateral 0, 0-1-0, 0-1-1, 1-1-1; metatarsus III—retrolateral 0, 0-0-1, 0-1-1, 1-1-1-1; ventral 0-2-2-3; metatarsus IV: prolateral 0-1-1-0, 1-1-0-1, 1-1-1-1; retrolateral 0-0-1-1, 1-1-1-1; ventral 0-2-2-3. Epigynum of female (Figs. 4, 5) simple with a single median opening externally; internally, usually with a midpiece composed of fused tubes ending in blind ducts near top; lateral ducts usually joined at base of midpiece; fertilization tubes long; spermatheca usually spherical. Palpus of male (Figs. 6, 7) complex, usually with a well-developed ventral patellar apophysis (PA); well-developed retrolateral tibial apophyses (RTA); tibia with one or two prolateral spines, usually several long ventral setae, and many short retrolateral setae; cymbium produced distad; embolus spine-like, sometimes thickened or bifurcate; conductor usually complex with basal and distal lobes; median apophysis and extrategular processes absent.

Distribution.—Baja California north to British Columbia; Appalachian Mountains of eastern U.S.A. (Map 1).

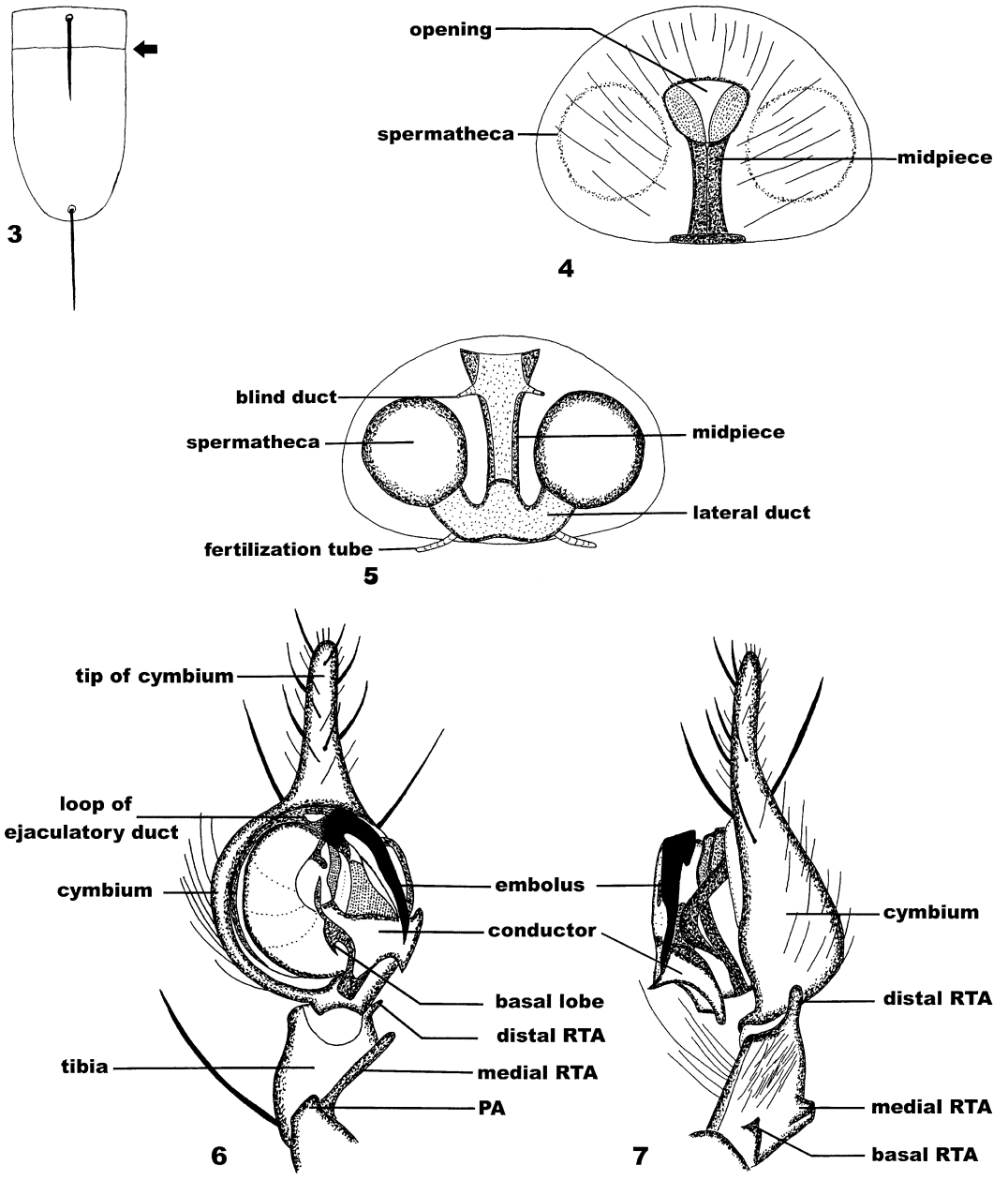
Natural History.—Cool, damp forests, beneath litter, under overhanging rocks, under and between bark of living and dead trees, under dead tree trunks, beneath moss on trees and rocks, in caves.

Species excluded.—The holotype of *Tegenaria modesta* Banks 1898 was lost. His description and illustration of *T. modesta* are too poor to allow the assignment of any of the known material from Mexico to the Banks species, and the name is here regarded as a *nomen dubium.* This name was found to be a junior primary homonym of *T. modesta* Keyserling 1879 by Roewer (1944) who replaced it with the name *Tegenaria modestella* Roewer 1944.

KEY TO THE SPECIES OF *CALYMMARIA*

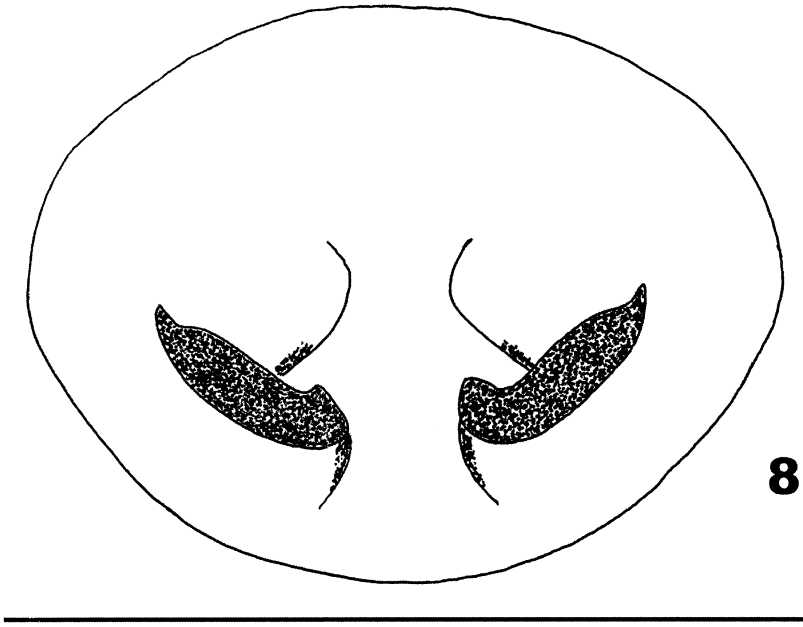
The following key will separate all 31 described species of *Calymmaria*. The key should be used along with the descriptions and illustrations. When using the key, emboli should be viewed ventrally, and RTA (retrolateral tibial apophyses) dorsally, unless otherwise stated.

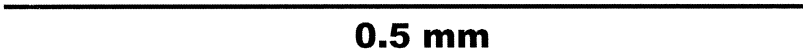
1. Males 2
   Females 28
2. Embolus very wide at base, apex bifurcate (Figs. 15, 53) or tapering abruptly to a point (Figs. 28, 65, 70, 105) 3
   Embolus thin, if widened at base, tapering gradually or widened midway or thickened along its entire length 8
3. Apex of embolus bifurcate (Figs. 15, 53) 4
   Apex of embolus tapering abruptly 5
4. Apex of embolus with two sharp points (Fig. 15) . . . . . *Calymmaria bifurcata*
   Apex of embolus with lower point rounded (Fig. 53) . . . . . *Calymmaria minuta*
5. Embolus with apex thick and tapering only near point (Fig. 70) . . . . . *Calymmaria orick*

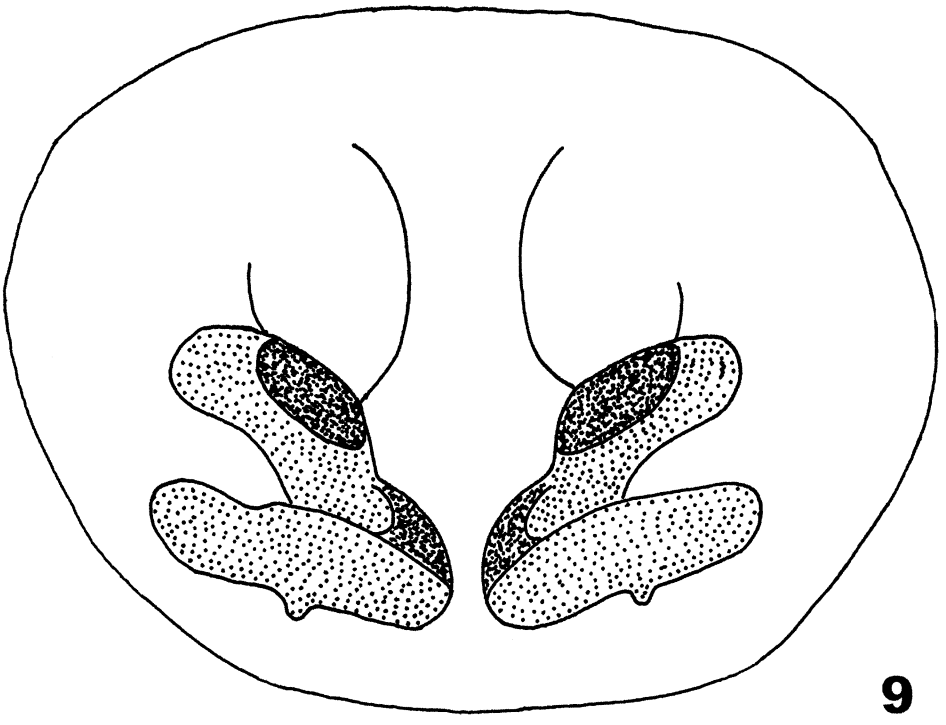


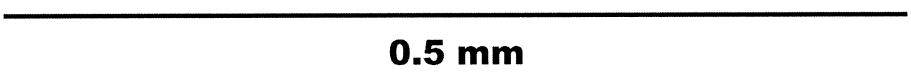
Figures 3–7.—Generalized morphology of *Calymmaria*. 3. Dorsal view of patella of *Calymmaria* showing fracture line (arrow); 4. Ventral view of epigynum of *Calymmaria*; 5. Dorsal view of epigynum of *Calymmaria*; 6. Ventral view of left palpus of *Calymmaria*; 7. Lateral view of left palpus of *Calymmaria*. RTA = Retrolateral tibial apophysis; PA = Patellar apophysis.

Embolus with apex tapering from base 6
6. Embolus with sides rounded and tapering abruptly (Fig. 28) . . . . . *Calymmaria emertoni*
Embolus with sides angular and tapering abruptly (Figs. 65, 70, 105) 7
7. Embolus with apex long, lower angle of base sharp; PA small, rounded; basal RTA bifurcate (Fig. 65–67) . . . . . *Calymmaria nana*

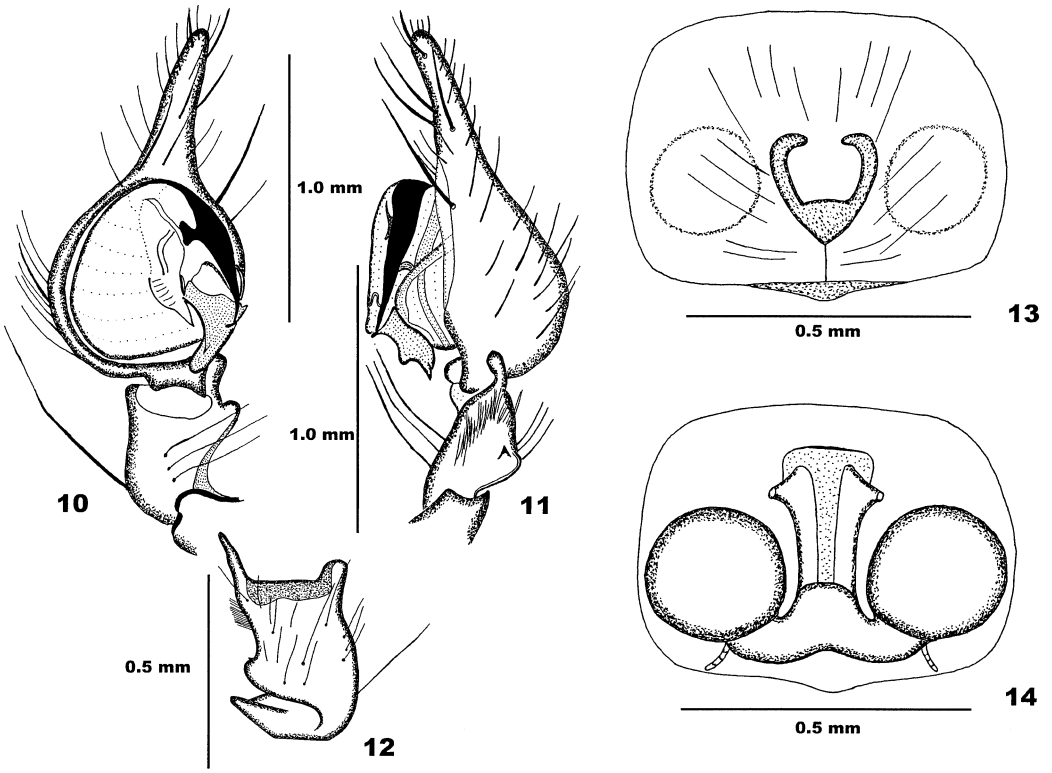








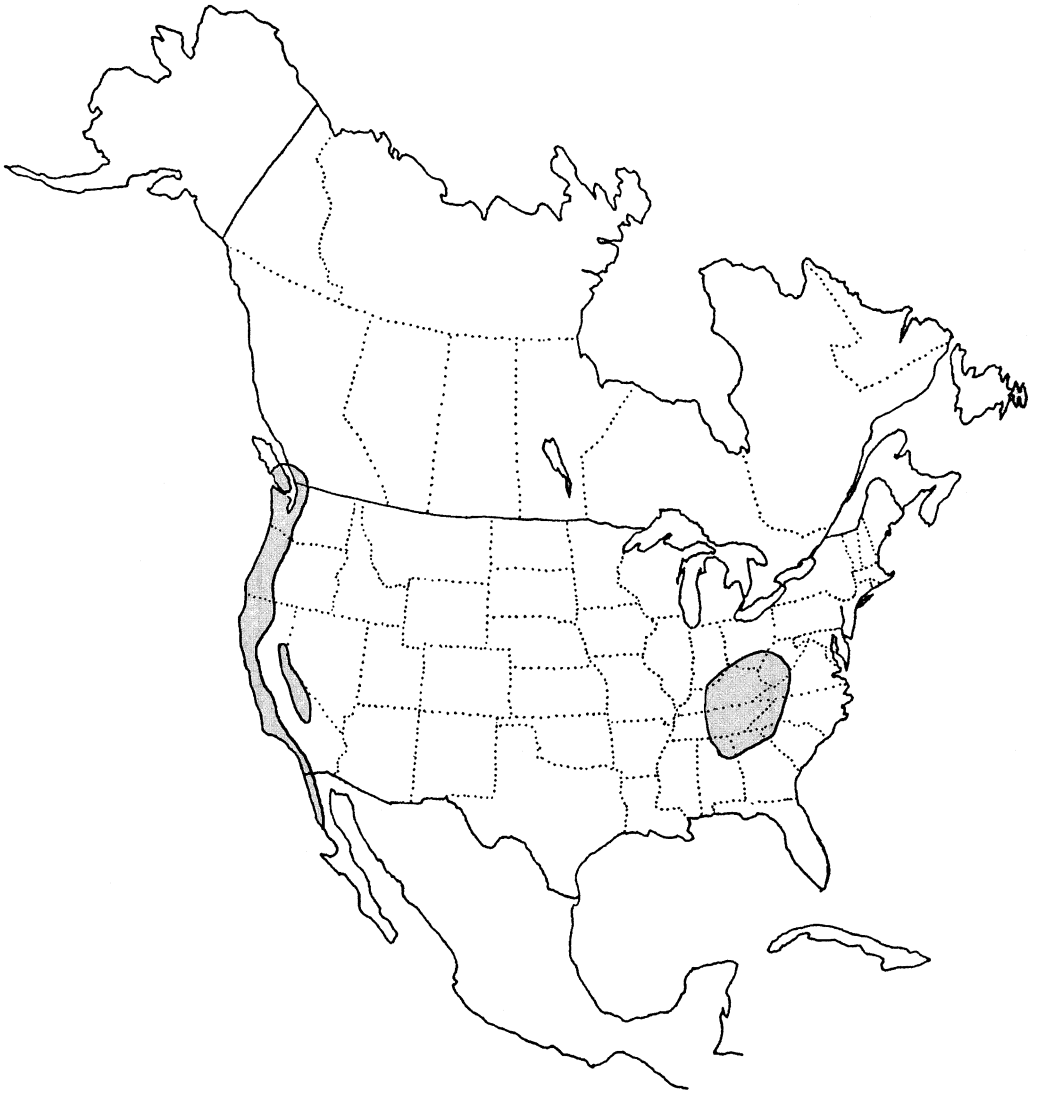
Figures 8–9.—*Calymmaria alleni*. 8. Epigynum, ventral; 9. Epigynum, dorsal.



Figures 10–14.—*Calymmaria aspenola*. 10. Palpus, ventral; 11. Palpus, lateral; 12. Palpal tibia, dorsal; 13. Epigynum, ventral; 14. Epigynum, dorsal.

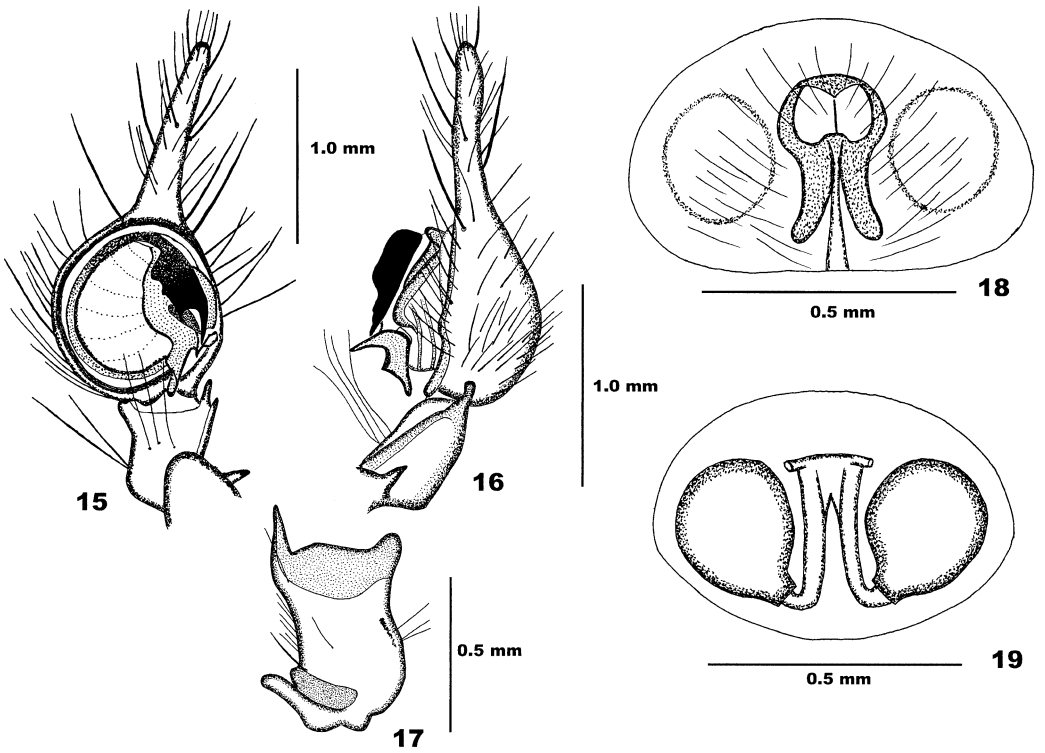
Embolus with apex shorter, lower angle of base less sharp; PA large, rounded; basal RTA entire (Fig. 105–107) . . . . . *Calymmaria siskiyou*

8. Ejaculatory duct conspicuously looped at base of embolus (Figs. 43, 80, 115) 9
   Ejaculatory duct not looped 11
9. Embolus thin, very long (Figs. 115–117) . . . . . *Calymmaria suprema*
   Embolus thicker 10
10. Embolus short, thick, with a swelling near apex when viewed laterally (Fig. 124) . . . . . *Calymmaria tubera*
    Embolus longer, thickest at base, with no swelling near apex when viewed laterally (Figs. 43–45) . . . . . *Calymmaria iviei*
11. Embolus thin or tapering gradually from base 12
    Embolus thick 19
12. Basal tibial apophysis complex, with many lobes (Figs. 73–75, 126–128), eastern U.S.A. 13
    Basal tibial apophysis simple, western U.S.A. 14
13. Medial RTA with two teeth, lobes of basal tibial apophysis from above pointed (Figs. 74, 75) . . . . . *Calymmaria persica*
    Medial RTA with one lobe, ventral and retrolateral lobes of basal apophysis large, rounded or quadrate from above (Figs. 127, 128) . . . . . *Calymmaria virginica*
14. Basal RTA with ventral lobe bifurcate and a rounded dorsal lobe; distal RTA with a basal lobe (Fig. 38, 39) . . . . . *Calymmaria gertschi*
    Basal RTA not as above; distal RTA without basal lobe 15
15. Basal RTA with teeth; medial RTA lobe-like laterally (Fig. 40–42) . . *Calymmaria humboldt*



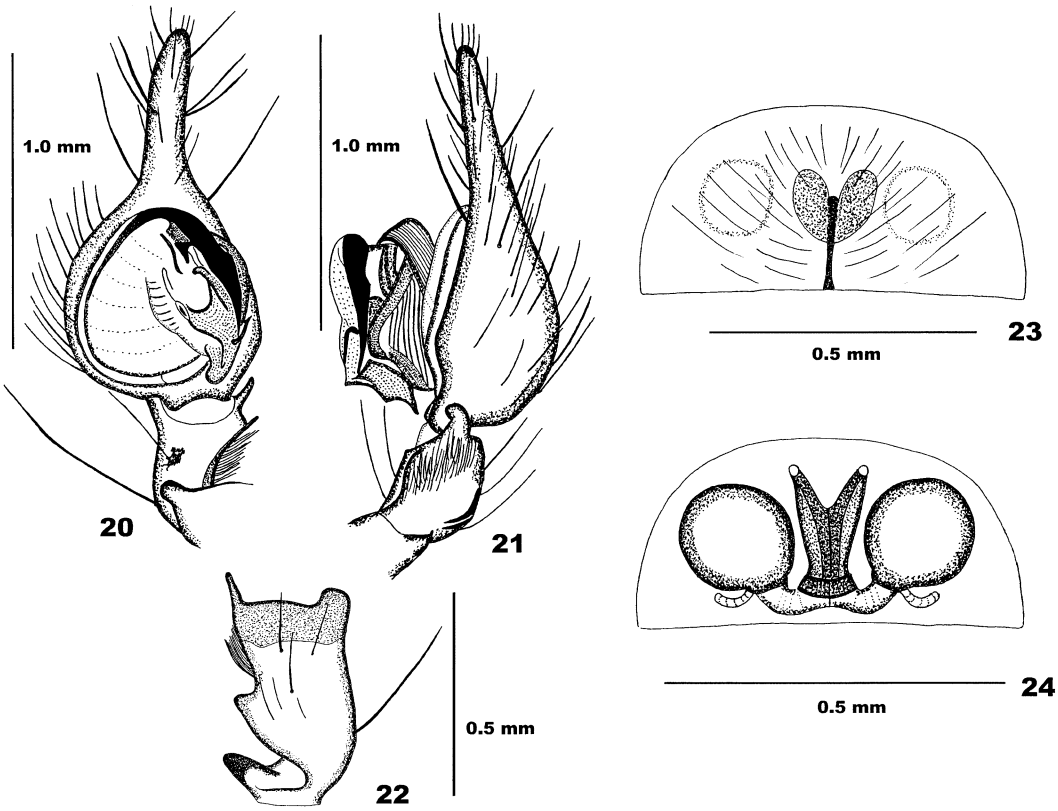
Map 1.—Distribution of genus *Calymmaria*.

Basal RTA entire; medial RTA not lobe-like laterally 16
16. Embolus with a swelling near base (Figs. 98–100); medial RTA with two rounded lobes . . . . . *Calymmaria sierra*
Embolus and medial RTA not as above 17
17. Embolus gradually tapering from base (Figs. 25–27) . . . . . *Calymmaria carmel*
Embolus tapering nearer the apex 18
18. Patellar apophysis absent; conductor with pointed lobes from below; medial RTA thick and flat from above (Figs. 131–133) . . . . . *Calymmaria yolandae*
Patellar apophysis well-developed; conductor and medial RTA not as above (Figs. 80–82) . . . . . *Calymmaria rothi*
19. Embolus with sharp bifurcation at apex (Figs. 110–112) . . . . . *Calymmaria sueni*
Embolus not bifurcate 20
20. Embolus with small rounded point at apex Figs. 85–87) . . . . . *Calymmaria scotia*



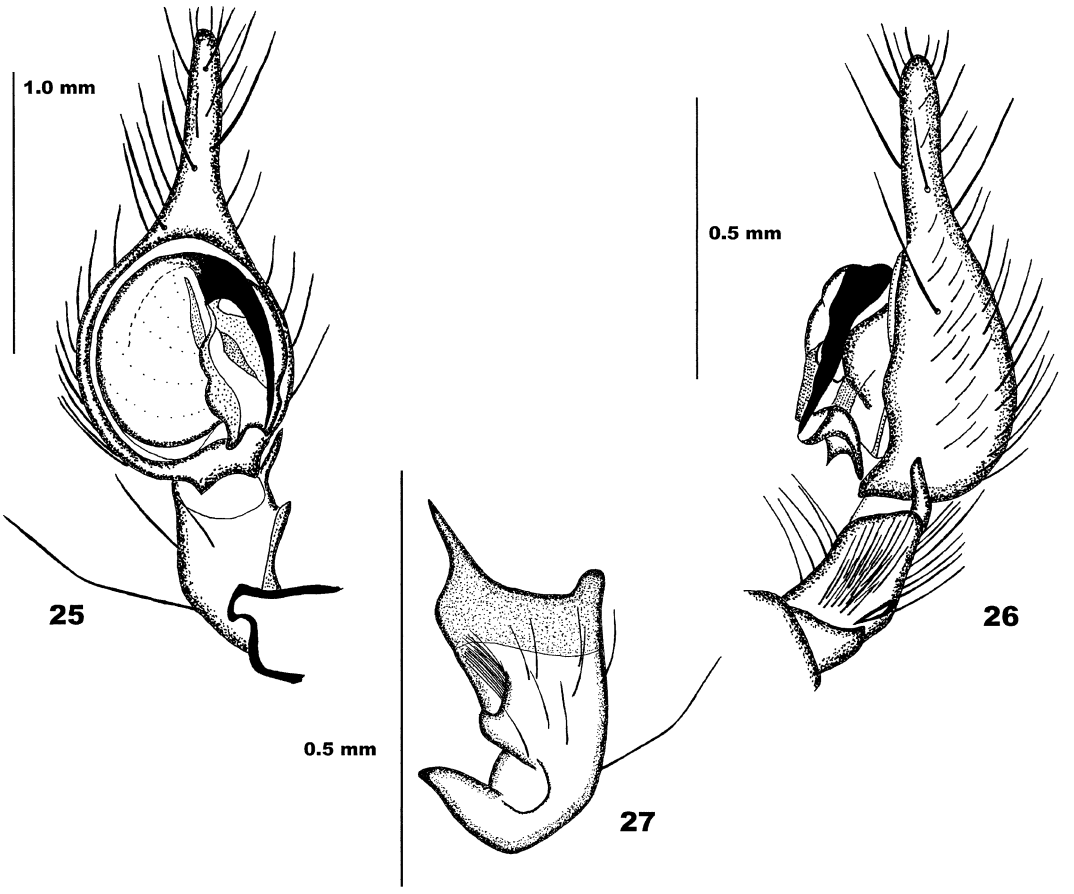
Figures 15–19.—*Calymmaria bifurcata*. 15. Palpus, ventral; 16. Palpus, lateral; 17. Palpal tibia, dorsal; 18. Epigynum, ventral; 19. Epigynum, dorsal.

Embolus with a sharp point 21
21. Embolus with an ectal tooth (Fig. 20, 21, 33, 34) 22
Embolus without an ectal tooth 23
22. Embolus with ectal tooth near base (Figs. 33, 34); Farallon Islands, California . . . . . *Calymmaria farallon*
Embolus with ectal tooth midway; mainland . . . . . *Calymmaria californica*
23. Medial RTA ridge-like (Figs. 93–95) . . . . . *Calymmaria shastae*
Medial RTA not as above 24
24. Medial RTA with a tooth near distal margin (Figs. 10–12) . . . . . *Calymmaria aspenola*
Medial RTA without such a tooth 25
25. Medial RTA bilobed (Figs. 91, 92, 121, 122) 26
Medial RTA not bilobed 27
26. Medial RTA with lobes behind one another from above; Baja California, Mexico (Figs. 120–122) . . . . . *Calymmaria tecate*
Medial RTA with lobes one after the other (Figs. 90–92) . . . . . *Calymmaria sequoia*
27. Embolus usually tapering abruptly when viewed laterally; conductor with sharp lobes; cymbium usually produced distad (Figs. 48–50) . . . . . *Calymmaria lora*
Embolus usually tapering less abruptly when viewed laterally; conductor with more rounded lobes; cymbium usually shorter (Figs. 58–60) . . . . . *Calymmaria monicae*
28. Spermatheca elongate, angular (Figs. 8, 9) . . . . . *Calymmaria alleni*
Spermatheca spherical 29
29. Lateral ducts of epigynum well-separated at base of midpiece (Figs. 19, 32, 64, 77, 89, 114, 130) 30
Lateral ducts fused at base of midpiece 36



Figures 20–24.—*Calymmaria californica*. 20. Palpus, ventral; 21. Palpus, lateral; 22. Palpal tibia, dorsal; 23. Epigynum, ventral; 24. Epigynum, dorsal.

30. Epigynal midpiece composed of two well-developed fused ducts (Figs. 89, 114) 31
Epigynal midpiece with fusion of ducts less obvious 32
31. Epigynum externally with internal midpiece evident (Figs. 113, 114) .... *Calymmaria sueni*
Epigynum externally with internal midpiece not evident (Figs. 88–89) .. *Calymmaria scotia*
32. Distribution in eastern U.S.A. 33
Distribution in western U.S.A. 34
33. Epigynum externally with a wide sclerotized shield-like area (Fig. 129), internally lateral ducts thick (Fig. 130) ..... *Calymmaria virginica*
Epigynum externally with V-shaped opening (Fig. 76), internally with midpiece thin in middle and wide at top, lateral ducts short and separation at base of midpiece obscured (Fig. 77) ..... *Calymmaria persica*
34. Epigynum with lateral ducts almost fused at base of midpiece (Fig. 64) .....
..... *Calymmaria monterey*
Epigynum with lateral ducts well-separated 35
35. Epigynum with blind ducts extending upward from midpiece, form highly variable (Fig. 32) ..... *Calymmaria emertoni*
Epigynum with blind ducts extending laterally from midpiece, form also highly variable (Fig. 19) ..... *Calymmaria bifurcata*
36. Epigynum with midpiece almost as long as wide (Figs. 47, 57) 37
Epigynum with midpiece much longer than wide 38
37. Epigynum with blind ducts near top of midpiece; external opening not obvious (Figs. 56, 57) ..... *Calymmaria minuta*



Figures 25–27.—*Calymmaria carmel*. 25. Palpus, ventral; 26. Palpus, lateral; 27. Palpal tibia, dorsal.

Epigynum with blind ducts not near top of midpece; external opening obvious (Figs. 46, 47) . . . . . *Calymmaria iviei*

38. Epigynum externally with median area raised forming a sclerotized hood (Figs. 96, 108) 39
Epigynum not as above 40

39. Epigynum with midpiece longer than diameter of spermatheca (Fig. 97) . . . . . *Calymmaria shastae*
Epigynum with midpiece shorter than diameter of spermatheca . . . . . *Calymmaria siskiyou*

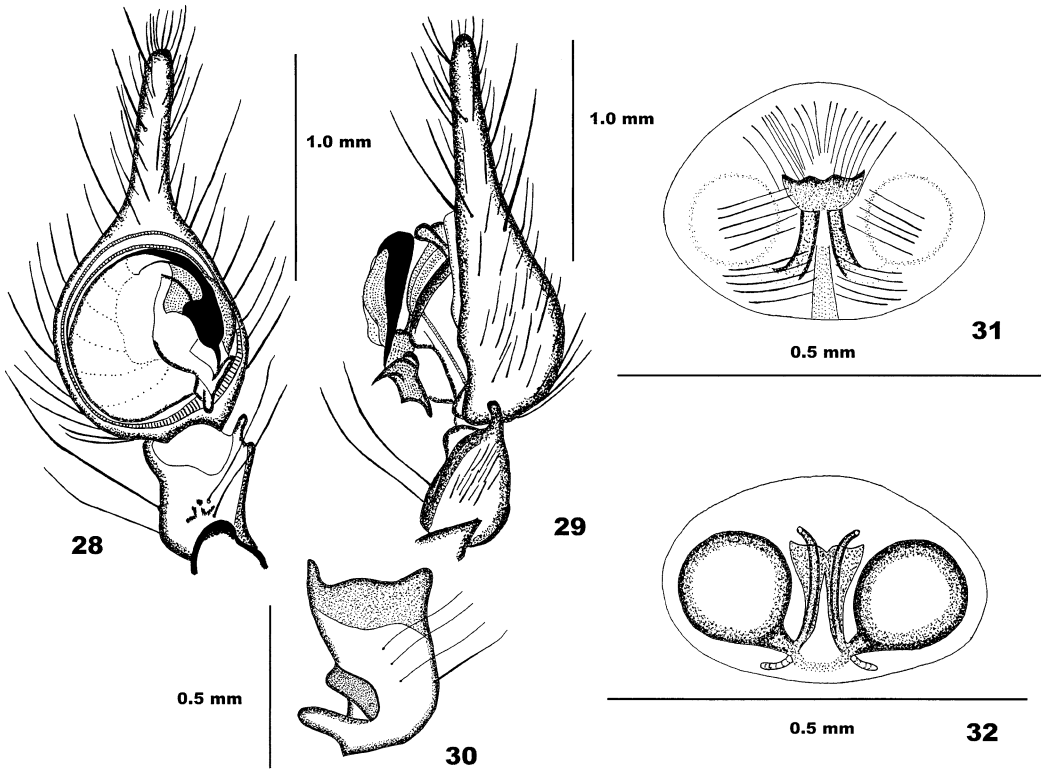
40. Epigynum with wide sclerotized area (Fig. 68) . . . . . *Calymmaria nana*
Epigynum not as above 41

41. Epigynum with midpiece equal to or shorter than the diameter of spermatheca (Fig. 24) . . . . . *Calymmaria californica*
Epigynum with midpiece longer 42

42. Epigynum with opening surrounded by thin but heavy sclerotization (Figs. 51, 52) . . . . . *Calymmaria lora*
Epigynum not as above 43

43. Epigynum externally with elongate sclerotized area (Fig. 102) . . . . . *Calymmaria sierra*
Epigynum not as above 44

44. Epigynum with lateral ducts usually divided (Figs. 37, 119) 45
Epigynum with lateral ducts usually single 46



Figures 28–32.—*Calymmaria emertoni*. 28. Palpus, ventral; 29. Palpus, lateral; 30. Palpal tibia, dorsal; 31. Epigynum, ventral; 32. Epigynum, dorsal.

45. Epigynum with midpiece tubes slightly separated above; blind ducts small (Fig. 37); Farallon Islands, California . . . . . *Calymmaria farallon*
Epigynum with midpiece tubes not separated above; blind ducts large (Fig. 119); mainland . . . . . *Calymmaria suprema*
46. Epigynum with midpiece tubes separated at top (Fig. 62) . . . . . *Calymmaria monicae*
Epigynum with midpiece tubes not well separated at top 47
47. Epigynum with midpiece very long, lateral ducts curved sharply (Fig. 104) . . . . . *Calymmaria similaria*
Epigynum not as above 48
48. Epigynum with midpiece narrow at top (Fig. 14) . . . . . *Calymmaria aspenola*
Epigynum with midpiece wide at top 49
49. Epigynum with midpiece narrow in middle (Fig. 79); Baja California, Mexico . . . . . *Calymmaria rosario*
Epigynum with midpiece wide in middle (Fig. 84); Sierra Nevada and Coastal range of California, U.S.A. . . . . *Calymmaria rothi*

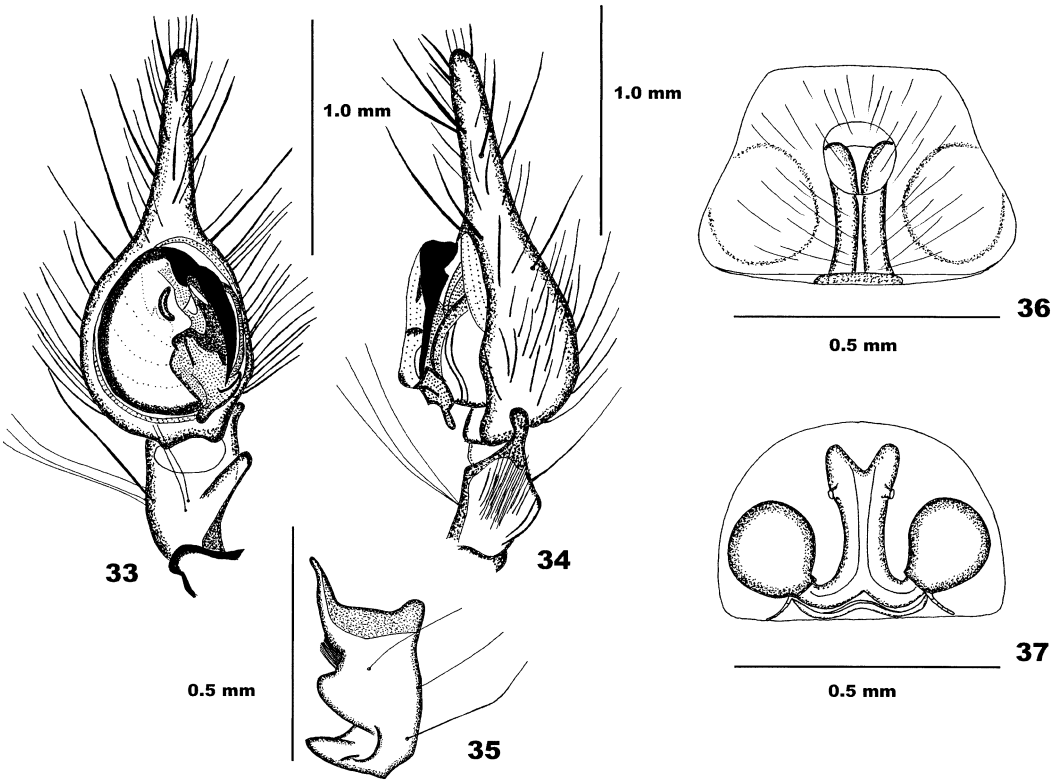
Calymmaria alleni new species
Figs. 8, 9; Map 2

Type.—Female holotype from 3700 feet, near Ash Mountain entrance, Sequoia National Park, Tulare County, California, U.S.A., 36°29′N, 118°49′W, 5 July 1956, W.J. Gertsch, V. Roth (AMNH).

Etymology.—The specific name is a patronym honoring Dr. Robert T. ''Tommy'' Allen, dissertation advisor of the senior author.

Diagnosis.—*Calymmaria alleni* is easily separated from other *Calymmaria* by the very peculiar form of the epigynum (Figs. 8, 9).

Description.—*Female:* Carapace typical. Dorsum of abdomen gray with lighter basal



Figures 33–37.—*Calymmaria farallon.* 33. Palpus, ventral; 34. Palpus, lateral; 35. Palpal tibia, dorsal; 36. Epigynum, ventral; 37. Epigynum, dorsal.

lanceolate mark and four pairs of pale yellow spots; venter gray with yellow lateral longitudinal stripes and three pairs of yellow medial spots. Legs annulate, spination typical. Epigynum externally with wide opening flanked by elongate angular sclerotized areas (Fig. 8); internally with midpiece lacking, medial ducts separate and elongate, rounded. Lateral ducts separate and very short; spermathecae elongate (Fig. 9). *Male:* Unknown.

Measurements.—(n = 3): Total length, 3.41–4.09 (4.02); carapace length, 1.49–1.83 (1.62); carapace width, 1.18–1.36 (1.24); femur I length, 1.61–1.95 (1.77).

Distribution.—Sequoia National Park, Tulare County, California (Map 2).

Natural History.—Mature specimens collected from July and October in a cave and at an elevation of 1100 m.

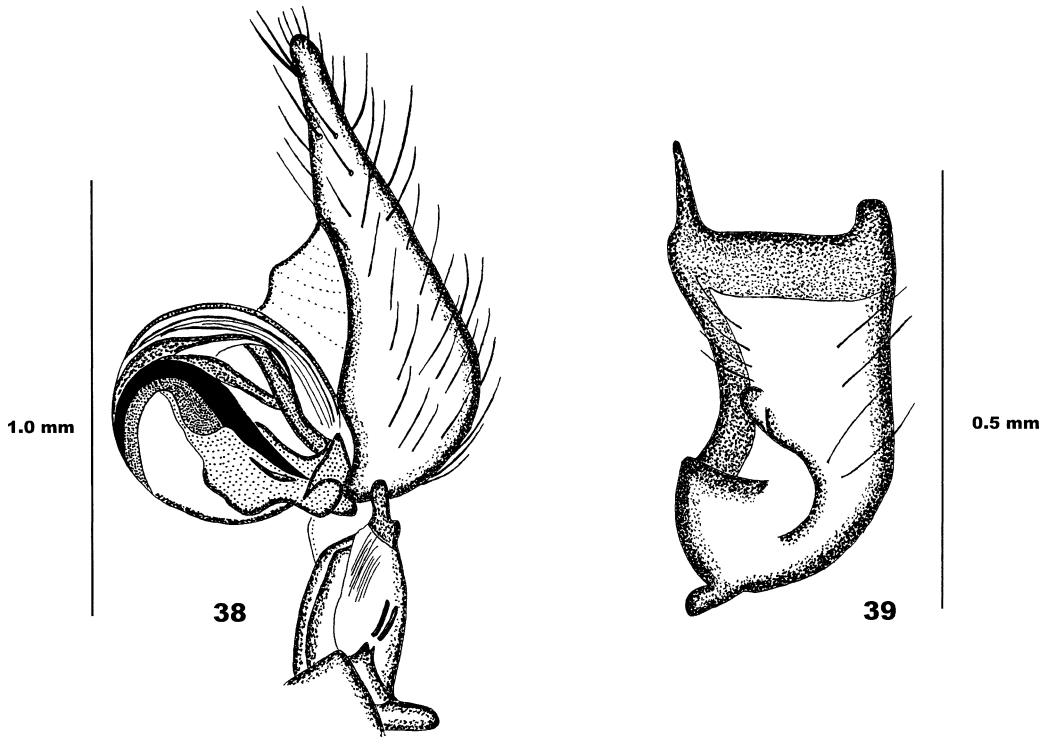
Material Examined.—U.S.A.: *California:* Tulare County, Sequoia National Park, near Ash Mountain entrance (3700′), 5 July 1956 (W.J. Gertsch, V. Roth), 2 ♀ (AMNH), west of Soda Springs, in cave, 11 July 1958 (V. Roth), 1 ♀ (AMNH), 7 miles NE. Ash Mountain entrance, 10 October 1959 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH).

Calymmaria aspenola Chamberlin & Ivie 1942
Figs. 10–14; Map 2

Calymmaria aspenola Chamberlin & Ivie 1942: 23, figs. 32, 33, 34; Roewer 1954: 45.

Types.—Male holotype and female allotype from Aspen Valley, Yosemite National Park, Tuolumne County, California, U.S.A., 37°49′N, 119°46′W (AMNH).

Diagnosis.—*Calymmaria aspenola* resembles *C. monicae* in general appearance. The epigynum of the female is variable, but usually specimens of *C. aspenola* can be separated from *C. monicae* by the thicker midpiece in which the ducts are not separated at the top (Fig. 14). Males are easily separated from other *Calymmaria* by the conspicuous sharp tooth near the medial RTA (Fig. 10).



Figures 38–39.—*Calymmaria gertschi*. 38. Palpus, ventro-lateral view; 39. Palpal tibia, dorsal.

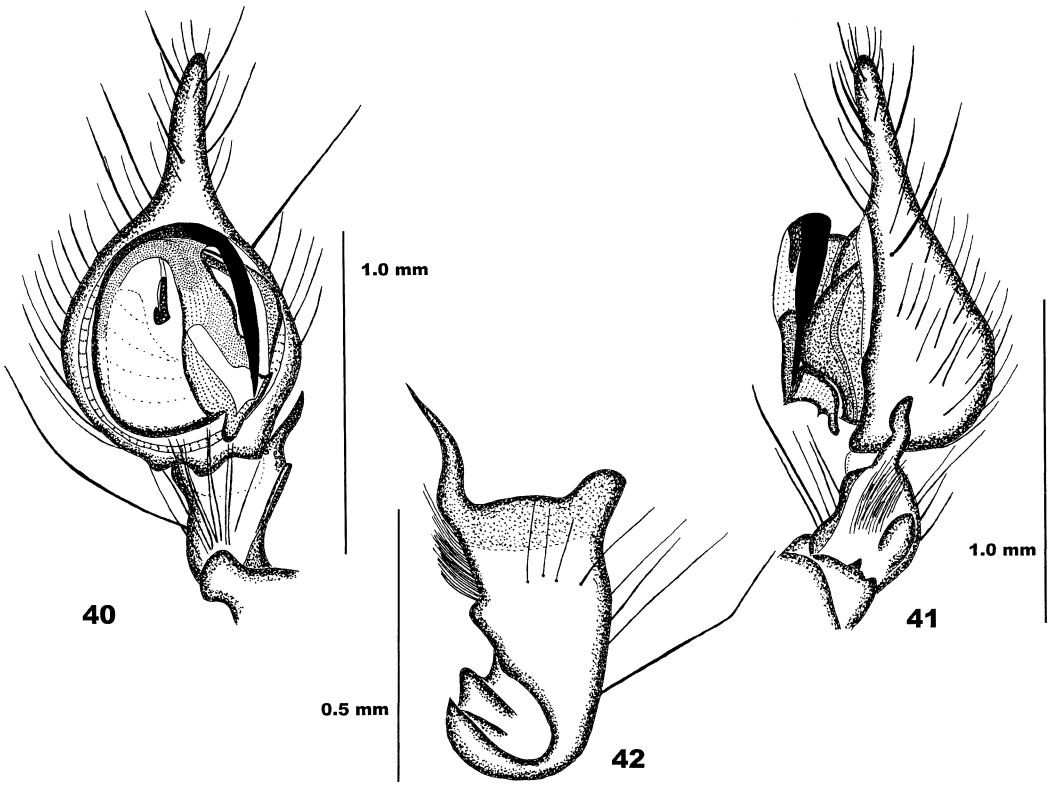
Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow with gray basal lanceolate mark followed by five transverse chevrons; venter gray with two yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with heart-shaped opening and thin sclerotized line below (Fig. 13); internally with midpiece wide, lateral ducts united medially in hump (Fig. 14). *Male*: Same as in female but with markings darker. Male palpus with PA large, rounded (Fig. 10); basal RTA thick and blunt, medial RTA large, shorter, rounded and with a sharp tooth near distal margin, distal RTA long, rounded (Figs. 10, 11); tibia with one prolateral spine, three long ventral setae, and many short retrolateral setae; cymbium elongate distad, with one spine near base of tip and four spines on tip; embolus thick and tapering, conductor with basal lobe pointed (Fig. 10).

Measurements.—*Female:* Total length, 4.34–5.89 (5.17); carapace length, 1.86–2.26 (2.01); carapace width, 1.36–1.61 (1.45), femur I length, 1.86–2.18 (2.04). *Male:* Total length, 4.65–5.21 (4.92); carapace length, 2.08–2.48 (2.29); carapace width, 1.86–2.11 (1.93); femur I length, 2.48–3.10 (2.82).

Distribution.—Sierra Nevada and Coast Ranges in California (Map 2).

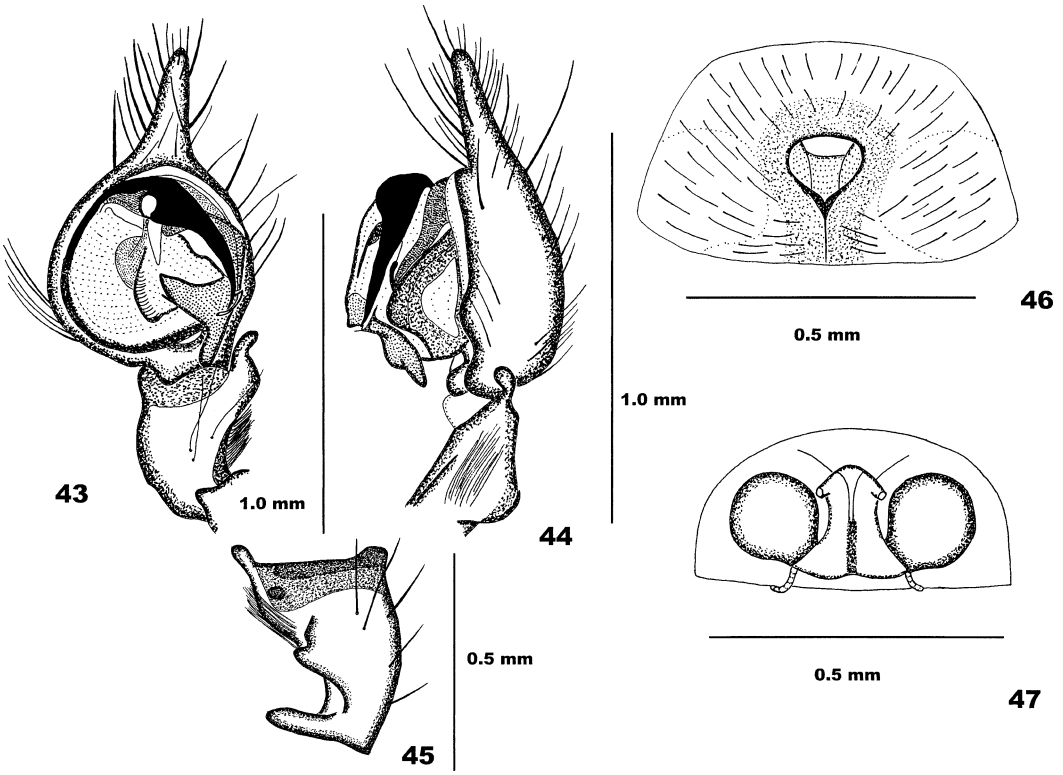
Natural History.—Mature specimens collected in February, March, July, August, and September from caves and dense forests (especially Douglas-fir) at elevations up to 2100 m.

Material Examined.—U.S.A.: *California:* Alameda County, 21 miles SE of Livermore on Mines Road, 12 February 1967 (V. Roth), 3 ♀, 2 immatures (AMNH); Alpine County, Ebbets Pass (8730′), 5 August 1953 (W.J. and J. W. Gertsch), 1 ♀, 2 immatures (AMNH), 10 September 1959 (no collector), 1 ♂, 12 ♀ (AMNH), 2 September 1961 (W.J. Gertsch, W. Ivie), 2 ♀ (AMNH); El Dorado County, Riverton 11 July 1953 (W.J. Gertsch), 2 ♀ (AMNH), 5 miles N. of Pollock Pines, 6 July 1958 (W.J. Gertsch, V. Roth), 2 ♀ (AMNH), Fallen Leaf Lake, 9 September 1959 (W.J. Getsch, V. Roth), 3 ♀ (AMNH), Placerville, 9 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 2 ♀, 2 immatures (AMNH), Lake Tahoe, Bliss State Park, 21 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂, 3 ♀, 6 im-



Figures 40–42.—*Calymmaria humboldt*. 40. Palpus, ventral; 41. Palpus, lateral; 42. Palpal tibia, dorsal.

matures (AMNH), S. of Meyers (7377′), 19 September 1963 (W.J. Gertsch), 1 ♀ (AMNH), Blodgett Forest Experiment Station, 13 miles E. of Georgetown (4000–4500′), 29–30 May 1970 (E.I. Schlinger), 1 ♀ (EMSC), 29 May 1971 (M. Bentzien), 1 ♀ (EMSC); Humboldt County, Carlotta, September 1961 (W. Ivie, W.J. Gertsch), 2 ♀, 4 immatures (AMNH); Los Angeles County, San Gabriel Mountains, on CA Hwy 2, montane forest (7000′), 27 September 1957 (R.X. Schick), 1 ♀ (AMNH); Mariposa County, Camp, Yosemite National Park, 18 September 1941 (W. Ivie), 1 ♂ paratype (AMNH), Glacier Point, Yosemite National Park (7200–7500′), 27 September 1944 (B. Malkin), 1 ♂, 3 ♀ (AMNH), Tamarack Flat, Yosemite National Park, 3 September 1958 (no collector), 1 ♂ 3 ♀ (AMNH), 11 September 1959 (W.J. Gertsch, V. Roth), 2 ♂, 2 ♀, 1 immature (AMNH), Buck Meadows, 11 September 1959 (no collector), Grouse Creek, 12 September 1959 (no collector), 8 ♂, 6 ♀, 1 immature (AMNH), Porcupine Flat Campground, Yosemite National Park, under logs and granite chips, 22 September 1961 (W. Ivie, W.J. Gertsch), 21 ♂, 34 ♀, 8 immatures (AMNH); San Diego County, Alpine, 10 September 1959 (no collector), 1 ♂, 1 immature (AMNH); Strawberry Creek, 17 September 1959 (V. Roth, W.J. Gertsch), 1 ♂, 3 ♀, 2 immatures (AMNH); Tulare County, Quaking Aspen Camp, Sequoia National Forest, 9 September 1959 (no collector), 4 ♀ (AMNH), Tulare County, 6 miles E. of Camp Connell, 10 September 1959 (no collector), 7 ♀, 1 ♂, 2 immatures (AMNH); Tuolumne County, Aspen Valley, Yosemite National Park, 11 August 1931 (W. Ivie), 1 ♂ holotype, 1 ♀ allotype, 1 ♂ paratype, 4 female paratypes (AMNH), Pinecrest, approx. 10 miles E. of Sonora, pine forest, 2 May 1970 (S.C. Williams), 1 ♀ (CASC); no county, Yosemite National Park, 16 August 1950 (V. Roth), 1 ♂, 1 immature (AMNH).



Figures 43–47.—*Calymmaria iviei*. 43. Palpus, ventral; 44. Palpus, lateral; 45. Palpal tibia, dorsal; 46. Epigynum, ventral; 47. Epigynum, dorsal.

Calymmaria bifurcata new species
Figs. 15–19; Map 2

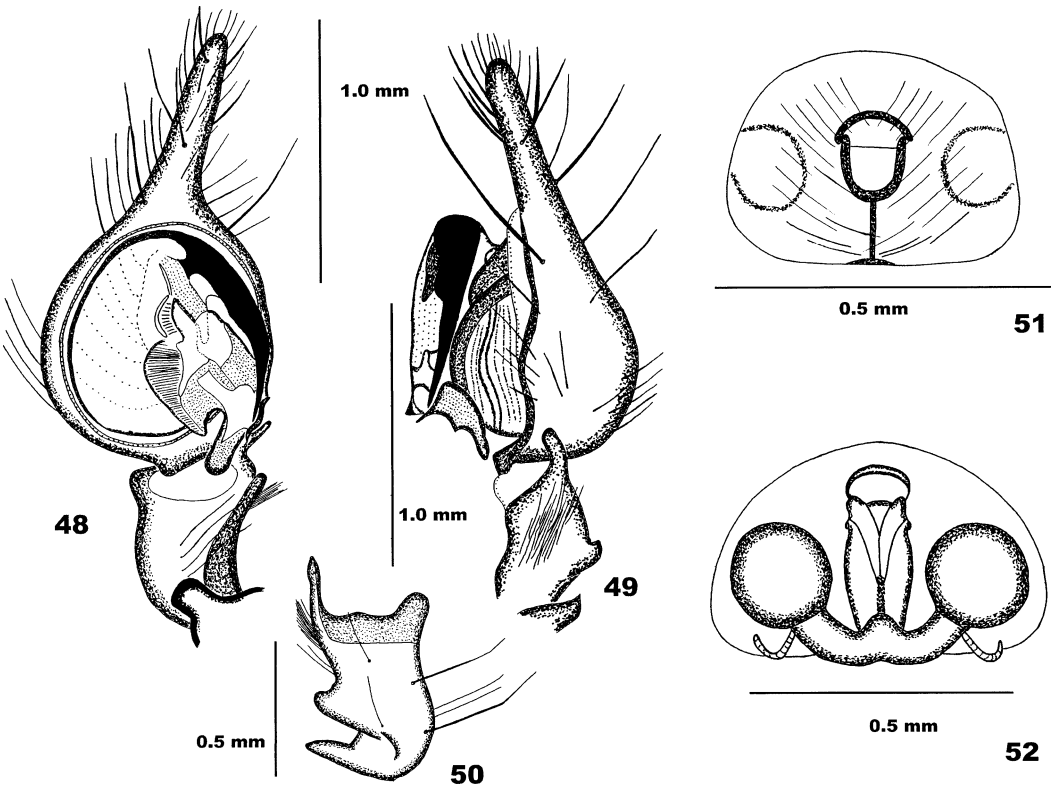
Calymmaria emertoni (misidentification): Chamberlin & Ivie 1937: 215, 232, 233, figs. 20, 21; Exline 1938: 21, fig. 28; Roewer 1954: 46; Bonnet 1956: 939.

Types.—Male holotype and female allotype from Carlotta, edge of redwood lumber camp, Humboldt County, California, U.S.A., 40°32′N, 124°03′W, 27 September 1963, W.J. Gertsch (AMNH).

Etymology.—The specific name is an adjective referring to the bifurcate embolus.

Diagnosis.—*Calymmaria bifurcata* females are very similar to females of *C. emertoni* and sometimes are difficult to separate. In general, the ducts of the epigynal midpiece are larger and diverge near the top in *C. bifurcata* (Fig. 19), while diverging further down in *C. emertoni* (Fig. 32), but many exceptions occur. Specimens of *C. bifurcata* are usually larger than those of *C. emertoni*. *Calymmaria bifurcata* occurs in northern California and in Oregon while *C. emertoni* is commonly collected in Oregon, Washington and British Columbia (Map 2). In Oregon the surest way to separate the females is to collect them along with the readily identifiable males. Male *C. bifurcata* are easily separated from other *Calymmaria* by the bifurcate embolus (Fig. 15). In 1937 Chamberlin & Ivie incorrectly identified and figured the male of *C. bifurcata* as *C. emertoni* (p. 233), an error no doubt caused by the similarity in the females.

Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow with dark gray basal lanceolate mark usually flanked by large yellow spots and followed by four or five transverse chevrons, venter gray with two pale yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum of female externally with large, usually heavily sclerotized opening from which ducts of midpiece diverge below (Fig. 18); internally ducts of midpiece diverge near top, lateral ducts short and do not unite medially, blind ducts



Figures 48–52.—*Calymmaria lora*. 48. Palpus, ventral; 49. Palpus, lateral; 50. Palpal tibia, dorsal; 51. Epigynum, ventral; 52. Epigynum, dorsal.

short and near top of midpiece (Fig. 19). *Male*: Carapace similar to female but usually darker yellow to orange with fewer markings. Abdomen as in female. Spination typical Male palpus with PA rounded and very wide (Fig. 15); basal RTA thick and rounded, narrower in middle when viewed from above (Fig. 17), medial RTA short and flat, distal RTA long and rounded; cymbium elongate distad, usually with three spines at base of tip and six spines on tip; tibia with two prolateral spines and three or four long ventral setae; embolus thick at base with tip bifurcate, conductor with narrow lobe and base arising beyond base of embolus (Fig. 15).

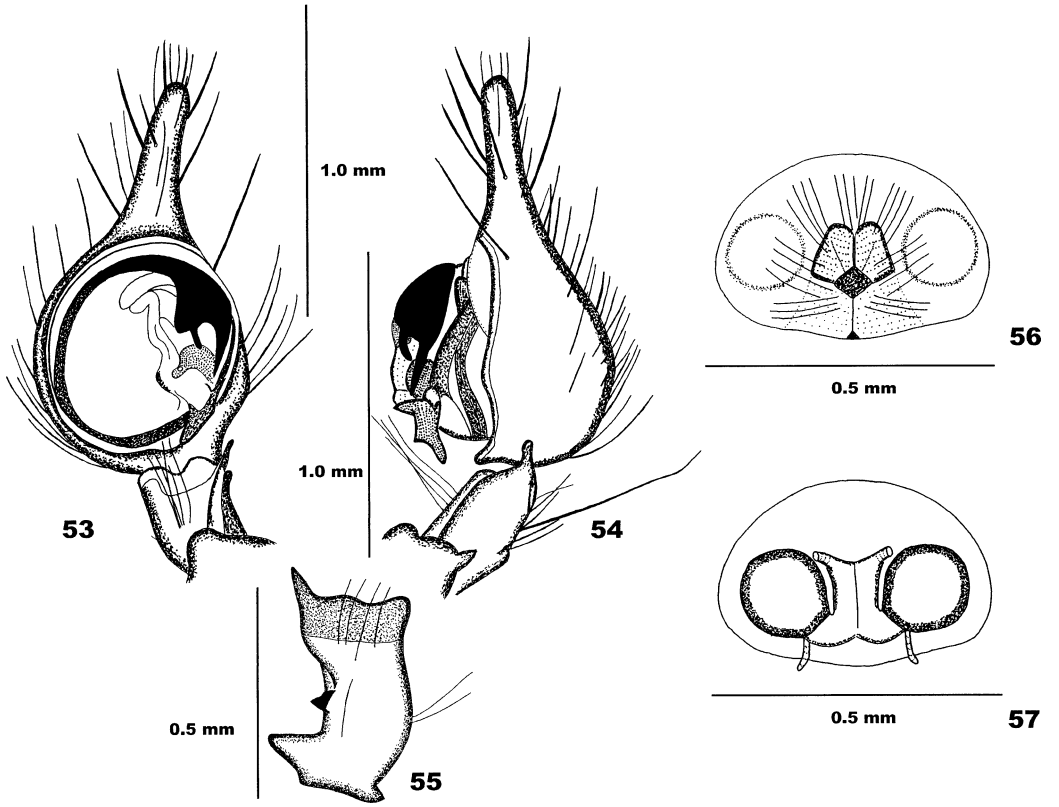
The illustration of the embolus supposedly representing *C. emertoni* given by Chamberlin & Ivie (1937, p. 233, fig. 21) was not that of the species described by Simon (1897), but rather represents *C. bifurcata*.

Measurements.—*Female:* Total length, 5.89–8.25 (6.98); carapace length, 2.54–3.84 (3.08); carapace width, 1.89–2.64 (2.23); femur I length, 3.32–5.08 (4.11). *Male:* Total length, 6.51–6.98 (6.62); carapace length, 2.79–3.66 (3.25); carapace width, 2.20–2.64 (2.45); femur I length, 4.65–5.89 (5.21).

Distribution.—Northern California and Oregon (Map 2).

Natural History.—Mature specimens collected in July, August and September from redwood and Douglas-fir forests, and from under rocks and fallen logs, sometimes in relatively dry conditions.

Material Examined.—U.S.A.: *Oregon*: Coos County, Bandon, 30 September 1959 (V. Roth), 1 ♂ (AMNH); Douglas County, 4 miles S. of Canyonville, 3 August 1959 (V. Roth, W.J. Gertsch), 1 ♂, 9 immatures (AMNH), Reedsport, dense Douglas-fir, 30 September 1959 (V. Roth), 1 ♂ (AMNH); Jackson County, Lithia Park, Ashland, 31 August 1959 (W.J. Gertsch, V. Roth), 21 ♂, 18 ♀, 9 immatures (AMNH); Josephine County, 2 miles N. of Selma, 22 August 1959 (V. Roth, W.J. Gertsch), 3 ♂, 2 ♀, 2 immatures



Figures 53–57.—*Calymmaria minuta*. 53. Palpus, ventral; 54. Palpus, lateral; 55. Palpal tibia, dorsal; 56. Epigynum, ventral; 57. Epigynum, dorsal.

(AMNH); Klamath County, cave, Crater Lake National Park, 11 August 1951 (D. Lowrie), 1 ♂ (AMNH); Linn County, Cascadia, underside of rock in forest, dry situation, 11 September 1948 (V. Roth), l male (AMNH), 1 miles W. of Cascadia, 23 July 1949 (V. Roth, F. Beer), 1 ♂, 2 immatures (AMNH), House Rock Forest Camp, 13 miles E. of Cascadia, 23 July 1949 (V. Roth, F. Beer), 4 ♂, 2 ♀, 1 immature (AMNH), Trout Creek Forest Camp, near Cascadia, 31 July 1951 (V. Roth), 2 ♂ (AMNH); Marion County, 18 September 1954 (V. Roth), 1 ♂ (AMNH); *California:* Del Norte County, Fort Dick, 31 September 1959 (V. Roth), 1 ♂, 1 ♀ (AMNH); Humboldt County, Pepperwood, redwood forest, 12 August 1950 (V. Roth), 2 ♂ (AMNH), Carlotta, 15 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂ (AMNH), Orick, 16 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂, 5 ♀ (AMNH), Carlotta, edge of redwoods by lumber camp, 27 September 1963 (W.J. Gertsch), 4 ♂, 3 ♀, 9 immatures (AMNH).

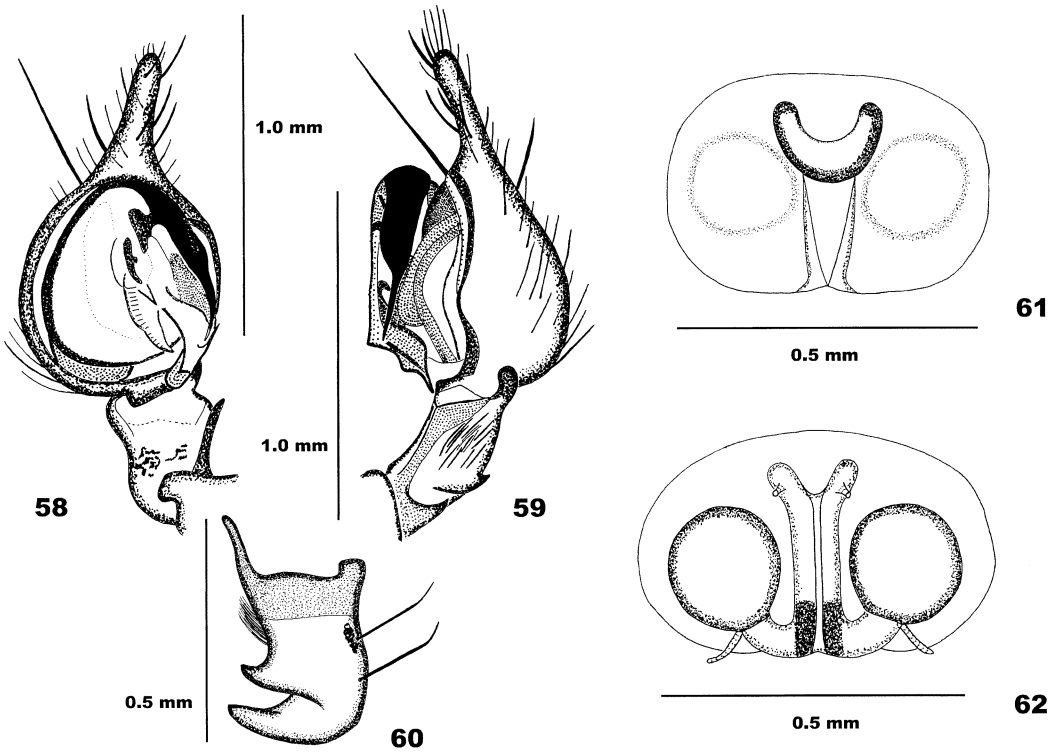
Calymmaria californica (Banks 1896)
Figs. 20–24; Map 3

Tegenaria californica Banks 1896: 90. Banks 1898: 230; 1904: 340; 1910: 16; Coolidge 1907: 375; Petrunkevitch 1911: 537; Emerton 1920: 326; Moles & Johnson 1921: 43; Worley 1932: 53; Schenkel 1950: 82–84, fig. 30.

Calymmaria californica (Banks): Chamberlin & Ivie 1937: 213, figs. 4, 5; Roewer 1954: 45; Bonnet 1956: 939; Roth 1956: 177.

Types.—Male holotype and female allotype from Palo Alto, Santa Clara County, California, U.S.A., 37°26′N, 122°08′W, no date, R.W. Doane (AMNH, examined).

Diagnosis.—*Calymmaria californica* closely resembles *C. monicae* and *C. aspenola*, but in *C. californica* the ducts of the epigynal midpiece in the female are much shorter, hardly higher than the diameter of the spermathecae (Fig. 24). The males of *C. californica* are easily distinguished by the conspicuous ectal tooth midway on the embolus (Fig. 20).



Figures 58–62.—*Calymmaria monicae*. 58. Palpus, ventral; 59. Palpus, lateral; 60. Palpal tibia, dorsal; 61. Epigynum, ventral; 62. Epigynum, dorsal.

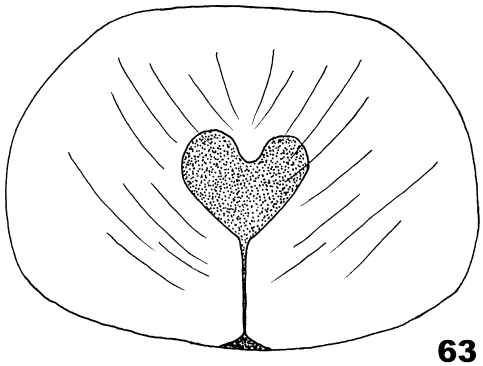
Description.—*Female:* Carapace typical. Dorsum of abdomen pale gray with darker basal lanceolate mark flanked by large pale gray or silver spots and followed by four or five very wide pale gray transverse chevrons; venter gray with two pale yellow lateral longitudinal stripes. Legs weakly to strongly annulate, spination typical. Epigynum of female externally with opening obscure and flanked by rounded sclerotized areas, below opening with a darker sclerotized line (Fig. 23); internally with ducts of midpiece widest at top and well-separated, blind ducts short, midpiece equal to or only slightly higher than diameter of spermathecae, lateral ducts thick and united medially (Fig. 24). *Male:* Carapace and abdomen same as in female, but darker. Legs annulate, spination typical.Male palpus with PA small and knob-like (Fig. 20); basal RTA large, rounded, medial RTA two small ridges, distal RTA short, thick, and slightly hooked ventrally (Fig. 20); tibia with one prolateral spine, one or two long ventral setae, and numerous short retrolateral setae; cymbium elongate distad, with two spines near base of tip and five or six spines on tip; embolus thick and tapering gradually to a point with a conspicuous ectal tooth midway (Fig. 20), conductor with lobe short, rounded.

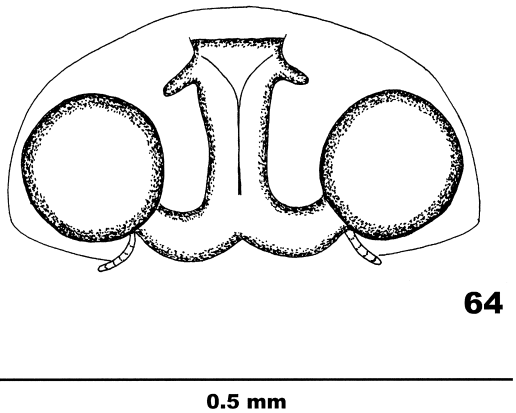
Measurements.—*Female:* Total length, 4.19–5.33 (4.85); carapace length, 1.86–2.33 (1.97); carapace width, 1.27–1.58 (1.44); femur I length, 1.86–2.54 (2.11). *Male:* Total length, 4.00–4.86 (4.32); carapace length, 1.74–2.33 (2.18); carapace width, 1.40–1.92 (1.76); femur I length, 2.08–2.98 (2.69).

Distribution.—Southern California to northern California, mainly in the Coast Ranges, and Yosemite National Park (Map 3).

Natural History.—Mature specimens collected in January, February, April, September, October, November, and December, from canyons and from beneath the bark of Douglas-fir.

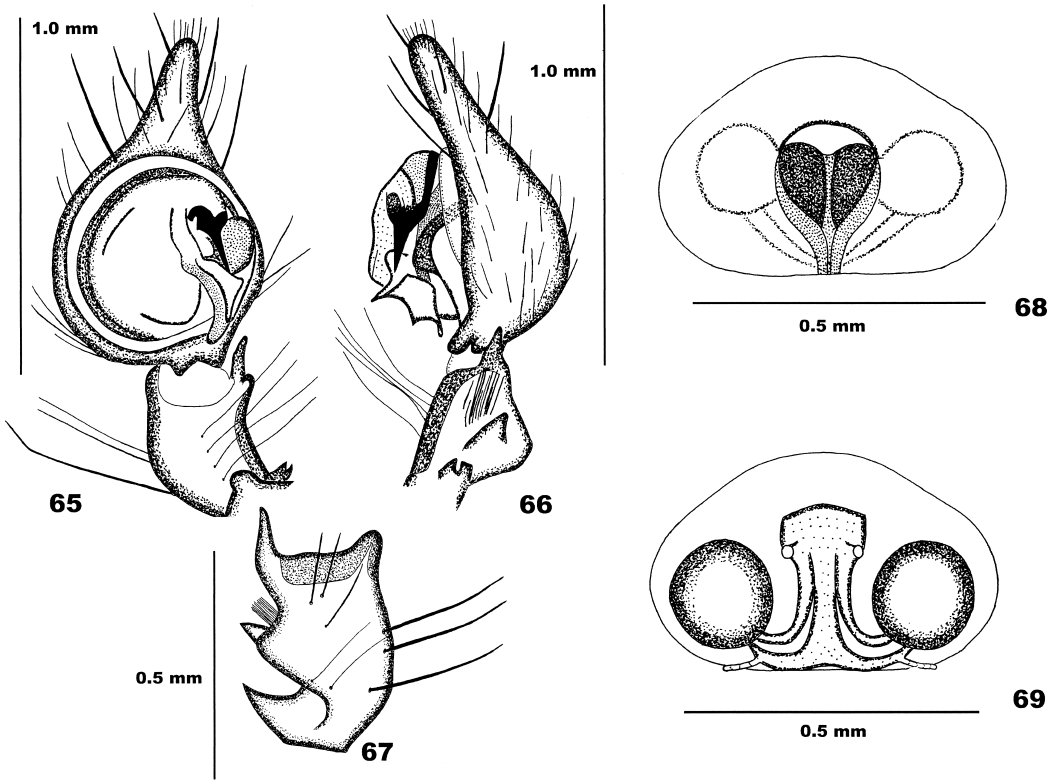
Material Examined.—U.S.A.: *California:* Alameda County, Berkeley, no date (no collector), 3 ♀ (AMNH), February 1920 (Dietrich), 1 ♀ (AMNH), Castro Valley, 7 January





Figures 63–64.—*Calymmaria monterey*. 63. Epigynum, ventral; 64. Epigynum, dorsal.

1939 (W.M. Pearce), 1 ♀ (AMNH), Redwood Park, Oakland, 12 March 1940 (no collector), 1 ♀ (CASC), Oakland, 1 February 1954 (V. Roth, R. Schuster), 5 ♀ (AMNH), Canyon off Niles Canyon, 1 January 1964 (V. Roth), 1 ♂, 8 ♀, 9 immatures (AMNH), off Niles Canyon on Palomres Road, 2 January 1964 (V. Roth), 2 ♀, 3 immatures (AMNH), 25 miles S. of Livermore on Mines Road, 7 December 1969 (V. Roth), 4 ♀, 1 immature (AMNH), Contra Costa County, Tilden Park, Berkeley Hills, 8 April 1950 (E.I. Schlinger), 1 ♀ (AMNH), SE. corner of Mt. Diablo State Park, 13 January 1964 (V. Roth, P. Craig), 1 ♀ (AMNH); Humboldt County, Carlotta, 15 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀, 3 ♂, 15 immatures (AMNH); Los Angeles County, Los Angeles, November (W.J. Gertsch), 1 ♂, 3 ♀ (AMNH), Tapia Park, Santa Monica Mountains, 20 February 1954 (R.X. Schick), 1 ♀ (AMNH); Marin County, 8 November 1919 (Dietrich), 1 ♂ (AMNH), slope of Mt. Tamalpais 10 January 1963 (V. Roth, P. Craig), 1 ♀ (AMNH), west slope of Mt. Tamalpais, 10 January 1963 (V Roth, P. Craig), 7 ♀, 2 immatures (AMNH), Ridge between San Anselmo and North San Rafael, 22 January 1977 (L. Freihofer), 1 ♂ (CASC); Mariposa County, 6 miles S. of Mather, 4 September 1958 (V. Roth), 1 ♂, 1 ♀, 2 immatures (AMNH); Monterey County, Pacific Grove, 24 December 1951 (B. Malkin), 1 ♀ (AMNH); Napa County, Oakville, 31 December 1953 (V. Roth), 2 ♀ (AMNH); San Francisco County, San Francisco, 6 November 1934 (no collector), 1 ♀ (CASC); Santa Clara County, Santa Cruz Mountains, Soda Springs Canyon, 24 April 1977 (D. C. Rentz, E. W. Kirschbaum),



Figures 65–69.—*Calymmaria nana*. 65. Palpus, ventral; 66. Palpus, lateral; 67. Palpal tibia, dorsal; 68. Epigynum, ventral; 69. Epigynum, dorsal.

2 ♀ (CASC), Stanford University, no date (no collector), 1 ♂ (AMNH), no date (R. W. Doane), 1 ♂ holotype, 1 ♀ allotype (AMNH); San Mateo County, Woodside, Winter 1957–1958 (Washburn), 1 ♂ (AMNH); Santa Cruz County, Carmel, 21 December 1953 (V. Roth), 1 ♀, 2 immatures (AMNH), 1 miles N. of Santa Cruz, 23 December 1953 (V. Roth), 2 ♀ (AMNH); Siskiyou County, 29 September 1951 (W.M. Pearce), 1 ♂ (AMNH); Sonoma County, Cazadero, 13 March 1918 (H. van Duzee), 3 ♀ (CASC), Glen Ellen, 15 February 1954 (V. Roth, R. Schuster), 2 ♀ (AMNH), 2 miles W. of Cazadero, 30 October 1954 (H. B. Leech), 2 ♂, 1 ♀ (AMNH), W. of Mark West Reservoir, in Douglas-fir litter, 22 January 1958 (F. R. Schuster), 1 ♀ (AMNH), Guerneville, 4 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH), N. of Guerneville, October 1962 (V. Roth), 2 ♂ (AMNH), Annadel State Park, under bark of *Eucalyptus*, 11 November 1979 (D. Ubick), 1 ♂, 1 ♀ (DUSC); no county, no specific locality (J.C. Chamberlin), 3 ♂, 1 ♀ (AMNH).

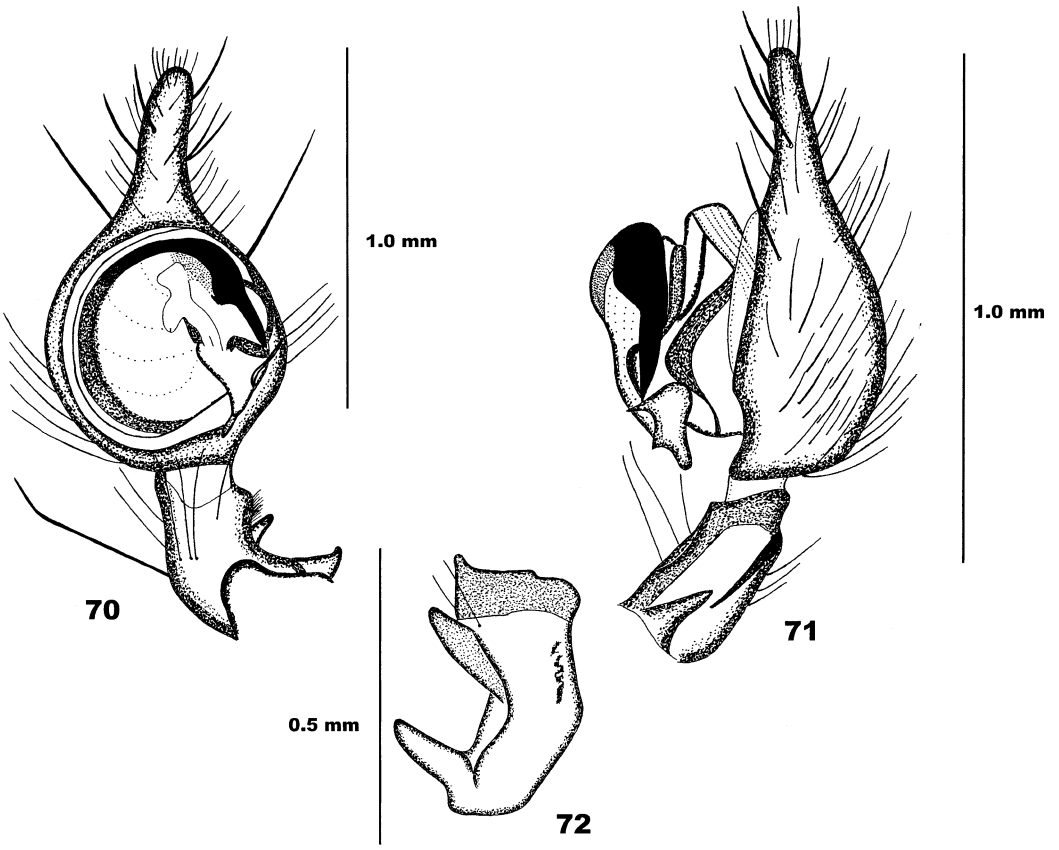
Calymmaria carmel new species
Figs. 25–27; Map 3

Type.—Male holotype from Carmel, Monterey County, California, U.S.A., 36°33′N, 121°55′W, 31 March 1954, J. O'Dell (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria carmel* can be distinguished from other *Calymmaria* by the gradually tapering embolus and conductor with small basal lobe. The two specimens available exhibit a wide variation in size and coloration.

Description.—*Male:* Carapace typical. Dorsum of abdomen pale yellow with basal gray lanceolate mark expanded in middle and followed by four gray transverse chevrons; venter pale gray with wide yellow lateral lon-



Figures 70–72.—*Calymmaria orick*. 70. Palpus, ventral; 71. Palpus, lateral; 72. Palpal tibia, dorsal.

gitudinal stripes. Legs annulate, spination typical. Male palpus with PA knob-like and slightly hooked (Fig. 25); basal RTA thick and bluntly pointed, medial RTA pointed, distal RTA long and pointed; tibia with one prolateral spine, ventrally with four or five long setae, many dense, short retrolateral setae, and numerous dorsal spines; cymbium elongate distad, with two spines near base of tip and five spines on tip; embolus thick at base and gradually tapering, conductor with small rounded basal lobe. *Female:* Unknown.

Measurements.—(n = 2): Total length, 4.68–6.20; carapace length, 2.23–3.10; carapace width, 1.80–2.33; femur I length, 2.82–5.21.

Distribution.—Monterey and San Bernardino Counties, California (Map 3).

Natural History.—Mature specimens collected from March and October.

Material Examined.—U.S.A.: *California:* Monterey County, Carmel, 31 March 1954 (J. O'Dell), 1 ♂ holotype (AMNH); San Bernardino County, Mountain Home Creek, 15 October 1959 (V. Roth), 1 ♂ (AMNH).

Calymmaria emertoni (Simon 1897)
Figs. 28–32; Map 3

Tegenaria emertoni Simon 1897: 17; Petrunkevitch 1911: 538.

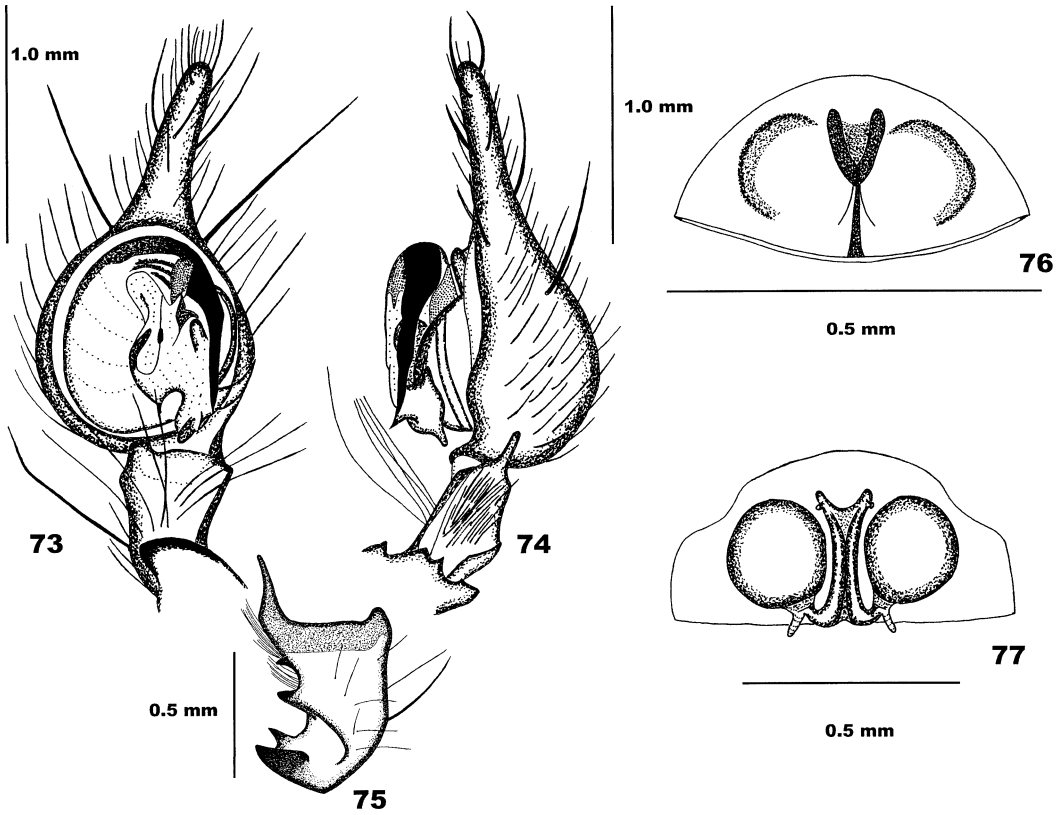
Tegenaria californica: Exline 1936: 25, fig. 2 (misidentification).

Tegenaria quadrata Exline 1936: 22, fig. 4, Roewer 1944: 33. NEW SYNONYMY.

Calymmaria quadrata (Exline): Chamberlin & Ivie, 1937:213; Exline 1938: 23, fig. 27; Roewer 1954: 46; Bonnet 1956: 940; Roth 1968: 31.

Calymmaria emertoni (Simon): Chamberlin & Ivie, 1937: 215, fig. 10, *not* 11; Exline 1938: 21, figs. 3; 27, 29, not 29; Roewer 1954: 46; Bonnet 1956: 940; Roth 1968: 31.

Types.—*Tegenaria emertoni*: male holotype from ''Washington Territory'', U.S.A. (MNHN, examined); *Tegenaria quadrata*: female holotype from Seattle, King County,



Figures 73–77.—*Calymmaria persica*. 73. Palpus, ventral; 74. Palpus, lateral; 75. Palpal tibia, dorsal; 76. Epigynum, ventral; 77. Epigynum, dorsal.

Washington, U.S.A., 47°36′N, 122°19′W (PESC, examined).

Diagnosis.—*Calymmaria emertoni* is a highly variable species closely resembling *C. bifurcata* from which female specimens are not readily separated (see diagnosis of *C. bifurcata*). Male *C. emertoni* resemble *C. nana*, but the embolus is rounded at the sides (Fig. 28).

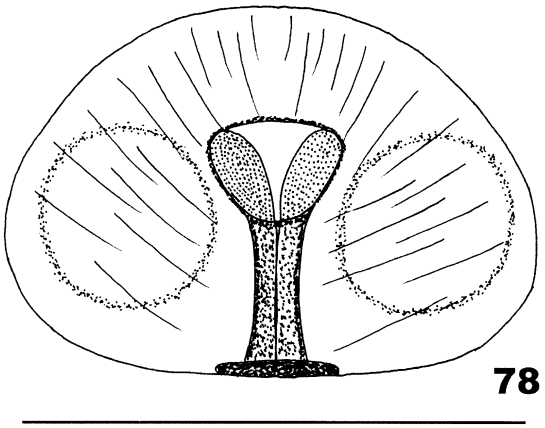
Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with gray basal lanceolate mark followed by four gray transverse chevrons; venter gray with two yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum of female externally with wide sclerotization below opening and fused ducts of midpiece visible (Fig. 31); internally with ducts of midpiece united near top and well separated below, blind ducts long (Fig. 32). *Male:* Same as in female but darker. Male palpus with PA short, broad (Fig. 28); basal RTA from above long, rounded at tip, medial RTA flat, wide from above, distal RTA short (Fig. 29); tibia with one prolateral spine, two long ventral setae, several short retrolateral setae; cymbium elongate distad, with two spines near base of tip, six spines on tip; embolus with thick base abruptly tapering to point, conductor with no basal lobe (Fig. 28).

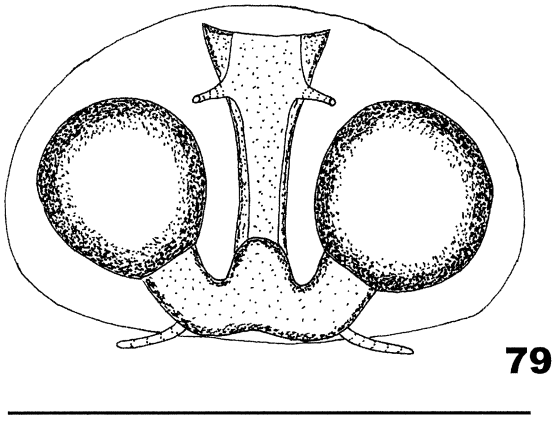
Measurements.—*Female:* Total length, 5.02–7.95 (6.68); carapace length, 2.05–3.22 (2.65); carapace width, 1.43–2.48 (2.00); femur I length, 2.45–4.37 (3.31). *Male:* Total length, 5.58–6.54 (6.10); carapace length, 2.82–3.13 (2.97); carapace width, 2.23 2.54 (2.41); femur I length, 4.65–5.52 (5.07).

Distribution.—Coast Ranges of northern California, western Oregon, and Washington (Map 3).

Natural History.—Mature specimens collected in every month except January and February. Occasionally specimens have been collected from buildings.

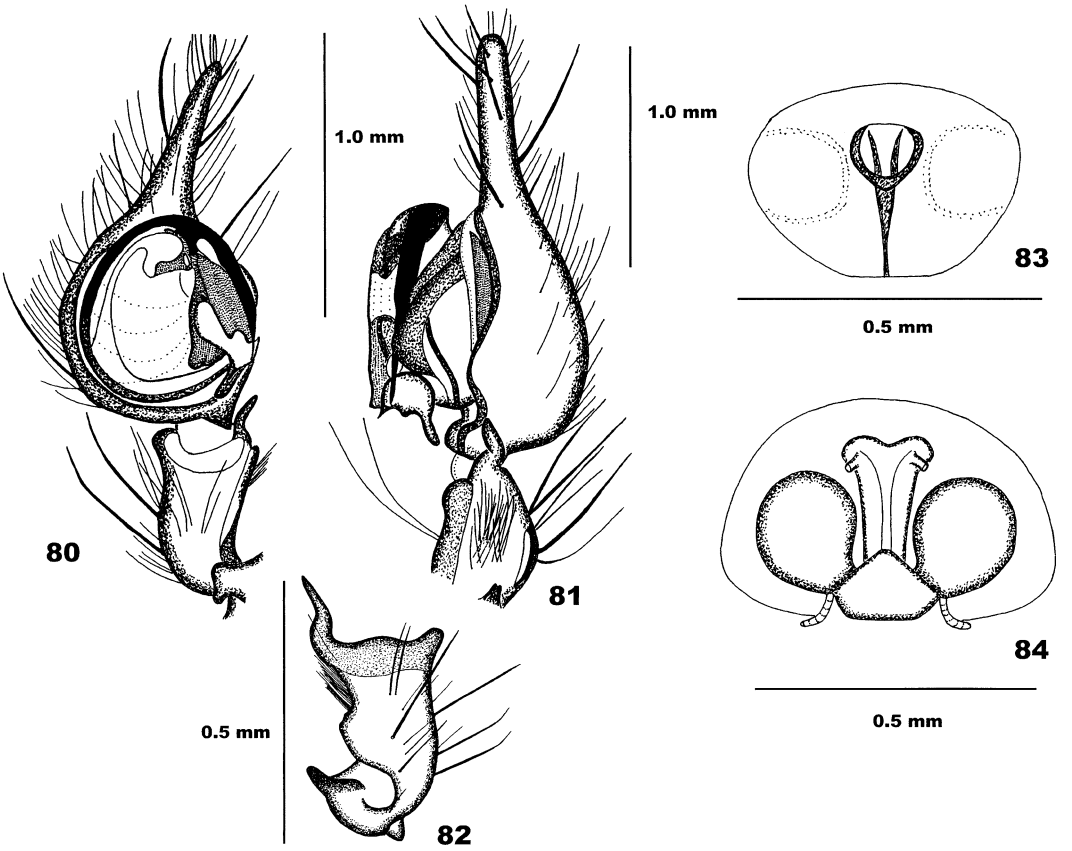
Material Examined.—CANADA: *British*





Figures 78–79.—*Calymmaria rosario*. 78. Epigynum, ventral; 79. Epigynum, dorsal.

Columbia: Kyuquot, under woodpile in shed, 2 April 1952 (S. L. Neave), 2 ♀ (AMNH), Moketas Island, 6 September 1958 (no collector), 2 ♂, 4 ♀ (AMNH), Union Island, under ground litter, 25 September 1959 (S. L. Neave), 1 ♀, 1 immature (AMNH); Wellington, Vancouver Island, 1–19 May 1950 (R. Guppy), 1 ♀ (AMNH), September 1950 (R. Guppy), 2 ♂ (AMNH); 1–20 November 1950 (R. Guppy) 1 ♀ (AMNH); Tofino, 10–13 May 1950 (R. Guppy), 1 ♀ (AMNH), 1–21 August 1950 (R. Guppy), 1 ♂ (AMNH), 5–20 June 1951 (R. Guppy), 1 ♀ (AMNH). U.S.A.: *Washington*: Clallam County, Sol Duc Hot Springs, Olympic National Park, 27 August 1959 (V. Roth, W.J. Gertsch), 1 ♀, 3 immatures (AMNH); Clark County, 10 miles N. of Vancouver, 10 September 1935 (R.V. Chamberlin, W. Ivie), 4 ♀ (AMNH); Grays Harbor County, Quinault, 30 August 1936 (C. Lloyd), 1 ♂ (AMNH); Island County, Rosario Beach, Whidby Island, 19 August 1955 (V. Roth), 1 ♂, 3 ♀, 1 immature (AMNH); Jefferson County, S. of Bogachiel, 26 August 1959 (W.J. Gertsch, V. Roth), 2 ♂, 1 ♀ (AMNH); King County, Mercer Island, 22 March 1937 (M. E. Russel) 1 ♀ (AMNH), Seattle, 8 October 1930 (H. Exline), 1 ♀ (AMNH), no date (? Kincaid), 1 ♀ (PESC); Lewis County, Ohanapecosh Campground, Mt. Rainier National Park, 12 June 1969 (ROM Field Party), 1 ♀ (CNC); San Juan County, Mt. Constitution, 5 August 1935 (H. Exline), 1 ♀ (AMNH), East Sound, Orcas Island, 17 Au-

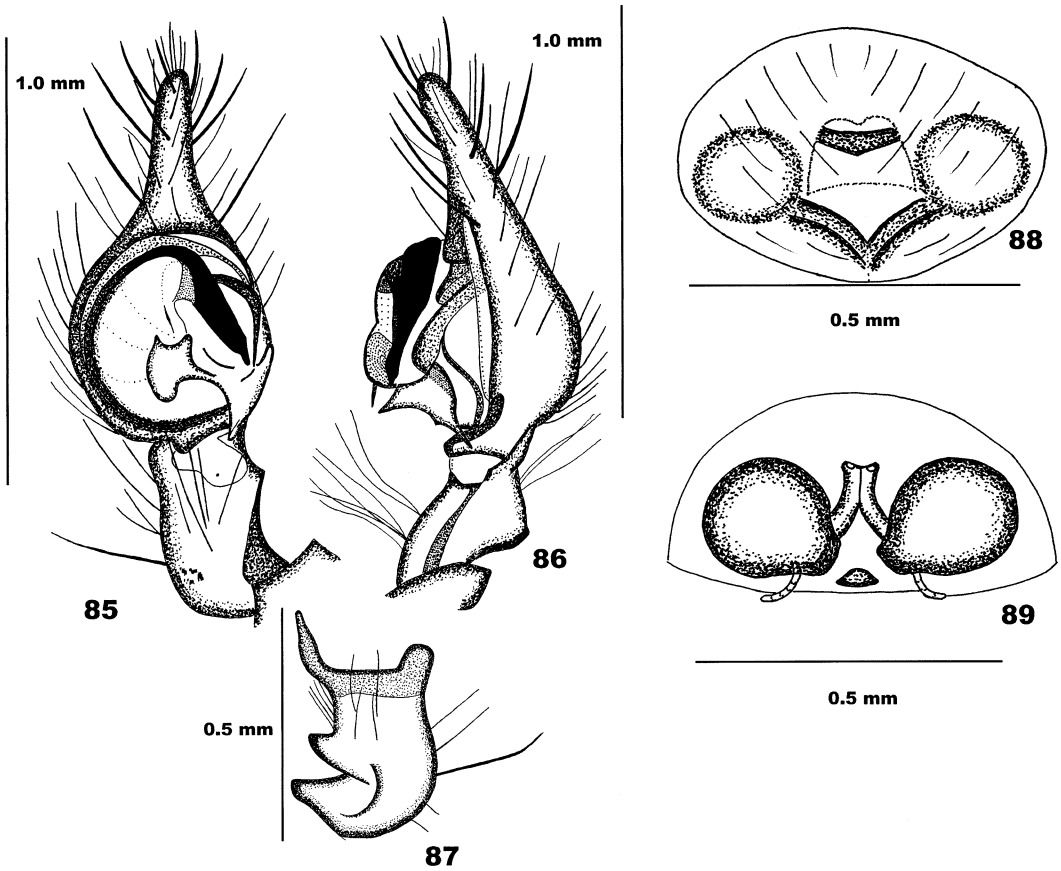


Figures 80–84.—*Calymmaria rothi*. 80. Palpus, ventral; 81. Palpus, lateral; 82. Palpal tibia, dorsal; 83. Epigynum, ventral; 84. Epigynum, dorsal.

gust 1936 (H. Exline), 1 ♀ (AMNH); Skamania County, 10 miles W. of Spirit Lake, 16 August 1955 (V. Roth), 1 ♀ (AMNH); Snohomish County, Everett, November–December 1934 (A. Lumley), 1 ♀ (AMNH), Arlington, 11 September 1935 (R.V. Chamberlin, W. Ivie), l female (AMNH), 4 miles NW. of Monroe, 27 August 1959 (V. Roth, W.J. Gertsch), 1 ♀, 2 immatures (AMNH); Thurston County, Olympia, September 1933 (Christopher), 1 ♂ (AMNH), 22 August 1954 (V. Roth), 1 ♂, 1 ♀ (AMNH); Whatcom County, Mt. Baker Glacier, 7 September 1965 (J. and W. Ivie), 1 ♀ (AMNH): *Oregon;* Benton County, Mary's Peak (3900′), 21 August 1952 (V. Roth), 1 ♂, 1 ♀ (AMNH), McDonald Forest, N. of Corvalis, 29 September 1959 (V. Roth), 1 ♂, 3 ♀, 2 immatures (AMNH); Curry County, Pistol River, 17 September 1956 (B. Malkin), 1 ♂, 2 ♀ (AMNH); Douglas County, Roseburg, Bogus Creek Forest Camp, 13 September 1955 (V. Roth, Capizzi), 2 ♂ (AMNH), 9 miles SW. Cottage Grove, 23 August 1959 (W.J. Gertsch, V. Roth), 1 ♂, l female, 1 immature (AMNH), Idleyld Park, N. Umpqua River, 23 August 1959 (V. Roth, W.J. Gertsch), 2 ♂, 11 ♀, 5 immatures (AMNH); Lane County, Triangle Lake, 30 September 1959 (V. Roth), 1 ♂, 1 ♀ (AMNH); Marion County, Silver Creek Falls, 27 September 1959 (V. Roth), 1 ♂ (AMNH); no county, 2 miles S. of Dolphin Log Cabin, 3 April 1948 (V. Roth), 1 ♀ (AMNH).

Calymmaria farallon new species
Figs. 33–37; Map 4

Types.—Male holotype and female allotype from South Farallon Island, former sea cave above landing, San Francisco County, California, U.S.A., 37°44′N, 123°02′W, 13 April 1970, W.E. Azevedo (CASC).



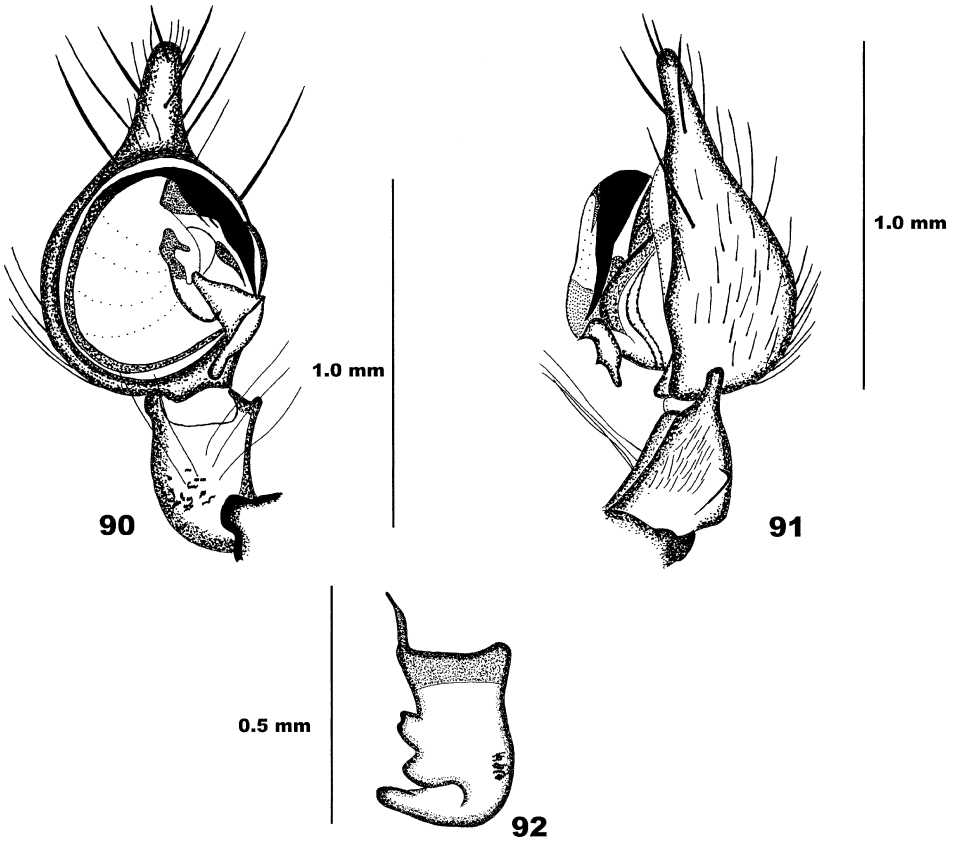
Figures 85–89.—*Calymmaria scotia*. 85. Palpus, ventral; 86. Palpus, lateral; 87. Palpal tibia, dorsal; 88. Epigynum, ventral; 89. Epigynum, dorsal.

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—This is a large species of *Calymmaria*. Females resemble *C. suprema*, but the midpiece of the epigynum is wide at the top. Males are readily separated from all other species of *Calymmaria* except *C. californica* by the presence of an ectal tooth near the base of the embolus. *Calymmaria farallon* males are separated from *C. californica* by its large size and ectal tooth more basal than distal (Fig. 34).

Description.—*Female:* Carapace typical. Dorsum of abdomen pale gray with basal dark gray lanceolate mark followed by dark gray mottling; venter pale gray with wide yellow lateral longitudinal stripes. Legs unmarked to strongly annulate, spination typical. Epigynum of female externally with large opening and sclerotized below (Fig. 36); internally with wide midpiece, small blind ducts, and thick, divided lateral ducts (Fig. 37). *Male:* Carapace typical. Dorsum of abdomen pale yellow with faint gray basal lanceolate mark followed by four pairs of irregular spots fused caudally; venter pale yellow. Legs unmarked or weakly annulate, spination typical. Male palpus with PA large and round; basal RTA thick and bluntly pointed, medial RTA rounded, distal RTA long and rounded (Fig. 33); tibia with one prolateral spine and several long setae, two long setae, short dense retrolateral setae; cymbium elongate distad, with two spines near base of tip and six spines on tip; embolus thick and tapering to a point with an ectal tooth near base (Fig. 33), conductor with small rounded basal lobe.

Measurements (n = 4 of each sex).—*Female:* Total length, 7.50–9.83 (8.29); carapace length, 2.85–4.31 (3.41); carapace width



Figures 90–92.—*Calymmaria sequoia*. 90. Palpus, ventral; 91. Palpus, lateral; 92. Palpal tibia, dorsal.

2.17–3.10 (2.64); femur I length, 3.29–5.02 (4.03). *Male:* Total length, 5.55–7.35 (6.47); carapace length, 2.91–3.60 (3.31); carapace width, 2.26–2.51 (2.41); femur I length, 4.03–4.65 (4.49).

Distribution.—Farallon Islands, San Fransisco County, California (Map 4).

Natural History.—Mature specimens collected from the ceiling of caves on the Farallon Islands in April, September, and October.

Material Examined.—U.S.A.: *California*: San Francisco County, South Farallon Islands, former sea cave above east landing, 13 April 1970 (W. E. Azevedo), 2 ♂, 2 ♀ (CASC); Southeast Farallon, on ceiling with web in entrance of cave on N. side of Shubrick Pt., 15 October 1977 (M. G. Kellog), 1 ♀ (CASC), Rabbit Cave, 16 September 1978 (V.F. Lee), 1 ♂, 1 immature (CASC); Northeast Farallon Island, cave N. of Breaker Cove (''Cricket Cave''), 19 September 1978 (V.F. Lee), 1 ♂, 1 ♀ (CASC).

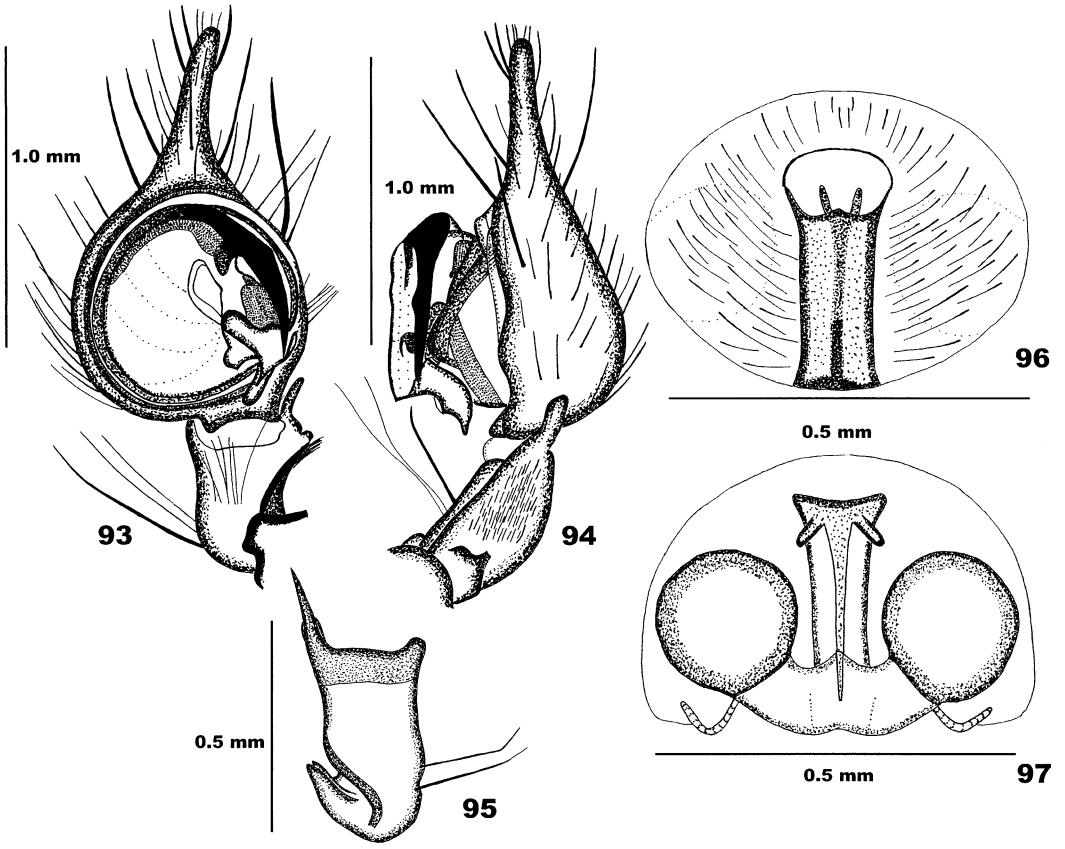
Calymmaria gertschi new species
Figs. 38, 39; Map 4

Type.—Male holotype from Anchor Bay, Mendocino County, California, U.S.A., 38°48′N, 123°34′W, 12 September 1961, W. Ivie, W.J. Gertsch (AMNH).

Etymology.—The specific name is a patronym honoring Dr. Willis J. Gertsch, co-collector of the type specimen.

Diagnosis.—*Calymmaria gertschi* is easily separated from other *Calymmaria* by the bilobed basal and distal RTA's (Figs. 38,39).

Description.—*Male:* Carapace typical, few markings: Dorsum of abdomen pale yellow with pale gray basal lanceolate mark followed by four distinct transverse chevrons; venter



Figures 93–97.—*Calymmaria shastae*. 93. Palpus, ventral; 94. Palpus, lateral; 95. Palpal tibia, dorsal; 96. Epigynum, ventral; 97. Epigynum, dorsal.

pale gray with faint yellow lateral longitudinal stripes. Legs faintly annulate, spination typical. Male palpus with PA a small angle (Fig. 38); basal RTA with a ventral bifurcate lobe and a dorsal club-shaped lobe; medial RTA two small ridges, distal RTA bilobed; tibia with dense short ventral setae; cymbium short distad, with two spines near base of tip and six spines near tip; embolus long, thin, tapering to a point, basal lobe of conductor poorly developed. *Female:* Unknown.

Measurements.—*(n = 1):* Total length, 4.12; carapace length, 1.82; carapace width, 1.49; femur I length, 2.36.

Distribution.—Anchor Bay, Mendocino County, California (Map 4).

Natural History.—One mature specimen collected in September.

Material Examined.—Known only from the type.

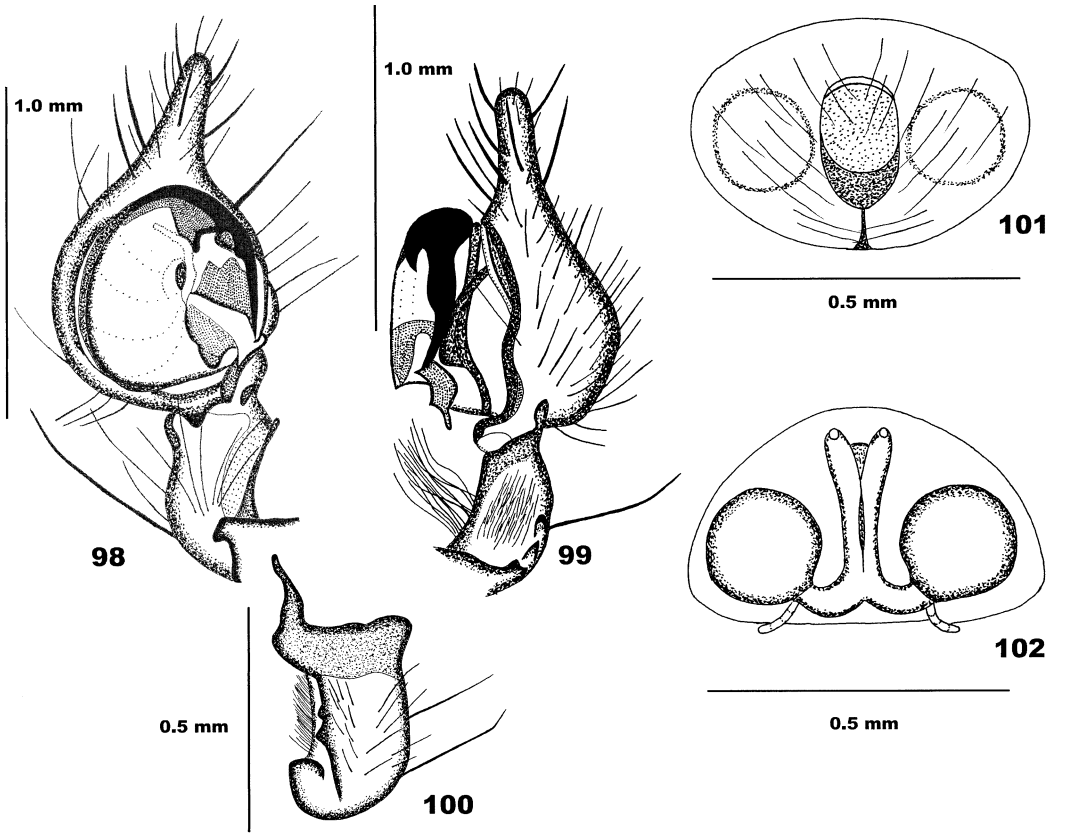
Calymmaria humboldt new species
Figs. 40–42; Map 4

Type.—Male holotype from redwood grove in Weott, Humboldt County, California, U.S.A., 40°19′N, 123°55′W, 21 September 1964, J. and W. Ivie (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria humboldt* can be separated from other *Calymmaria* by the toothed basal RTA, lobe-like medial RTA (Fig. 41), and the thin, long embolus (Fig. 40).

Description.—*Male:* Carapace typical, dorsum of abdomen gray with basal lanceolate mark flanked by large pale yellow spots and followed by four pairs of yellow spots decreasing in size and becoming transverse stripes caudally; venter gray with pale gray lateral longitudinal stripes. Legs weakly an-



Figures 98–102.—*Calymmaria sierra*. 99. Palpus, ventral; 99. Palpus, lateral; 100. Palpal tibia, dorsal; 101. Epigynum, ventral; 102. Epigynum, dorsal.

nulate, spination typical. Male palpus with PA large and knob-like (Fig. 40); basal RTA with two large teeth separated by two small teeth, medial RTA lobelike, distal RTA long, rounded and curved (Fig. 41); tibia with one long prolateral spine, several long ventral setae, and dense short dorsal setae; cymbium moderately elongate distad, with three spines near base of tip and six spines on tip; embolus long, thin tapering, conductor with small round basal lobe (Fig. 40). *Female:* Unknown.

Measurements.—*(n = 1):* Total length, 5.22; carapace length, 2.45; carapace width, 2.02; femur I length, 2.48.

Distribution.—One specimen from Humboldt County, California (Map 4).

Natural History.—Mature specimen collected from redwoods in September.

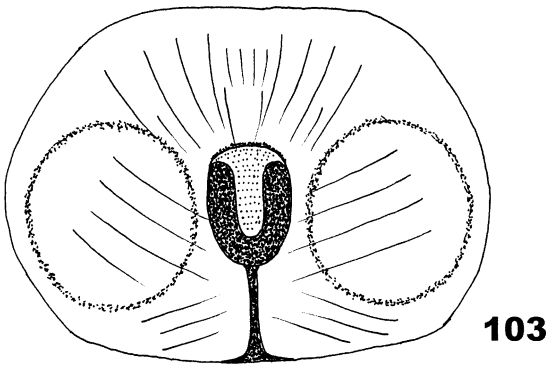
Material Examined.—Known only from the type.

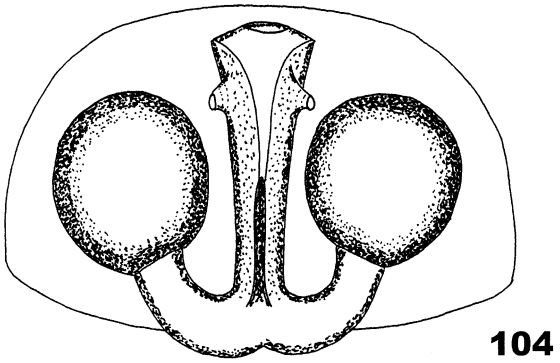
Calymmaria iviei new species
Figs. 43–47; Map 5

Types.—Male holotype from 6 miles S. of Fish Camp, Mariposa County, California, U.S.A., 37°23′N, 119°38′W, 12 September 1959, no collector (AMNH); female allotype from Fish Camp, Mariposa County, California, U.S.A., 37°28′N, 119°38′W, 5 September 1958, V. Roth (AMNH).

Etymology.—The specific name is a patronym in honor of Wilton Ivie, collector of a large number of *Calymmaria* specimens examined in this study.

Diagnosis.—Female *Calymmaria iviei* can be easily separated from other *Calymmaria* by the lack of external sclerotization of the epigynum (Fig. 46), and the short, truncate midpiece (Fig. 47). Males can be separated by the short PA, thickened embolic base with coiled





Figures 103–104.—*Calymmaria similaria*. 103. Epigynum, ventral; 104. Epigynum, dorsal.

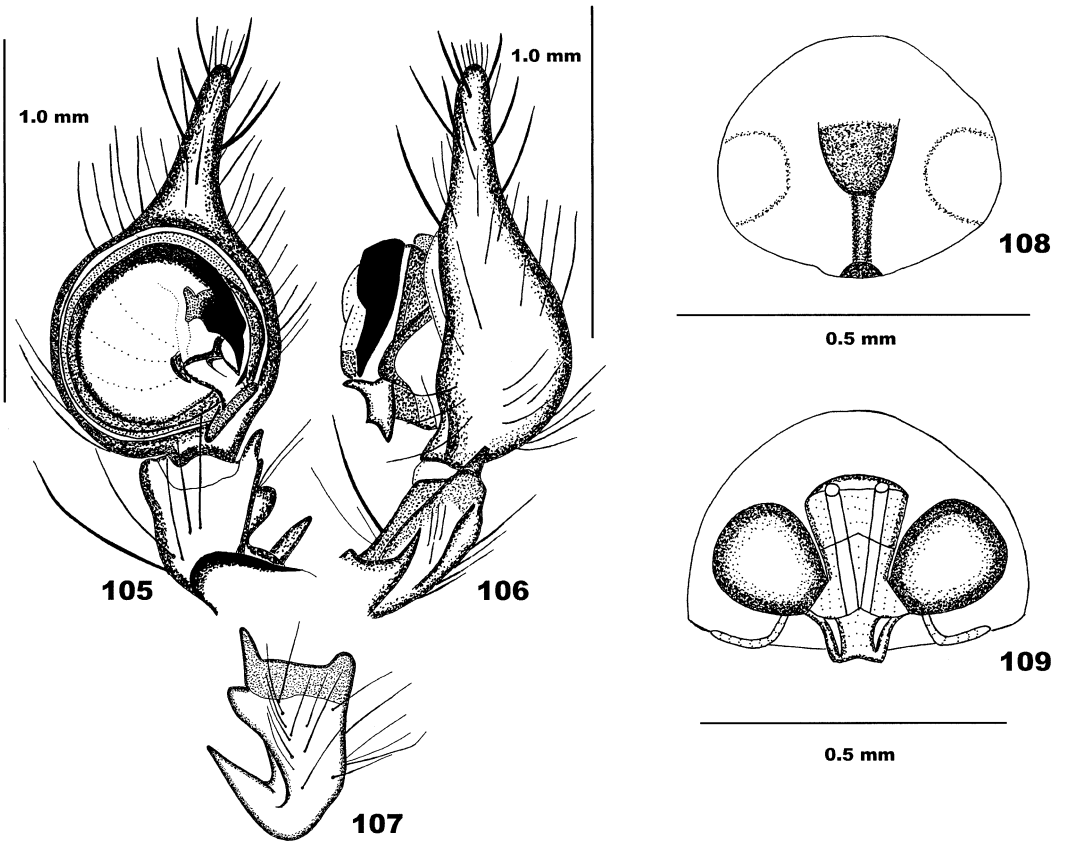
ejaculatory duct (Fig. 43), and the bilobed medial RTA (Fig. 45).

Description.—*Female:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by two pairs of yellow spots and followed by five transverse chevrons; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum of female externally with wide opening and little sclerotization (Fig. 46); internally with midpiece short and truncate, blind ducts very short, lateral ducts fused medially and very wide (Fig. 47). *Male:* Carapace orange, typical. Abdomen as in female but markings usually more distinct. Legs weakly annulate, spination typical. Male palpus with PA a short point (Fig. 43); basal RTA long, rounded from above, medial RTA bilobed, distal RTA short, rounded, and constricted at base (Figs. 43, 44); tibia with three moderately long prolateral spines, three long ventral setae, and many long retrolateral setae; cymbium short distad, with two spines near base of tip and six spines on tip; embolus thick at base with conspicuous coil in ejaculatory duct, tapering to a sharp point, conductor with elongate, rounded basal lobe (Fig. 43).

Measurements.—*Female:* Total length, 4.02–5.21 (4.36); carapace length, 1.49–1.74 (1.60); carapace width, 1.09–1.30 (1.17); femur I length, 1.43–1.77 (1.60). *Male:* total length, 3.72–4.19 (3.91); carapace length, 1.67–1.89 (1.78); carapace width, 1.49–1.59 (1.54); femur length, 1.86–2.17 (1.96).

Distribution.—San Francisco Bay area north into Mendocino County, California, and Yosemite National Park (Map 5).

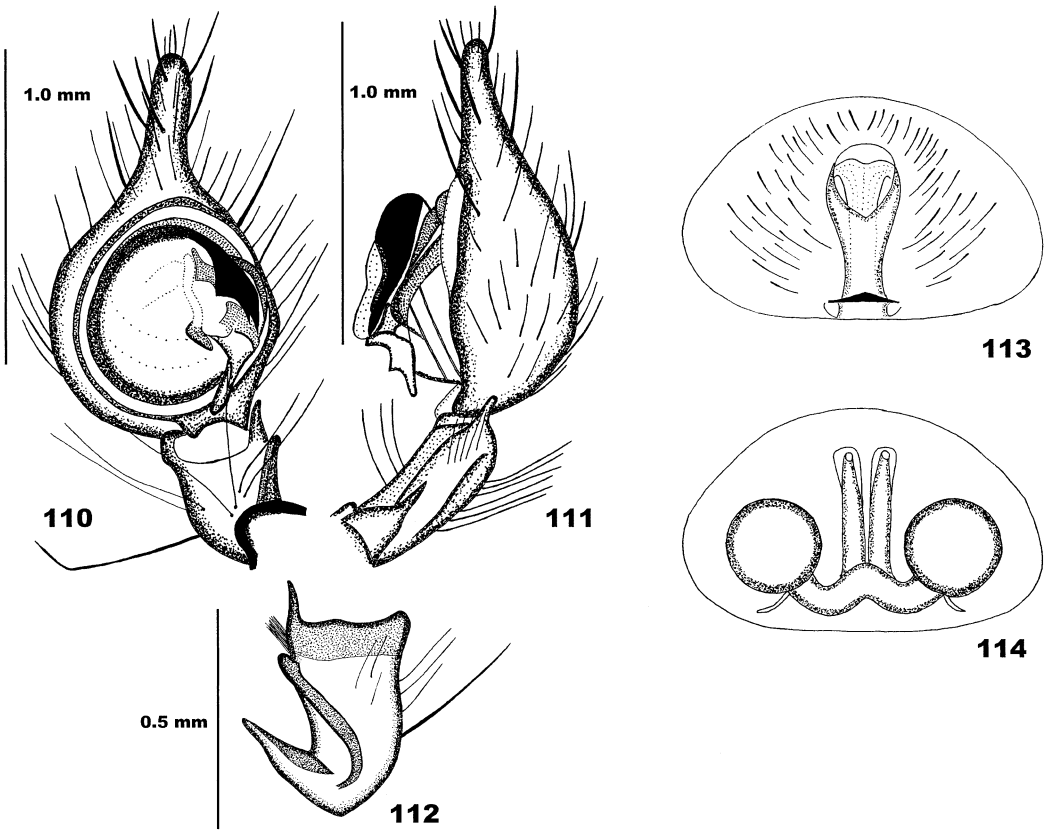
Natural History.—Mature specimens tak-



Figures 105–109.—*Calymmaria siskiyou*. 105. Palpus, ventral; 106. Palpus, lateral; 107. Palpal tibia, dorsal; 108. Epigynum, ventral; 109. Epigynum, dorsal. Scale bar was inadvertently omitted from the original drawing for Fig. 107.

en in January, February, March, May, September, and December. One specimen was collected from an old packrat nest.

Material Examined.—U.S.A.: *California*: Alameda County, Castro Valley, 9 March 1941 (W.M. Pearce), 10 ♀ (AMNH), Livermore, 25 miles S. on Mines Rd., 17 December 1968 (V. Roth), 4 ♀ (AMNH); Contra Costa County, Marsh Creek Springs, 5 May 1940 (W.M. Pearce), 1 ♀ (AMNH), Diablo, 25 March 1947 (B. Malkin, D. G. Kelley), 1 ♀ (AMNH); Madera County, 5 miles S. of Fish Camp, just over county line, 22 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂, 2 ♀, 5 immatures (AMNH); Mariposa County, Wawona Camp, Yosemite National Park, 17 September 1941 (W. Ivie), l female (AMNH), Fish Camp, 5 September 1958 (V. Roth), 3 ♀, 1 immature (AMNH), 2 miles S. of Fish Camp, 12 September 1959 (no collector), 1 ♂ (AMNH), 1 miles S. of Fish Camp; 23 September 1961 (W. Ivie, W.J. Gertsch), 10 ♂, 6 ♀, 1 immature (AMNH); Mendocino County, 1 miles SE. of Caspar on Caspar Creek, 13 September 1961 (W.J. Gertsch, W. Ivie), 1 ♀ (AMNH); Napa County, Oakville, 13 December 1953 (V. Roth), 1 ♀ (AMNH), 3 miles W. of Oakville, 15 February 1954 (V. Roth, R.O. Schuster), 2 ♀ (AMNH), 10 miles S. of Monticello, 6 January 1957 (R.O. Schuster), 1 ♀ (AMNH), 17 February 1957 (R.O. Schuster), 2 ♀ (AMNH); Sonoma County, Junction of Porter Creek Road and Calistoga Road, in old packrat nest, 15 February 1960 (J. S. Buckett), 1 ♀ (AMNH); Yolo County, 5.4 miles S. of Winters, 17 January 1960 (Smith, R.O. Schuster), 1 ♀ (AMNH).



Figures 110–114.—*Calymmaria sueni*. 110. Palpus, ventral; 111. Palpus, lateral; 112. Palpal tibia, dorsal; 113. Epigynum, ventral; 114. Epigynum, dorsal. Scale bars were inadvertently omitted from the original drawings for Figs. 113 and 114.

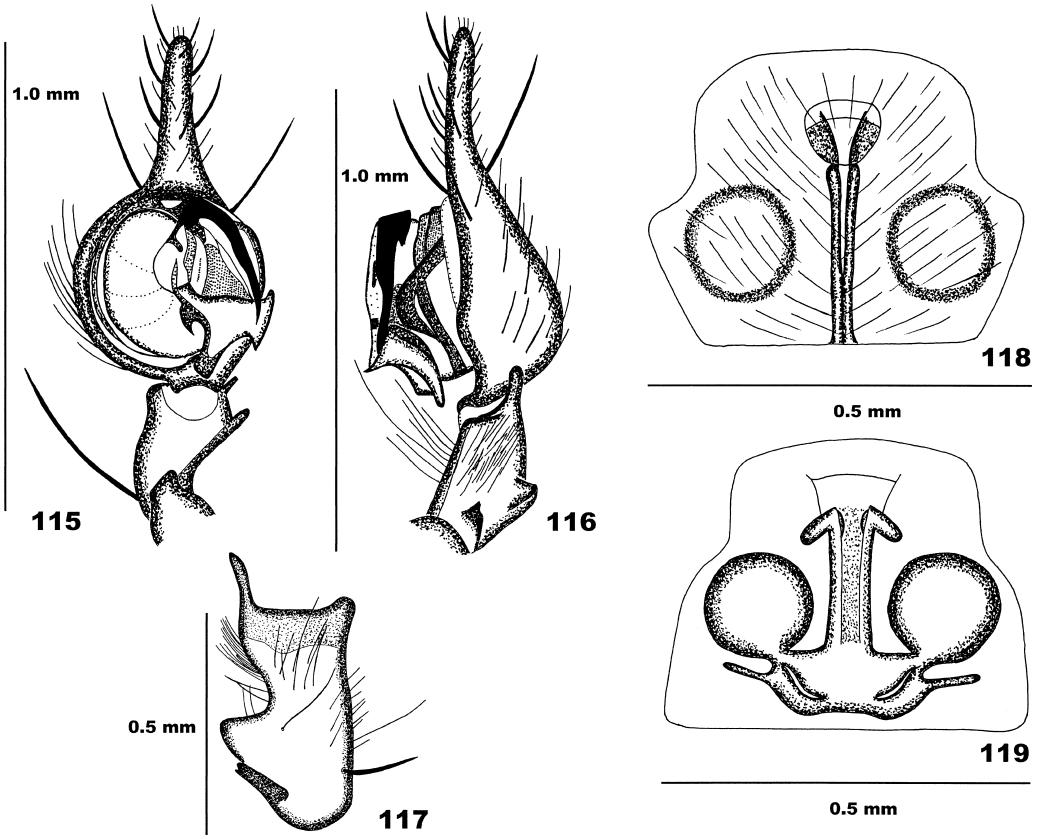
Calymmaria lora Chamberlin & Ivie 1942
Figs. 48–52; Map 5

Calymmaria lora Chamberlin & Ivie 1942: 22, figs. 30, 31; Roewer 1954: 46.

Types.—Male holotype from Friant, Fresno County, California, U.S.A., 36°59′N, 119°42′W, March 1913, R.V. Chamberlin (AMNH, examined).

Diagnosis.—*Calymmaria lora* resembles *C. aspenola* and *C. monicae*. Female specimens of *C. lora* can usually be separated from other *Calymmaria* by the thick sclerotization around the epigynal opening (Fig. 51). Male specimens of *C. lora* are very difficult to separate from *C. monicae*. Males of *C. lora* usually possess a very small raised area distal to the medial RTA (Fig. 50), the PA is more rounded, and the distal lobes of the conductor are usually longer and rounder (Fig. 48). Specimens of both sexes of *C. lora* vary greatly in size and markings.

Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow or silver with gray basal lanceolate mark followed by four pairs of gray spots, the last pair contiguous; venter gray with small pale spots. Legs annulate, spination typical. Epigynum externally with large opening surrounded by heavy sclerotization (Fig. 51); internally with wide midpiece, very small blind ducts, strong sclerotization around opening, and wide lateral ducts fused medially (Fig. 52). *Male:* Same as in female.Male palpus with PA large, truncate (Fig. 48); basal RTA thick, round, usually with a very small raised area near its distal margin, medial RTA knob-like, distal RTA long, rounded (Figs. 49, 50); tibia with two large prolateral spines, usually four ventral long setae, many short retrolateral setae; cym-



Figures 115–119.—*Calymmaria suprema*. 115. Palpus, ventral; 116. Palpus, lateral; 117. Palpal tibia, dorsal; 118. Epigynum, ventral; 119. Epigynum, dorsal.

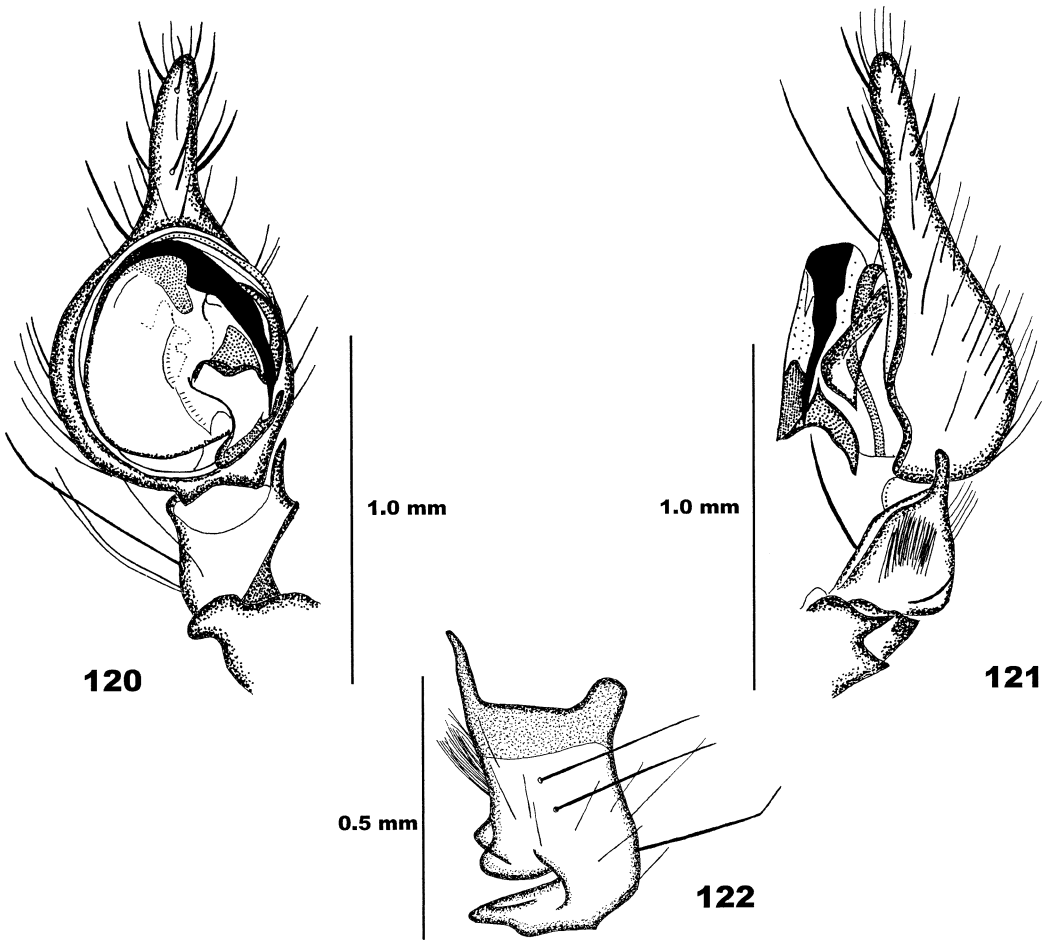
bium elongate distad, with two spines near base of tip and five or six spines on tip; embolus thick and tapering to a long point, conductor with basal lobe pointed (Fig. 48).

Measurements.—*Female:* Total length, 5.02–6.83 (5.87); carapace length, 2.17–3.19 (2.60); carapace width, 1.43–2.51 (1.87); femur I length, 2.48–3.72 (2.93). *Male:* Total length, 5.27–7.35 (6.36); carapace length, 2.60–3.72 (3.07); carapace width, 2.17–2.82 (2.49); femur I length 3.47–5.89 (4.61).

Distribution.—San Francisco Bay area in California, north to Sonoma County and south to Los Angeles County; Sierra Nevada Mountains from Tulare County north to Placer County (Map 5).

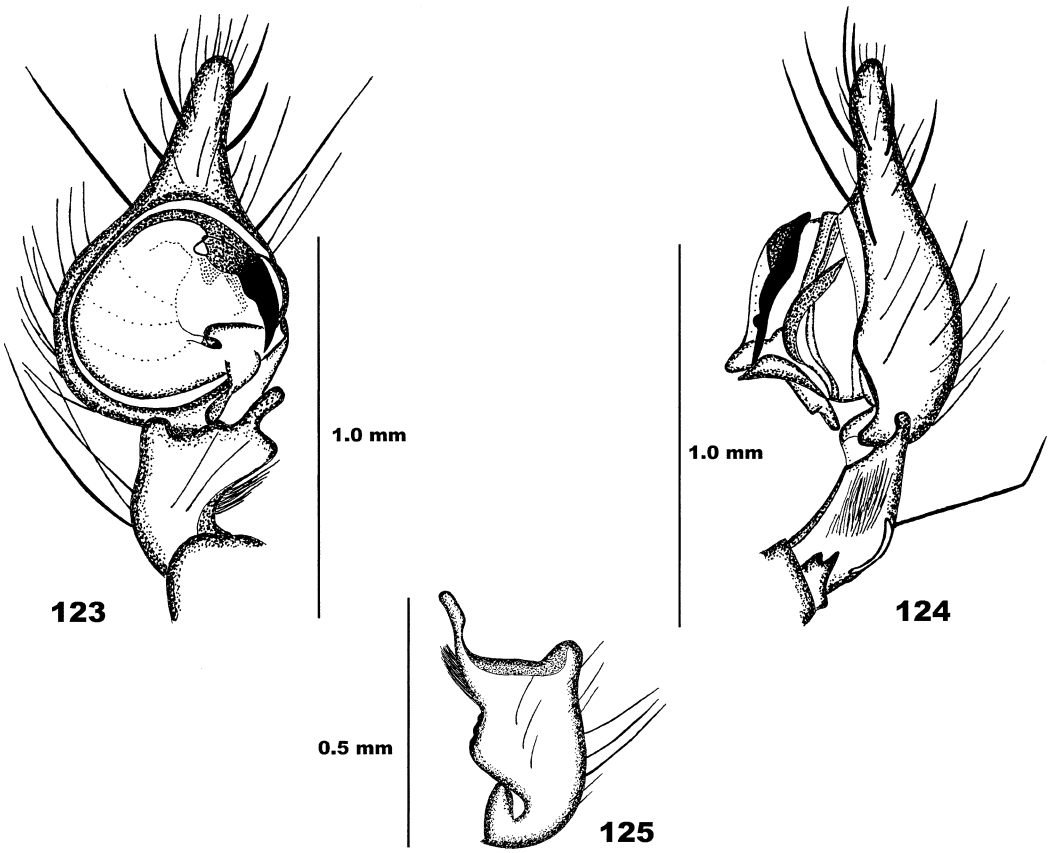
Natural History.—Mature specimens collected from every month except February and June, taken from beneath bark of California sycamore and giant sequoia at elevations from 390 to 2100 m.

Material Examined.—U.S.A.: *California*: Contra Costa County, Clayton, 30 April 1939 (E. S. Ross), 1 ♀ (AMNH); Marsh Creek Springs, 5 May 1940 (W.M. Pearce), 2 ♀, 1 immature (AMNH), no specific locality, 2 April 1941 (W.M. Pearce), 4 ♀, 4 immatures (AMNH), Mt. Diablo, 25 March 1947 (B. Malkin, D. Kelley), 2 ♀ (AMNH), SE. corner, 13 January 1961 (V. Roth, P. Craig), 5 ♀, 3 immatures (AMNH); Fresno County, Friant, March 1913 (R.V. Chamberlin), 1 ♀ holotype, 1 ♀ paratype (AMNH), Shaver Lake, 15 July 1952 (M. Cazier, W.J. Gertsch, R. Schrammel), 1 ♀ (AMNH), September 1959 (no collector), 22 ♂, 19 ♀, 16 immatures (AMNH), Cherry Gap (6000′), 6 August 1959 (R.X. Schick), 2 ♀, 2 immatures (AMNH), Cedar Grove, Kings Canyon National Park, 13 September 1959 (V. Roth, W.J. Gertsch), 7 ♂, 15 ♀, 6 immatures (AMNH), Dinkey Creek Campground under rocks, Sierra National Forest, 28–29 August 1979 (D. Ubick), 5 ♂, 5 ♀, 3 immatures (DUSC); Los Angeles



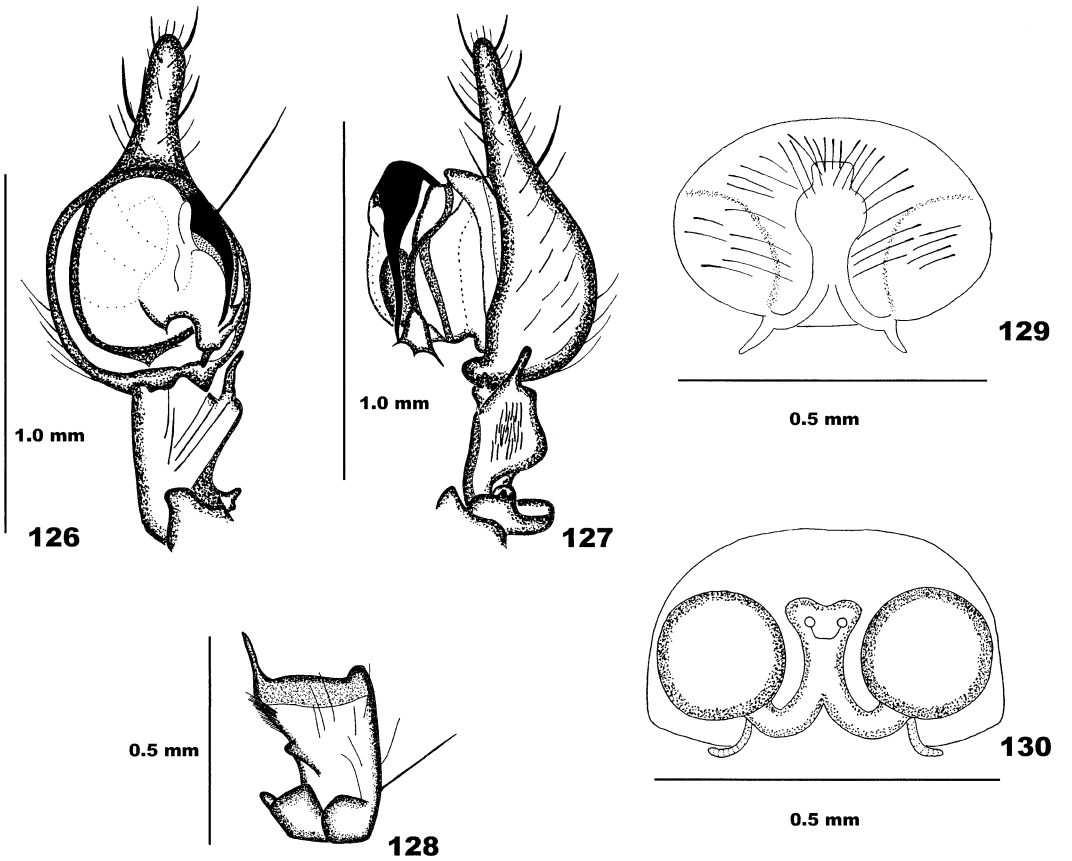
Figures 120–122.—*Calymmaria tecate*. 120. Palpus, ventral; 121. Palpus, lateral; 122. Palpal tibia, dorsal.

County, San Gabriel Mountains on Highway 2 in montane forest (7000′), 27 September 1957 (R.X. Schick), 1 ♂, 1 immature (AMNH); Madera County, Bass Lake, 9 July 1958 (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), North Fork, March 1970 (E. Dietrich), 2 ♀ (AMNH); Marin County, Mill Valley, 20 November 1955 (H. B. Leech), 1 ♂ (AMNH); Mariposa County, Buck Meadows, 11 September 1939 (no collector), 19 ♂, 19 ♀, 5 immatures (AMNH), 15 September 1959 (no collector), 1 ♂ (AMNH), 2 miles S. of Fish Camp, 12 September 1959 (no collector), 2 ♂, 2 ♀ (AMNH), El Portal, 8 April 1960 (W. Ivie, W.J. Gertsch, R. Schrammel), 2 ♀ (AMNH), 1 miles S. of Fish Camp, 23 September 1961 (W. Ivie, W.J. Gertsch), 14 ♂, 8 ♀, 14 immatures (AMNH); Mono County, Big Bend Campground, 5 miles W. of Lee Vining, 21 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂, 5 ♀, 5 immatures (AMNH); Monterey County, Carmel, no date (no collector), 1 ♂ (AMNH), Monterey, October 1945 (A.F. Archer), 4 ♂ (AMNH); Napa County, 4 miles N. of St. Helena, 31 December 1953 (G. A. Marsh, R.O. Schuster, V. Roth), 1 ♂, 7 ♀, 7 immatures (AMNH), N. side of Howell Mountain, 2 miles NE. of Angwin (1300′), 20 October 1975 (H. B. Leech), 1 ♂, 7 ♀ (CASC), 10 November 1975 (H. B. Leech), 2 ♂, 1 ♀, 2 immatures (CASC); Placer County, Tahoe City, 8 July 1956 (W.J. Gertsch), 1 ♀ (AMNH); 3 miles N. [?], 20 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂ (AMNH); Riverside County, Idyllwild, 11 August 1955 (W.J. Gertsch), 1 ♀ (AMNH), Mill Canyon,



Figures 123–125.—*Calymmaria tubera*. 123. Palpus, ventral; 124. Palpus, lateral; 125. Palpal tibia, dorsal.

Banning site #4 (6500′), 24 May 1960 (Chenault), 2 ♀ (CASC); San Bernardino County, Big Pines Rec. Area, San Gabriel Mountains (6860′), 15 October 1955 (R.X. Schick), 1 ♂, 1 ♀ (AMNH); San Francisco County, in house, 29 October 1972 (H. B. Leech), 1 ♂ (CASC); Santa Clara County, Stanford, 15 January 1928 (J.C. Chamberlin), 1 ♂ (AMNH); Coyote River, 3 miles S. of Gilroy Hot Springs, under exfoliating bark on trunk of living *Platanus racemosa*, 24 November 1966 (H. B. Leech), 1 ♀ (CASC); Santa Cruz County, Ben Lomond, 4 July 1958 (W.J. Gertsch, V. Roth), 2 ♂ (AMNH); Solano County, Green Valley, 24 March 1954 (E. Schlinger), 1 ♀ (AMNH); Sonoma County, Cazadero, 13 April 1913 (H. Van Dusee), 1 ♀ (AMNH); Tulare County, Wilsonia, 13 September 1959 (V. Roth, W.J. Gertsch), 1 ♂ (AMNH), Quaking Aspen Camp, Sequoia National Forest, 9 September 1959 (no collector), 1 ♂ (AMNH), Big Trees; Sequoia National Park, 15 July 1952 (no collector), 1 ♀ (AMNH), Cedar Grove, Kings River Canyon, Kings Canyon National Park (4633′), 16 July 1952 (W.J. Gertsch), 2 ♀ (AMNH), Main Camp, Sequoia National Park, 5 July 1959 (V. Roth, W.J. Gertsch), 2 ♀ (AMNH), near Ash Mountain entrance, Sequoia National Park (3700′), 5 July 1956 (W.J. Gertsch, V. Roth), 5 ♀, 7 ♂ (AMNH), 9 July 1958 (W.J. Gertsch, V. Roth), 4 ♀, 2 immatures (AMNH), 4 October 1959 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH), 3 miles W. of Gent Forest, 9 July 1958 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH), Camp Nelson, Sequoia National Forest, 11 July 1958 (V. Roth), 1 ♂ (AMNH), near Camp Nelson, Belknap Springs, 11 July 1958 (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), Soda Creek, west of Camp Nelson, 11 July 1958



Figures 126–130.—*Calymmaria virginica*. 126. Palpus, ventral; 127. Palpus, lateral; 128. Palpal tibia, dorsal; 129. Epigynum, ventral; 130. Epigynum, dorsal.

(V. Roth, W.J. Gertsch), 1 ♂, 7 ♀ (AMNH), 14 September 1959 (V. Roth, W.J. Gertsch), l male, 2 ♀, 5 immatures (AMNH), Double Bunk Meadows, 6 miles W. of Johnsondale, 15 September 1959 (no collector), 2 ♂, 2 ♀, 3 immatures (AMNH), Soda Springs, W. of Springville, 20 September 1959 (W.J. Gertsch, V. Roth), 2 ♂ (AMNH), 7 miles NE. of Ash Mountain entrance, Sequoia National Park, 30 September 1959 (W.J. Gertsch, V. Roth), 1 ♂ (AMNH), 15 October 1959 (V. Roth), 1 ♂ (AMNH), Halstead Meadow, under rock, Sequoia National Park, 23 August 1979 (D. Ubick), 1 ♂ (DUSC); Tuolumne County, Aspen Valley, Yosemite National Park, 4 September 1959 (V. Roth, W.J. Gertsch), 3 ♀ (AMNH); Ventura County, summit of Mt. Pinos, W. of Lebec, 15 September 1960 (V. Roth), 5 ♂, 10 ♀ (AMNH), 31 July to 1 August 1961 (V. Roth), 2 ♀ (AMNH).

Calymmaria minuta new species
Figs. 53–57; Map 5

Types.—Male holotype from 5 miles N. of Scotia, Humboldt County, California, U.S.A., 40°32′N, 124°05′W, 1 October 1959, V. Roth (AMNH); female allotype from 5 miles W. of Forest Glen, Trinity County, California, U.S.A., 40°22′N, 123°24′W, 21 August 1959, W.J. Gertsch, V. Roth (AMNH).

Etymology.—The specific name is an adjective referring to the relatively small size of this species.

Diagnosis.—*Calymmaria minuta* can be separated from other *Calymmaria* by its small size, the heavily sclerotized epigynum (Fig. 56), and the bifurcate embolus of the male (Fig. 53).

Description.—*Female:* Carapace typical. Dorsum of abdomen dark gray with a pair of

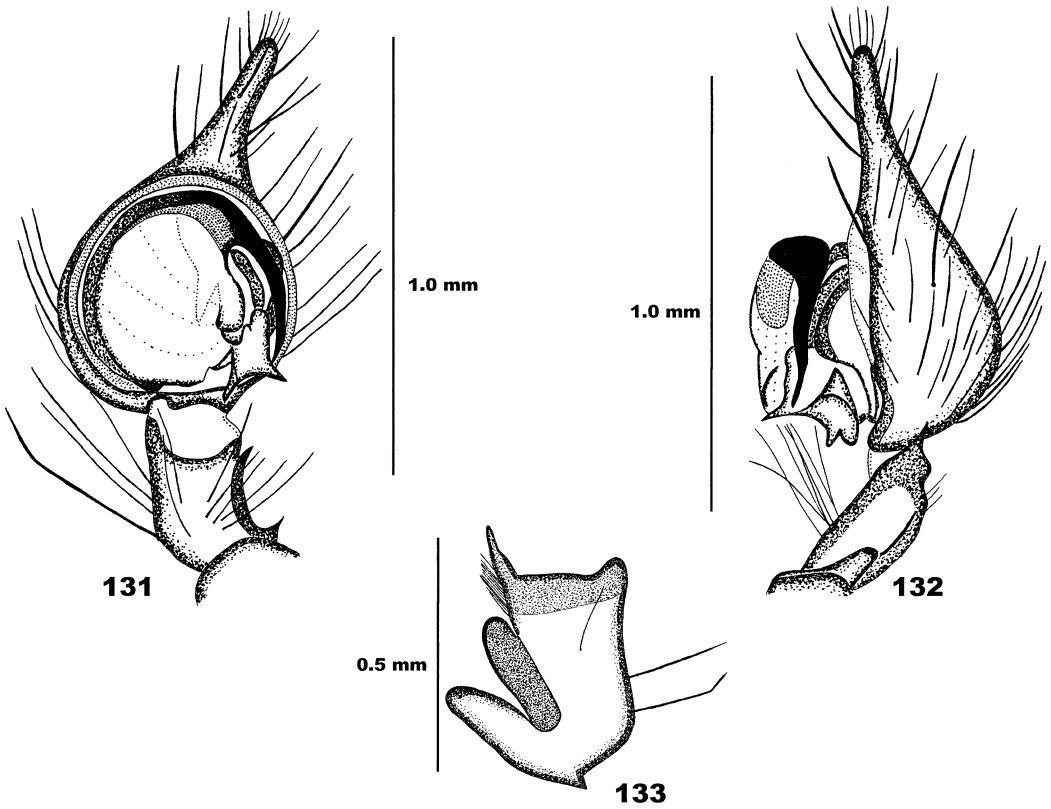


Figure 131–133.—*Calymmaria yolandae*. 131. Palpus, ventral; 132. Palpus, lateral; 133. Palpal tibia, dorsal.

pale yellow spots followed by two transverse chevrons; venter pale gray with pale yellow lateral longitudinal stripes. Legs faintly annulate, spination typical. Epigynum externally with small opening surrounded by a wide area of sclerotization (Fig. 56); internally with midpiece very short, thick, with short blind ducts at top, lateral ducts short and thick (Fig. 57). *Male:* Same as in female. Male palpus with PA large, round (Fig. 53); basal RTA triangular from above, medial RTA toothlike, distal RTA short (Fig. 55); tibia with two long prolateral setae, several long ventral setae; cymbium moderately elongate distad, with two spines near tip of base and six spines on tip; embolus very thick basally, bifurcate, with lower division lobelike, conductor small with basal lobe poorly developed (Fig. 53).

Measurements.—*Female* (n = 2): Total length, 2.29–3.10; carapace length, 1.30–1.49; carapace width, 0.99–1.09; femur I length, 1.49–1.55. *Male (n = 3):* Total length, 3.72–4.50 (4.01); carapace length, 1.77–2.11 (1.94); carapace width, 1.49–1.58 (1.55); femur I length, 2.36–3.10 (2.83).

Distribution.—Mendocino, Humboldt and Trinity Counties, California (Map 5).

Natural History.—Mature specimens collected in August, September, and October.

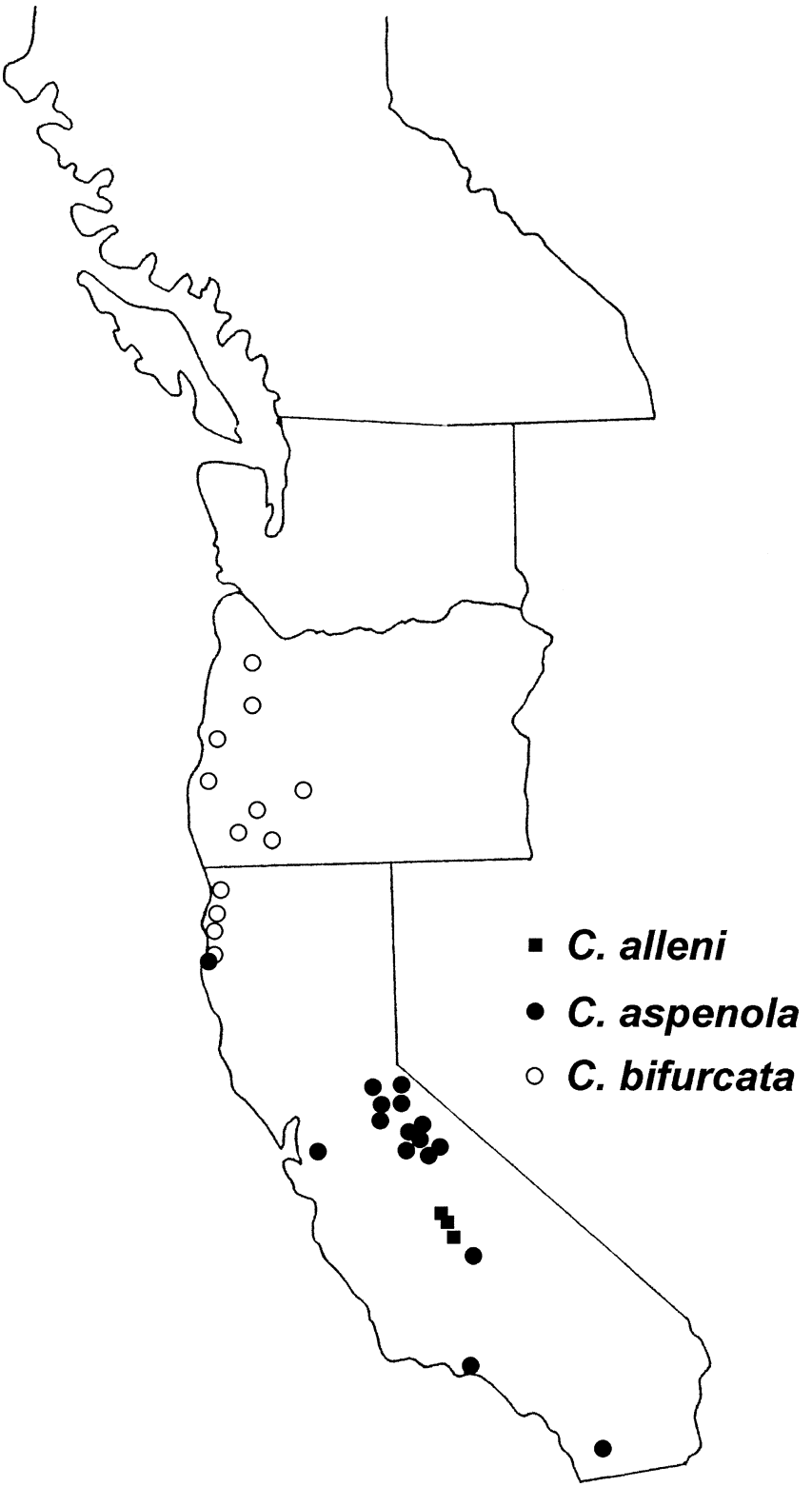
Material Examined.—U.S.A.: *California*: Humboldt County, Scotia, 1 October 1959 (V. Roth), 1 ♂, 3 immatures (AMNH); Mendocino County, 1 miles SE. of Caspar, 13 September 1961 (W.J. Gertsch, W. Ivie), 1 ♂ (AMNH); Trinity County, 5 miles W. of Forest Glen, 21 August 1959 (W.J. Gertsch, V. Roth), l male, 2 ♀ (AMNH).

Calymmaria monicae Chamberlin & Ivie 1937

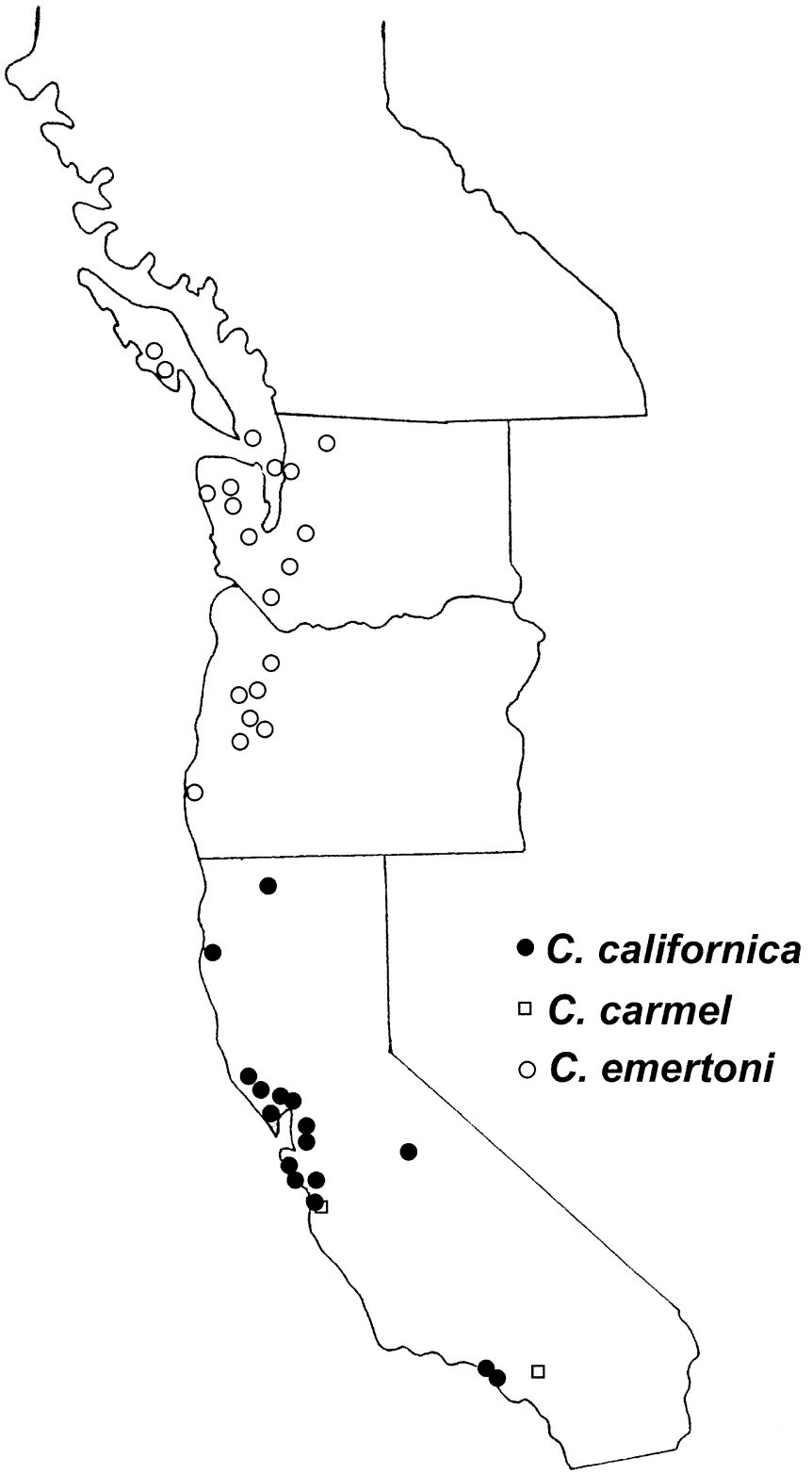
Figs. 58–62; Map 6

Calymmaria monicae Chamberlin & Ivie 1937: 213, 229, figs. 1–3, 14–17; Roewer 1954: 46; Bonnet, 1956: 940.

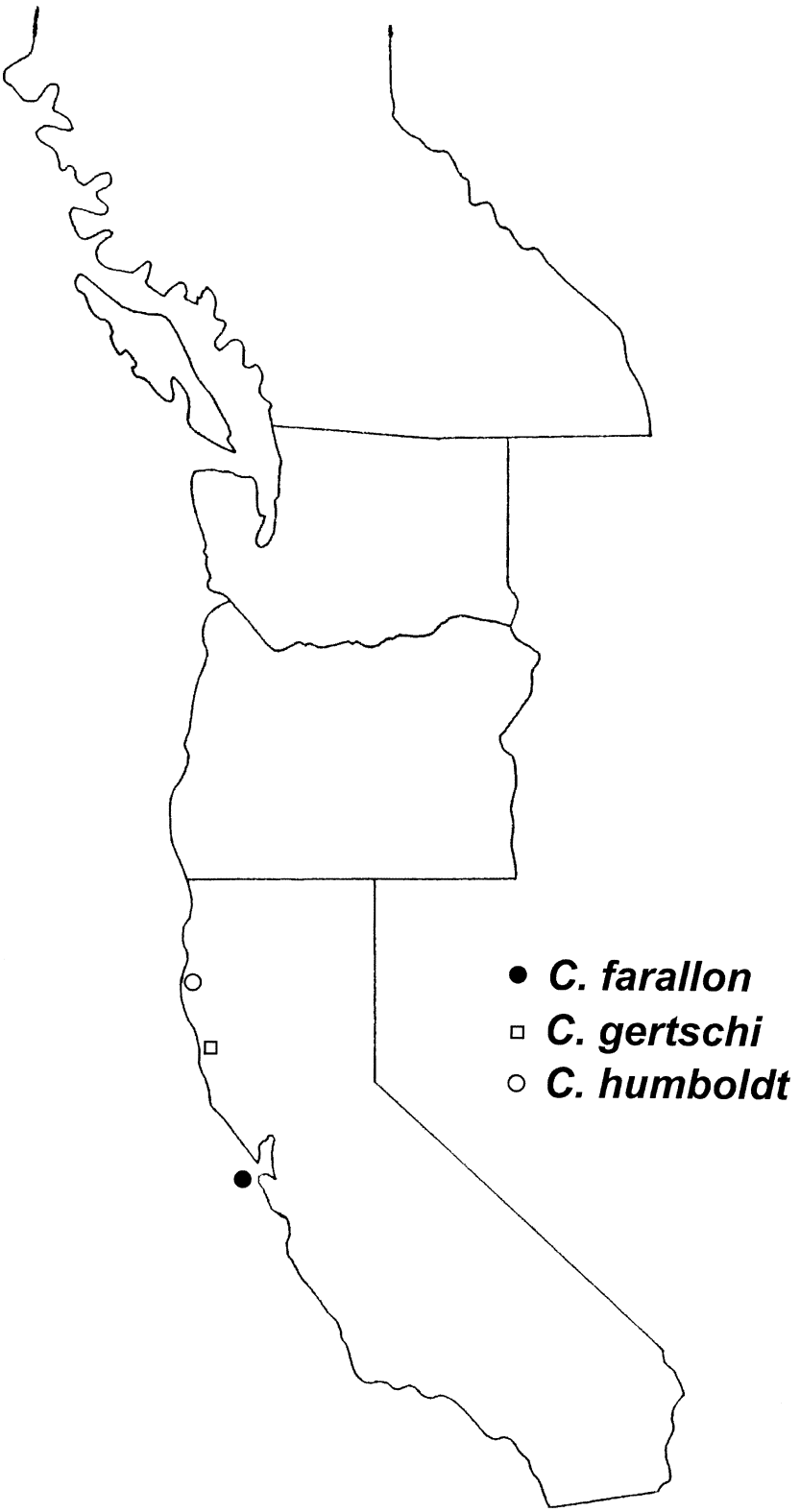
Types.—Male holotype and female allotype from Santa Monica, Los Angeles County,



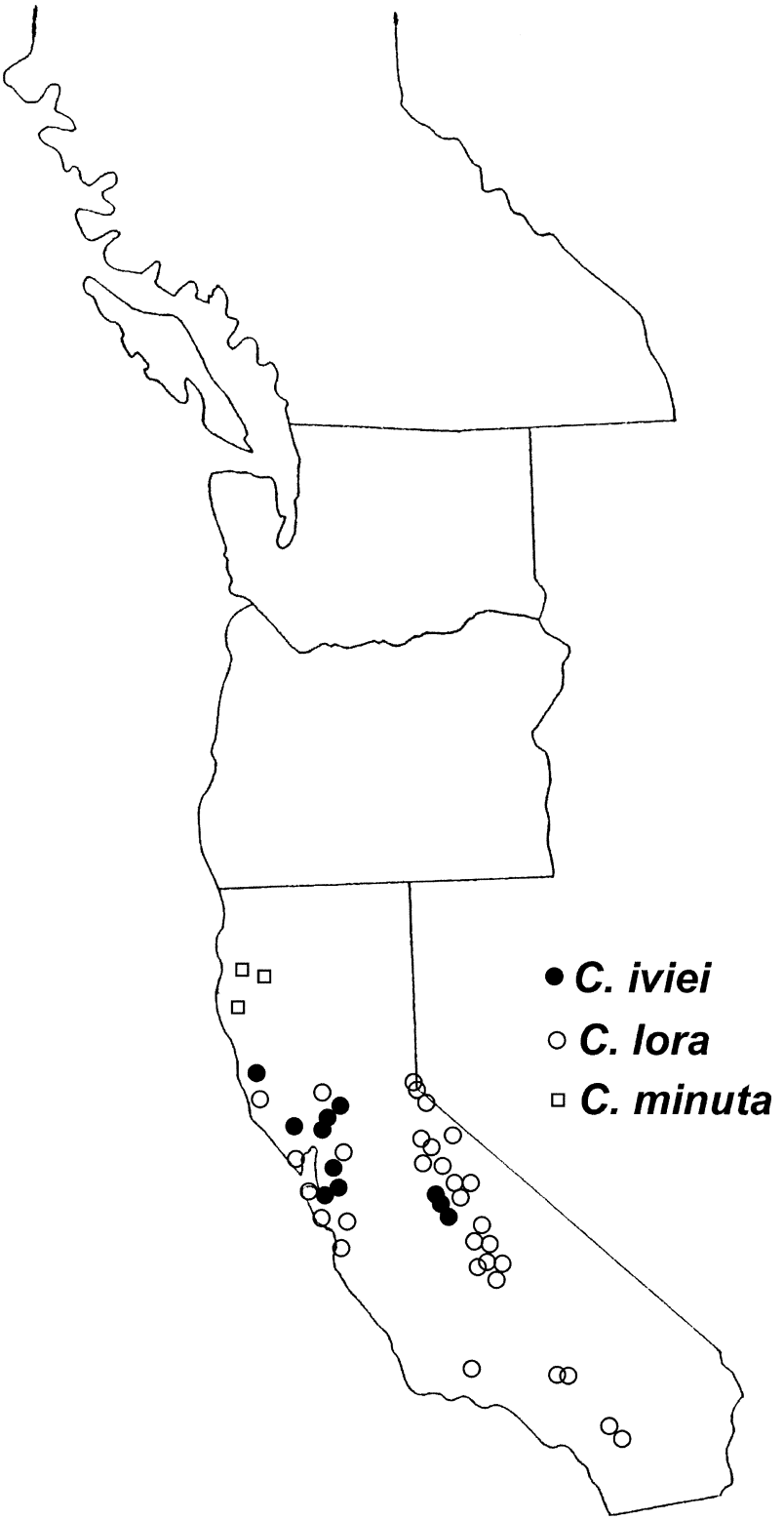
Map 2.—Distribution of *C. alleni* (■), *C. aspenola* (●), and *C. bifurcata* (○).



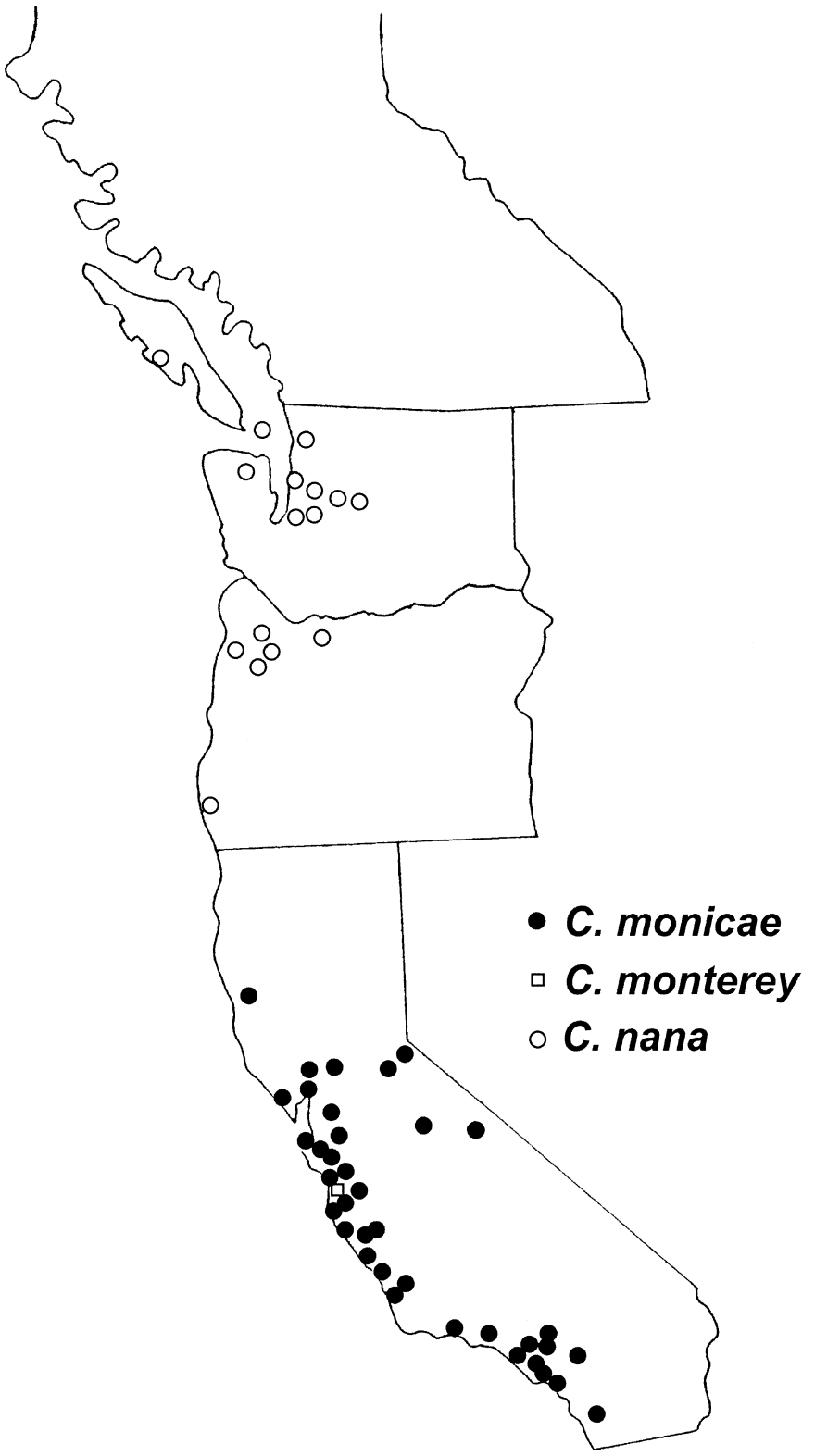
Map 3.—Distribution of *C. californica* (●), *C. carmel* (□), and *C. emertoni* (○).



Map 4.—Distribution of *C. farallon* (●), *C. gertschi* (□), and *C. humboldt* (○).



Map 5.—Distribution of *C. iviei* (●), *C. lora* (○), and *C. minuta* (□).



Map 6.—Distribution of *C. monicae* (●), *C. monterey* (□), and *C. nana* (○).

California, U.S.A., 34°01′N, 118°29′W (AMNH, examined).

Diagnosis.—*Calymmaria monicae* closely resembles *C. aspenola*, *C. californica*, and *C. lora*. Female *C. monicae* can be separated from *C. aspenola* by the thinner epigynal midpiece with ducts separated at the top (Fig. 62), from *C. californica* by having the midpiece much longer than the diameter of the spermathecae (Fig. 24), and from *C. lora* by the lack of heavy sclerotization around the opening (Fig. 61). Male *C. monicae* can be easily separated from *C. aspenola* by the lack of the retrolateral tooth near the medial RTA (Fig. 51), and from *C. californica* by the distinct medial RTA and lack of the ectal embolic tooth (Figs. 20, 21). Male specimens of *C. monicae* are difficult to separate from *C. lora*. The palpi of male *C. lora* usually possess a very small raised area near the medial RTA (Fig. 50), but this character is not always reliable. Usually the PA in *C. monicae* is more hooked than in *C. lora* (Fig. 58), and specimens of *C. lora* are usually larger in overall size.

Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with basal gray lanceolate mark followed by darker gray mottling; venter gray with pale yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with large opening heavily sclerotized below (Fig. 61); internally with ducts of midpiece separated above, blind ducts below top, short, lateral ducts thick and fused medically (Fig. 62). *Male:* same as in female only darker. Male palpus with PA truncate and slightly hooked (Fig. 58); basal RTA long, thick, pointed, medial RTA thick at base and pointed upward, distal RTA rounded; tibia with two prolateral spines and many short retrolateral setae; cymbium moderately elongate distad, with one spine near base of tip and five spines on tip; embolus thick, tapering to a sharp point, conductor with basal lobe pointed (Fig. 58).

Measurements.—*Female:* Total length, 3.88–5.58 (4.79); carapace length, 1.64–2.20 (1.98); carapace width, 1.09–1.67 (1.43); femur I length, 1.58–2.20 (2.02). *Male:* Total length, 4.84–5.43 (5.06); carapace length, 2.08–2.48 (2.31); carapace width, 1.83–2.05 (1.94; $n = 2$); femur I length, 2.95–3.91 (3.18).

Distribution.—Exceedingly common throughout California, from San Diego north to Mendocino County, with most specimens from southern California and San Francisco areas. Scattered records from the Sierra Nevada Mountains from Tulare County north to El Dorado County (Map 6).

Natural History.—Mature specimens collected at any time of the year, particularly from canyons around Los Angeles and at elevations up to 3300 m.

Material Examined.—U.S.A.: *California*: Alameda County, Berkeley, October 1919 (Dietrich), 2 ♂ (AMNH), Oakland, on Mountain Boulevard, 17 October 1953 (V. Roth, R. Schuster), 3 ♀ (AMNH), 1 February 1954 (V. Roth, R. Schuster), 2 ♀ W. of Orinda, 27 December 1953 (V. Roth, Marsh, R. Schuster), 4 ♀ (AMNH), Hayward, 3 February 1954 (J. Tyler), 1 ♀ (AMNH); Contra Costa County, Clayton, 3 April 1941 (W.M. Pearce), 1 ♀ (AMNH); El Dorado County, 3 miles W. of Riverton, 13 September 1959 (no collector), 1 ♂ (AMNH), Fallen Leaf Lake, 9 December 1959 (W.J. Gertsch, V. Roth), 1 ♀ (AMNH); Inyo County, Bishop Creek (10,000 to 11,000′), 17 August 1941 (W.M. Pearce), 1 ♂ (AMNH); Los Angeles County, November (W.J. Gertsch), 1 ♀ (AMNH), November to December 1922 (G. Grant), 1 ♂ (AMNH), November 1952 (no collector), 3 ♂, 6 ♀ (AMNH), Claremont, no date (no collector), 1 ♀ (AMNH), El Segundo, 24 February 1948 (W.M. Pearce), 16 ♀, 2 immatures (AMNH), Glendale, 24 November 1950 (E.I. Schlinger), 1 ♂, 1 ♀ (AMNH), 1 January 1951 (E.I. Schlinger), 1 ♂, 1 ♀ (AMNH), 1 January 1956 (no collector), 1 ♀ (AMNH), 27 December 1956 (E.I. Schlinger), 1 ♀ (AMNH), Los Angeles, no date (no collector), 1 ♀ (AMNH), February 1952 (no collector), 1 ♀ (AMNH), Big Rock Camp, San Gabriel Mountains; 9 April 1955 (R.X. Schick), 1 ♀ (AMNH), Big Tujunga Canyon, San Gabriel Mountains, 3 June 1955 (R.X. Schick), 1 ♀ (AMNH), costal sage, coastal oak woodlands, Big Tujunga Canyon, 24 February 1957 (R.X. Schick), 1 ♀ (AMNH), UCLA, 16 December 1955 (W. McDonald), 1 ♂ (AMNH), Sepulveda Canyon, March 1956 (R.X. Schick), 1 ♀ (AMNH), Santa Monica, 25 December 1932 (W. Ivie), 4 ♂, 5 ♀, l immature (AMNH); October 1955 (no collector), 3 ♂, 2 ♀, l immature (AMNH), Santa Monica Mountains; 25 December 1932 (no collector), 5 ♀ (AMNH),

February 1952 (R.X. Schick), 1 ♀ (AMNH), 25 December 1952 (W. Ivie), 1 ♂, 1 ♀ (AMNH); January to February 1953 (R.X. Schick), 2 ♀ (AMNH), April 1953 (R.X. Schick), 2 ♀ (AMNH), April 1953 (no collector), 3 ♀, 3 immatures (AMNH), December 1953 (no collector), 4 ♀ (AMNH), Tapia Park, Santa Monica Mountains, 20 February 1954 (R.X. Schick), l female (AMNH), 6 March 1954 (R.X. Schick), 2 ♀, 1 immature (AMNH), 20 March 1955 (R.X. Schick), 2 ♀, 1 immature (AMNH); Madera County, 5 miles S. of Fish Camp, just over county line, 23 September 1961 (W. Ivie, W.J. Gertsch), 7 ♂, 1 ♀, 8 immatures (AMNH); Marin County, Taylorville, 28 September 1919 (Dietrich), 1 ♀ (AMNH), Samuel P. Taylor State Park, 8 May 1949 (H. B. Leech), 1 ♀ (AMNH), Inverness, 8 November 1953 (V. Roth, G. Marsh); 1 ♀ (AMNH), 1 March 1964 (P. H. Arnaud), 1 ♀ (CASC), Bolinas, 26 March 1954 (E.I. Schlinger), 1 ♀ (AMNH), 27 September 1963 (J. and W. Ivie), 2 ♂, 2 ♀ (AMNH); Muir Woods in California laurel, 10 January 1964 (V. Roth, P. Craig), 6 ♀ (AMNH), 4 miles outside Muir Woods near Mill Valley, 10 January 1964 (no collector), 4 ♀ (AMNH); Mendocino County, 2 miles N. of Piercy, 19 August 1959 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH); Monterey County, no date (no collector), 2 ♀ (AMNH), Cypress Point, 17 mile Drive, Pacific Grove, 10 October 1938 (W.M. Pearce), 2 ♂, 2 ♀, 2 immatures (AMNH), 25 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀ (AMNH), 5 October 1963 (J. and W. Ivie), 2 ♂, 4 ♀, 4 immatures (AMNH), King City Rd., 27 April 1943 (no collector), 1 ♀ (AMNH), Monterey, October 1945 (A.F. Archer), 2 ♂ (AMNH), Pacific Grove, 28 March 1947 (B. Malkin), 2 ♀ (AMNH), 3 April 1960 (W. Ivie, R. Schrammel), 9 ♀, 1 immature (AMNH), Carmel, 23 December 1951 (B. Malkin), 2 ♂, 1 ♀ (AMNH), 5 April 1954 (no collector), 1 ♀ (AMNH), 7 April 1954 (no collector), 1 immature (AMNH), 8 April 1954 (no collector), 5 ♀ (AMNH), Del Monte Forest, outside Monterey, closed cone pine forest, 29 April 1959 (R.X. Schick), 2 ♀ (AMNH), Big Sur, 2 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 5 ♀ (AMNH), Redwood Canyon, 4 miles S. of Gorda, 2 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 4 ♀, 1 immature (AMNH); Napa County, N. side of Howell Mountain, 2 miles NNE. of Angwing (1300′), 21 November 1977 (H. B. Leech), 1 ♂ (CASC); Orange County, Laguna Beach, 28 December 1932 (W. Ivie), 2 ♂, 4 ♀ (AMNH); Santa Barbara County, Santa Barbara, March 1913 (R.V. Chamberlin), 4 ♀ (AMNH), 25 December 1932 (W. Ivie), 3 ♂, 5 ♀ (AMNH), 21–27 November 1948 (H. L. Shantz), 1 ♀ (AMNH), 17 July 1953 (H. L. Shantz), 1 ♀ (AMNH), 18 miles NE. of Santa Barbara, 1 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 2 ♀ (AMNH), Sisquoc, 29 July 1961 (V. Roth), 1 ♀ (AMNH); San Benito County, 4 miles W. of San Juan Bautista, 21 December 1953 (V. Roth), 1 ♀ (AMNH), Pinnacles National Monument, 7 October 1958 (V. Roth), 1 ♂ (AMNH); San Bernardino County, Camp 0-ongo near Running Springs, San Bernardino Mountains, 8–12 August 1966 (C. L. Hogue), 1 ♀ (LCMC); San Diego County, Alpine, 9 May 1947 (W.M. Pearce), 2 ♀ (AMNH); San Francisco County, San Francisco Bay District, no date (no collector), 4 ♀ (AMNH), no date (R. F. Sternitsky), l female (AMNH), San Francisco, 27 December 1932 (no collector), 1 ♀ (AMNH), 29 November 1934 (no collector), 1 ♀ (CASC), Golden Gate Park, no date (no collector), 1 ♀ (CASC), 10 March 1935 (no collector), 1 ♀ (CASC), 1 October 1972 (D. Ubick), 2 ♂, 1 immature (DUSC), Glen Canyon Park, 14 June 1979 (D. Ubick), 1 ♂ (DUSC); San Luis Obispo County, Pismo Beach, 1 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH), Cambia, 2 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH), Reservoir Canyon, San Luis Obispo, 15 October 1979 (W.J. Gertsch, V. Roth), 1 ♂ (AMNH); San Mateo County, La Honda, no date (no collector), 5 ♀, 3 immatures (AMNH), Jaspar Ridge, 1920–1921 (J.C. Chamberlin), 4 ♀, 1 immature (AMNH), San Gregorio Beach, Spring 1921 (no collector), l female (AMNH), Spring 1961 (no collector), 1 ♀ (AMNH), Miramar, 5 December 1953 (V. Roth), 3 ♂, 5 ♀, 3 immatures (AMNH), 1 miles S. of Sharp Park, 5 December 1953 (V. Roth), 4 ♀ (AMNH), south of Woodside, 17 September 1964 (J. and W. Ivie), 1 ♀ (AMNH), Portola State Park, 22 November 1970 (M. M. Bentzien), 3 ♀ (UCBC); Santa Clara County, Stanford, 15 January 1928 (J.C. Chamberlin), 1 ♂, 2 ♀ (AMNH), San Jose, 2 November 1974 (D. Ubick), 1 ♂, 1 ♀ (DUSC); Santa Cruz Coun-

ty, Capitola, March 1913 (R.V. Chamberlin), 3 ♀ (AMNH), Boulder Creek, 23 December 1953 (V. Roth), 2 ♀, 1 immature (AMNH), Ben Lomond, 6 July 1956 (V. Roth, W.J. Gertsch), 2 ♀ (AMNH), 23 September 1961(W. Ivie, W.J. Gertsch), 1 ♂ (AMNH), Cave Gulch, 16 November 1974 (no collector), 2 ♂ (DUSC); Sonoma County, Sonoma, 5 February 1955 (B. Malkin), 1 ♀ (AMNH); Tulare County, 2.5 miles [?] California Hot Springs, 5 October 1959 (V. Roth), 1 ♂ (AMNH); Ventura County, Wheeler Springs, 10 October 1968 (V. Roth), 1 ♂ (AMNH), 24 October 1958 (V. Roth), 1 ♂ (AMNH); Yolo County, Davis, 5 March 1948 (E.I. Schlinger), 1 ♀ (AMNH).

Calymmaria monterey new species
Figs. 63, 64; Map 6

Type.—Female holotype from Big Sur, Monterey County, California, U.S.A., 36°16′N, 121°48′W, 18 July 1953, W.J. Gertsch (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria monterey* is a large species separated from other *Calymmaria* by the wide epigynal midpiece and long blind ducts (Fig. 64).

Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with gray basal lanceolate mark flanked by dark gray spots and followed by four transverse chevrons; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with heart-shaped opening (Fig. 63); internally with wide midpiece, blind ducts long, lateral ducts thick and united medially (Fig. 64). *Male:* Unknown.

Measurements.—Total length, 6.75–9.67 (7.65); carapace length, 3.13–3.72 (3.44); carapace width, 2.23–2.51 (2.41); femur I length, 4.90–5.89 (5.43).

Distribution.—Monterey County, California (Map 6).

Natural History.—Mature specimens collected in July and September.

Material Examined.—U.S.A.: *California:* Monterey County, Big Sur, 18 July 1953 (W.J. Gertsch), 3 ♀ (AMNH), 2 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 4 ♀, 2 immatures (AMNH), Carmel, 10 September 1953. (no collector), 1 ♀ (AMNH).

Calymmaria nana (Simon 1897)
Figs. 65–69; Map 6

Tegenaria nana Simon 1897: 8–17, 1898: 251–252; Banks 1910: 16; 1913: 181, fig. 47; Petrunkevitch 1911:538; Exline 1936: 23, fig. 1.

Calymmaria nana (Simon): Chamberlin & Ivie 1937: 215, figs. 22, 23; Exline 1938: 21, 22, figs: 32, 33; Roewer 1954: 46; Bonnet 1956: 940.

Type.—Female holotype from ''Washington Territory'' in MNHN, examined.

Diagnosis.—*Calymmaria nana* can be easily separated from other *Calymmaria* by the peculiar shape of the epigynum (Figs. 68, 69); and the short, thick-based embolus in the male (Fig. 65), which resembles the embolus in *C. emertoni* but is less rounded at the sides.

Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow with basal gray lanceolate mark flanked by a pair of gray transverse chevrons; venter gray with yellow lateral longitudinal stripes. Legs weakly annulate, spination typical. Epigynum externally with wide, heavily sclerotized opening (Fig. 68); internally with midpiece truncate at top, blind ducts very short, lateral ducts arising from top of midpiece (Fig. 69). *Male:* Same as in female. Male palpus with PA small, knob-like (Fig. 65); basal RTA with two truncate lobes (Fig. 66), medial RTA pointed, distal RTA thick at base; tibia with three prolateral spines, four long ventral setae, and many short retrolateral setae; cymbium very short distad, with two spines near base of tip and four spines on tip; embolus thick at base, tapering abruptly, conductor with basal lobe poorly developed (Fig. 65).

Measurements.—*Female:* Total length, 3.72–4.68 (4.23); carapace length, 1.55–1.80 (1.66); carapace width, 1.12–1.36 (1.23); femur I length, 1.55–1.89 (1.77). *Male:* Total length, 3.72–5.11 (4.21); carapace length, 1.61–2.17 (1.87); carapace width, 1.46–1.58 (1.53); femur I length, 2.48–2.85 (2.57).

Distribution.—Western British Columbia, Washington and Oregon. One possibly erroneous record from the San Francisco Bay area in California (Map 6).

Natural History.—Mature specimens collected from fir needles, under rocks and boards, under maple and cedar duff, and in leaf litter in every month except January, at elevations from 50 to 1500 m.

Material Examined.—CANADA: British

Columbia; Side Saanich Inlet, 14 September 1935 (RV. Chamberlin, W. Ivie), 2 ♂, 1 ♀ (AMNH). U.S.A.: *Washington*; Clallam County, Port Angeles, 2 February 1933 (no collector), 1 ♀ (AMNH); King County, April 1951 (B. Malkin), 1 ♀ (AMNH), Seattle, no date (? Kincaid), 1 ♀ (AMNH), 25 April 1932 (H. Exline), 1 ♀ (AMNH), University of Washington Campus (I50′), 3 June 1963 (J.R. Thomson), 1 ♀ (BMSC), Volunteer Park (400′), 11 August 1963 (J.R. Thomson), 1 ♂ (BMSC), Foster Island (25′), 14 May 1963 (J. R. Thomson), 1 ♀ (BMSC), 9 September 1963 (J.R. Thomson), 2 female (BMSC), Sallal Prairie, 5.1 miles ESE. of N. Bend, under Rock (640′), 9 April 1977 (C. Stoner), 1 ♀ (BMSC), 8.6 miles NNE. of N. Bend on North Fork County Road (1120′), 23 April 1977 (W. Jones), 1 ♀ (BMSC), 1.6 miles S. of Des Moines on Highway 509, under maple duff (150′), 27 November 1975 (R. Crawford), 2 ♀ (BMSC), Kittitas County, 8 miles WNW. of Thorp in Taneum Canyon under rocks (2440′), 27 April 1974 (J.P. Pelham), 1 ♀ (BMSC), 3.8 miles SSW. of Thorp in Robinson Canyon, under rock (2200′), 30 March 1975 (R. Crawford), 1 ♀ (BMSC); Pierce County, Mt Rainier National Park, 9 August 1929 (RV. Chamberlin), 1 ♀ (AMNH), 6 July 1938 (W. Ivie), 1 ♀ (AMNH), Elbe, in leaf litter (1300′), 14 September 1975 (R. Crawford), 1 ♀ (BMSC); San Juan County, Doubleneck, 27 July 1935 (H. Exline), 1 ♀ (AMNH), Friday Harbor, 18 August 1935 (H. Exline), 1 ♀ (AMNH); Skagit County, 1.6 miles NNW. La Conner on Indian Reservation Road 204, from maple and cedar duff (140′), 6 March 1976 (R. Crawford), 1 ♀ (BMSC); Skamania County, 6.3 miles NW. of Trout Lake on Road N88, under loose bark (2740′), 9 October 1976 (R. Crawford), 1 ♀ (BMSC); Snohomish County, Edmonds, 16 August 1927 (no collector), 2 ♂ (AMNH); Thurston County, Olympia, 29 November 1930 (H. Exline), 1 ♀ (AMNH), 1 October 1932 (H. Exline), 1 ♀ (AMNH), 6–10 June 1944 (H. Exline Frizzell), 1 ♀ (AMNH); *Oregon*; Benton County, 10 miles N. of Corvallis, under board, 31 August 1947 (V. Roth), 1 ♀ (AMNH), 12 miles N. of Corvallis at Camp Adair, 25 September 1947 (V. Roth), 2 ♂, 3 ♀ (AMNH), Corvallis, in forest, 7 February 1948 (V. Roth), l ♀ (AMNH), 8 miles N. Corvallis, in McDonald Forest, 27 December 1949 (V. Roth, R. Beer), 1 ♀ (AMNH), 30 September 1950 (V. Roth), 1 ♀ (AMNH), 10 miles W. of Corvallis, 19 March 1951 (V. Roth), 2 ♀ (AMNH); Curry County, 8 miles E. of Gold Beach, 29 April 1951 (V. Roth), 2 ♀ (AMNH); Hood River County, 10 miles S. of Parkdale, 16 September 1949 (V. Roth), 3 ♀ (AMNH); Marion County, Salem, 18 September 1954 (V. Roth), 1 ♂ (AMNH); Tillamook County, Beaver Creek, 7 September 1932 (H. Exline), 1 ♀ (AMNH); Washington County, Forest Grove, 28 November 1940 (W. Ivie), 1 ♀, 1 immature (AMNH); Yamhill County; McMinnville, 23 March 1952 (B. Malkin, K.M. Fender), 1 ♀ (AMNH), Newburg, on highway, in fir needles, 22 September 1954 (V. Roth), 1 ♂ (AMNH); *California:* Alameda County, Berkeley, 13 December 1953 (V. Roth), 1 ♀ (AMNH).

Calymmaria orick new species
Figs. 70–72; Map 7

Type.—Male holotype from Orick, Humboldt County, California, U.S.A., 41°17′N, 124°03′W, 16 September 1961, W.J. Gertsch (AMNH).

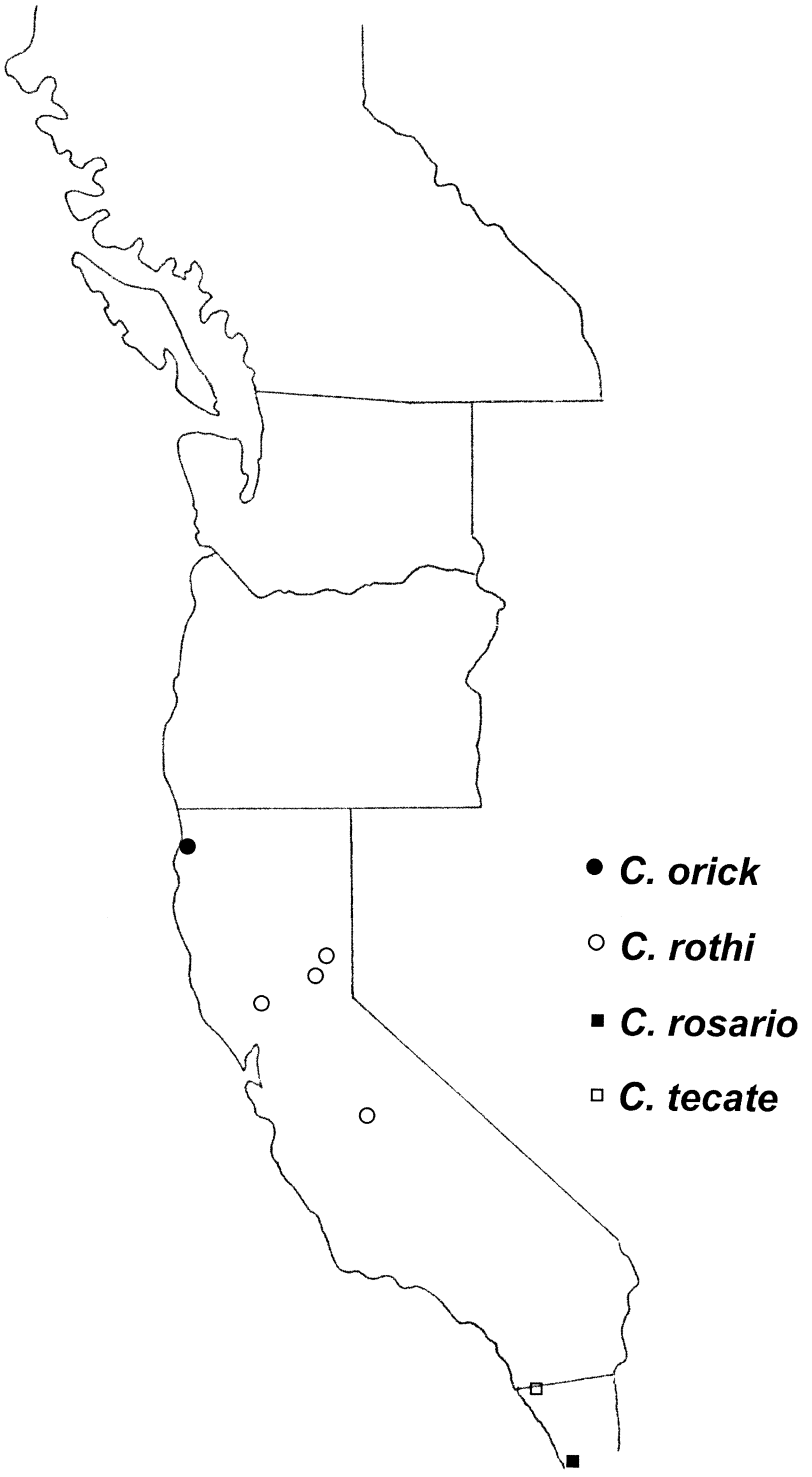
Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria orick* resembles *C. emertoni*, *C. nana*, and *C. siskiyou* but the tip of the embolus is longer and thicker (Fig. 70).

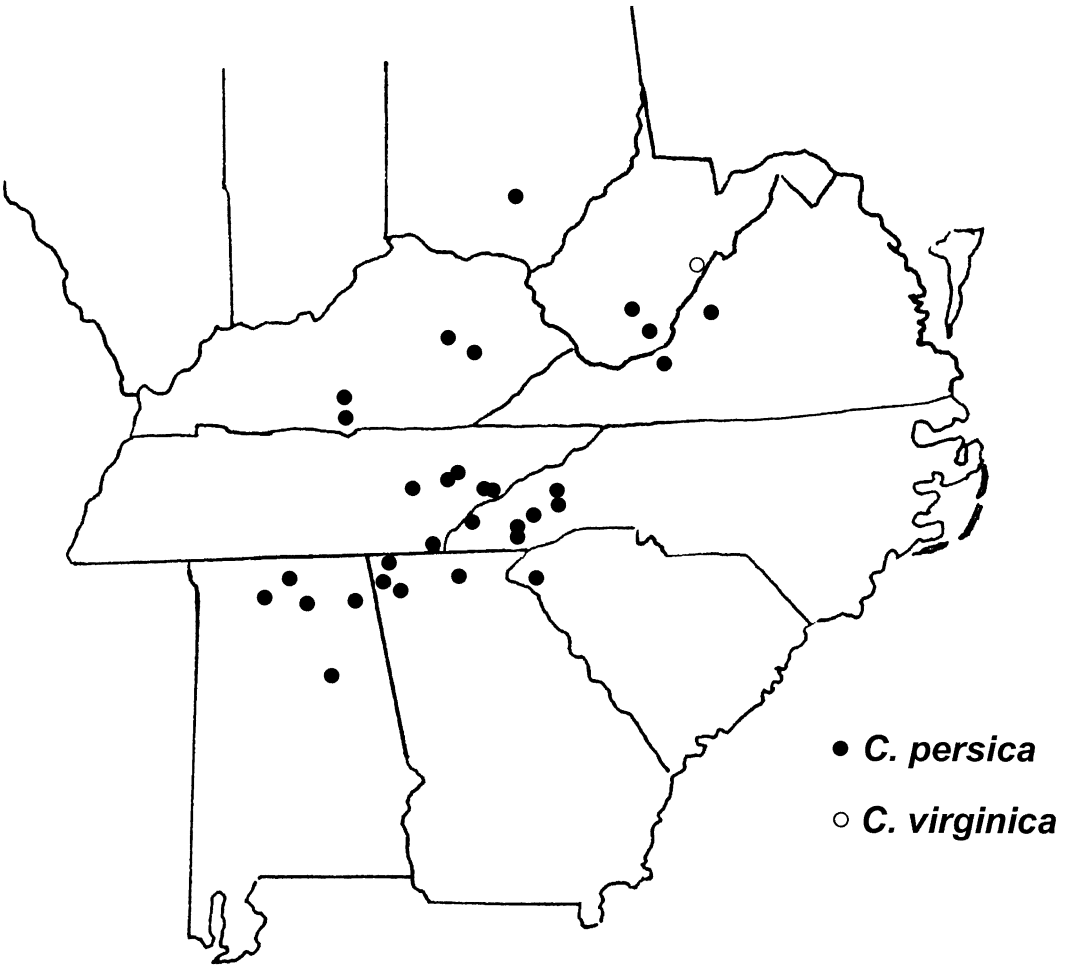
Description.—*Male:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by two large yellow spots and three transverse chevrons; venter gray with one pair of basal yellow spots and two yellow lateral longitudinal stripes. Legs weakly annulate, spination typical. Palpus with PA large, round (Fig. 70); basal RTA long, pointed, medial RTA long, pointed distad, distal RTA very short, round (Fig. 71); tibia with one prolateral spine, three ventral setae; cymbium somewhat short distad, with two spines near base of tip and six spines on tip; embolus thick near base tapering abruptly into thick point, conductor lacking basal lobe (Fig. 70). *Female:* Unknown.

Measurements.—*(n = 1):* Total length, 3.47; carapace length, 1.55; carapace width, 1.30, femur I length, 1.92.

Distribution.—Humboldt County, California (Map 7).



Map 7.—Distribution of *C. orick* (●), *C. rothi* (○), *C. rosario* (■), and *C. tecate* (□).



Map 8.—Distribution of *C. persica* (●) and *C. virginica* (○).

Natural History.—One mature specimen collected in September.

Material Examined.—Known only from the type.

Calymmaria persica (Hentz 1847)
Figs. 73–77; Map 8

Tegenaria persica Hentz 1847: 463, fig. 23; Roewer 1944: 33.

Tegenaria cavicola Banks 1896: 203; Roewer 1944: 33. NEW SYNONYMY.

Cybaeus montavencis Bishop & Crosby 1926: 201, figs. 51–53; Bonnet 1956: 1302. NEW SYNONYMY.

Calymmaria cavicola (Banks): Chamberlin & Ivie 1937: 213; Muma 1945: 95; Roth 1952: 287; 1968: 31; Beatty & Nelson 1979: 52.

Calymmaria montavencis (Bishop & Crosby): Chamberlin & Ivie 1937: 213; 1944: 129.

Calymmaria persica (Hentz): Roth 1952: 287; Roth 1968: 31.

Types.—*Tegenaria persica*: male holotype from Alabama (lost). *Tegenaria cavicola*: female holotype from Salt Petre Cave, Crawford County, Indiana, U.S.A., 38°14′N, 86°21′W (MCAC, examined). *Calymmaria monatvencis*: male holotype and female allotype from Grandfather Mountain, Avery County, North Carolina, U.S.A., 36°06′N, 81°48′W (AMNH, examined).

Diagnosis.—*Calymmaria persica* can be easily separated from the other species occurring in the Appalachian Mountains, *C. virginica*, by the form of the epigynum (Figs. 76, 77), and the many differences in the RTA and embolus (Figs. 73–75). *Calymmaria persica* is

a highly variable species, especially in size, which has led to its separation into several species. There appears to be little variation in genitalia among specimens.

Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with pale gray basal lanceolate mark followed by three dark gray transverse chevrons and one spot; venter gray with wide pale yellow lateral longitudinal stripes. Legs annulated, spination typical.. Epigynum externally with v-shaped sclerotization around opening (Fig. 76); internally with midpiece long, ducts well-separated at top, blind ducts short, lateral ducts thin, short (Fig. 77). *Male:* Same as in female Male palpus with PA wide, rounded (Fig. 73); basal RTA with several lobes, medial RTA with proximal and distal lobes, distal RTA long (Figs. 74, 75); tibia with one prolateral spine, several long ventral setae, many short retrolateral setae; cymbium elongate distad, with two spines near base of tip and six spines on tip; embolus thick at base, tapering gradually, conductor with basal lobe pointed (Fig. 73).

Measurements.—*Female:* Total length, 4.03–9.70 (6.60); carapace length, 1.55–4.06 (2.67); carapace width, 1.21–2.82 (1.95); femur I length, 1.83–6.00 (3.64). *Male:* Total length, 6.08–7.28 (6.53); carapace length, 2.95–3.41 (3.19); carapace width, 2.34–2.64 (2.48); femur I length, 2.39–6.20 (4.69).

Distribution.—Ohio to Alabama along the Appalachian Mountains (Map 8).

Natural History.—Mature specimens collected from woods, caves, along streams, behind waterfalls, in every month of the year from elevations of 60–2000 m.

Material Examined.—U.S.A.: *Indiana*: Crawford County, Salt Petre Cave, no date (N. Banks), 1 immature (MCZC); *Ohio*: Hocking County, Old Main's Cave, 29 August 1921 (N. Banks), 1 ♂ (OSUC); *Kentucky*: no county, Boones Cave, Dix River, 9 September 1921(Finckhouser), 1 ♀ (AMNH); Breathitt County, Quicksand, 25 June 1925 (S.C. Bishop), 5 ♀ (AMNH), 26 June 1925 (S.C. Bishop), 1 ♀ (AMNH); Powell County, Mauldin Cave, 26 October 1966 (Reddell, T. Barr), 1 ♂ (AMNH); Simpson County, Old Smoky Cave, 200 to 500 ft. from entrance, 25 July 1981 (R. Crawford), 2 ♂, 3 immatures (BMSC): Warren County, Bowling Green, September 1929 (no collector), 3 immatures (AMNH); *West Virginia*: Speedway Roadside Park, Rt. 20, 16 April 1966 (D. Lickliter), 1 ♀, 1 immature (AMNH), Jackson's Park, Unity Road, Athens, 23 April 1966 (W. Shear), 1 ♀, 1 immature (AMNH), old pumphouse, Athens, 25 November 1966 (W. Shear), 2 ♀ (WASC); Raleigh Col, Grandview State Park, natural tunnel no. 1, in double sheet webbing on tunnel roof, 21 May 1966 (W. Shear), 2 ♀ (WASC), picnic area no. 2, under a stone, 21 May 1966 (W. Shear), 1 immature (WASC), Grandview State Park, 3 July 1966 (W. Shear), 1 ♀ (WASC), tunnels area, 23 September 1967 (W. Shear), 1 ♂ (WASC), in cave, 14 May 1980 (J. Amrine), 1 ♀ (UAIC); no county, Norman Cave, 31 March 1972 (J.A. Kochalka), 2 ♀ (UVSC); *Virginia*: Giles County, no location, 6 July 1946 (H.K. Wallace), 1 ♀; immature (FSCA), 21 August 1948 (H.K. Wallace), 2 ♂ (AMNH), White Pine Lodge, 19 August 1948 (H.K. Wallace), 1 ♂ (H.K. Wallace), 1 ♂ (AMNH); *North Carolina*: Buncombe County, Mt. Pisgah, no date (no collector), 1 ♀ (AMNH), Lodge to summit, 14 October 1926 (C.R. Crosby), 1 ♀ (AMNH); Graham County, 5 miles E. of Bryson City, 2 October 1960 (W.J. Gertsch, W. Ivie), 1 ♀ (AMNH); Jackson County, Cullowhee Mountain, 28 November, 1969 (F. Coyle), 1 ♀ (FACC), Wolf Creek, 5 miles from Cullowhee (2400′), 9 August 1980 (J. S. Heiss), 2 ♂ (UAIC), White Water Falls (2400′), 9 August 1980 (J. S. Heiss), 4 ♂ (UAIC); Macon County, Elliot Pk. Forest, 7.5 miles SE. of Highlands on Bull Pen Road (2900′), 10 September 1975 (F. Coyle), 1 ♂ (FACC), Buck Creek, clearcut, 1.6 miles NW. of intersection of Buck Creek and state road 1538 (3500′), 10 September 1976 (F. Coyle), 2 ♂ (FACC), Horse Cove, clearcut, 3.6 miles E. of Highlands, pitfall (3000′), 10 September 1976 (F. Coyle), 1 ♂ (FACC), Dry Falls, Nantahala National Forest (3200′), 8 August 1980 (J. S. Heiss), 2 ♂ (UAIC); McDowell County, Ridgecrest, 26 June 1951 (A.F. Archer), 1 ♀ (AMNH); Swain County, Deep Creek near Bryson City, 8 July 1933 (W. Ivie), 2 immatures (AMNH); Yancey County, Mt. Mitchell, 30 September 1960 (W.J. Gertsch, W. Ivie), 2 ♀ (AMNH); *Tennessee*: no county, George Light Cave, 20 March 1965 (J.A. Payne), 1 ♀ (AMNH); Anderson County, 30 miles W. of Knoxville, no date (no collector), 1 ♀, 4 immatures (AMNH); Blount County, September 1931 (W.M. Barrows), 2 ♂ (AMNH); Marion

County, Indian Cave, Little Cedar Mountain, 4.5 miles SE. of Jasper; 29 July 1967 (S. Peck, A. Fiske), 1 immature (AMNH); Roane County, Harriman; 11 July 1933 (W. Ivie), 1 ♀ (AMNH), Kingston 12 July 1933 (W. Ivie), 3 ♀, 3 immatures (AMNH); Sevier County, Le Conte Lodge (6500′), October 1926 (S.C. Bishop), 1 ♂ (AMNH), Elkmont, 10 September 1928 (no collector), 1 ♀ (AMNH), Clingman's Dome and below, Great Smoky Mountains National Park, 6 September 1935 (no collector), 3 ♂, 2 ♀ (AMNH); Warren County, Cumberland Cavern; Higginbotham Entrance, from web on walls in first 500 ft., 24 July 1981 (R. Crawford), 1 immature (BMSC); *South Carolina*: Oconee County, Stumphouse Cave, 2 February 1967 (J.A. Payne), 1 ♀, 6 immatures (AMNH); *Georgia*: Chatooga County, Parker Cave, 2 miles NE. of Sunligna, 12 June 1967 (J. Holsinger, S. Peck, A. Fiske, R. Baroody), 1 ♀ (AMNH); Dade County, Byers Cave, 1.5 miles SW. of Rising Fawn, 18 June 1967 (J. Holsinger, S. Peck, A. Fiske, R. Baroody), 1 ♀ (AMNH), 3 July 1967 (S. Peck & A. Fiske), 5 ♀, 2 immatures (AMNH); Muskogee, Ft. Benning, 24 October 1943 (no collector), 1 ♀ (AMNH); Union and Lumpkin County, on line 2 miles W. of Neels Gap on Appalachian Trail (3500′), 13 September 1975 (D. Pittillo), 1 ♂, 1 ♀ (FACC); Walker County, Bible Springs Cave, 2 miles NE. of Lookout Mountain, no date (J. Holsinger, S. Peck, R. Baroody, A. Fiske), 1 ♀ (AMNH), Mt. Cove Cave, 1 miles E. of Lookout Mountain, 20 June 1967 (S. Peck, A. Fiske), 1 immature (AMNH); *Alabama*: Blount County, Bangor Cave, 1 miles N. of Bangor, 28 June 1967 (S. Peck, A. Fiske), 1 ♂, 5 immatures (AMNH); Coosa County, Hatchet Creek, 18 April 1940 (A.F. Archer), 1 ♀ (AMNH); DeKalb County, DeSoto Park, December 1937 (W.B.Jones), 1 ♂ (AMNH), 7 October 1950 (A.F. Archer), 2 ♀ (AMNH); Jackson County, Blowing Cave, near Garth, 29 February 1940 (W.B.Jones, A.F. Archer), 1 ♀, 2 immatures (AMNH); Madison County, Herrin Cave, near New Hope, 26 September 1939 (Jones and Flanagan), 1 ♂ (AMNH), Alladin Cave, Sharp Cove, 1 December 1939 (W.B.Jones, A.F. Archer), 2 ♀, 4 immatures (AMNH), Monte Sano, summer 1940 (A.F. Archer), 1 ♀, 7 immatures (AMNH), December 1940 (A.F. Archer), 2 ♀, 7 immatures (AMNH), Cave Spring Cave no. 60, Chapman Mountain, 8 September 1965 (S. Peck), 1 immature (AMNH); Marshall County, Honeycomb Cave, Guntersville Dam, 11 January 1939 (A.F. Archer), 2 ♀ (AMNH); Morgan County, Sans Souci Cave, 5 miles S. of Decatur, no date (no collector), 3 ♀ (AMNH); Walker County, Warrior River, 20 October 1912 (H.H. Smith), 2 ♂ (AMNH); *Mississippi*: Wilkinson County, 1 airline miles SE. of Fort Adams, 30 March 1974 (D.A. Rossman), 1 ♀ (AMNH).

Calymmaria rosario new species
Figs. 78, 79; Map 7

Type.—Female holotype from under reeds on a hillside along a lagoon, El Rosario, Baja California, Mexico, 30°03′N, 115°43′W, 5 May 1961, W.J. Gertsch, V. Roth (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria rosario* can be separated readily by the distinctive form of the epigynum (Figs. 78, 79).

Description.—*Female:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by silver patches, mottled gray behind; venter gray. Legs annulate, spination typical. Male: unknown. Epigynum externally with large opening heavily sclerotized below (Fig. 78); internally with midpiece long, blind ducts long, lateral ducts thick and fused at midline in a hump (Fig. 79).

Measurements.—*(n = 1):* Total length, 4.34; carapace length, 1.86; carapace width, 1.24; femur I length, 1.58.

Distribution.—One specimen from Baja California, Mexico (Map 7).

Natural History.—One mature specimen collected from hillside near lagoon in May (Map 7).

Material Examined.—Known only from the type.

Calymmaria rothi new species
Figs. 80–84; Map 7

Types.—Male holotype and female allotype from Monarch Mine, Sierra City, Sierra County, California, U.S.A., 39°33′N, 120°37′W, 7 September 1959, W.J. Gertsch, V. Roth (AMNH).

Etymology.—The specific name is a patronym honoring Vincent D. Roth, who did much to advance our knowledge of *Calymmaria* and related spiders.

Diagnosis.—*Calymmaria rothi* resembles *C. aspenola* and *C. monicae* in the form of the epigynum, but the epigynal midpiece is thinner than in *C. aspenola*, and the ducts of the midpiece are not as widely separated at the top as they are in *C. monicae* (Fig. 62). Male *C. rothi* are easily separated from other *Calymmaria* by the thin embolus and the hooked PA (Fig. 80).

Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with gray basal lanceolate mark followed by four transverse chevrons and a large spot; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with opening heavily sclerotized below (Fig. 83); internally with midpiece long, thin, blind ducts long, lateral ducts thick, fused at midline in a hump (Fig. 84). *Male:* Same as in female only darker. Male palpus with PA hooked (Fig. 80); basal RTA with bifurcate apex (Fig. 81), medial RTA with two small teeth (Fig. 82), distal RTA long, rounded; tibia with three prolateral spines, several long ventral setae, many retrolateral short setae; cymbium elongate distad, with two spines near base and five spines on tip; embolus long, thin, and tapering, conductor with large, round, basal lobe (Fig. 80).

Measurements.—*Female:* Total length, 5.27–7.75 (6.95); carapace length, 2.23–3.72 (2.93); carapace width, 1.71–2.48 (2.16); femur I length, 2.79–4.03 (3.72). *Male:* Total length, 6.20–7.28 (6.69); carapace length, 3.10–3.72 (3.41); carapace width, 2.54–3.04 (2.73); femur I length, 4.31–6.20 (4.86).

Distribution.—Napa, Sierra, Nevada and Mariposa Counties, California (Map 7).

Natural History.—Mature specimens collected in March and September, some specimens collected from a mine.

Material Examined.—U.S.A.: *California*: Mariposa County, 2 miles S. of Fish Camp, 12 September 1959 (no collector), 1 ♂, 3 immatures (AMNH); Napa County, Samuel Spring, 13 March 1954 (E. Schlinger), 1 ♀ (AMNH); Nevada County, Truckee, in house. Lake Tahoe area (6000′), December 1975 (M. Whiting), 1 ♂ (AMNH); Sierra County, The Cups, Sierra City, 6 September 1959 (V. Roth, W.J. Gertsch), 1 ♂, 5 ♀ (AMNH), Monarch Mine, 7 September 1959 (W.J. Gertsch, V. Roth), 1 ♂, 5 immatures (AMNH).

Calymmaria scotia new species
Figs. 85–89; Map 9

Types.—Male holotype and female allotype from 5 miles N. of Scotia, Humboldt County, California, U.S.A., 40°32′N, 124°05′W, 1 October 1959, V. Roth (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria scotia* is easily separated from other *Calymmaria* by the distinctive form of the epigynum (Figs. 88, 89) and the peculiarly shaped embolus (Fig. 85).

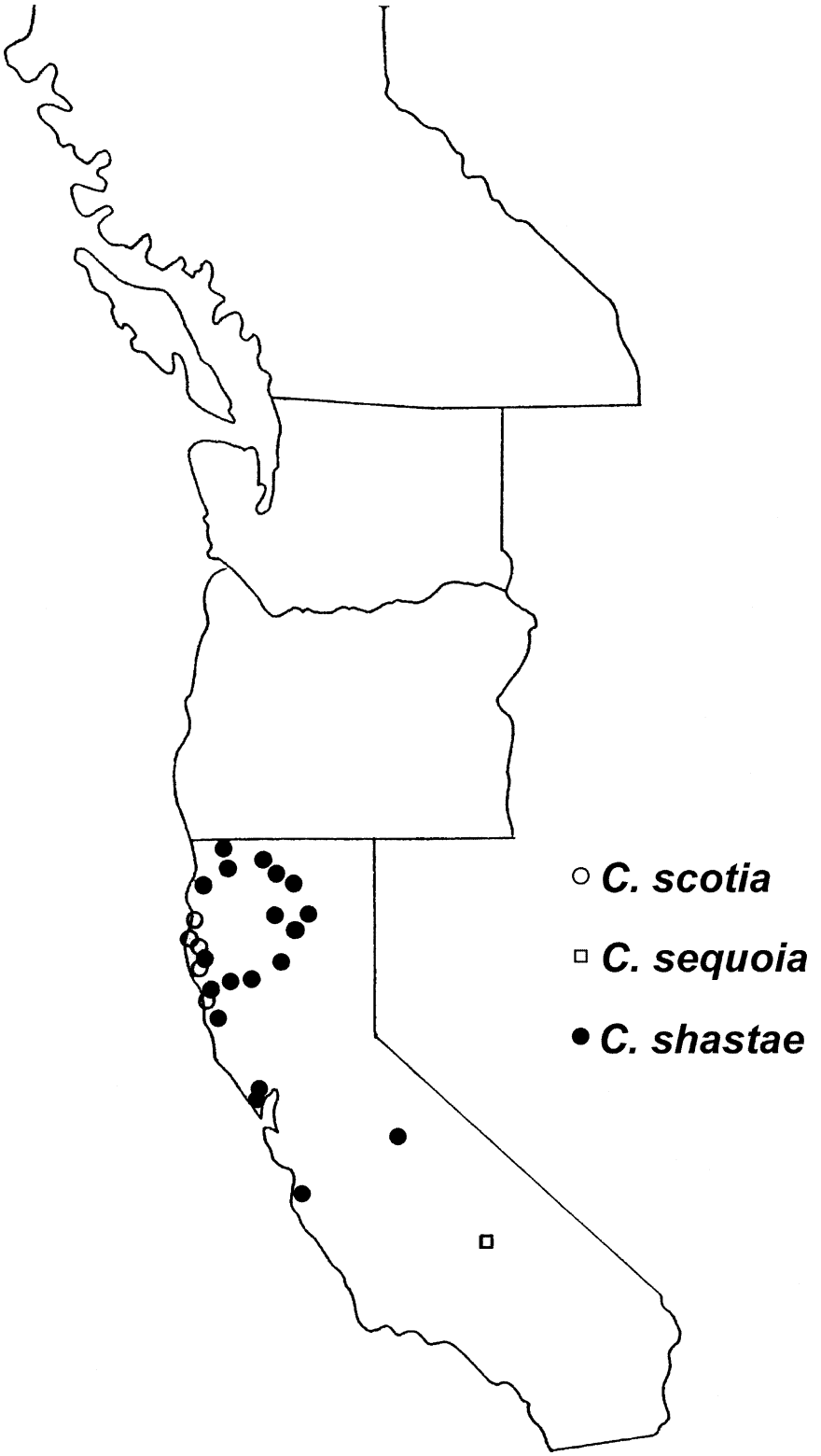
Description.—*Female:* Carapace typical. Dorsum of abdomen gray with paler basal lanceolate mark flanked by large yellow spots and followed by four pairs of yellow spots; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with opening bordered below by a transverse sclerotized band, and with v-shaped sclerotization near epigastric furrow (Fig. 88); internally with midpiece very short, blind ducts very small, lateral ducts widely separated (Fig. 89). *Male:* Same as in female, legs generally unmarked. Male palpus with PA short, pointed, distal RTA long, round (Fig. 86); tibia with one prolateral spine and several long ventral setae; cymbium moderately short distad, with two spines near base of tip and six spines on tip; embolus gradually tapering to nipple-like point, conductor with large basal lobe.

Measurements.—*Female:* Total length, 3.57–4.28 (3.78); carapace length, 1.49–1.55 (1.54); carapace width, 0.93–1.19 (1.08); femur I length, 1.52–1.86 (1.62). *Male:* Total length, 2.79–3.47 (3.16); carapace length, 1.27–1.64 (1.49); carapace width, 0.99–1.27 (1.13); femur I length; 1.49–2.02 (1.79).

Distribution.—Humboldt and Mendocino Counties, California (Map 9).

Natural History.—Mature specimens collected in February, September and October.

Material Examined.—U.S.A.: *California*: Humboldt County, l miles S. of Dyerville, 19 September 1953 (R. Schuster, G. Mash), 1 ♀ (AMNH), F. K. Lane State Park, near Phillipsville, 1 October 1959 (V. Roth), 1 ♀ (AMNH), 5 miles N. of Scotia, 1 October 1959 (V. Roth), 1 ♂, 1 ♀ (AMNH), 2 miles N. of Phillipsville, 14 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂, 1 ♀ (AMNH); Mendocino County, Caspar Creek, 1 miles SE.



Map 9.—Distribution of *C. scotia* (○), *C. sequoia* (□), and *C. shastae* (●).

Caspar, 13 September 1961 (W.J. Gertsch, W. Ivie), 1 ♂, 1 ♀ (AMNH), 4.2 miles S. of Piercy, 17 February 1967 (V. Roth), 1 ♀ (AMNH).

Calymmaria sequoia new species
Figs. 90–92; Map 9

Type.—Male holotype from Quaking Aspen Camp, Sequoia National Forest, Tulare County, California, U.S.A., 36°07′N, 118°32′W, 9 September 1959, no collector (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria sequoia* can be separated by the thick embolus, triangular shaped conductor (Fig. 90), and multi-lobed medial RTA (Fig. 92).

Description.—*Male:* Carapace typical. Dorsum abdomen gray with basal lanceolate mark flanked by yellow patches and followed by four transverse chevrons; venter gray with yellow lateral longitudinal stripes. Legs weakly annulate or unmarked; spination typical. Palpus with PA rounded (Fig. 90); basal RTA long, rounded, medial RTA with two lobes, the distal lobe bifurcate (Fig. 92), distal RTA long, round; tibia with long ventral setae, and many short retrolateral setae; cymbium short distad, with two spines near base of tip and seven spines on tip; embolus thick, tapering, conductor with basal lobe. *Female:* Unknown.

Measurements.—Total length, 3.44–4.03 (3.76); carapace length, 1.61–1.86 (1.77); carapace width, 1.24–1.52 (1.44); femur I length, 1.74–2.17 (2.00).

Distribution.—Sequoia National Forest, Tulare County, California (Map 9).

Natural History.—Mature specimens collected in September. *Calymmaria aspenola* and *C. lora* were present in the same collection.

Material Examined.—U.S.A.: *California*: Tulare County, Quaking Aspen Camp, Sequoia National Forest, 9 September 1959 (no collector), 11 ♂ (AMNH).

Calymmaria shastae Chamberlin & Ivie 1937
Figs. 93–97; Map 9

Calymmaria shastae Chamberlin & Ivie 1937: 214, figs. 6, 7, 24; Roewer 1954: 46; Bonnet 1956: 940.

Types.—Male holotype and female allotype from Weed, Siskiyou County, California, U.S.A., 41°25′N, 122°23′W (AMNH, examined).

Diagnosis.—*Calymmaria shastae* females resemble *C. siskiyou* but the epigynal ''hood'' is longer in *C. shastae* (Fig. 96). Males can be separated from other *Calymmaria* by the form of the basal and medial RTA (Figs. 94. 95), and embolus.

Description.—*Female:* Carapace typical. Dorsum of abdomen yellow with gray basal lanceolate mark flanked by yellow patches and followed by five gray transverse chevrons; Venter gray with two yellow lateral longitudinal stripes. Legs usually unmarked, spination typical. Epigynum externally with large opening and heavy sclerotization below (Fig. 96); internally with midpiece elongate, blind ducts long, lateral ducts thick, short, united medially in a point (Fig. 97). *Male:* Same as in female but usually darker. Male palpus with PA short, wide, truncate (Fig. 93); basal RTA truncate at tip, medial RTA a low ridge, distal RTA wide, rounded; tibia with two prolateral spines, several long ventral setae, and dense short retrolateral setae; cymbium moderately elongate distad, with two spines near base of tip and six spines on tip; embolus thickest in middle, long, tapering, with swelling laterally (Fig. 94), conductor with rounded basal lobe.

Measurements.—*Female:* Total length, 4.96–5.74 (5.40); carapace length, 2.17–2.51 (2.34); carapace width, 1.55–1.86 (1.71); femur I length, 2.17–3.09 (2.70). *Male:* Total length, 4.37–5.74 (5:28); carapace length, 2.05–2.76 (2.51); carapace width, 1.61–2.17 (1.98); femur I length, 2.17–3.88 (3.13).

Distribution.—Northern California (Map 9).

Natural History.—Mature specimens collected in every month except January, March, July and December, from woods and caves at elevations up to 2100 m.

Material Examined.—U.S.A.: *California*: Humboldt County, Miranda, 4 June 1939 (no collector), 6 ♀ (AMNH), 2 miles S. of Weott, redwoods, 1 October 1959 (V. Roth), 1 ♀ (AMNH), 5 miles W. of Pepperwood, 6 April 1960 (W.J. Gertsch, W. Ivie), l female (AMNH); Marin County, Novato, 15 May 1954 (E. Schlinger), 1 ♀ (AMNH), San Geronimo, 19 September 1963 (J. and W. Ivie), 3 ♀, 4 immatures (AMNH); Mendocino County, Caspar Creek, 1 miles SE. of Caspar, 13 Sep-

tember 1961 (W.J. Gertsch, W. Ivie), 1 ♀ (AMNH), 4.1 miles SW. of Leggett, on top of grade, 17 February 1967 (V. Roth), 3 ♀ (AMNH); Monterey County, Pacific Grove, white dune area, 25 September [no year] (W.J. Gertsch, W. Ivie), 1 ♂, 1 immature (AMNH); San Francisco County, Twin Peaks, 6 November 1934 (no collector), 1 ♀ (AMNH); Shasta County, 8 September 1935 (RV. Chamberlin, W. Ivie), 1 ♂, 1 ♀ (AMNH), Subway Cave, 1 miles N. of Old Station, 2 September 1959 (W.J. Gertsch, V. Roth), 11 ♂, 17 ♀, 11 immatures (AMNH), 16 September 1965 (J. and W. Ivie), 1 ♂, 6 ♀, 3 immatures (AMNH), Shingletown, 4 September 1959 (V. Roth, W.J. Gertsch), 1 ♂ (AMNH), 13 September 1959 (no collector), 1 ♂ (AMNH), Tower, 7 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH), Potter Creek Cave, 7 September 1961 (W.J. Gertsch), 1 ♀ (AMNH), 5 miles W. of Manzanita Lake, 19 September 1961 (W. Ivie, W.J. Gertsch), 3 ♀, 1 immature (AMNH); Siskiyou County, no date (no collector), 1 ♂, 2 ♀ (AMNH), 1 miles E. of Somesbar, 22 August [no year] (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), Weed, 8 September 1935 (R.V. Chamberlin, W. Ivie), 1 ♂, 1 ♀ (AMNH), Bartle, 18 June 1942 (W.M. Pearce), 1 ♀ (AMNH), 18 September 1961 (W. Ivie, W.J. Gertsch), 4 ♀, 1 immature (AMNH), 18 miles N. of Happy Camp, 22 August 1959 (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), 3 miles E. of McCloud, 2 September 1959 (W.J. Gertsch, V. Roth), 1 ♀, 1 immature (AMNH), Panther Meadows, Shasta Ski Bowl, 2 September 1959 (W.J. Gertsch, V. Roth), 1 ♂, 2 ♀, immature (AMNH), 5 miles W. of Mt. Shasta, 2 September 1959 (W.J. Gertsch, V. Roth), 2 ♀, 1 immature (AMNH), Panther Mountain Road, Mt. Shasta (7000′); 17 September 1961 (W.J. Gertsch, J. Gertsch), 8 ♂, 3 ♀ (AMNH), Deadhorse Summit, near Pondosa (5500′), 18 September 1961 (W. Ivie, W.J. Gertsch), 7 ♂, 12 ♀, 7 immatures (AMNH); Tehama County, 2 miles N. of Paskenta, Dead Mule Spring, Covelo Road (5150′), 29 August 1972 (H. B. Leech), 1 ♂ (CASC), Deer Creek, 19 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂, 2 ♀ (AMNH), south of Lassen National Park, near junction, 19 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀, 2 immatures (AMNH).

Calymmaria sierra new species
Figs. 98–102; Map 10

Types.—Male holotype and female allotype from 2 miles N. of Calpine, Sierra County, California, U.S.A., 39°41′N, 120°26′W, 6 September 1959, W.J. Gertsch, V. Roth (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—Female *Calymmaria sierra* can be separated from other *Calymmaria* by the heavily external sclerotization of the epigynum (Fig. 101). Male *C. sierra* can be separated by the thin embolus, the small hooked PA (Fig. 98), and the bilobed medial RTA.

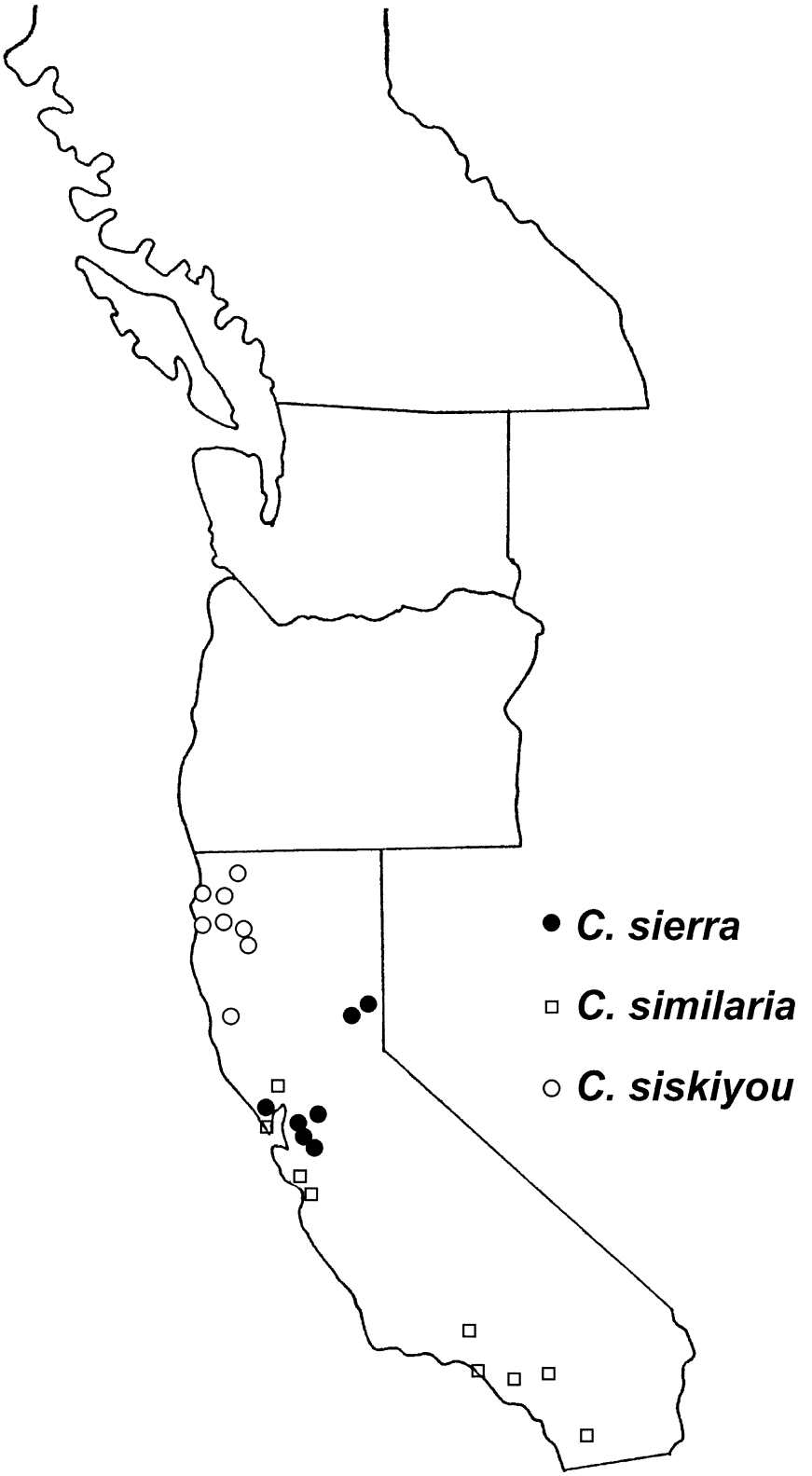
Description.—*Female:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by two pairs of yellow spots and followed by three yellow transverse chevrons; venter gray with two yellow lateral longitudinal stripes. Legs usually unmarked, spination typical. Epigynum externally with heavy sclerotization around the opening (Fig. 101); internally with midpiece short, wide near top, blind ducts long, lateral ducts thick and united medially in a hump (Fig. 102). *Male*: Same as in female, with markings less distinct. Male palpus with PA small, hooked (Fig. 98); basal RTA with bifurcate tip (Fig. 99); medial RTA with two lobes (Figs. 99, 100), distal RTA long, round; tibia with two prolateral spines, six long ventral setae, and many short retrolateral setae; cymbium short distad, with two spines at base of tip and six spines on tip; embolus thin, long, tapering, conductor with large, rounded basal lobe (Fig. 98).

Measurements.—*Female:* Total length, 4.34–4.65 (4.50); carapace duration, 1.71–2.02 (1.86); carapace width, 1.24–1.43 (1.34); femur I length, 1.61–2.14 (1.90). *Male:* Total length, 3.57–4.43 (4.01); carapace length, 1.71–2.02 (1.84); carapace width, 1.36–1.71 (1.53); femur I length, 1.92–2.42 (2.15).

Distribution.—San Francisco Bay area and Sierra Nevada Mountains of California (Map 10).

Natural History.—Mature specimens collected in January, May, September, October, November and December.

Material Examined.—U.S.A.: *California*: Alameda County, Castro Valley, 7 January 1939 (W.M. Pearce), 1 ♀ (AMNH), 18 January 1939 (W.M. Pearce), 1 ♂ (AMNH), 1 July 1939 (W.M. Pearce), 1 ♂ (AMNH), Oakland, 28 January 1953 (R. Schuster), 1 ♀ (AMNH), Mountain Boulevard and Park, 17 October 1953 (R. Schuster, V. Roth), 3 ♂, 4 ♀, 2 im-



Map 10.—Distribution of *C. sierra* (●), *C. similaria* (□), and *C. siskiyou* (○).

matures (AMNH); Contra Costa County, Marsh Creek Springs, 5 May 1940 (W.M. Pearce), 1 ♀ (AMNH), 2 miles W. of Orinda, 12 December 1953 (V. Roth), 2 ♂, 6 ♀, 3 immatures (AMNH); Marin County, 427 Rose Ave., Mill Valley, 12 November 1953 (H. B. Leech), 1 ♂ (AMNH), Mill Valley, 16 October 1955 (H. B. Leech), 1 ♀, 1 immature (AMNH), W. slope of Mt. Tamalpais, 10 January 1963 (V. Roth, P. Craig), 1 ♀ (AMNH), 4 miles outside of Muir Woods, 10 January 1964 (V. Roth), 2 ♀, 1 immature (AMNH); Plumas County, southside of Lake Almandor, 5 September 1959 (W.J. Gertsch, V. Roth), 4 ♂, 4 ♀ (AMNH); Sierra County, 2 miles N. of Calpine, 6 September 1959 (W.J. Gertsch, V. Roth), 2 ♂, 4 ♀, 1 immature (AMNH), Sierra City, The Cups, 6 September 1959 (V. Roth, W.J. Gertsch), 1 ♂, 2 ♀ (AMNH).

Calymmaria similaria new species
Figs. 103, 104; Map 10

Type.—Female holotype from Arrowhead Lake, San Bernardino County, California, U.S.A., 34°11′N, 117°15′W, 6 May 1936, S.C. Bishop (AMNH).

Etymology.—The specific name is an adjective referring to this species' similarity to *C. aspenola*.

Diagnosis.—The epigynum of *C. similaria* is similar to that of *C. aspenola* externally, but the midpiece is not as wide as in *C. aspenola* and the lateral ducts do not meet medially in a hump (Fig. 104).

Description.—*Female:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark and three pairs of yellow spots decreasing in size caudally; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum variable, externally with large opening heavily sclerotized laterally and below (Fig. 103); internally with midpiece long, widest at top. Blind ducts short, lateral ducts thick and fused medially (Fig. 104). *Male:* Unknown.

Measurements.—Total length, 4.40–5.77 (5.29); carapace length, 1.71–2.17 (2.02); carapace width, 1.24–1.67 (1.50); femur I length; 1.86–2.45 (2.08).

Distribution.—Coast Ranges of California (Map 10).

Natural History.—Mature specimens collected in every month except January, September, October.

Material Examined.—U.S.A.: *California:* Alameda County, Berkeley, Strawberry Canyon, 22 March 1947 (B. Malkin), 1 ♀ (AMNH); Kern and Ventura Cos., 31 July to 1 August 1961 (Roth and Roth), 2 ♀, 2 immatures (AMNH); Los Angeles County, Saddle Peak, Santa Monica Mountains, 11 February 1953 (R.X. Schick), 1 ♀ (AMNH), San Antonio Canyon near Claremont, 1 July 1956 (V. Roth, W.J. Gertsch), 4 ♀, 3 immatures (AMNH); Marin County, Inverness, 8 November 1953 (V. Roth), 1 ♀ (AMNH); Monterey County, Pacific Grove, March 1913 (R.V. Chamberlin), 3 ♀, 2 immatures (AMNH), Pebble Beach, 25 March 1957 (A. M. Nadle), 3 ♀ (AMNH); Napa County, Oakville, 31 December 1953 (V. Roth), 2 ♀, 2 immatures (AMNH); San Bernardino County, Arrow head Lake, 6 May 1936 (S.C. Bishop), 5 ♀, 3 immatures (AMNH); San Diego County, Mt. Palomar, 30 June 1956 (W.J. Gertsch, V. Roth), 5 ♀, 3 immatures (AMNH); San Francisco County, 9 April (no year) (R.F. Sternitzky), 1 ♀ (AMNH); Santa Cruz County, Ben Lomond, 25 June 1952 (M. Cazier, W.J. Gertsch, R. Schrammel), 1 ♀ (AMNH), Felton, 3 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 2 ♀, 2 immatures (AMNH).

Calymmaria siskiyou new species
Figs. 105–109; Map 10

Types.—Male holotype from 18 miles N. of Happy Camp, Siskiyou County, California, U.S.A., 42°03′N, 123°22′W, 22 August 1959, W.J. Gertsch, V. Roth (AMNH); female allotype from Little French Creek, 2 miles E. of Del Loma, Trinity County, California, U.S.A., 40°46′N, 123°17′W, 6 April 1960, W.J. Gertsch, W. Ivie, R. Schrammel (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria siskiyou* females resemble *C. shastae* in external form of the epigynum, but the sclerotization is much wider (Fig. 108). Internally the midpiece in *C. siskiyou* is much wider than in *C. shastae* and the blind ducts do not protrude (Fig. 109). Male specimens of *C. siskiyou* are similar to *C. emertoni* and *C. nana*, but can be separated from *C. emertoni* by the rounded sides of the embolus (Fig. 28), and from *C. nana* by the larger PA, elongate cymbium, and longer pointed basal RTA (Fig. 65).

Description.—*Female:* Carapace typical.

Dorsum of abdomen yellow with gray basal lanceolate mark followed by four transverse chevrons; venter gray with yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with large opening heavily sclerotized below (Fig. 108); internally with midpiece very short, wide blind ducts not protruding, lateral ducts thick, short above, thin, longer below (Fig. 109). *Male:* Carapace bright orange. Abdomen as in female. Male palpus with PA large, round (Fig. 105); basal RTA long, pointed, medial RTA large, rounded, distal RTA truncate retrolaterally; tibia with three prolateral spines, three long ventral setae, rows of long spines dorsally (Fig. 107); cymbium moderately elongate distad, with six spines on tip; embolus thick at base, tapering abruptly to a point, conductor with no basal lobe (Fig. 105).

Measurements.—*Female:* Total length, 4.65–5.25 (5.02); carapace length; 1.89–2.28 (2.15); carapace width, 1.40–1.77 (1.59); femur I length, 2.01–2.48 (2.26). *Male (one specimen):* Total length, 4.03; carapace length, 2.05; carapace width, 1.83; femur I length, 2.64.

Distribution.—Northwestern California (Map 10).

Natural History.—Mature specimens collected in April, August, and September from redwoods.

Material Examined.—U.S.A.: *California*: Humboldt County, 14 miles W. of Willow Creek, 21 August 1959 (V. Roth), 2 ♀ (AMNH), 5 miles SW. of Orleans, 22 August 1959 (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), Carlotta, 15 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀ (AMNH), Orick, 16 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀ (AMNH); Mendocino County, Navarro River, 6 miles S. of Albion, in redwoods, 13 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀ (AMNH); Siskiyou County, 18 miles N. of Happy Camp, 22 August 1959 (W.J. Gertsch, V. Roth), 1 ♂, 3 ♀ (AMNH); Trinity County, 2 miles E. of Hayfork Summit, 21 August 1959 (W. Ivie, V. Roth), 1 ♀, (W.J. Gertsch, V. Roth), 1 ♀ (AMNH), Little French Creek, 2 miles E. of Del Loma, 6 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH).

Calymmaria sueni new species
Figs. 110–114; Map 11

Types.—Male holotype and female allotype from under rock at Lake Creek, Crater Lake National Park, Klamath County, Oregon, U.S.A., 42°56′N, 122°09′W, no date, D. Lowrie (AMNH).

Etymology.—The specific name is a patronym in honor of Dr. James Y. Suen, chair of the Department of Otolaryngology at University of Arkansas Medical School. Dr. Suen treated the senior author during his illness and was a good friend to him as well.

Diagnosis.—*Calymmaria sueni* can be separated by the short epigynal midpiece and thin, well-separated lateral ducts (Fig. 114), and the bifurcate embolus thickened midway (Fig. 110).

Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow with gray basal lanceolate mark followed by four gray transverse chevrons and a large spot; venter gray with two yellow lateral longitudinal stripes. Legs unmarked, spination typical. Epigynum externally with heavy sclerotization around and below the opening (Fig. 113); internally with midpiece short, thin, blind ducts small, lateral ducts thin, well-separated (Fig. 114). *Male:* Same as female only darker. Male palpus with PA large, round (Fig. 110); basal RTA long, tapering, pointed, medial RTA a long ridge rounded distad, distal RTA long, rounded; tibia with one promarginal spine, five long ventral setae, and five retrolateral setae; cymbium moderately elongate distad, with two spines near base of tip and five spines on tip; embolus thick in middle and bifurcate at tip, conductor with foot-shaped basal lobe (Fig. 110).

Measurements.—*Female (n = 2):* total length, 3.44–4.09; carapace length, 1.55–1.58; carapace width, 1.05–1.09; femur I length, 1.55. *Male (n = 1):* Total length, 4.00; carapace length, 2.05; carapace width, 1.58; femur I length, 2.23.

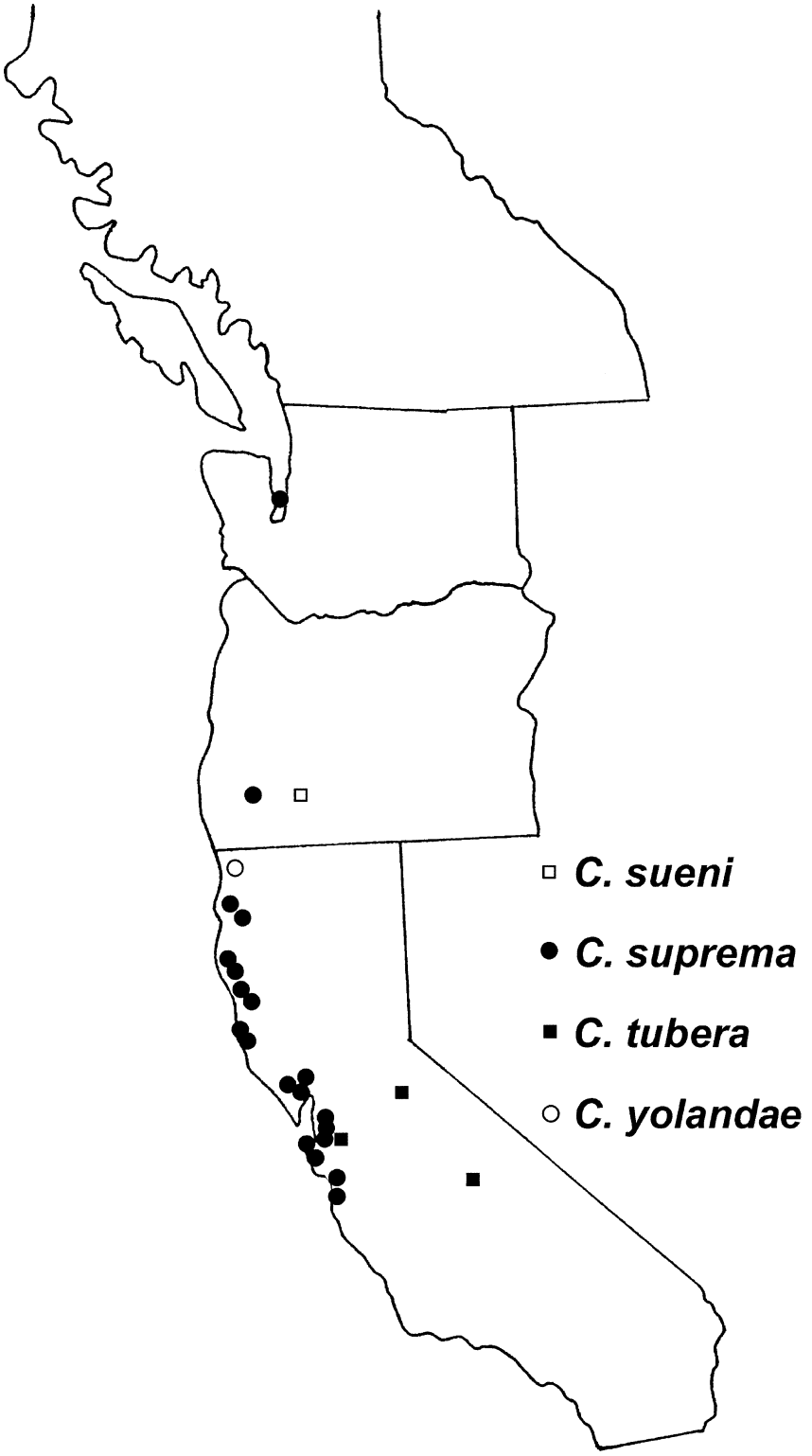
Distribution.—Crater Lake National Park, Oregon (Map 11).

Natural History.—Mature specimens taken from under rock.

Material Examined.—U.S.A.: *Oregon*: Klamath County, Crater Lake National Park, Lake Creek, under rock, no date (D. Lowrie), 1 ♂, 2 ♀ (AMNH).

Calymmaria suprema Chamberlin & Ivie 1937
Figs. 115–119; Map 11

Calymmaria suprema Chamberlin & Ivie 1937; 214, figs. 12, 13, 18, 19; Roewer 1954: 47; Bonnet 1956: 940.



Map 11.—Distribution of *C. sueni* (□), *C. suprema* (●), *C. tubera* (■), and *C. yolandae* (○).

Types.—Male holotype and female allotype from Big Basin, Santa Cruz County, California, U.S.A., 37°10′N, 122°13′W (AMNH, examined).

Diagnosis.—*Calymmaria suprema* can be separated from other *Calymmaria* by the long epigynal midpiece in the females (Fig. 119), and in the males by the long, thin, embolus with looped ejaculatory duct near the base (Fig. 115).

Description.—*Female:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by patches of yellow and followed by four gray transverse chevrons; venter gray with two yellow lateral longitudinal stripes. Legs annulate, spination typical. Epigynum externally with large opening and long, narrow, heavy sclerotization below (Fig. 118); internally with midpiece thick and long, blind ducts thick, long, lateral ducts thick (Fig. 119). *Male:* Carapace typical. Dorsum of abdomen yellow with very pale gray basal lanceolate mark flanked by one pair of gray spots and followed by four gray transverse chevrons; venter as in female. Legs annulate, spination typical. Male palpus with PA large, knob-like (Fig. 115); distal RTA long, round (Fig. 116); tibia with one prolateral spine, four long ventral setae, and many short retrolateral setae; cymbium elongate distad, with two spines near base of tip and seven spines on tip; embolus long, thin, tapering, with ejaculatory duct looped near base, conductor with basal lobe large, pointed (Fig. 115).

Measurements.—*Female:* Total length, 6.51–8.63 (7.63); carapace length, 2.45–3.81 (3.41); carapace width, 1.61–2.76 (2.37); femur I length, 2.85–4.96 (4.33): *Male:* Total length, 6.90–9.75 (8.55); carapace length, 3.26–4.65 (4.11); carapace width, 2.64–3.66 (3.33); femur I length, 4.84–6.90 (6.17).

Distribution.—Western Washington, Oregon, south to San Francisco Bay area of California (Map 11).

Natural History.—Mature specimens collected in every month except May, from caves, redwood forests, and human habitations such as basements and garages.

Material Examined.—CANADA: *British Columbia*: Victoria, Goldstream Campground, 27–28 June 1969 (ROM Field Party), 1 ♀ (CNC). U.S.A.: *Washington*: King County, NE. Seattle, Univ. of Washington campus, by light at museum basement door (200′), 16 April 1974 (R. Crawford), 1 ♀ (BMSC), in basement of building (200′), 14 November 1981 (R. Crawford), 1 ♀ (BMSC): *Oregon*; Douglas County, Idleyld Park, N. Umpqua, 23 August 1959 (V. Roth, W.J. Gertsch), 3 ♂, 1 ♀ (AMNH); *California*: Alameda County, Berkeley, October (E. Dietrich), 1 ♂ (AMNH), Strawberry Canyon, 7 April 1960 (W. Ivie, W.J. Gertsch, R. Schrammel), 2 ♂, l immature (AMNH), Castro Valley, 23 October 1938 (W.M. Pearce), 4 ♂, 1 ♀ (AMNH), 19 September 1942 (W.M. Pearce), 10 ♂, 7 ♀ (AMNH), Niles Canyon, 21 March 1941 (W.M. Pearce), 4 ♀, 1 immature (AMNH), Mountain Boulevard, Oakland, 11 October 1953 (R. Schuster, G. Marsh), 1 ♂, 1 ♀ (AMNH), 17 October 1953 (V. Roth, R. Schuster), 3 ♂, 6 ♀, 3 immatures (AMNH), Oakland, 1 February 1954 (V. Roth, R. Schuster), 2 ♀ (AMNH), Niles, off Niles Canyon on Palomres Road, 1 January 1964 (V. Roth), 4 ♀ (AMNH); Contra Costa County, Orinda Village, 15 November 1969 (E.I. Schlinger), 1 ♀ (EMSC); Humboldt County, Pepperwood, 1 July 1952 (W.J. Gertsch, M. Cazier, R. Schrammel), 5 ♀, 1 immature (AMNH), 10 miles W. of Willow Creek, 21 August 1959 (W.J. Gertsch, V. Roth), 1 ♂, 1 ♀ (AMNH), 18 miles W. of Willow Creek, 21 August 1959 (V. Roth, W.J. Gertsch), 3 ♂, 1 ♀, 1 immature (AMNH), 9 miles E. of Carlotta, 1 October 1959 (V. Roth), 3 ♂, 15 ♀ (AMNH), 5 miles N. of Scotia, 1 October 1959 (V. Roth), 1 ♀ (AMNH), 2 miles N. of Phillipsville, 14 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂, 3 ♀, 6 immatures (AMNH), 5 miles S. of Scotia, 14 September 1961 (W. Ivie, W.J. Gertsch), 33 ♂, 49 ♀, 13 immatures (AMNH), Carlotta, 15 September 1961 (W. Ivie, W.J. Gertsch), 1 ♀ (AMNH), 27 September 1963 (W.J. Gertsch), 1 ♂, 2 ♀ (AMNH), Orick, 16 September 1961 (W. Ivie, W.J. Gertsch), 1 ♂, 1 ♀ (AMNH), Phillipsville, 2 September 1963 (J. and W. Ivie), 5 ♂, 1 ♀, 4 immatures (AMNH), Redwoods State Park, near Miranda, 30 September 1963 (W.J. Gertsch), 3 ♂, 5 ♀, 2 immatures (AMNH); Marin County, Muir Woods National Monument, among leaves, 24 October 1953 (V. Roth); 2 ♀ (AMNH), Samuel P. Taylor State Park, redwoods, 24 October 1953 (V. Roth), 1 ♂, 2 immatures (AMNH), 8 November 1953 (V. Roth, R. Schuster), 1 ♀ (AMNH), Mill Valley, among redwoods, 7 July 1956 (W.J. Gertsch,

V. Roth), 7 ♀ (AMNH), in house, 20 October 1963 (E. S. Ross), 2 ♂ (CASC), ¼ miles N. of Laurel Dell, Mt. Tamalpais, 8 September 1969 (M. M. Bentzien), 1 ♂ (EMSC), Ridge between San Anselmo and San Rafael, 17 February 1977 (L. G. Freihofer), 1 ♀ (CASC); Mariposa County, Wawona Camp, Yosemite National Park, 17 September 1941 (W. Ivie), 3 immatures (AMNH); Mendocino County, Longvale, 30 June 1952 (W.J. Gertsch), 3 ♂, 5 ♀, 1 immature (AMNH), Ryan Creek, 8 March 1955 (P. D. Hurd), 1 ♀ (AMNH), Russian Gulch State Park, Mendocino, 19 August 1959 (W.J. Gertsch, V. Roth), 9 ♂, 1 ♀, 1 immature (AMNH), 13 September 1961 (W.J. Gertsch, W. Ivie), 1 ♀, 1 immature (AMNH), 2 miles N. of Piercy, 19 August 1959 (W.J. Gertsch, V. Roth), 1 ♀, 3 immatures (AMNH), Piercy, 6 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀, 5 immatures (AMNH), Rockport, 19 August 1959 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH), Navarro River, 6 miles S. of Albion, in redwoods; 13 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂, 10 ♀, 7 immatures (AMNH), 5 miles E. of Anchor Bay, 12 September 1961 (W.J. Gertsch, W. Ivie), 1 ♂, 2 immatures (AMNH), Caspar Creek; 1 miles SE. of Caspar, 13 September 1961 (W.J. Gertsch, W. Ivie), 2 ♂, 7 ♀, 4 immatures (AMNH), Greenwood Creek, Elk, 13 September 1961 (W. Ivie, W.J. Gertsch), 2 ♂, 5 ♀, 4 immatures (AMNH), 22 September 1963 (W.J. Gertsch), 1 ♂, 1 ♀ (AMNH), 16 February 1967 (V. Roth), 5 ♀, 1 immature (AMNH), 12 to 15 miles E. of Noyo, 13 September 1961 (W.J. Gertsch, W. Ivie), 9 ♂, 8 ♀, 2 immatures (AMNH), Hartsook Inn, Piercy, 23 September 1963 (W.J. Gertsch), 10 ♂, 13 ♀ (AMNH), Leggett, 20 September 1964 (J. and W. Ivie), 1 ♀ (AMNH), Albion, 16 February 1967 (V. Roth), 20 ♀, 5 immatures (AMNH), 17 February 1967 (V. Roth), 2 ♀ (AMNH), summit on Highway 1 before S. fork of Eel River, outside Leggett, 15 September 1971 (V. Roth), 1 immature (AMNH), fen area, Inglenook Fen (30–50′), 15 December 1973 (C.E. Griswold), 3 ♀ (EMSC), 4 miles N. of Fort Bragg (30′), no date (C.E. Griswold), 1 ♀ (EMSC); Napa County, 2 miles W. of Oakville, 31 December 1953 (V. Roth), 1 ♀ (AMNH), Clay Cave, common in first room on open-type platform web, 26 November 1959 (R.E. Graham); 1 ♂ (AMNH), 2 miles NNE. of Angwin, N. side of Howell Mountain (1300′), 24 January 1977 (H. B. Leech), 1 ♂ (CASC); San Francisco County, December 1922 (C. Grant), 1 ♂, 1 ♀ (AMNH), San Francisco, Golden Gate Park, 3 October 1972 (D. Ubick), 2 ♂, 3 ♀ (DUSC), Strybing Arboretum, 30 September 1976 (P. Arnaud), 2 ♂ (CASC), right outside wall (75 m), 18 October 1976 (P. Arnaud), 2 ♂ (CASC), entrance, outside wall (75 m), 12 October 1977 (P. Arnaud), 1 ♂ (CASC); San Mateo County, La Honda, 7 November 1921 (J.C. Chamberlin), 3 ♀ (AMNH), Montara, 15 August 1958 (R.E. Leech), 1 ♂, 1 ♀ (CASC); Santa Clara County, Stanford, 24 December 1922 (J.C. Chamberlin), 1 ♀ (AMNH); Santa Cruz County, Ben Lomond (1600′), 2 June 1945 (L.W. Saylor), l female (AMNH), 23 June 1952 (W.J. Gertsch, M. Cazier, R. Schrammel), 2 ♂, 3 ♀ (AMNH), 20 July 1953 (W.J. and J. W. Gertsch), 9 ♂, 2 immatures (AMNH), 6 July 1956 (V. Roth, W.J. Gertsch), 3 ♂, 1 ♀ (AMNH), 2 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), l female (AMNH), 3 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 5 ♀ (AMNH), 23 September 1961 (W. Ivie, W.J. Gertsch), 15 ♀, 6 immatures (AMNH), 1 miles N. of Santa Cruz, 23 December 1953 (V. Roth), 1 ♀ (AMNH), Felton, 16 August 1959 (W.J. Gertsch, V. Roth), 7 ♂, 8 ♀ (AMNH), 3 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 1 ♀ (AMNH), Empire Cave, 7 August 1962 (R. E. Graham), 1 ♀ (AMNH), 2 miles NE. of Soquel, Bales Creek, redwood forest, 24–25 April 1970 (M. M. Bentzien), 2 ♂, 2 ♀, 1 immature (EMSC); Sonoma County, 3 miles W. of Glen Ellen, 15 February 1954 (V. Roth, R. Schuster), 1 ♀, 2 immatures (AMNH), 5 miles E. of Guerneville, 18 August 1959 (V. Roth, W.J. Gertsch), 1 ♀ (AMNH), Guerneville, 4 April 1960 (W.J. Gertsch, W. Ivie, R. Schrammel), 9 ♀ (AMNH).

Calymmaria tecate new species
Figs. 120–122; Map 7

Type.—Male holotype from 11 miles S. of Tecate, Baja California, Mexico, 32°24′N, 116°38′W, 10 November 1957, V. Roth (AMNH).

Etymology.—The specific name is a noun in apposition taken from the type locality.

Diagnosis.—*Calymmaria tecate* is easily separated from other *Calymmaria* by the presence of a retrolateral apophysis on the palpus

(Fig. 120), and the bilobed medial RTA (Fig. 122).

Description.—*Male:* Carapace typical. Dorsum of abdomen light yellow with gray basal lanceolate mark followed by dark gray mottling; venter gray with pale yellow lateral longitudinal stripes. Legs weakly annulate, spination typical. Palpus with PA rounded and hooked, RTA present and pointed (Figs. 120, 121); basal RTA from above long and bluntly pointed, medial RTA with two rounded lobes, one behind the other (Fig. 122), distal RTA long, rounded; tibia with one prolateral spine, and many short retrolateral setae; cymbium moderately elongate distad, with two spines near base of tip and seven spines on tip; embolus thickened at base and middle, tapering, conductor with pointed basal lobe (Fig. 120). *Female:* Unknown.

Measurements.—*(n = 1):* Total length, 4.90; carapace length, 2.42; carapace width, 1.89; femur I length, 3.72.

Distribution.—Tecate, Baja California, Mexico (Map 7).

Natural History.—One mature specimen collected in November from a culvert.

Material Examined.—MEXICO: *Baja California:* 11 miles S. of Tecate, in culvert, 10 November 1957 (V. Roth), 1 ♂, 1 immature (AMNH).

Calymmaria tubera new species
Figs. 123–125; Map 11

Types.—Male holotype from off Niles Canyon on Palomres Road, Alameda County, California, U.S.A., 37°34′N, 121°57′W, 2 January 1964, V. Roth (AMNH).

Etymology.—The specific name is a noun in apposition from the Latin *tuber,* a swelling or hump, referring to this species' distinctively shaped embolus.

Diagnosis.—*Calymmaria tubera* can be easily separated from other *Calymmaria* by the presence of a loop in the ejaculatory duct (Fig. 123), by the swelling on the embolus (Fig. 124), by the bifurcate basal RTA (Fig. 124), and toothed medial RTA (Fig. 125).

Description.—*Male:* Carapace typical. Dorsum of abdomen gray with basal lanceolate mark flanked by two pairs of large yellow spots and followed by three yellow transverse chevrons; venter gray with two yellow thin lateral longitudinal stripes. Palpus with PA large, round (Fig. 123); basal RTA bifurcate, medial RTA with three rounded teeth (Fig. 125), distal RTA long, rounded; tibia with two prolateral spines, two long ventral setae, and many short retrolateral setae; cymbium short distad, with two spines near base of tip and six spines on tip; embolus short, thick, with ejaculatory duct looped at base, and with a large swelling near apex when viewed laterally (Fig. 124). *Female:* Unknown.

Measurements.—*(n = 3):* Total length, 3.72–4.65 (4.04); carapace length, 1.71–2.42 (1.99); carapace width, 1.33–1.89 (1.59); femur I length, 1.64–2.02 (1.83; *n* = 2).

Distribution.—Alameda and Mariposa Counties, California (Map 11).

Natural History.—Mature specimens collected in January, August, and September from beneath rocks.

Material Examined.—U.S.A.: *California*: Alameda County, Niles, off Niles Canyon Rd., 1 January 1964 (V. Roth), 1 ♂ (AMNH), on Palomres Rd., 2 January 1964 (V. Roth), 1 ♂ (AMNH); Fresno County, under rocks on hillside above Graveyard Meadows, vicinity of Graveyard Peak, 12 August 1959 (B. Firstman), 1 ♂ (AMNH); Mariposa County, 12 miles E. of Buck Meadows, 11 September 1959 (no collector), 1 ♂ (AMNH).

Calymmaria virginica new species
Figs. 126–130; Map 8

Types.—Male holotype from Minnehaha Springs, Pocahontas County, West Virginia, U.S.A., 38°09′N, 79°58′W, July 1947, K.W. Haller (AMNH); female allotype from Cranberry Glades Natural Area, Monongahela National Forest, Pocahontas County, West Virginia, U.S.A., 38°12′N, 80°16′W, 20 May 1967, W.A. Shear (AMNH).

Etymology.—The specific name refers to (West) Virginia, where the species has been collected.

Diagnosis.—*Calymmaria virginica* can be easily separated from the only other species occurring in the eastern U.S.A., *C. persica*, by the trilobed PA (Fig. 127), and the thin, tapering embolus (Fig. 126).

Description.—*Female:* Carapace typical. Dorsum of abdomen pale yellow with gray basal lanceolate mark followed by three gray transverse chevrons and a gray spot; venter gray with two pale yellow lateral longitudinal stripes. Legs unmarked, spination typical. Epigynum externally with shield-like sclerotiza-

tion and lateral ducts clearly visible (Fig. 129) internally with midpiece short, blind ducts very short, lateral ducts thin and separated below (Fig. 130). *Male:* Same as in female, but legs annulate. Male palpus with PA short, truncate (Fig. 126); basal RTA with three lobes, the ventral lobe large and rounded, the retrolateral lobe truncate, and the prolateral lobe long and pointed, medial RTA short, pointed, distal RTA long, round (Fig. 127); tibia with one prolateral spine, several long ventral setae, and short retrolateral setae; cymbium moderately elongate distad, with one spine near base of tip and five spines on tip; embolus tapering, conductor with basal lobe pointed (Fig. 126).

Measurements.—*Female (n = 2):* Total length, 3.41–3.97; carapace length, 1.43–1.59; carapace width, 1.05–.09; femur I length, 1.40–1.58. *Male (n = 1):* Total length, 3.78; carapace length, 1.61; carapace width, 1.49; femur I length, 2.42.

Distribution.—Pocahontas County, West Virginia (Map 8).

Natural History.—Nothing is known of the natural history of this species.

Material Examined.—U.S.A.: *West Virginia*: Pocahontas County, Minnehaha Springs, July 1947 (K. W. Haller), 1 ♂ (AMNH), Cranberry Glades Natural Area, Monongahela National Forest, 20 May 1967 (W. A. Shear), 2 ♀ (WASC).

Calymmaria yolandae new species
Figs. 131–133; Map 11

Type.—Male holotype from Patrick, Del Norte County, California, U.S.A., 41°52′N, 123°50′W, 16 September 1961, W. Ivie, W.J. Gertsch (AMNH).

Etymology.—Named in honor of the senior author's mother, Yolanda Heiss.

Diagnosis.—*Calymmaria yolandae* can be separated from other *Calymmaria* by the lack of a PA, the slender embolus, peculiarly shaped conductor (Fig. 131), and flat, large medial RTA (Fig. 133).

Description.—*Male:* Carapace typical. Dorsum of abdomen pale yellow with gray basal lanceolate mark followed by three gray transverse chevrons; venter gray. Legs unmarked, spination typical. Palpus with PA lacking; basal RTA long, round medial RTA wide, flat from above, distal RTA small, pointed (Fig. 132); tibia with one prolateral spine and seven long ventral setae; cymbium moderately elongate distad, with two spines near base of tip and seven spines on tip; embolus long, thin, conductor with basal lobes round, (Fig. 131). *Female:* Unknown.

Measurements.—*(n = 1):* Total length, 4.03; carapace length, 1.80; carapace width, 1.40; femur I length, 2.17.

Distribution.—Del Norte County, California (Map 11).

Natural History.—One mature specimen collected in September.

Material Examined.—Known only from the type.

PHYLOGENY

A cladogram for the species of *Calymmaria* was developed using the method of cladistic analysis as outlined by Hennig (1965, 1966), Ross (1974), Nelson & Platnick (1981) and Wiley (1982). A data matrix of character states was constructed for groups considered closely related to *Calymmaria*. This data matrix was used to establish the plesiomorphic and apomorphic state of characters in *Calymmaria*. In addition to the cladistic procedures discussed by the above authors, I have made use of one additional criterion: the more complex form of a character is assumed to be its apomorphic state. This latter criterion has been discussed by Platnick (1975a, 1975b).

Several apomorphic character states in *Calymmaria* can be determined by the criteria stated above. All species of *Calymmaria* possess a dorsal fracture line of the patella on all legs (Fig. 3). The patellar fracture line is absent from most Nearctic agelenid and all other hahniid genera. The presence of the patellar fracture line is considered the apomorphic state of this character, and those possessing it are hypothesized to form a monophyletic lineage. This monophyletic lineage consists of the following genera: *Calymmaria*, *Willisus*, *Blabomma*, *Yorima*, *Cybaeota*, and *Cybaeina* (Fig. 134). These genera (except *Calymmaria*) were used for the outgroup comparisons to establish plesiomorphic and apomorphic character states in *Calymmaria*. In the following discussion, the characters within *Calymmaria* are presented along with the evidence used to determine character states.

The length of the patella plus the tibia on the first pair of legs in *Calymmaria* is very long in relation to the length of the carapace.

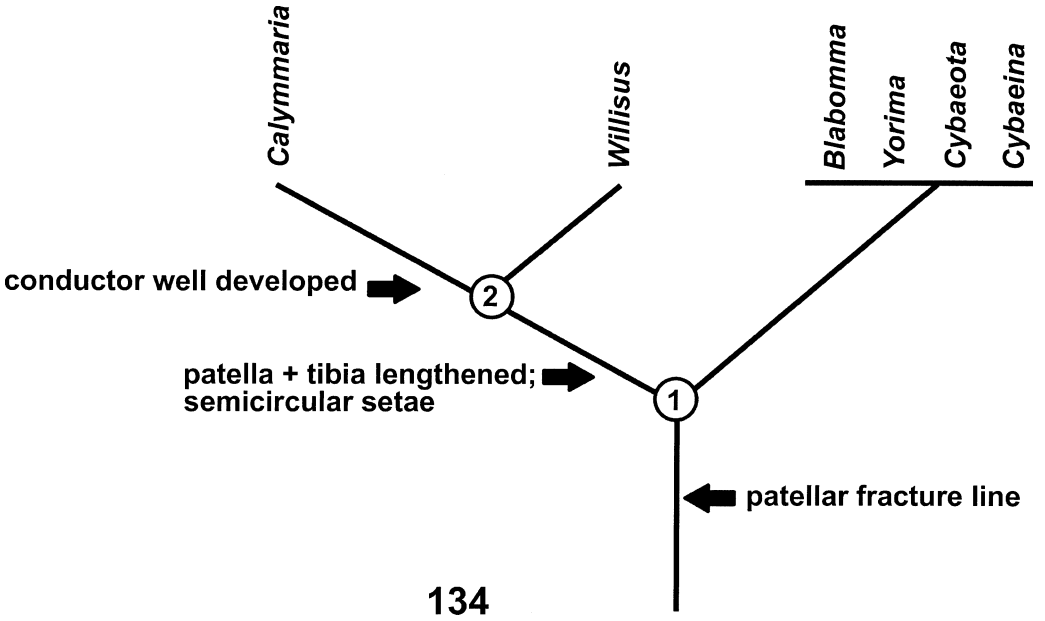


Figure 134.—Cladogram of genera related to *Calymmaria*. See text for further explanations.

It is much shorter in related genera except *Willisus*. The short patella-tibia is considered to be the plesiomorphic state, the long patella-tibia the apomorphic state.

Between the claws of *Calymmaria* are semicircular setae. The setae do not occur in any related genus except *Willisus*. The absence of semicircular setae is considered the plesiomophic character state, its presence apomorphic.

In *Calymmaria* the conductor of the male palpus is well developed with many distal lobes and sometimes a basal lobe (Fig. 6). The basal lobe may be sclerotized or not sclerotized. In related genera the conductor is usually not modified into many lobes. The form of the unmodified conductor is considered plesiomorphic. The form of the conductor in which many lobes are developed is considered apomorphic.

The embolus of the male palpus in *Calymmaria* may be a simple long spine, or may be thickened and flattened at the base, thickened along its entire length, bifurcate, or with an ectal tooth. In related genera, the embolus is usually long, round, and whip-like or a simple spine. The simple, long, round, spine-like embolus is considered to be the plesiomorphic state, and the thickened, shortened, flattened, bifurcate, and toothed forms are considered to be apomorphic.

In *Calymmaria* the basal RTA may be a simple one-lobed apophysis (Fig. 7), or may be very complex with several lobes (Figs. 75, 128). In related genera the basal RTA is usually not modified into many lobes, and is frequently absent. The simple single-lobed RTA is considered the plesiomorphic state, the multi-lobed form apomorphic. Near the base of the embolus of some species of *Calymmaria*, the ejaculatory duct makes a distinct loop. The ejaculatory duct does not make a loop in any of the related genera. The absence of the loop of the ejaculatory duct is considered the plesiomorphic state, its presence apomorphic.

A cladogram was developed using the apomorphic character states that have been discussed. *Calymmaria* shares a dorsal patellar fracture line with *Willisus*, *Blabomma*, *Yorima*, *Cybaeota*, and *Cybaeina*. These six genera are here hypothesized to form a monophyletic lineage (Fig. 134), although it is quite possible that this single apomorphic character is a case of homoplasy. Within this hypothesized lineage, *Calymmaria* and *Willisus* share two apomorphic character states: elongated first patella-tibia, and semicircular setae between the claws. *Willisus* and *Calymmaria* are

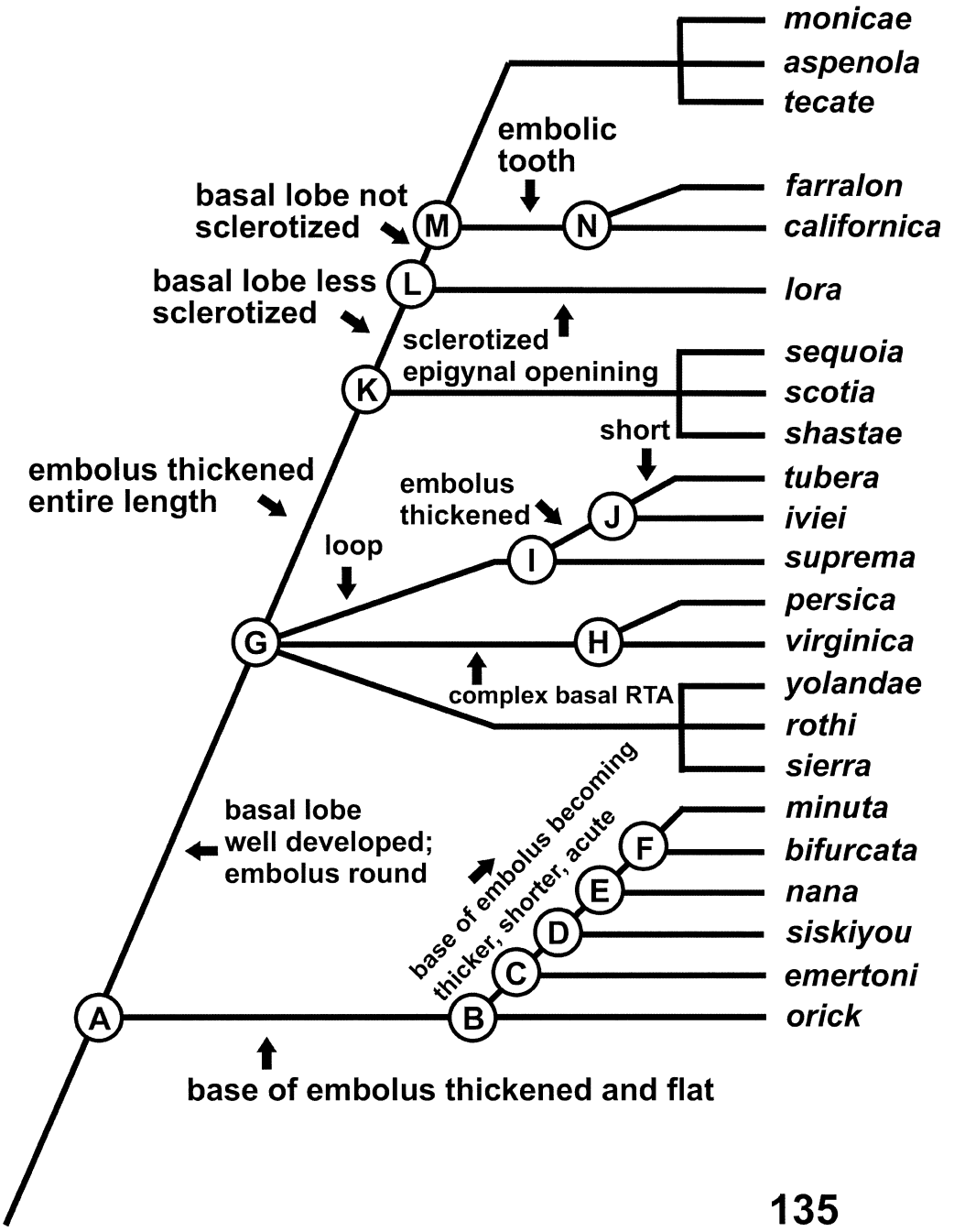


Figure 135.—Cladogram of the species of *Calymmaria*. See text for further explanations.

here considered to be sister groups. The apomorphic character state separating *Calymmaria* and *Willisus* is the complex multi-lobed palpal conductor in *Calymmaria*.

From the data concerning plesiomorphic and apomorphic character states, a preliminary cladogram was constructed to examine possible relationships among the species of *Calymmaria*. Eight species could not be placed in the cladogram: *C. alleni*, *C. carmel*;

C. gertschi, *C. humboldt*, *C. monterey*, *C. rosario*, *C. similaria*, and *C. sueni*. Character analysis of these species did not yield useful information. This group includes all *Calymmaria* species known from only one sex, and also *C. sueni*. See Appendix for information about characters included in the analysis.

It is postulated that the hypothetical ancestor, A (Fig. 135), possessed a well-developed conductor lacking a basal lobe, a thin, round, spine-like embolus, a simple basal RTA, and a straight ejaculatory duct. From this hypothetical ancestor, two lineages arose. In one lineage, the embolus became thickened and flattened at the base. This lineage gave rise to hypothetical ancestors B-F in which the base of the embolus may have progressively become thicker, shorter, and more acute. Six extant species arose from ancestors B-F respectively: *C. orick*, *C. emertoni*, *C. siskiyou*, *C. nana*, *C. bifurcata*, and *C. minuta*.

In the second lineage arising from hypothetical ancestor A, the remaining species of *Calymmaria* share an apomorphic character state, a palpal conductor with a well-developed basal lobe. This lineage is represented by hypothetical ancestor G. The available data indicate that four lineages arose from ancestor G. The extant species *C. rothi*, *C. sierra*, and *C. yolandae* apparently have changed little from ancestor *G. Calymmaria persica* and *C. virginica* share a similar complex basal RTA. These two species are considered to have arisen from the common hypothetical ancestor H. In the third lineage arising from ancestor G, the ejaculatory duct became looped. This lineage led to hypothetical ancestor I. *Calymmaria suprema* apparently changed little from ancestor I. Hypothetical ancestor I gave rise to ancestor J, in which the embolus became thickened and shortened. Two extant species arose from ancestor J, *C. iviei* and *C. tubera*.

In the fourth lineage arising from hypothetical ancestor G, the embolus became thickened along its entire length. This apomorphy gave rise to hypothetical ancestor K. Ancestor K, like ancestor G, also represents an unresolved polytomy from which a number of lineages arose. *Calymmaria shastae*, *C. scotia* and *C. sequoia* have apparently changed little from ancestor K. Lineages L-N arose from ancestor K. The basal lobe of the conductor became progressively less sclerotized. Hypothetical ancestor L gave rise to the extant species *C. lora*, in which the basal lobe is only partly sclerotized. Ancestor L also gave rise to hypothetical ancestor M, in which the basal lobe completely loses its sclerotization. Hypothetical ancestor M represents another unresolved polytomy. One lineage arising from ancestor M gave rise to hypothetical ancestor N, which possessed an ectal embolic tooth. Ancestor N gave rise to the extant species *C. californica* and *C. farallon*. The second lineage arising from ancestor M represents the unresolved polytomy including *C. monicae*, *C. aspenola*, and *C. tecate*.

A complete understanding of the evolutionary history of *Calymmaria* must obviously await a better understanding of cladistic and biogeographic relationships among the species as well as the relationship of *Calymmaria* to other groups. It is hoped this work will enable such research to proceed.

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Appendix.—Characters used in the cladistic analysis. This matrix was compiled by the second author subsequent to the analysis discussed in the text.

Characters		
1	Basal lobe of conductor	0 = absent or not well developed; 1 = well-developed
2	Base of embolus	0 = thickened & flat; 1 = embolus round
3	basal RTA	0 = simple or without two subequal lobes; 1 = with two subequal lobes
4	ejaculatory duct	0 = not looped; 1 = looped.
5	embolus thickness	0 = not thick; 1 = thickened
6	embolus length	0 = normal length; 1 = shortened
7	embolus shape	0 = flat; 1 = round
8	sclerotization of basal lobe	0 = well sclerotized; 1 = lightly sclerotized; 2 = highly sclerotized.
9	ectal embolic tooth	0 = absent; 1 = present

Species	Known Sexes	Characters 1 2 3 4 5 6 7 8 9
C. alleni	F	? ? ? ? ? ? ? ? ?
C. aspenola	M, F	1 1 0 0 1 0 1 2 0
C. bifurcata	M, F	0 0 0 0 1 1 0 0 0
C. californica	M, F	1 1 0 0 1 0 1 2 1
C. carmel	M	1 0 0 0 1 0 1 0 0
C. emertoni	M, F	0 0 0 0 1 1 0 0 0
C. farallon	M, F	1 1 0 0 1 0 1 2 1
C. gertschi	M	0 1 0 0 0 0 1 0 0
C. humboldt	M	1 1 0 0 0 0 1 0 0
C. iviei	M, F	1 1 0 1 1 0 1 0 0
C. lora	M, F	1 1 0 0 1 0 1 1 0
C. minuta	M, F	0 0 0 0 1 1 0 0 0
C. monicae	M, F	1 1 0 0 1 0 1 2 0
C. monterey	F	? ? ? ? ? ? ? ? ?
C. nana	M, F	0 0 0 0 1 1 0 0 0
C. orick	M	0 0 0 0 1 1 0 0 0
C. persica	M, F	1 1 1 0 1 0 1 0 0
C. rosario	F	? ? ? ? ? ? ? ? ?
C. rothi	M, F	1 1 0 0 0 0 1 0 0
C. scotia	M, F	1 1 0 0 1 0 1 0 0
C. sequoia	M	1 1 0 0 1 0 1 0 0
C. shastae	M, F	1 1 0 0 1 0 1 0 0
C. sierra	M, F	1 1 0 0 0 0 1 0 0
C. similaria	F	? ? ? ? ? ? ? ? ?
C. siskiyou	M, F	0 0 0 0 1 1 0 0 0
C. sueni	M, F	1 0 0 0 1 1 0 0 0
C. suprema	M, F	1 1 0 1 0 0 1 0 0
C. tecate	M	1 1 0 0 1 0 1 2 0
C. tubera	M	1 1 0 1 1 1 1 0 0
C. virginica	M, F	1 1 1 0 0 0 1 0 0
C. yolandae	M	1 1 0 0 0 0 1 0 0