A TAXONOMIC REVISION OF THE CRAB SPIDER GENUS CORIARACHNE (ARANEIDA: THOMISIDAE) FOR NORTH AMERICA NORTH OF MEXICO

Thesis for the Degree of M. S.
MICHIGAN STATE UNIVERSITY

Thomas Anthony Bowling

1973

ABSTRACT

A TAXONOMIC REVISION OF THE
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The four known species of the genus Coriarachne that occur in Canada and the United States are described and illustrated. A key to species and distribution maps are provided. Two species are synonymized; C. nakina with C. brunneipes, and C. aemula with C. versicolor. Lectotypes of versicolor are designated. A hybrid between C. utahensis and versicolor is noted.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirement
for the degree of

MASTER OF SCIENCE

Department of Entomology

1973

ACKNOWLEDGMENTS

I would like to thank the following institutions and persons for contributions toward the completion of this work: Mr. K. Hyatt of the British Museum of Natural History for sending Keyserling's cotypes of Coriarachne versicolor for examination; and Dr. J. A. L. Cooke of the American Museum of Natural History for sending paratypes of Coriarachne utahensis (Gertsch) with the rest of their loan material; and Dr. D. Barr of the Royal Ontario Museum for including types of Coriarachne nakina Gertsch in their loan.

I also wish to acknowledge the following for loan material: Dr. H. W. Levi, Museum of Comparative Zoology; Dr. R. L. Fischer, Michigan State University; Dr. J. R. Tripp, Southern Florida College; Dr. C. D. Dondale, Canadian National Museum; Dr. W. B. Peck, Central Missouri State University; Dr. G. F. Edmunds, University of Utah; Dr. B. R. Vogel, Texas Memorial Museum; Dr. R. X. Schick, California Academy of Science; Dr. M. Prokop, Field Museum of Natural History; Dr. W. A. Drew, Oklahoma State University, Dr. R. L. Post, North Dakota State University; D. B. Richman, University of Arizona; Dr. C. A. Triplehorn, Ohio State University; the late Dr. L. J. Bayer, University of Wisconsin; D. J. Buckle; and T. R. Renault.

Thanks go to my guidance committee: Dr. R. J. Sauer, my major professor; Dr. R. L. Fischer; Dr. M. T. Hetherington; Dr. J. E. Bath; and Dr. G. E. Guyer.

Special appreciation is extended to Dr. C. D. Dondale, who suggested this project, for his helpful advice and constant encouragement.

Finally, I want to express my gratitude to my wife, Kay, for her patience and understanding during the completion of this thesis.

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INTRODUCTION

The purpose of this revision is to aid in the identification of spiders of the thomisid genus Coriarachne from Canada and the United States. To this end keys, illustrations, and descriptions are provided. Descriptions are limited to include only morphological characters that are important to species delimitation. Only important and significant literature citations are included here. For a complete bibliography workers who are interested are referred to works by Gertsch (1939, 1953), Roewer (1954), and Bonnet (1959).

A small, but world-wide genus, Coriarachne is found in boreal and temperate regions. Its greatest numbers are found in North America where there are four species. C. depressa (C. L. Koch) is the only species recorded from Europe. Practically nothing is known of the Oriental fauna except for C. fulvipes (Karsch) which was recorded from Japan by Yaginuma (1970).

Spiders of the genus Coriarachne are rather slow-moving and robust with the typical crab-like appearance characteristic of the subfamily Misumeninae. As with the rest of the subfamily, species of Coriarachne wait to ambush their prey rather than actively pursuing it. They are found

almost exclusively on tree bark, wooden fence posts and the like where their color camouflages them. Often these spiders will congregate under loose bark, leaf litter, or similar situations to spend the winter either in the adult or penultimate stage (Jennings, 1972; Holmquist, 1926; Kaston, 1948; Lowrie, 1948).

This review deals primarily with species found in Canada and the United States, although it likely will also identify any species of Coriarachne from Mexico. All locality records included here were confirmed by examination of specimens. No records from the literature were relied upon. Common anatomical terms used can be defined by referring to Kaston (1948), Schick (1965), and Figures 1-3.

Genus Coriarachne Thorell

Coriarachne Thorell, 1870, On European spiders (Upsala, 1869-1870), p. 186. Genotype: C. depressa (C. L. Koch).

Bassania (preoc.) P.-Cambridge, O., 1898, Biol. Cent.-Amer., Arachnida, Araneida, 1: 249.

Bassaniana (n. nov.) Strand, 1928, Miscellanea nomenclatorica et palaeontologica, I-II, Arch. Naturg. 92 A(8): 30.

Platyxysticus Gertsch, 1932, Amer. Mus. Novit. 563: 1.

Coriarachne, Gertsch, 1939, Bull. Amer. Mus. 76: 277.

Carapace as broad or slightly broader than long, strongly flattened, clothed with long thin setae or shorter filiform to subspatulate spines; cephalic sutures very

obvious; front vertical and very low; color, mottled with yellow, white dark brown, and russet. Eyes: anterior eye row straight to modestly recurved; posterior eye row more strongly recurved; median ocular area (MOA) as broad as or slightly broader than long; lateral eyes larger than medians; posterior median eyes (PME) closer to anterior lateral eyes (ALE) than posterior lateral eyes (PLE); eye tubercles discrete, not confluent.

Legs: color similar to carapace; terminal segments lighter than basal segments; legs I and II subequal; III and IV also subequal; moderately stout, more robust in females than males.

Abdomen: colored like cephalothorax but usually lighter in overall appearance; white patches may form indistinct transverse bands. Abdominal sulci, a pair of elongate grooves or with two or three pairs of shallow pits; venter lightly mottled, overall a dirty white.

Male palpus: tibia broader than long, with strongly developed ventral and retrolateral apophyses; retrolateral apophysis often with a terminal spur; cymbium about as broad as long; tegulum either circular or slightly longer than broad; tegular surface smooth except for a small tegular ridge; embolus with pars pendula broad basally, narrowing apically; truncus usually evenly arched, sometimes terminating in a short spiral.

Epigynum: atrium indistinct; septum subtriangular to parallel sided; spermathecae somewhat kidney-shaped with

numerous folds and occasionally scattered pits; copulatory tubes variable in length.

Diagnosis & Comments

Coriarachne can be separated from all other North American thomisid genera by the accentuated flatness of the carapace and by the anterior eye row being either straight or slightly recurved.

Of the eight genera of the subfamily Misumeninae in Canada and the United States, Misumena, Misumenoides, and Misumenops can be separated from Coriarachne by having eye tubercles confluent rather than discrete. Tmarus has a distinctive abdominal protuberance and a sloping front. Both Synema and Diaea have rather shiny and very convex carapaces. In addition, they are usually more brightly colored. Xysticus and Ozyptila are the genera most similar to Coriarachne. However, these groups are readily separated by the arched condition of the carapace; it being much flatter in Coriarachne. Also Xysticus nearly always has a pale median band on the carapace which is lacking in Coriarachne.

The structure of the genitalia and accessory organs have proven to be important in the separation of species. In males the terminal segment of the pedipalp serves as an intromittant organ and has a characteristic structure for each species. The length and shape of the embolus is of primary importance. In brunneipes, for example, the embolus is short and spiral-shaped at the apex, while in versicolor

it is long and relatively straight. In previous works (Gertsch, 1939, 1953), the shape of the septum has been used to separate the females. However, because of its variability this character has been found to be unreliable, except for brunneipes in which the broad and parallel-sided septum is easily recognized. In other species, the length of the copulatory tubes is a much more consistent character.

KEY TO NORTH AMERICAN SPECIES OF CORIARACHNE THORELL

1. Carapace extremely flat, anterior eye row straight, spines setaform, abdominal sulci a pair of elongate grooves, genitalia as in Figures 5, 16, and 17..... ..... brunneipes

1'. Carapace not so flattened, abdominal sulci two or three pairs of pits, spines not setaform..... 2

2. Anterior eye row weakly recurved, anterior legs of male only slightly mottled, maculations on posterior declivity of female carapace contigous or nearly so, spines on female carapace subspatulate, genitalia as Figures 4, 10, and 13.....floridana

2'. Anterior eye row definitely recurved, anterior legs quite mottled, carapace slightly convex.....3

3. Embolus short, copulatory tubes short, slightly visible if at all between spermathecae (Figures 8, 12, 15, and 18.....utahensis

3'. Embolus long, copulatory tubes long and quite visible between spermathecae (Figures 6, 7, 19, 20, 21).....

.....versicolor

Coriarachne brunneipes Banks

Coriarachne brunneipes Banks, 1893, Jour. N. Y. Ent. Soc. 1: 133.

Gertsch, 1939, Bull. Amer. Mus. 86: 410, Figures 258, 259, 271.

Gertsch, 1953, Bull. Amer. Mus. 102: 461, Figures 74-76.

Roewer, 1954, Katalog der Araneae 2 (Pt. 2): 832.

Bonnet, 1956, Bibliographia Araneorum 2 (Pt. 2): 1204.

Schick, 1965, Bull. Amer. Mus. 129: 171, Figures 253-255.

Platyxysticus brunneipes, Gertsch, 1933, Amer. Mus. Novit. 563: 2, Figure 4.

Coriarachne nakina Gertsch, 1953, Bull. Amer. Mus. 102: 462, Figures 69-72. NEW SYNONYMY.

Male

Total length, 3.83-6.33 mm, mean 5.25 mm: cephalothorax length, 2.00-3.08 mm, mean 2.47 mm; width, 1.92-3.00 mm, mean 2.45 mm. Carapace extremely flat, clothed with long setaform spines, uniform dark reddish brown occasionally broken by a dull yellow or white patch. Anterior eye row straight or very slightly recurved. Legs concolorous with carapace, distal segments lighter than basal segments. Dorsum of abdomen mottled with brown, black, yellow, and white. Sulci an elongate pair of grooves. Venter like dorsum only lighter. Palp as in Figure 5.

Female

Total length, 6.25-11.17 mm, mean, 8.24mm: cephalothorax length, 2.32-4.08 mm, mean 3.25 mm; width, 2.36-4.04 mm, mean 3.37 mm. Coloration similar to male, slightly lighter overall. Genitalia as in Figures 16, 17.

Type

Male and female syntypes from Olympia, Washington, in Museum of Comparative Zoology. Types of nakina are deposited in the Royal Ontario Museum and are from the following locations: male holotype, Attawapiskat, Ontario; female allotype, Nakina, Ontario; female paratypes, Lake Abitibi, Ontario.

Range

Western United States from Rocky Mountains to Pacific coast, in Canada from British Columbia eastward to northern Ontario (see Map 1).

Localities

ONTARIO: Lake Abitibi; Nakina; Attawapiskat. MANITOBA: Telford; Picnic Bog. ALBERTA: Banff. MACKENZIE: Fort Smith. BRITISH COLUMBIA: Burnaby Island; Queen Charlotte Island; Langford; Terrace; Victoria, Vancouver Island; Williamshead. WASHINGTON: Island Co.; King Co.; San Jaun Co.; Snohomish Co.; Mason Co.; Thurston Co.; Yakima Co.; Cottage Lake; Tomino. OREGON: Josephine Co.; Lane Co.; Multnomah Co.; Polk Co.; Douglas Co.; Benton Co.; Deschutes Co.; Jackson Co.; Columbia Co.; Yamhill Co.; Klamath Co.; Marion Co.; Wheeler

Co.; Clackamas Co. CALIFORNIA: Sonoma Co.; Siskiyou Co.; Santa Cruz Co.; Mono Co.; Eldorado Co.; Yosemite National Park. COLORADO: Gunnison Co.; El Paso Co. IDAHO: Bear Lake Co. WYOMING: Yellowstone National Park; Sublette Co. NEVADA: Elko Co.; Clark Co.; Charleston Mtns. ARIZONA: White Mtns. ALASKA: Haines.

Diagnosis & Comments

C. brunneipes is easily distinguished by its relatively uniform color and extremely flattened carapace.

Gertsch (1953) described specimens from Ontario as C. nakina based almost entirely on the slightly longer than broad carapace as opposed to brunneipes which is slightly broader than long. He also mentions small differences in the male palp. Subsequent examination has shown these characters to vary and appear in specimens of brunneipes throughout the range of the species. In addition, brunneipes is now known to range eastward to Ontario. For these reasons nakina is synonymized with brunneipes.

Coriarachne floridana Banks

Coriarachne floridana Banks, 1896, Trans. Amer. Ent. Soc. 23: 71.

Gertsch, 1939, Bull. Amer. Mus. 76: 409, Figures 256, 257, 270.

Gertsch, 1953, Bull. Amer. Mus. 102: 461, Figures 65, 66.

Roewer, 1954, Katalog der Araneae 2 (Pt. 2): 832.

Bonnet, 1956, Bibliographia Araneorum, 2 (Pt. 2): 1206. Platyxystious floridana, Gertsch, 1932, Amer. Mus. Novit. 563: 2. Figure 3.

Male

Total length, 3.42-5.25 mm, mean, 4.48 mm: cephalothorax length, 1.64-2.64 mm, mean, 2.26 mm; width, 1.72-3.00 mm, mean, 2.53 mm. Carapace mottled with brown, yellow, and white. Anterior eye row very weakly recurved, posterior eye row more strongly recurved. Legs same color as carapace with an evenly tawny-colored stripe on the ventral surface. Abdomen with irregular maculations of dark brown, yellow, and white. White maculations may appear as irregular transverse bands. Venter of same color but more diffuse pattern. Palp as in Figure 4.

Female

Total length, 4.92-7.92 mm, mean 6.19 mm: cephalothorax length, 2.20-3.16 mm, mean, 2.71 mm; width, 2.56-3.48 mm, mean, 3.00 mm. Overall similar to male's general color though somewhat lighter, posterior declivity of carapace with two contiguous, or nearly so, brown maculations; spines on carapace subspatulate. Abdomen with a more diffuse pattern than male. Genitalia as in Figures 10, 13.

Type

Male and female cotype from Punta Gorda, Florida in the Museum of Comparative Zoology.

Range

Southeastern United States extending northward into New England and southern Ohio (see Map 1).

Localities

FLORIDA: Liberty Co.; Alachua Co.; Baker Co.; Leon Co.; Marion Co.; Duval Co.; Pinelas Co.; Highlands Co.; Polk Co.; Charlotte Co. GEORGIA: Daugherty Co.; Baker Co.; Thomas Co.; Clark Co.; Bartow Co.; Charlton Co.; Mitchell Co.; Thompson's Mill; Oconee Forest. ALABAMA: Lee Co.; Shelby Co. TEXAS: Sabine Co. ARKANSAS: Calhoun Co.; Grant Co.; Ashley Co. MISSISSIPPI: Greene Co. LOUISIANA: Caddo Parrish. SOUTH CAROLINA: Pickens Co.; Abbeville Co. VIRGINIA: Giles Co.; Fall's Church. MARYLAND: Prince Co. NEW JERSEY: Ocean Co. Suffolk Co.; Nassau Co. OHIO: Hocking Co.; Franklin Co.

Diagnosis & Comments

The brown stripe on the ventral surface of the legs and the nearly straight anterior eye row along with the subspatulate spines and contiguous maculations on the carapace of the female serve to separate floridana from other North American species.

This is an interesting species in that although it differs quite obviously from utahensis in appearance, the structure of the genitalia of the two species is virtually identical.

Coriarachne versicolor Keyserling

Coriarachne versicolor Keyserling, 1880, Die Spinnen Amerikas, Laterigradae, 1: 53, Pl. 1, Figure 27.

Gertsch, 1939, Bull. Amer. Mus. 76: 409, Figures 254, 255, 269.

Gertsch, 1953, Bull. Amer. Mus. 102: 458, Figures 61, 64.

Roewer, 1954, Katalog der Araneae, 2 (Pt. 2): 832.

Bonnet, 1959, Bibliographia Araneorum 2 (Pt. 2): 1206.

Bassania aemula P.-Cambridge, O., 1898, Biol. Cent.-Amer., Arachnida, Araneida, 1: 249, Pl. 31, Figures 5, 5a-5f.

Xysticus versicolor, Simon, 1903, Histoire naturelle des Araignées, 2(4): 1014.

Bassaniana aemula, Strand, 1928, Miscellanea nomenclatorica et palaeontologica, I-II, Arch. Naturg. 92 A(8): 30.

Platyxysticus versicolor, Gertsch, 1932, Amer. Mus. Novit. 563: 3. Figure 1.

Xysticus banksi Bryant (not Gertsch), Chickering and Bacorn, 1933, Papers Mich. Acad. Arts, Sci. and Letters, 17: 523.

?Coriarachne lenta, Chamberlin and Ivie, 1944, Bull. Univ. Utah biol. ser., 8(5): 156.

Coriarachne aemula, Gertsch, 1953, Bull. Amer. Mus. 102: 459, Figures 67, 68. NEW SYNONYMY.

Male

Total length, 3.92-5.75 mm, mean 4.72 mm: cephalothorax length, 2.04-2.96 mm, mean, 2.35 mm; width, 2.20-3.00 mm, mean, 2.49 mm. Carapace similar to floridana in color, more

convex, anterior eye row recurved definitely more than in floridana. Spines filiform. Legs mottled around entire circumference. Abdomen as in floridana. Palp as in Figures 6, 7.

Female

Total length, 4.42-7.67 mm, mean, 5.77 mm: cephalothorax length, 3.24-3.92 mm, mean, 2.52 mm; width, 2.32-3.24 mm, mean 2.67 mm. Overall similar to male, though somewhat lighter, mottling more diffuse on carapace and abdomen. Genitalia as in Figures 19, 20, 21.

Type

Cotypes from Mariposa, California; Boston, Massachusetts; Peoria, Illinois; and Georgia. Cotypes from Georgia in British Museum of Natural History, others in Muséum National d'Histoire Naturelle of Paris. Lectoholotype and lecto-allotypes are designated here by the author from Keyserling's cotypes from Georgia deposited in the British Museum of of Natural History. This designation was made since from the Georgia material alone there were three different species, all called versicolor by Keyserling. Female type of aemula from Orizaba, Veracruz, Mexico reported by Gertsch (1953) to be in the British Museum of Natural History. Communication with the curator, Mr. Kieth Hyatt, reveals it is no longer there and presumably lost.

Range

Eastern United States and southern Ontario westward to

Rocky Mountains, in the Southwest as far as western Arizona, also extending into eastern Mexico at least as far as Orizaba, Veracruz (see Map 1).

Diagnosis & Comments

C. versicolor and the following species, utahensis, are very similar with respect to coloration and spination. However, versicolor males have a longer embolus than their utahensis counterparts as a comparison of Figures 6, 7 to Figure 8 will show. It should be noted that in addition to the sclerotized truncus varying in length between the two species, the length and position of the pars pendula also varies. In versicolor it extends from 260° - 270° to 340° - 350°. Whereas with utahensis it extends from 270° - 280° to 360° - 380°.

Females can be separated by the length of the copulatory tubes. In versicolor the tubes are well exposed and long (Figures 20, 21). C. utahensis has much shorter copulatory tubes which are not visible or only slightly so. A second character that sometimes is of some value is the width of the septum; it being typically wider in utahensis than in versicolor. This is not completely reliable, however, and can lead to misidentification as was the case with Gertsch (1932). Specimens he used as paratypes of utahensis from Zion National Park indeed looked similar to the typical septum of utahensis. Examination of the spermathecae and copulatory tubes showed, however, these spiders were actually versicolor.

Gertsch (1953) was the first to realize that Bassania O. P.-Cambridge was a synonym of Coriarachne. At the time, he left the single species of the genus, aemula, as a valid species of Coriarachne. As was mentioned earlier, the type of aemula, a female, could not be located. Therefore, specimens from Mexico determined by Gertsch as aemula and figures by O. P. Cambridge (1898) were relied upon for characters to compare with versicolor. Examination of these representatives showed no consistent differences between the two species. Consequently, aemula is considered here as a synonym of versicolor.

The male associated with aemula is described by Gertsch (1953) as being quite similar to utahensis, differing only on the angle of the spur on the retrolateral apophysis of the palp. This character has been found to be quite unreliable. Therefore, the placement of this male must be considered to be in error and actually represents an extension of the range of utahensis.

There has been a recurring problem of nomenclature associated with versicolor. Occasionally in the literature one finds C. lenta (Walckenaer) as a senior synonym of versicolor. The description of lenta, like many of Walckenaer's, was based on drawings of spiders from Georgia by John Abbot. In personal communication, Dr. C. D. Dondale advises that neither Abbot's drawing nor Walckenaer's description is clear enough to tell what species is being dealt with - versicolor, utahensis, or floridana. In fact

it may not even be Coriarachne. For this reason Coriarachne lenta (Walckenaer) must be regarded as a nomem dubium.

Coriarachne utahensis (Gertsch)

Platyxysticus utahensis Gertsch, 1932, Amer. Mus. Novit. 563: 5, Figure 2.

Coriarachne utahensis, Gertsch, 1939, Bull. Amer. Mus. 76: 408.

Gertsch, 1953, Bull. Amer. Mus. 102: 460, Figures 62, 63.

Roewer, 1954, Katalog der Araneae, 2 (Pt. 2): 833.

Bonnet, 1959, Bibliographia Araneorum 2 (Pt. 2): 1206.

Schick, 1965, Bull Amer. Mus. 129: 169, Figures 250-252.

Male

Total length,4.08-6.25 mm, mean, 4.65 mm: cephalothorax length, 2.12-3.80 mm, mean 2.68 mm; width, 2.12-3.00 mm, mean, 2.49 mm. Structure and color essentially identical to versicolor. Palp as in Figure 8.

Female

Total length, 4.50-9.92 mm, mean, 6.28 mm: cephalothorax length, 2.12-3.80 mm, mean, 2.68 mm; width, 2.20-3.80 mm, mean, 2.79 mm. Like the male coloration is essentially the same as versicolor. Genitalia as in Figures 12, 15, 18.

Type

Salt Lake City, Utah, male holotype, female allotype, and male and female paratypes; Bluff, Utah, female paratypes;

Zion National Park, female paratypes (actually versicolor). Types in American Museum of Natural History collection.

Range

Trans-Canadian and northern United States, along Gulf coast states from Florida into Mexico, also from central Alaska south along mountain reanges into Mexico (see Map 1).

Diagnosis & Comments

Males can be identified by the short embolus and recurved anterior eye row. Females are distinguished by the maculations on the posterior declivity being separate, anterior eye row recurved, and copulatory tubes barely, if at all, visible.

Often in areas where the range of utahensis overlaps with versicolor a form occurs that has genitalia characteristics intermediate to those two species (see Figures 9, 11, 14). Since both parental forms and the intermediate have been recorded from the same area (see Map 1), it is likely that this intermediate is a hybrid resulting from cross-breeding of versicolor and utahensis.

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PLATE I

Figure 1...Generalized male palp: cym, cymbium; emb, embolus; pp, pars pendula; ra, retrolateral apophysis; teg, tegulum; tr, tegular ridge; trc, truncus; va, ventral apophysis

Figure 2...Female epigynum: ms, median septum

Figure 3...Internal female genitalia: spr, spermathecae; ct, copulatory tubes.

Figure 4...Palp of floridana male

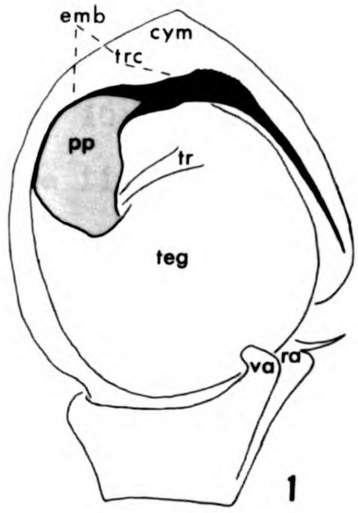
Figure 5...Palp of brunneipes male

Figure 6...Palp of versicolor male lectoholotype

Figure 7...Palp of versicolor male

Figure 8...Palp of utahensis male

Figure 9...Palp of versicolor x utahensis male



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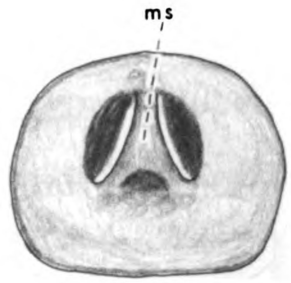

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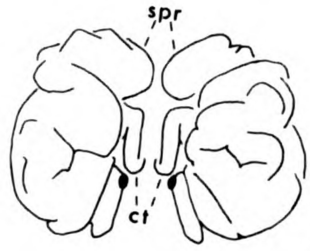

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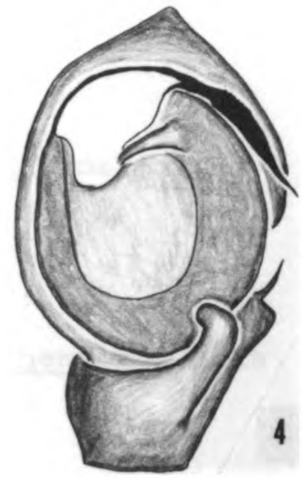

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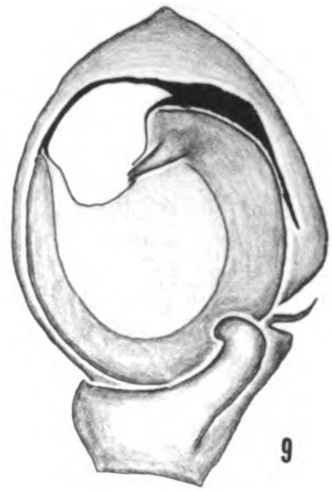

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PLATE II

Figure 10...Septum of *floridana* female

Figure 11...Septum of *versicolor* x *utahensis* female

Figure 12...Septum of *utahensis* female

Figure 13...Spermathecae of *floridana* female

Figure 14...Spermathecae of *versicolor* x *utahensis* female

Figure 15...Spermathecae of *utahensis* female

Figure 16...Septum of *brunneipes* female

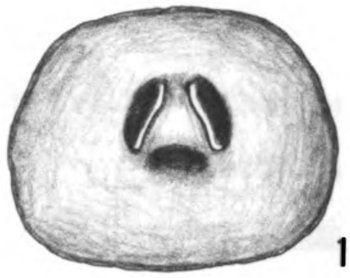
Figure 17...Spermathecae of *brunneipes* female

Figure 18...Spermathecae of *utahensis* female

Figure 19...Septum of *versicolor* female lectoallotype

Figure 20...Spermathecae of *versicolor* female lectoallotype

Figure 21...Spermathecae of *versicolor* female



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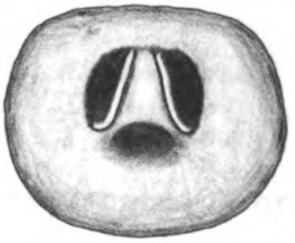

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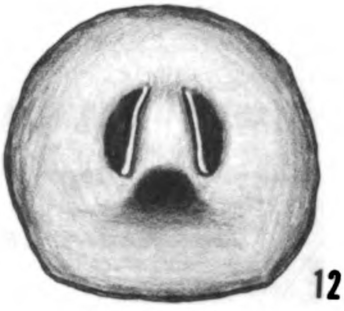

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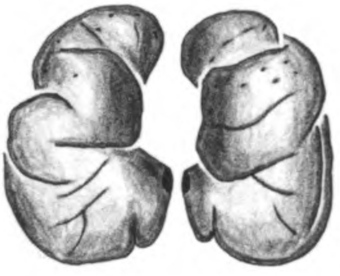

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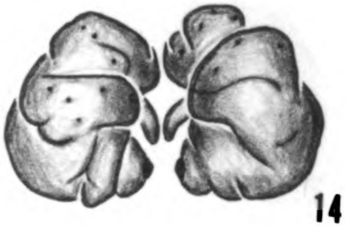

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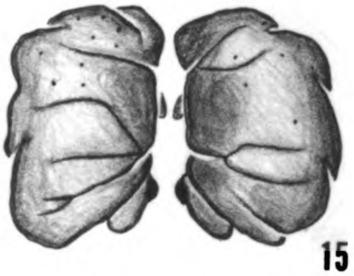

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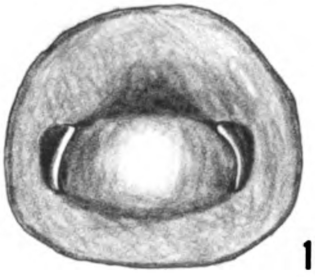

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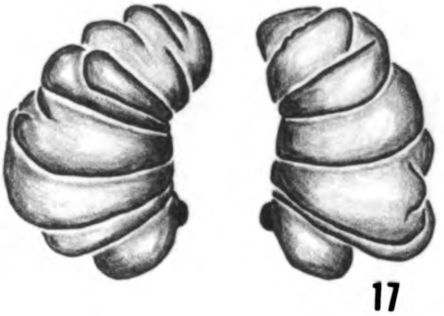

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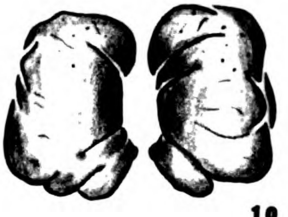

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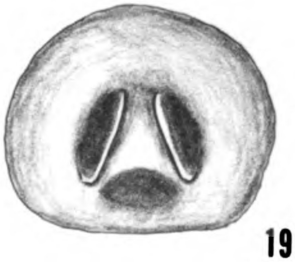

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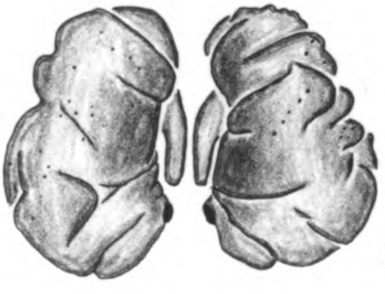

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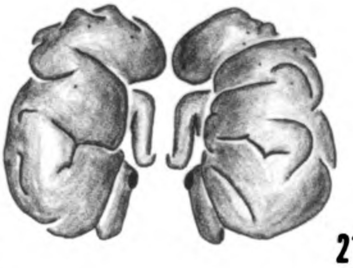

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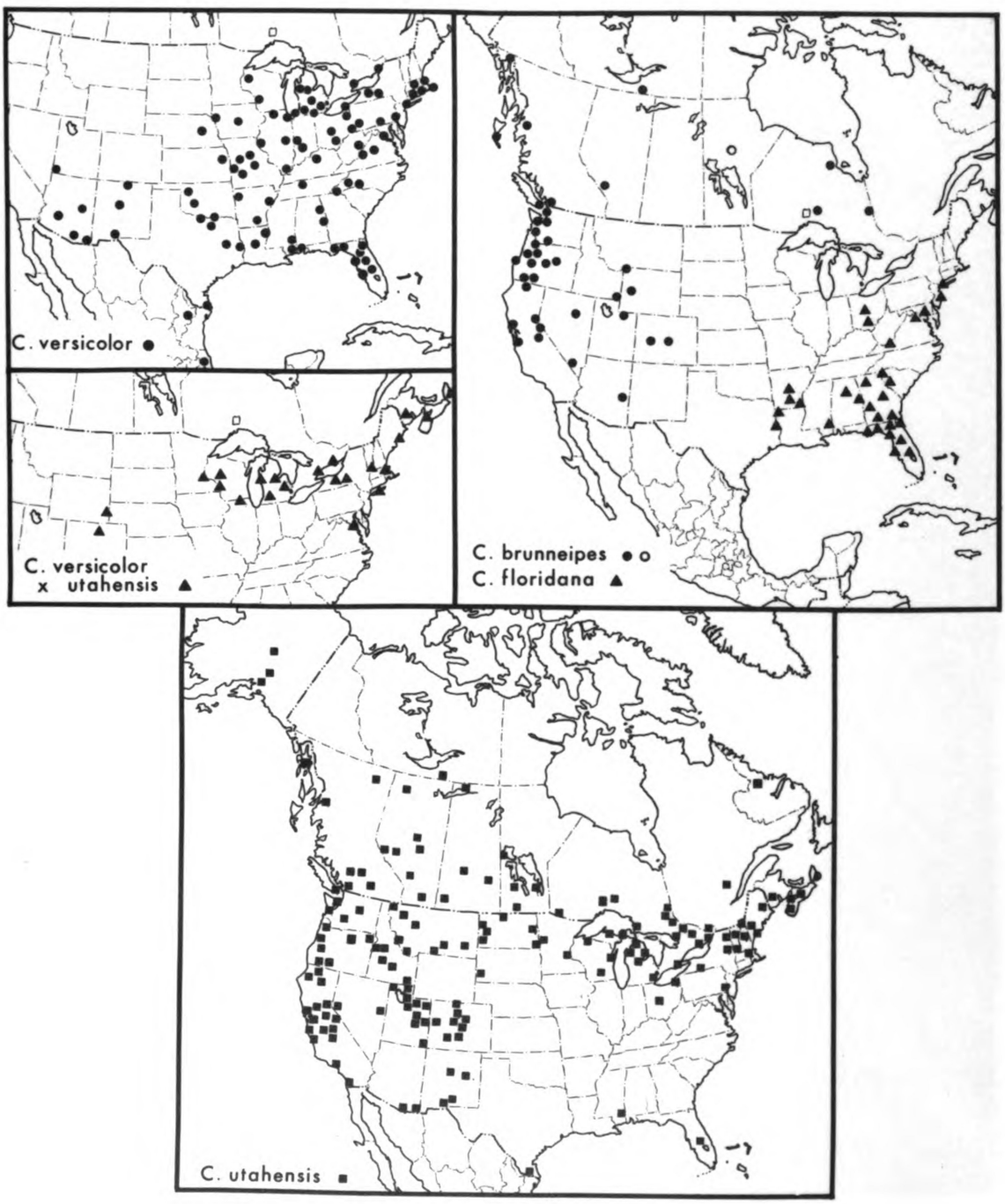
PLATE III

Map 1...Distribution map of the genus Coriarachne of North America north of Mexico. (Note: open character for brunneipes denotes provincial record of unknown locality.)


C. versicolor ●
C. versicolor x utahensis ▲
C. brunneipes ● o
C. floridana ▲
C. utahensis ■