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INTRODUCTION

THE DICTYNIDS ARE small sedentary spiders that spin irregular mesh webs as traps to ensnare their insect prey and as retreats for the spiders themselves. The framework of simple dry lines is often put down with considerable regularity in subparallel rows, and these are then crossed and covered to form a quite symmetrical lattice or network. The sticky ribbons are complex bands consisting of a warp of two or four dry supporting lines and a woof of curled threads bearing the sheet of viscid silk. These hackled bands are produced by carding out the silk issuing from the cribellum by means of a comb of bristles, the calamistrum, on the fourth metatarsus.

The lacy lattices, meshes, and sheets of the dictynid web are common objects in our environment. Most often they are placed on plants, usually on projecting side branches or on the heads, and frequently on the terminal dried stalks left over from the previous growing season. Sometimes the webs are more deeply hidden in foliage in spun-over leaves. Some species live close to the ground, in plain sight, under a convenient stone or chip, or deep in leaf mold or other debris. A few species seem to prefer trees, fences, stone walls, or buildings when they are available. Most dictynids are quite gregarious spiders, and often they live close together in large numbers. One of the Mexican species (*Mallos gregalis* Simon) is a social spider that bands together in large colonies and completely blankets scrubby trees with its communal web. In some areas the dictynids become of some economic importance because of their overspinning of ornamental conifers and evergreens with matted webs covered with unsightly fragments. In the southwest the walls of buildings are sometimes covered with webs of *Dictyna calcarata*, hung with lint and flecked with insect remains. However, for the most part dictynid webs are only a minor nuisance.

Not much is known about the biology of this group of spiders. All of the species seem to live only a single year, but there may be more than one generation in warmer areas. Most seem to be spring or early summer spiders in that the males appear at that season and are largely absent during the later months of the year when the females are still to be found and may still be producing eggs. The species of *Mallos* mature later in the year, mostly after July when both males and females are available. The females of the Dictynidae produce a few eggs at a time, encase them in several small lenticular egg sacs, and suspend them in the webbing. The mating seems to have been observed in only one species of the family, *Heterodictyna viridissima* Walckenaer (Jeanne Berland, 1916, Arch. Zool. Exp. Gén., vol. 55, no. 4, pp. 53–59). During the mating the female seizes the chelicerae of the male with her own and positions herself properly for the mating. The many strange modifications of the male chelicerae and the correlated elevation of the head are directly attributable to this copulatory procedure. The male introduces the right embolus of the palpus in the right orifice of the female epigynum and vice versa.

The present paper is a systematic revision of the spider family Dictynidae from that part of North America lying north of the Mexican border, and from the adjacent island of Greenland. In this region, which comprises most of the Nearctic Realm, occurs a large and complex fauna especially rich in species of the genus *Dictyna*. This fauna has been exploited by several spider students during the past dozen years, with substantial increase in the number of known species. With these contributions came also the need for a revision of the whole family in order to stabilize the synonymy and eliminate the many errors. The present study is still in many ways a preliminary one, but its publication at this time seems desirable. Very large collections of Dictynidae have been assembled at the American Museum of Natural History and the University of Utah during a collecting campaign of many years by workers particularly interested in this family. A vast amount of new distribution information was thus available for a clearer understanding of the ranges of the many species. Quite a number of new species are included in this study, and others can be expected to turn up with more intensive collecting.

The types of all new species and new subspecies are in the collections of the American Museum of Natural History unless stated otherwise. The relationship and numerical importance of the Dictynidae from Nearctica can best be appreciated by comparison with other faunal areas. Araneologists are fortunate in having two major bibliographic works concerned with the world spider fauna. One of these is C. R. Roewer's "Katalog der Araneae" in which are listed in essential completeness the spider representation from the entire world. An even more ambitious and scholarly work is the "Bibliographia araneorum" of Pierre Bonnet of the University of Toulouse, which is now partially available and which soon will be published in its entirety. From these sources and from supplementary catalogues it has been possible to glean reasonably accurate information on the distribution of dictynid genera and species for the world. Such a list is no better than the systematics on which it is based, so the following generalizations are subject to future revision. Particularly vulnerable are the genera from the tropical realms, inasmuch as they were established largely by students little familiar with the world dictynid fauna. Until recent years the family Dictynidae was considered coextensive with the family Amaurobiidae, and it is probable that additional dictynid genera will be relegated to the latter family.

As shown by the following list the family Dictynidae has representatives in all the major land realms:

	Genera	Species
Ethiopian	4	12
Oriental	4	17
Australian	4	8
Neotropical	13	56
Nearctic	8	174
Palearctic	12	104
Total Species		371

In the "Katalog der Araneae" the dictynid species are assigned to 36 genera. Of these, the Mexican *Temecula* is clearly an amaurobiid and quite probably a synonym of *Titanoeca*. The genus *Archaeodictyna* of Caporiacco is relegated without hesitation to *Dictyna* where Eugène Simon originally placed his *auguiniceps*, the type of the genus. Of the remaining 34 genera, only *Dictyna* occurs in every major region.

The small number of species shown for the Ethiopian, Oriental, and Australian regions is indicative of more than mere ignorance of these otherwise large faunas. The dictynids are weakly represented in such largely tropical areas, whereas they are numerous in temperate and mountainous regions. The Palearctic region embraces vast and little-exploited areas of northern Asia, but its fauna of 12 genera and 104 species is more fairly representative of the European and Mediterranean portions. The Nearctic fauna of eight genera and 174 species (of which 159 come from north of Mexico and are reviewed in this paper) is numerically the richest of the entire world. It has nearly twice as many species as Europe and Mediterranean North Africa. Its advantage is due to the diversity of the genus *Dictyna* which alone has 133 species. The preëminence of the Dictynidae in the North Temperate zone is shown by the combined Nearctic and Palearctic faunas which boast 278 species, or about 75 per cent of the world fauna.

The Neotropical region has 56 species assigned to 13 genera and can be expected to have a much larger species representation. Some of the genera are little known and probably will fall to older ones. It should be mentioned that many of the South American species now placed in *Dictyna* should be assigned to the genus *Mallos*.

The principal world genera are listed below, with the number of species found in the three dominant realms:

	Palearctica	Nearctica	Neotropica
Lathys	22	11	0
Argenna	5	5	0
Altella	8	0	0
Devade	3	0	0
Argennina	0	1	0
Tricholathys	1	12	0
Pagomys	1	3	0
Thallumetus	0	1	8
Mallos	0	17	5
Heterodictyna	6	1	0
Dictyna	56	133	25

A very close correspondence can be noted between the fauna of the Palearctic region and that of the Neartic region. *Lathys* is rep-

resented strongly in Eurasia, with 22 species, of which some have the anterior median eyes reduced in size or have completely lost them. Four of these live in Japan. In North America the genus is also well represented with 11 named and other undescribed forms from the Mexican plateau. The genera *Argenna* to *Pagomys* as listed are closely allied types unknown from tropical or subtropical regions. Eighteen species are Palearctic, and 20 occur in North America. None of these American forms are the same as those from northern Europe. The genus *Thallumetus*, which is exclusively American, is largely Neotropical, with several described and unnamed species occurring in South America and the West Indies, others in Central America and Mexico, and a single striking representative in the southeastern United States. The genus *Mallos* is dominant in South and Central America and strongly represented in Mexico and the western United States. Closely related Palearctic representatives are the European and North African species of the genus *Heterodictyna*. The single North American *Heterodictyna* is probably an introduced species. The type genus of the family, *Dictyna*, is of world-wide distribution, with quite typical species from every area. Three of the species (*major*, *arundinacea*, and *annulipes*) are Holarctic in range and occur from Greenland or Canada and the northern United States around the northern periphery of the world to northern Europe. The Nearctic species seem to be more diversified in their palpal features than those from Palearctica and have remarkably modified the emboli of the palpi.

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A revisional study cannot be brought to completion without help of many kinds from numerous individuals and institutions. We take this opportunity to express our appreciation to the many named below who have contributed loans and gifts of specimens and other services:

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Most of the illustrations used in this paper were prepared by Miss Marjorie Statham from pencil sketches made by the second author. A few were done by Mr. Wilton Ivie, and others were finished by both authors. The final preparation of the plates and maps is to be credited to Miss Statham.

Finally, we are happy to commend Mrs. Carolyn Gordon Cazier and her successor, Miss Jeannette Reinhardt, for their many hours of meticulous work on bibliographic research, the typing of the manuscript, and the preparation of the distribution maps.

SYSTEMATIC ACCOUNT

THE FAMILY DICTYNIDAE as herein defined is used in the restricted sense of Bertkau and many recent authors to comprehend only the small series of genera related to *Dictyna*. The other genera assigned to the family in the broad sense by Simon in his "Histoire naturelle des araignées" should be placed in a separate adjacent family, the Amaurobiidae. The dictynids were derived from types similar to the present amaurobiids, which they parallel closely and with which they intergrade quite completely in structural features. None of the characters previously used to separate these two groups are considered to be completely valid by themselves, inasmuch as the only explicit differences rest in the genitalia. The Amaurobiidae are typically larger cribellate types with divided cribellum, usually biseriate calamistrum, and with more numerous trichobothria on the terminal segments of the legs. They retain a well-developed median apophysis on the bulb of the male palpus and most often have a complementary median lobe or bar in the female epigynum. The family Dictynidae represents a derivative branch which has completely lost the median apophysis on the palpal bulb and has modified the epigynum in different fashion to compensate for its loss. The dictynids are typically small cribellate types with uniseriate calamistrum, usually entire cribellum, and less numerous trichobothria on the terminal leg segments.

The genera *Zanomys* and *Tugana* were established in 1948 by Chamberlin (Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 17). The former has as its type *Zanomys kaiba* Chamberlin and also includes *Dictyolathys californicus* Banks and other western species. The genus *Tugana* is based on a six-eyed Cuban species (*Tugana cavatica* Bryant). Both genera should be referred to the family Amaurobiidae.

FAMILY DICTYNIDAE

Small cribellate spiders of the suborder Araneomorphae with one pair of book lungs and a single transverse tracheal spiracle immediately in front of the spinnerets. Cribellum undivided except in a few species of *Mallos*. Calamistrum always uniseriate and running nearly the full length of the laterally compressed fourth metatarsus. Chelicerae robust, free at the base, with a conspicuous lateral condyle sometimes developed to a horn, and with both margins of the furrow toothed. Legs of moderate length, only rarely with well-developed spines, and with three tarsal claws. Trichobothria present on metatarsi and tarsi except in *Dictyna* and some *Mallos*. Anal tubercle of moderate size, short, lacking a conspicuous fringe of hair. Eyes typically eight in two essentially straight rows, but the anterior median sometimes reduced in size or completely missing. Male palpus always lacking a median apophysis on the bulb.

The limits of the genera are as difficult to assess in the Dictynidae as in other groups of animals. It has seemed desirable to use relatively few generic names for the large number of species of the *Dictyna-Mallos* complex because of the nearly complete bridging of the many species groups. The fewer species of the *Argenna* series have been assigned to relatively more genera because of greater differences between the various series. The eight North American genera may be separated by the following key:

KEY TO THE NORTH AMERICAN GENERA OF THE FAMILY DICTYNIDAE

1. Tarsi with one to four trichobothria along dorsal surface; pars cephalica low or of moderate height, with the clypeus narrow, only rarely as high as the diameter of a median or lateral eye 2

   Tarsi without dorsal trichobothria; pars cephalica typically strongly elevated, with the clypeus high, usually equaling one and one-half diameters of a median or lateral eye . 6

2. Anterior median eyes greatly reduced in size or missing; posterior eye row clearly procurved; basal spiral of conductor of male palpus twisted to a dorsal position over the tibia . . . . . *Lathys*

   Anterior median eyes equaling at least two-thirds of the diameter of the lateral eyes; posterior eyes essentially straight, at most weakly procurved; basal spiral of conductor always ventral in position 3

3. Upper margin of the furrow of the chelicera with four or five small teeth; lower margin with four teeth (or three in *saltona*) . . . . . *Tricholathys*

Upper margin with three teeth; lower margin with two or three teeth, or rarely smooth 4

4. Legs with at least a few scattered dorsal, lateral, and ventral spines . . . . *Argennina*
Legs unspined, except occasionally at distal ends of posterior tibiae and metatarsi . . 5

5. Tibial apophysis of male palpus a short excavated spur no longer than the width of segment; for epigyna see figures on plate 1 . . . . . *Argenna*
Tibial apophysis of male palpus a long, curved process about twice as long as the width of the segment (pl. 2, fig. 4; for epigynum of *monticola*, see pl. 2, fig. 5) . . . *Pagomys*

6. Lower margin of the furrow of the chelicera without teeth; femur, patella, and tibia of male palpus greatly thickened; openings of epigynum far forward from the genital groove . . . . . *Thallumetus*
Lower margin of the furrow of the chelicera with one, two, or, rarely, three teeth . . . 7

7. Lower margin of the furrow of the chelicera with two or, rarely, three teeth . *Mallos*
Lower margin of the furrow of the chelicera with a single tooth 8

8. Carapace with a pale marginal band; eyes small and widely separated, the posterior median being fully two diameters or more apart; tibia of male palpus lacking ctenidia; epigynum without lateral foveae . . . . . *Heterodictyna*
Carapace without pale side bands; eyes larger and closer together, the posterior median typically much closer together, rarely as much as one and one-half diameters apart; tibia of male palpus bearing ctenidia, usually on a distinct process; epigynum with lateral foveae . . . . . *Dictyna*

Genus ARGENNA Thorell

Argenna Thorell, 1870, Nova Acta R. Soc. Sci. Upsaliensis, vol. 7, ser. 3, p. 123.

Protadia Thorell, 1898, Histoire naturelle des araignées, vol. 1, p. 239.

Small dictynine spiders usually less than 3 mm. in length. Carapace quite broad and of moderate height, convex, the median groove obsolete. Clypeus subvertical, narrow, scarcely as high as the diameter of an anterior median eye. Anterior eye row slightly procurved, the eyes close together. Posterior eye row slightly procurved, essentially straight, the eyes subequal and subequidistantly spaced. Median ocular quadrangle as broad as or broader than long, narrowed in front, the front eyes smaller. Sternum as long as or somewhat longer than broad, truncated in front, rounded on the sides, narrowed behind to a rounded or conical point which separates the posterior coxae by their width. Labium about as long as broad at the base, two-thirds as high as the apically rounded maxillae which are subparallel or convergent apically. Chelicera about twice as long as broad, with a weak basal carina set with one or two long feathery hairs and a few simple ones. Armature of cheliceral grooves similar in both sexes: upper margin with three teeth of which the middle one is largest; lower margin with two or three teeth. (*Argenna subnigra*, *obesa*, and *patula* with two teeth; *Argenna saphes*, *lorna*, and *prominula* with three teeth.)

Leg formula, 4123. Legs of moderate length, clothed with simple covering hairs and without true spines except for weak ones at distal ends of the tibiae and metatarsi of the posterior legs. First legs of some males armed beneath metatarsi with a series of short truncated setae. Calamistrum in females a distinct series of curved setae set on a weak carina and occupying most of the length of the fourth metatarsus; in males largely aborted. Tarsi and metatarsi with two or three trichobothria, the principal one much longer than the others.

Abdomen suboval, clothed with simple covering hairs. Cribellum a low transverse lobe with narrow, undivided spinning field. Epigynum presenting externally a pair of widely separated, small orifices in shallow atria (*obesa* and *yakima*) or a pair of well-separated oval or round orifices which are deep and conspicuous (*saphes*, *lorna*, *prominula*, and others). Embolus of male palpus a thin spine originating near base of bulb on prolateral side. Conductor of the embolus a conspicuous sclerite lying on retrolateral side of bulb, with a shallow groove in which the embolus lies, and forming at base of bulb a triangular or rounded sheath in which the tip of embolus fits. Tibia of male palpus with a short, excavated, retrolateral apophysis.

Type Species: Of *Argenna*, *A. mengei* Thorell (=*subnigra* O. P.-Cambridge); of *Protadia*, *P. patula* Simon.

Four American species are at present assigned to the genus *Argenna*, which includes for the most part spiders of high mountain or northern range. Our most common species

occurs abundantly in the northern United States and adjacent Canada and also lives in the Rocky Mountains. Two others occur only at high altitudes in the Rocky Mountain states and are still rather uncommon in collections. The fourth species comes from Mt. Ranier, Washington. Five European species are near allies of the American forms.

KEY TO THE AMERICAN SPECIES OF *Argenna*

1. Lower margin of cheliceral furrow with two teeth . . . . . *obesa* Emerton
   Lower margin with three teeth 2
2. Openings of epigynum small; basal piece of conductor a small spiral (pl. 1, figs. 10, 11) . . . . . *yakima*, new species
   Openings of epigynum deep, with carinate margins; basal piece of conductor essentially straight 3
3. Openings of epigynum suboval (pl. 1, fig. 8), separated by little more than the long diameter; basal piece of conductor a long, thin spine (pl. 1, fig. 6) . . *saphes* Chamberlin
   Openings of epigynum round (pl. 1, fig. 12), separated by nearly two full diameters; male unknown . . . . . *lorna*, new species

Argenna obesa Emerton

Plate 1, figures 1–5; text figure 1

Argenna obesa EMERTON, 1911, Trans. Connecticut Acad. Arts Sci., vol. 16, p. 399, pl. 4, figs. 4–4e. BARROWS, 1918, Ohio Jour. Sci., vol. 18, p. 301. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 177; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 503, pl. 102, figs. 1888–1890. HACKMAN, 1954, Acta Zool. Fennica, vol. 79, pp. 9, 92. LEVI AND FIELD, 1954, Amer. Midland Nat., vol. 51, p. 464. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1303. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 1, p. 665.

Argenna aktia CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 25. COMSTOCK, 1940, The spider book, p. 288. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 1, p. 665.

Lathys hesperus CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 14.

DIAGNOSIS: Females vary from 2.1 mm. to 3.4 mm. and average 2.5 mm. in total length. Males average 2.2 mm. in length because of the smaller abdomen. Carapace of an average female, 0.9 mm.; of an average male, 1 mm., long.

The dorsal aspect of the female, with typical coloration pattern, is well illustrated in plate 1, figure 3. The carapace varies from pale yellowish to dark chestnut brown, is darker in the males, and has the usual darker shadings on the pars thoracica. The legs are somewhat paler than the carapace and lack contrasting marks or rings. The abdomen varies from gray to dusky brown and usually presents an indistinct pattern of pale chevrons especially noticeable in the caudal half.

The eyes of the posterior row are very weakly procurved, almost straight, in the females and are straight or even faintly recurved in the males. The eyes of the median quadrangle are subequal in size. The lower margin of the chelicera (pl. 1, fig. 4) bears only two teeth as in the European *subnigra*.

The epigynum (pl. 1, fig. 2) presents a pair of very shallow atria, divided indistinctly by a low median septum, in each of which lies a small opening far to the front and to the side of which are the pair of rather small, internal, seminal receptacles.

The male palpus is illustrated in plate 1, figures 1 and 5. Notable features are the broadly truncated tibial apophysis and the large conductor of the embolus which ends as a curved, pointed spur at the base of the bulb.

TYPE LOCALITIES: Of *Argenna obesa*, male and female cotypes from Ipswich and Plum Island, Massachusetts, and Cold Spring Harbor, Long Island, New York, in the Museum of Comparative Zoölogy; of *Argenna aktia*, west side of Utah Lake near Provo, Utah, male holotype in the American Museum of Natural History; and of *Lathys hesperus*, west side of Utah Lake, male holotype in the American Museum of Natural History. It should be mentioned that a male from Plum Island, Massachusetts, in the Museum of Comparative Zoölogy, is labeled "type" of *Argenna obesa* Emerton, but this designation was not made by Emerton. In the original description of *Lathys hesperus* Chamberlin, the type locality was given as "Utah?." The exact location is indicated above.

DISTRIBUTION: Northern United States and Canada from Newfoundland west to Oregon, southward in the east to southern New Jersey and southern Ohio, southward in the western mountains to southern Utah (see fig. 1).

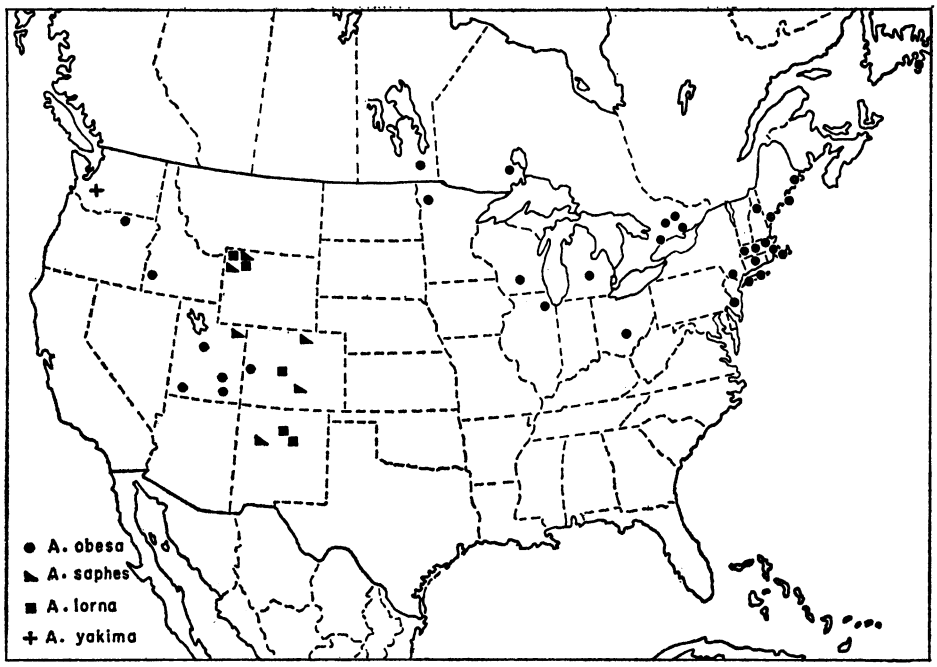


FIG. 1. Distribution of *Argenna*.

SELECTED RECORDS: *Newfoundland*: Grand Bank (Burin), March 8, 1951 (Hackman, 1954), two females. *Saskatchewan*: Lac La Ronge, July 10–22, 1947 (T. B. Kurata), three females. *Ohio*: Rockbridge, June 12, 1915 (W. M. Barrows), one male. *Utah*: Zion National Park, June 9, 1927 (R. V. Chamberlin), one male. *Oregon*: Four miles southeast of Umatilla, November 25, 1940 (W. Ivie), two females.

Argenna yakima, new species

Plate 1, figures 10, 11; text figure 1

Male: Total length, 3.27 mm. Carapace, 1.37 mm. long, 1.10 mm. wide. Abdomen, 1.80 mm. long, 1.20 mm. wide.

Carapace yellow to orange-brown, a little darker on the sides of the head, with faint dusky radiating lines, the eyes ringed with black. Chelicerae dusky yellowish brown. Sternum, labium, and maxillae and appendages quite uniform yellowish, clothed evenly with short, black, covering hairs. Abdomen uniform gray, with faint yellowish tinge, evenly covered with short, procumbent, black hairs.

Carapace of moderate height, convex, narrowed somewhat in front, the width at second eye row being 0.70 mm. Clypeus narrow, equaling not quite a full diameter of the anterior median eye. First eye row slightly procurved as seen from in front, the median eyes separated by about two-thirds of their diameter, scarcely half as far from the subequal lateral eyes. Second eye row very weakly recurved, the median eyes separated by their diameter, about as far from the subequal lateral eyes. Median ocular quadrangle forming a square figure, the eyes subequal in size. Carapace with poorly defined longitudinal median groove and with weak black setae on midline and in eye region. Chelicerae with rounded enlargement at base in front and with the frontal surface finely granulated, set with whitish hairs. Chelicerae with three teeth on the upper margin and three smaller ones opposite them on lower margin; upper margin with a thin keel along inner margin to base. Labium slightly longer (0.27 mm.) than wide (0.24 mm.), broadly rounded at apex and nearly three-fourths as long as the moderately inclined maxillae. Sternum cordate, slightly longer (0.80 mm.) than broad (0.76 mm.), bluntly pointed between the

posterior coxae which are separated by nearly their width.

Leg formula, 4123, all the legs quite thin and unspined except as follows: one weak prolateral spine on first femur; weak ventral spines beneath tibiae and metatarsi of third and fourth legs.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	1.02	1.00	0.90	1.10
Patella	0.44	0.43	0.40	0.44
Tibia	0.91	0.82	0.70	0.99
Metatarsus	0.80	0.80	0.75	1.05
Tarsus	0.50	0.48	0.47	0.55
Total	3.67	3.53	3.22	4.13

Abdomen suboval, about as high as broad. Palpus as illustrated in plate 1, figure 10.

FEMALE: Total length, 4.30 mm. Carapace, 1.35 mm. long, 1.10 mm. wide. Abdomen, 3.15 mm. long, 1.80 mm. wide.

Coloration and structure in close agreement with those of the male. Median ocular quadrangle slightly broader than long (35/30), as wide in front as behind, the front eyes as large as, with the same diameter as, the suboval posterior medians which are separated by fully the long diameter. Chelicerae geniculate at base, stouter than in the male, but with the same armature. Legs somewhat shorter than in the male. First leg: femur, 1.10 mm.; patella, 0.40 mm.; tibia, 0.80 mm.; metatarsus, 0.72 mm.; and tarsus 0.45 mm.; total, 3.47 mm. Tibia and patella of fourth leg 1.30 mm. Abdomen an elongate oval, covered thinly with short black hairs.

Epigynum as illustrated in plate 1, figure 11.

TYPE LOCALITY: Male holotype from White River, 5000 feet, Mt. Ranier National Park, Washington, July 21, 1951 (Lorna and Herbert Levi); female allotype from same locality, July 6, 1938 (W. Ivie).

DISTRIBUTION: Known only from the type locality (see fig. 1).

Argenna lorna, new species

Plate 1, figure 12; text figure 1

FEMALE: Total length, 1.85 mm. Carapace, 0.68 mm. long, 0.61 mm. wide. Abdomen, 1.23 mm. long, 0.85 mm. wide.

Carapace light yellowish brown, with inconspicuous dusky shadings on the pars thoracica, the eyes ringed with black. Chelicerae light yellowish brown. Sternum, maxillae, and labium dusky over a pale yellowish base. Legs quite uniform pale yellowish to yellowish brown, a little darker distally, lighter than the carapace. Abdomen light dusky over a grayish base, the dorsum with a very indistinct pattern of small spots, which form inconspicuous chevrons behind, and a pale patch at apex, the venter uniformly dusky.

Clothing of carapace a few weak black bristles on clypeus and a small patch on midline at posterior declivity. Abdomen evenly set with gray hairs. Structure typical, in very close agreement with the Rocky Mountain *Argenna saphes* and the European *Argenna prominula*. Carapace quite broad, of moderate height, the width at the second eye row two-thirds of the total width, the median groove obsolete. Cypeus sloping, scarcely as high as the diameter of the median eye. Eye group slightly more than half of the width of the head. Anterior eye row a little narrower than the posterior row, the eyes subcontiguous, lying in a slightly procurved line, the dark median eyes two-thirds as large as the lateral eyes. Second eye row weakly procurved, the oval median eyes separated by their short diameter, not quite so far from the subequal lateral eyes. Median ocular quadrangle as broad as long, slightly narrowed in front, the front eyes a little smaller. Sternum longer (0.43 mm.) than broad (0.40 mm.), broadly rounded between the posterior coxae which are separated by their width. Labium about as broad as long (0.15 mm.), two-thirds as high as the apically rounded, subparallel maxillae. Chelicera with three subcontiguous teeth on lower margin, and three separated ones on upper margin as shown in plate 1, figure 12.

Legs clothed evenly with grayish hairs, without true spines except for one or two very weak ventral ones at distal ends of tibiae and metatarsi of the fourth legs. Leg formula, 4123, the first tibia and patella shorter than the carapace. Calamistrum occupying about four-fifths of length of fourth metatarsus, composed of about 12 curved setae set on an inconspicuous carina on retrolateral edge.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	0.48	0.42	0.35	0.48
Patella	0.22	0.20	0.21	0.25
Tibia	0.33	0.28	0.21	0.36
Metatarsus	0.26	0.25	0.24	0.35
Tarsus	0.23	0.23	0.18	0.23
Total	1.52	1.38	1.19	1.67

Abdomen elongate oval, nearly as high as broad. Cribellum a narrow, transverse field without evident median division.

Epigynum as illustrated in plate 1, figure 12. Openings round and deep, separated widely by nearly two full diameters, their transverse width exceeding the width of the sternum.

TYPE LOCALITY: Mt. Washburn, Yellowstone National Park, Wyoming, August 13, 1940 (W. Ivie), female holotype and paratypes.

DISTRIBUTION: Rocky Mountain states from northern Wyoming south into New Mexico (see fig. 1).

KNOWN LOCALITIES: *Wyoming*: Madsen Junction, Yellowstone National Park, June 22, 1938 (W. Ivie), one female paratype. *Colorado:* Virginia Basin, Elk Mountains, 11,500 to 12,000 feet, July 3, 1957 (H. and L. Levi), female paratype from under a stone. *New Mexico:* Lake Peak, northeast of Santa Fe (C. C. Hoff), female paratype. Pecos Baldy, Cowles (C. C. Hoff), two female paratypes.

This small species is closely allied to *Argenna saphes* Chamberlin and *A. prominula* Tullgren. From the former it is readily separated by the proportionately smaller and more widely separated orifices of the epigynum. From the Scandinavia *prominula* it differs in its somewhat smaller size and the smaller epigynal orifices. Tullgren's figure of the epigynum of *prominula* lacks detail and is probably indistinguishable from that given here for the American *lorna*. However, a female of prominula from Finland presents proportional differences in the epigynum.

Argenna saphes Chamberlin

Plate 1, figures 6–9; text figure 1

Argenna saphes CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser. vol. 10, no. 6, p. 6, pl. 1, fig. 1. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1303.

DIAGNOSIS: Females average 2 mm. in total length, with a carapace length of 0.75 mm.

The general appearance, coloration, and structure of this small species are almost exactly as in *lorna*.

The epigynum (pl. 1, fig. 8) presents two very large, deep, suboval openings which are usually separated by about their long diameter.

The male assigned to this species has not heretofore been described, so a diagnosis is given below. There is some possibility that the male should be assigned to *lorna*, inasmuch as both species have been collected together. Seemingly there are no features that make possible the certain assignment to one or the other species, but females of *saphes* are more numerous in the mixed collections.

MALE: Total length, 1.80 mm. Carapace, 0.76 mm. long, 0.66 mm. wide. Abdomen, 1.06 mm. long, 0.68 mm. wide.

Coloration essentially as in the female but somewhat darker. Carapace dusky yellowish brown, with an indistinct dusky marginal seam and a median blackish patch above the obsolete median groove from which radiate indistinct dusky streaks. Abdomen mostly dusky black, the dorsum showing small whitish flecks which form indistinct chevrons, the venter grayish.

Structure essentially as in the female. Carapace narrower in front, the width at the second eye row being 0.38 mm. Clypeus sloping, equal in width to the diameter of the anterior lateral eye.

Leg formula, 4123, the first and fourth pairs subequal in length. First leg stouter than the others, the metatarsus armed beneath with a thin series of about 20 truncated setae.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	0.55	0.50	0.36	0.50
Patella	0.26	0.23	0.22	0.26
Tibia	0.36	0.31	0.23	0.40
Metatarsus	0.36	0.31	0.29	0.41
Tarsus	0.24	0.25	0.20	0.23
Total	1.77	1.60	1.30	1.80

Abdomen proportionaetly narrower than in the female. Calamistrum aborted.

Palpus as illustrated in plate 1, figures 6 and 9.

TYPE LOCALITY: Mirror Lake, Uinta Mountains, Utah, August 18, 1942 (W. Ivie), female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountain states from northern Wyoming south into New Mexico and eastern Utah (see fig. 1).

KNOWN LOCALITIES: *Wyoming*: Bridge Bay, Yellowstone National Park, August 11, 1940 (W. Ivie), three females. Madison Junction, Yellowstone National Park, June 22, 1938 (W. Ivie), males and females. *Colorado*: Rist Canyon (8000 feet), west of Fort Collins, August 2, 1946 (C. C. Hoff), one female, one penultimate male. West Lake Camp Grounds (8100 feet), west of Fort Collins, August 11, 1946 (C. C. Hoff), one female from pine-needle debris. Monarch Pass (12,000 feet) in Sawatch Mountains, July 7, 1952 (H. Levi), one female from alpine zone. *Utah*: See type locality. *New Mexico*: Mt. Taylor (C. C. Hoff), three females and one penultimate male. Just east of Rio Pueblo (C. C. Hoff), one female.

GENUS PAGOMYS CHAMBERLIN

Pagomys CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

Bromella TULLGREN, 1948, Ent. Tidskr. vol. 69, p. 156.

Small dictynine spiders rarely more than 2 mm. in length. Carapace of moderate height, convex, the median groove obsolete. Clypeus sloping, narrow, about equal in height to the diameter of the anterior lateral eye. Eye rows essentially straight and the eyes subequal in size. Front eye row faintly procurved, the eyes close together, the dark, somewhat smaller median eyes separated by about the radius and half as far from the lateral eyes. Posterior eye row straight or slightly procurved, the median eyes separated by about the diameter, a little nearer the subequal lateral eyes. Median ocular quadrangle broader than long, moderately narrowed in front, the anterior median eyes smaller. Sternum nearly as broad as long, bluntly rounded or truncated behind where the hind coxae are widely separated by their width. Labium nearly twice as broad as long, rounded apically, and scarcely half as high as the parallel maxillae. Chelicerae rather short and stout, the claw of moderate length, with a weak basal carina set with two or more long feathery setae and three or four smaller ones. Armature of cheliceral grooves similar in both sexes: upper margin with an inconspicuous long carina on inner margin and two or three separated teeth near tip of the claw; lower margin with three subcontiguous, conical teeth nearly opposite the upper series or unarmed (*lactea*). Legs of moderate length, the first pair more than twice the length of the carapace, clothed with simple setaceous hairs and without true spines. All tarsi with two median trichobothria, the apical one three times as long as the diameter of the segment, the second one half as long; all metatarsi with a similar pair in basal half. Leg formula, 1423. Calamistrum uniseriate, consisting of a short basal line of 10 or more curved setae. Abdomen suboval. Cribellum inconspicuous, a small transverse lobe with narrow, undivided spinning field. Epigynum presenting two small openings on rounded elevations. Tibia of male palpus with a conspicuous apophysis. Embolus a thin spine which encircles the bulb and rests in a small conductor at base of bulb.

TYPE SPECIES: Of *Pagomys*, *P. uinta* Chamberlin (=*monticola* Gerstch and Mulaik); of *Brommella*, *B. notabilis* Tullgren.

Three closely allied species and a somewhat aberrant fourth one are now assigned to the genus *Pagomys* Chamberlin, which appeared somewhat earlier in 1948 than *Brommella* Tullgren and thus has priority. The earliest known species (*P. monticola* Gertsch and Mulaik) occurs at high altitudes in various ranges of the Rocky Mountains. A closely allied species known from only a few female specimens (*P. bishopi*, new species) occurs in the high Sierras. The third species was described as *Brommella notabilis* by Albert Tullgren on the basis of a single male from Bromma, near Stockholm, Sweden. Specimens of the Rocky Mountains *monticola* have now been compared with both sexes of the Swedish species by Ake Holm of Uppsala. He noted several small differences in the shape of the bulb and paracymbium of the male palpus and very apparent differences in the

epigynum. He concluded that the two species were distinctly different.

The fourth species herein referred to *Pagomys* is *lactea*, new species. It differs from the typical representatives in lacking teeth on the lower margin of the cheliceral furrow and in other features noted in the description.

Pagomys monticola Gertsch and Mulaik

Plate 2, figures 1–5

Argenna monticola GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 2, fig. 2.

Pagomys uinta CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15, pl. 3, figs. 34–36.

Pagomys monticola ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1333.

DIAGNOSIS: Females average 2 mm. in total length. Carapace of an average female, 0.8 mm. long, 0.64 mm. wide.

The carapace and appendages are pale yellow to yellowish brown, are sometimes dusky, and the eyes are ringed with black. In alcoholic specimens the abdomen is gray to yellowish and without pattern, but in fresh specimens it is sometimes tinged with green.

The eyes of the front row are straight as seen from in front, and the dark median eyes are only two-thirds of the diameter of the lateral eyes. The posterior row is weakly procurved, and the eyes are subequal in size. The median ocular quadrangle is broader than long (17/14), narrowed in front (17/11), and the anterior eyes are about two-thirds as large. The sternum is nearly as broad as long (50/47). The chelicerae are quite similar in both sexes, and the armature of upper and lower margins of the furrow is shown in plate 2, figures 2 and 3.

The epigynum (pl. 2, fig. 5) is quite simple and presents a pair of small, well-separated openings on a convex plate, which lead to the inner receptacles.

The male palpus (pl. 2, figs. 1, 4) is notable for the strikingly developed tibial apophysis.

TYPE LOCALITIES: Of *Argenna monticola*, Scott Able Canyon, Otero County, New Mexico, female holotype in the American Museum of Natural History; of *Pagomys uinta*, Mirror Lake, Uinta Mountains, Utah, male holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains from southern New Mexico and northern Utah northward to northern Montana.

KNOWN RECORDS: *Montana*: Iceberg Lake (6000 feet) and Cracker Lake (6000 feet), Glacier National Park, July 15 and 16, 1953 (L. and H. Levi), two females from under stones. *Utah*: Mirror Lake (10,500 feet), Uinta Mountains, August 18, 1942 (W. Ivie), males and females; July 28, 1936 (W. Ivie). *New Mexico*: Scott Able Canyon (9000 feet), Otero County, July, 1934 (S. Mulaik), female type of *monticola*.

Pagomys bishopi, new species

FEMALE: Total length, 1.73 mm. Carapace, 0.75 mm. long, 0.55 mm. wide. Abdomen, 1.03 mm. long, 0.76 mm. wide.

Cephalothorax and appendages light yellowish brown, only lightly shaded with dusky, except for the eyes which are ringed with black and enclose a dusky field. Abdomen nearly uniform white. Clothing of entire body quite inconspicuous blackish hairs, of which most have been rubbed off the present specimens.

Structure in close agreement with that of *Pagomys monticola*. Carapace convex, of moderate height, the pars cephalica gently rounded on clypeal margin, narrowed at second eye row to 0.33 mm., about three-fifths of the greatest width, the median groove obsolete. Clypeus sloping, equal in height to the diameter of the dark median eye. Front eye row very slightly procurved, the eyes close together, the median eyes separated by about their diameter, nearer the larger oval lateral eyes. Second eye row straight, the median separated by a little more than the full diameter, two-thirds as far from the somewhat larger lateral eyes, which equal the anterior lateral eyes in size. Median ocular quadrangle broader than long (0.14 mm./0.10 mm.), narrowed in front by the same ratio, the anterior eyes only two-thirds as large as the posterior. Sternum slightly longer (0.44 mm.) than broad (0.41 mm.), widely truncated in front, moderately rounded on the sides, bluntly rounded behind between the fourth coxae which are separated by their width. Labium broader (0.15 mm.) than long (0.07 mm.), broadly rounded apically, and scarcely half as high as the short, parallel maxillae (0.16 mm.). Chelicerae rather short, the claw of

moderate size. Upper margin of chelicera with an inconspicuous carina and two separated teeth near the tip of claw; lower margin with three subcontiguous conical teeth, the basal nearly opposite the apical tooth of upper margin.

Legs clothed with fine black hairs and seemingly lacking true spines. Leg formula, 1423, the first and fourth legs subequal in length. Patella and tibia of first leg slightly shorter than the carapace. Calamistrum consisting of a series of about 10 curved setae situated mostly in basal half of segment.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	0.56	0.50	0.45	0.54
Patella	0.26	0.24	0.20	0.25
Tibia	0.48	0.40	0.34	0.46
Metatarsus	0.38	0.35	0.34	0.48
Tarsus	0.33	0.29	0.27	0.26
Total	2.01	1.78	1.60	1.99

Abdomen suboval, nearly as high as broad. Cribellum a narrow, transverse lobe, without median subdivision.

TYPE LOCALITY: Female holotype, female and two immature paratypes, from the top of Half Dome, 8800 feet, Yosemite National Park, California, May 24, 1936 (S. C. Bishop).

This is a smaller, paler species than *Pagomys monticola*. The eye group is narrower and the median ocular quadrangle proportionately broader.

Pagomys lactea, new species

FEMALE: Total length, 1.45 mm. Carapace, 0.60 mm. long, 0.45 mm. wide. Abdomen, 0.80 mm. long, 0.55 mm. wide.

Cephalothorax and appendages pale yellowish, the eyes narrowly ringed with black. Abdomen white. Clothing of body inconspicuous grayish hairs, most of which are now missing in the rubbed specimen.

Structure and appearance very similar to those of the typical species of *Pagomys*. Carapace longer than broad, moderately convex, the median groove obsolete, the pars cephalica gently rounded along clypeal edge and narrowed at the second eyes to 0.24 mm., less than half of the greatest width of the carapace. Clypeus subvertical, equal in height to one and one-half diameters of an anterior median eye. First eye row straight as seen from in front, the eyes close together, the dark median separated by about the radius, half as far from the slightly larger lateral eyes. Second eye row weakly recurved, the suboval median eyes separated by the short diameter, a little nearer the subequal lateral eyes. Median ocular quadrangle as broad as long, slightly narrowed in front (10/8), the front eyes slightly smaller.

Sternum slightly longer (0.35 mm.) than broad (0.33 mm.), cordate, truncated behind where the hind coxae are separated by their length. Labium only slightly broader than long (0.11 mm./0.10 mm.), subtriangular, narrowly rounded at apex, two-thirds as high as the thin, strongly convergent maxillae. Chelicerae subtriangular, the claw quite short, the upper margin of the furrow with three small teeth near tip of claw, the lower margin without evident teeth.

Legs slender, of moderate length, clothed with pale hairs and seemingly lacking true spines. Leg formula, 1423, the first and fourth legs subequal in length. Patella and tibia of first leg slightly longer than the carapace. Calamistrum consisting of about a dozen curved setae and occupying the middle third of the fourth metatarsus.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	0.54	0.45	0.43	0.54
Patella	0.16	0.16	0.14	0.16
Tibia	0.47	0.37	0.30	0.40
Metatarsus	0.40	0.34	0.32	0.40
Tarsus	0.25	0.23	0.23	0.23
Total	1.82	1.55	1.42	1.73

Abdomen suboval, as high as broad. Cribellum a transverse lobe with narrow, undivided spinning field.

TYPE LOCALITY: Female holotype from Palo Duro Canyon, near Amarillo, Texas, December, 1934 (Dorothea and Stanley Mulaik).

GENUS **ARGENNINA** GERTSCH AND IVIE

Argennina GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 851, p. 2. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 6. ROEWER, 1954, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1303.

Small dictynine spiders, the only known female being 5 mm. in length. Carapace about

two-thirds as broad as long, quite evenly convex, nearly three-fourths as broad in front as the greatest width, the median and cephalic sutures largely obsolete. Clypeus two-thirds as high as the diameter of an anterior median eye. First eye row straight, very weakly procurved as viewed from above, the much smaller median eyes only two-thirds of the diameter of the lateral eyes, separated by scarcely their full diameter, and about half as far from the lateral eyes. Posterior eye row very slightly recurved, essentially straight, the median eyes separated by two-thirds of their diameter, about half as far from the lateral eyes. Median ocular quadrangle broader than long (20/16), narrowed in front (20/14), the anterior median eyes much smaller. Sternum longer than broad, bluntly pointed between the posterior coxae, which are separated by nearly their width. Labium longer than broad, five-eighths as high as the endites. Chelicera moderately stout, about twice as long as broad, with the armature of the groove as follows: upper margin with three teeth of which the middle tooth is largest; lower margin with two equal, moderately separated teeth.

Leg formula, 4123. Legs of average length, clothed with simple covering hairs and armed with a limited number of weak spines as follows: first metatarsus with a single small submedian and a distal spine below; second tibia with two weak prolateral and two single ventral spines; second metatarsus with three single ventral spines, the last one apical; fourth tibia with three or four weak dorsals, two single prolaterals and retrolaterals, and three pairs of ventral spines of which the last is distal. Calamistrum of the single known female poorly developed, consisting of a weak series of curved spines presumed to occupy most of the length of the fourth metatarsus. Tarsi and metatarsi with two or three trichobothria.

Abdomen a long oval, twice as long as broad. Cribellum a transverse lobe nearly as long as broad, without evident division. Epigynum presenting a pair of small, widely separate orifices at the sides of a shallow atrium. Male unknown.

TYPE SPECIES: *Argennina unica* Gertsch and Mulaik.

Without the male, the status of *Argennina* remains somewhat uncertain. It is a very close ally of the European *Devade*, with which it agrees in the possession of a few more leg spines than are found in other genera of this series, in the armature of the cheliceral groove and in general superficial appearance. *Argennina unica* has the anterior median eyes much smaller than the lateral eyes, and the median ocular quadrangle is greatly narrowed in front. In *Devade hirsutissima* the eyes of the median quadrangle are subequal in size and form essentally a square figure.

Argennina unica Gertsch and Mulaik

Plate 2, figure 10

Argennina unica GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 2, fig. 5; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 326. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1303.

DIAGNOSIS: The female type is 5 mm. long. Carapace, 1.2 mm. long, 0.8 mm. wide.

The pale yellowish brown carapace is unmarked except for the dark field enclosed by the eyes. The legs are dull yellowish and lack contrasting markings. The long abdomen is whitish or dull yellow and shows no pattern.

Most of the important structural details are noted in the generic description. The two teeth on the lower cheliceral margin are separated by the basal width of one tooth and are thus closer together than in the European *Devade hirsutissima*.

The epigynum is illustrated in plate 2, figure 10.

The male is unknown. The palpus of the similar *Devade hirsutissima* (pl. 2, fig. 12) is notable for the elongation of the whole segment and relatively smaller size of the tarsal elements.

TYPE LOCALITY: Edinburg, Texas, female holotype in the American Museum of Natural History.

DISTRIBUTION: Only the type is known.

GENUS **TRICHOLATHYS** CHAMBERLIN AND IVIE

Tricholathys CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 26.

Arctella HOLM, 1945, Arkiv för Zool., vol. 36A, no. 15, p. 70.

Small dictynine spiders rarely more than 6 mm. in length. Carapace longer than broad, of moderate height, being not fully half as

high as the width, evenly convex, the pars cephalica broad in front. Clypeus narrow, moderately inclined or subvertical, and equal in height to about the diameter of the anterior median eye. Eyes rather small, the group occupying about half of the width of the head. Front eye row weakly procurved as seen from in front (in a weakly recurved row as seen from above), the slightly smaller dark median eyes separated by about the radius, a little nearer the lateral eyes. Posterior eye row essentially straight, the median eyes separated by about their diameter and about the same distance from the subequal lateral eyes. Median ocular quadrangle slightly broader than long, slightly narrowed in front, the eyes subequal or the anterior eyes somewhat smaller. Sternum cordate, moderately longer than broad, bluntly pointed between the posterior coxae which are separated by less than their full width. Labium longer than broad, somewhat narrowed and rounded at apex, and more than two-thirds as long as the subparallel endites. Chelicerae stout in female, incrassated at base, somewhat longer and apically narrower in the male, the weak carina at base of the claw set with a small series of somewhat feathery setae. Armature of cheliceral groove similar in both sexes: upper margin typically with five teeth, the first on inner side at edge of thin keel, the second larger principal tooth just above, and then a series of three smaller teeth between this one and the base of claw. One of these latter teeth is occasionally missing. Lower margin with four teeth, but the one nearest the base of claw often missing and not infrequently lacking on only one chelicera. Lower margin with only two teeth in *Tricholathys lapponica* Holm of Sweden. Teeth on both margins smaller and more widely spaced in the males.

Leg formula, 4123. Legs of moderate length, clothed with simple hairs and a few weak spines: first and second metatarsi with a median pair and single apical spine beneath; posterior legs with a few ventral and lateral spines; median spines of front metatarsi sometimes missing. Calamistrum a single series of curved bristles occupying the basal three-fifths of the fourth metatarsus. Fourth tarsus with dorsal series of three trichobothria at middle of which the apical one is very much the longest; fourth metatarsus with a similar series above near the apex. Abdomen suboval. Cribellum a transverse lobe with undivided, narrow spinning field. Epigynum presenting externally two shallow, suboval foveae, separated by a low, broad, median septum, in which are located the small atriobusal orifices. Internal epigynum consisting of convoluted tubes and a pair of larger seminal receptacles. Embolus of male palpus a thin spine originating near base of bulb on prolateral side. Conductor of the embolus usually conspicuously coiled at base of bulb. Tibia of male palpus typically broadly angled at apex.

TYPE SPECIES: Of *Tricholathys*, *T. spiralis* Chamberlin and Ivie; of *Arctella*, *A. lapponica* Holm.

The typical species assigned to the genus *Tricholathys* comprise a group of quite uniform appearance largely restricted to the western United States. Outside this range the only species so far known is *Tricholathys* (*Arctella*) *lapponica* Holm (1945, Arkiv för Zool., vol. 36A, no. 15, pp. 70–73, figs. 23a–23g). The very broad, spiraled conductor of this species and the presence of only two teeth, instead of the conventional four, on the lower cheliceral margin suggest that it is a derivative type.

The typical American species are similar in appearance and difficult to separate because of the considerable uniformity of palpal and epigynal features. Two series can be detected on the basis of the epigyna. The first includes *spiralis*, *dakota*, *knulli*, and *jacinto*, in which the openings of the epigynum are relatively large and lead into quite thick tubes forming a quite tight loop (see pl. 3). The palpi of the known species of this group have large, heavy, spiraled conductors. The second series includes *hirsutipes*, *monterea*, *saltona*, *rothi*, *hansii*, and *cascadea*. In the epigyna of these the openings are proportionately smaller, and the thinner internal tubes form much larger loops as typified by figures on plate 4. In the known males the spiral on the conductor is smaller and less conspicuous.

The species *ohioensis* and *reclusa* are placed in *Tricholathys* because of close structural correspondence. In *ohioensis* the palpus (pl. 2,

figs. 6, 8) is strangely modified by elongation of the conductor and embolus of the palpus. The tip of the conductor forms a short hook.

Tricholathys spiralis Chamberlin and Ivie

Plate 3, figures 1–5; text figure 2

Tricholathys spiralis CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 28, pl. 13, figs. 100–105. LEVI AND LEVI, 1951, Zoologica, vol. 36, pt. 4, p. 235. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4.

DIAGNOSIS: Females vary from 3.3 mm. to 5.5 mm. and average 4.4 mm. in total length. Carapace of an average female, 1.8 mm. long. Males about the same size as the females, averaging 4.0 mm. in length.

The carapace is yellowish to orange-brown and has dusky shadings on the pars thoracica. The chelicerae are light to dark chestnut brown, darkest in the males. The legs are light yellowish brown and lack contrasting rings or spots. The abdomen varies from dark gray to dusky brown, is darkest in the males, and presents a poorly marked pattern of dark and light chevrons. The general appearance is essentially the same as shown for *jacinto* (pl. 5, figs. 1, 2).

The frontal view of the head and chelicerae is shown in plate 3, figure 2. The eyes of the posterior row are very slightly procurved, and the median eyes are separated by somewhat more than their diameter. The armature of the chelicerae is as follows: the upper margin with five teeth, the fifth being at the edge of the inner carina; the lower margin with four subequal teeth, but one of these is frequently missing. The chelicera of the female is basally geniculate and is shorter and proportionately stouter than that of the male.

The epigynum (pl. 3, fig. 3) is characterized by the very large, shallow atria, which are divided by a narrow septum, and the quite large openings which lead into thick tubules which form a loop.

The palpus (pl. 3, figs. 1, 5) features a very long, coiled, apical portion of the conductor.

TYPE LOCALITY: The west side of Utah Lake, near Provo, Utah, male holotype in the American Museum of Natural History.

DISTRIBUTION: Western United States from eastern Colorado and northern Wyoming through Utah into northern California, Oregon, and Washington (see fig. 2).

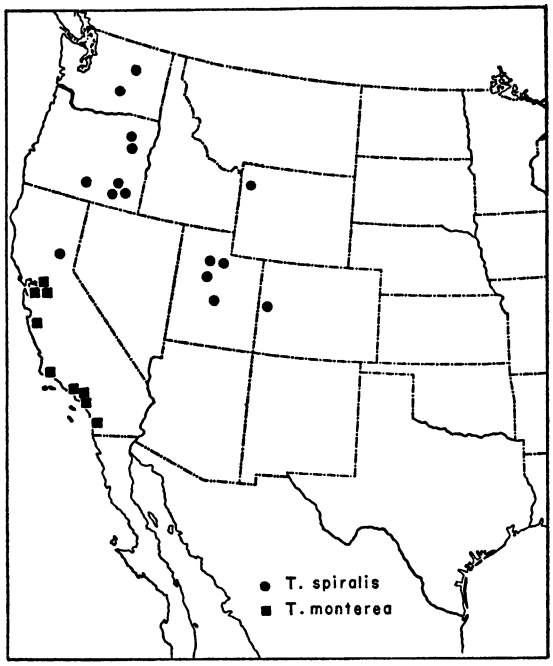


FIG. 2. Distribution of *Tricholathys spiralis* and *monterea*.

SELECTED RECORDS: *Colorado*: Grand Junction, June 17, 1940 (W. Ivie), one male, two females. *Wyoming*: Near Gros Ventre Slide, Moose, July 26, 1950 (H. Levi), one male. *Washington*: Whiskey Dick Canyon, 5 miles north of Vantage, Kittitas County, August 4, 1954 (B. Malkin), two males, five females; Coulee City, July 12, 1938, (W. Ivie), male, two females. *Oregon*: Tencent Lake, Harvey County, July 18, 1940 (W. M. Pearce), three females.

Tricholathys dakota, new species

Plate 3, figure 7

FEMALE: Total length, 5.00 mm. Carapace, 1.75 mm. long, 1.35 mm. wide. Abdomen, 2.50 mm. long, 1.80 mm. wide.

Coloration and structure in very close agreement with those of *spiralis*, except for the epigynum (pl. 2, fig. 7) in which the atria are proportionately smaller and more widely separated by a broad septum.

TYPE LOCALITY: Female holotype from under rock in sand near shore of West Lake (8000 feet), northwest of Fort Collins, Colorado, July 21, 1946 (C. C. Hoff).

OTHER LOCALITIES: *North Dakota*: Divide County, 1937–1938 (Joe Davis), female paratype. *Colorado*: Summit Lake near Mt. Evans (12,800 feet), August 17, 1952 (B. Malkin and V. E. Thatcher), one male in penultimate stage, probably this species.

Tricholathys knulli Gertsch

Plate 3, figure 6

Tricholathys knulli GERTSCH, 1936, Amer. Mus. Novitates, no. 851, p. 1, fig. 1. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 326. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Total length of the only known female, 3.5 mm. Carapace, 1.25 mm. long, 0.85 mm. wide.

The coloration and structure are almost exactly as in *spiralis*. The dorsum of the abdomen is pale grayish and shows only faint traces of chevrons in the caudal half. The chelicera bears four small teeth on the lower margin of the furrow. The posterior eye row is very weakly procurved, and the median eyes are separated by scarcely the full diameter.

The epigynum (pl. 3, fig. 6) is quite similar to that of *spiralis* and that of *dakota* and features relatively large openings and quite thick tubules that form a small loop on each side. The much smaller atria and greater separation of these atria by a very broad median septum are diagnostic features.

TYPE LOCALITY: Brownsville, Texas, June 1, 1934 (J. N. Knull), female holotype in the American Museum of Natural History.

Tricholathys jacinto, new species

Plate 3, figures 8–12; plate 5, figures 1, 2

FEMALE: Total length, 4.80 mm. Carapace, 1.85 mm. long, 1.35 mm. wide. Abdomen, 3.00 mm. long, 1.80 mm. wide.

Carapace bright orange-brown, somewhat dusky on the sides, with dusky radiating lines from median groove, a dusky marginal seam, and the eyes ringed with black. Sternum and maxillae orange-brown, the labium and chelicerae dusky orange-brown. Legs yellow to orange-brown, somewhat dusky but without well-marked rings or stripes. Abdomen dusky to black, with a light purplish cast, the dorsum with faintly indicated paler chevrons, the venter uniformly dusky. Dorsal view of female as shown in plate 5, figure 2.

Structure typical, in close agreement with that of *Tricholathys spiralis*. Clothing of the carapace sparse, the midline with a series of erect black setae running from the obsolete median groove to the eyes, the pars cephalica with suberect black covering setae and several longer setae on the clypeus. Clypeus low, equal in height to the diameter of an anterior median eye. Eyes typical, with both rows essentially straight and the eyes subequal in size. Posterior median eyes separated by the full diameter, a little farther from the slightly larger lateral eyes. Anterior eye row weakly procurved as viewed from in front. Median ocular quadrangle broader than long (0.25 mm./0.22 mm.), narrowed in front in the same ratio, the eyes subequal in size. Chelicerae (pl. 3, fig. 11) with rounded enlargement at base, moderately roughened on frontal surface, set with a few long hairs, the lower margin with four teeth quite close together, of which the innermost one is largest, and the upper margin with four teeth in typical arrangement, the innermost one set on edge of the inner carina. Labium longer (0.42 mm.) than wide (0.35 mm.), narrowed at apex where it is broadly rounded, more than two-thirds as long as the parallel endites (0.60 mm.). Sternum cordate, longer (1.02 mm.) than broad (0.87 mm.), the sternum bluntly pointed and separating the hind coxae by half of their width.

Leg formula, 4123, the legs rather thinly clothed with fine black hairs and spined as follows: first and second metatarsi with median pair and single apical spine beneath; third tibia with a prolateral, a retrolateral, and a ventral pair, all apical in position; third metatarsus with two ventral pairs, two single prolaterals, and an apical retrolateral spine at apex; fourth metatarsus with two singles and an apical pair beneath and with a prolateral and a retrolateral spine at apex. Calamistrum occupying basal three-fifths of fourth metatarsus. Fourth tarsus with three trichobothria in median position, the most apical longest; fourth metatarsus with a similar series at apex.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	1.35	1.12	1.02	1.30
Patella	0.60	0.55	0.50	0.65
Tibia	0.99	0.78	0.55	1.02
Metatarsus	0.87	0.81	0.75	1.10
Tarsus	0.50	0.50	0.45	0.55
Total	4.31	3.76	3.27	4.62

Abdomen an elongate oval, about as high as broad, clothed evenly with subprocumbent black hairs.

Epigynum as illustrated in plate 3, figure 8, the external orifice and tube large in size.

MALE: Total length, 3.50 mm. Carapace, 1.70 mm. long, 1.30 mm. wide. Abdomen, 2.00 mm. long, 1.15 mm. wide.

Appearance and coloration essentially as in the female. Abdomen nearly black above, with indistinct grayish chevrons, the venter dusky gray. Dorsal view of male shown in plate 5, figure 1.

Structure essentially as in the female. Eye group somewhat smaller, occupying only half of the width of the head. Abdomen much smaller. Legs proportionately longer but spined as in the female. Leg formula, 1423, the first and fourth pairs subequal in length.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	1.42	1.20	1.05	1.35
Patella	0.59	0.51	0.50	0.63
Tibia	1.20	0.90	0.68	1.12
Metatarsus	1.10	0.90	0.85	1.26
Tarsus	0.63	0.53	0.45	0.55
Total	4.94	4.04	3.53	4.91

Palpus as illustrated in plate 3, figures 9 and 12.

TYPE LOCALITY: Male holotype, female allotype, and male and female paratypes from Idyllwild, San Jacinto Mountains, Riverside County, California, June 18, 1952 (W. J. Gertsch).

DISTRIBUTION: Known only from Riverside and Monterey counties, California.

OTHER RECORD: *California*: Hastings Natural History Reservation, Monterey County, June 2, 1945 (J. Linsdale), female paratype.

Tricholathys hirsutipes Banks

Plate 4, figures 1–3

Lathys hirsutipes BANKS, 1921, Proc. California Acad. Sci., ser. 4, vol. 11, p. 100, fig. 2. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 3, p. 2359.

Tricholathys hirsutipes ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Twenty females vary from 3.2 mm. to 5.5 mm. and average 4.2 mm. in total length. Carapace of an average female, 1.8 mm. The males average 3.8 mm. in length.

The carapace varies from pale yellow to quite dark orange or chestnut brown and may be quite dusky, especially on the pars cephalica. The legs are somewhat paler brown, with some duskiness, but lack contrasting rings or spots. The chelicerae, which are basally enlarged, are dark chestnut brown. The oval abdomen varies from pale grayish to dusky brown and in darker specimens shows a pattern of faint pale and dusky chevrons.

The structure is very similar to that of *spiralis* and related species. The carapace is broader in front and more convex, and the eye group thus is proportionately smaller. The posterior eye row is essentially straight in most specimens but may be very slightly recurved. The eyes are somewhat smaller, and the posterior median eyes are separated by nearly one and one-half times their diameter. The chelicerae are typically armed on the lower furrow with four teeth, but five may be present, and occasionally there is reduction to three or even two teeth on one or both chelicerae.

The epigynum (pl. 4, fig. 2) features two relatively small, widely separated atria, between which lies a very broad septum. The openings are rather small and open into thin tubules which form a broad loop.

The palpus (pl. 4, figs. 1, 3) is similar to that of *monterea* and has the apical portion of the conductor developed into a small spiral.

TYPE LOCALITY: Sacramento, California, May 27, 1918 (H. Van Duzee), male holotype in the California Academy of Sciences.

DISTRIBUTION: Central and northern California from Mono County northward in the mountains to Jackson County, Oregon.

KNOWN RECORDS: *California:* Twenty-five miles north of Susanville on Pine Creek road, July 2, 1940 (W. M. Pearce), one male, females. McArthur, June 29, 1940 (W. M. Pearce), three females. Healdsburg, May 15,

1938 (H. B. Leech), one female. Benton, Mono County, May 14, 1942 (W. M. Pearce), one male, two females. *Oregon:* Siskiyou Summit (4500 feet), Jackson County, July 5, 1951 (B. Malkin), one female.

Tricholathys saltona Chamberlin

Plate 4, figures 9–11

Tricholathys saltona CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 17, pl. 4, fig. 38. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Females average 2.5 mm. and have the carapace 1.0 mm. long. The males average slightly smaller, 2.25 mm.

This is a smaller, paler species than *hirsutipes*. The yellowish or pale brown carapace has the pars thoracica more or less dusky. The legs are yellowish. The abdomen varies from whitish to quite dusky and has an indistinct pattern of dusky chevrons in well-marked specimens.

The carapace is of moderate breadth and not strongly rounded in front as in *hirsutipes*. The eye group occupies five-eighths of the head width and the eyes are of average size and quite close together, the posterior median eyes being separated by about the full diameter. The posterior eye row is straight. The chelicerae in most instances bear only three teeth on the lower margin of the furrow, but four, the typical number, are occasionally present.

The epigynum (pl. 4, fig. 10) is essentially identical with that of *hirsutipes* but presents small differences in the shape and size of the atria and the general proportions of the whole epigynum.

The palpus (pl. 4, figs. 9, 11) is similar to that of *hirsutipes*.

TYPE LOCALITY: Fish Springs, west side of Salton Sea, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from the type locality.

Tricholathys monterea, new species

Plate 4, figures 4–6; text figure 2

FEMALE: Total length, 2.70 mm. Carapace, 1.15 mm. long, 0.96 mm. wide. Abdomen, 1.70 mm. long, 1.10 mm. wide.

Carapace shining dark brown, the pars thoracica varied with black radiating lines, the clothing very sparse, consisting of a few erect black setae, the eye tubercles black. Chelicerae dark brown. Sternum and labium dusky brown, the coxae and appendages yellowish brown, with dusky shadings. Abdomen gray to black, the dorsum varied with numerous tiny pale spots, covered rather thinly with procumbent gray hairs, the venter paler gray.

Structure typical, essentially as in *hirsutipes* and *saltona*. Carapace evenly convex, broad in front, the head three-fourths as broad as greatest width, the median groove obsolete. Clypeus sloping, equal to two-thirds of the diameter of a median eye. Eye group small, equal to half of the width of head at second eye row, the front row slightly procurved, the median eyes separated by a radius, half as far from the lateral eyes which are larger in the ratio of 10/8. Posterior eye row straight, the median eyes separated by a diameter, as far from the subequal lateral eyes. Median ocular quadrangle broader than long (23/19), narrowed in front in the same ratio; the front eyes slightly smaller. Subequal lateral eyes separated by one-third of the diameter.

Chelicera with four teeth on lower margin. First leg: femur, 0.86 mm.; patella, 0.36 mm.; tibia, 0.66 mm.; metatarus, 0.65 mm.; and tarsus, 0.33 mm. long. Tibia and patella of fourth leg, 1.10 mm. long.

Epigynum as illustrated in plate 4, figure 4.

MALE: Total length, 3.16 mm. Carapace, 1.40 mm. long, 1.08 mm. wide. Abdomen, 1.75 mm. long, 1.12 mm. wide.

Coloration and structure in close agreement with those of the female. First leg: femur, 1.15 mm.; patella, 0.45 mm.; tibia, 0.96 mm.; metatarsus, 0.85 mm.; and tarsus, 0.53 mm. Tibia and patella of fourth leg, 1.40 mm. long. Chelicera geniculate at base, longer than in female, curved outward and narrowed apically, the lower margin with four teeth more distantly located from base of thinner fangs.

Palpus as illustrated in plate 4, figures 5 and 6.

TYPE LOCALITY: Male holotype and female allotype from under rock on volcanic hill. Hastings Natural History Reservation, Monterey County, California, March 28, 1946 (J. Lindsdale).

DISTRIBUTION: Coastal range area of California from San Francisco region south to San Diego County (see fig. 2).

KNOWN RECORDS: *California:* Woolsey Canyon, Berkeley, April 6, 1941 (B. E. Sagal), two females. Lafayette, May 9, 1945 (E. G. Linsley), one male. Orinda, Contra Costa County, May 3, 1938 (H. B. Leech), one male. Gaviota, May 18, 1936 (S. C. Bishop), two females. Long Beach, May 15, 1936 (S. C. Bishop), one female. Three miles west of Santa Monica, March 17, 1941 (W. Ivie), penultimate male, immature female. Glendale, May 16, 1944 (E. I. Schlinger), one female. Ocean Beach, La Jolla, May 10, 1936 (S. C. Bishop), two males, two females. Beverly Glen Canyon, Santa Monica Mountains, May 24, 1952 (R. X. Schick), one male.

Tricholathys hansii Schenkel

Argennina hansii SCHENKEL, 1950, Verhandl. Naturf. Gesell. Basel, vol. 61, p. 31, figs. 4a–5b.
Tricholathys hansii ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Total length of male type, 2.3 mm. Carapace, 1.1 mm. long, 0.8 mm. wide.

The position of *hansii* among the known species is difficult to assign in spite of a relatively long and detailed description. The small size and differences in coloration suggest that it is distinct from *monterea*, even though it occurs within the range of that species.

TYPE LOCALITY: Berkeley Hills, California, April 23, 1939, male type in the Schenkel collection (presumably in the Naturhistorischen Museum, Basel, Switzerland).

DISTRIBUTION: Known only from the type locality.

Tricholathys rothi, new species

Plate 4, figures 7, 8; plate 5, figure 3

MALE: Total length, 2.75 mm. Carapace, 1.27 mm. long, 0.98 mm. wide. Abdomen, 1.50 mm. long, 1.05 mm. wide.

Carapace dusky brown to black, with distinct black radiating lines, darkest on the sides. Sternum and labium dusky brown, the endites paler. Chelicerae dusky brown, with long black hairs. Legs dusky yellowish brown, with black hairs. Abdomen nearly black above, with a very faint pattern of indistinct pale chevrons, and dusky below.

Structure in close agreement with that of *Tricholathys monterea.* Eye group equal to four-sevenths of width of head at second eye row. Posterior median eyes separated by scarcely the full diameter. Median ocular quadrangle slightly broader than long (25/22), narrowed in front by the same ratio. Chelicerae of typical size and dentition. First leg: femur, 0.95 mm.; patella, 0.42 mm.; tibia, 0.80 mm.; metatarsus, 0.70 mm.; and tarsus, 0.47 mm.; total, 3.34 mm. Tibia and patella of fourth leg, 1.25 mm.

Palpus as illustrated in plate 4, figures 7 and 8.

FEMALE: Total length, 3.10 mm. Carapace, 1.40 mm. long, 1.06 mm. wide. Abdomen, 1.75 mm. long, 1.25 mm. wide.

Coloration somewhat lighter than in the male. Carapace dusky brown. Abdomen blackish, with indistinct pattern of small pale spots, the venter dusky.

Structure of carapace and eye relations similar to those of male. Legs proportionately shorter. First leg: femur, 0.92 mm.; patella, 0.42 mm.; tibia, 0.70 mm.; metatarsus, 0.67 mm.; and tarsus, 0.47 mm.; total, 3.10 mm. Tibia and patella of fourth leg, 1.20 mm.

Epigynum as illustrated in plate 5, figure 3. Atria large in size, separated by a broad septum.

TYPE LOCALITY: Male holotype from Independence, Oregon, May 13, 1951 (V. Roth).

DISTRIBUTION: Western Oregon.

KNOWN RECORDS: *Oregon:* Eugene, August, 1946 (B. Malkin), female allotype; Eugene, May, 1947 (B. Malkin), female paratype; Peavine Ridge, near McMinnville, November, 1946 (K. M. Fender), female paratype; Bay City, August 4, 1929 (R. V. Chamberlin), two female paratypes.

Tricholathys cascadea, new species

Plate 5, figure 4

FEMALE: Total length, 2.00 mm. Carapace, 0.80 mm. long, 0.60 mm. wide. Abdomen, 1.20 mm. long, 0.75 mm. wide.

Carapace pale dusky yellow, lightest above, the sides with dusky radiating lines, a narrow marginal seam, and a median W-shaped blackish figure in front of obsolete

median groove. Eyes ringed with black. Sternum dusky over a pale whitish base. Legs pale yellowish, lightly shaded with dusky, clothed with fine grayish hairs. Abdomen almost uniform dusky gray above, with very faint, narrow, pale chevrons behind, the venter whitish.

Carapace of moderate height, convex, the width of the head at the second eye row, 0.38 mm. Clypeus vertical, narrow, equaling only the radius of the anterior median eye. Dark median eyes of lightly procurved front row slightly smaller than the lateral eyes. Second eye row straight, the median eyes separated by almost the full diameter, a little nearer the equal lateral eyes. Median ocular quadrangle slightly broader than long (16/15), narrowed in front (16/14), the front eyes somewhat smaller. Sternum longer (0.50 mm.) than broad (0.42 mm.). Chelicerae typically armed, the four teeth on the lower margin distinct.

Front pairs of legs without true spines and those on the posterior legs weakly developed. First leg: femur, 0.50 mm.; patella, 0.23 mm.; tibia, 0.40 mm.; metatarsus, 0.30 mm.; and tarsus, 0.27 mm.; total, 1.70 mm. Tibia and patella of fourth leg, 0.66 mm.

Abdomen oval, nearly as high as broad, clothed evenly with grayish hairs.

Epigynum as illustrated in plate 5, figure 4.

TYPE LOCALITY: Female holotype from Fly Lake, Jefferson County, Oregon, April 21, 1952 (Vincent Roth).

Tricholathys ohioensis Chamberlin and Ivie

Plate 2, figures 6–8

Argenna ohioensis CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 26, pl. 12, figs. 92–94. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 503. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 1, p. 665.

Tricholathys ohioensis CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 17. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Three females average 2.2 mm. in total length and have a carapace length of 0.75 mm. Two males are 1.7 mm. and 1.9 mm. long, and the latter, the type, has the carapace 0.94 mm. long.

The carapace is light yellowish brown and has the sides dusky and marked with the usual radial streaks. The legs are dusky yellowish brown. The abdomen varies from gray to blackish and shows no definite pattern.

The structure of this species is essentially the same as in the more typical species. The carapace is of moderate height and is about seven-tenths as wide in front at the eyes as the greatest width. The clypeus is low and equals scarcely the diameter of the anterior median eye. The dark anterior median eyes are equal to only about two-thirds of the diameter of the large lateral eyes. The posterior eye row is straight, and the median eyes are separated by the diameter or nearly so. The median ocular quadrangle is broader than long (25/22), considerably narrowed in front (25/16), and the anterior eyes are very much smaller. The lower margin of the cheliceral furrow bears four small teeth.

The epigynum (pl. 2, fig. 7) presents two shallow atria, which are very widely separated, and a series of small tubules which lead into small oval receptacles.

The male palpus (pl. 2, figs. 6, 8) is quite distinct from that of typical members of the genus. The conductor of the embolus is extended forward into a thin loop which projects far beyond the cymbium. The basal piece of the conductor is a short, curved spur.

TYPE LOCALITY: Columbus, Ohio, male holotype in the American Museum of Natural History.

DISTRIBUTION: Northeastern states westward to Ohio and Nebraska.

KNOWN LOCALITIES: *Connecticut:* Shelton, March 13, 1936 (Kaston, 1948). *Massachusetts:* Provincetown, Cape Cod, September 10, 1910, one subadult female on beach under straw. *New Jersey:* Ramsey, July, 1939 (W. J. Gertsch), one female. *Ohio:* Columbus (W. M. Barrows), male holotype. *Nebraska:* Lincoln, May 6, 1939 (E. Fichter), one male; Lincoln, July 5, 1938 (E. Fichter), two females.

Tricholathys reclusa Gertsch and Ivie

Plate 2, figure 9

Argennina reclusa GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 3, figs. 19–20. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser.,

vol. 10, no. 6, p. 6. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 1, p. 667.

DIAGNOSIS: Three females are 2.1 mm., 1.6 mm., and 2.47 mm. long. The last, the type, has the carapace 0.9 mm. long and 0.7 mm. wide.

The carapace is very pale yellowish brown and has the eyes narrowly ringed with black. The legs are whitish and unmarked. The abdomen is gray to dusky yellowish and lacks any distinctive pattern.

The eyes of the first row are essentially straight, are subcontiguous, and the median eyes are about eight-elevenths of the diameter of the lateral eyes. The posterior row is straight, and the median eyes are separated by the diameter. The median ocular quadrangle is broader than long (0.4/10) and narrowed in front (14/9) and the anterior median eyes are only slightly smaller. The lower margin of the cheliceral furrow bears four small subcontiguous teeth.

The epigynum (pl. 2, fig. 9) is quite typical for the genus, with widely separated atria and a pattern of long, coiled tubules usually visible through the integument.

The adult male is unknown, but a male in the penultimate stadium, referred with reasonable certainty to this species, has the tarsal element considerably prolonged. This suggests that the developed palpus may be modified somewhat after the fashion of the palpus of *ohioensis*.

TYPE LOCALITY: Ten miles north of Cove Fort, Utah, in the American Museum of Natural History.

DISTRIBUTION: Utah and Arizona.

OTHER LOCALITIES: *Arizona:* Oak Creek Canyon, about 20 miles south of Flagstaff, 1935 (W. Ivie), two females. Four miles southeast of Ruby, September 5, 1950 (W. J. Gertsch), one male in penultimate stage, probably this species.

GENUS LATHYS SIMON

Lethia MENGE, 1869, Schr. Naturf. Gesell. Danzig, vol. 2, p. 249 (name preoccupied by Hübner in Lepiodoptera in 1816).

Lathys SIMON, 1884, Bull. Soc. Zool. France, vol. 9, p. 321, footnote (new name for *Lethia* Menge); 1892, Histoire naturelle des araignées, vol. 1, pp. 231–237, 240; 1914, Les arachnides de France, vol. 6, pt. 1, pp. 34, 44–47, 61–62. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 1. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, pp. 1327–1330. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 3, p. 2358.

Scotolathys SIMON, 1884, Bull. Soc. Zool. France, vol. 9, p. 321; 1892, Histoire naturelle des araignées, vol. 1, pp. 231, 233, 235, 243; 1914, Les arachnides de France, vol. 6, pt. 1, pp. 34, 47, 62. DE DALMAS, 1916, Ann. Soc. Ent. France, vol. 85, pp. 251–255. BRYANT, 1943, Psyche, vol. 50, pp. 83–86. KASTON, 1945, Amer. Mus. Novitates, no. 1292, pp. 3, 4. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

Neophanes MARX, 1891, Proc. Ent. Soc. Washington, vol. 2, p. 6.

Prodalia MARX, 1891, Proc. Ent. Soc. Washington, vol. 2, p. 7. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15.

Dictyolathys BANKS, 1900, Proc. Acad. Nat. Sci. Philadelphia, p. 534. BRYANT, 1943, Psyche, vol. 50, pp. 83–86.

Small to average dictynine spiders varying from 1.25 mm. to 3.50 mm. in length. Carapace moderately high, convex, the height equal to about three-fourths of the width, the median groove obsolete. Clypeus very narrow, equaling about the radius of an anterior lateral eye. Front eye row essentially straight, the median eyes small, minute, or entirely missing. Posterior eye row slightly to moderately procurved, the eyes subequal in size and subequidistantly spaced. Median ocular quadrangle in eight-eyed species somewhat broader than long, greatly narrowed in front, and the anterior median eyes very much smaller. Eyes quite widely spaced in some species (*alberta*), but typically the triads of large eyes quite close together. Sternum nearly as broad as long, bluntly truncated between the posterior coxae which are separated by their width. Labium broader than long, about half as high as the subparallel maxillae. Chelicerae rather short, moderately stout, without basal enlargements or spurs, clothed with simple hairs and long feathery setae on the fang groove. Armature of chelicerae similar in both sexes: upper margin with four principal teeth near tip of claw, the innermost pair best developed, the ones near the base of the fang small and occasionally absent. Lower margin with a file of three to six subcontiguous teeth nearly opposite the upper series. Legs of moderate length, the first and fourth pairs longer and

subequal, the clothing simple hairs. All tarsi with a submedian trichobothrium and the metatarsi with a subapical series of two trichobothria (three in *alberta*), of which the apical one is more than twice as long as the diameter of the segment. Leg formula, 1423. Calamistrum uniseriate, consisting of 15 or more curved setae set on a weakly angled ridge, and running the full length of the segment. Abdomen suboval. Cribellum a transverse lobe, with entire spinning field. Epigynum presenting two small openings on an essentially flat plate, only rarely lying in a shallow atrium. Patella and tibia of male palpus in some specimens with apical or lateral carinae or spurs. Embolus a thin spine which margins the bulb and lies in a spiraled or twisted, dorsally directed conductor resembling a screw.

TYPE SPECIES: Of *Lethia*, *L. varia* Menge; of *Lathys*, *Lethia varia* Menge (=*Ciniflo humilis* Blackwall); of *Scotolathys*, *S. simplex* Simon; of *Neophanes*, *N. pallidus* Marx; of *Prodalia*, *P. foxi* Marx; and of *Dictyolathys*, *D. maculata* Banks.

The genus *Lathys* was discussed by Gertsch in 1946 (Amer. Mus. Novitates, no. 1319, pp. 1–3), and reasons were given for regarding *Scotolathys* as constituting only a species group within it. The species are bound together by distinctive genitalic features that demand disregard of other morphological changes. Even in the small American fauna are found intergrades between the two groups. The following notes have been excerpted from the above paper:

"The status of the genus *Scotolathys* has been discussed by Comte de Dalmas, E. Bryant, B. J. Kaston, and others listed in the synonymies above. The genotype, *Scotolathys simplex* Simon, comes from Algiers, and the eyes and other features are well shown by Simon in his 'Histoire naturelle des araignées.' *Scotolathys* differs from *Lathys* only in the loss of the anterior median eyes, though vestiges are retained in some of the species, such as *heterophthalma* and *delicatula*, already admitted to the former genus. As a consequence of this loss of eyes and the shifting together of the two triads, there is an exaggeration of the procurvature of the posterior row. Although no material of this group from Europe or Africa has been available for study, there seems no reason to believe that the American species are not fully congeneric. The discovery of males of *simplex*, *heterophthalma*, *simplicior*, and other exotic species will doubtless disclose that the palpi are similar in pattern to those of the species of *Lathys*. In this paper *Scotolathys* is considered a synonym of *Lathys*. . . .

"The various American species of *Lathys* illustrate in a very graphic manner the stages in reduction in size and final loss of the anterior median eyes and the gradual approximation of the triads of eyes. At one extreme we have *Lathys alberta* (=*pallida* Emerton) which has an eye formula similar in a general way to species of *Dictyna*. The front eyes [the present paper, pl. 6, fig. 3] are rather widely separated, the median being a full diameter apart, and the median eyes are not strikingly reduced in size. The posterior row is weakly procurved, and the eyes are well separated by a full diameter. In *dixiana*, which is similar in size and general appearance to *alberta*, we find the anterior median eyes reduced in size [the present paper, pl. 5, fig. 12], and the posterior eyes near together, separated by a little less than the full diameter. Much the same formula is to be found in *Lathys coralynae* Gertsch and Davis of Mexico. A further change is evident when we study the eye formula of *foxi* [the present paper, pl. 7, fig. 3]. The plainly evident median eyes are now only slightly separated and even nearer the large lateral eyes. The procurvature of the posterior row is accentuated by the nearness of the eyes. In *delicatula* of Texas [the present paper, pl. 7, fig. 7] we find a changeable condition as regards the median eyes in that they may be present or absent in examples from the same series. About half the specimens show only six eyes, but in the remainder the tiny median eyes are clearly evident. They are quite variable in size from well-formed eyes with a light cornea to mere pigmental vestiges. Not infrequently only one is present, the other side being completely without indication of the missing one of the pair.

"In such species as *maculina* (=*maculata* Banks), *pallida*, and *albida* (=*alba* Chamberlin and Ivie) the six-eyed condition has been

fully attained. The two triads of eyes [the present paper, pl. 6, fig. 3] are close together, and the procurvature of the posterior row of eyes is quite striking. . . .

"The genitalia of the American species of *Lathys* are of the same general type as is found in *Dictyna*. The broad patella has the apical or lateral margins modified into rounded or angled carinae, but in no case is a prominent spur present as in some European species. The tibia is broader than long and is remarkable not for its apophyses, which when present are rather insignificant spurs, but for a striking modification of the prolateral and dorsal surface into a groove or depression which receives the spiraled portion of the embolic division of the palpus. . . . In dorsal view the [tip of the embolus] is visible as a straight or coiled spur lying on the [dorsum of the] tibia. This spur has been [incorrectly] described by various authors as a process of the tibia. . . . The bulb of the palpus is suboval in shape and shows no prominent processes on its surface. The embolic division originates from the bulb at the base as a broad, triangular plate which narrows and twists around the modified cymbium and tibia on the retrolateral side, and ends as a twisted and pointed spine. The embolus is an intimate part of this division, is sheathed by the twisted conductor or seemingly fused with it into a single unit. In this connection it can be noted that in *Dictyna* the embolus is always discretely separate from the conductor, although the distal portion may almost lose its identity in the complicated folds of the conductor. The details of the palpus are remarkably constant throughout the series of species now placed in this genus.

"The epigynum of the female is a sclerotized plate which may be flat or convex, is often lightly grooved or depressed, and presents two separate atriobursal orifices. The character of these orifices and the details of the tubules and receptacles visible through the integument are important in the differentiation of the species. In *dixiana* there is a well-marked atrium in which the orifices lie. In *alberta* the orifices are two rather large, separate, round openings on the flat surface. In *maculina* and related species the openings are inconspicuous and are set in a very slightly depressed atrium."

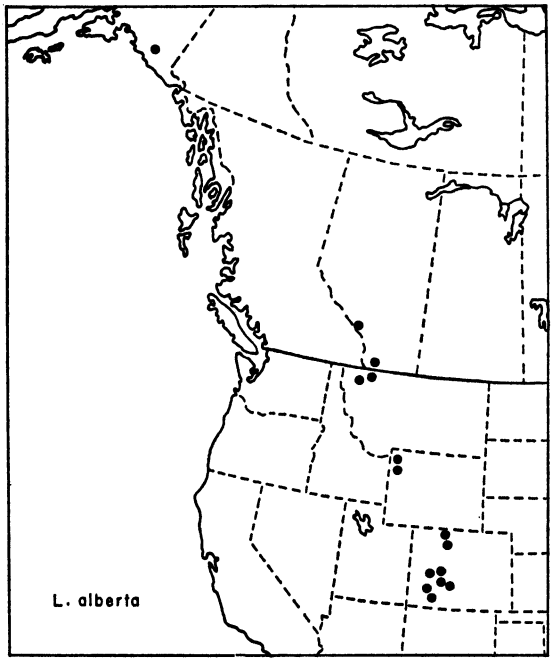


FIG. 3. Distribution of *Lathys alberta*.

Lathys alberta Gertsch

Plate 5, figures 8–10; text figure 3

Lathys pallida EMERTON, 1894, Trans. Connecticut Acad. Arts Sci., vol. 9, p. 410, pl. 1, figs. 5–5d [name preoccupied by *Lathys* (*Neophanes*) *pallida* Marx]. BANKS, 1910, Bull. U. S. Natl. Mus., no. 72, p. 17. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 112 (catalogue). BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 3, p. 2361.

Lathys alberta GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 3, fig. 11 (new name for *Lathys pallida* Emerton). SCHENKEL, 1950, Verhandl. Naturf. Gesell. Basel, vol. 61, p. 34, fig. 3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1329.

Argenna matanuska CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, pp. 12–13, fig. 1.

DIAGNOSIS: Twenty adult females vary from 2.5 mm. to 3.6 mm. in total length and average 3.05 mm. A single male is 3.2 mm. long. The length of the carapace is about 1.5 mm. in both sexes.

This is the largest species of the genus. The carapace varies from pale yellowish to orange-brown and is lightly shaded and lined with dusky streaks. The abdomen presents a more or less distinct pattern of dusky chevrons on a grayish base color, but not infrequently it is uniformly gray. The legs are a quite uniform dusky yellowish brown.

The eyes (pl. 5, fig. 8) form a transverse group nearly two and one-half times as wide as long; and the posterior row is moderately procurved. The quite large anterior median eyes of the female are half of the diameter of, and are well separated from, the very large lateral eyes. In the male these eyes are nearly two-thirds of the diameter of the laterals. The median ocular quadrangle is about as long as broad and narrowed in front in the ratio of 25/17. The female chelicera is armed as follows: two large teeth and two small denticles on the upper margin; four teeth on the lower margin, of which the two middle ones are larger, and often one of the others is missing. The chelicera is longer and thinner in the male than in the female, and the long fang is more slender in the apical half. The armature is the same as in the female, but the series of teeth are set far back from the fang, and those on the lower margin are small denticles.

The epigynum (pl. 5, fig. 10) presents two round orifices, separated by nearly the diameter, which lie between round receptacles visible through the integument.

The male palpus (pl. 5, fig. 9) is typical for the genus and features a coiled conductor which projects from the caudal edge of cymbium at nearly a right angle to the tibia.

TYPE LOCALITIES: Of *Lathys pallida*, mountains above Laggan, Alberta, two male cotypes (previously dried), of which one is in the Museum of Comparative Zoölogy; of *Argenna matanuska*, Matanuska, Alaska, female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains from Alaska and Alberta to Colorado, seemingly most common at higher elevation, where the spiders live under stones and ground detritus (see fig. 3).

KNOWN LOCALITIES: *Alaska:* Chitina Glacier, 30 miles north of Mt. St. Elias, May–June, 1912 (D. W. Easton), two females, one immature. *Alberta:* Mountains near Laggan (T. E. Bean), two male cotypes. Banff (N. B. Sanson), females, immatures. Seba, one female. Carthew Lakes, Waterton National Park, July 27, 1953 (H. Levi), females, one penultimate male. *Montana:* Piegan Pass, 7900 feet, and Dawson Pass, 7500 feet, Glacier National Park, August 11, 23, 1953 (H. Levi), females. *Colorado:* Ten miles west of Estes Park, Rocky Mountain National Park, July 8, 1949 (W. J. and J. W. Gertsch), two immatures. Monarch Pass, Sawatch Mountains, 11,800 feet, July 4, 1952 (H. and L. Levi), two females, four immatures, from under stones. Crater Lake, Elk Mountains, 9850 feet, August 8, 1952 (L. and H. Levi), male, females. Estes Cone, 11,000 feet, July 18, 1926 (H. H. Cleairs), one female. Cumberland Pass, Sawatch Range, 12,500 feet, July 13, 1957 (H. and L. Levi), males and females from under stones. Mt. Belleview, Elk Mountains, 12,100 to 12,450 feet, July 28, 1957 (H. and L. Levi), females. Slumgullion Pass, San Juan Mountains, 12,000 feet, August 2, 1957 (H. and L. Levi), males and females from talus on timberline. Copper Creek Valley, Elk Mountains, 10,000 to 11,000 feet, July 10, 1957 (H. and L. Levi), male. *Wyoming:* Top of Brooks Mountain, Togwotee Pass, under rocks, July 8, 1950 (D. C. Lowrie), females, immatures. Signal Mountain, Moran, July 22, 1950 (D. C. Lowrie), one female. Yellowstone National Park (R. V. Chamberlin), females.

Lathys dixiana Ivie and Barrows

Plate 5, figures 11–13; text figure 4

Lathys dixiana IVIE AND BARROWS, 1935, Bull. Univ. Utah, biol. ser., vol. 3, p. 3, pl. 1, figs. 6, 7. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 124. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 3, fig. 12. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1329. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 3, p. 2359.

DIAGNOSIS: Four females vary from 2.3 mm. to 2.7 mm. in total length, and the carapace is about 1 mm. long. No mature males are known.

The dorsal aspect of the female type (2.5 mm. long) is shown in plate 5, figure 13. The carapace is dusky yellowish to brown.

The legs are strongly annulated in black, especially below and on the sides.

The eyes (pl. 5, fig. 12) are large and somewhat closer together than in *alberta*. The anterior median eyes are small, being about one-third of the diameter of the lateral eyes, are separated by scarcely their diameter, and are about as far from the lateral eyes. The anterior median eyes lie outside the dark color of the side eyes and are always well developed. The front eye row is essentially straight and the posterior row moderately procurved, so that a line along the caudal edges of the lateral eyes cuts the posterior third of the median eyes. The posterior median eyes are separated by somewhat less than the full diameter. The armature of the chelicera is five teeth on the upper margin and four on the lower margin.

The epigynum (pl. 5, fig. 11) presents two round openings which are separated by a weakly developed septum and lie in a shallow atrium.

TYPE LOCALITY: Gainesville, Florida, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southeastern United States (see fig. 4). This rare species was found by Ivie under scales of bark on the trunk of pine trees, and it has been beaten from vegetation.

KNOWN LOCALITIES: *Georgia:* Three miles southeast of Savannah, April 15 and May 3, 1943 (W. Ivie), four females. *Florida:* Highland Hammock, near Sebring, November 22, 1952 (A. M. Nadler), one female. Gainesville, February, 1933 (W. M. Barrows), female holotype and paratypes. Welaka, July 25, 1946 (J. C. Moore), one male in the penultimate instar. *Louisiana:* Kisatchie National Forest, Grant Parish, June, 1941 (Jones and Archer), female. *Mississippi:* Lucedale, February 12, 1931 (H. Dietrich), one female.

Lathys sylvania, new species

Plate 7, figure 10; text figure 4

Lathys foxii CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 125.

Ten females vary from 1.50 mm. to 2.15 mm. in total length and average 1.67 mm.

Carapace pale yellowish to dusky brown, with a distinct, narrow, marginal black seam, with radiating blackish lines on the pars thoracica and a series of black lines running forward to the eyes from a transverse black bar in front of obsolete median groove. Eyes ringed with black. Sternum at least dusky on the sides, medially pale, but some dark specimens have the whole sternum dusky. Labium dusky to blackish; maxillae dusky yellow. Legs yellowish to light brown, with indistinct, narrow, black rings largely broken above, but apical rings on tibiae and metatarsi fairly distinct. Abdomen gray to yellowish, the dorsum with a series of dusky or black chevrons which coalesce in dark specimen largely to cover the dorsum except for a few pale bars. Venter grayish, with three more or less distinct black stripes from base to spinnerets.

FEMALE FROM SAVANNAH BEACH, GEORGIA: Total length, 2.00 mm. Carapace, 0.80 mm. long, 0.60 mm. wide. Abdomen, 1.38 mm. long, 1.05 mm. wide.

Structure in close agreement with that of *Lathys foxi* Marx. Carapace sparsely clothed with erect hairs, those on the midline and in eye region long and curved. Pars cephalica three-fourths as wide at the second eye row as the width of the carapace. Carapace quite high and convex, the height equal to about three-fourths of the width. Clypeus very narrow, equal in height to only about one-fourth of the diameter of the lateral eye. First eye row narrower than the second (0.24 mm./0.30 mm.), the median barely discernible as small black spots lying between the large oval lateral eyes. Posterior eye row quite strongly procurved, a line at caudal edge of the median cutting through the centers of the median eyes. Posterior median eyes round, separated by the radius, as far from the subequal lateral eyes. Quadrangle of anterior lateral and posterior median eyes broader than long (0.24 mm./0.17 mm.), narrowed behind (0.19 mm.), the anterior lateral eyes a little larger.

Sternum 0.50 mm. long, 0.46 mm. wide, truncated in front, quite broadly rounded on the side, bluntly truncated between the posterior coxae which are separated by their width. Labium 0.20 mm. wide, 0.15 mm. long, slightly narrowed and gently rounded at apex, three-fifths as high as the subparallel maxillae. Chelicerae rather short, without

basal enlargement, smooth, set with a few black hairs. Armature of cheliceral furrows as follows: upper margin with four sharp, conical teeth of which three are close together; lower margin with four subcontiguous teeth. Legs thinly clothed with dark hairs, completely lacking spines. Leg formula, 1423, the first and fourth pair subequal in length. Fourth tarsus with a single long trichobothrium at middle above; fourth metatarsus with a very long one at base and a short one close by on upper surface. Calamistrum occupying the entire length of the fourth metatarsus.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	0.63	0.50	0.44	0.62
Patella	0.25	0.24	0.22	0.27
Tibia	0.50	0.37	0.30	0.46
Metatarsus	0.40	0.34	0.31	0.42
Tarsus	0.30	0.25	0.25	0.26
Total	2.08	1.70	1.52	2.03

Abdomen suboval, nearly as high as broad, clothed evenly with grayish hairs. Cribellum a transverse lobe, with narrow, undivided, spinning field.

Epigynum as illustrated in plate 7, figure 10.

TYPE LOCALITY: Female holotype from 1 mile north of Sylvania, Georgia, April 7, 1943 (Wilton Ivie).

DISTRIBUTION: Southeastern United States from Florida westward into Mississippi (see fig. 4).

KNOWN RECORDS: The following specimens have been designated as paratypes: *Florida:* Dunedin, March, 1927 (W. S. Blatchley), females. Edgewater, February 18, 1939 (C.A. Frost), female. *Georgia:* Savannah, March 4, 1943 (W. Ivie), three females. Three miles south of Savannah, May 3, 1943 (W. Ivie), female. *Mississippi:* Ship Island, March 16, 1936 (H. Dietrich), two females.

Lathys foxi Marx

Plate 7, figures 1–4; text figure 4

Prodalia foxii MARX, 1891, Proc. Ent. Soc. Washington, vol. 2, p. 34, pl. 1, figs. 5a–5d. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15.

Dictyna foxii BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28, pl. 1, fig. 78; 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71.

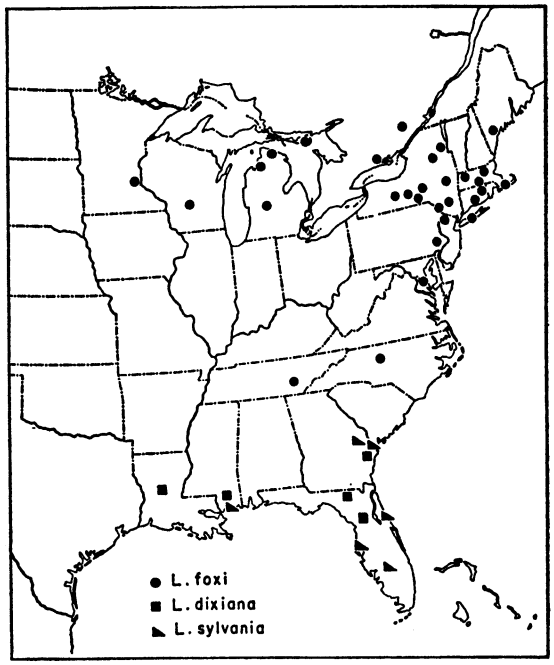


FIG. 4. Distribution of *Lathys foxi, dixiana,* and *sylvania.*

Lathys foxi SIMON, 1892, Histoire naturelle des araignées, vol. 1, p. 240. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 3, fig. 13. EMERTON, 1911, Trans. Connecticut Acad. Arts Sci., vol. 16, p. 400, pl. 4, figs. 5–5E. MUMA, 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 7. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 3, p. 2359.

Lathys foxii PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 112. COMSTOCK, 1912, The spider book, p. 279, fig. 260; 1940, *op. cit.*, rev. ed., p. 281, fig. 260. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 501, pl. 100, figs. 1868–1870. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1330.

DIAGNOSIS: Twenty females vary from 1.6 mm. to 2.2 mm. in total length, average 1.94 mm. long, and have a carapace length of about 0.8 mm. Males are of about equal size.

The carapace is yellowish to orange-brown in the females, with dusky shadings. The abdomen is whitish, occasionally all dusky, but typically marked with a pattern of about six blackish chevrons which are well

separated by whitish intervals. The males are much darker and usually have the lightly roughened carapace quite dusky and the abdomen dusky to nearly uniform blackish. Some males may have an all pinkish abdomen.

The eye arrangement is illustrated in plate 7, figure 2. The small anterior median eyes are only slightly separated, are scarcely more than one-third of the diameter of, and lie close to, the large lateral eyes. The procurvature of the posterior row is greater than in *dixiana* and *alberta* because of the nearness of the eyes. The median ocular quadrangle is about as long as broad and narrowed to half of the breadth in front. The narrow clypeus is equal in height to the diameter of an anterior median eye. The armature of the chelicerae is four teeth on the upper and lower margins in the females but frequently only three on the upper margin in the males.

The epigynum (pl. 7, fig. 3) is typical and presents two small, widely separated, rounded openings which lie near the front edge of the round receptacles.

The male palpus is illustrated in plate 7, figures 1 and 4. The broad patella is enlarged on the retrolateral side into a rounded apophysis.

TYPE LOCALITY: Female type or cotypes from Tennessee collected by Dr. Fox, presumably lost.

DISTRIBUTION: Northeastern United States and adjacent Canada, westward to Minnesota, south to North Carolina and Tennessee (see fig. 4). Females have been taken from April to November but males only from May to June.

SELECTED LOCALITIES: *Ontario:* Four miles northeast of Newburgh, September, 1943 (H. H. Harrington), one female. *Maine:* Hollis, June 12, 1908 (J. H. Emerton), male and female. *Tennessee:* Beersheba, Grundy County, July, one female. *North Carolina:* Blowing Rock, October 10, 1923 (S. C. Bishop), one female. *Minnesota:* Lake Minnetonka, near Minneapolis, July 17, 24, 1924 (Fletcher), two females.

Lathys delicatula Gertsch and Mulaik

Plate 7, figures 5–9; text figure 5

Scotolathys delicatulus GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 4, fig. 4; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 326.

Lathys delicatula GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 3, fig. 14. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1329.

Zanomys moabana CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 18.

Lathys moabana ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1330.

Scotolathys apachea CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16, pl. 4, fig. 37.

Lathys apachea ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1329.

DIAGNOSIS: Twenty females vary from 1.4 mm. to 2.1 mm. in total length and average 1.8 mm. The carapace of an average female is 0.7 mm. long. The males are of about equal size.

The usually unmarked carapace varies from pale whitish to bright yellowish brown, and the eyes are ringed with black. The abdomen usually has a dorsal pattern of dusky or black chevrons on a pale ground but may be completely unmarked. Specimens from southern Texas are typically strongly marked, whereas examples from western Texas and the Rocky Mountain states are considerably paler. The legs are nearly concolorous with the carapace and lack darker rings or spots.

The eye group is scarcely twice as wide as long and has the triads quite close together as shown in plate 7, figure 7. The eye relations are somewhat variable. The procurvature of the posterior row is considerable, and the median eyes of that row are typically separated by about two-thirds of their diameter and are about as far from the equal lateral eyes. The anterior lateral eyes are separated by about two-thirds of their diameter. In some specimens the anterior median eyes are completely missing, and there are no vestiges or pigment spots to indicate their location. These median eyes, when present, vary in size from small points to well-marked eyes and lie in the darkly pigmented area at the edge of the lateral-eye tubercles. In quite a number of cases only one of the median eyes is present, and there is considerable variation in size. Cheliceral margins in both sexes with four subcontiguous teeth or denticles.

The epigynum (pl. 7, figs. 6, 8) is somewhat variable in the size of the openings and

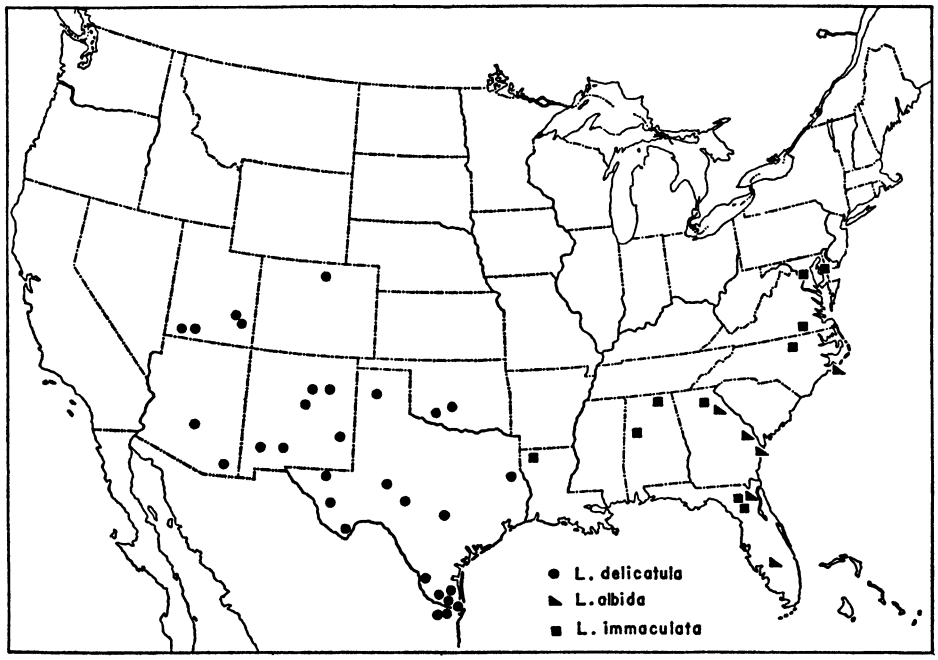


FIG. 5. Distribution of *Lathys delicatula, albida,* and *immaculata.*

their position in relation to the large receptacles. In some instances the small round or suboval openings lie in front of the round receptacles; in others they lie nearly on a median line or at some point between these extremes. A weak, median, longitudinal carina may be present.

The male palpi (pl. 7, figs. 5, 9) are quite typical for the genus.

TYPE LOCALITIES: Of *Scotolathys delicatulus,* 15 miles southwest of Harlingen, Texas, female holotype in the American Museum of Natural History; of *Zanomys moabana,* Moab, Utah, female holotype in the American Museum of Natural History; of *Scotolathys apachea,* 8 miles north of Roosevelt Dam, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southern and western Texas northward into the Rocky Mountain states to northern Colorado and southern Utah (see fig. 5). The record from Friday Harbor, Washington, must be considered doubtful.

SELECTED RECORDS: *Texas:* San Augustine County, June, 1936 (S. Mulaik), one female. The Basin, Chisos Mountains, Brewster County, December 14, 1954 (K. W. Haller), one female. *Colorado:* Twenty miles northwest of Fort Collins (6100 feet), November 24, 1946 (C. C. Hoff), one female. *Oklahoma:* Norman, November 22, 1927 (M. J. Brown), one female. *Utah:* Pintura, Washington County, March 8, (W. Ivie), females. *Washington:* Friday Harbor, July, 1928 (Shackleford), one male.

Lathys maculina Gertsch

Plate 6, figures 9–12; text figure 6

Dictyolathys maculata BANKS, 1900, Proc. Acad. Nat. Sci. Philadelphia, p. 534 (name preoccupied by *Lathys maculata* Keyserling, 1890, of Australia). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 112. BRYANT, 1943, Psyche, vol. 50, p. 85, figs. 1a, 1b.

Scotolathys maculatus EMERTON, 1913, Bull. Amer. Mus. Nat. Hist., vol. 32, p. 257, pl. 48, figs. 5a, 5b. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 326. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 502, pl. 100, fig. 1867, pl. 101, fig. 1887.

Scotolathys maculata BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., vol. 41, p. 173. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 126.

Lathys maculina GERTSCH, 1946, Amer. Mus.

Novitates, no. 1319, p. 4, fig. 15 (new name for *Dictyolathys maculata* Banks).

Lathys maculata ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1330.

DIAGNOSIS. Twenty females vary from 1.3 mm. to 2.0 mm. and average 1.6 mm. in total length. The carapace of an average female is 0.65 mm. long. The males are about equal in size.

A typically marked female is illustrated in plate 6, figure 12. The carapace is pale whitish to bright yellowish or orange and without contrasting darker shading except for the black eye tubercles. The legs are the same color, only faintly shaded in dusky, and never with darker rings. The abdomen is a duller white or yellow in base color and presents above a more or less strongly marked pattern of dusky to deep black chevrons which are often broken into series of blackish spots. It is possible that an occasional specimen may be completely immaculate, but none has been found without a trace of pattern.

The eyes form a transverse group somewhat less than twice as broad as long, and there is considerable variability in eye size, separation of eyes, and degree of procurvature. Only six eyes in two triads are present, and there are never median eyes or vestiges of these. Reports of their presence are considered to be erroneous. The two eyes of the front row are separated by a little less than the full diameter. The procurvature of the posterior eyes is of moderate degree, so that a line along the caudal edges of the lateral eyes cuts through about the center of the equal median eyes. The posterior median eyes are separated by a little less than the full diameter and are scarcely more than half as far from the lateral eyes. The armature of the chelicerae in both sexes is as follows: four unequal teeth on the upper margin, of which the innermost one is at the end of the thin carina and the next one is largest; and four to six small equal teeth in a close series on the lower margin, of which each outer one is weaker and may be lost or reduced in size.

The epigynum (pl. 6, fig. 11) presents two obliquely placed openings in a shallow atrium, which lie at the front edge of large, round receptacles.

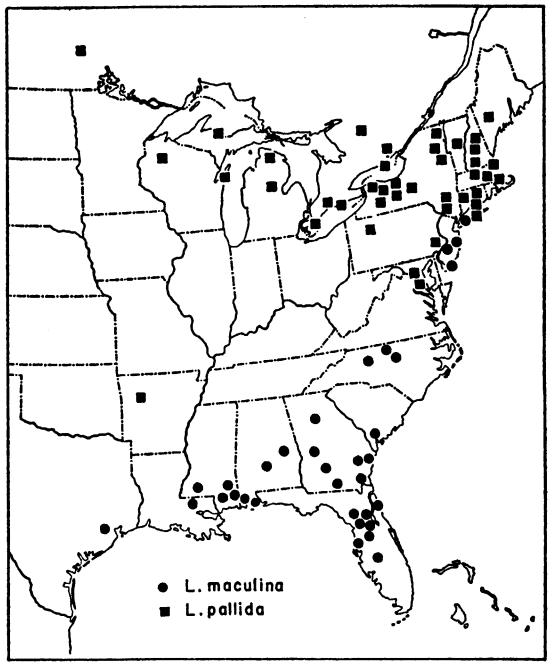


FIG. 6. Distribution of *Lathys maculina* and *pallida*.

The male palpus is illustrated in plate 6, figures 9 and 10. No conspicuous modifications of the patella and tibia are present.

TYPE LOCALITY: Mobile, Alabama, female holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Southeastern United States from Florida to east Texas and northward to New Jersey and Long Island, New York (see fig. 6). This is an abundant species in ground detritus in the southeast where males and females have been taken during almost every month of the year.

SELECTED LOCALITIES: *New York:* Riverhead, Long Island, June 3, 1928 (C. S. Crosby), males and females. *New Jersey:* Lakehurst, May 1, 1912 (J. H. Emerton), two males, one female. Lakehurst, April 17, 1910, male and female. *North Carolina:* Carrot Island, near Beaufort, Carteret County, October 14, 1951 (R. Barnes), males and females. *Louisiana:* Greenburg, March 19, 1936 (Bishop collection), males and females. *Mississippi:* Lucedale, January, March, 1931 (H. Dietrich), males, four females. *Texas:* Houston, Harris County, June 11, 1937 (S. Mulaik), female.

Lathys immaculata Chamberlin and Ivie

Plate 6, figures 7, 8; text figure 5

Scotolathys maculata immaculata CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 126.

Lathys immaculata GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 4. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1330.

DIAGNOSIS: Ten females vary from 1.2 mm. to 2.15 mm. and average 1.45 mm. in total length. The carapace of an average female is 0.6 mm. long. The males are of about equal size.

This very close ally of *maculina*, which occurs with it in the field and was originally described as merely a varietal form, differs in its paler coloration and completely immaculate abdomen. The close structural correspondence is evident in all features and includes the genitalia.

The epigynum (pl. 6, fig. 8) is very similar to that of *maculina* but differs in the wider separation of the openings and the smaller size of the seminal receptacles.

The palpus (pl. 6, fig. 7) shows only small differences from that of *maculina*.

TYPE LOCALITY: Demorest, Georgia, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southeastern United States from Florida to Louisiana and northward to Maryland (see fig. 5). This sibling species is frequently taken in the same situations as *maculina* and probably has been confused with it.

SELECTED LOCALITIES: *Maryland:* Lanham, Prince Georges County, March 12, 1942 (M. H. Muma), male and female. College Park, Prince Georges County, November, 1931 (M. H. Muma), males and females. *North Carolina:* Durham, October to February (A. S. Pearce), males and females. *Alabama:* Monte Sano, Madison County, December, 1940 (A. F. Archer), one female. Hurricane Creek, near Tuscaloosa, September 5, 1941 (A. F. Archer), one female. *Louisiana:* Shreveport, April 13, 1949 (J. H. Robinson), one female.

Lathys albida Gertsch

Plate 6, figures 13, 14; text figure 5

Scotolathys alba CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 126, figs. 178, 179 (name preoccupied by *Lathys alba* Keyserling, 1890).

Lathys albida GERTSCH, 1946, Amer. Mus. Novitates, no. 1309, p. 2 (new name for *Scotolathys alba* Chamberlin and Ivie).

Lathys alba ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1329.

The name *Lathys alba* was used by Keyserling in 1890 for an Australian spider now placed in the genus *Callevopthalmus* of the family Amaurobiidae. The preoccupation of the specific name *alba* in the genus *Lathys* makes necessary the use of *albida* as proposed by the second author in 1946 for *Lathys* (*Scotolathys*) *alba* of Chamberlin and Ivie.

DIAGNOSIS: Five females vary from 1.25 mm. to 1.70 mm. and average 1.50 mm. in total length. An average female has a carapace 0.65 mm. long. The male is about equal in size.

This species has the same appearance as *Lathys immaculata* and *pallida* and may be confused with the former. The carapace is pale yellowish and unmarked except for the narrow black rings around the eyes. The legs are concolorous. The abdomen is whitish and immaculate.

The eye arrangement and most structural features are similar to those of *maculina*. The lower cheliceral margin usually bears four small teeth.

The epigynum is well illustrated in plate 6, figure 13, and presents two round orifices which are separated by a radius to a full diameter and which lie at the front edge of the round receptacles.

The male palpus (pl. 6, fig. 14) is similar to that of *maculina*.

TYPE LOCALITY: Three miles southeast of Savannah, Georgia, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southeastern United States from North Carolina to Florida (see fig. 5). This seems to be a relatively rare species which occurs within the range of both *Lathys maculina* and *immaculata* and has been collected in the same situations.

KNOWN LOCALITIES: *North Carolina:* Carrot Island, near Beaufort, Carteret County, January 25, 1952 (R. Barnes), male, three females. *Georgia:* Athens, February 25, 1944 (V. F. Shelford), female. North of Sylvania,

April 10, 1943 (W. Ivie), females. Three miles southeast of Savannah, April 4, 1943 (W. Ivie), female holotype and male allotype. *Florida:* Newman's Lake, near Gainesville, March 19, 1938 (W. J. Gertsch), female. West of Neunan's Lake, February 12, 1942 (W. Ivie), male, three females. Mineral City, February 20, 1936 (Bishop collection), one male.

Lathys pallida Marx

Plate 6, figures 1–6; text figure 6

Neophanes pallidus MARX, 1891, Proc. Ent. Soc. Washington, vol. 2, p. 34, pl. 1, figs. 4a–4f. BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 29, pl. 3, figs. 86a, 87; 1904, Jour. New York Ent. Soc., vol. 12, p. 83.

Scotolathys pallidus SIMON, 1892, Histoire naturelle des araignées, vol. 1, p. 243. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 5. EMERTON, 1909, Trans. Connecticut Acad. Arts Sci., vol. 14, p. 213, pl. 8, figs. 2–2d. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 502, pl. 101, figs. 1882–1886.

Lathys pallida GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 4. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 112. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1330.

DIAGNOSIS: Twenty females vary from 1.2 mm. to 1.7 mm. and average 1.4 mm. in total length. An average female has a carapace 0.65 mm. long. The males are about the same size as the females.

This species has the appearance of *Lathys immaculata* and *albida* but occurs largely outside the ranges of both of these. The carapace is pale yellowish, only rarely shows any duskiness, and the eye tubercles are black, as usual in the genus. The legs are pale and unmarked. The abdomen is immaculate white.

The six eyes (pl. 6, fig. 3) are large, pearly white in color, and the triads are close together as in *maculina* and the other six-eyed species. In this species and in none of the related Eastern species are traces of anterior median eyes present. The cheliceral armature is as in *maculina*, but the lower margin of the furrow usually has only four small teeth.

The epigynum (pl. 6, fig. 4) presents a pair of slightly elevated, rounded tubercles, usually separated by less than the full diameter, on each of which is a slit-like opening. The seminal receptacles are well separated and of moderate size.

The male palpus is quite typical for the genus. The tibia and cymbium, from which the bulb and its appendages have been removed, are shown in plate 6, figure 1. The embolus (pl. 6, figs. 2, 6) is a thin spine which encircles the bulb and loses its identity in the coiled termination of the embolus. The tibia of the palpus bears a conspicuous curved spine on the dorsal aspect not present in the related species.

TYPE LOCALITY: Male and female cotypes from the District of Columbia, Long Island, New York, New Hampshire, and Tennessee. Part of this material is presumed to be in the collection of the United States National Museum, but no lectotype has been designated.

DISTRIBUTION: Northeastern United States and adjacent Canada from Maine to Manitoba and southward to Kentucky, Tennessee, and Arkansas. This northern species is abundant in ground detritus and is usually taken by sifting such materials. Collections have been made in about 20 separate localities in southern Ontario, chiefly by T. B. Kurata, and similarly large numbers of records for New York and Massachusetts are available in the collections of Cornell and Harvard Universities. (See fig. 6.)

SELECTED LOCALITIES: *Ontario:* Sproule Bay, Lake Opeongo, Algonquin National Park, June 26–July 7, 1945 (W. Ivie, T. Kurata), male, 26 females; North Bay, Prince Edward County, August 15, 1930 (T. Kurata), one female. *Manitoba:* Victoria Beach, June 28 and 29, July 30, 1931 (T. Kurata), two males, 18 females. *Maine:* Bridgton, August 22, 1925, one female. *Tennessee:* No specific locality (Marx). *Kentucky:* Natural Bridge, July 4, 1925 (I. MacIntyre), one female. *Arkansas:* Cove Creek Valley, 15 miles south of Prairie Grove, Boston Mountains (M. Hite), female.

GENUS THALLUMETUS SIMON

Thallumetus SIMON, 1892, Histoire naturelle des arraignées, vol. 1, p. 241; 1892, Ann. Soc. Ent. France, vol. 61, p. 434.

Dixomys CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8.

Small dictynine spiders usually less than 3 mm. in length. Carapace nearly as broad as long, the thoracic portion essentially circular, as seen from above moderately convex. Pars cephalica moderately elevated, highest in the ocular region, strongly convex, the clypeus sloping forward gently. Eye group about three-fifths as wide as the head. First row of eyes moderately procurved as seen from in front, the median eyes separated by almost their diameter, only one-fourth as far from the subequal lateral eyes. Second row of eyes moderately recurved, the oval median eyes separated by twice the small diameter, only two-thirds as far from the subequal lateral eyes. Median ocular quadrangle broader than long (26/20), as wide in front as behind, the front eyes a little larger. Median ocular quadrangle in *pinea* with a small, rounded projection set with a few bristles. Lateral eyes of each side contiguous and subequal. Clypeus rather high, equal in height to the width of the median quadrangle. Chelicerae of average size, without conspicuous modification, in frontal aspect with a weakly developed tubercle at base on outer side and moderately emarginated on the inner edges. Armature of the cheliceral furrows as follows: three teeth on the upper margin, of which the middle one is largest; the lower margin smooth, without evident teeth. Sternum slightly longer than broad, subcordate, bluntly pointed between the posterior coxae, which are separated by their width.

Leg formula, 1423 or 1243. Legs slender, clothed with pale hairs but completely devoid of true spines. Calamistrum a single line of curved bristles occupying the length of the fourth metatarsus, which is moderately flattened. Trichobothria on metatarsi few, two in middle position visible on some legs, and on tarsi lacking or difficult to discern. Abdomen longer than broad, suboval as seen from above, about as high as broad. Spinning plate of cribellum a narrow, transverse plate without subdivision.

Epigynum very large, with the openings far forward.

Male palpus strikingly modified as follows: Femur strongly incrassated, often as broad as long. Patella strongly incrassated as seen from above, subtriangular in form. Tibia thickened, presenting above two angled processes. Cymbium a simple cup enclosing the bulb and elements. Embolus short, lying in a shallow conductor, similar to that found in *Heterodictyna*.

TYPE SPECIES: Of *Thallumetus*, *T. salax* Simon; of *Dixomys*, *Lathys pinea* Chamberlin and Ivie.

The genus *Thallumetus* is restricted to the Americas, with several species already known from the principal areas of both continents and the West Indies. The remarkable development of the male palpus is scarcely matched in any other group of the family Dictynidae.

Thallumetus pineus Chamberlin and Ivie

Plate 7, figures 11–14

Lathys pinea CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 125, pl. 12, fig. 182. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 5.

Thallumetus petrunkevitchinus GERTSCH, 1945, Trans. Connecticut Acad. Arts Sci., vol. 30, pp. 191–193, pl. 1, figs. 1–3.

Dixomys pinea CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8.

Thallumetus pineus ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1335.

DIAGNOSIS: Female: Total length, 2.3 mm. Carapace, 0.85 mm. long, 0.8 mm. wide. Abdomen, 1.6 mm. long, 1.1 mm. wide. Male: Total length, 2.1 mm. Carapace, 0.95 mm. long, 0.9 mm. wide. Abdomen, 1.3 mm. long, 0.9 mm. wide.

The carapace is dull to bright orange and may have dusky shadings along the side margins and on the sides of the head. The sternum and mouth parts are various shades of orange. The legs and palpi are dusky, with the joints lighter. The abdomen is dark gray to blackish above and on the sides and has a more or less well-defined white pattern on the length of the dorsum which encloses a large dark mark over the heart. The venter is a uniform light gray. The male (pl. 7, fig. 12) is marked much as the female and is usually somewhat brighter orange.

The epigynum (pl. 7, fig. 14) is very large, equaling the sternum in size, and presents elevated ridges in front between which are the atriobursal orifices.

The male palpus (pl. 7, figs. 11, 13) is remarkable in its size and development of the femur, patella, and tibia.

TYPE LOCALITIES: Of *Lathys pinea*, 3 miles

southeast of Savannah, Georgia, female holotype in the American Museum of Natural History; of *Thallumetus petrunkevichinus*, 5 miles west of Gainesville, Alachua County, Florida, male holotype, in the American Museum of Natural History.

DISTRIBUTION: Southeastern United States from Florida and Georgia west to Tennessee and Texas.

KNOWN RECORDS: *Florida:* Two miles south of Lake Placid, Highlands County, April, 1956 (C. C. Hoff), two females. Five miles west of Gainesville, Alachua County, March 18, 1938 (W. J. Gertsch), male holotype of *petrunkevichinus* from the floor of a moist hammock. *Georgia:* Three miles southeast of Savannah, May 3, 1943 (W. Ivie), female holotype of *pineus* and paratype, and April 4, 1943, female paratype of *pinea*, from under scales of bark on the trunks of large pines. *Alabama:* Lagoon, Baldwin County, October 29, 1949 (A. F. Archer), one female. *Mississippi:* A. and M. College, March 28, 1903 (J. H. Comstock), male. *Tennessee:* Reelfoot Lake, April 12, 1945 (J. and W. Rapp), one male. *Texas:* De Berry, May 8, 1952 (W. J. Gertsch), one male swept from roadside plants.

GENUS MALLOS O. P.-CAMBRIDGE

Mallos O. P.-CAMBRIDGE, 1902, Biologia Centrali-Americana, Arachnida, vol. 1, p. 308.

Dictynina BANKS, 1904, Proc. California Acad. Sci., ser. 3, vol. 3, p. 342.

Coenothele SIMON, 1909, Compt. Rendus Acad. Sci., Paris, p. 736.

Dictynoides CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 243.

Small to medium-sized dictynine spiders varying from 1.7 mm. to 8 mm. in length, but most of the species are less than 4 mm. long. Carapace longer than broad, of moderate height, being about half as high as the width, quite evenly convex. Pars cephalica of moderate breadth in front where it equals about four-sevenths of the greatest width in typical females but broader and higher in some males. Clypeus relatively high, inclined or subvertical, equaling or considerably exceeding the diameter of the lateral eye, highest in the males. Eyes of moderate size and occupying three-fourths of the head width. Front eye row weakly procurved as seen from in front (in a weakly recurved line as seen from above), the somewhat smaller median eyes separated by the diameter or less and somewhat nearer the lateral eyes. Posterior eye row weakly recurved, essentially straight, the median eyes typically separated by the full diameter and only slightly nearer the equal lateral eyes. Median ocular quadrangle a little broader than long and narrowed in front in about the same ratio, the front eyes smaller. Sternum cordate, about nine-elevenths as broad as long, bluntly pointed between the posterior coxae which are separated by about their width. Labium about as long as broad, narrowed and rounded at apex; about three-fifths as long as the subparallel endites. Chelicerae of moderate stoutness in the females, apically narrowed but nearly subparallel as seen from in front, with a weak angle at base on the outer edge in front. Chelicerae in males much longer, usually curved, often emarginated on the inner margin to outline an oval opening between the pair, with a more or less distinct carina or conical process at base and a similar one directly below on the ventral surface. Armature of cheliceral grooves similar in both sexes: upper margin typically with three subcontiguous teeth of which the median is enlarged, but a fourth tooth may be present between this series and base of claw; lower margin with three or two teeth. Teeth in the males usually more widely separated and farther away from base of claw, often on an enlarged process.

Leg formula, 1423. Legs of moderate length, clothed with simple hairs and only rarely with a few weak spines. Calamistrum a single line of curved bristles occupying the whole length of the laterally flattened fourth metatarsus. Trichobothria difficult to see but probably present on the tarsi, where two short ones are visible in some species, and usually easily seen on the metatarsi near the base, where two or three occur, only the most distal usually being much longer than the others. Abdomen suboval. Cribellum entire in more than half of the species known to us (in which case the caudal margin of the spinning field is evenly rounded across the midline, for which see pl. 9, fig. 10) but more or less distinctly divided longitudinally in some species (in which case the caudal margin is slightly emarginated and a more or less

distinct line or band crosses the plate, as shown in pl. 9, fig. 5). Epigynum presenting externally two shallow, suboval atria, separated by a more or less distinct septum, completely lacking the lateral foveae of *Dictyna*. Male palpus characterized as follows: femur and patella normal, never armed with distinct teeth or processes; tibia with weak carinae or conical elevations, never with a dorsal spine bearing modified setae as in *Dictyna*. Embolus of male palpus a thin spine originating near the base of bulb on the prolateral side. Conductor of the embolus an expansive sheath, which receives the thin embolus at distal edge of the bulb, margins the bulb along the retrolateral side, coils widely at base of the tibia, and terminates in a more or less distinctive apical coil or spur.

TYPE SPECIES: Of *Mallos*, *M. niveus* O. P.-Cambridge; of *Dictynina* Banks, *D. pallida* Banks; of *Coenothele* Simon, *C. gregalis* Simon; and of *Dictynoides* Chamberlin, *D. arizonensis* Chamberlin (=*Mallos dugesi* Becker).

The name *Mallos* is used herein for a substantial group of species that show very close relation, and have been mostly assigned, to the genus *Dictyna*. All the species completely lack (1) an apophysis bearing two (or occasionally only one) ctenidia on the tibia of the male palpus and (2) the correlated structures of the female epigynum, the lateral foveae, a pair of lateral grooves which receive the tibial apophysis and orient the palpal element at the time of mating. The genitalia otherwise correspond quite closely to those of *Dictyna*. In a few species the cribellum is bipartite, but most species show no trace of subdivision of this spinning organ.

The typical species of *Mallos* range in the Americas from the Pacific Northwest and mountain states southward through Mexico, Central America, and deep into South America. No species occurs in the eastern United States, and none has been recorded from the West Indies. The genus is very strongly represented in Mexico and largely replaces *Dictyna* in Central and South America. Some of the species (*trivittatus* Banks, *grandis* O. P.-Cambridge, and others) are perhaps the largest known representatives of the entire family.

The genus *Mallos* can be divided into two principal groups, as follows:

Pars thoracica with distinct white bands; size less than 4 mm. . . . . *niveus* group

Pars thoracica uniform brown to the side margins; size 4 mm. to 8 mm. . . . *trivittatus* group

THE *Niveus* GROUP

The sides of the pars thoracica are distinctly bordered with a pale band made more conspicuous by chalky white bodies visible through the integument. The chelicerae usually have two small teeth on the lower margin, but three may be present in *bryanti*, and three are normally found in *dugesi*. The cribellum is bipartite in *niveus* and *pallidus* but is entire in the other species from north of Mexico. The patella of the male palpus lacks an accessory lobe or spur.

This species group seems to be exclusively American, with about 20 species already described from continental North America, and with Mexico the center of greatest development. Seven species occur in the western United States, and most of these range into adjacent Mexico.

One of the Mexican species is the social spider *Mallos gregalis* Simon known to the villagers of mountainous Michoacan as the *mosquero*. These spiders envelop scrubby trees with their sticky webbing and live together in sizable colonies. A branch from such a colony forms an animated fly trap when hanging from the ceiling of an adobe hut, to the advantage of both spiders and villagers.

The closely related *Mallos bryanti* of Arizona and most of the other species of the genus are quite gregarious, often spinning their solitary webs close together in large aggregations, but none seems to have attained the social status of *gregalis*.

Mallos dugesi Becker

Plate 8, figures 1–4, 9; text figure 7

Dictyna dugesi BECKER, 1886, Compt. Rendus Ann. Soc. Ent. Belgique, vol. 30, p. xxiii. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108 (catalogue). BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1435.

Dictynoides arizonensis CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 244, fig. 1.

Mallos arizonensis GERTSCH, 1942, Amer. Mus. Novitates, no. 1158, p. 17.

Mallos dugesi ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1331.

DIAGNOSIS: Females vary from 3.5 mm. to 6 mm. in total length and average 4.5 mm. Carapace of a typical female, 1.75 mm. long, 1.5 mm. wide. The males vary from 3 mm. to 4.5 mm. and average 3.75 mm. in length.

The dorsal aspect of a female is shown in plate 8, figure 4. The yellowish or orange-brown carapace usually has the cephalic portion paler and has a conspicuous marginal white stripe on the sides. Three bands of white hairs on the cephalic portion are usually evident. The sternum, labium, and mouth parts are dusky brown. The unmarked legs are pale yellow. The whitish abdomen presents a dusky pattern of spots above, and on the otherwise whitish venter a median dusky or brownish stripe. The smaller male (pl. 8, fig. 9) resembles the female, but the carapace is usually a more uniform brown and lacks conspicuous bands of white hair. The white marginal stripe on the carapace is reduced in the males, often to a series of spots.

In the female, the front eye row is very weakly procurved as seen from in front and the median eyes, which are separated by scarcely their full diameter, are about as far from the somewhat larger lateral eyes. The oval eyes of the posterior row are equal in size, lie in a straight or very weakly recurved line, and are separated by slightly more than the long diameter. The median ocular quadrangle is essentially square, and the front eyes are only a trifle smaller. The sloping clypeus is as high as the diameter of the anterior lateral eye. The typical cheliceral armature is as follows: three subcontiguous teeth on the upper margin of which the middle one is largest and three smaller subequal teeth on the lower margin.

The epigynum (pl. 8, fig. 3) presents two small, well-separated orifices which appear as brown spots.

The male presents significant differences from the female. The proportionately longer carapace (1.7 mm. long and 1.3 mm. wide) is quite broad in front, and the sloping clypeus is wider. The eyes are similar in arrangement, but the median ocular quadrangle is clearly narrower in front. The chelicerae are longer, moderately curved, emarginated on the inner margin to form an oval opening, and are enlarged at the base on the outre side. The cheliceral teeth are situated some distance from the base of the claw and are more widely spaced, especially the three on the lower margin.

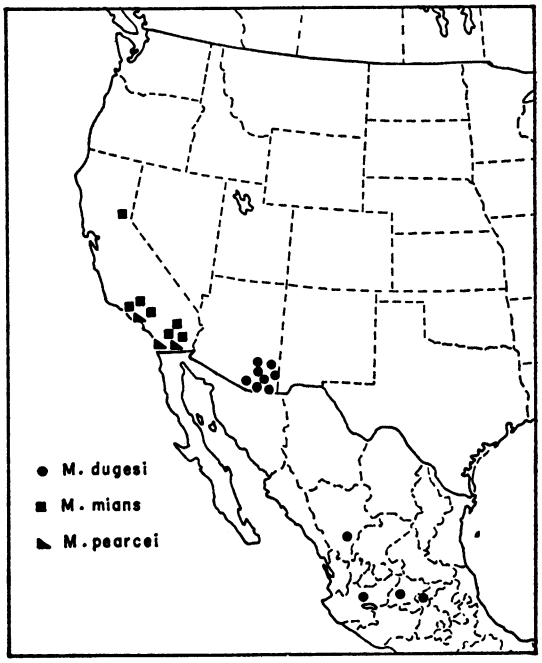


FIG. 7. Distribution of *Mallos dugesi*, *mians*, and *pearcei*.

The male palpus (pl. 8, figs. 1, 2) presents weak carinal ridges on the short tibia and a quite typical conformation of the bulb and apophyses. The conductor terminates in a thin spine.

TYPE LOCALITIES: Of *Dictyna dugesi*, Guanajuato, Guanajuato, Mexico, female cotypes in the Brussels Natural History Museum; of *Dictynoides arizonensis*, Miller Canyon, Huachuca Mountains, Arizona, female type in the Museum of Comparative Zoölogy.

DISTRIBUTION: Southeastern Arizona and western and southern Mexico (see fig. 7).

This handsome dictynid spins its webs on grasses and herbs in the canyons of southeastern Arizona and matures in late summer and fall. It has been taken in the following mountain ranges: Chiricahua, Mule, Dragoon, Huachuca, Santa Rita, Santa Catalina, Atascosa, and Pinaleno.

SELECTED RECORDS: *Queretaro:* San Juan del Rio, October 2, 1940 (H. Wagner), one female. *Jalisco:* Guadalajara, one female. *Guanajuato:* Guanajuato, one male. *Durango:* Nombre de Dios, August 13, 1947 (W. J.

Gertsch), males and females. *Arizona:* Wet Canyon, Graham Mountain, September 14, 1950 (W. J. Gertsch), males and females. Cave Creek Canyon, Chiricahua Mountains, September, 1950 (W. J. Gertsch), many males and females.

Mallos blandus, new species

Plate 10, figure 7

FEMALE: Total length, 5.25 mm. Carapace, 2.00 mm. long, 1.65 mm. wide. Abdomen, 3.35 mm. long, 2.65 mm. wide.

Carapace pale yellowish brown, except along margins of the pars thoracica where a row of white granules beneath the integument forms a narrow seam. Pars cephalica with bands of white hairs. Eyes very narrowly ringed with black. Sternum, labium, and maxillae light brown; chelicerae darker brown. Legs yellowish, unmarked, clothed evenly with whitish hairs. Abdomen gray to white, quite finely reticulated with grayish lines, the dorsum with a dentated median band of blackish hairs one-third as wide as, and running the whole length of, the abdomen, the venter with an indistinct median dusky band which enlarges to form a blackish figure enclosing the spinnerets.

Structure typical, in close agreement with that of *Mallos niveus* and related species. Carapace convex, the pars cephalica quite high and rounded, the median groove a shallow, transverse depression set far back on the carapace. Clypeus with a heavy brush of white hairs, vertical, equal in height to scarcely two diameters of an anterior median eye. Eyes rather small and well separated, the anterior row slightly narrower than the posterior. Anterior row of eyes weakly procurved, the median eyes separated by a little more than the diameter (10/13), only a diameter from the lateral eyes with are larger in the ratio of 13/10. Second eye row straight, the median eyes separated by more than the diameter (10/15), as far from the subequal lateral eyes. Median ocular quadrangle broader than long (32/28), slightly narrower in front (32/30), the eyes subequal in size.

Sternum, 1.20 mm. long, 0.95 mm. wide, truncated in front, broadly rounded on the sides and produced behind into a blunt point between the posterior coxae which are separated by two-thirds of their width. Labium, 0.40 mm. long, 0.37 mm. wide, narrowed and rounded at apex, two-thirds as high as the moderately inclined maxillae. Chelicerae of moderate size, subparallel, rounded at base, narrowed apically, clothed with heavy white hairs and black setae. Armature of cheliceral furrows as follows: upper margin with three teeth of which the middle tooth is the largest; lower margin with two small teeth opposite the upper series.

Legs clothed thickly with hairs but lacking true spines, except for several weak ones at apex of third and fourth metatarsi. Leg formula, 1243, the tarsi and metatarsi largely lacking conspicuous trichobothria. Calamistrum a conspicuous row of curved spines occupying the whole length of the laterally flattened and curved fourth metatarsus.

	I (mm.)	II (mm.)	III (mm.)	IV (mm.)
Femur	2.25	1.80	1.45	1.60
Patella	0.70	0.70	0.60	0.70
Tibia	1.90	1.50	1.00	1.20
Metatarsus	1.60	1.30	1.50	1.25
Tarsus	0.85	0.75	0.60	0.60
Total	7.30	6.05	5.15	5.35

Abdomen suboval, about as high as broad, clothed evenly with soft covering hairs, without elevated hairs or setae but presenting four pairs of small brownish muscle scars in the median dark stripe. Cribellum a conspicuous transverse lobe with large, undivided spinning field.

Epigynum as illustrated in plate 10, figure 7.

TYPE LOCALITY: Female holotype and three paratypes from White City, New Mexico, September 24, 1950 (W. J. Gertsch).

Mallos bryanti Gertsch

Plate 8, figures 10, 11

Mallos bryanti GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 6, figs. 2, 3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1332 (*bryantae*).

DIAGNOSIS: Females vary from 3 mm. to 6.2 mm. and average 4.5 mm. in length. Carapace of a typical female, 2.7 mm. long, 1.5 mm. wide. The males are only slightly smaller and average about 4 mm.

This species resembles *Mallos dugesi* quite

closely in structure but usually is much darker in color. The pars cephalica in both sexes is yellowish brown, clothed with three bands of white hairs, and is much lighter than the dark brown sides of the carapace, which are margined by the usual conspicuous whitish bands. The chelicerae, mouth parts, and sternum are brown. The legs, which in the females are quite uniform yellowish brown and clothed evenly with whitish hairs, are sometimes annulated in brown in the males. The abdomen is often quite pale, reticulated with grayish, but usually shows a dorsal pattern similar to that of *dugesi* (pl. 8, fig. 4) and a conspicuous ventral longitudinal brown band.

The subequal eyes of the posterior row lie in a nearly straight line and are separated by one and one-third of the long diameter. The median ocular quadrangle is essentially square, only slightly narrowed in front. The armature of the cheliceral margins is as follows: upper margin with three teeth of which the middle tooth is much the largest; lower margin most often with two teeth, but in some specimens the third tooth, the one nearest the claw, is found on one or both chelicerae. The chelicera of the male resembles that of *dugesi*, but it is not quite so elongated.

The epigynum of the female (pl. 10, fig. 10) presents two oval orifices well separated by a V-shaped septum.

The male palpus (pl. 8, fig. 11) is similar to that of *dugesi*, but the terminal portion of the conductor of the embolus is proportionately longer, stouter, and curved.

TYPE LOCALITY: Madera Canyon, Santa Rita Mountains, Arizona, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southern Arizona and Mexico.

KNOWN RECORDS: *Arizona:* Pinery Canyon, Chiricahua Mountains, September 8, 1950 (W. J. Gertsch), males and females. Three miles west of Paradise, Chiricahua Mountains, September 9, 1950 (W. J. Gertsch), male. Buena Vista Peak, 8000 feet, Barfoot Park, Chiricahua Mountains, August 27, 1956 (A. F. Archer), male, penultimate male. Santa Rita Mountains, September and October, 1936 (O. Bryant), males and females. Tucson (O. Bryant), one female. *New Mexico:* Cottonwood Canyon, 25 miles north of Alma, September 21, 1950 (W. J. Gertsch), two males, one female. *Chihuahua:* Twenty-two and four-tenths miles south of Miñaca, August 23, 1950 (Ray Smith), one female, nine immatures.

Mallos niveus O. P.-Cambridge

Plate 8, figures 5–8; text figure 8

Mallow niveus O. P.-CAMBRIDGE, 1902, Biologia Centrali-Americana, Arachnida, vol. 1, p. 308, pl. 35, fig. 1. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 7. ROEWER, 1954, Katalog des Araneae, vol. 2, pt. B, p. 1331.

Dictyna nivea F. P.-CAMBRIDGE, 1902, Biologia Centrali-Americana, vol. 2, p. 358, pl. 33, figs. 20–21. SIMON, 1903, Histoire naturelle des araignées, vol. 2, p. 977. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 110. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1445.

Emblyna urica CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 13, pl. 6, fig. 63.

Mallos alpheus CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 14, pl. 3, figs. 31–32. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1331.

DIAGNOSIS: Females vary from 1.7 mm. to 3.5 mm. and average about 3 mm. in total length. The males are only slightly smaller. Carapace of a typical female, 1.2 mm. long, 1 mm. wide.

This is a brownish species in the southwestern mountains of the United States, but in Mexico it is pale yellowish or even snowy white as the name suggests. In melanic specimens the carapace is dark brown on the sides, except for the narrow marginal white bands, and the pars cephalica is pale yellowish brown, with the usual three longitudinal stripes of white hairs converging caudad. The sternum, labium, and maxillae are dark brown. The pale yellowish legs become gradually darker apically and are marked with brown rings. The abdomen is light above, with a dark brown band on the basal half which is obscured behind, but in the caudal half is flanked by three or four brown spots on each side. The venter of the abdomen features the usual median brown stripe from epigynum to spinnerets, with a white patch on each side of it. This species exhibits the

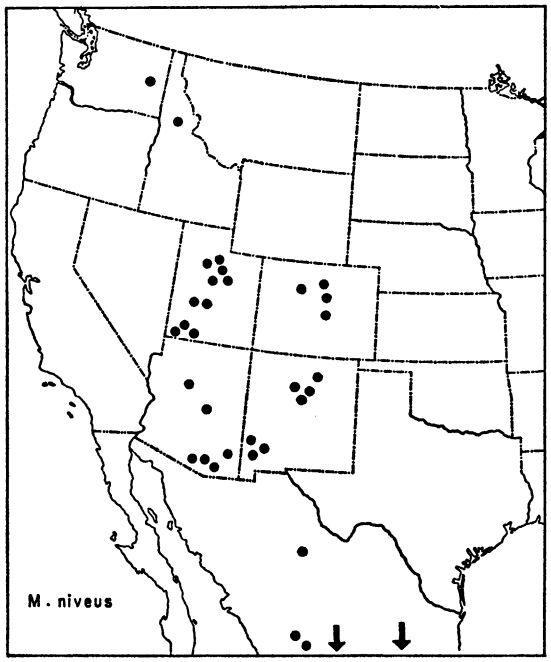


FIG. 8. Distribution of *Mallos niveus*.

usual considerable variation in color from dark chocolate brown to relatively unmarked pale yellowish.

The front row of eyes is gently procurved, and the median eyes, which are separated by not fully their diameter, are closer to the somewhat larger lateral eyes. The posterior eye row is straight, with the median eyes separated by their full diameter, but a little nearer the subequal lateral eyes. The quadrangle of the median eyes is only slightly wider than long and narrowed somewhat in front. The vertical clypeus is only a bit higher than the long diameter of the anterior lateral eye. The typical armature of the chelicera is as follows: upper margin with three subcontiguous teeth, of which the median tooth is largest; the lower margin with two small teeth.

The cribellum is divided. The caudal margin of the spinning plate is weakly emarginated, and a thin but distinct line bisects the transverse field essentially as shown for *pallidus* (pl. 9, fig. 5).

The epigynum is well illustrated in plate 8, figure 6, and features widely separated semilunar foveae.

The male palpus (pl. 8, figs. 5, 7, 8) is quite typical of the genus. The tibia has a weak, rounded, carinal spur on the retrolateral side. In males from Utah and Arizona (pl. 8, fig. 5) the terminal coil of the conductor is somewhat thinner, and the loop along the edge of the conductor forms a more prominent truncation. In Mexican specimens the terminal coil is somewhat broader as shown in plate 8, figure 7.

TYPE LOCALITIES: Of *Mallos niveus*, Amula, Guerrero, Mexico, immature male type in the British Museum (Natural History); of *Emblyna urica*, Hurricane, Utah, female holotype in the American Museum of Natural History; of *Mallos alpheus*, American Fork Canyon, Utah, female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains and Great Basin of the western United States from Washington, Idaho, Colorado, and New Mexico southward into Mexico (Veracruz, Oaxaca, Jalisco, and Guatemala). (See fig. 8.)

SELECTED RECORDS: *Washington:* Fishtrap Lake, 35 miles southwest of Spokane, August 14, 1951 (Kohls and Hughes), one female. *Idaho:* Clearwater Creek, near Kooshia, August 23, 1940, immature males and females. *Utah:* Salt Lake City (W. J. Gertsch), males and females. *Colorado:* Boulder, October 10, 1934 (H. G. Rodeck), one male. *Arizona:* Madera Canyon, Santa Rita Mountains, June 7, 1952 (W. J. Gertsch), males and females. *New Mexico:* Twenty-four miles south of Taos (C. C. Hoff), male and females. *Mexico:* Specimens from nine states are represented in the collection of the American Museum.

Mallos pallidus Banks

Plate 9, figures 3–8, 13; text figure 9

Dictynina pallida BANKS, 1904, Proc. California Acad. Sci., ser. 3, vol. 3, p. 342, pl. 39, fig. 22. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 111 (catalogue).

Mallos pallidus CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 5. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 7, fig. 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1332.

Dictyna eutypa CHAMBERLIN AND GERTSCH, 1928, Proc. Biol. Soc. Washington, vol. 41, p. 175; 1929, Jour. Ent. Zool. Pomona College, vol. 21, p. 101, pl. 1, fig. 2.

Mallos eutypus GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 4. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1332.

Mallos halli CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 4, pl. 1, fig. 1.

DIAGNOSIS: Females vary from 2.25 mm. to 5 mm. and average 3.6 mm. in total length. Carapace of an average female, 1.35 mm. long, 1.10 mm. wide. Males average about 3 mm. in length.

The dorsal aspect of a male is shown in plate 9, figure 13. This is a strongly marked species on the average, and in the California mountains it is often very dark. The dark brown carapace is paler on the pars cephalica and has the white band on the margins distinct. The sternum is usually dark brown. The yellowish brown legs are usually distinctly marked with brownish rings. The abdomen is grayish above and usually has a median longitudinal dark band from near the base to the caudal end, and this band may be flanked by darker side bands or spots. The venter of the abdomen has a median brown band from the epigynum to the spinnerets, which is flanked by a whitish patch or band on each side. The smaller males resemble the females, but they are often darker, more strongly marked, and have the two front pairs of legs often uniform brown. Specimens of both sexes from the arid regions of the southwest are often very pale and almost completely without pattern.

The front eye row is very weakly procurved, essentially straight, as seen from in front, and the median eyes, which are separated by the full diameter, are only about half as far from the distinctly larger lateral eyes. The subequal eyes of the posterior row lie in a straight line and are separated by slightly more than the long diameter. The median ocular quadrangle is slightly broader than long and narrowed somewhat in front. The vertical clypeus is equal in height to the full diameter of the anterior lateral eye. The typical armature of the chelicera is as follows: upper margin with three medium teeth, of which the middle one is largest; lower margin with two small teeth.

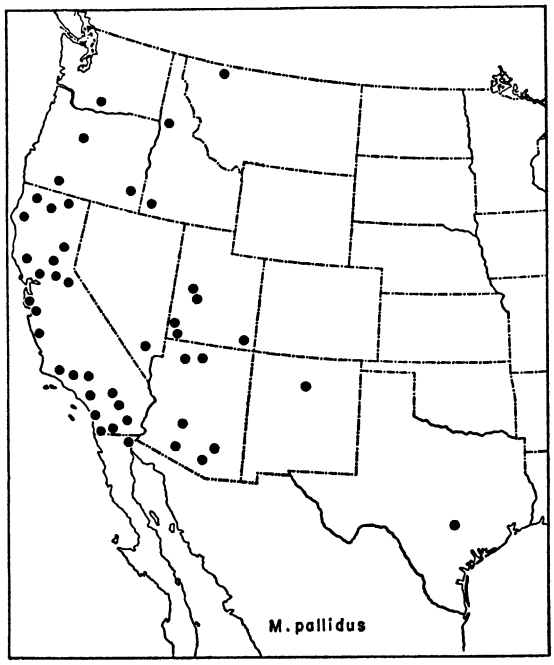


FIG. 9. Distribution of *Mallos pallidus*.

The spinning plate of the cribellum is usually distinctly emarginated behind and divided longitudinally by a dusky line (pl. 9, fig. 5).

The epigynum is quite variable in form. In the typical dark race of the California mountains the two foveae (pl. 9, fig. 4) are of medium size and are slightly to quite widely separated. Specimens from Utah and other arid states usually have large oval foveae (pl. 9, fig. 3) quite close together. All intergrades between these two extremes often occur in the same collection.

The male palpus is quite typical for the genus. In specimens from northern California the apical portion of the conductor (pl. 9, fig. 6) is a heavy oval coil. In Utah specimens (*eutypus*, pl. 9, fig. 7) this coil is somewhat thinner.

TYPE LOCALITIES: Of *Dictynina pallida*, Mt. Shasta, California, three female cotypes in the Museum of Comparative Zoölogy; of *Dictyna eutypa*, Bluff, San Juan County, Utah, female holotype in the American Museum of Natural History; of *Mallos halli*, Ben Lomond, California, female holotype in the American Museum of Natural History.

DISTRIBUTION: Western United States from

Washington and Montana southward into northern Mexico (see fig. 9).

SELECTED RECORDS: *Montana*: Kintla Lake, Glacier National Park, June, 1936 (L. W. Saylor), one immature. *Washington:* Chapparal Creek, Mt. Adams, September 2, 1954 (B. Malkin), female. *Oregon:* Sucker Creek Canyon, Malheur County, June 15, 1951 (B. Malkin), males and females. *Idaho:* Hot Creek Falls, Bruneau Canyon, Owyhee County, June 30 1952 (B. Malkin), male and female. *California:* Kyburz, Eldorado County 4000 feet, July 11, 1952 (W. J. Gertsch), males and females. Mount Palomar, San Diego County, July 13, 1953 (W. J. and J. W. Gertsch), males and females. *Baja California:* El Mayor, June 11, 1952 (W. J. Gertsch), males and females. *Texas:* Mount Baker, Austin, October 27, 1945 (D. and H. Frizzell), one male. *New Mexico:* Juan Tabo area, Sandia Mountains (C. C. Hoff), male. *Arizona:* Quitobaquito, Organ Pipe Cactus National Monument, June 13, 1952 (W. J. Gertsch), male and female.

Mallos mians Chamberlin

Plate 9, figure 10–12; text figure 7

Dictyna mians CHAMBERLIN, 1919, Jour. Ent. Zool. Pomona College, vol. 12, p. 4, pl. 3, fig. 8.

Mallos pallidus GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 7 (part).

Mallos mians ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1332.

DIAGNOSIS: Females vary from 3.5 mm. to 6.3 mm. and average 4.5 mm. in total length. Males vary from 3 mm. to 4 mm. and average 3.5 mm. in length. Carapace of a typical female or male, 1.5 mm. long, 1.25 mm. wide.

This is a larger, paler species than *pallidus* and has been confused with it. In well-marked specimens, the carapace is dusky brown on the sides, pale on the pars cephalica, and has the white marginal bands distinct. The sternum is normally uniform dusky yellowish to dark brown and lacks a broad, central, pale stripe. The legs are distinctly marked with median and apical brownish rings on the principal segments. The abdomen is grayish, with a dorsal pattern of black spots, which give a somewhat speckled appearance, and has frequently a median contrasting stripe margined by a series of small blackish spots on each side. In many cases the abdomen is quite pale and presents a large blackish spot at about the center of the dorsum. The venter presents a median dusky stripe of variable distinctness from genital groove to the spinnerets. Some very pale specimens lack all traces of pattern on legs and abdomen and are mostly pale yellowish or white.

The structure of the carapace, relations of the eyes, and armature of the cheliceral grooves are in close agreement with those of *pallidus*.

The cribellum is entire. The caudal edge of the spinning plate of the cribellum is evenly rounded and lacks any emargination or visible evidence of subdivision (see pl. 9, fig. 10).

The epigynum (pl. 9, fig. 11) presents the typical shallow foveae with the lateral semilunar ridge and shows the usual pattern of tubules, often asymmetrically arranged, beneath the clear integument. It is subject to considerable variation in the size and width of separation of the foveae.

The male palpus (pl. 9, fig. 12) is similar to that of *pallidus* but is somewhat more elongated and presents a proportionately much smaller and more rounded apical coil on the conductor of the embolus.

TYPE LOCALITY: Los Angeles County, California, female type in the Museum of Comparative Zoölogy.

DISTRIBUTION: California, especially the southern half of the state (see fig. 7). Some earlier records under *pallidus* belong with this species.

KNOWN RECORDS: *California:* Idyllwild, San Jacinto Mountains, June 18, 1952 (W. J. Gertsch), male, females. Mount Palomar, San Diego County, July 13, 1953 (W. J. Gertsch), male, female; June 30, 1956 (W. J. Gertsch and V. Roth), males and females. Cleveland National Forest, near Henshaw Reservoir, San Diego County, July 30, 1956 (V. Roth and W. J. Gertsch), females. San Antonio Canyon, near Claremont, July 1, 1956 (V. Roth and W. J. Gertsch), many males and females. Colonna, March 28, 1941 (S. and D. Mulaik), many males and females. Tapia Park, Santa Monica Mountains, April to November (R. X. Schick), males and females. Big Tujunga Canyon, San Gabriel Mountains, March, 1953 (R. X. Schick), two males. Fullerton, March 3, 1948 (W. M. Pearce), one female. Fairmont Camp, Santa Cruz River, July 22, 1948 (H. L. Schantz),

female. Dutch Flat, Placer County, May 2, 1954 (E. Schlinger), one female.

Mallos pearcei, new species

Plate 9, figures 1, 2; text figure 7

FEMALE: Total length, 4.5 mm. Carapace, 1.5 mm. long, 1.15 mm. wide. Abdomen, 3.1 mm. long, 2.3 mm. wide.

General appearance as in well-marked specimens of *mians*. Carapace dusky brown on the sides and streaked with black, paler yellowish brown on the pars cephalica, the side margins with a narrow, irregular, milky white stripe. Sternum dusky to dark brown and usually presenting a broad, median, hastate stripe. Legs pale yellowish but strongly ringed with brown. Dorsum of abdomen with a dusky pattern much as in *mians* or with a mottled aspect. Venter of abdomen pale on the sides and with a dusky median band from epigynum to spinnerets.

Structure almost exactly as in *pallidus* and *mians*. Eyes of the posterior row separated by the full diameter. Clothing of the carapace normal, with most of the hairs forming three rows running forward from the obsolete median groove to the eye rows. Clypeus with a fringe of white hairs, vertical, as high as the full diameter of the anterior lateral eye. Chelicera subparallel, of average size, typically armed on the furrows, the two teeth on the lower margin small.

Legs clothed with whitish hairs, without true spines. Legs of average length, quite thin, and with the first pair clearly longest. Only one conspicuous trichobothrium present on some of the metatarsi near the apex. First leg: femur, 1.6 mm.; patella, 0.55 mm.; tibia, 1.35 mm.; metatarsus, 1.1 mm.; and tarsus, 0.7 mm. Patella and tibia of fourth leg 1.5 mm. long.

Abdomen suboval, nearly as high as broad, covered evenly with inconspicuous whitish hairs. Cribellum entire, the caudal edge of the spinning plate not emarginated, essentially as in *mians* (pl. 9, fig. 10).

Epigynum (pl. 9, fig. 2) very similar to that of *mians* but proportionately larger in size, the visible epigynal area about equaling the width of the sternum.

MALE: Total length, 2.5 mm. Carapace, 1.35 mm. long, 1 mm. wide. Abdomen, 2.2 mm. long, 1.3 mm. wide.

Coloration and structure essentially as in the female. Chelicerae somewhat longer, with a weak rounded enlargement at the base. Legs proportionately longer. First leg: femur, 1.75 mm.; patella, 0.5 mm.; tibia, 1.7 mm.; metatarsus, 1.25 mm.; and tarsus, 0.7 mm. Patella and tibia of fourth leg, 1.5 mm. long.

Male palpus (pl. 9, fig. 1) similar to that of *pallidus* and *mians* but proportionately shorter and heavier than in those species, readily distinguished by the greatly enlarged, subcircular, apical coil of the conductor of the embolus.

TYPE LOCALITY: Male holotype, male paratypes, and female allotype from Viejas Valley, San Diego County, California, May 5, 1947 (W. M. Pearce), from under a bridge.

DISTRIBUTION: The southern portion of San Diego County, California, near the city of San Diego (see fig. 7). The specimens noted below are designated paratypes.

RECORDS: *California:* San Diego County: Lakeview District, July, 1948, one male, two females. El Cajon, May 16, 1947, May 16, 1947, seven females. Steele Canyon, June 21, 1947, one female. Potrero, June 20, 1947, one female. Dulzura, July 21, 1947, one female. Barrett, July 1, 1947, one female. Jamul, June 6, 1947, two females. Bee Canyon, July 8, 1947, one female. (All the above were collected by W. M. Pearce, for whom this interesting species is named.)

THE *trivittatus* GROUP

The quite uniform brown carapace lacks pale marginal side bands. The lower margin of the furrow of the chelicera bears two subequal teeth. The cribellum is entire.

Three related large species from the western United States and Mexico are assigned to this group, which is closely allied to the preceding. One of these, *Mallos trivittatus* Banks, has a wide range in the western United States and adjacent Mexico. Two others are exclusively Mexican, but only one (*Mallos avara* Banks) has been described.

Mallos trivittatus Banks

Plate 10, figures 1–5; text figure 10

Lethia trivittata BANKS, 1901, Proc. Acad. Nat. Sci. Philadelphia, vol. 53, p. 577, pl. 33, figs. 9–10; 1902, Proc. U. S. Natl. Mus., vol. 25, p. 213.

Lathys trivittata PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 112 (catalogue).

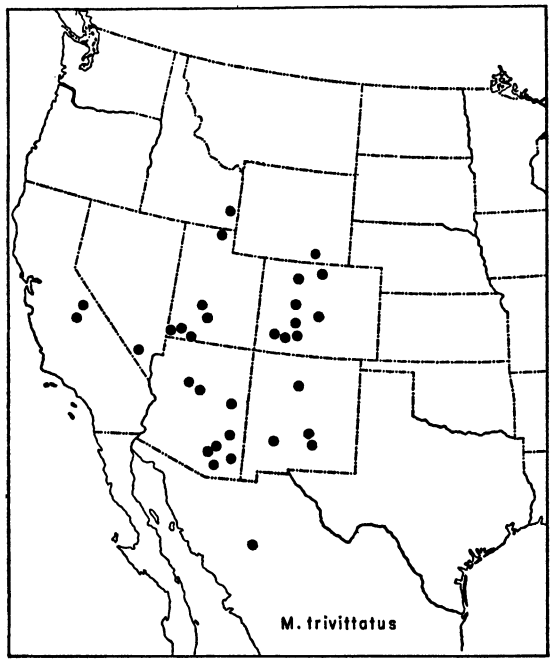


FIG. 10. Distribution of *Mallos trivittatus*.

Dictynoides trivittatus CHAMBERLIN, 1919, Ann. Ent. Soc. America, vol. 12, p. 244.

Dictyna trivittata GERTSCH, 1935, Amer. Mus. Novitates, no. 792, p. 15. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1452.

Mallos trivittatus GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 9. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1332.

Mallos zionis CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15.

DIAGNOSIS: The females vary from 4.8 mm. to 8.0 mm. in total length and average 6.7 mm. Carapace of a typical female, 2.3 mm. long, 1.8 mm. wide. The males vary from 4 mm. to 5.7 mm. and average 4.9 mm. in length.

The dorsal aspect of a typical female is shown in plate 10, figure 5. The carapace is dark reddish brown, has radiating brown streaks on the sides, and lacks any trace of whitish marginal bands present in most species of the genus. The somewhat paler pars cephalica has three bands of white hairs running from the eyes back to the median groove. The yellowish brown legs are very faintly ringed with dusky. The abdomen is usually grayish and presents a median stripe of broken brownish chevrons, the front half of which is usually darkened. The smaller males resemble the females closely but usually have a darker stripe on the proportionately smaller abdomen.

The front eye row is very weakly procurved as viewed from in front, and the median eyes, which are separated by the full diameter, are only their radius from the clearly larger lateral eyes. The eyes of the posterior row are equal in size, lie in a straight line, and are separated by the full diameter. The median ocular quadrangle is somewhat broader than long, slightly narrower in front, and the front eyes are slightly smaller. The vertical clypeus is as high as the full diameter of the median eye. The armature of the chelicera is as follows: three subcontiguous teeth on the upper margin, of which the middle is much the largest; two equal teeth on lower margin.

The epigynum (pl. 10, figs. 3, 4) present two suboval orifices separated by a narrow, subtriangular, median septum.

The male palpus (pl. 10, figs. 1, 2) is quite typical of the genus. The tibia has two inconspicuous ventral humps, between which the apical process of the conductor rests, and presents on the retrolateral side a rather weak carina with rounded upper spur and lower prong. A figure of the palpus of *Mallos avara* Banks (pl. 10, fig. 6) is included for comparison.

TYPE LOCALITIES: Of *Lethia trivittata*, Albuquerque, New Mexico, male and female cotypes in the Museum of Comparative Zoölogy; of *Mallos zionis*, Zion National Park, Washington County, Utah, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States and adjacent Mexico, northward into northern Colorado and southern Idaho (see fig. 10).

This large dictynid, which probably exceeds all other North American species in size, lives in our western mountains at modest to high elevations (at least 10,000 feet) where it is often abundant. The walls of cliffs, the rough bark of trees, and the walls of all kinds of buildings provide ideal habitats for these spiders.

SELECTED RECORDS: *Wyoming:* Encampment, July 15, 1933, males and females. *Idaho:* Bear Lake (R. V. Chamberlin), one female. *Colorado:* Fort Collins, August 11,

1946 (C. C. Hoff), one female. Squaw Creek, 9800 feet, 30 miles west of Creede in the San Juan Mountains, July 18, 1952 (H. Levi), one female. Taylor River, 8100 feet, at One Mile Creek, Gunnison County, August 3, 1952 (H. Levi), males and females from aspen twigs near cliff. *New Mexico:* Camp Mary White, near Cloudcroft, Otero County, August 9–12, 1935 (S. Mulaik), males and females. *California:* East Trail, Mt. Whitney, 10,000 feet, August 8, 1931 (W. Ivie), females from under flakes on a granite cliff. South fork of Bishop Creek, Inyo County, August 17, 1941 (W. M. Pearce), males and females. *Chihuahua:* Cañon Prieto, near Primavera, June 30, 1946 (W. J. Gertsch), one female.

Genus **HETERODICTYNA** Dahl

Ergatis Simon, 1914 (not Blackwall), Les arachnides de France, vol. 6, p. 1, pp. 49–50.

Heterodictyna Dahl, 1904, Sitz.-Ber. Gesell. Naturf. Fr., Berlin, p. 118; 1907, Zool. Anz., vol. 31, p. 63. Bonnet, 1957, Bibliographia araneorum, vol. 2, pt. 3, p. 2183.

Characters of the genus *Mallos* except as follows: Sides of the pars thoracica bordered with a distinct pale band which shows chalky white bodies through the integument. Eyes smaller and more widely separated, the posterior median eyes often by two full diameters. Chelicerae provided in both sexes with a single small tooth on the lower margin of the furrow and three or four teeth on the upper margin. Chelicerae of males larger than those of the female, essentially parallel as seen from in front, with the basal angle developed to a rounded or conical spur, or a transverse carina. Trichobothria probably present on the tarsi of some species and usually present on the metatarsi. Cribellum entire in most species but bipartite in *viridissima*. Epigynum a low elevation, with indistinct lateral atria. Male palpus of the *Mallos* type, completely lacking ctenidia on the tibia, but with a distinct tooth or process on the patella.

Type Species: *Dictyna flavescens* Walckenaer.

A small series of closely related species, grouped around *Dictya flavescens* Walckenaer, is given generic status adjacent to *Mallos* because of substantial palpal differences. Until now all the known species have been Palearctic, with at least six described from Europe and North Africa, but recently another species has been discovered in California. Whereas there is reason to believe that the California species may be an introduced one, it is quite distinct from the known species and presumably undescribed.

Simon used Blackwall's *Ergatis* for this group as a subgenus of *Dictyna*. *Ergatis* is a synonym of typical *Dictyna* and has as its type species *benigna* Walckenaer. In another place Gertsch (1946, Amer. Mus. Novitates, no. 1319, p. 5) has given reasons for not using this much older name.

The following Palearctic species are at present assigned to the genus *Heterodictyna:* *Dictyna puella* Simon, *flavescens* Walckenaer, *viridissima* Walckenaer, *hortensis* Simon, *patellaris* Simon, and *numicida* Dennis.

Heterodictyna linsdalei, new species

Plate 10, figures 8–13

Female: Total length, 3.00 mm. Carapace, 1.10 mm. long, 0.90 mm. wide. Abdomen, 2.20 mm. long, 1.30 mm. wide.

Dorsal view of a typical female as shown in plate 10, figure 13. Whole spider whitish except as follows: Eye tubercles black. Pars cephalica with a series of short dusky bars forming narrow lateral bands on each side, which outline the head and end at the indistinct median groove, the space between the bands and the side margins white. Legs clothed with gray hairs. Abdomen yellowish behind, with an irregular pattern of milky white spots showing through the integument, occasionally with a conspicuous red or black central spot, and clothed sparsely with gray hairs.

Structure essentially as in *flavescens*. Clypeus equal in height to two and one-half diameters of the median eye. First eye row very slightly procurved as seen from in front, moderately recurved from above, the median eyes separated by much more than the diameter (7/10), two diameters from the lateral eyes which are larger in the ratio of 8/6. Posterior eye row moderately recurved, the median eyes separated by two diameters, as far from the subequal lateral eyes. Subequal lateral eyes of each side contiguous. Median ocular quadrangle broader than long (25/21), narrowed in front in the same ratio.

Chelicera with a single tooth on lower margin and a closely set series of four on the upper margin. First leg: femur, 1.20 mm.; patella, 0.40 mm.; tibia, 1.10 mm.; metatarsus, 0.83 mm.; and tarsus, 0.45 mm. Tibia and patella of fourth leg 1.17 mm. long.

Epigynum (pl. 10, fig. 11) a low elevation with a pair of round, very shallow, and indistinct atria separated by a broad septum.

MALE: Total length, 2.80 mm. Carapace, 1.10 mm. long, 1.05 mm. wide. Abdomen, 1.70 mm. long, 1.00 mm. wide.

Dorsal view of a typical male as shown in plate 10, figure 8. Carapace orange-brown, with a V-shaped, dusky brown band enclosing black streaks which outlines the pars cephalica, leaving the top of head orange-brown, the side margins of pars thoracica light, and paler spots visible through the integument. Chelicerae reddish brown, the sternum, labium, and maxillae light yellowish brown. Coxae and legs paler yellowish brown, without contrasting markings. Abdomen gray above, with a pattern of large milky white spots showing through the integument, dusky on the sides, the venter gray.

Structure as in the female. Posterior median eyes separated by somewhat more than two full diameters. Clypeus equal in height to about three full diameters of the anterior median eyes. Chelicerae (pl. 10, fig. 10) rather short, the two together being about as long as the width, the sides as seen from in front essentially straight, with the inner margins only slightly excavated to leave a very long, fusiform opening, in lateral view slightly convex, the basal angle developed to an angled triangular process. Legs long and thin, without spines. First leg: femur, 1.1 mm.; patella, 0.33 mm.; tibia, 0.97 mm.; metatarsus, 0.77 mm.; and tarsus, 4 mm. Tibia and patella of fourth leg, 1 mm.

Palpus (pl. 10, figs. 9, 12) rather short and stout. Embolus originating near the front of the tegulum, quite heavy, forming an even curve to the conductor and ending in a sinuous thread. Cymbium elevated to a rounded ridge which is shallowly excavated on the prolateral side. Tibia short, with an elevated carina above and a small tooth on the prolateral edge. Patella convex and bearing a conspicuous long lobe on the retrolateral side.

TYPE LOCALITY: Male holotype and female allotype from Hastings Natural History Reservation, Monterey County, California, July 16, 1940 (J. M. Linsdale).

DISTRIBUTION: Coastal ranges of California from Marin County to Los Angeles.

KNOWN RECORDS: *California:* Taylor State Park, Marin County, May 8, 1949 (H. B. Leech), females. Vicinity of Stanford (L. W. Swan), males and females. Hastings Natural History Reservation, May to July (J. M. Linsdale), males and females. Tapia Park and other localities in the Santa Monica Mountains, April to July (R. X. Schick), many males and females.

This pretty species, which we dedicate to Dr. Jean M. Linsdale with pleasure and respect, is a near ally of *Heterodictyna flavescens* Walckenaer and the several other European and North African species previously assigned by Simon to the subgenus *Ergatis*. The much greater development of the patellar lobe on the male palpus distinguishes it from the known species.

GENUS DICTYNA SUNDEVALL

Dictyna SUNDEVALL, 1833, Conspectus arachnidum, p. 16. SIMON, 1893, Histoire naturelle des araignées, vol. 1, p. 241; 1903, *op. cit.*, vol. 2, p. 977.

Ergatis BLACKWALL, 1841, Trans. Linnean Soc. London, p. 608.

Operaria BLACKWALL, 1841, Ann. Mag. Nat. Hist., vol. 6, p. 229.

Emblyna CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 9.

Phantyna CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15.

Tivyna CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

Tosyna CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

Varyna CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 17.

Small to medium-sized dictynine spiders varying from 1.2 mm. to 4 mm. in length, with the average near 2 mm. Carapace longer than broad, quite high and convex, about half as high as the length in females and somewhat higher in males. Pars cephalica broadly convex and quite wide, the width at the second eye row being about two-thirds of the width of the carapace, but slightly to much broader in some males. Clypeus typically high, in females vertical or nearly so, equal-

ing one and one-half diameters of the anterior median eye in height, rarely only the diameter (*terrestris*), in males higher and often more inclined, the height two diameters but often three or four. Eyes of moderate size, occupying about three-fourths of the head width. Front eye row slightly procurved to essentially straight as seen from in front, the slightly smaller median eyes variously separated by the radius to more than the full diameter but distinctly nearer the lateral eyes. Posterior eye row weakly recurved, often nearly straight, the median eyes most often separated by about the full diameter and only slightly nearer the subequal lateral eyes. Median ocular quadrangle a little broader than long and narrowed in front by the same ratio, the front eyes smaller. Sternum cordate, slightly to distinctly longer than broad, bluntly pointed between the posterior coxae which are separated by about their width. Labium about as broad as long, narrowly rounded in front, about three-fifths as long as the moderately convergent endites. Chelicerae (pl. 38, figs. 3, 4) of moderate stoutness in the females, gradually narrowed apically, subparallel, with the lateral condyle conspicuous, developed to a weak rounded angle on the outer side. Chelicerae of the males much longer and thinner, bowed apart to leave a broad central space, with the basal angle often more strongly modified to a distinct horn. Armature of cheliceral groove similar in both sexes: upper margin typically with three subcontinguous teeth; lower margin with a single small tooth.

Leg formula, 1243, the second and fourth legs subequal in females. Legs of moderate length, in both sexes longer in males which have the first two pairs proportionately much longer, clothed with simple hairs. Calamistrum a single line of curved bristles occupying the whole length of the laterally flattened fourth metatarsus in both sexes. Trichobothria seemingly missing on the tarsi, but three are usually easily discernible at the apical end of the metatarsus, and one of these may be very long. Abdomen suboval in outline, about as high as the width, moderately overlapping the carapace in front. Cribellum a transverse plate, the spinning field narrow and undivided. Epigynum presenting externally two more or less distinct, shallow atria separated by a low septum of variable width and with carinate lateral foveae variously separated from the atria, which are absent only in the *spathula* group. Male palpus characterized as follows: Femur of average thickness, unmodified except in *Dictyna ardea;* patella normal to greatly inflated, unarmed or bearing spurs or other processes; tibia variously formed, typically with a process tipped with two modified setae, the ctenidia, which are almost always present, though rarely on separate eminences and even occasionally absent as in the *spathula* group. Embolus of male palpus a long spine of variable thickness, acuminate to apex or variously modified apically. Conductor of embolus an expansive sheath, which is basally heavy and coiled to produce a basal spiral of variable form and which margins the bulb along the retrolateral edge, or even broadly around to the prolateral side, as a shallow sheath for the embolus.

TYPE SPECIES: Of *Dictyna, arundinacea* Linnaeus; of *Ergatis, benigna* Walckenaer (=*arundinacea* Linnaeus); of *Operaria, benigna* Walckenaer; of *Emblyna, completa* Chamberlin and Gertsch; of *Phantyna, micro* Chamberlin and Ivie; of *Tivyna, floridana* Banks; of *Varyna, mulegensis* Chamberlin; and of *Tosyna, apacheca* Chamberlin and Ivie.

The genus *Dictyna* comprises a very large assemblage of species from all world centers, which are the most derivative members of the whole family. The presence of lateral foveae on the epigynum and ctenidia on the tibia of the male palpus distinguishes them from all related types. Sexual dimorphism is most pronounced in this genus, with striking development of the male chelicerae and correlated elevation of the head. These chelicerae are greatly elongated in many species, as in the Arizona *Dictyna rita* (pl. 13, figs. 6, 9) and reach their acme in *Dictyna anguiniceps* from Egypt. In this strange species, with greatly elevated head, the chelicerae are several times as long as broad and lift the head far above the mouth opening to a position comparable to that of the Archaeidae. In other species of the genus the specialization is transverse in direction, with the lateral wide bowing of the chelicerae, as is well illustrated in *Dictyna varyna miranda* (pl. 13, fig. 1).

The lateral condyle is frequently developed into a conspicuous crest or horn. The carinae bordering the opening between the chelicerae are thickened to form distinct teeth on both upper and lower margins in specialized species.

The genus *Dictyna* represents a higher development than *Mallos*, principally in the specialization of the chelicerae and tibial spurs of the palpus. Both lack evident trichobothria on the tarsi, except in an occasional species of *Mallos*. The cribellum is occasionally bipartite in *Mallos*, and the chelicerae ordinarily bear two teeth on the lower margin. In *Dictyna* the cribellum is always entire, and the lower cheliceral margin is armed with a single tooth. It is clear that *Mallos* is more generalized and representative of the ancestral type from which both genera were derived.

The present paper considers some 119 species of the genus *Dictyna* from North America north of Mexico and from Greenland. They can be divided into two quite natural series by the following key:

Embolus of male palpus a simple slender rod, usually quite thin at the base (more rarely thick as in the *personata* group), gradually acuminate to the apex, and lacking modifications at distal end . . . . . section *Dictyna*

Embolus typically thick at base, gradually enlarged, often flattened and ribbed, usually twisted, and with the apical portion divided, incised or otherwise complicated . . . . . section *Emblyna*

Section DICTYNA

A simple embolus without distal modifications characterizes this large and interesting section. This type of embolus can be considered less specialized than that found in *Emblyna*. In *Dictyna* structural innovations occur on several segments of the palpus, with the patella and tibia being often strangely modified, and the tibia further bearing the ctenidia on spurs of diverse length and position. The diversity in these features has made it possible to subdivide this section into 13 groups. The key below is offered merely as a guide to aid in the separation of the males of the groups. The females are distinct enough in their way, but we have been unable to find characters suitable for a key. The various groups are of very unequal weight and importance and largely intergrade from beginning of the series to the end. It is possible that some of the elements in this section, notably the *personata* group, may actually belong in *Emblyna*. In that case, their emboli must be regarded as being secondarily simplified.

Key to the Groups of the Section *Dictyna*

1. Patella of male palpus enlarged or otherwise modified, often bearing spurs or special setae 2
   Patella of male palpus of normal size, lacking spines, special setae, or other modifications 6
2. Tibial processes without evident ctenidia . . . . . *spathula* group
   Tibial processes with one or two distinct ctenidia 3
3. Patella of male palpus bearing one or more distinct spurs or a lateral lobe 4
   Patella globular, without lobes or spurs, set with short setae . . . . . *bicornis* group
4. Patella greatly swollen, with a single conspicuous dorsal spur . . . . . *pixi* group
   Patella only moderately enlarged, with a well-developed retrolateral lobe or spur . . 5
5. Patella with a flattened retrolateral lobe . . . . . *rita* group
   Patella with a pointed spur . *varyna* group
6. Tibia of male palpus armed with a conspicuous laterally directed tibial apophysis, which is usually clearly longer than the length of the tibia or greatly exceeding the width . . . . . *longispina* group
   Tibia of male palpus armed with a relatively short spur or process much shorter than the tibial length and only rarely as long as the basal width of the tibia 7
7. Cymbium narrow at base, long and thin, strongly curved ventrally, thinned apically to a slender finger . . . *terrestris* group
   Cymbium sagittate or cup-shaped . . . 8
8. Embolus thick, originating near the caudal edge of the tegulum; cymbium sagittate; bulb and elements prominent, far exceeding the limits of the cymbium . . . . . *personata* group
   Embolus relatively thin, originating on side or high up on the tegulum 9
9. Embolus originating near front prolateral edge of the tegulum 10
   Embolus originating near middle of tegulum on prolateral side 12
10. Tibial apophysis of medium length and directed more or less strongly caudad . . . . . *apacheca* group
    Tibial apophysis of variable length, not directed caudad 11

11. Tibia quite long and slender; ctenidia conspicuous, set on a short process at base . . . . . *foliacea* group
    Tibia short and stout; bulb and elements compact, with the embolus quite short and the cymbium relatively large . . . . . *brevitarsus* group
12. Basal spiral of the conductor ending in a wide truncated spur . . . . . *volucripes* group
    Basal spiral of the conductor ending in a short sharp spur . . . . . *major* group

The *spathula* Group

This species group exhibits some remarkable modifications of the palpal and epigynal structures. In the male palpus the patella is greatly inflated to bulbal shape, attains a girth about equaling the width of the cymbium, and presents in front at base of tibia several rounded or angled spurs. The tibia is strikingly modified with a series of more or less conspicuous spurs. Some of these, as in *moaba*, still bear the typical ctenidia, but they are largely if not completely lost in *pallida* and *spathula*. The cymbium and bulbal elements show no special distinctions. The embolus is a long thin spine for its full length. The female epigynum features a caudally free, finger-like or spatulate process lying on the median septum. The lateral foveae of typical *Dictyna* are completely missing or perhaps now incorporated in masked form in the spatulate process.

The chelicerae of the males are of average size and development as illustrated by those of *spathula* (pl. 11, figs. 2–3). They are curved and moderately bowed apart to from a long fusiform opening, and the size of the basal angle, which is a sharp horn in *spathula*, varies from species to species.

Of the five or six species known from North America, four occur partially or entirely within the United States.

Dictyna spathula Gertsch and Davis

Plate 11, figures 1–6

Dictyna spatula Gertsch and Davis, 1937, Amer. Mus. Novitates, no. 961, p. 16, figs. 17, 18. Roewer, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317. Bonnet, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1450 (*spathula*).

Dictyna cubana Bryant, 1940, Bull. Mus. Comp. Zoöl., vol. 86, no. 7, p. 298, figs. 58, 62, 63.

Diagnosis: A typical female is 2 mm. long, with the carapace 0.75 mm. long, 0.55 mm. wide, the abdomen, 1.1 mm. long, 0.75 mm. wide. The males are slightly smaller.

The carapace of the female is quite uniform dark brown in color, with the pars cephalica slightly paler. The sternum is yellowish brown and is somewhat dusky around the margins. The pale whitish or yellow legs lack darker markings. The grayish abdomen has a typical dorsal pattern of black spots, which includes a dentate streak from base to center, followed by four pairs of black spots that go back to the apex, and a few black spots on each side. The venter of the abdomen is mostly pale, with a dusky patch behind the genital groove and dusky spots along the sides. The male has a darker carapace than the female and has the black markings of the abdomen more distinct and often fused together.

The structure in both sexes is quite typical for the *spathula* group. The eyes of the posterior row are gently recurved, and the median eyes are separated by a little less than the full diameter. The metatarsi of all the legs have two subapical trichobothria, of which the distal one is longer on the fourth leg. The lower margin of the chelicera is armed with a tiny tooth.

The epigynum (pl. 11, fig. 5) is very similar to that of *pallida* and presents the typical spatulate process broadly rounded at the apex.

The male palpus (pl. 11, figs. 1, 4, 6) is easily distinguished from that of *pallida* and other species by a comparison of the various elements. The cymbium is of moderate length, subtriangular as seen from above, and not strongly arched in side view. The conductor is suboval in form, not much bent apically, and ends in a small, twisted process lying over the tibia.

Type Localities: Of *spathula*, Acapulco, Guerrero, Mexico, female holotype in the American Museum of Natural History; of *cubana*, Soledad, Cuba, male holotype in the Museum of Comparative Zoölogy.

Distribution: Southern and eastern Mexico, Cuba and the Bahama Islands, and the southern part of Florida.

Known Records: *Florida:* Metacumbe Key, February 29, 1936 (Bishop collection), male and female. Key West, December 30,

1950 (A. M. Nadler), one female. *Bahama Islands:* Bennett's Harbour, Cat Island, March 24, 1953 (E. B. Hayden), two males. Mangrove Cay, Andros Island, April 26, 1953 (E. B. Hayden), one male. North Bimini, March 25, 1953 (A. M. Nadler), one female. *Cuba:* Havana, females. Soledad, August 22, 1933 (N. Weber), male holotype of *cubana*. *Chiapas*: Tonala, August, 1909 (A. Petrunkevitch), one female. *Veracruz:* Tierra Blanca, July 28, 1941 (H. Dybas), one female. *Guerrero:* Acapulco, June 17, 1956 (L. I. Davis), female holotype of *spatula*. Pie de la Cuesta, 8 miles west of Acapulco, June 29, 1941 (L. I. Davis), two females. *Nayarit:* Ixtlan, June 22, 1941 (L. I. Davis), one female. Compostela, July 26, 1954 (W. J. Gertsch), three females. *Jalisco:* Ajijic, Lake Chapala, July 28, 1954 (W. J. Gertsch), male and female. *San Luis Potosi:* Tamazunchale, May 14, 1952 (W. J. Gertsch), one female.

Dictyna pallida Keyserling

Plate 11, figures 9–12

Dictyna pallida KEYSERLING, 1887, Verhandl. Zool. Bot. Gesell. Wien, vol. 37, p. 472, pl. 6, fig. 33. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510. BANKS, 1910, Bull. U. S. Natl. Mus., no. 72, p. 17. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 18. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1446.

Dictyna floridana BANKS, 1904, Proc. Acad. Nat. Sci. Philadelphia, p. 125, pl. 7, fig. 10.

Tivyna floridana CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16, figs. 42, 43.

DIAGNOSIS: Female: Total length, 2.5 mm. Carapace, 1.1 mm. long, 0.85 mm. wide. Abdomen, 1.7 mm. long, 1.1 mm. wide.

This is a somewhat larger and paler species than *spatula*. The yellowish brown carapace is quite uniform in color in the single example available to us for study. The sternum and the legs are pale yellowish and are without contrasting markings. The pale abdomen shows above a faint pattern of grayish spots, consisting of a basal dentate band back to near the middle, and behind this three broken chevrons. The venter is mostly whitish and shows only faint duskiness just in front of the cribellum.

Except for a somewhat larger size, this rare species seems to be very close to *spatula* in structural features. The posterior eyes lie in a distinctly recurved row (a line along the caudal edges to the median eyes passes through the centers of the lateral eyes) and are separated by the full diameter. The lower margin of the chelicera bears a single tiny tooth.

The epigynum (pl. 11, fig. 9) is proportionately broader and larger than in *spatula*, and the spatulate process is a little thinner and lies nearer the genital groove.

The male palpus (pl. 11, figs. 10–12) is similar to that of *spatula*, but the whole appendage is proportionately longer. The cymbium, which is considerably narrowed in the apical half and quite strongly curved, does not nearly cover the similarly formed conductor.

TYPE LOCALITIES: Of *pallida*, Chesapeake Bay, Maryland, female lectotype in the United States National Museum; of *floridana*, Lake Worth, Florida, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: District of Columbia, Maryland, and Florida.

KNOWN RECORDS: Only the original type specimens of *pallida* and *floridana*, a single male and four female cotypes, are known in collections. One of the cotypes in the United States National Museum was designated as lectotype of *pallida* by Gertsch in 1946. A single paratype specimen from Chesapeake Bay (formerly a cotype) is in the collection of the American Museum of Natural History.

Dictyna petrunkevitchi Gertsch and Mulaik

Plate 11, figures 7, 8

Dictyna petrunkevitchi GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 330, figs. 22, 23. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Female: Total length, 2.2 mm. Carapace, 0.85 mm. long, 0.63 mm. wide. Abdomen, 1.2 mm. long, 0.8 mm. wide.

This species differs little from *pallida* and perhaps is merely a subadult specimen with not fully developed epigynum. The orange-brown carapace has dusky lines defining the pars cephalica and radiating to the margins of the pars thoracica. The yellow sternum has a narrow dusky band on the margins, and the yellow legs are unmarked. The dorsum of the

abdomen bears a black pattern of spots on a pale ground as shown in plate 11, figure 8.

The structure of the single known specimen is very similar to that of *pallida* except in minor details. The eyes of the posterior row are nearer together, separated by only four-fifths of the full diameter.

The epigynum (pl. 11, fig. 7) shows the typical form of this group of species, but it is quite small and may not be fully developed.

TYPE LOCALITY: Thirty-two miles east of Laredo, Zapata County, Texas, November 11, 1934 (S. Mulaik), female holotype in the American Museum of Natural History.

Dictyna moaba Ivie

Plate 11, figure 13; plate 12, figures 1–4

Dictyna moaba IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). Roewer, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Female: Total length, 1.85 mm. Carapace, 0.65 mm. long, 0.53 mm. wide. Abdomen, 1.2 mm. long, 9.0 mm. wide. Males are slightly smaller.

This is a very pale species, without dark pattern on any part of the body. The clear yellow carapace is slightly darker than the legs, and the abdomen is white or pale yellow.

In this small species, which is structurally very similar to *pallida* and *spathula*, the eyes are somewhat nearer together. The posterior row is distinctly recurved, and the eyes are equal in size, separated by five-sevenths of the long diameter. The median ocular quadrangle is broader than long (13/11) and narrowed in front (13/10), and the dark anterior median eyes are distinctly smaller. The metatarsi are provided with a curved trichobothrium at base, which is twice as long as the width of the segment, and a much shorter one just behind it.

The epigynum (pl. 11, fig. 13) has a proportionately large, spatulate process.

The male palpus (pl. 12, figs. 1–4) is a very distinctive structure. The patella is not so strongly inflated as in the related species and bears a strong tooth in front (pl. 12, fig. 3). The tibia is armed with three principal processes as follows: a small pointed spur on the retrolateral side which bears the typical ctenidium; a rounded lobe on the prolateral side; and a conspicuous twisted dorsal lobe which probably contains the second ctenidium. The cymbium is of moderate width and strongly arched as seen in lateral view. The sweep of the suboval conductor takes it far outside the limits of the cymbium, and it is very strongly curved downward in its apical portion.

TYPE LOCALITY: Imperial Valley, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States.

KNOWN RECORDS: *Utah:* Moab, May 9, 1933 (R. V. Chamberlin), male and female. Six miles north of Greenriver, May 9, 1933. Emery, April 15, 1933, females. Notom, September 8, 1929 (R. V. Chamberlin and W. J. Gertsch), female. Bluff, May 11, 1933, females. *Arizona:* Junction of Verde and Salt rivers, April 9, 1935, females. Colossal Cave Camp, September 8, 1941. *California:* Fish Springs on Salton Sea, March 12, 1941, four males, 16 females. Fort Yuma, October 13, 1941, female.

THE *micro* GROUP

This small series of species bridges the quite remarkable *pallida* group with the more conventional species of the section *Dictyna*. The male palpus bears processes on both patella and tibia, and the former is inflated to a moderate degree. The bulbous patella presents a dorsal, pointed, or rounded spur, and in *pixi* the retrolateral margin has a sharp conical spur. The tibia is rather short and has two principal apophyses typically on opposite sides of the dorsum. The prolateral apophysis carries two thin ctenidia in *micro* but only one in *pixi* and *ingenuata*. The second ctenidium in *pixi* is on the retrolateral spur and presumably on the caudally directed apophysis of *ingenuata*. The embolus originates and continues for its full length as a thin rod. The female epigynum is of small size but presents the typical features of the subgenus, including the pair of lateral foveae which are sometimes difficult to see.

Only three species are so far known, and all come from the eastern United States and southern Texas.

Dictyna micro Chamberlin and Ivie

Plate 12, figures 7–10

Dictyna micro CHAMBERLIN AND IVIE, 1944,

Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 119, figs. 175–177. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1315.

Phantyna micro CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 15, figs. 40, 41.

DIAGNOSIS: Females average 1.3 mm. in total length. Carapace, 0.57 mm. long, 0.45 mm. wide. Abdomen, 0.9 mm. long, 0.6 mm. wide. The males are only slightly smaller in size.

This species is a very near relative of *Dictyna pixi*, new species, and is quite similar in coloration. The light brown carapace has the thoracic portion marked with dusky radial streaks. The light yellowish sternum is shaded with duskiness which is heaviest along the margins. The legs and palpi are uniform orange-yellow and lack markings. The grayish abdomen is heavily marked above with blackish spots and mottling, essentially as in *pixi* (see pl. 12, fig. 12), and the venter is mottled.

The posterior eye row is slightly recurved, and the median eyes are separated by slightly less than the diameter. The metatarsi of all the legs present a very long trichobothrium at the apex, which is curved and twice as long as the width of the segment, and a much shorter one just behind it. The chelicerae of the male are modified in typical fashion and have a small, rounded, basal spur.

The epigynum (pl. 12, fig. 8) features two small round openings set close together on the midline and usually shows the internal tubes and receptacles clearly through the integument. The lateral foveae are visible as inconspicuous lateral slits quite remote from the openings, often even farther than shown on the illustration.

The male palpus (pl. 12, figs. 7, 9, 10) is similar to that of *pixi*. The cymbium is a shallow subtriangular cup which largely covers the round bulb and conductor. The considerably expanded patella bears a small spur in front on the retrolateral side. The tibia bears two principal spurs, the prolateral one a twisted three-pronged process (of which one part is the modified ctenidium), and a sharp spur essentially dorsal in position which points upward and outward and has a single black ctenidium at its apex.

TYPE LOCALITY: Gainesville, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from Georgia and Florida.

KNOWN LOCALITIES: *Georgia:* Savannah Beach, May 4, 1943 (W. Ivie), four females. Three miles southeast of Savannah, April 8, 1943 (W. Ivie), two males. *Florida:* Gainesville, February 10, 1942 (W. Ivie), male holotype, female allotype, male and female paratypes. Miami, March 2, 1936 (S. C. Bishop), one male. Dunedin, December, 1925 (W. S. Blatchley), male and female.

Dictyna pixi, new species

Plate 12, figures 5, 6, 11, 12

FEMALE: Total length, 1.5 mm. Carapace, 0.55 mm. long, 0.47 mm. wide. Abdomen, 1 mm. long, 0.75 mm. wide

Dorsal view of a female as illustrated in plate 12, figure 12. Carapace dark brown on the side, paler on the pars cephalica, which has the usual three bands of whitish hairs thin and inconspicuous. Sternum, labium, and chelicerae dusky brown, the maxillae paler. Legs pale yellowish, without darker markings. Abdomen gray to black above, with a more or less distinct pale pattern as follows: a narrow median streak from base to center; a series of five pairs of spots, sometimes joined to form chevrons, from middle back to apex; a series of four to five spots along the upper margin. Venter of the abdomen gray to black, with few indistinct paler spots.

Appearance and structure in very close agreement with those of *micro*. Eyes of the posterior row in essentially a straight line, the equal eyes separated by the diameter. Lower margin of the furrow of the chelicera with a single small tooth. Legs of normal length, the tibia and patella of first leg as long as the carapace. Metatarsi of the legs with a very long trichobothrium near the apex, nearly three times as long as the width of the segment, and a short one just behind it.

Epigynum similar to that of *micro*, as illustrated in plate 12, figure 8.

MALE: Total length, 1.35 mm. Carapace, 0.65 mm. long, 0.53 mm. wide. Abdomen, 0.8 mm. long, 0.5 mm. wide.

Color and structure as in the female except as follows: Carapace dark throughout, nearly black in melanic specimens. Chelicera modified as usual with an angled spur, a base strongly curved forward in the apical half,

excavated on inner side and moderately curved along outer side. Clypeus higher than in the female, the height exceeding the full diameter of the anterior lateral eye.

Palpus as illustrated in plate 12, figures 5, 6, and 11. Dorsal process on the patella a rounded lobe on the retrolateral side; dorsal process on the tibia on the prolateral side and directed mostly forward.

TYPE LOCALITY: Male holotype, female allotype, and male and female paratypes from Washington Crossing, New Jersey, May 15, 1953 (W. Ivie).

DISTRIBUTION: Known from scattered localities in the eastern United States as shown below.

KNOWN RECORDS: *Michigan:* E. S. George Reserve, Livingston County, May 13, 1949 (Bohnsack), one male. *North Carolina:* Vance County, June 2, 1953 (R. D. Barnes), one female. *Arkansas:* Cove Creek Valley, 15 miles west of Prairie Grove, Boston Mountains, Washington County, July 26–August 7, 1956 (M. Hite), one male.

This tiny species is a very close ally of *Dictyna micro* of Florida. It is much darker and presents significant differences in the genitalia which are well shown in the illustrations.

Dictyna provida Gertsch and Mulaik

Plate 13, figures 2–5

Dictyna provida GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 8, fig. 10; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1447.

Dictyna ingenuata GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 332, fig. 19. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321.

DIAGNOSIS: Female: Total length, 1.5 mm. Carapace, 0.55 mm. long, 0.45 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide. Male: Total length, 1.45 mm. Carapace, 0.62 mm. long, 0.5 mm. wide. Abdomen, 0.8 mm. long, 0.55 mm. wide.

This small species resembles *pixi* in general appearance. It now seems quite probable that the single male described as *ingenuata* belongs with *provida*. The brown carapace has the usual radiating dark streaks on the pars thoracica, has a narrow black seam, and is pale yellowish on the head. The dusky brown sternum is darkened around the margins. The base color of the legs is pale yellow, but the femora are blackish, and the tibiae have a broad, basal, blackish ring. The abdomen is mainly blackish, with a broken, median, pale band of spots on the dorsum, and the venter is mottled with black. In the single known male the carapace is dusky reddish brown, and the dull yellowish legs lack contrasting markings. The grayish abdomen lacks darker pattern, but it is not well preserved.

The posterior eye row is distinctly recurved and the median eyes are separated by two-thirds of their diameter. The metatarsi have a long trichobothrium at their distal end, which is twice as long as the width of the segment, and a shorter one behind it.

The epigynum (pl. 13, fig. 5) is quite distinct from that of related species in having the small oval openings just in front of the genital groove.

The male palpus (pl. 13, figs. 2–4) shows general similarity to that of *pixi*. The patella is considerably enlarged and bears above at the front edge a sharp spur. The tibia has a small dorsal spur, bearing one ctenidium, and a strong retrolateral process lying parallel to the long axis of the joint and directed caudad, which seems to contain the second ctenidium.

TYPE LOCALITIES: Of *provida*, Edinburg, Hidalgo County, Texas, female holotype in the American Museum of Natural History; of *ingenuata*, Edinburg, Texas, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southern Texas.

KNOWN RECORDS: *Texas:* Edinburg, Hidalgo County, May 2, 1935 (S. Mulaik), females; May 2, 1939, one male. Monte Cristo, Hidalgo County, September 10, 1935 (S. Mulaik), two females. No specific locality in Llano County, July 10, 1936 (L. I. Davis), immature male.

THE *varyna* GROUP

The *varyna* group is atypical only in the presence on the slightly enlarged patella of the male palpus of a retolateral spur or lobe. The quite short tibia has a rounded lobe on the retrolateral side and bears above on the prolateral edge a more or less distinct apophysis. In *mulegensis* this prolateral apoph-

ysis is a pointed spur tipped with two black ctenidia. In *segregata*, *varyna*, and the Mexican *parietalis* the prolateral apophysis bears only a single enlarged black ctenidium, and a second smaller one is to be found on the upper surface of the retrolateral lobe or may be entirely missing. The embolus is the typical thin rod of the section. The epigynum presents two relatively small round or oval median atria close together and has well-separated, conspicuous, lateral foveae.

The chelicerae of the males are of special interest because they are similar in modification to those of the *borealis* group of the section *Emblyna*. They reach their acme in *varyna* and the subspecies *miranda* (see pl. 13, fig. 1) in which the laterally flattened chelicerae are very widely bowed apart and the carinal teeth are especially large. The basal angle is only of modest size but presents a distinct, sharp, downwardly directed horn, a feature not found in the *borealis* group. In *mulegensis* the chelicerae are more modestly developed (as shown in pl. 14, figs. 10, 11) and are intermediate to the more typical ones of the section *Dictyna*. The median carinae are rather strongly developed, but distinct carinal teeth are usually not present.

The principal center of the *varyna* group seems to be Mexico where several known and undescribed species occur. The three from the United States range far south into Mexico. *Dictyna parietalis* O. P.-Cambridge lives in tropical Mexico and Central America. The only known South American species is *Dictyna remota* Banks of the Galapagos Islands and the adjacent mainland.

Dictyna mulegensis Chamberlin

Plate 14, figures 9–13; plate 15, figures 8, 9; text figure 14

Dictyna mulegensis CHAMBERLIN, 1924, Proc. California Acad. Sci., ser. 4, vol. 12, p. 582, figs. 7–9. GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 12; 1942, Amer. Mus. Novitates, no. 1158, p. 15. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1445.

Varyna mulegensis CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 17.

DIAGNOSIS: Females vary from 2 mm. to 4 mm. but average about 3 mm. in total length. Carapace of a typical female, 1 mm. long, 0.75 mm. wide. The males are slightly smaller.

The general color pattern of an average female is illustrated in plate 14, figure 13, but the species is sometimes nearly as dark as *segregata*. The carapace varies from light to dark chestnut brown on the sides, which are marked with black radiating lines, and the orange pars cephalica bears the usual rows of white hairs. The sternum is dusky yellow to almost black. The chelicerae are light brown in the females but dark chestnut in the males. The yellowish legs are lightly to heavily annulated with brown or black. The abdomen is whitish, reticulated with gray, and has above a more or less distinct pattern of spots as shown in the plate.

The posterior eye row is distinctly recurved, and the median eyes are separated by the full diameter, only slightly farther from the equal lateral eyes. The lower margin of the chelicera bears a small tooth. The metatarsi of all the legs have a row of three trichobothria in the distal half, of which the apical one is longest, exceeding the width of the segment somewhat.

The epigynum (pl. 15, figs. 8, 9) is typical for this series and has the two suboval orifices close together on the midline and the lateral foveae distinct grooves on each side, separated by about the width of the sternum.

The male palpus (pl. 14, figs. 9, 12) has the patella moderately inflated and bearing a minute setigerous tubercle above and a lateral process clothed with stiff hairs. The tibia is armed above with a stout, suberect process which bears two black ctenidia set in sockets. The cymbium is a shallow cup largely containing the bulb and its elements. The thin embolus is hidden apically in the basally thickened conductor, which is twisted over the edge of the tibia.

TYPE LOCALITY: Mulegé, Baja California, male type in the California Academy of Sciences.

DISTRIBUTION: Southwestern United States from southern California to southern Texas and south into Mexico to Nayarit, Durango, and Hidalgo (see fig. 14).

SELECTED RECORDS: *California:* Thousand Palms Canyon, Indio Hills, March 20, 1954, female. *Arizona:* Six miles east of Nogales,

June 23, 1939 (A. M. and L. I. Davis), males and females. *Texas:* Four miles east of Hargill, June 2, 1939 (S. Mulaik), males and females. *Baja California:* Mulegé, May 15, 1921 (E. P. Van Duzee), male type of *mulegensis*. *Sonora:* Hermosillo, July 18, 1954 (W. J. Gertsch), males and females. *Durango:* Nombre de Dios, August 14, 1947 (W. J. Gertsch), males and females *Nayarit:* Palm Grove 5 miles east of San Blas, July 25, 1954 (W. J. Gertsch), males and females. *Hidalgo:* Ixmiquilpan, August 18, 1947 (H. Wagner), female. *Veracruz:* Tuxpan, October 15, 1947 (H. Wagner), female.

Dictyna segregata Gertsch and Mulaik

Plate 14, figures 1–5; text figure 13

Dictyna segregata GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 1851, p. 4, figs. 13, 14; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1450.

Dictyna patellaris JONES, 1947, Field and Lab., vol. 15, p. 1, figs. 1–4.

DIAGNOSIS: Female: Total length, 2.6 mm. Carapace, 1.1 mm. long, 0.95 mm. wide. Abdomen, 1.35 mm. long, 1.1 mm. wide. The males are slightly smaller.

This species is a close ally of *mulegensis* and agrees closely in morphology and coloration. It is ordinarily somewhat darker, as shown in plate 14, figure 1, and has more distinct, wider, blackish rings on the legs. Males are often very dark, with mahogany brown carapaces on which the three rows of white hairs are conspicuous.

The epigynum (pl. 14, fig. 5) is the same type as in *mulegensis*, but the median atria are circular in form.

The male palpus (pl. 14, figs. 3, 4) is similar to that of *mulegensis* but quite distinct. The patella is moderately enlarged and bears on the retrolateral side a large thin process, the upper edge of which is blackish and armed with a thickly set row of minute teeth set in sockets. The short and broad tibia has a large dorsal process on the prolateral edge which is armed at the tip with a thick black ctenidium. On the retrolateral edge of the tibia is a smaller ctenidium in a group of several short setae. The wide separation of the ctenidia on two distinct eminences distinguishes this species readily from *mulegensis*.

TYPE LOCALITIES: Of *segregata*, northwest of Edinburg, Hidalgo County, Texas, male holotype in the American Museum of Natural History; of *patellaris*, Clear Creek Woods, Denton County, Texas, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Louisiana, eastern Texas, and eastern Mexico (see fig. 13).

SELECTED RECORDS: *Louisiana*: Shreveport, Caddo Parish, July 28, 1948 (J. H. Robinson), male. Tallulah (P. Glick), male. *Texas*: Houston, May 3, 1955 (R. D. Barnes), male. San Antonio, July 25, 1946 (L. I. Davis), females. Brownsville, June 11, 1933 (P. Darlington), two females. *Tamaulipas:* El Mante, May 18, 1952 (W. J. Gertsch), females. Reynosa, May 2, 1936 (W. Green), males and females.

Dictyna varyna, new species

Plate 14, figures 6–8

FEMALE: Total length, 2 mm. Carapace, 0.85 mm. long, 0.65 mm. wide. Abdomen, 1.3 mm. long, 0.8 mm. wide.

Carapace orange-brown, with the sides dusky and with darker radiating lines. Sternum clear to dusky yellow or orange-brown, with duskiness along the borders to form an indistinct dark seam. Legs whitish to yellow and without dark rings of markings. Abdomen whitish to gray, with fine dusky reticulations, the dorsum with a more or less distinct pattern of dusky to blackish marks consisting of a narrow dentate streak from base to center, which is followed by four pairs of small spots, the venter mostly pale.

Structure typical, in close agreement with that of *segregata* and the Mexican *parietalis*. Eyes subequal in size. Posterior eye row slightly recurved, the median eyes separated by the full diameter. Lower margin of the chelicera with a minute tooth.

Epigynum as illustrated in plate 14, figure 8.

MALE: Total length, 2.3 mm. Carapace, 1 mm. long, 0.83 mm. wide. Abdomen, 1.3 mm. long, 0.8 mm. wide.

Carapace quite uniform orange-brown, with the sides dusky. Carapace broad, the prominent pars cephalica very strongly elevated and highest behind the eyes, squared

off in front where the width equals five-eighths of that of the carapace.

Legs typical, the first pair longest, the first tibia and patella together longer than the carapace. First leg: femur, 1.1 mm.; patella, 0.32 mm.; tibia, 0.9 mm.; metatarsus, 0.75 mm.; and tarsus, 0.4 mm.

Chelicerae very strongly modified as follows: base of chelicera with a weakly developed tooth on the outer side; inner margins strongly bowed to describe a suboval figure, the edges of which are carinate and produced at the apical edge into a distinct opposing tooth on each side.

Male palpus as illustrated in plate 14, figures 6 and 7. Patella enlarged and armed on the retrolateral side at the apex with a distinct spur with carinate margin set with a band of short setae. Tibia somewhat broader than long, the prolateral edge with a stout spur bearing an enlarged ctenidium, the retrolateral edge with a weaker elevation bearing the second small ctenidium.

TYPE LOCALITY: Male holotype and female allotype from the Virgin River banks at St. George, Utah, July 22, 1952 (W. J. Gertsch).

DISTRIBUTION: Southwestern United States from southern Utah into California and adjacent Mexico. The following specimens are designated as paratypes: *California:* Indio, March 23, 1946 (W. M. Pearce), one female. *Baja California:* El Mayor, June 15, 1952 (W. J. Gertsch), males and females. Seven miles southeast of Mexicali, June 15, 1952 (W. J. Gertsch), males and females. *Nevada:* Moapa, June 10, 1934 (W. Ivie), males and females.

Dictyna varyna miranda, new subspecies

Plate 13, figure 1

Females vary from 3 mm. to 4.5 mm. and average nearly 4 mm. in total length. Males average 3 mm. in length.

Whole spider much darker than typical *varyna*. Carapace dark orange-brown to blackish, the sides, as usual, darkest. Abdomen whitish in base color but usually quite completely masked with a blackish pattern, giving the dorsum a mottled appearance. Legs mostly clear yellowish in the males but with distinct dusky rings in the females.

Structure as in *varyna* except for the much larger size. Chelicerae of males more strongly bowed in front and with the basal and subapical horns more strongly developed. Male palpus more strongly developed than in *varyna*, but the details are the same.

TYPE LOCALITY: Male holotype, female allotype, and about 40 male and female paratypes from the sandy margins of the Humboldt River at Miranda, Humboldt County, California, July 1, 1952 (W. J. Gertsch).

This population differs from typical *varyna* in greater size and darker coloration. In palpal features the species is most closely related to *Dictyna parietalis* of southern Mexico and Central America. In that species the ctenidia are separate on low elevations, neither of which is developed into a strong spur.

THE *rita* GROUP

The presence of a flattened lobe on the retrolateral margin of the patella distinguishes this species from all others. The pars cephalica of the male is very strongly elevated, and the chelicerae (pl. 13, figs. 6, 9) are very long, curved, concave in front, and moderately bowed apart.

The single known species, which resembles to some extent the members of the *varyna* group, comes from the Santa Rita Mountains of southern Arizona.

Dictyna rita Gertsch

Plate 13, figures 6–11

Dictyna rita GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 12, figs. 28–30. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

DIAGNOSIS: Female: Total length, 2 mm. Carapace, 0.85 mm. long, 0.65 mm. wide. Abdomen, 1.35 mm. long, 1.1 mm. wide. Male: Total length, 1.7 mm. Carapace, 0.9 mm. long, 0.65 mm. wide. Abdomen, 0.9 mm. long, 0.6 mm. wide.

The dark brown carapace is paler on the pars cephalica which is clothed with rows of heavy white hairs. The sternum is dark brown and somewhat dusky on the margins. The legs are yellowish in base color in both sexes, but they are marked with broad reddish brown rings in the female and only faintly annulated in the male. The abdomen is whitish, with a pattern of dusky chevrons above and a mottled appearance on the sides and venter.

The structure of this species most closely allies it to the *mulegensis* group. The posterior row of eyes is slightly recurved, and the median eyes are separated by the full diameter. The carapace and chelicerae of the male are modified from the normal. The clypeus is nearly horizontal, about equal in height to two diameters of an anterior median eye, and has a conspicuous transverse groove below the eyes. The chelicerae, which are longer than usual in the genus and nearly four times as long as wide, have a rounded spur at the base. They are gently bowed on the inner side to form an elongate cavity and moderately curved on the outer side.

The epigynum (pl. 13, fig. 7) is similar to that of *segregata*.

The male palpus (pl. 13, figs. 8, 10, 11) shows important differences from that of *segregata* and allies. The quite flat patella bears on the retrolateral side a broadly rounded lobe. The tibia, which is narrow at base and broadly rounded on the retrolateral side, bears a short erect spur near the middle of the dorsum on which are set the two ctenidia.

TYPE LOCALITY: Madera Canyon, Santa Rita Mountains, Arizona, male holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from the male holotype and two females from the type locality, taken July 16, 1940, by W. J. Gertsch.

THE *bicornis* GROUP

In this small group the patella of the male palpus is a moderately enlarged, globular segment without a distinct spur but clothed on the retrolateral side with short setae. The tibia is of moderate length, narrowed at the base, with a rounded retrolateral lobe in front, and bears at the base above a conspicuous sessile ctenidium to which is closely appressed a second much thinner one. The epigyna (pl. 15, figs. 7, 12) are quite distinctive and easy to recognize. The male chelicerae are of moderate length and curvature and have the basal angle developed into a short horn (pl. 15, figs. 3, 4).

Only two species of this group have been described from North America. Their relationship is clearly with the *longispina* and *apacheca* groups, from which they differ mainly in having the patella of the male palpus enlarged.

Dictyna bicornis Emerton

Plate 15, figures 1–6; text figure 11

Dictyna bicornis EMERTON, 1915, Trans. Connecticut Acad. Arts Sci., vol. 20, p. 141, text figs. BARROWS, 1924, Ohio Jour. Sci., vol. 24, no. 6, p. 312. GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 13. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 116. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 14. JONES, 1947, Field and Lab., vol. 15, p. 27, fig. 69. LOWRIE, 1948, Ecology, vol. 29, no. 3. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 509, pl. 105, fig. 1952, pl. 106, fig. 1975. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1431.

Dictyna annamae GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 330, figs. 24, 25.

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.1 mm long, 0.87 mm. wide. Abdomen, 2.1 mm. long, 1.4 mm. wide. A male is 2.3 mm. long, with the carapace 1 mm. long.

The yellow to orange carapace has the sides dusky brown, with darker radiating lines. The yellow sternum is bordered by a narrow black band. The legs and palpi are pale yellow to orange-brown and usually lack contrasting markings. The whitish or yellow abdomen has a distinct dusky or black pattern as follows: a basal lanceolate stripe back to the middle of the dorsum; a double row of three or four spots narrowly connected by curved bars; dark mottlings on the sides; and the venter light with a triangular dark spot in front of the epigastric furrow. A female from Idaho has the entire body and legs dusky to blackish.

The posterior eyes lie in a clearly recurved row, and the median eyes are separated by the full diameter. The single small tooth on the lower margin of the chelicera is distinct. The male chelicera has the basal horns distinctly developed (which occasioned the name *bicornis*), but they are not of much greater size than in many other species.

The epigynum (pl. 15, fig. 7) presents two distinctly margined circular atria close together on the midline near the genital groove. The lateral foveae are distinct slits lying on

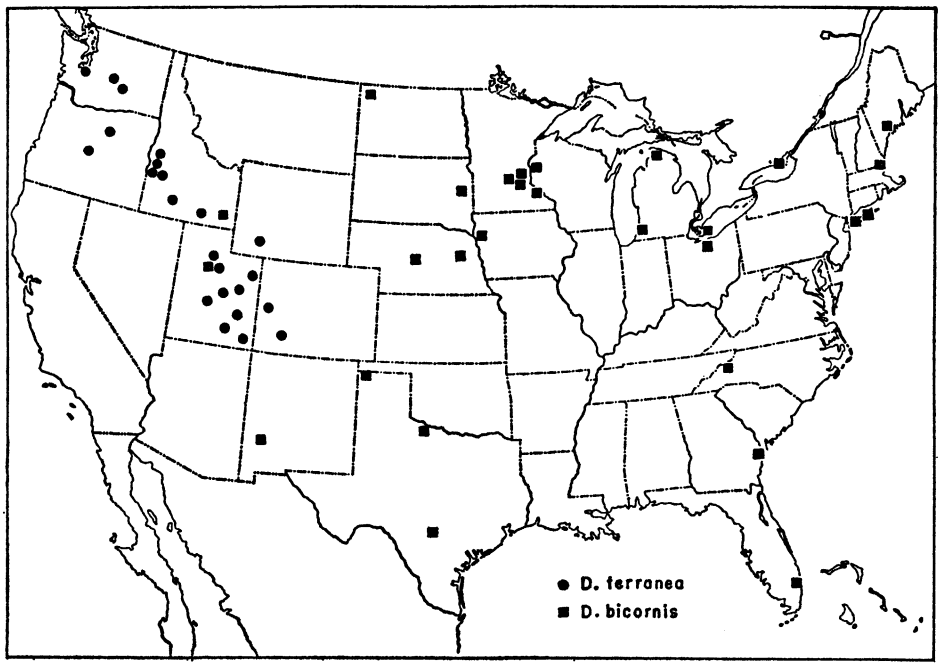


FIG. 11. Distribution of *Dictyna terranea* and *bicornis*.

each side of the atria. The atriobursal orifices are discernible in the atria and lead into thin tubes that trace a distinct curve outward.

The male palpus (pl. 15, figs. 1, 2, 6) is distinctive. The short patella is enlarged, globular in shape, and is clothed laterally with short stiff hairs. The short tibia is about as broad as long, is protuberant at the base and apex on the retrolateral side, and bears above near the base a conspicuous, curved ctenidium, to which is closely appressed a second thinner ctenidium. The bulb and conductor are covered for the most part by the convex cymbium. The embolus is a long thin spine.

TYPE LOCALITIES: Of *bicornis*, Ipswich, Massachusetts, cotypes in the Museum of Comparative Zoölogy; of *annamae*, Comfort, Kendall County, Texas, male holotype in the American Museum of Natural History.

DISTRIBUTION: Eastern United States and Canada from Maine and southern Ontario to Florida, westward to Idaho and Utah, New Mexico, and Texas (see fig. 11). This is a rather uncommon species.

SELECTED RECORDS: *Ontario:* Pleasant Bay, Prince Edward County, July 23, 1930 (T. Kurata), one male, one female. Swansea, June 24, 1945, males. *Maine:* Ogunquit, June 28, 1913 (J. Emerton), male. *North Carolina:* Hot Spring, October 12, 1926. *Texas:* Palo Duro Canyon, December, 1939 (Mulaik). Texline, July 14, 1939 (L. I. Davis) male. Vernon, July 16, 1939 (L. I. Davis). *South Dakota:* Brookings, October 11, 1937, male and immature. *North Dakota:* Divide County, 1936–1938 (J. Davis), females. *Utah:* Salt Lake City, April 15 (W. J. Gertsch), female. *New Mexico:* Silver City, April 26–30, 1948 (H. Shantz), males. *Idaho:* Pocatello, July 12, 1952 (Borys Malkin), female.

Dictyna terranea Ivie

Plate 15, figures 10–13; text figure 11

Dictyna terranea IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325.

Dictyna pacifica JONES, 1948, Field and Lab., vol. 16, p. 39, figs. 525, 526, 528, 529.

DIAGNOSIS: Female: Total length, 2.2 mm. Carapace, 0.85 mm. long, 0.7 mm. wide. Abdomen, 1.4 mm. long, 1.1 mm. wide. Males are slightly smaller.

This species is a very close ally of *bicornis* and is obviously derived from the same stock.

It averages slightly smaller in size and ordinarily has a more distinct black pattern on the abdomen. The horns at the base of the chelicerae are acutely pointed, ventrally directed spurs smaller than in *bicornis*. The more significant differences are to be found in the genitalia.

The epigynum (pl. 15, fig. 12) is almost exactly as in *bicornis*, but the tubes from the atriobursal orifices are essentially straight.

The male palpus (pl. 15, figs. 10, 11, 13) differs from that of *bicornis* as follows: the patella is globular in dorsal view but is somewhat angled as viewed from the side; and the tibia is clearly longer than broad and armed at the base with a curved black ctenidium, which is directed upward and has closely appressed to it the much-reduced second ctenidium.

This species, which is obviously derived from *bicornis*, or vice versa, can be regarded as merely a subspecies, especially as they are largely separated geographically. However, a female of *bicornis* from Pocatello, Idaho, places that species within the range of the other, and if the identification is authentic, strengthens the proposition that they have attained full specific distinction.

TYPE LOCALITIES: Of *terranea*, Fruitland, Idaho, male holotype in the American Museum of Natural History; of *pacifica*, Vantage, Washington, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Pacific Northwest and Rocky Mountain states from Washington to Utah and Colorado (see fig. 11).

KNOWN RECORDS: *Idaho:* Payette, July 23, 1939. Sand Hollow, 4 miles north of Notus, April 3, 1933. Three miles east of Parma, July 3, 1935 (W. Ivie). Ten miles south of Swan Valley, July 6, 1935, female. Thousand Springs, June 9, 1931, females. Eleven miles south of Malta, August 17, 1936, male and females. *Wyoming:* Rock Springs, June 3, 1933, females. *Utah:* Green River, May 7, 1933 (W. Ivie), male and female. Castle Park, Dinosaur National Monument, July 1–24, 1948, female. Ferron, April 13, 1933. Henry Mountains, September 9–12, 1929 (R. V. Chamberlin and W. J. Gertsch). Moab, May 9, 1933, June 19, 1934, females. Mouth of American Fork Canyon, May 12, 1934, female. Bluff, May 11, 1933. Richfield, September 21, 1935 (R. V. Chamberlin), females. Salt Lake City, May 11, 1946, females. *Colorado:* West Elk Creek, Gunnison River, September, 1937, immature. Grand Junction, June 17, 1940, male. *Washington:* Tacoma, August 9, 1929, female. Vantage, May 1, 1936 (M. Hatch). Cle Elum, June 12, 1938 (M. Hatch). *Oregon:* Richmond, July 10, 1953 (V. Roth), one male. Redmond, May 4–19, 1939 (J. Schuh; K. Gray), two males.

THE *longispina* GROUP

In this group and the following groups of the section *Dictyna* the patella of the male palpus is normal in size and lacks distinctive processes. The *longispina* group is remarkable for the size of the tibial apophysis which greatly exceeds the width of the segment and usually is much longer than the length. In *longispina* and *bellans* the tibia is twice as long as broad, and the long tibial apophysis bears a single ctenidium. The second one is sessile and lies near the apex of the tibia. In the other species the tibia is short, only about as long as broad, and both ctenidia are borne on the tip of the long spur. The epigyna in this group are remarkable for the migration of the lateral foveae to positions remote from the median atria. In *agressa* the lateral foveae are about parallel with the long axis and lie on each side a modest distance from the atria. In *calcarata* they are large openings on the sides of the abdomen on a transverse line from the genital groove. In *longispina* and *bellans* they have moved far to the side and around the base of the abdomen to lie hidden just above the pedicel. The position of the lateral foveae is correlated with the length of the tibial apophysis. Although these species are closely related to one another, they are also quite near relatives of species with relatively short tibial apophyses.

The chelicerae are of quite typical form in all the species of the group, being moderately bowed apart to leave a long fusiform opening and having the basal angle a rounded carina. In *calcarata* (pl. 17, figs. 2, 6) they are relatively long and quite prominently angled on the sides.

Several of the species of the group (which belong to the subgenus *Tosyna*) have very wide distributions. *Dictyna calcarata* is abundant in the western states and ranges from

Washington southward into southern Mexico. *Dictyna bellans* is largely an eastern species which ranges from Michigan deep into eastern Mexico and also occurs in Oregon.

Dictyna bellans Chamberlin

Plate 16, figures 4–7; text figure 12

Dictyna longispina BARROWS, 1918, Ohio Jour. Sci., vol. 18, no. 8, p. 301. BANKS, 1932, Publ. Univ. Oklahoma, vol. 4, p. 20. JONES, 1936, Field and Lab., vol. 4, p. 69; 1947, Field and Lab., vol. 15, p. 29, fig. 72. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 329. GERTSCH AND DAVIS, 1942, Amer. Mus. Novitates, no. 1158, p. 16.

Dictyna bellans CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, no. 3, p. 242, pl. 15, figs. 3–5. CROSBY AND BISHOP, 1936, Jour. New York Ent. Soc., vol. 44, p. 44. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1430.

Dictyna extensa JONES, 1947, Field and Lab., vol. 15, p. 2, figs. 5–9.

DIAGNOSIS: Females vary from 2 mm. to 4 mm. and average 2.5 mm. in total length. An average female: Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.7 mm. long, 1.3 mm. wide. An average male: Total length, 2 mm. Carapace, 1 mm. long, 0.74 mm. wide. Abdomen, 1.1 mm. long, 0.7 mm. wide.

The bright orange-red carapace has dusky shadings on the pars thoracica. The dusky orange sternum is darker on the sides and behind. The yellow to orange legs lack contrasting dark markings. The abdomen is variable in color, may be pale gray, with lighter reticulations and without pattern details, but most often it is gray or whitish with a brownish pattern as follows: dorsum with a basal median dark mark widened behind into a transverse spot and followed behind with a double row of dark spots connected by narrow transverse bars; sides of abdomen dark. Venter pale whitish, with a gray transverse patch enclosing the cribellum and spinnerets.

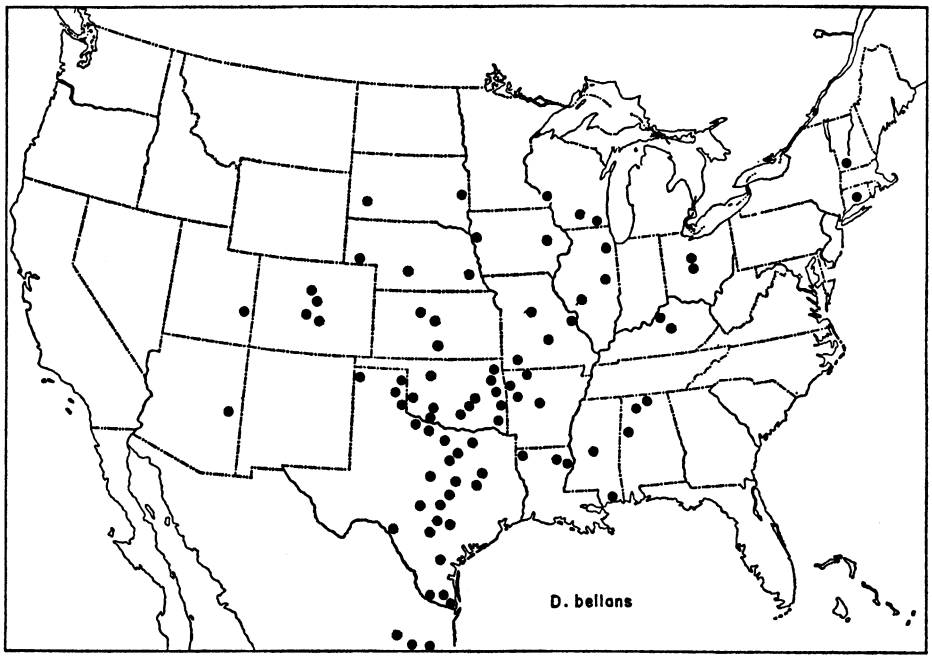


FIG. 12. Distribution of *Dictyna bellans*.

The structure is typical in both sexes, with the pars cephalica moderately elevated in the female, the clypeus being as high as the long diameter of the lateral eye, and more strongly vaulted in the male, which has the slightly inclined clypeus as high as one and one-half full diameters of the lateral eye. The posterior eye row is moderately procurved, and the equal eyes are separated from the full diameter to somewhat more than the long

diameter of the oval median eyes. The orange-red chelicerae of the male are strongly convex, to form a suboval opening not fully as wide as the width of the chelicera. On the face of the chelicera near the base is a distinct short horn slanting forward and downward. The lower margin of the chelicera has the usual small tooth near the tip of the fang.

The epigynum (pl. 16, fig. 6) is very remarkable. The oval median atria are narrowly separated by a thin septum which is often much less developed than shown in the plate. The lateral foveae, which are not easily visible in ventral view, have migrated around the sides of the abdomen and lie on each side of the pedicel. This unusual placement is seemingly a response to the great length of the tibial apophysis.

The male palpus (pl. 16, figs. 4, 7) is similar to that of *calcarata* and relatives in fundamental features. The patella is short and broad, convex above, but is not much modified. The tibia is about twice as long as its width above the spur and is widened at the base into a very long process directed upward and backward, which is armed at the tip with a single black ctenidium. The second ctenidium is to be found on the dorsal surface of the tibia near the distal end and is set in a small socket. The embolus originates on the prolateral side of the bulb towards the front end and describes a semicircle into the conductor. The basal portion of the conductor is angled and transversely spiraled into a conspicuous process, the end of which is finely denticulate.

TYPE LOCALITIES: Of *bellans*, Canton, Mississippi, male holotype in the Museum of Comparative Zoölogy; of *extensa*, male holotype from Auburn, Alabama, in the Museum of Comparative Zoölogy.

DISTRIBUTION: Central portion of the United States from North and South Dakota, Michigan and Ohio south into Alabama, Texas, and Mexico, westward into Utah and Arizona (see fig. 12).

SELECTED RECORDS: *South Dakota:* State Game Farm, Custer County, June 24, 1937, males and females. *Utah:* Moab, May 9, 1933, males, females. *Arizona:* White Mountain Reservation, east of McNary, July 8, 1940 (J. M. and W. J. Gertsch), females. *Wisconsin:* College Camp, Walworth County, July 28, 1938 (D. Lowrie), males, females. *Alabama:* Decatur, May 30, 1939 (A. F. Archer), male, females. *Louisiana:* Tallulah, October 3, 1930 (Glick), one male taken in the air at an elevation of 100 feet. *Nuevo Leon:* Linares, July 18, 1956 (W. J. Gertsch; V. Roth).

Dictyna bellans hatchi Jones

Dictyna hatchi JONES, 1948, Field and Lab., vol. 16, p. 43, figs. 7, 33–36.

The population from western Oregon described as *hatchi* by Sarah Jones seems to be very closely related to *bellans* and yet presents certain differences of importance. The few known specimens are darker in color. The basal process on the conductor is transversely developed, quite broad, and scarcely different from that of *bellans*. The tibial apophysis is proportionately longer than in typical *bellans*. Until more is known of the distribution of this population, it seems best to hold it separate as a subspecies.

TYPE LOCALITY: Roseburg, Oregon, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Known only from Oregon.

KNOWN LOCALITIES: *Oregon:* Glendale, June 14, 1938 (M. Hatch), male, female. Roseburg, June 14, 1938 (M. Hatch), holotype. Mocks Bottom, Portland, July 4, 1947 (V. Roth), four females. McFadden Pond, 12 miles south of Corvallis, April 10, September 11 (V. Roth), two males.

Dictyna longispina Emerton

Plate 16, figures 1–3

Dictyna longispina EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 446, pl. 9, fig. 4. BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509; 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 27; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 3. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 110. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 510, pl. 102, fig. 1906, pl. 106, fig. 1971. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1444.

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.1 mm. long, 0.85 mm. wide. Abdomen, 2 mm. long, 1.4 mm. wide. Male: Total length: 2.2 mm. Carapace, 1.1 mm.

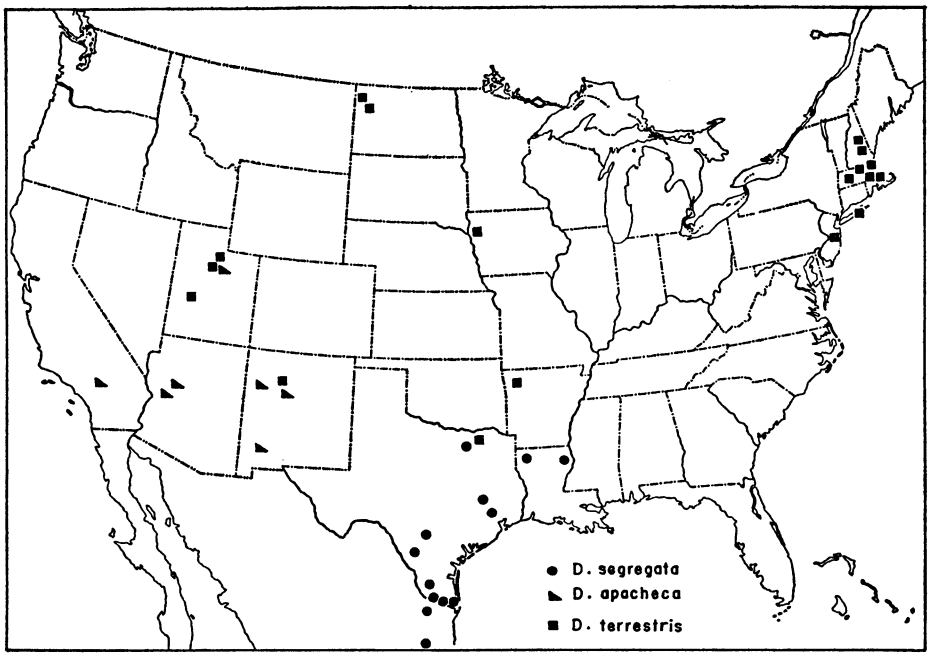


FIG. 13. Distribution of *Dictyna segregata, apacheca,* and *terrestris.*

long, 0.85 mm. wide. Abdomen, 1.2 mm. long, 0.8 mm. wide.

This rare species is known from a very few poorly preserved specimens. In general it seems to be darker than *bellans*, but the pattern and structure are very similar.

The epigynum (pl. 16, fig. 2) is like that of *bellans*. It seems to differ in having larger median atria, and the lateral foveae are located somewhat in front of the pedicel. However, these differences may not be reliable.

The male palpus (pl. 16, figs. 1, 3) differs from that of bellans in the following respects: the tibia is a little longer, and the dorsal spur is proportionately considerably longer; the basal piece of the conductor is rounded and drawn out longitudinally to form a longer, spiraled spur.

TYPE LOCALITY: Meriden, Connecticut, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northeastern states from Connecticut to Michigan.

KNOWN RECORDS: *Connecticut:* Meriden, June 3, 1883 (J. H. Emerton), male and female. *New York:* Ithaca, male and female. Sacandage Park, June 17, 1910 (Alexander), one male. New York, 1910, one male. *Michigan:* Near Burlington, male and female. *Alabama:* Auburn (N. Banks), male, females.

Dictyna calcarata Banks

Plate 17, figures 1–6; text figure 15

Dictyna calcarata BANKS, 1904, Proc. California Acad. Sci., vol. 3, p. 342, pl. 40, fig. 42; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108. JONES, 1936, Field and Lab., vol. 4, p. 69; 1947, Field and Lab., vol. 15, p. 67; 1948, Field and Lab., vol. 16, p. 30. GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 17; 1942, Amer. Mus. Novitates, no. 1158, p. 15. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 330. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1432.

Dictyna dactylata CHAMBERLIN AND WOODBURY, 1929, Proc. Biol. Soc. Washington, vol. 42, p. 131.

Dictyna hoples CHAMBERLIN AND WOODBURY, 1929, Proc. Biol. Soc. Washington, vol. 42, p. 132.

DIAGNOSIS: Females vary from 2.5 mm. to 4.5 mm. and average 3.5 mm. in total length. Carapace of a typical female, 1.4 mm. long, 1.1 mm. wide. Males average about 3 mm. in length.

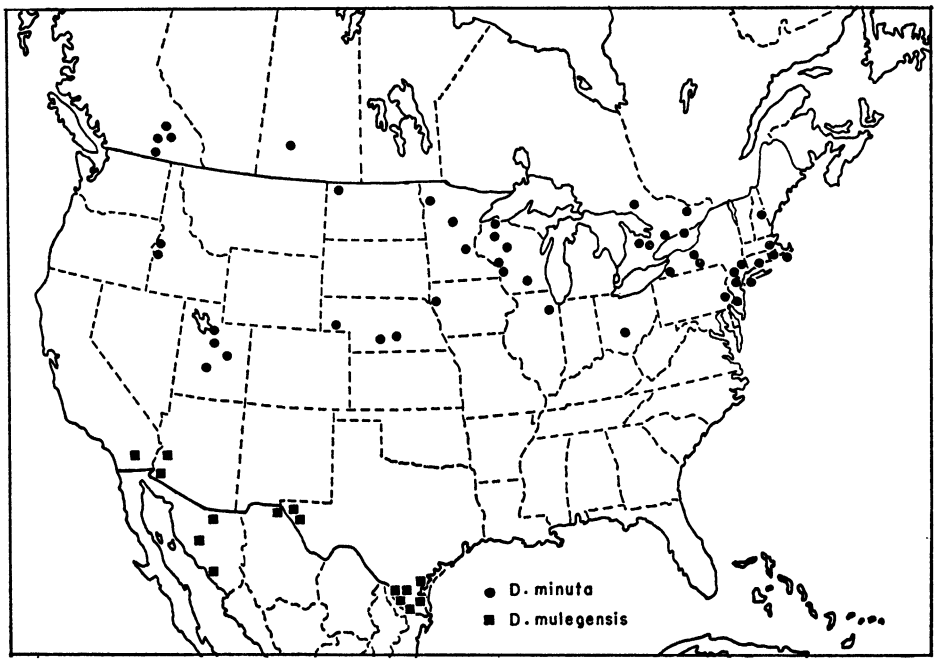


FIG. 14. Distribution of *Dictyna minuta* and *mulegensis.*

The carapace is quite uniform orange or dark reddish brown, with black radiating lines on the sides, and the usual rows of whitish hairs on the pars cephalica. The sternum is dark orange-brown and is margined by a narrow dusky band. The yellowish legs are usually marked with distinct dusky rings, but these are less distinct in the males and often absent on the first two pairs of legs. The white or yellowish abdomen is strongly marked in black as follows: a narrow triangular figure from base to center of dorsum; two irregular bands from center to apex, leaving a pale band between; and a speckling of small spots on the sides and the venter.

The pars thoracica is essentially circular in form, and the pars cephalica is prominent, quite narrow, equaling only six-elevenths of the total width. The posterior eye row is distinctly recurved, and the median eyes are separated by the narrow diameter, the full diameter from the lateral eyes. In the male the pars cephalica is more strongly elevated and prominent, with the clypeus sloping and equal to nearly two diameters of the anterior median eye. The reddish brown chelicerae (pl. 17, figs. 2, 6) are very long and quite slender, concave, bowed apart in the middle to form a fusiform opening, and have the basal horn weakly developed. The lower cheliceral margin has a single small tooth near the base of the claw.

The epigynum (pl. 17, fig. 5) is quite remarkable because of the lateral position of the foveae, which are located on each side of the abdomen remote from the median atria.

The male palpus (pl. 17, figs. 1, 3, 4) is similarly remarkable, because of the great length of the tibial apophysis. This is nearly as broad at the base as the short tibia, occupies most of the dorsal surface, stands erect as a heavy spur nearly one-third longer than the femur, and bears at the tip the two dark ctenidia set in sockets. The long, black embolus arises at the extreme base of the bulb as a thin spine and continues around the periphery to lie hidden in the very large distal portion of the conductor.

TYPE LOCALITIES: Of *calcarata*, San Pedro, California, male holotype in the Museum of Comparative Zoölogy; of *dactylata*, St. George, Utah, female holotype in the American Museum of Natural History; of *hoples*, Zion National Park, Utah, male holotype in the American Museum of Natural History.

DISTRIBUTION: Entire western United States from Washington and Montana south through the coastal and mountain states into Oklahoma and Texas and into Mexico (see fig. 15). This species is frequently abundant on houses and buildings where its unkempt webs make known its presence.

SELECTED RECORDS: *Montana:* Granite County, July 20, 1950 (W. Jellison), one female. *Washington:* Yakima, spring, 1944 (H. Moennich), female. Boy Center, August, 1931. Walla Walla, August, 1931. *Colorado:* Aspen, July 24–27, 1919. Science Lodge, Boulder County, August 19, 1939 (Lanham), immature males, females. *Oklahoma:* Gore, July 20, 1937 (Standish-Kaiser), male and female. *Texas:* New Braunfels, Comal County, August 19, 1935 (S. Mulaik), male and females. Llano, Llano County, August, 1935 (L. I. Davis), male and females. San Solomon Springs, Reeve County, July 6, 1934 (S. Mulaik), females. Dallas County, 1936 (Jones). *Nuevo Leon:* Monterrey, June 10, 1936 (L. I. Davis), three males and females. *Distrito Federal, Mexico:* Teotihuacan, August 20, 1946 (C. Goodnight), one female. *Sinaloa:* Culiacan, June 19, 1939 (A. M. and L. I. Davis). *Nayarit:* Twenty-five kilometers south of Tepic, September 24, 1953 (B. Malkin), one female.

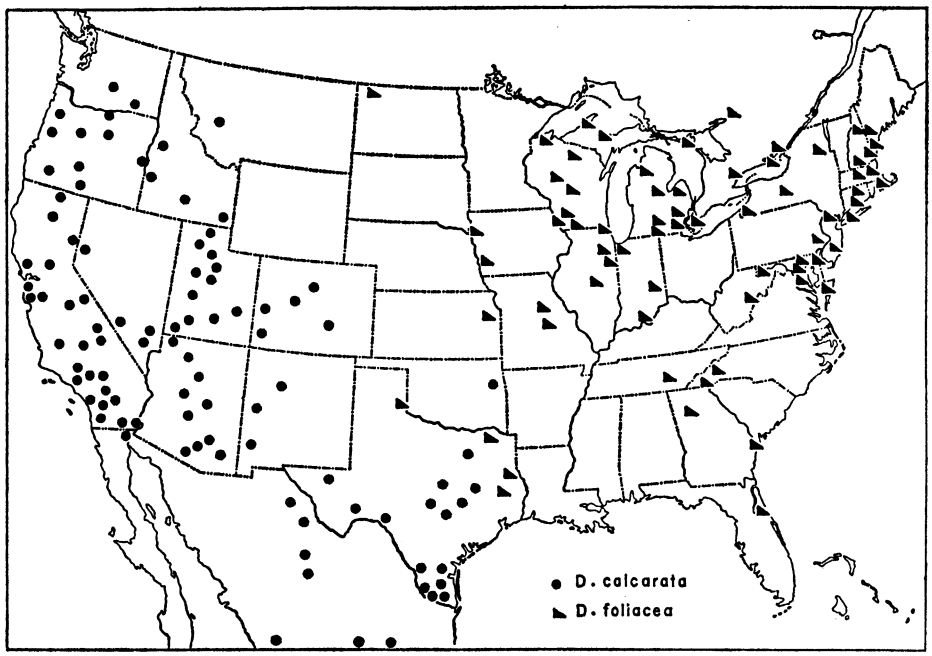


FIG. 15. Distribution of *Dictyna calcarata* and *foliacea.*

Dictyna formidolosa Gertsch and Ivie

Plate 16, figures 8–10; plate 17, figure 12; text figure 16

Dictyna armata BANKS, 1911, Proc. Acad. Nat. Sci. Philadelphia, p. 444, pl. 34, fig. 9 (not *D. armata* Thorell, 1875).

Dictyna formidolosa GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 10 (new name for *D. armata* Banks). CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 117. MUMA, 1944, Amer. Mus. Novitates, no. 1257; 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 511, pl. 102, figs. 1907, 1908. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1438.

DIAGNOSIS: Female: Total length, 1.8 mm. Carapace, 0.7 mm. long, 0.54 mm. wide. Abdomen, 1.15 mm. long, 0.85 mm. wide. Male: Total length, 1.85 mm. Carapace, 0.85 mm. long, 0.58 mm wide. Abdomen, 1.1 mm. long, 0.6 mm. wide.

The dorsal pattern of a well-marked fe-

male is illustrated in plate 17, figure 12.

The reddish orange carapace is paler on the pars cephalica and marked with radiating blackish lines on the pars thoracica. The yellowish to orange sternum is lightly dusted throughout and occasionally quite dusky on the margins. The whitish legs lack darker markings, but they may be vaguely ringed with reddish in the males. The pale orange or reddish abdomen has a dusky to blackish pattern of small dots above, consisting of a basal median black dash and a double row of irregular black spots, a series of oblique black bars on the sides, and a dusky venter. The males are much darker, have the abdomen brighter red, and often have the abdomen quite blackish.

The posterior eye row is gently recurved, and the median eyes are separated by the full diameter. The pars cephalica of the female is moderately broad, equaling three-fifths of the greatest width. The carapace of the male is proportionately longer and has the elongate, prominent pars cephalica broad in front, strongly elevated, equaling at the second eye row two-thirds of the greatest width. The orange-brown chelicerae are long, quite slender, curved laterally, strongly bowed apart in the middle to form a fusiform figure, the edges of which are carinated, and have at the base a small horn.

The epigynum (pl. 16, fig. 9) is typical for those species in which the male tibial apophysis is long. The median atria are visible on the midline, but the lateral foveae are located on the sides around the base of the abdomen.

The male palpus (pl. 16, figs. 8, 10) resembles that of *calcarata*. The patella is normal in form. The short tibia is produced into a very long spur, bearing at the apex the two black ctenidia, which is about twice as long as the width of the tibia. The conductor lies close to the cymbium, is gradually thickened basally, and ends in a quite large process apically twisted at the tip.

TYPE LOCALITY: Black Mountain, north fork of Swannanoa River, North Carolina, cotypes in the Museum of Comparative Zoölogy.

DISTRIBUTION: Entire eastern United States and Canada from New England and southern Ontario westward to South Dakota and Oklahoma, southward to Florida, the Gulf states, and eastern Texas (see fig. 16). This small species is most often found in ground detritus.

SELECTED RECORDS: *Ontario:* Toronto, June 2, 1933 (T. B. Kurata), males and females. *Florida:* Neunans Lake, near Gainesville, March–July (W. J. Gertsch and W. Ivie), males and females. White Springs, June 15, 1935 (W. Ivie), males and females. *Texas:* Conroe, August 14, 1958 (L. I. Davis), female. North of Jasper, Jasper County. Fort Bend County. *Oklahoma:* Cherokee, Alfalfa County, June 4, 1937 (Standish-Keiser), male. *South Dakota:* Canton, June 12, 1936 (A. Petersen), females. Brookings, October 6, 1937, females.

Dictyna gloria Chamberlin and Ivie

Plate 17, figures 10, 11

Dictyna gloria CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 118, fig. 171. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321.

DIAGNOSIS: Female: Total length, 1.4 mm. Carapace, 0.6 mm. long, 0.46 mm. wide. Abdomen, 0.9 mm. long, 0.65 mm. wide. Male: Total length, 1.4 mm. Carapace, 0.65 mm. long, 0.46 mm. wide. Abdomen, 0.8 mm. long, 0.6 mm. wide.

The orange to bright reddish brown carapace has brown shadings on the pars thoracica and a conspicuous band of white hairs on the head. The sternum is reddish brown and dusted uniformly with dusky. The gray to blackish abdomen has an oblong white patch on each shoulder of the dorsum and a median, slightly dentate caudal stripe running from a point behind the middle to the spinnerets. The venter has a whitish stripe from genital groove to the spinnerets.

This pretty species is a close ally of *formidolosa*. The eyes of the posterior row lie in a gently recurved row, with the median eyes separated by about three-fourths of the diameter. The pars cephalica of the male is moderately elevated and equals about three-fifths of the width of the carapace. The chelicerae are proportionately somewhat shorter than in *formidolosa* and have the basal angles as rounded spurs.

The epigynum (see pl. 16, fig. 9) closely resembles that of *formidolosa*.

The male palpus (pl. 17, figs. 10, 11) is of

the same type as in *formidolosa* and closely resembles that of *cholla*.

The tibial spur, which is somewhat thinner and shorter and equals only one and one-half times the width of the tibia, bears two ctenidia at the tip. The conductor is proportionately larger than in *cholla* and somewhat exceeds the width of the cymbium.

TYPE LOCALITY: One mile north of Sylvania, Georgia, female holotype in the American Museum of Natural History.

DISTRIBUTION: Coastal Georgia and North Carolina.

KNOWN RECORDS: *Georgia:* One mile north of Sylvania, April 15, 1943 (W. Ivie), female holotype. *North Carolina:* Pivet Island, Beaufort, July 7, August 7, 1951 (R. D. Barnes), male, four females.

Dictyna cholla Gertsch and Davis

Plate 17, figures 7–9; text figure 16

Dictyna cholla GERTSCH AND DAVIS, 1942, Amer. Mus. Novitates, no. 1158, p. 12, figs. 31, 39. Roewer, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1316.

Dictyna hardyi GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 17, figs. 19, 20.

DIAGNOSIS: Female: Total length, 1.5 mm. Carapace, 0.6 mm. long, 0.44 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide. Male: Total length, 1.2 mm. Carapace, 0.53 mm. long, 0.42 mm. wide.

This is a very pale whitish species with a faint pattern. The yellowish carapace is lightly shaded with dusky on the sides of the head and on the pars thoracica. The yellowish legs are unmarked. The whitish abdomen (pl. 17, fig. 7) may be immaculate above but often shows a dorsal pattern of dusky spots as follows: a narrow dash from base to near the middle; a series of four pairs of dusky spots from middle back to the caudal apex.

The eyes are proportionately large and close together. The posterior row is slightly recurved, and the median eyes are separated by half to two-thirds of their diameter. The clypeus is rather low, equaling only about the full diameter of the anterior median eye. The chelicerae are of moderate length in the male, have a small pointed horn at the base, and have the sides bowed to produce a long oval between them.

The epigynum (pl. 17, fig. 8) features two tiny atria located on a rounded eminence. The lateral foveae are margined by small semilunar carinae which are wide apart and located just above the genital furrow.

The male palpus (pl. 17, fig. 9) is quite similar to that of *gloria*. The tibial spur is about one and a half times as long as the width of the tibia.

TYPE LOCALITIES: Of *cholla*, 27 miles south of Nogales, Sonora, Mexico, female holotype in the American Museum of Natural History; of *hardyi*, Laguna Madre, 25 miles southeast of Harlingen, Texas, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States from Nevada and northern Utah southward into Sonora, Mexico, and southern Texas (see fig. 16). This small species lives mostly in ground detritus.

KNOWN RECORDS: *Texas:* Laguna Madre, 25 miles southeast of Harlingen, August 22, 1945 (D. E. Hardy and V. L. Wooley), male holotype of *hardyi*. *Utah:* Near Salt Lake, March 30, 1941, females. *Arizona:* Sacaton, November 16, 1934 (F. S. Stickney), male and female. Madera Canyon, Santa Rita Mountains, September 8, 1941, male. Twenty miles southwest of Prescott, April 8, 1935, females. Eighteen miles east of Nogales, June 23, 1939 (L. I. Davis), two females. *California:* Seeley, 7 miles west of El Centro, March 14, 1941, females. Fort Yuma, September 13, 1941, male and females. Fish Springs, March 12, 1941, male and female. *Nevada:* Twenty miles east of Reno, September 6, 1935, females. *New Mexico:* Sandia Mountains, Bernalillo County (C. C. Hoff), female and immature. Five miles north of Jemez (C. C. Hoff), male and immature. West of Silver City, September 8, 1951 (W. Ivie), females. *Sonora:* Twenty-seven miles south of Nogales, June 15, 1939 (L. I. Davis), female holotype of *cholla*.

Dictyna agressa Ivie

Plate 18, figures 1–4; text figure 16

Dictyna agressa IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318.

DIAGNOSIS: Female: Total length, 1.4 mm. Carapace, 0.57 mm. long, 0.47 mm. wide. Abdomen, 0.9 mm. long, 0.65 mm. wide.

Male: Total length, 1.4 mm. Carapace, 0.65 mm. long, 0.5 mm. wide.

This small yellowish species is very similar to *cholla* but usually is somewhat darker. The yellowish to orange carapace has the sides marked with radiating dusky lines and a narrow dusky seam on the side margins. The yellowish sternum is dusky along the margins. The yellow legs lack contrasting markings. The whitish abdomen has a more or less distinct basal dusky marking running back to the middle and a series of dusky spots, or broken chevrons, on the caudal half.

The pars cephalica is of modest elevation as in *cholla*, with the clypeus equaling only about the diameter of a median eye. The posterior eye row is slightly recurved, and the median eyes are separated by two-thirds to three-fourths of the full diameter. The male has a somewhat higher clypeus and moderately elevated pars cephalica. The chelicerae of the male are bowed in front to form a fusiform opening, and the basal horns are weak, rounded spurs.

The epigynum (pl. 18, fig. 2) has the foveae widely separated and lying visible on the sides of the abdomen.

The male palpus (pl. 18, figs. 1, 3, 4) is similar to that of *cholla* and *formidolosa*. The tibial spur is dorsal or nearly so in position, is directed at nearly a right angle from the tibia, and is longer than the tibial width. The conductor of the embolus is inflated on the retrolateral side and terminates in a quite small, twisted spur.

TYPE LOCALITY: Redondo Beach, California, male holotype in the American Museum of Natural History.

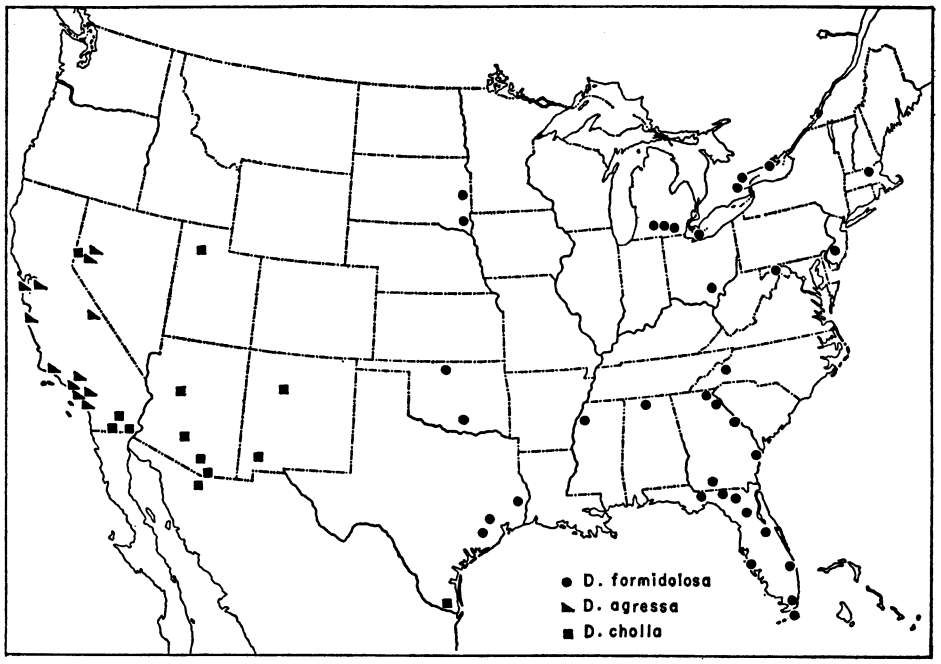


FIG. 16. Distribution of *Dictyna formidolosa, agressa,* and *cholla.*

DISTRIBUTION: California and Nevada (see fig. 16).

KNOWN LOCALITIES: *California:* Redondo Beach, March 18, 1941, male holotype, female allotype, male and female paratypes. Laguna Beach, July 11, 25, 1931, males, December 28, 1932 (W. Ivie), male and females. Hermosa Beach, March 18, 1941, males and females. Montrose, December 31, 1932, females. Pacific Grove, August 17, 1931, females. Mount Palomar, July 25, 1931 (R. V. Chamberlin), females. Three miles west of Santa Monica, March 17, 1941, male and females. Topanga Canyon, March 18, 1941, males and females. Santa Barbara, August 21, 1931 (R. V. Chamberlin), male.

Nevada: Twenty miles east of Reno, October 6, 1934 (R. V. Chamberlin and W. Ivie), female. Wadsworth, July 11, 1937 (R. V. Chamberlin), female.

THE *terrestris* GROUP

This group features a very remarkable palpus in which the elongated, curved cymbium is gradually thinned to end as a slender finger. The conductor is similarly modified, and the thin embolus follows it in a series of loops. The tibial apophysis is a short spur tipped with two black ctenidia. The epigynum presents typical, well-separated, lateral atria and is not otherwise notable. In this group the carapace is of quite weak elevation, so that the clypeal height is lower than in all other members of the genus, equaling only slightly more than the diameter of the median eye in the male and even less in the female. In spite of some unusual features, *Dictyna terrestris* is presumed to be closely allied to the *apacheca* and *personata* groups.

Dictyna terrestris Emerton

Plate 18, figures 6–8

Dictyna terrestris EMERTON, 1911, Trans. Connecticut Acad. Arts Sci., vol. 16, p. 399, pl. 4, figs. 3–3d. JONES, 1947, Field and Lab., vol. 15, p. 18, fig. 48. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 511, pl. 105, figs. 1953, 1954. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1452.

Tosyna terrestris CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

DIAGNOSIS: Males and females vary from 1.4 mm. to 2 mm. in length. An average female is 1.6 mm. long, with the carapace 0.65 mm. long, 0.5 mm. wide; the abdomen, 1 mm. long, 0.7 mm. wide.

Specimens from the western United States have the following color pattern: The yellow to orange-brown carapace is quite dusky, is marked with dark radiating lines, and has a narrow black marginal seam. The sternum is clear yellowish to dusky orange and has a narrow black seam on the margins. The pale yellowish legs are unmarked. The abdomen is usually quite uniformly dusky above, with traces of a series of paler chevrons, and is paler on the venter. In the eastern United States this species is a red spider, with the whole body and the appendages tinted from pinkish to bright red.

The carapace is not very high in this species, as reflected in the clypeus which is scarcely as high as the diameter of an anterior median eye in the female and only slightly more in the male. The eyes are quite close together, with those of the distinctly recurved posterior row separated by half to three-fourths of the diameter. The lower margin of the chelicera bears a minute tooth. The male chelicerae have a very weakly rounded angle at the base and are bowed to form an elongate oval space between them.

The epigynum (pl. 18, fig. 8) presents an indistinct median septum separating the shallow atria and has the lateral foveae well separated.

The male palpus (pl. 19, figs. 6, 7) is remarkably modified from the average for the group. The patella is of normal form and is slightly broader than the small tibia which bears above at base on the retrolateral side a small dorsal spur tipped with two ctenidia. The cymbium is quite narrow at the base, gradually thinning to a slender finger apically, and is strongly curved ventrally. The conspicuous conductor of the embolus follows the curve of the cymbium and passes well beyond it apically.

TYPE LOCALITY: Three Mile Island, Lake Winnepesaukee, New Hampshire, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northeastern United States, westward to the Rocky Mountain states, south into Texas.

KNOWN RECORDS: *New Hampshire:* Three Mile Island, Lake Winnepesaukee, June 1, 1909 (J. Emerton), male holotype. Chocorua, June 1, 1912 (E. Bryant), female. *Connecticut:* Litchfield, June 16, 1935. *Massachusetts:* Fitchburg (R. V. Chamberlin), female allotype. Duxbury, June 4, 1921 (E. Bryant), female. Norfolk, June 10, 1911 (J. Emerton), female. Plum Island, June 17, 1910 (J. Emerton), male. *New Jersey:* Lambertville, May 1, 1953 (W. Ivie), males and females. *North Dakota:* Divide County, 1936 (J. Davis), female. Noonan, July 6, 1936 (J. Davis), female. Dorinth, August 15, 1936 (J. Davis), female. *Utah:* Dry Canyon, Salt Lake City, October 15, 1932, October, 1939, males and females. Mouth of Bill's Canyon, May 6,

1934, females. Near Delta, June 6, 1934, female. Mouth of Dry Canyon, October 12, 1939, male and females. Mill Creek Canyon, April 8, 1932, males and females. *New Mexico:* Jemez Springs (C. C. Hoff), male. *Iowa:* Sioux City. *Texas:* Seven miles west of Commerce, July 19, 1938 (J. Davis).

Dictyna marilina Chamberlin

Dictyna marilina CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 7, fig. 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322.

DIAGNOSIS: Female holotype: Total length, 1.9 mm. Carapace, 0.8 mm. long, 0.6 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide.

Only females of this species are known at present, and they suggest a close alliance with *terrestris*. The chestnut brown carapace has black radiating markings on the pars thoracica and a narrow marginal black seam. The sternum is yellowish, with a dark border. The clear yellowish legs lack contrasting markings. The dorsum of the yellowish abdomen presents at the base a black mark in the form of a parallel-sided stripe which is crossed towards its posterior end by a straight cross stripe, and behind this a series of black chevrons widely broken at the middle. The venter is yellowish except for a brown cross band in front of the cribellum and a dark, nearly black longitudinal stripe on each side of the spinnerets and cribellum.

The structure is very close to that of *terrestris*. The posterior eye row is weakly recurved, and the median eyes are separated by nearly the full diameter.

The epigynum differs in no important detail from that of *terrestris* (see pl. 18, fig. 8).

TYPE LOCALITY: Eight miles north of Roosevelt Dam, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States as indicated below.

KNOWN RECORDS: *Arizona:* Eight miles north of Roosevelt Dam, April 11, 1935, female holotype. Black Forest, Drake, April 24, 1936 (S. C. Bishop), one female. *California:* Mount Palomar, July 26, 1931 (W. Ivie), one female. *Utah:* Hurricane, February 25, 1937 (W. Ivie), one female. *Chihuahua:* Santa Barbara, July 18, 1947 (W. J. Gertsch), three females.

THE *apacheca* GROUP

In this minor group the tibial apophysis of the male palpus is a curved spine or a slender spur directed caudad. The lateral foveae of the epigynum are separated by the width of the sternum. The male chelicerae are moderately bowed apart to leave a long fusiform opening, and the lateral angle is a rounded spur or distinct conical horn. The two western species assigned to this group are closely related to various Mexican species and are about equally near members of the *longispina* group.

Dictyna apacheca Chamberlin and Ivie

Plate 18, figures 9–12; text figure 13

Dictyna apacheca CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 28, pl. 12, figs. 95, 96. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1426.

Tosyna apacheca CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

DIAGNOSIS: Female: Total length, 1.5 mm. Carapace, 0.66 mm. long, 0.53 mm. wide. Abdomen, 1.1. mm. long, 0.8 mm. wide. Male: Total length, 1.5 mm. Carapace, 0.68 mm. long, 0.55 mm. wide. Abdomen, 0.9 mm. long, 0.7 mm. wide.

The carapace varies from pale yellowish brown to light chestnut and has the usual darker radial markings on the pars thoracica. The sternum is yellowish, somewhat dusky, and often has a dusky marginal band. The yellowish legs may be essentially clear but also may show faint dusky rings. The pale grayish abdomen is marked above with irregular blackish markings, which consist essentially of a median mark on the basal half, followed behind by two rows of very irregular and more or less connected spots.

The posterior eye row is slightly recurved, and the median eyes are separated by one-half to three-fourths of the diameter. The male chelicerae have a distinct conical horn at the base, are of average length, and are evenly curved on the outer margins to form an open middle space of fusiform shape.

The epigynum (pl. 18, fig. 11) is quite similar to that of the *pixi* group. The median atria are small, lie close together on the midline, and lead into black tubes usually con-

spicuous beneath the integument. The lateral foveae are widely separated to about the width of the sternum.

The male palpus (pl. 18, figs. 9, 10, 12) features a small, curved, dorsal process on the tibia, bearing the two black ctenidia at the tip, which is directed caudad over the base of the patella. The cymbium is a shallow cup largely containing the bulbal elements.

TYPE LOCALITY: Oak Creek Canyon, 20 miles south of Flagstaff, Arizona, male holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern states from southern California eastward into New Mexico (see fig. 13).

KNOWN RECORDS: *California:* Arrowhead Lake, May 6, 1936 (S. C. Bishop), females. *Utah:* American Fork Canyon, June 13, 1941 (W. Ivie), males and females. *Arizona:* Twenty miles south of Prescott. *New Mexico:* Rock Creek Camp, Nimbres Mountains, September 7, 1941 (W. Ivie), males and females. Six miles north of Piños Altos, Grant County, December 16, 1954 (Karl W. Haller), male, females. Sandia Mountains, Bernalillo County (C. C. Hoff), females, juveniles. Northeast of Grants (C. C. Hoff), male and female.

Dictyna subpinicola Ivie

Plate 18, figure 5; plate 19, figures 1, 2

Dictyna subpinicola IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325.

DIAGNOSIS: Female: Total length, 2 mm. Carapace, 0.8 mm. long, 0.65 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide. Male: Total length, 1.9 mm. Carapace, 0.85 mm. long, 0.77 mm. wide. Abdomen, 1.2 mm. long, 0.8 mm. wide.

The dark orange-brown carapace has radial dusky markings on the pars thoracica and is dusky on the sides of the pars cephalica. The yellowish brown sternum is dusky along the borders. The legs are dusky yellowish brown and lack darker markings. The grayish brown abdomen has a dusky pattern above, consisting of a thin median stripe from base to middle and a series of five or six narrow chevrons usually broken up into many small spots. The venter is light, except in front of the spinnerets where there is a transverse dark area.

The posterior eye row is only gently procurved, being nearly straight, and the eyes are separated by the full diameter. The clypeus is slightly higher than the anterior lateral eye in the female and somewhat higher and inclined forward in the male. The chelicera has a small tooth on the lower margin of the furrow. The male chelicerae have a prominent angle at the base on the outer side, but no distinct horn is present. In lateral view the chelicerae are strongly bent, and in frontal view they are bowed apart to outline a fusiform figure.

The epigynum (pl. 18, fig. 5) features two small atria separated by a thin septum, which lead into thin tubes visible through the integument. The lateral foveae are widely separated to the width of the sternum.

The male palpus (pl. 19, figs. 1, 2) shows some similarity to that of *apacheca*. The long, curved, tibial apophysis is dorsal in position, points caudad, and bears a series of curved setae and the two ctenidia at the tip.

TYPE LOCALITY: Lost Lake, near Tamarack, Idaho, male holotype in the American Museum of Natural History.

DISTRIBUTION: Northwestern United States from Montana to Oregon.

KNOWN RECORDS: *Idaho:* Lost Lake, July 27, 1939 (W. Ivie), males and females. *Oregon:* Green Lake, Sisters Mountains, August 28–30, 1952 (V. Roth), females. *Montana:* Yellowstone National Park, August 9, 1940 (W. Ivie), males and females.

THE *foliacea* GROUP

This minor group exhibits interesting palpal and epigynal features. The male palpus is quite slender, and the bulbal elements are of relatively small size. The tibia is moderately to greatly elongated and presents at the base above a pair of laterally directed, closely appressed ctenidia in *minuta* and a single connate ctenidium in *foliacea*. The epigynum of *Dictyna minuta* is of conventional form, with the lateral foveae well separated to the width of the genital groove. In *foliacea* and the related *mora* these foveae are located far in front of the atria. The male chelicerae have the basal angle developed to a rounded spur.

Dictyna foliacea is an abundant eastern species which ranges from southern Canada into Florida and Texas. It is a derivative type which could have been evolved from *Dictyna minuta* or a similar species. This group is represented in Cuba and Mexico by a slender species (*Dictyna albopilosa* Franganillo) in which the tibial apophysis is median in position.

Dictyna minuta Emerton

Plate 19, figures 4–7; text figure 14

Dictyna minuta EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 447, pl. 9, figs. 5–5a. BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509; 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 27; 1904, Jour. New York Ent. Soc., vol. 12, p. 83; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17; 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 4. BARROWS, 1918, Ohio Jour. Sci., vol. 18, no. 8, p. 302. GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 13. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 510, pl. 102, figs. 1898–1899, pl. 104, figs. 1938–1939. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. JONES, 1947, Field and Lab., vol. 15, p. 18, fig. 47. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 11. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1445.

DIAGNOSIS: Female: Total length, 1.8 mm. Carapace, 0.75 mm. long, 0.57 mm. wide. Abdomen, 1.2 mm. long, 0.9 mm. wide. Male: Total length, 1.6 mm. Carapace, 0.75 mm. long, 0.6 mm. wide. Abdomen, 0.9 mm. long, 0.6 mm. wide.

The carapace is dusky yellowish brown, and the usual dark streaks and shadings on the pars thoracica are distinctly indicated. The dusky brown or blackish sternum in some specimens shows traces of a central darker streak. The legs are yellowish and distinctly but narrowly ringed in the females, but the rings in males are less strongly indicated. The base color of the abdomen is usually yellow or pale brown, less frequently essentially white, and is usually marked in bold brown or blackish pattern as follows; base of dorsum with a more or less broad, dentate stripe back to near the middle, the last spot of the series usually darkest; caudal part of dorsum with a series of chevrons which are often joined to form a single caudal maculation; sides with numerous black spots; venter pale yellowish but with a narrow, median, black stripe flanked by small spots. In males the dorsum of the abdomen may be pale, with little or no pattern, or may be largely dusky.

This species is closely allied to *foliacea* and may be the stem form from which that species is derived. The posterior median eyes are separated by the full diameter. The chelicerae and structure of the carapace of the male are very similar to those of *foliacea*.

The epigynum (pl. 19, fig. 4) features the two median atria rather widely separated and has the lateral foveae in the normal position.

The male palpus (pl. 19, figs. 5–7) resembles that of *foliacea*, but the tibia is proportionately shorter and has the tibial apophysis a tiny spur tipped with the two closely appressed ctenidia. The conductor is quite similar in shape but has the terminal portion of the basal division a much longer spine.

TYPE LOCALITY: Providence, Rhode Island, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northern United States and adjacent Canada (see fig. 14).

SELECTED RECORDS: *Ontario:* Pottageville, York County, July 19, 1938 (T. Kurata), females. Mer Bleu, east of Ottawa, June 4, 1931, female. *Saskatchewan:* Saskatoon, female. *British Columbia:* Vernon, August, 1931 (H. B. Leech), female, Kelowna, September, 1931 (H. B. Leech), females. Salmon Arm, May 25, 1938 (H. B. Leech), females. *New Hampshire:* Chocorua, June 1–3, 1912 (E. Byrant), male. *New Jersey:* Ramsey, June, 1941 (W. J. Gertsch), female. *Ohio:* Columbus, June 13, 1917, male and female. *Nebraska:* Ten miles west of Lexington, June 6, 1933, male. Ten miles west of Grand Island, June 6, 1933, females. *Idaho:* Northeast of Fruitland, May 20, 1946 (W. Ivie), males and females. *Utah:* Price, June 16, 1940, female. Richfield, September 21, 1935 (R. V. Chamberlin), females.

Dictyna foliacea Hentz

Plate 19, figures 8–13; text figure 15

Theridion foliaceum HENTZ, 1850, Jour. Boston Soc. Nat. Hist., vol. 6, p. 297, pl. 9, fig. 14.

Dictyna vittata KEYSERLING, 1883, Verhandl. Zool. Bot. Gesell. Wien, vol. 33, p. 663, pl. 21, fig. 12 (not *D. vittata* Keyserling, 1882). BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510.

Dictyna frondea EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 449, pl. 9, figs. 9–9a. BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509; 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28; 1904, Jour. New York Ent. Soc., vol. 12, p. 83; 1907, Ann. Rept. Dept. Geol. Nat. Resources Indiana, vol. 31, p. 738; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17; 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 3. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109. BARROWS, 1918, Ohio Jour. Sci., vol. 18, p. 301. WORLEY AND PICKWELL, 1931, Studies Dept. Zool. Univ. Nebraska, no. 135, p. 12. CROSBY AND BISHOP, 1928, Mem. Cornell Univ. Agr. Exp. Sta., no. 101, p. 1035. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178. LOWRIE, 1942, Bull. Chicago Acad. Sci., vol. 6, p. 167; 1948, Ecology, vol. 29, no. 3. MUMA, 1943, Common spiders of Maryland, p. 28, pl. 11, fig. 3. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 118. MUMA, 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 332.

Dictyna foliacea SCHEFFER, 1905, Kansas Univ. Sci. Bull., vol. 3, no. 3, p. 117. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 3. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109. BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., p. 172. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178; 1945, Amer. Mus. Novitates, no. 1292; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 507, pl. 105, fig. 1951, pl. 106, figs. 1972–1974. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. JONES, 1940, Trans. Illinois State Acad. Sci., vol. 33, no. 2, p. 216; 1947, Field and Lab., vol. 15, p. 30, figs. 73–77; 1948, Field and Lab., vol. 16, p. 30. LOWRIE, 1942, Bull. Chicago Acad. Sci., vol. 6, p. 167; 1948, Ecology, vol. 29, no. 3. TRUMAN, 1942, Proc. Pennsylvania Acad. Sci., vol. 16, p. 25–28. MUMA, 1943, Common spiders of Maryland, p. 28, pl. 11, fig. 4; 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6. ROEWER, 1945, Katalog der Araneae, vol. 2, pt. B, p. 1321. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1437.

Dictyna sublata JONES (not Hentz), 1947, Field and Lab., vol. 15, no. 1, p. 31, figs. 78–81, 86.

DIAGNOSIS: Females vary from 1.6 mm. to 2.7 mm. and average 2 mm. in total length. Female: Carapace, 0.9 mm. long, 0.67 mm. wide. Abdomen, 1.1 mm. long, 0.85 mm. wide. Male: Carapace, 0.95 mm. long, 0.69 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide.

The dorsal view of a female is illustrated in plate 19, figure 11. The carapace is bright orange to chestnut brown and has dusky shadings on the pars thoracica. The dusky brown sternum is darkest along the borders and frequently has a dark median stripe. The pale yellowish legs have no contrasting markings. The abdomen is dark reddish or purplish brown, darkest in the males, but the females usually have the dorsum ornamented with a broad yellowish band from near the base to the apex, which may be a quite clear strip or much dissected and broken along the borders.

In this slender species, the carapace is of moderate height in the female, the height of the clypeus of this sex being the diameter of an anterior lateral eye. The pars cephalica of the male is higher, and the moderately sloping clypeus equals two full diameters of the anterior lateral eye and is also equal to the length of the median eye quadrangle. The posterior eye row is moderately procurved, and the equal eyes are separated by the full diameter of the median eyes or slightly more. The orange-brown chelicerae of the male are strongly concave in front and bowed apart in the middle to form a fusiform opening. The angle at the base of chelicera is a rounded spur.

The epigynum (pl. 19, fig. 8) is unusual in the location of the lateral foveae, which are small grooves far in front of the large median atria.

The male palpus (pl. 19, figs. 9–11, 12, 13) is rather small and elongated. The tibia is broadest at the apical end, concave on the retrolateral side, and is armed at the base with a short spur bearing a heavy curved ctenidium. The second ctenidium is seemingly lost or incoporated into the single one on the tibial spur, this latter alternative being the most likely. The embolus arises on the prolateral side at the front end of the bulb and forms a semicircle into the conductor, which is moderately enlarged basally and is spiraled and drawn out to a thin spur.

TYPE LOCALITIES: Of *Theridion foliaceum*, female type from Alabama originally in

Hentz collection but now lost; of *Dictyna vittata*, Washington, D. C., female type in the United States National Museum; of *Dictyna frondea*, New Haven, Connecticut, many male and female cotypes in the Museum of Comparative Zoölogy.

DISTRIBUTION: The eastern United States and Canada from southern Ontario south into Florida, westward to North Dakota and Texas (see fig. 15).

SELECTED RECORDS: *Maine:* Northwest of Wells, August 12, 1933, females. *Ontario:* Tilden, Point Pellee, Essex County, July 2 to August 27, 1938 (T. Kurata), 25 females. Favourable Lake Mine, latitude 53° N., July 20, 1939 (T. Kurata), one male. *Florida:* Crescent City, male. *North Dakota:* Divide County, 1936–1938, male and females. *Texas:* Salt Fork of Red River, near Wellington, July 16, 1939 (L. I. Davis), three females. Lufkin, May 8, 1952 (W. J. Gertsch), females. Garrison, May 8, 1952 (W. J. Gertsch), females.

Dictyna mora, new species

Plate 19, figure 3

FEMALE: Total length, 2.2 mm. Carapace, 0.9 mm. long, 0.67 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

General appearance and pattern of abdomen very much as in *foliacea* (pl. 19, fig. 11) but coloration quite red.

Carapace dull yellowish brown, the sides of the head reddish, and the pars thoracica with reddish radiating streaks. Sternum dusted with red over a yellowish ground. Legs yellow, clothed with grayish hairs, without contrasting markings. Dorsum of abdomen rusty red on the sides, with a broad median band white in color from base to apex, somewhat invaded behind with indistinct rusty chevrons. Venter of the abdomen whitish on the sides and with a faint rusty stripe from base to the spinnerets.

Structure essentially as in *foliacea*. Carapace of average height, convex, the clypeus equal in height to the full diameter of the anterior lateral eye. Posterior eye row slightly recurved, the median eyes separated by the long diameter, about as far from the equal lateral eyes.

Epigynum (pl. 19, fig. 3) similar to that of *foliacea* but distinct in having the lateral foveae located just above the widely separated black atria.

TYPE LOCALITY: Female holotype from 10 miles southeast of Mora, New Mexico (C. C. Hoff).

THE *brevitarsus* GROUP

This group includes the type of the genus and is thus most exemplary of the large genus *Dictyna*. The relatively short embolus is a thin rod which originates near the front of the tegulum on the prolateral side. The palpus is rather short and compact, with a quite large cymbium which largely cups and extends beyond the side margins of the bulb and elements. The tibia is rather short and bears a short spur tipped with two black ctenidia. Atypical innovations are the following: In *nebraska* the tibia (pl. 21, fig. 14) bears a suberect, rounded lobe at the base of which are the broad ctenidia; in *brevitarsus* (pl. 21, fig. 2) the second ctenidium is very small and lies in front of the principal ctenidium; in *quardrispinosa* the tibial spur and the ctenidia are strangely twisted (pl. 22, figs. 2–4); in *brevitarsus* the embolus is shortened and lies in a small conductor (pl. 21, fig. 1); and finally it can be noted than the basal spirals of the conductor exhibit distinctive forms in every species of the series. The epigyna are of quite conventional design. In *arundinacea* and *nebraska* the median atria are large and close together, whereas in the other species these openings are much smaller and quite widely separated. The lateral foveae are conspicuous carinate grooves very close together in *nebraska* (pl. 21, fig. 12) and *bostoniensis*, but moderately separated in the other species except *arundinacea*, where they are as wide apart as the sternal width. The male chelicerae (for those of *bostoniensis*, see pl. 20, fig. 6) are of moderate length, are typically convex in front and bowed apart to leave a long fusiform opening, and the basal angles are variously developed to a rounded lobe or a small horn.

Most of the species of this group are of northern or mountain distribution, and one of them (*arundinacea*) is also widespread in Palearctica.

Dictyna brevitarsus Emerton

Plate 21, figures 1–4; text figure 17

Dictyna brevitarsus EMERTON, 1915, Trans. Connecticut Acad. Sci. Arts, vol. 20, p. 140. CROSBY AND BISHOP, 1928, Mem. Cornell Univ. Agr. Exp. Sta., no. 101, p. 1035. GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 13. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81 (*brevitarsis*). CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 14 (*brevitarsis*). JONES, 1947, Field and Lab., vol. 15, p. 26, fig. 68; 1948, Field and Lab., vol. 16, p. 30. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 510, pl. 102, fig. 1897, pl. 104, fig. 1937. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319. HACKMAN, 1954, Acta Zool. Fennica, vol. 79, p. 93 (*brevitarsa*). BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1432.

DIAGNOSIS: Female: Total length, 2.6 mm. Carapace, 1.1 mm. long, 0.84 mm. wide. Abdomen, 1.7 mm. long, 1.2 mm. wide. Male: Total length, 2.45 mm. Carapace, 1.15 mm. long, 0.84 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

This species is somewhat variable in size, with northern specimens being smaller (some females are less than 2 mm.), and shows considerable color variation. The carapace may be light clear orange or dusky reddish brown and is darkest on the pars cephalica. The sternum exhibits the same variation, is lightly to heavily shaded with dusky, especially on the sides, and often there is a thin, median, dark stripe. The yellow to orange legs are usually immaculate, but Rocky Mountain specimens often have dark rings. The abdomen varies from pale yellow to dark orange-brown, is often nearly plain, but usually it shows a distinct pattern as follows: dorsum with a basal blackish stripe widened behind and a double row of black spots; sides black; venter all pale yellowish or marked with a median black streak and dusky shading at the base and around the spinnerets. Specimens from the mountains of Utah and New Mexico are very dark, with the abdomen sometimes entirely black.

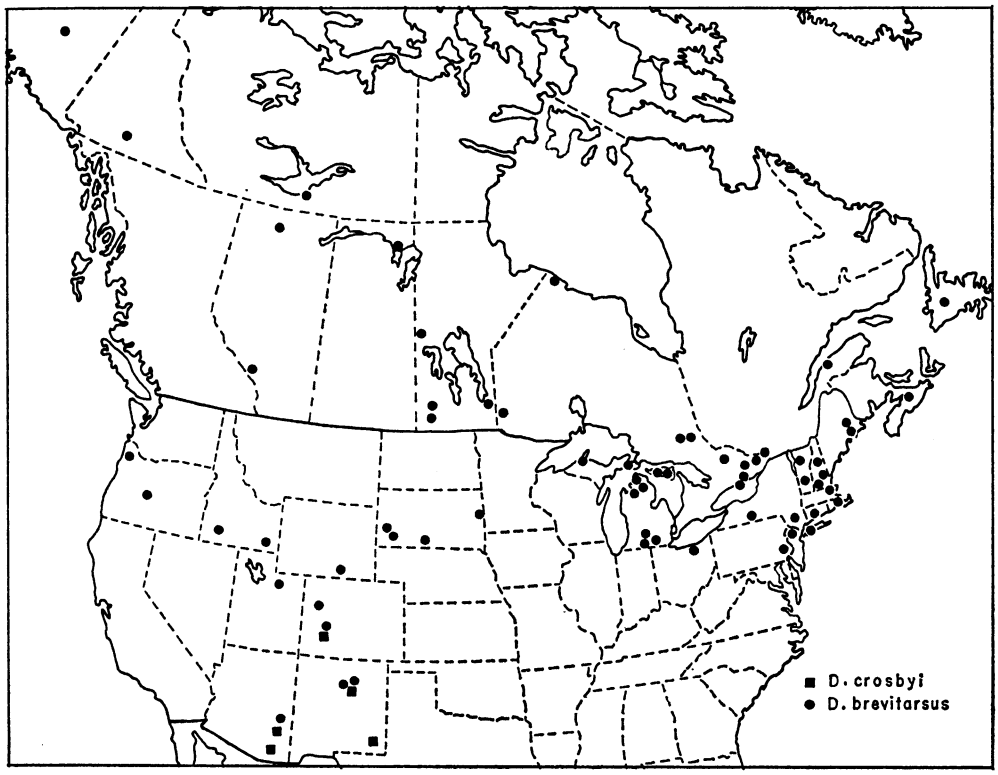


FIG. 17. Distribution of *Dictyna crosbyi* and *brevitarsus*.

The posterior eye row is slightly procurved,

and the median eyes are separated by the full diameter. The pars cephalica is of average height in the female, which has the clypeal height equal to the full diameter of the anterior lateral eye, and typically higher in the male, being nearly two diameters.

The dusky orange chelicerae of the male are long and slender, are concave in front and moderately bowed to form a fusiform opening, and have the basal angle developed into a blunt tooth.

The epigynum (pl. 21, fig. 3) has the suboval median atria widely separated but each atrium lies close to a short lateral fovea, these foveae being separated by about the width of the sternum.

The male palpus (pl. 21, figs. 1, 2, 4) presents in dorsal view a short tibia, widened apically to a distinct retrolateral lobe, which bears above, near the base on the retrolateral side, a short spur tipped with a heavy black ctenidium. Immediately in front is the second ctenidium, more or less hidden by the larger one. The cymbium shallowly cups the bulb and accessory elements. The thick embolus is short and cuts across the bulb to enter the fold of the conductor, leaving the heavy bulbal tube exposed. The short conductor is spiraled and ends in a heavy point.

TYPE LOCALITIES: Danvers, Massachusetts, and Mt. Washington Glen, Ithaca, New York, male cotypes in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northern North America from Alaska and Canada eastward to Nova Scotia, south into New Jersey and the Great Lake region, and down the Rocky Mountains into New Mexico and Arizona (see fig. 17).

SELECTED RECORDS: *Alaska:* College, June 26, 1945 (J. C. Chamberlin), immature female. *Yukon:* Whitehorse, July 1–12, 1948, male. *Mackenzie:* Great Slave Lake, August 1–5, 1945, female. *Saskatchewan:* Wollaston Lake, August 4, 1947 (T. B. Kurata), male, female. *Manitoba:* The Pass, July 7, 1931 (T. B. Kurata), females. *Ontario:* Favourable Lake, latitude 53° N., June 19, 1938 (G. Nesbitt), male and females. *Nova Scotia:* Truro, one male. *Labrador:* Goose Bay, July 6, 17, 1948, two females. *Newfoundland:* Millertown Junction, August 21, 1949, male (Hackman, 1954). *Arizona:* Baldy Peak, White Mountains, June 18, 1936 (E. D. Ball), two males. *New Mexico:* Spirit Lake Trail, Cowles (C. C. Hoff), male, females. Northeast of Santa Fe (C. C. Hoff), males, females. *Utah:* Mirror Lake, Uinta Mountains, August 18, 1942 (W. Ivie), male and female.

Dictyna crosbyi Gertsch and Mulaik

Plate 21, figures 5–9; text figure 17

Dictyna crosbyi GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, pp. 331, 332. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

Emblyna newina CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 11, fig. 29.

DIAGNOSIS: Female: Total length, 3.5 mm. Carapace, 1.12 mm. long, 0.84 mm. wide. Abdomen, 2.1 mm. long, 1.6 mm. wide. Male: Total length, 2.7 mm. Carapace, 1.25 mm. long, 1 mm. wide. Abdomen, 1.6 mm. long, 1 mm. wide.

This dark species has the general appearance of *brevitarsus* and is quite closely related in structure. The dusky reddish brown carapace is darkest on the sides in the females but uniformly dark in males. The sternum is dark brown. The yellow to brown legs are narrowly ringed with brown. The dull yellowish or brown abdomen usually has a dorsal brown pattern consisting of a broad, basal, somewhat dentate stripe from base to middle which is followed by a more or less distinct series of chevrons or separated spots. The under side has a broad median brown band from genital furrow to the spinnerets, which is flanked by white patches.

The posterior eye row is moderately procurved, and the eyes are separated by one and one-third full diameters of the median eyes. The pars cephalica of the male is proportionately longer, higher, and more prominent than in *brevitarsus*, and the gently sloping clypeus is as high as two diameters of the lateral eye. The dark reddish brown chelicerae of the male are long and slender, moderately concave in front, bowed laterally to leave a median fusiform opening, and the basal angle is a weak spur.

The epigynum (pl. 21, fig. 5) resembles that of *brevitarsus* in type, but the well-separated atria are much larger and nearer the wide lateral foveae, which are separated by less than the sternal width.

The palpus (pl. 21, figs. 6–9) shows close

resemblance to that of *brevitarsus*. The embolus is somewhat longer and forms an oval figure to lie in the much larger conductor, which spirals apically and ends in a short point. The dorsal spur on the tibia is nearly sessile and presents the two ctenidia of nearly equal size.

TYPE LOCALITIES: Of *crosbyi*, Scott Able Canyon, New Mexico, female holotype in the American Museum of Natural History; of *newina*, north of Ouray, Colorado, male holotype in the American Museum of Natural History.

DISTRIBUTION: Mountains of the Rocky Mountain states listed below (see fig. 17).

KNOWN LOCALITIES: *Colorado:* North of Ouray, June 19, 1940 (W. Ivie), males and females. *Arizona:* Summerhaven, June 6, 1952 (W. J. Gertsch), males and females. White Mountains Reservation, east of McNary, July 8, 1940 (W. J. Gertsch), female. *New Mexico:* Scott Able Canyon, July, 1934 (S. Mulaik), female holotype. Sandia Mountains, Bernalillo County (C. C. Hoff), female.

Dictyna bostoniensis Emerton

Plate 20; text figure 18

Dictyna bostoniensis EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 447, pl. 9, fig. 3. MARX, 1889, Proc. U. S. Natl. Mus., no. 782, vol. 12, p. 509. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 2. PETRUNKEVITCH, 1911, Bull. Amer. Must. Nat. Hist., vol. 29, p. 108. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 307. LOWRIE, 1942, Bull. Chicago Acad. Sci., vol. 6, p. 167. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 117. MUMA, 1945, Proc. Biol. Soc. Washington, vol. 58, p. 93. JONES, 1947, Field and Lab., vol. 15, p. 28, fig. 71; 1948, Field and Lab., vol. 16, p. 30. LOWRIE, 1948, Ecology, vol. 29, no. 3, pp. 335, 345. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 509, pl. 102, fig. 1894, pl. 104, figs. 1947–1950. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319.

Dictyna sociella CHAMBERLIN, 1919, Ann. Ent. Soc. America, vol. 12, p. 242, pl. 15, fig. 8. WORLEY, 1932, Univ. Washington Publ. Biol., vol. 1, no. 1, p. 18. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1450.

DIAGNOSIS: Males and females vary from 2.5 mm. to 4.5 mm. in length. Female: Total length, 3.2 mm. Carapace, 1.2 mm. long, 0.9 mm. wide. Abdomen, 2.3 mm. long, 1.8 mm. wide. Male: Total length, 2.7 mm. Carapace, 1.2 mm. long, 0.9 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

This is a pale species which may be all whitish but is often quite strongly marked with a dusky to bold black pattern as shown in plate 20, figures 1, 10, and 11. The carapace is orange, with dark radiating lines on the pars cephalica, and has an indistinct pale stripe around the margins. The clear yellow to orange sternum often has marginal duskiness and not infrequently a median dark band most noticeable behind. The white to yellow legs may be clear, but in some specimens narrow, broken, dusky rings are present. The whitish abdomen is reticulated in gray, may be completely devoid of darker pattern, but may be marked as shown in the plate. The dorsum usually has at the base a toothed, apically trifurcated, narrow band and shows behind a series of chevrons that may be well separated, broken into spots or fused to a single blackish maculation. The venter (pl. 20, fig. 10) may be all pale but often shows a series of blackish spots.

The structure is similar to that of other species of the *brevitarsus* group. The slightly procurved eyes of the posterior row are separated by at least the full diameter and frequently almost half as much more. The carapace is relatively broad in the male (pl. 20, fig. 11), is of moderate height, and the clypeus is equal in height to nearly two full diameters of the anterior lateral eye. The chelicerae of the male (pl. 20, fig. 6) are of moderate length and slenderness and are concave in front and bowed on the sides to leave a fusiform opening. The base of the chelicera is quite prominently enlarged, but the angle is developed only to a weak spur. The small tooth on the lower cheliceral margin is distinct in both sexes.

The epigynum (pl. 20, fig. 7) is of unusual interest in that it seemingly lacks lateral foveae. It seems likely that they have migrated to the edges of the median atria and are the carinate grooves separating the shallow atria. Enlarged views of the entire epigynum are shown in plate 20, figures 8 and 9, the former depicting the external, and the latter the internal, view.

The male palpus (pl. 20, figs. 2–5) is quite similar to that of *brevitarsus*. The thick, rela-

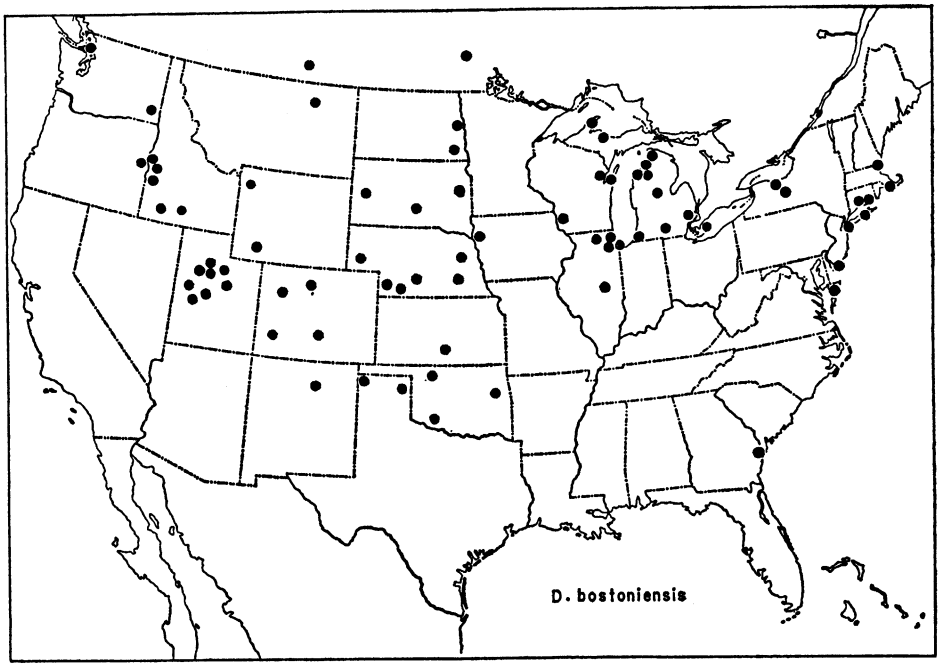


FIG. 18. Distribution of *Dictyna bostoniensis.*

tively short embolus cuts across the bulb to lie in the groove of the rather small conductor, which is distinctively coiled at the apex. The tibial spur is sublateral in position and bears the usual two black ctenidia.

TYPE LOCALITIES: Of *bostoniensis*, Boston, Massachusetts, male and female cotypes in the Museum of Comparative Zoölogy; of *sociella*, Wawawai, Washington, female holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northern United States and adjacent Canada from Massachusetts to Washington, south to Georgia, Texas, and New Mexico (see fig. 18).

SELECTED RECORDS: *Manitoba:* Victoria Beach, July 4, 30, 1931 (T. B. Kurata), males and females. *Alberta:* Medicine Hat, August 1–16, 1930 (Carr), male, females. *South Dakota:* Island Park, near Chamberlain, June 18, 1951 (H. Levi), male, female. *Washington:* Whiskey Dick Canyon, 5 miles north of Vantage, Kittitas County, August 4, 1954 (B. Malkin), females. *Georgia:* Savannah Beach, May 4, 1943 (W. Ivie), male. *Oklahoma:* Cherokee, June 4, 1937, male, female. Grandfield, July 5, 1937, female. *Texas:* Texline, July 14, 1939 (L. I. Davis). Canadian, July 15, 1939 (L. I. Davis). *Utah:* Richfield, May 25, September, 1930 (W. J. Gertsch), males, females.

Dictyna nebraska Gertsch

Plate 21, figures 10–14

Dictyna nebraska GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 16, figs. 17, 18. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Female: Total length, 3.4 mm. Carapace, 1.3 mm. long, 0.97 mm. wide. Abdomen, 2.2 mm. long, 1.5 mm. wide. Male holotype: Total length, 3.3 mm. Carapace, 1.56 mm. long, 1.06 mm. wide. Abdomen, 1.8 mm. long, 1.15 mm. wide.

The carapace is reddish brown and is darkest on the sides of the head and on the pars thoracica which shows faint radiating streaks. The sternum varies from yellow to dark orange-brown. The yellow to light brown legs lack darker markings. The whitish abdomen is reticulated in gray, may be quite brown in the male, and has an inconspicuous dorsal pattern, consisting in females of a smudgy basal band and a faint caudal smudge or distinct chevron. The pale venter has a dusky patch on each side of the spinnerets.

This interesting species is closely allied to *brevitarsus* and other species of this series.

The posterior eye row is moderately recurved, and the eyes are separated by one and one-fourth diameters of the median eyes. The pars cephalica is typically elevated and has the clypeus of the male equal to about two diameters of an anterior median eye. The male chelicerae closely resemble those of *bostoniensis* but are more strongly concave in front, have the central openings a little wider and the basal angle a more prominent rounded spur.

The epigynum (pl. 21, figs. 12, 13) features two very large suboval atria separated by a thin septum. The pair of quite conspicuous lateral foveae lie close together near the base of the atria, so that their width is only two-thirds of that of the sternum.

The palpus (pl. 21, figs. 10, 14) is similar to that of *bostoniensis*. The rather thin embolus (pl. 21, fig. 11) margins the bulb and lies in the quite large conductor, which is produced apically into a two-pronged process. The short tibia has at the base, above a heavy lobe curved upward and forward and beside it on the retrolateral side, a short sessile spur bearing two curved black ctenidia.

TYPE LOCALITY: Weeping Water River, east of Lincoln, Nebraska, male holotype in the American Museum of Natural History.

DISTRIBUTION: Central states from North Dakota to Nebraska and Colorado.

KNOWN LOCALITIES: *Nebraska:* Weeping Water River, east of Lincoln, 1941 (M. J. Harbaugh), male holotype. Sidney, June 5, 1933, male and female. Ten miles west of Lexington, June 6, 1933 (W. Ivie), females. *North Dakota:* Divide County, 1936–1938 (J. Davis), female. *Colorado:* Fort Collins (W. Ivie), males and females.

Dictyna quadrispinosa Emerton

Plate 22, figures 1–4

Dictyna quadrispinosa EMERTON, 1919, Canadian Ent., vol. 51, p. 106, figs. 5–5b. CROSBY AND BISHOP, 1928, Mem. Cornell Univ. Agr. Exp. Sta., no. 101, p. 1035. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1449.

DIAGNOSIS: Male: Total length, 2.3 mm. Carapace 1.1 mm. long, 0.8 mm. wide.

This species is known only from the male. The dusky chestnut brown carapace is darkest on the sides of the head and has dark radiating lines and an indistinct black marginal seam on the pars thoracica. The sternum is uniform dusky dark brown. The legs are dusky yellowish brown. The dusky to blackish abdomen shows above indistinctly a pattern of lighter transverse chevrons or rows of paler spots, and the venter is paler gray.

The structure of this interesting species is quite similar to that of *brevitarsus* and its relatives. The posterior eye row is slightly recurved, and the median eyes are separated by the full diameter. The pars cephalica is prominent, strongly elevated, and convex, and equals at the second eye row somewhat more than half of the greatest width of the carapace. The clypeus slopes gently and is equal in height to about two diameters of the anterior median eye. The chelicerae are quite long and slender, are moderately concave as viewed from the side, and are moderately bowed in front to form a long fusiform opening.

The male palpus (pl. 22, figs. 1–4) presents several unusual modifications. The rather thin embolus originates at the front edge of the bulb and curves around the margin to be hidden in the quite expansive conductor, which terminates in a bifurcate process of which one branch is a long curved spur. The short rounded tibia is elevated somewhat dorsally at the apex into a rounded projection which bears two curved, laterally directed spines. The front spine is a slender curved finger which may bear the two ctenidia. The second spine is stouter and joins behind to an oblique black ridge.

TYPE LOCALITY: Black Brook, Clinton County, New York, male type in the Cornell University collection.

DISTRIBUTION: Western New York to South Dakota.

KNOWN RECORDS: *New York:* Vrooman's Nose, Schoharie County, May 15, 1921, male. Black Brook, Clinton County, June, 1916 (C. R. Crosby), male holotype. *South Dakota:* Horsethief Lake, Pennington County, June 21, 1953 (H. Levi), male swept from vegetation. Three miles north of Pringle, 5000 feet, Custer County, June 23, 1954 (H. Levi), male taken while sweeping meadow. Custer State Park, June 20, 1950 (H. Levi), male.

It should be noted that the male type of *quadrispinosa* in the Cornell University collection is badly fragmented and lacks both palpi. Furthermore, the specimen from Vrooman's Nose, which was noted by Crosby and Bishop and used to prepare an unpublished description, has been mislaid or lost.

Dictyna alaskae Chamberlin and Ivie

Plate 22, figures 10–12

Dictyna alaskae CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 13, figs. 2, 3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318.

DIAGNOSIS: Female: Total length, 2.2 mm. Carapace, 0.8 mm. long, 0.7 mm. wide. Abdomen, 1.5 mm. long, 1.2 mm. wide. Male holotype: Total length, 2.1 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.3 mm. long, 0.85 mm. wide.

The dark reddish brown carapace is somewhat dusky on the sides of the head and shows dusky radial shadings on the pars thoracica. The sternum varies from yellow to orange-brown and is dusky on the margins. The yellowish legs are unmarked. The dorsum of the gray abdomen has a large blackish mark from the base to near the middle and dark transverse marks in the caudal half, and is uniformly dusky on the venter. In some specimens the abdomen is brown or pink.

The structure is quite typical for this series, with the male head moderately elevated and convex, and the sloping clypeus equaling two full diameters of the lateral eye. The subequal eyes of the posterior row are slightly recurved and separated by one and a half full diameters. The chelicerae are moderately concave as viewed from the side and are bowed apart in front to form a fusiform opening twice as long as wide.

The epigynum (pl. 22, fig. 11) has the oval median atria quite widely separated and the lateral foveae separated by a width greater than that of the sternum.

The male palpus (pl. 22, figs. 10, 12) shows relationship to that of *brevitarsus* and other species of this group. The short tibia bears a dorsal spur which is tipped with two black ctenidia. The thin embolus margins the bulb and lies in the groove of the conductor, which has its basal portion ending as a long, twisted spine.

TYPE LOCALITY: Three miles northeast of Central, Alaska, male holotype in the American Museum of Natural History.

DISTRIBUTION: Northern North America from Alaska across to Labrador and south into Montana.

KNOWN RECORDS: *Alaska:* Three miles northeast of Central, June 21, 1945 (J. C. Chamberlin), male holotype, female allotype. Circle City, June 21, 1945 (J. C. Chamberlin), male. College, June 26, 1945 (J. C. Chamberlin), male. Matanuska, October, 1943 (J. C. Chamberlin), immature. McCarthy, June 10, 1934, female. *Mackenzie:* Pearson Point, Great Slave Lake, July 10, August 12–15, 1947 (D. S. Rawson), males and females. Reindeer Station, July, 1948 (J. R. Vokeroth), male, female, and subadult. Sawmill Bay, June 13, 1948 (D. F. Hardwick), female. *Alberta:* Rowe Brook, 6000 feet, Waterton National Park, July 24, 1953 (H. Levi), female. *Montana:* Bowman Lake, 4100 feet, Glacier National Park, August 4, 1953 (H. Levi), female. Cache City, July 10, 1950 (H. Levi), male, female. *Manitoba:* The Pass, July 7, 1941 (T. B. Kurata), female. *Quebec:* River George, latitude 55° 1′ N., July 18, 1947 (J. Rousseau), one female. *Labrador:* Goose Bay, June 11, 1948, female. Cabot Lake, September, 1922 (F. W. Waugh).

Dictyna arundinacea Linaeus

Plate 22, figures 5–7

Dictyna arudinacea LINNAEUS, 1758, Systema naturae, ed. 10, p. 620. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 11. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1310. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1426.

Dictyna voluta GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 10, fig. 28. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1457.

DIAGNOSIS: Female: Total length, 3.6 mm. Carapace, 1.2 mm. long, 1 mm. wide. Abdomen, 3 mm. long, 2.3 mm. wide. Male: Total length, 3.1 mm. Carapace, 1.5 mm. long, 1.2 mm. wide. Abdomen, 2 mm. long, 1.4 mm. wide.

The carapace is a uniform dark reddish brown, not much darker on the sides, against which background the rows of white hairs are conspicuous. The sternum is dark brown. The reddish brown legs are unmarked. The whitish

to light brown abdomen is finely reticulated with gray, and has above a dusky to blackish pattern consisting of a basal smudge or distinct mark from base to middle and indistinct spots or chevrons behind, and below a more or less distinct median stripe from epigynum to spinnerets.

This Palearctic species is somewhat larger than *alaskae* and shows definite resemblance in the genitalia and general structure. The posterior eye row is moderately recurved, and the rather small eyes are separated by one and one-half diameters of the median eyes. The head of the male is prominent, broad in front where the width is almost two-thirds that of the carapace, and the sloping clypeus is as high as two full diameters of the anterior lateral eye. The male chelicerae are long and slender, are moderately concave as seen from the side, are bowed in front to form a fusiform opening, and the basal angle is developed to a small but distinct pointed horn.

The epigynum (pl. 22, fig. 6) has the large suboval atria separated by a narrow septum and the conspicuous lateral foveae well separated to the full width of the genital groove and the sternum.

The male palpus (pl. 22, figs. 5, 7) is quite similar to that of *alaskae*. The embolus originates on the prolateral side of the bulb at the front edge of the tegulum, broadly circles the bulb, and lies in the large conductor. The basal element of the conductor is twisted into a conspicuous transverse spiral piece. The short tibia is armed above at the base with a short erect spur tipped with two black ctenidia.

TYPE LOCALITIES: Of *arundinacea*, northern Europe, no type material extant; of *voluta*, Electra Lake, Colorado, male holotype in the American Museum of Natural History.

DISTRIBUTION: The species is widespread in Europe, presumably also occurs through Siberia, and has been found sparingly in boreal North America as indicated below.

KNOWN RECORDS: *Ontario:* Fort Albany, James Bay, June 22, 1942 (F. A. Urquhart), male, females. *Labrador:* Goose Bay, June, July (H. C. Friesen), males, females. *Colorado:* Electra Lake, June 28, 1919 (F. E. Lutz), male; July 1, 1919 (F. E. Lutz), male and females.

THE *major* GROUP

This is a minor group which differs from the preceding only in a few details. The palpus is somewhat less stout and has the bulbal elements proportionately larger. The embolus is much longer and originates near the base of the tegulum on the prolateral side. The conductor is of average size, and the basal spiral ends in a sharp, laterally directed spur. The tibia is somewhat longer than broad and bears a spur of medium length, rarely equaling the width of the segment, which is tipped with black ctenidia. The typical two ctenidia are usually present, but three are not uncommon in *tridentata*.

The nominate species of this series, *Dictyna major*, is of Holarctic distribution, being widespread in northern Eurasia and northern North America. Four related species occur in the western mountains where, within their range, they are among the most abundant members of the genus.

Dictyna major Menge

Plate 24, figures 2–4; text figure 19

Dictyna major MENGE, 1869., Schr. Naturf. Gesell. Danzig, vol. 2, p. 247, pl. 48, fig. 147. JACKSON, 1937, Proc. Zool. Soc. London, vol. 107, p. 547. BRAENDEGAARD, 1940, Meddel. Grønland, vol. 125, no. 8, p. 27. CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 15. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1311.

Dictyna hamifera THORELL, 1872, Ofvers. K. Vetensk. Akad. Forhandl., vol. 29, p. 156. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109. EMERTON, 1919, Vidensk. Meddel. Grønland, vol. 125, no. 8, p. 7.

Dictyna vincens CHAMBERLIN, 1919, Ann. Ent. Soc. America, vol. 12, p. 243, pl. 15, figs. 1, 2. WORLEY, 1932, Univ. Washington Publ. Biol., vol. 1, no. 1, p. 18. CHAMBERLIN AND IVIE, 1933, Bull. Univ. Utah, biol. ser., vol. 2, p. 4; 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 5. GERTSCH AND JELLISON, 1939, Amer. Mus. Novitates, no. 1032, p. 1. JONES, 1948, Field and Lab., vol. 16, p. 31. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1455.

Dictyna clackamas CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 7.

Dictyna chenea CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 7.

DIAGNOSIS: Females vary from 2.2 mm. to 4 mm. and average 3 mm. in length. Males are somewhat smaller. A typical female: Cara-

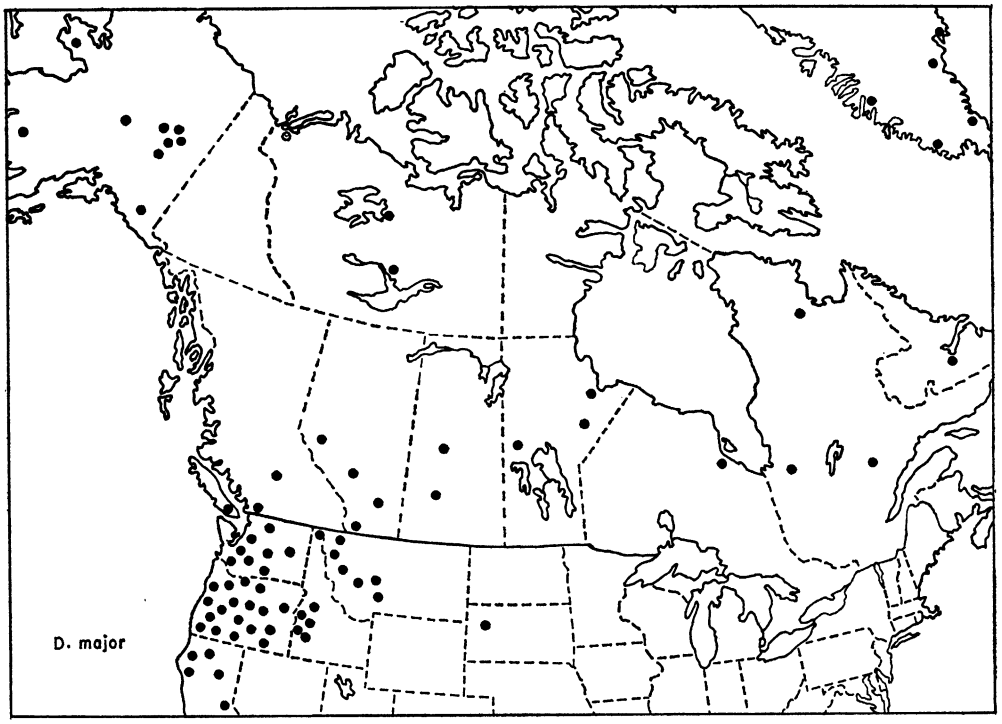


FIG. 19. Distribution of *Dictyna major*.

pace, 1.15 mm. long, 0.97 mm. wide. Abdomen, 2 mm. long, 1.45 mm. wide. Male: Total length, 2.6 mm. Carapace, 1.2 mm. long, 0.93 mm. wide. Abdomen, 1.5 mm. long, 1.1 mm. wide.

The usually very dark brown carapace faintly shows radiating black lines on the pars thoracica and has the five bands of white hairs on the pars cephalica conspicuous. The sternum is dark brown or blackish. The legs vary from light to dark brown and usually show traces of narrow dark rings. The abdomen varies from yellowish to light brown and typically presents the following pattern: dorsum with basal stripe, which may be dentate on the sides and apically trifurcate, running to near the middle and behind this a series of chevrons, which may be broken into discrete side stripes or series of spots or which may be fused into a single dark marking; sides mostly pale, with dark spots or patches near the base; venter with a dark longitudinal stripe from genital groove near the spinnerets, which often encloses four or more small pale spots.

The rather small eyes of the poteriors line are very weakly recurved, essentially straight, and the median eyes are separated by about one and one-half diameters. The pars cephalica of the male is typically elevated, and the height of the sloping clypeus equals two diameters of the anterior lateral eye. The male chelicerae are quite long and slender, have the basal angle developed to a rounded spur, and are moderately bowed in front to form a fusiform opening.

The epigynum (pl. 24, fig. 3) presents the two suboval atria close together on the midline and separated by a narrow septum. The lateral foveae are conspicuous grooves, with their lateral separation slightly exceeding the width of the genital groove and the sternal width.

The male palpus (pl. 24, figs. 2, 4) is representative of this group. The tibia is broad at the apex and bears above at the base an erect spur tipped with two black ctenidia. The cymbium largely encloses the bulbal elements. The thin embolus originates near the base of the tegulum, circles the rim of the cymbium in spiral outline, and disappears in the quite large conductor. The basal portion

of the conductor describes a short spiral and ends as a small, laterally directed spur.

TYPE LOCALITIES: Of *major*, male type from Heubuden, Preussen (now Poland), possibly in the Danzig Natural History Museum; of *hamifera*, Disko, Greenland, male and female cotypes in the Riksmuseum, Stockholm, Sweden; of *vincens*, Olympia, Washington, male holotype in the Museum of Comparative Zoölogy; of *clackamas*, Damascus, Clackamas County, Oregon, female holotype in the Amerian Museum of Natural History; and of *chenea*, Cheney, Washington, female holotype in the American Museum of Natural History.

DISTRIBUTION: Northern portion of Holarctic region from Greenland, Canada, and northern United States and Alaska, to Siberia and north and central Europe. In Europe the species is recorded from northern France, Holland, Denmark, East Prussia, Hungary, and Scotland. In North America the species is widespread in the north but occurs in the United States only in the northern Rocky Mountains and the coastal states, southward into central California. (see fig. 19).

SELECTED RECORDS: *Greenland:* East Greenland; West Greenland (from latitude 59° 55′ to latitude 69° 15′ N.) (Braendegaard, 1946). *Labrador:* Cabot Lake, September, 1922 (F. W. Waugh), female. *Quebec:* Fort Chimo, June 25, 1948 (N. Smith), males, females. *Manitoba:* Churchill, June–July, 1936 (E. E. McClure), male. *Ontario:* Fort Albany, James Bay, June 26, 1942 (F. A. Urquhart), male. *Mackenzie:* Reindeer Station, June–July, 1948 (J. R. Vokeroth), males, females. Kidluit Bay, July 24–28, 1948 (J. R. Vokeroth), female. Fort Resolution, July 2–4, 1947 (D. Rawson), female. *Montana:* Kintla Lake, Glacier National Park, June, 1936 (L. W. Saylor), females. *Idaho:* Northeast of Fruitland, July–August (W. Ivie), males and females. *California:* Ebbets Pass, 8730 feet, Alpine County, August 5, 1953 (W. J. and J. W. Gertsch), male, females. Clio, Plumas County, July 8, 1952 (W. J. Gertsch), males, females.

Dictyna tridentata Bishop and Rudeman

Plate 23, figures 8–11; text figure 20

Dictyna tridentata BISHOP AND RUDEMAN, 1946, Proc. Biol. Soc., Washington, vol. 59, p. 2, figs. 3, 4. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1326.

Dictyna banksi JONES, 1947, Field and Lab., vol. 15, p. 14, figs. 35–37.

DIAGNOSIS: Female: Total length, 3.6 mm.

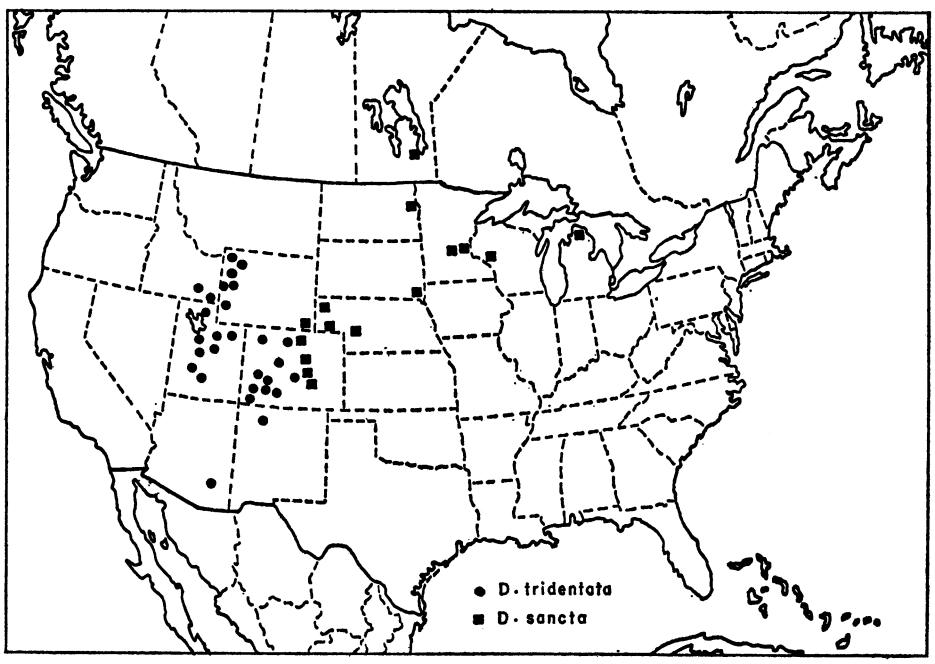


FIG. 20. Distribution of *Dictyna tridentata* and *sancta*.

Carapace, 1.3 mm. long, 1.05 mm. wide. Abdomen, 2.3 mm. long, 1.7 mm. wide. Male: Total length, 2.8 mm. Carapace, 1.25 mm. long, 0.95 mm. wide. Abdomen, 1.65 mm. long, 1.1 mm. wide.

This very dark brown species agrees closely in color pattern and structure with *major* but averages somewhat larger in size.

The epigynum (pl. 23, fig. 10) presents two suboval atria separated by scarcely the short diameter and well-marked lateral foveae that are as wide apart as the genital groove and wider than the sternum in the ratio of nearly 4/3.

The male palpus (pl. 23, figs. 8, 9, 11) is proportionately shorter and broader than in *major*, and the sharp spur on the conductor is directed laterad. The tibial apophysis is robust, is slightly curved, and bears two or three ctenidia at the apex, the latter atypical number, from which the species takes its name, being frequent.

TYPE LOCALITIES: Of *tridentata*, summit of Grand Teton Pass, Wyoming, male holotype in Cornell University; of *banksi*, Longs Peak Inn, Colorado, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Rocky Mountains from Wyoming and Idaho south into New Mexico and Arizona (see fig. 20).

SELECTED RECORDS: *Colorado:* Garfield, 9000 feet, Chaffee County, July 7, 1952 (H. Levi), two males, three females. Gothic, near Crested Butte, July 12, 1956 (W. J. Gertsch, V. Roth), males, females. *Utah:* Fish Lake, Sevier County, July 24, 1930 (W. J. Gertsch), males, females. *New Mexico:* Rio Arriba County (C. C. Hoff), female. *Wyoming:* Bridge Bay, Yellowstone National Park, July 9, 1935 (W. Ivie), males, females. *Idaho:* Cub River Canyon, Wasatch Mountains, July 5, 1952 (B. Malkin), males, females.

Dictyna cebolla Ivie

Plate 24, figures 5–7

Dictyna cebolla IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published), p. 3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319.

DIAGNOSIS: Female allotype: Total length, 3 mm. Carapace, 1.2 mm. long, 0.9 mm. wide. Abdomen, 2 mm. long. 1.4 mm. wide. Male holotype: Total length, 2.5 mm. Carapace, 1.25 mm. long, 0.9 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

This species agrees closely in size, color pattern, and structure with *major*. Specimens from high altitudes are often very dark.

The epigynum (pl. 24, fig. 6) is similar to that of *juno*. The lateral foveae are separated laterally to a width equaling that of the genital groove or the sternum.

The male palpus (pl. 24, figs. 5, 7) has the proportions essentially as in *major* but can be distinguished as follows: The embolus forms a more symmetrical spiral. The basal spiral of the conductor is small, and the spur is short and directed laterally. The tibial apophysis is proportionately heavier, slightly curved, and is tipped with two large ctenidia.

TYPE LOCALITY: Gunnison, Colorado, male holotype in the American Museum of Natural History.

DISTRIBUTION: Mountains of Colorado, New Mexico, Utah, and Idaho.

SELECTED RECORDS: *Colorado:* Four miles east of Gunnison, July, 1947 (W. Ivie), males and females. Gore Creek, 8500 feet, Gore Mountains, Eagle County, August 19, 1952 (H. Levi), five females in aspen. Cold Spring Camp, 8500 feet, 7 miles north of Black Hawk, Gilpin County, June 30, 1952 (H. Levi), three females on *Thermopsis*. Monarch Pass, 10,800 feet, Sawatch Mountains, Chaffee County, July 3, 1952 (H. Levi), females from wet subalpine meadows. *Idaho:* Rock Creek Ranger Station, Magic Mountain, 6500 feet, Twin Falls County, July 20, 1952 (B. Malkin, W. F. Barr), two males and three females. *Utah:* Elk Ridge, June 12, 1936 (A. M. Woodbury), male and females. *New Mexico:* Red River Village (C. C. Hoff), male. Nine miles northwest of Eagle Nest (C. C. Hoff), females.

Dictyna juno Ivie

Plate 23, figures 1–7

Dictyna juno IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322.

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.2 mm. long, 1 mm. wide. Abdomen, 2.1 mm. long, 1.7 mm. wide. Male: Total length, 2.8 mm. Carapace, 1.4 mm.

long, 1 mm. wide. Abdomen, 1.6 mm. long, 1.1 mm. wide.

This species agrees closely in size, color pattern, and structure with *major* and is best differentiated by details of the genitalia. Dorsal and ventral views of a typical female are illustrated (pl. 23, figs. 2, 4).

The epigynum (pl. 23, fig. 7) presents two rather small median atria which are round in shape and are separated by a median septum, often about equaling the diameter of the atrium. The lateral foveae are quite close together, are considerably less separated than the width of the genital groove, and are scarcely as far apart as the sternal width. The internal structure of the female epigynum is illustrated in plate 23, figure 6.

The male palpus (pl. 23, figs. 1, 3, 5) is similar to that of *major* but easily distinguished as follows: The tibial apophysis is shorter and directed upward as a slightly different angle. The cymbium and bulbal elements are somewhat smaller, and the embolus, which ends as a long thin spine, is proportionately shorter. The basal portion of the cymbium describes a larger spiral and ends in a long, tapering, caudally directed spur.

TYPE LOCALITY: West side of Utah Lake, Utah, male holotype in the American Museum of Natural History.

DISTRIBUTION: Western Oregon, Idaho, and Utah.

KNOWN RECORDS: *Oregon:* Ten miles northwest of Klamath Falls, June 16, 1952 (V. Roth), male and female. *Idaho:* North end of Bear Lake, August 8, 1949 (W. J. and J. W. Gertsch), males and females. Bloomington Lake, Wasatch Mountains, July, 1952 (B. Malkin), males and females. Bear River Canyon, July 14, 1952 (B. Malkin), females. Montpelier, July 10, 1952 (B. Malkin), females. *Utah:* East and west sides of Utah Lake, May to July (W. Ivie), many males and females. City Creek Canyon, Salt Lake City, May 22, 1943 (W. Ivie), females.

Dictyna sancta Gertsch

Plate 22, figures 8, 9; plate 24, figure 1; text figure 20

Dictyna sancta GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 13, figs. 21, 22. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

Dictyna sauncta (*sic*) JONES, 1948, Field and Lab., vol. 16, p. 31.

Dictyna alias CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 7.

Emblyna religens CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 11.

DIAGNOSIS: Female: Total length, 3.5 mm. Carapace, 1.4 mm. long, 1.06 mm. wide. Abdomen, 2.5 mm. long, 2.1 mm. wide. Male: Total length, 2.3 mm. Carapace, 1.15 mm. long, 0.86 mm. wide. Abdomen, 1.4 mm. long, 0.1 mm. wide.

This is a somewhat paler species than the four preceding, but it agrees closely in size, color pattern, and structure. Northern specimens, notably the male type of *alias*, are much smaller.

The epigynum (pl. 24, fig. 1) has the small median atria separated by nearly the diameter and the lateral foveae very near together, their full extension being less than the sternal width or the width of the genital groove.

The male palpus (pl. 22, figs. 8, 9) resembles that of *major* but is distinct, as follows: the spur on the conductor is longer and directed somewhat caudad; the tibial spur is much shorter and curved forward.

TYPE LOCALITIES: Of *sancta*, Garden of the Gods, Colorado Springs, Colorado, male holotype in the American Museum of Natural History; of *alias*, Manitoba, Canada, male holotype in the American Museum of Natural History: of *religens*, Jefferson, South Dakota, female holotype in the American Museum of Natural History.

DISTRIBUTION: Northern plains states and foothills east of the Rocky Mountains from Nebraska and Colorado to Manitoba and eastward into Minnesota and Michigan (see fig. 20).

KNOWN RECORDS: *Manitoba:* July 11, 1931, male. Victoria Beach, July 4, 1931, male, female. *Michigan:* Near Crass Village, August 3, 1947 (A. M. Chickering), five females. Douglas Lake (E. L. Miner), females. *North Dakota:* University of North Dakota, June 1896 (R. P. Currie), male. *South Dakota:* Jefferson, June 13, 1936 (D. Petersen), females. Sheridan Lake, Black Hills, August 6, 1953 (B. Malkin and V. E. Thatcher), females. *Montana:* Bozeman. *Colorado:* Garden of the Gods, Colorado Springs, June 24, 1940,

(W. J. Gertsch and L. Hook), male, female. Fountain Valley, June 23, 1940 (W. J. Gertsch and L. Hook), males, females. Northeast of Boulder, August 3, 1939 (H. Lanham), three females. *Wyoming:* Pine Bluffs, July 19, 1935 (W. Ivie), males, females. *Wisconsin:* Pepin, July 15, 1949 (H. Levi), male. *Nebraska:* Sioux County, July, female. Ogallala, July 4, 1947 (M. Muma), males, females. Twelve miles west of Sidney, July 19, 1935 (W. Ivie). Agate, July, 1943 (P. O. McGrew), one female. *Minnesota:* Lake Minnetonka, June 4, 1932 (W. J. Gertsch), males, females. Minneapolis, May 28, 1931 (W. J. Gertsch), males, females.

The *volucripes* Group

This series differs from the *major* group only in the shape of the basal spiral of the conductor which is twisted and ends in a wide truncated spur, as is well illustrated in *volucripes* (pl. 26, fig. 1). The tibial apophysis is longest in *coloradensis*, in which it equals the width of the segment, but it may be a short spur (*tucsona*, pl. 25, fig. 2). The male chelicerae are of conventional form, being fairly long, concave in front, bowed apart to form a fusiform opening, and usually have the basal angle developed to a rounded spur. In *abundans* (pl. 24, figs. 8, 9) the basal angle is a conspicuous rounded process or horn clearly visible from above. The various species are best separated by size differences and by the details of the quite similar genitalia. The degree of separation of the lateral foveae of the epigyna is useful in the differentiation of females.

This American group is widely distributed over most of continental North America. The typical eastern species, *volucripes*, ranges from southern Canada south into eastern Mexico. *Dictyna coloradensis* largely replaces *volucripes* in Canada and occurs from coast to coast and southward in the mountains. The remaining species are western, and most of them penetrate into adjacent Mexico.

Dictyna volucripes Keyserling

Plate 26, figures 1–3; text figure 21

Dictyna volucripes Keyserling, 1881, Verhandl. Zool. Bot. Gesell. Wien, vol. 31, p. 286, pl. 11, fig. 11. Banks, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510; 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 27; 1895, Proc. New York Acad. Sci., vol. 8, p. 422; 1900, Proc. Acad. Nat. Sci. Philadelphia, vol. 52, p. 534; 1904, Proc. California Acad. Sci., vol. 3, no. 13, p. 342; 1904, Jour. New York Ent. Soc., vol. 12, p. 83; 1910, Bull. U. S. Natl. Mus., no. 72, p. 18; 1932, *in* Banks, Newport, and Bird, Publ. Univ. Oklahoma, vol. 4, p. 20. Britcher, 1903, Proc. Onondaga Acad. Sci., p. 124. Scheffer, 1905, Kansas Univ. Sci. Bull., vol. 3, no. 2, p. 102. Bryant, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 5. Petrunkevitch, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 111. Chamberlin, 1921, Canadian Ent., vol. 53, p. 245; 1924, Proc. California Acad. Sci., vol. 12, no. 28, p. 581; 1928, Canadian Ent., vol. 60, no. 4, p. 93. Barrows, 1924, Ohio Jour. Sci., vol. 24, no. 6, p. 312. Chamberlin and Woodbury, 1929, Proc. Biol. Soc. Washington, vol. 42, p. 131. Worley and Pickwell, 1931, Studies Dept. Zool., Univ. Nebraska, vol. 28, nos. 1, 4, p. 13. Jones, 1936, Field and Lab., vol. 4, p. 69; 1947, Field and Lab., vol. 15, p. 21, figs. 53–56; 1948, Field and Lab., vol. 16, p. 32. Kaston, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 505, pl. 102, figs. 1904–1905, pl. 104, figs. 1942–1946, pl. 137, fig. 2075, pl. 144, figs. 2143–2144. Gertsch and Jellison, 1939, Amer. Mus. Novitates, no. 1032, p. 1. Kurata, 1939, Canadian Field Nat., vol. 53, p. 81. Gertsch and Mulaik, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 331. Gertsch and Davis, 1942, Amer. Mus. Novitates, no. 1158, p. 14. Lowrie, 1942, Amer. Mus. Novitates, no. 1158, p. 14; 1948, Ecology, vol. 29, no. 3, p. 337. Chamberlin and Ivie, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 124. Muma, 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6. Roewer, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1326. Bonnet, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1457.

Diagnosis: Females vary from 2.5 mm. to 4 mm. and average 3.3 mm. in length. An average female: carapace, 1.3 mm. long, 1 mm. wide; abdomen, 2.1 mm. long, 1.4 mm. wide. An average male: 2.7 mm.; carapace, 1.3 mm. long, 1. mm wide; abdomen, 1.6 mm. long, 1.1 mm. wide.

The dark brown carapace is darkest on the sides, shows faint radial dusky streaks on the thoracica portion, and is clothed on the pars cephalica with five scarcely discrete bands of white hairs. The sternum varies from yellowish to chestnut brown. The legs are orange to brown, often lack darker markings, but narrow dusky rings may be present. The base

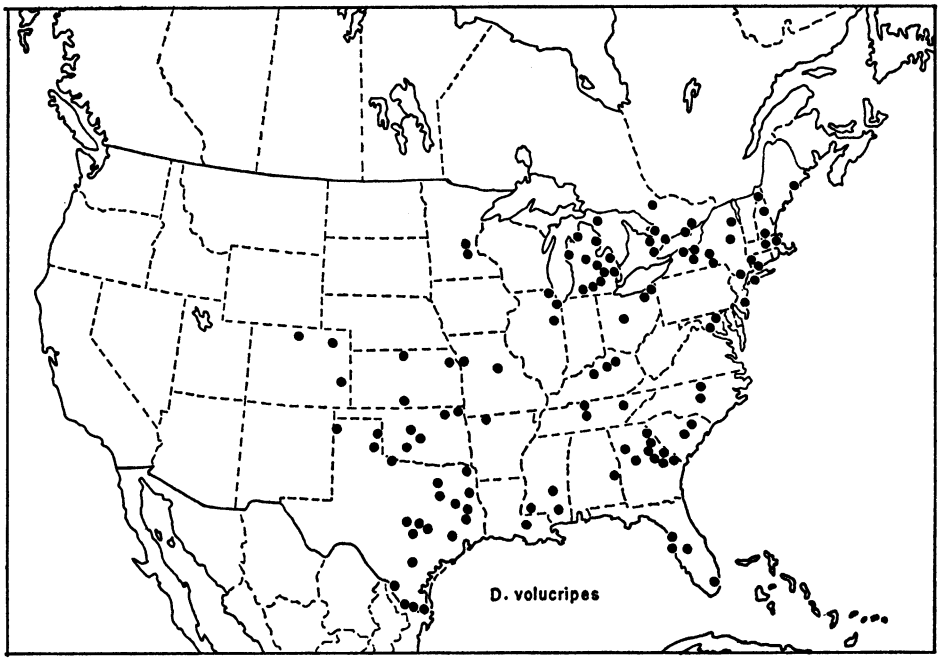


FIG. 21. Distribution of *Dictyna volucripes*.

color of the whole abdomen varies from whitish to yellow or brown and has a variable pattern as follows: dorsum with no more than a basal or a submedian brownish smudge or with a distinct basal mark running back to the center and followed by a series of chevrons; sides plain or with a series of brownish stripes; venter with a dusky smudge around and in front of spinnerets or a distinct dusky stripe from spinnerets to genital groove.

The eyes of the posterior row are slightly recurved and are separated by one and one-third to two full diameters of the median eye. The clypeus is equal in height to one and one-half diameters of the anterior lateral eye in the female and to two full diameters in the male. The male chelicerae are of moderate length and size, the two together being one-third longer than the width. As seen from the sides they are concave, from the front moderately bowed on the sides to leave a long oval opening, and the basal angle is developed into a rounded spur.

The epigynum (pl. 26, fig. 2) presents on the midline just above the genital groove two large suboval atria separated by a thin septum. The conspicuous lateral foveae are wide apart so that their greatest separation exceeds considerably the width of the genital groove and the sternal width in the ratio of about 9/7.

The male palpus (pl. 25, figs. 1, 3) is representative of this group of species. The somewhat broader than long tibia is expanded on the retrolateral side into an apically rounded lobe, and is armed above at the narrowed base with a heavy suberect spur tipped with two black ctenidia. This dorsal spur projects at a right angle from the segment, may be essentially straight or moderately curved, and is equal in length to the basal width of the tibia. The cordate cymbium largely covers the bulb and conductor, so that the latter extends only a short distance beyond the cymbial edge (see pl. 26, fig. 1). The basal element of the conductor is twisted spirally and ends in a wide truncated spur.

TYPE LOCALITY: Blue Hills, Massachusetts, female holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Entire eastern United States and southern Canada, south to Florida and the Gulf states, westward to the Rocky Mountains, and thence southward into Texas and eastern Mexico (see fig. 21). This species is largely replaced in Canada by

coloradensis, in Florida by *volucripoides*, and in the western United States by other species.

SELECTED RECORDS: *Onatario:* Pottageville, York County, June (T. B. Kurata), males and females. *Connecticut:* Norwalk, July, 1933 (W. J. Gertsch), males and females. *Michigan:* Albion, May to October (A. M. Chickering), males and females. *Georgia:* Southeast of Royston, April 30, 1943 (W. Ivie), male and females. *Texas:* Vernon, July 16, 1939 (A. M. and L. I. Davis), males and females. Rio Hondo, December 3, 1954 (Karl W. Haller), males and females. *Nuevo Leon:* Montemorelos, May 23, 1952 (W. J. Gertsch), males and females. Linares, July 8, 1941 (L. I. Davis), males and females.

Dictyna volucripes volucripoides Ivie

Plate 26, figure 8

Dictyna volucripoides IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published), p. 4.

DIAGNOSIS: Female: Total length, 2.5 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.8 mm. long, 1.15 mm wide. Male holotype: Total length, 2 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide.

This population agrees closely with *volucripes* except for its smaller size. The male palpus is smaller and somewhat less robust, and the tibial spur is somewhat shorter and slightly curved forward. It is regarded as a subspecies until more information becomes available on its distribution and relationship to *volucripes*.

TYPE LOCALITY: Gainesville, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Florida.

SELECTED RECORDS: *Florida:* Englewood, April 1, 1936 (W. J. Gertsch), males and females. Orlando, September 3, 1944 (Nirenberg), males and females. Leesburg, March 1–11, 1954 (M. Statham), males and females. High Springs, August 27, 1933 (W. Ivie), male and female.

Dictyna coloradensis Chamberlin

Plate 26, figures 4–7; text figure 22

Dictyna coloradensis CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 241, pl. 14, figs. 7, 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320. BONNET, 1956, Bibliographia Araneorum, vol. 2, pt. 2, p. 1433.

Dictyna arundinaceoides BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509; 1901, Proc.

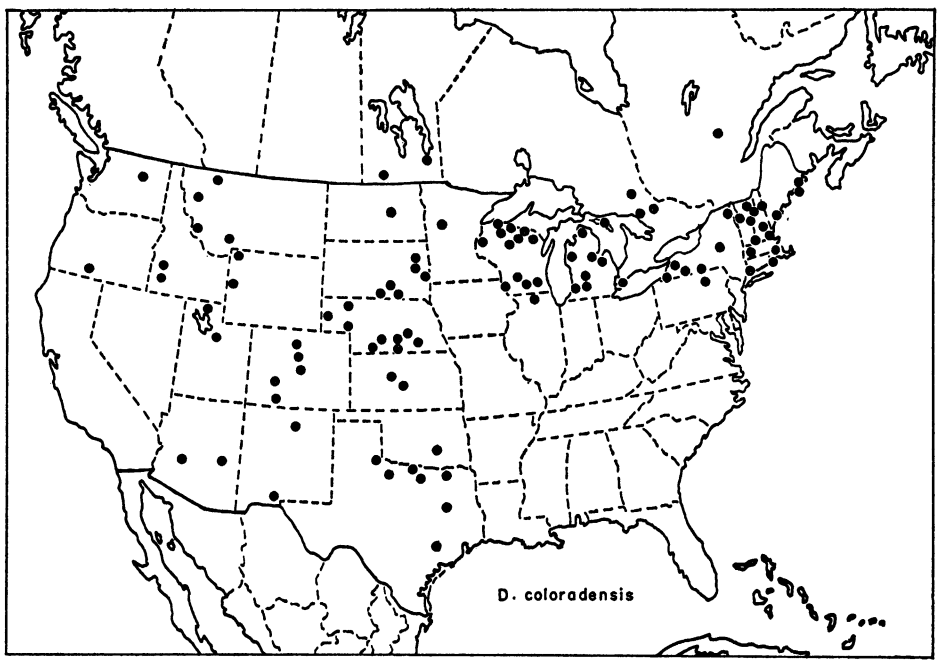


FIG. 22. Distribution of *Dictyna coloradensis*.

Acad. Nat. Sci. Philadelphia, p. 577; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 107. WORLEY AND PICKWELL, 1931, Studies Dept. Zool. Univ. Nebraska, no. 135, vol. 27, nos. 1, 4, p. 11. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. GERTSCH AND JELLISON, 1939, Amer. Mus. Novitates, no. 1032, p. 1. JONES, 1947, Field and Lab., vol. 15, p. 21, figs. 57–61; 1948, Field and Lab., vol. 16, p. 29. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 505, pl. 144, figs. 2141, 2142. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 124 (note under *D. volucripes* Keyserling). For *Dictyna arundinaceoides* Keyserling, see *annulipes* Blackwall.

Dictyna marxi JONES, 1947, Field and Lab., vol. 15, p. 33, figs. 82–85; 1948, Field and Lab., vol. 16, p. 30.

DIAGNOSIS: Female: Total length, 3.8 mm. Carapace, 1.6 mm. long, 1.3 mm. wide. Abdomen, 2.4 mm. long, 1.9 mm. wide. Male: Total length, 3.2 mm. Carapace, 1.5 mm. long, 1.2 mm. wide. Abdomen, 1.9 mm. long, 1.4 mm. wide.

This northern and boreal species is closely allied to *volucripes* but easily differentiated as follows: Both sexes average larger in size, as indicated by the measurements given above for a quite typical pair. The coloration is usually much darker, with the carapace very dark brown to nearly black in northern specimens, and the abdomen is almost always very boldly marked with a black pattern on a yellowish base. The median dark band on the venter is most often well marked and contrasts sharply with the large yellowish side spots that flank it.

The epigynum (pl. 26, fig. 4) is not easy to differentiate from that of *volucripes*. The median atria are usually somewhat larger, and the lateral foveae are slightly more wide apart.

The male palpus (pl. 26, figs. 5–7) is quite distinct in the conductor which flares out widely from the edge of the cymbium, leaving a large open space. The erect tibial apophysis is about as long as the lateral width of the segment.

This species largely replaces *volucripes* in Canada and has been confused with it. Some of the published records attributed to *volucripes* belong here.

TYPE LOCALITIES: Of *coloradensis*, Colorado Springs, Colorado, male type in the Museum of Comparative Zoölogy; of *marxi*, South Newfane, Vermont, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northern United States and Canada, New England, New York, and Great Lakes region, south at least into Pennsylvania in the east, widespread in the Rocky Mountains and adjacent plain states, south into Texas (see fig. 22).

SELECTED RECORDS: *Mackenzie:* Great Slave Lake, August 28, 1944, two females. *Alberta:* Fairview, July 20, 1954 (S. Rounds), male, females. *British Columbia:* Cascade, June 19, 1954 (B. Malkin), male and female. Dawson Creek, July 22, 1954 (S. Rounds), male and female. *Pennsylvania:* Wilawana, June 10, 1940 (R. H. Crandall), male. *Ontario:* Fort Albany, James Bay, July 26, 1939, two males. *Manitoba:* Victoria Beach, July 28, 1931 (T. B. Kurata), three females. Aweme, June 27, 1917, males and females. *Quebec:* Sherbrooke, July 2, 1916 (J. H. Emerton), two females.

Dictyna idahoana Chamberlin and Ivie

Plate 25, figure 10; plate 26, figures 12, 13; text figure 23

Dictyna idahoana CHAMBERLIN AND IVIE, 1933, Bull. Univ. Utah, biol. ser., vol. 2, no. 2, p. 4, pl. 1, figs. 1–3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1440.

DIAGNOSIS: Female: Total length, 3.2 mm. Carapace, 1.2 mm. long, 1.05 mm. wide. Abdomen, 2.2 mm. long, 1.75 mm. wide. Male: Total length, 3.3 mm. Carapace, 1.6 mm. long, 1.1 mm. wide. Abdomen, 1.8 mm. long, 1.35 mm. wide.

This very dark species, with bold pattern on the abdomen, is a close relative of *volucripes*. The carapace is dark reddish brown to black and contrasts sharply with the rows of snow-white hairs on the pars cephalica. The sternum is dark brown to black. The yellowish dorsum of the abdomen has a black pattern consisting of a basal dentate band enlarged behind and a series of chevrons.

The epigynum (pl. 25, fig. 10) is similar to that of *volucripes*, but the oval median atria are proportionately larger and the lateral foveae nearer together, their greatest separation not much exceeding the width of the

genital groove and exceeding the width of the sternum at most by the ratio of 8/7.

The male palpus (pl. 26, figs. 12, 13) closely resembles that of *volucripes* in the shape and size of the bulb and elements, of which the conductor is not noticeably expanded beyond the edge of the cymbium. The tibial spur is of moderate size, curved forward, and distinctly shorter than the lateral width of the segment.

TYPE LOCALITY: Thousand Springs Ranch, near Twin Falls, Idaho, male holotype in the American Museum of Natural History.

DISTRIBUTION: Western mountains from Idaho southward into Arizona, New Mexico, and northern Mexico (Chihuahua). (See fig. 23.)

KNOWN RECORDS: *Idaho:* Wood River, 5 miles north of Shoshone, July 20, 1952 (B. Malkin), males and females. Magic Hot Springs, Twin Falls County, July 20, 1952 (B. Malkin), male and females. Adelaide, May, 1932 (D. E. Fox), males and females. *Utah:* Mount Nebo, July 2, 1942 (G. F. Knowlton), male. Grouse Creek, Raft River Mountains (W. Ivie), one female. *Colorado:* Grand Junction, June 17, 1940 (W. Ivie), males and females. Summit of Cerro Pass, June 19, 1940 (W. Ivie), males and females. Delta, 1930 (R. V. Chamberlin), male. Akron, July 5, 1949 (W. J. and J. W. Gertsch), females. West fork, Wolf Creek, San Juan Mountains, July 20, 1952 (H. Levi), one female. *Arizona:* Forestdale, July 12, 1954 (W. J. Gertsch), many males and females. Cutter, July 12, 1954 (W. J. Gertsch), males. Ashurst, July 12, 1954 (W. J. Gertsch), many males and females. Six miles south of Wide River, July 23, 1950 (M. A. Cazier), two males, female. Cienega, 30 miles northeast of Globe, July 12, 1954 (W. J. Gertsch), males and females. Willcox, July 7, 1954 (W. J. Gertsch), males and females. Ten miles north of Prescott, July 24, 1949 (W. J. and J. W. Gertsch), males and females. Brown Canyon, Baboquivari Mountains, June 8, 1952 (W. J. Gertsch), male. Florida Canyon, Patagonia Mountians, September 6, 1950 (W. J. Gertsch), females. *New Mexico:* Quay County (C. C. Hoff), males and females. *Chihuahua:* Forty-four miles north of Chihuahua, June 13, 1939 (A. M. and L. I. Davis), male.

Dictyna peon, new species

Plate 25, figures 11–13

Dictyna idahoana GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 17.

FEMALE: Total length: 3.35 mm. Carapace, 1.45 mm. long, 1.2 mm. wide. Abdomen, 2.1 mm. long, 1.7 mm. wide.

Carapace very dark brown to blackish, just a little paler on the pars cephalica which bears the usual five bands of snow-white hairs and quite uniform blackish on the pars thoracica. The sternum, labrum, and maxillae dark brown and evenly clothed with white hairs. Coxae and legs yellowish brown, somewhat dusky, plain or with narrow apical rings on the segments of the legs. Base color of abdomen whitish to yellow, reticulated with gray; the dorsal pattern usually boldly marked and consisting of a basal dentate brown or black mark enlarged behind at near the middle, which is followed by a series of dashed chevrons or spots; the sides with many black patches; and the venter with a dusky to black median band from genital groove to spinnerets, flanked by two large white patches.

Structure closely similar to that of *idahoana* and other species of the *volucripes* group. Anterior row of eyes weakly procurved, the median eyes separated by about one and one-half diameters, scarcely the full diameter from the lateral eyes which are larger in the ratio of about 4/3. Posterior eye row slightly recurved, the median eyes separated by about one and one-half diameters, a little farther from the subequal lateral eyes. Median ocular quadrangle broader than long and narrowed in front in the same ratio (10/9). Clypeus equal in height to one and one-half diameters of the anterior lateral eye.

First leg: femur, 1.3 mm.; patella, 0.42 mm.; tibia, 0.97 mm.; metatarsus, 0.9 mm.; and tarsus, 0.5 mm. Tibia and patella of the fourth leg, 1.1 mm.

Epigynum (pl. 25, fig. 12) similar to that of *volucripes*, with the oval median atria quite large and the conspicuous lateral foveae wide apart, the widest separation far exceeding the width of the genital groove and the sternum, the latter by the ratio of 10/7.

MALE: Total length, 2.45 mm. Carapace, 1.25 mm. long, 0.96 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

Coloration and essential structure as in the female. Clypeus sloping forward, equal in height to two full diameters of the anterior lateral eye. Chelicerae long and slender, the basal angle developed into a distinct but small horn, in close agreement with that of *idahoana* and *volucripes*.

First leg: femur, 1.25 mm.; patella, 0.36 mm.; tibia, 1.05 mm.; metatarsus, 0.9 mm.; and tarsus, 0.45 mm. Tibia and patella of the fourth leg, 0.9 mm. long.

Palpus (pl. 25, figs. 11, 13) most similar to that of *volucripes* but distinguished as follows: bulb and elements somewhat smaller, more compact, the apical portion of the conductor less extended beyond the cymbial edge, and the basal spiral of conductor much heavier. Tibial apopyhsis quite similar in shape and length to that of *volucripes* but much longer than that of *idahoana*.

TYPE LOCALITY: Male holotype, female allotype, and paratypes from Rustlers' Park, 8600 feet, Chiricahua Mountains, Arizona, July, 30, 1955 (W. J. Gertsch).

DISTRIBUTION: Mountains of southern Arizona and New Mexico, western Mexico, and southward through the mountains and plateau region of Mexico to Jalisco, Tlaxcala, and Puebla.

SELECTED RECORDS: The following are designated as paratypes: *Arizona:* Garden Canyon, Huachuca Mountains, July 31, 1949 (W. J. and J. W. Gertsch), male and females. Southwestern Research Station, 5 miles west of Portal, August 5–15, 1955 (W. J. Gertsch), males and females. Portal, June 18, 1955 (M. Statham), male and female. *New Mexico:* Lincoln County (C. C. Hoff), one male. *Durango:* Palos Colorados, August 5, 1947 (W. J. Gertsch), many males and females. *Chihuahua:* San Jose Babicora, July 4, 1947 (W. J. Gertsch), many males and females. *Zacatecas:* Laguna Balderama, June 24, 1954 (R. H. Brewer), males and females. *Chihuahua*: Twenty miles west of Matachic, July 7, 1947 (W. J. and J. W. Gertsch). *Sinaloa:* Seventy miles south of Mazatlan, July 24, 1954 (W. J. Gertsch), female. *Jalisco:* Plan de Barrancas, August 4, 1956 (V. Roth, W. J. Gertsch), female. Jalostolitlan, August 3, 1954 (W. J. Gertsch), males. Tepitatlan, August 3, 1954 (W. J. Gertsch), female. *Puebla:* Tehuacan, July 24, 1956 (W. J. Gertsch, V. Roth) female. *Tlaxcala:* Huamantla, July 26, 1956 (V. Roth, W. J. Gertsch), male. *Guerrero:* Eleven miles west of Chilpancingo, July 30, 1956 (W. J. Gertsch, V. Roth), female.

Dictyna saepei Chamberlin and Ivie

Plate 25, figures 4–6

Dictyna saepei CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 6, pl. 1, figs. 5–7. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

DIAGNOSIS: Female: Total length, 3.3 mm. Carapace, 1.25 mm. long, 1 mm. wide. Abdomen, 2.1 mm. long, 1.7 mm. wide. Male holotype: Total length, 2.7 mm. Carapace, 1.2 mm. long, 0.9 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

This is a very dark species which resembles *idahoana* and *peon* in coloration. The abdomen usually has the typical markings confluent to form a quite uniform black stripe from base to apex, has the sides blackish, and the median black stripe on the venter boldly outlined by the whitish patch on each side.

The epigynum is similar to that of *idahoana* (pl. 25, fig. 10). The greatest separation of the lateral foveae about equals the width of the genital groove or the sternum.

The male palpus (pl. 25, figs. 4–6) has a shorter tibial apophysis that that of *idahoana* and related species.

TYPE LOCALITY: Ben Lomond, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: California, Oregon, and Washington.

SELECTED RECORDS: *Washington:* Chelan, June 17, 1954 (B. Malkin), female. *Oregon:* Sucker Creek Canyon, Malheur County, June 15–18, 1951 (B. Malkin), female. Paisley, Lake County, June 28, 1951 (B. Malkin), female. *California:* Grass Lake, Siskiyou County, July 4, 1952 (W. J. Gertsch), males and females. Stevens Creek, Santa Clara County, April 20, 1941 (W. M. Pearce), males and females. Big Tujunga Canyon, San Gabriel Mountains, February, 1955 (R. Schick), males and females. Benton, September 4, 1941 (W. M. Pearce), females.

Dictyna annexa Gertsch and Mulaik

Plate 25, figures 7–9; text figure 23

Dictyna annexa GERTSCH AND MULAIK, 1936,

Amer. Mus. Novitates, no. 851, p. 6, fig. 8. GERTSCH AND DAVIS, 1942, Amer. Mus. Novitates, no. 1158, p. 14. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1426.

Dictyna idahoana GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 331 (not *idahoana* Chamberlin and Ivie).

DIAGNOSIS: Females vary from 2 mm. to 3 mm. and average 2.3 mm. in total length. A typical female: Carapace, 0.95 mm. long, 0.75 mm. wide. Abdomen, 1.5 mm. long, 1.1 mm. wide. Males average 2 mm. in length. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen 1.2 mm. long, 0.75 mm. wide.

This is the smallest species of the *volucripes* group. The orange-brown carapace is paler on the pars cephalica. The sternum is orange-brown and may be dusky on the margins. The yellowish legs usually show traces of darker rings. The abdomen is usually whitish, strongly reticulated with gray, may be plain but is most often boldly marked as follows: dorsum with a basal dentate mark broadened behind and a series of three chevrons or pairs of spots behind; sides of abdomen gray or maculated with dusky; venter with a median dusky stripe from base to spinnerets, flanked by a large snowy white patch on each side.

The male chelicerae are of average length, only slightly concave as seen from the side, slightly bowed apart in front, and have the basal angle weakly developed to a rounded ridge.

The epigynum (pl. 25, fig. 8) is similar to that of *abundans*, but the greatest separation of the lateral foveae slightly exceeds the width of the sternum and is a little less than the width of the genital groove.

The male palpus (pl. 25, figs. 7, 9) is similar to that of *abundans*. The tibial apophysis is longer and slightly curved.

TYPE LOCALITY: Five miles west of Edinburg, Texas, male holotype in the American Museum of Natural History.

DISTRIBUTION: Texas, New Mexico, and adjacent Mexico (see fig. 23).

SELECTED RECORDS: *Texas:* Salt Fork of Red River, north of Wellington, July 16, 1939 (L. I. Davis), male and females. Red Gate, May 1, 1952 (W. J. Gertsch), males and females. *New Mexico:* Albuquerque (C. C. Hoff), male. Sandia Mountains (C. C. Hoff),

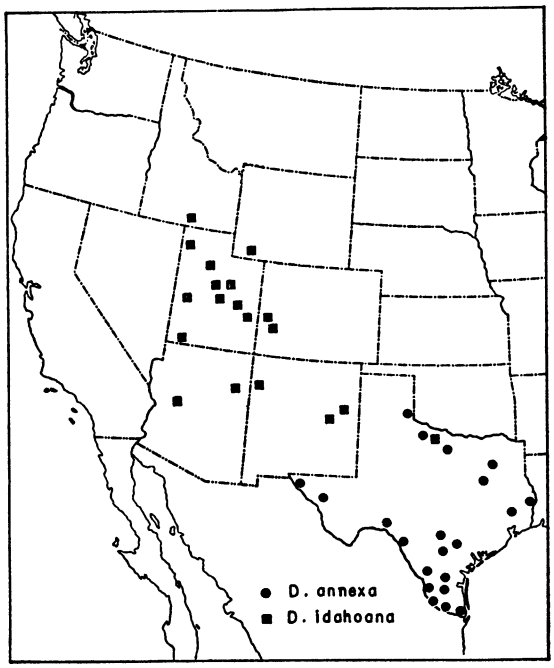


FIG. 23. Distribution of *Dictyna annexa* and *idahoana*.

male and females. *Tamaulipas:* Santa Teresa, May 15, 1952 (W. J. Gertsch), males and females. *Coahuila:* Fifteen miles north of Saltillo, May 24, 1952 (W. J. Gertsch), males and females.

Dictyna abundans Chamberlin and Ivie

Plate 24, figures 8–13

Dictyna abundans CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 7, no. 3, p. 5, pl. 1, figs. 2–4. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318 (not *tucsona*).

DIAGNOSIS: Female: Total length, 3.2 mm. Carapace, 1.3 mm. long, 1 mm. wide. Abdomen, 2.2 mm. long, 1.7 mm. wide. Male holotype: Total length, 3.5 mm. Carapace, 1.6 mm. long, 1.1 mm. wide. Abdomen, 1.7 mm. long, 1.25 mm. wide.

This very pale species is one of the most distinct of the *volucripes* group. The orange to dusky brown carapace is darkest on the pars thoracica and has the rows of white hairs on the head conspicuous. The sternum varies from dusky yellow to nearly uniform black. The legs of the females usually show distinctly narrow dusky rings, but they may be completely absent. The abdomen is usu-

ally white or yellowish and shows only faintly the typical pattern of the group.

The chelicerae of the male are quite long and slender, are similar to those of *saepei* and relatives, but have the basal angle developed very strongly into a quite heavy rounded horn easily visible from above.

The epigynum (pl. 24, figs. 11, 12) presents quite large oval or round median atria separated by a quite narrow septum. The lateral foveae are quite close together, their greatest separation being clearly less than the width of the genital groove or the sternum.

The male palpus (pl. 24, figs. 10, 13) is similar to that of *annexa* and *saepei* but is easily differentiated by the very short tibial spur, which bears the normal two black ctenidia.

TYPE LOCALITY: Four miles southeast of Moapa, Nevada, male holotype in the American Museum of Natural History.

DISTRIBUTION: Utah, Nevada, and southern California, southward into Arizona.

SELECTED RECORDS: *Utah:* Fifteen miles west of St. George, July 22, 1952 (W. J. Gertsch), males and females. Zion National Park, July 4, 1931 (W. J. Gertsch), male. Richfield, May 25, 1930 (W. J. Gertsch), male and females. *Nevada:* Lee Canyon, Charleston Mountains, July 21, 1952 (W. J. Gertsch), males and females. Twenty miles south of Goldfield, July 20, 1952 (W. J. Gertsch), males and females. *Arizona:* Scottsdale, January 16, 1903 (H. Britcher), males and females. *California:* Winterhaven, November 27, 1952 (R. Schick), male and females. Thousand Palms Canyon, Indio Hills, March 20, 1954 (R. Schick), male and females. Near Twentynine Palms, Mohave Desert (J. A. Anderson), male and females.

Dictyna tucsona Chamberlin

Plate 25, figures 1–3

Dictyna tucsona CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8.

Dictyna phoenix CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8, fig. 5.

Dictyna abundans ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318 (part).

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.15 mm. long, 0.95 mm. wide. Abdomen, 2 mm. long, 1.6 mm. wide. Male: Total length, 2.3 mm. Carapace 1.15 mm. long, 0.9 mm. wide. Abdomen, 1.25 mm. long, 0.9 mm. wide.

This is a close relative of *abundans* and agrees with it in some of its color forms. Specimens from hot arid regions are usually colored as follows: carapace golden brown to light chestnut, somewhat dusky on the sides which also show radiating dusky lines; sternum and legs golden yellow to orange, without darker markings; abdomen whitish to golden yellow, reticulated with gray, without dorsal pattern and only faintly indicated dusky band on venter. Specimens from the cooler mountains of eastern Arizona and from the foothills of Sonora and Sinaloa are much darker, have a distinct dark pattern on both dorsum and venter of the abdomen, and may have dark rings on the legs. The strongly marked female type of *Dictyna phoenix* represents one of the color forms of this widely ranging species.

In structure *tucsona* is very similar to *abundans* and *annexa*. The male chelicera has the basal angle only moderately developed into a weak spur scarcely visible from above.

The epigynum (pl. 25, fig. 3) is quite similar to that of *abundans*, but the median atria are a little larger. The lateral foveae are quite close together, so that their greatest separation is less than the width of the genital groove and only slightly more than the sternal width.

The male palpus (pl. 25, figs. 1, 2) closely resembles that of *abundans*, but the dorsal spur on the tibia is clearly longer and directed at a somewhat different angle.

TYPE LOCALITIES: Of *tucsona*, Tucson, Arizona, female holotype in the American Museum of Natural History; of *phoenix*, Phoenix, Arizona, female holotype in the American Museum of Natural History.

KNOWN RECORDS: *Utah:* Kanab, July 9, 1943 (G. F. Knowlton), male. *Arizona:* Coolidge Dam, July 12, 1952 (W. J. Gertsch), males and females. Cutter, July 12, 1954 (W. J. Gertsch), males and females. Tubac, September 26, 1937 (R. H. Crandall), female. Rincon Mountains, September 14, 1940 (R. H. Crandall), female. Gates Canyon, Tucson Mountains, April 14, 1936 (S. C. Bishop), females. Twenty-one miles southwest of Ruby, September 5, 1950 (W. J. Gertsch), female. Portal, August 5, 1955

(W. J. Gertsch), male. Eight miles northeast of Portal, May 18, 1956 (M. Statham), male. Organ Pipe National Monument, June 10, 1952 (W. J. Gertsch), males and females. *New Mexico:* Seven miles southeast of Rodeo, August 5, 1955 (W. J. Gertsch), male and female. *California:* Near Twentynine Palms, August, 1939 (John A. Anderson), male and female. North end of Salton Sea, August 11, 1955 (W. J. Gertsch), male, females. Palm Desert, July 6, 1953 (W. J. and J. W. Gertsch), male and females. *Sonora:* Twenty miles southwest of Sonoyta, June 13, 1952 (W. J. Gertsch), males and females. La Choya, June 12, 1952 (W. J. Gertsch), males and females. Hermosillo, July 18, 1954 (W. J. Gertsch), male. Fifteen miles east of Guaymas, July 18, 1954 (W. J. Gertsch), males and females. Guaymas, July 18, 1954 (W. J. Gertsch), males and females. Ten miles west of Alamos, July 19, 1954 (W. J. Gertsch), males and females. Thirteen miles south of El Carrizo, July 21, 1954 (W. J. Gertsch), female. *Sinaloa:* Five miles south of Mazatlan, July 23, 1954 (W. J. Gertsch), males and females. *Baja California:* San Felipe, June 16, 1952 (W. J. Gertsch), males and females. Seven miles southeast of Mexicali, June 15, 1952 (W. J. Gertsch), two females. El Major, June 15, 1952 (W. J. Gertsch), males and females.

The *personata* Group

In this group are included a number of small species with quite remarkably modified palpi. In the typical ones the embolus originates at the caudal edge of the tegulum as a thick bar and then gradually is thinned to the apex. The cymbium is quite shallow and narrow and is far exceeded by the enlarged bulbal elements. Two atypical species assigned to this group are *Dictyna sylvania* and *dauna*. In both of these the embolus arises much higher up on the tegulum, and the bulbal elements are less developed. The embolus of *sylvania* (pl. 26, fig. 17) has a small fold in the apical third. It is quite possible that this whole series belongs in the section *Emblyna* in spite of the virtually unmodified embolus. The male chelicerae are slender, curved, and bowed apart to leave an oval or fusiform opening. In *secuta* (pl. 27 figs. 4, 6) the basal angle is produced into a sharp horn, and in *personata* the chelicerae have an angled spur halfway down on the outer side.

The typical members of this group occur in the western United States. The two species of doubtful relationship (*dauna* and *sylvania*) come from southern Florida and the southeastern part of the United States, respectively.

Dictyna personata Gertsch and Mulaik

Plate 28, figures 1–4

Dictyna personata Gertsch and Mulaik, 1936, Amer. Mus. Novitates, no. 851, p. 9, fig. 3; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 329, figs. 20, 21. Gertsch, 1946, Amer. Mus. Novitates, no. 1319, p. 15. Roewer, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323. Bonnet, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1447.

Tosyna pior Chamberlin, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 16.

Diagnosis: Female holotype: Total length, 2 mm. Carapace, 0.75 mm. long, 0.55 mm. wide. Abdomen, 1.4 mm. long, 0.8 mm. wide. Male: Total length, 2.4 mm. Carapace, 1 mm. long, 0.75 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

The pale yellowish carapace has the pars cephalica more or less heavily marked with brownish radiating bands and a distinct narrow black marginal seam. The pale yellowish sternum is contrastingly marked with a distinct, narrow, marginal seam. The dull yellow legs are faintly to distinctly marked with narrow, incomplete, dusky rings at the middle of the femora and at the base and distal end of the tibiae. The whitish abdomen is reticulated with gray lines and presents above a basal, notched, black stripe and behind a row of three pairs of irregular black spots. The venter is mostly whitish, but there are two black dashes on each side of the cribellum and spinnerets. The abdomen in some males has a distinctly speckled appearance, or the markings may be nearly obliterated.

The structure in both sexes is quite typical, with the convex carapace of average height. The eyes of the front row are gently procurved as viewed from in front, essentially straight, with the slightly smaller median eyes separated by one-third of their diameter and scarcely as far from the lateral eyes. The posterior eye row is weakly recurved, and the

subequal eyes are separated by two-thirds or somewhat more of the diameter. The median ocular quadrangle is as broad as long and narrowed in front in the ratio of 3/4. The clypeus is slightly higher than the diameter of an anterior median eye in the female but nearly two full diameters in the male. The male chelicerae are elongate, have a weakly developed horn or angle at the base on the outer side, are moderately bowed to form a central fusiform opening, and have a distinct angled spur halfway down the outer side.

The epigynum (pl. 28, fig. 2) has the median atria quite wide apart and the narrow lateral foveae separated by the width of the sternum.

The male palpus (pl. 28, figs. 1, 3, 4) is quite remarkably modified. The thin tibia bears at the base on the outer side a small spur tipped with two black ctenidia. The thin cymbium is a shallow, sagittate cup which covers only half of the bulbal elements. The embolus is very heavy at the base, traces a wide oval, and becomes hidden in the conspicuous conductor (pl. 28, fig. 3) in the resting position. The course of the freed distal portion of the embolus is illustrated in plate 28, figure 4.

TYPE LOCALITIES: Of *Dictyna personata*, 30 miles southeast of Laredo, Texas, female holotype in the American Museum of Natural History; of *Tosyna pior*, near Marble Canyon, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States from California and Utah southward into Texas and Chihuahua.

KNOWN RECORDS: *California:* MacDoel, Siskiyou County, July 4, 1952 (W. J. Gertsch), male. *Nevada:* Las Vegas, 1954 (D. J. Zinn), male. *Utah:* Two miles east of Glenwood, June 30, 1940 (W. J. Gertsch), male. Hurricane, February 25, 1939 (W. Ivie), female. *Utah:* East Canyon, near Salt Lake City, July 12, 1943 (W. Ivie), male. *Arizona:* Tempe, March 10, 1950 (M. H. Frost), male, in house. *New Mexico:* Northwest of Bernalillo (C. C. Hoff), female. *Texas:* Llano, July 9, 1936 (L. I. Davis), male and female. Edinburg, September 10, 1940 (S. and D. Mulaik), female. Thirty miles southeast of Laredo, August 4, 1935 (S. Mulaik), female holotype of *personata*. *Chihuahua:* Matachic, July 10, 1947 (W. J. Gertsch), male.

Dictyna sierra Chamberlin

Plate 28, figures 5–7

Dictyna sierra CHAMBERLIN, 1940, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8, fig. 16. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325.

DIAGNOSIS: Female: Total length, 1.8 mm. Carapace, 0.65 mm. long, 0.5 mm. wide. Abdomen, 1.2 mm. long, 0.9 mm. wide. Male holotype: Total length, 1.75 mm. Carapace, 0.8 mm. long, 0.63 mm. wide. Abdomen, 1.1 mm. long, 0.75 mm. wide.

This very dark species is closely related to *Dictyna personata*. The dark chestnut brown carapace is marked with black radiating lines on the pars thoracica and has a narrow black seam on the sides. The sternum, labium, and maxillae are blackish. The yellow legs have broad and conspicuous black rings, two each on the femora, tibiae, and metatarsi. The venter of the abdomen is dusky yellow, but the sides and dorsum are blackish, with a yellowish pattern above which consists of a basal mark and a series of chevrons.

The posterior eye row is slightly recurved and the subequidistantly spaced eyes are separated by two-thirds of the diameter in the female, by nearly the full diameter in the male. The chelicerae of the male are long and rather slender, with the side curvature moderate, to form a median open area of fusiform outline. The basal horn is a weak rounded angle, and there is no angle at the middle of the chelicera as in *personata*.

The epigynum (pl. 28, fig. 6) has the median atria separated by a short septum, and the lateral foveae are separated by about the width of the sternum.

The male palpus (pl. 28, figs. 5, 7) is similar to that of *personata*, but the cymbium is proportionately larger, and the bulbal elements are less strongly developed. The embolus originates at a point on the prolateral side.

TYPE LOCALITY: Peavine, Sierra County, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: Oregon and northern California.

KNOWN RECORDS: *Oregon:* Steens Moun-

tains, 8000 feet, June 22–26, 1951 (B. Malkin), female. Frenchglen, June 26, 1951 (B. Malkin), female. *California:* Peavine, Sierra County, June 10, 1940 (W. M. Pearce), male holotype.

Dictyna pictella, new species

Plate 28, figure 9

FEMALE: Total length, 1.55 mm. Carapace, 0.65 mm. long, 0.55 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide. Total length of the female paratype, 1.9 mm.

Carapace dark dusky brown, with the usual dark radiations faintly indicated and the side margins with a narrow black seam. Sternum dusky brown. Legs yellowish brown, marked with blackish rings partially incomplete above. Abdomen blackish, with a median pale band on the dorsum enclosing a dentated dark basal band and chevrons behind, the venter quite uniform gray.

Structure in close agreement with that of *sierra*. Posterior eye row weakly recurved, the large round median eyes separated by their diameter, as far from the subequal lateral eyes. Pars cephalica typically elevated, and the clypeus equal in height to scarcely more than the full diameter of the anterior median eye.

Epigynum (pl. 28, fig. 9) presenting the quite large oval atria farther forward than in *sierra*, separated by a rather narrow septum, and lateral foveae separated by about the width of the sternum.

TYPE LOCALITY: Female holotype from Pintura, Utah, April 15, 1932 (W. Ivie).

OTHER LOCALITY: *Utah:* Scipio, May 25, 1947 (D. E. Beck), female paratype.

This tiny species agrees closely in size and appearance with female specimens from Oregon assigned to *sierra*. In *pictella* the carapace is uniform brown, instead of having the cephalon yellow, and the pale pattern on the abdomen is very distinct.

Dictyna secuta Chamberlin

Plate 27, figures 1–6

Dictyna secuta CHAMBERLIN, 1924, Proc. California Acad. Sci., ser. 4, vol. 12, p. 583, fig. 10. GERTSCH AND DAVIS, 1942, Amer. Mus. Novitates, no. 1158, p. 16, fig. 37. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317.

Dictyna bishopi GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 328, figs. 30, 32.

DIAGNOSIS: Female holotype: Total length, 1.57 mm. Carapace, 0.65 mm. long, 0.52 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide. Male: Total length, 1.65 mm. Carapace, 0.85 mm. long, 0.6 mm. wide. Abdomen, 0.9 mm. long, 0.65 mm. wide.

This small species (pl. 27, fig. 5) exhibits the usual considerable variation in base color and pattern. The bright yellow carapace of specimens from arid regions has a distinct narrow black seam on the side margins and a variable amount of duskiness on the sides of the pars cephalica. The clear yellow sternum has a distinct dusky border. The pale yellow legs are marked with very inconspicuous dusky rings on the distal ends of the tibiae and metatarsi. The white to bright yellow abdomen may be immaculate but more often presents above a series of small black spots, consisting of a basal mark and a series of black spots in the caudal half. The venter of the abdomen is mostly whitish, but a dusky patch lies in front of and encloses the spinnerets, and there are sometimes dusky dashes on each side near the apex of the abdomen. A male from Guaymas, Sonora, and three specimens from Yermo, California, are smaller than usual and have the abdomen unmarked milky white. Specimens from the hills of San Diego County, California, have the basic black pattern suffused with dusky brown.

The posterior eye row is recurved, and the equal eyes are separated by three-fourths to the full diameter. The pars cephalica of the male is prominent, equaling, in the specimen from San Diego County, two-thirds of the total length of the carapace, and projects far forward. The chelicerae (pl. 27, figs. 4, 6) are long, quite slender, are strongly curved in lateral view, and are bowed on the sides, to leave a fusiform opening equal to the width of the chelicera. The horn at the base of the chelicera is a conspicuous triangular spur.

The epigynum (pl. 27, fig. 2) presents the small median atria close together on the midline, where two rounded black receptacles are usually clearly visible through the integument, and well-separated lateral foveae.

The male palpus (pl. 27, figs. 1, 3) is similar to that of *personata* and that of *sierra*.

The embolus is thick at its origin on the prolateral side of the bulb, where it makes a sharp loop turned downward and then continues around the bulb to lie hidden in the conductor, and forms a flat, blade-like spine at the apical end. The short dorsal spur of the tibia is basal in position and bears the two ctenidia at the apex.

TYPE LOCALITIES: Of *secuta*, San Esteban Island, Gulf of California, Mexico, male holotype in the California Academy of Sciences; of *bishopi*, Hot Springs, Brewster County, Texas, female holotype in the American Museum of Natural History.

DISTRIBUTION: Southwestern United States from western Texas to California and adjacent Mexico.

KNOWN RECORDS: *California:* Palm Canyon, San Jacinto Mountains, October 5, 1952, female. Thousand Palms Canyon, Indio Hills, March 20, 1954, four females. Four miles east of Yermo, July 10, 1939 (W. M. Pearce), male, two females. Guatay, San Diego County, July 9, 1955 (W. J. and J. W. Gertsch), male, 15 females. Highway from San Francisco to Santa Cruz, July 1, 1948 (H. L. Shantz), male. Saratoga Springs, Death Valley, April 23, 1955 (R. Schick), female. Furnace Creek, Death Valley, March 23, 1941 (W. Ivie), female. Cow Creek, Funeral Mountains, April 25, 1955 (R. Schick), male. *Baja California:* San Esteban Island, April 19, 1921 (J. C. Chamberlin), male holotype of *secuta* from under loose scaling of mesquite tree. *Sonora:* Guaymas, June 16, 1939 (L. I. Davis), female. Fifteen miles east of Guaymas, July 18, 1954 (W. J. Gertsch), two males. *Texas:* Hot Springs, June 7–10, 1938 (D. and S. Mulaik), female holotype of *bishopi*. El Paso, June 23, 1947 (W. J. Gertsch), one penultimate male. *Arizona:* Cottonia, male. *Utah:* St. George, July, 1930 (E. W. Davis), male.

Dictyna saltona, new species

Plate 27, figures 7–9

FEMALE: Total length, 1.73 mm. Carapace, 0.73 mm. long, 0.53 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide. Male: Total length, 1.6 mm. Carapace, 0.85 mm. long, 0.6 mm. wide. Abdomen, 0.9 mm. long, 0.65 mm. wide.

Coloration in very close agreement with that of bright examples of *secuta*. Carapace yellow in the female, with the sides of the pars cephalica dusky and the margins of the pars thoracica with a narrow black seam. Pars cephalica of the male suffused with dusky brown. Sternum clear yellow in the female, with a faint dusky margin, orange in the male, with a distinct blackish border. Abdomen whitish, reticulated with gray, the dorsum with a thin basal line enlarged behind and three pairs of small black points in caudal half, the venter with three black dashes on each side of the grayish spinneret area and two on each side near the base of the abdomen.

Structure in close agreement with that of *secuta*. Posterior eye row slightly recurved, the median eyes separated by three-fourths of the diameter. Male chelicerae not much curved laterally and shorter than in *secuta*, the two of them taken together not much longer than the width. Basal horns of chelicera distinct short spurs. Sides of chelicerae bowed to form an oval opening.

Epigynum (pl. 27, fig. 9) similar to that of *secuta*, but the internal receptacles are much larger.

Male palpus (pl. 27, figs. 7, 8) similar to that of *secuta* but distinct as follows: embolus forming a broad loop at point of origin on prolateral side; cymbium subtriangular, expansive enough to cover the bulbal parts and the conductor; and basal process of conductor a broad transverse fold, beneath which the apical portion is hidden.

TYPE LOCALITY: Male holotype and female allotype from the north end of Salton Sea, Imperial County, California, August 11, 1955 (W. J. Gertsch).

Dictyna sylvania Chamberlin and Ivie

Plate 26, figures 9–11

Dictyna sylvania CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 122, figs. 173–174. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325.

DIAGNOSIS: Male holotype: Total length, 1.55 mm. Carapace, 0.8 mm. long, 0.59 mm. wide. Abdomen, 0.8 mm. long, 0.6 mm. wide.

The orange-brown carapace is marked with dusky shading on the pars cephalica and has a wide, V-shaped maculation on the back of the head more conspicuous than the other markings. The yellowish sternum is shaded

with dusky. The whitish legs are somewhat dusky but do not have contrasting markings. The orange-brown abdomen has a faint lighter pattern above, consisting of indistinct chevrons, and is gray below.

This eastern species seems to be allied to the series grouped around *personata*, and only the male is known. The head is moderately arched behind the eyes, and the subvertical clypeus equals about two diameters of an anterior median eye. The posterior eye row is slightly procurved, and the equal eyes are separated by about three-fourths of the full diameter. The male chelicerae are of moderate length, and the basal horn is indistinct, developed to a rounded angle. In side view the chelicerae are moderately bent and in frontal view are bowed to form a fusiform opening.

The palpus (pl. 26, figs. 9–11) is similar to that of the *personata* group. The embolus originates on the prolateral side, is relatively heavy, and forms an oval loop to the conductor. The apical half of the conductor (pl. 26, fig. 11) presents a slight enlargement near the middle which is not easy to see. The short dorsal spur on the tibia lies at the base of the segment, and the two ctenidia are distinct.

TYPE LOCALITY: One mile north of Sylvania, Georgia, male holotype in the American Museum of Natural History.

DISTRIBUTION: North Carolina, Georgia, and Texas.

KNOWN RECORDS: *North Carolina:* Lake Woccomow, April 10, 1929 (S. C. Bishop), male. *Georgia:* One mile north of Sylvania, April 7, 1943 (W. Ivie), male holotype. *Texas:* Six Mile Creek, Carthage, May 9, 1952 (W. J. Gertsch), male.

Dictyna dauna, new species

Plate 27, figures 10–13; plate 28, figure 8

FEMALE: Total length, 1.65 mm. Carapace, 0.77 mm. long, 0.55 mm. wide. Abdomen, 1.15 mm. long, 0.8 mm. wide.

Dorsal aspect of female as illustrated in plate 28, figure 8. Carapace dull yellowish, with a series of black dashes margining the pars cephalica and on the sides of the pars thoracica. Sternum and maxillae yellowish; the labium somewhat dusky. Chelicera dull yellowish, with a basal black patch. Legs pale yellow, with distinct narrow black rings at ends of tibiae and metatarsi and a broken ring on the patellae, consisting largely of a patch on each side of the segment. Abdomen dull to snowy white, reticulated with gray, the venter plain, but the dorsum with a series of small spots as follows: one at base, one just below each shoulder, and two or three pairs behind.

Carapace rather low and convex, the clypeus equaling only about three-fourths of the diameter of the median eye. Anterior row of eyes essentially straight, the dark median eyes separated by about two-thirds of their diameter, only about half as far from the clearly larger lateral eyes. Posterior eye row moderately recurved, the median eyes separated by the long diameter, as far from the equal lateral eyes. Median ocular quadrangle broader than long (20/16), narrowed in front in about the same ratio.

Epigynum (pl. 27, fig. 12) with two very large, shallow, suboval atria, at the inner edge of which are the small atriobursal orifices. Lateral foveae with distinct carinae on each side continuous with the margin of the atria.

MALE: Total length, 1.85 mm. Carapace, 0.83 mm. long, 0.63 mm. wide. Abdomen, 1.05 mm. long, 0.75 mm. wide.

Coloration essentially as in the female, but the carapace is without conspicuous black dashes, only dusky on the pars cephalica with faint radiating lines, and the abdomen lacks all marks but a small black spot at the base and a pair near the apex.

Structure normal, with the pars cephalica of moderate elevation, the clypeus equaling the full diameter of the anterior lateral eye. Chelicerae only slightly bowed apart to leave a fusiform opening and with scarcely any rounded angle at the base. Legs of normal length, the tibia and patella of the first together, 0.95 mm. long.

Male palpus as illustrated in plate 27, figures 10, 11, and 13. Tibial apophysis a small dorsal spur on retrolateral side, which bears the large ctenidia. Embolus a thin spine originating at about the middle of the bulb, evenly curved around the margin and lost in the groove of the conductor.

TYPE LOCALITY: Male holotype and female allotype from Kendall, Florida, February 19, 1951 (A. M. Nadler).

DISTRIBUTION: Southern Florida and Bimini, Bahama Islands.

KNOWN RECORDS: *Florida:* Kendall, November to January (A. M. Nadler), several females and immatures. *Bahama Islands:* South Bimini, December, 1952, male and five females; March 22, 1953 (A. M. Nadler), two males.

UNKNOWN OR UNCERTAIN SPECIES

Dictyna foliata Keyserling

Dictyna foliata KEYSERLING, 1882, Verhandl. Zool. Bot. Gesell. Wien, vol. 32, p. 216. MARX, 1890, Proc. U. S. Natl. Mus., vol. 12, p. 509.

It seems quite improbable that this name can properly be assigned as a synonym of *Dictyna sublata* Hentz, where it has been placed for many years. Until the type or other authentic specimens are available for study, the species must remain doubtful even as to group position.

TYPE LOCALITY: Colorado; female type presumably in the Vienna Natural History Museum.

Dictyna querida Chamberlin and Ivie

Dictyna querida CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 120. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

This species is based on an immature specimen. Whereas it seems quite distinct in coloration and general appearance from other known species, its placement even to group is uncertain.

TYPE LOCALITY: Three miles southeast of Savannah, Georgia, immature holotype taken April 4, 1943, by Wilton Ivie, in the American Museum of Natural History.

SECTION **EMBLYNA** CHAMBERLIN

The thick, distally modified embolus of *Emblyna* is presumed to be derived from the simpler one of *Dictyna*. In this large group of more than 60 species, specialization is largely centered on the embolus, which takes many singular forms and is distinctively modified according to the species group. The palpus is otherwise of quite stereotyped design, with the patella normal in size and the tibia bearing a short spur, tipped with the usual pair of ctenidia, at the base of the segment on the dorsal surface. The epigyna of the females have large median atria, but the lateral foveae are comparatively close together. It has been possible to divide this series into four groups on the basis of the embolus and the form of the male chelicerae. As is true of *Dictyna*, these groups are of unequal importance, are used merely as a convenience to subdivide the large assemblage, and are based only on the males.

KEY TO THE GROUPS OF THE SECTION *Emblyna*

1. Chelicerae relatively stout, typically flat in front, more or less strongly angled on the sides, with the carinate margins of the central opening produced into subapical opposing teeth (see pl. 42, fig. 10) . . . . . *borealis* group
   Chelicerae more slender, concavely curved in front, moderately bowed apart to form a simple fusiform or oval opening without opposing teeth 2
2. Tibial apophysis of medium length, about equal to the basal width of the segment . . . . . *roscida* group
   Tibial apophysis much shorter, at most a weak spur one-half of the basal width 3
3. Embolus originating near the base of the tegulum . . . . . *sublata* group
   Embolus originating at or above the middle of the tegulum . . . . . *annulipes* group

THE *roscida* GROUP

The greater development of the tibial apophysis of the male palpus, which is nearly equal to the basal width of the segment, distinguishes this small group from all other members of the section. The whole palpus is quite slender, and the bulbal parts are of modest dimensions. The rather slender embolus arises near the middle of the tegulum, forms a regular spiral, and is only moderately flattened and enlarged apically to end as a truncated bar. The epigyna present small oval atria rather close together and typical lateral foveae of average separation.

Dictyna roscida Hentz

Plate 29, figures 8–12; text figure 24

Theridion roscidum HENTZ, 1850, Jour. Boston Soc. Nat. Hist., vol. 6, pl. 9, figs. 15, 16; 1875, Occas. Papers Boston Soc. Nat. Hist., vol. 2, p. 149, pl. 16, figs. 15, 16.

Dictyna rubra EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 448, pl. 9, fig. 7. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510. BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510; 1910, Bull. U. S. Natl. Mus., no. 72,

p. 17. BRYANT, 1908, Occas. Papers Boston Soc, Nat. Hist., vol. 7, pt. 9, p. 4. PETRUNKEVITCH. 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 110. BARROWS, 1918, Ohio Jour. Sci., vol. 18, no. 8, p. 302. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 328. BRITCHER, 1903, Proc. Onondaga Acad. Sci., vol. 1, p. 2.

Dictyna roscida CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 120. KASTON, 1945, Amer. Mus. Novitates, no. 1292, p. 2 (part; not *florens*); 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 508, pl. 102, figs. 1902–1903, pl. 104, figs. 1930–1941. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1317.

Dictyna borealis KEYSERLING, 1887, Verhandl. Zool. Bot. Gesell. Wien, vol. 37, p. 473, pl. 6, fig. 34 (not *Dictyna borealis* O. P.-Cambridge, 1872).

Dictyna keyserlingii MARX, 1891, Proc. Ent. Soc. Washington, vol. 2, p. 190 (new name for *D. borealis* Keyserling). CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 15.

Dictyna keyserlingi BANKS, 1919, Bull. U. S. Natl. Mus., no. 72, p. 17 (new name for *D. borealis* Keyserling). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 110.

Dictyna florens GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 17. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 328.

DIAGNOSIS: Females vary from 1.5 mm. to 3 mm. and average about 2.25 mm. in length. A typical female: Carapace, 0.85 mm. long, 0.7 mm. wide. Abdomen, 1.5 mm. long, 1.15 mm. wide. Males vary from 1.5 mm. to 2.5 mm. A typical male: Total length, 2.2 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.3 mm. long, 0.9 mm. wide.

This handsome species varies from pink to bright red in general color tone. The carapace is usually light to dark orange-brown and is darkened somewhat on the pars thoracica which shows the usual dusky radiating lines. The sternum is clear yellow to orange-brown. The abdomen is whitish in some specimens and has the sides of the dorsum pink, leaving a wide, median, white band. Most specimens have the abdomen pinkish to purplish brown on the sides, present on the dorsum a distinct white or yellow stripe which may be variously toothed on the margins or divided into a series of distinct marks, and have the venter mostly pale. Northern specimens, to which

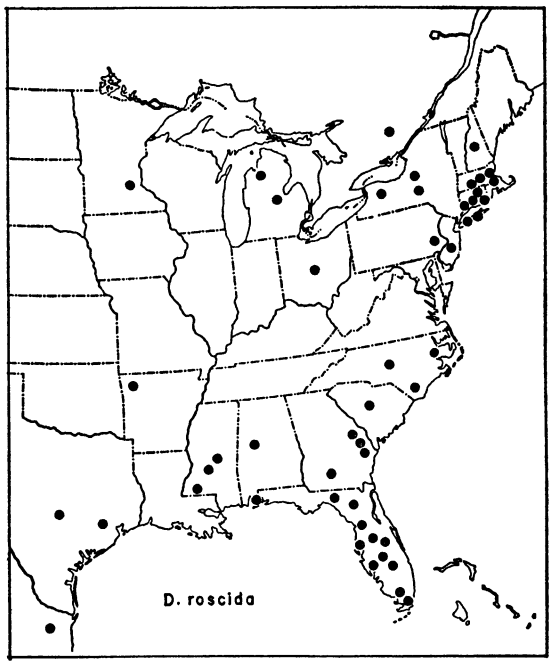


FIG. 24. Distribution of *Dictyna roscida*.

Emerton very appropriately gave the name *rubra*, are larger, have the abdomen quite bright red, and most often show a quite indistinct median band on the dorsum. Specimens from Florida (pl. 29, fig. 12) are much smaller and have the plain dorsal stripe of the abdomen bright yellow.

The carapace is of medium height as reflected in the height of the clypeus which in the female is the full diameter of the anterior median eye and in the male about one and one-half diameters. The posterior eyes lie in a slightly recurved row, with the median eyes separated by the full diameter or slightly more. The male chelicerae are of moderate length, the two together being as broad as long, are only slightly concave as seen from the side, are moderately bowed in front to leave a long fusiform opening, and have the basal angle a rounded spur or in large specimens a distinct conical horn directed ventrad.

The epigynum (pl. 29, fig. 8) presents the suboval median atria separated by a narrow to medium septum and has the distinct lateral foveae separated by the width of the genital groove or slightly more than the sternal width.

The male palpus (pl. 29, figs. 9–11) is of

moderate size and has the bulbal elements mostly contained within the cymbial width. The moderately thick embolus originates at the middle of the tegulum on the prolateral side, forms a regular oval, and terminates in a quite narrow, apically truncated bar. The basal element of the conductor is moderately twisted apically to form a hook. The dorsal tibial apophysis, which is tipped apically by two small ctenidia, is not fully as long as the width of the segment, is directed somewhat caudad, and forms an obtuse angle with the long axis of the segment.

TYPE LOCALITIES: Of *Theridion roscidum* Hentz, Alabama, the original material lost, but a neotype female from 2 miles east of Sylvania, Georgia, is in the American Museum of Natural History; of *Dictyna rubra* Emerton, New Haven, Connecticut, male type in the Museum of Comparative Zoölogy; of *Dictyna borealis* Keyserling, Sitka, Alaska, male lectotype in the United States National Museum.

The type locality for *Dictyna borealis* Keyserling, which was based on a Marx specimen, is quite likely spurious. The species has never been recorded from western Canada or even the western United States.

DISTRIBUTION: Eastern United States and Canada from Ontario (near Ottawa) south into Florida, westward to Minnesota, and south into Texas, eastern Mexico (Tamaulipas), and Honduras (see fig. 24).

SELECTED RECORDS: *Ontario:* Mer Bleu (east of Ottawa), June 4, 1931 (T. Kurata), one male. *Minnesota:* Minneapolis, June 1, 1931 (W. J. Gertsch), male, female (immature). *New Hampshire:* Moosilauke, July 4, 1913 (Emerton), two males. *New York:* Riverhead, Long Island, May 1, 1946 (R. Latham), two males, one female. *Georgia:* East of Sylvania, April 17, 1943 (W. Ivie), two males, four females. *Florida:* Near Sebring, March 24, 1938 (W. J. Gertsch), one female. West of Arcadia, March 31, 1938 (W. J. Gertsch), two males. Naples, January 18, 1946 (S. Rounds), one female. Near Trilby, April 8, 1938 (W. J. Gertsch), two females. Royal Palm Station, February 14, 1951 (A. M. Nadler), female. *Alabama:* Tuscaloosa (A. F. Archer), males, females. *Louisiana:* Mansura, January 27, 1909 (Rosenfeld), one female. *Texas:* Zilker Park, Austin, October 26, 1947 (D. L. and H. E. Frizzell), males, females. Houston, June 11, 1937 (D. and S. Mulaik), one female. *Tamaulipas:* Victoria, June 12, 1936 (L. I. Davis), female. Six miles east of Villa Juarez, June 7, 1941 (L. I. Davis), female. *Honduras:* La Ceiba, October 22, 1916 (F. Dyer), female.

Dictyna florens Ivie and Barrows

Plate 29, figures 1–7

Dictyna florens IVIE AND BARROWS, 1935, Bull. Univ. Utah, biol. ser., vol. 3, no. 2, pt. 1, figs. 1–5. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1316. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1437.

DIAGNOSIS: Female: Total length, 2.3 mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.6 mm. long, 1.2 mm. wide. Male: Total length, 1.9 mm. Carapace, 0.94 mm. long, 0.7 mm. wide. Abdomen, 1 mm. long, 0.8 mm. wide.

This distinct species is a close ally of *roscida*, from which it is separable readily by genitalic features but which it often resembles closely in coloration. The dorsal view of the female allotype is shown in plate 29, figure 7. The yellowish to bright reddish brown carapace has the usual dusky markings on the pars cephalica. The sternum is clear yellow to orange-brown, and the similarly colored legs lack darker markings. The abdomen is quite typically illustrated in plate 29, figure 7, and varies from pink to very dark red or purple-brown. The pattern in males may be quite similar, but often the median stripe on the dorsum is narrower or quite indistinct, essentially as in *roscida*.

The structure is very similar in both sexes to that of *roscida* except as follows: the carapace is somewhat narrower, and the male chelicerae (pl. 29, fig. 4) are slightly less bowed and have the lateral angle a weak rounded or conical spur. The proportions of the male are as illustrated in plate 29, figures 2 and 4.

The epigynum (pl. 29, fig. 6) is very similar to that of *roscida* but typically has a somewhat broader septum between the suboval median atria. The lateral foveae are moderately separated to a distance distinctly less than the width of the genital groove or the sternum.

The male palpus (pl. 29, figs. 1, 3, 5) differs

from that of *roscida* principally in the form and lateral direction of the tibial apophysis, which forms a right angle with the dorsal margin of the tibia.

TYPE LOCALITY: Fort Myers, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from Florida. Records from Texas and Tamaulipas by Gertsch and Mulaik, 1940, and Gertsch and Davis, 1937, are now referred to *roscida*.

SELECTED RECORDS: *Florida:* Highland Hammock, March 24, 1938 (W. J. Gertsch), male, two females. Punta Gorda, January 1–16, 1946 (S. Rounds), male. Tavernier, November 29, 1952 (A. M. Nadler), female. Three miles south of Lake Istokpoga, February 28, 1951 (A. M. Nadler), females. Naples, January 27 to February 6, 1946 (S. Rounds), male. Arcadia, March 31, 1938 (W. J. Gertsch), females. Lake Placid, February 22, 1951 (A. M. Nadler), males, females.

THE *annulipes* GROUP

To this quite heterogeneous group are assigned the remaining species of the *Emblyna* complex, in which the chelicerae are of the conventional type shown for *sublata*. The embolus originates at or above the middle of the tegulum and at this point is always a thick bar. In some of the species (*annulipes* and *phylax*) the embolus is modified apically much as in the *sublata* group, and these species are intermediate to the other series, which is divided on an arbitrary basis. The remaining species have somewhat thinner emboli, but they are modified in interesting and distinctive fashion. Some of the atypical and unusual features of this series are the following: The embolus of *cruciata* is twisted and angled and bears no accessory elements in spite of its location in this section. In the closely related *coweta* the embolus terminates in two lateral spines and a central curl. In the western *ardea* the femur of the palpus is widely lobed, and the basal spiral of the conductor is curiously formed. The tibia of *angulata* bears a conspicuous apical lobe, and the embolus is a great flat spatula. The tibial apophysis is always a small spur on the dorsal surface near the base. The epigyna are of quite conventional form, with relatively small median atria and lateral foveae of moderate separation.

Members of this large group occur all over North America. The nominate species (*annulipes*) is abundant in the northern United States and adjacent Canada and also occurs in the northern portions of the Palearctic region. Several minor series have distinctive distributions. The species *uintana* and its congeners *peragrata*, *chitina*, *crocana*, and *francisca* are typical of the western states, particularly the mountainous areas. A related series (*evicta*, *capens*, and *decaprini*) is eastern. The *stulta* series of small brown species (including *callida*, *melva*, *scotta*, *ardea*, *branchi*, and *pinalia*) ranges mostly in the southwestern states. Finally, the *cruciata* complex (including *manitoba*, *coweta*, and *suwanea*) is found in the eastern states from southern Canada to Florida.

Dictyna angulata Emerton

Plate 30, figures 1–6; text figure 25

Dictyna angulata EMERTON, 1915, Trans. Connecticut Acad. Arts Sci., vol. 20, p. 410, 3 figs. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 15. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 511, pl. 102, figs. 1900–1901. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1426.

Dictyna demores CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 117, fig. 170.

DIAGNOSIS: Female: Total length, 1.85 mm. Carapace, 0.7 mm. long, 0.6 mm. wide. Abdomen, 1.3 mm. long, 0.95 mm. wide. Male: Total length, 1.75 mm. Carapace, 0.8 mm. long, 0.63 mm. wide. Abdomen, 1.05 mm. long, 0.7 mm. wide.

The carapace is dark dusky brown on the pars thoracica, but the head is paler. The sternum is dark dusky brown and has a narrow, marginal, black seam. The light yellow legs have very faint, narrow, dusky rings at distal ends of some of the segments. The base color of the abdomen is gray, but it is more or less covered by a dusky pattern as follows: the dorsum with a toothed median band from base to middle and behind this a series of narrow chevrons joined into large spots along the sides; sides varied with dusky spots; and the venter with a broad, median, dark band from base to spinnerets, in some

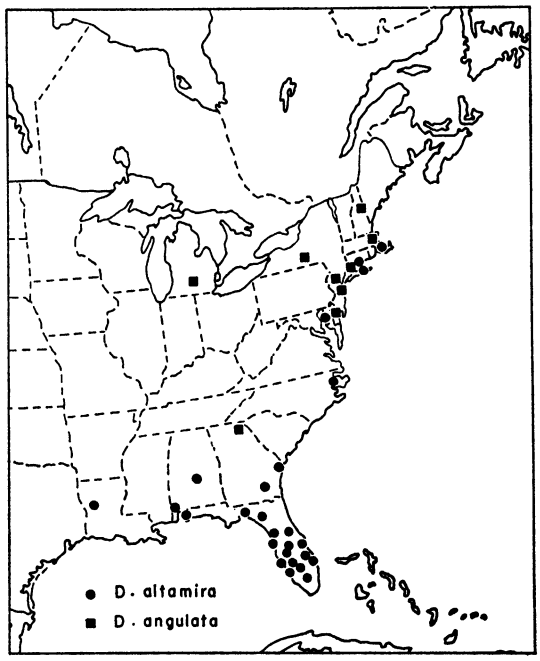


FIG. 25. Distribution of *Dictyna altamira* and *angulata*.

specimens broken by paler spots, and pale patches on the sides.

The posterior eye row is slightly recurved, and the quite large eyes are separated by at most the full diameter of the median eyes. The carapace is moderately elevated in both sexes, with the clypeus slightly exceeding the full diameter of the anterior lateral eye in the female and equaling two diameters of the anterior median eye in the male. The male chelicerae are rather short, the two together being nearly as broad as the greatest width, are moderately concave as seen from the side, are bowed apart in front to leave a fusiform opening, and have the basal angle weakly developed.

The epigynum (pl. 30, figs 2, 3) presents two rather large, inconspicuous atria separated by a poorly defined septum, which has been emphasized in the drawing. The rounded lateral foveae are quite widely separated by a distance somewhat exceeding the width of the genital groove and the sternum.

The male palpus (pl. 30, figs. 1, 4–6) is distinctive in several details. The embolus originates at about the middle of the tegulum on the prolateral side, is quite thick, forms an oval figure, and is substantially enlarged distally to a heavy spatulate spur, much of which is not covered by the quite large conductor. The tibia is longer than broad, is enlarged on the retrolateral side into a long rounded lobe, and has the dorsal spur short and tipped with two heavy black ctenidia.

TYPE LOCALITIES: Of *angulata*, Hyde Park, Massachusetts, male and female cotypes in the Museum of Comparative Zoölogy; of *demores*, Demorest, Georgia, female holotype in the American Museum of Natural History.

DISTRIBUTION: Eastern United States from New Hampshire and Michigan south to Georgia (see fig. 25).

KNOWN RECORDS: *New Hampshire:* Near Conway, June 21, 1935, female. *Massachusetts:* Hyde Park, May, July, 1900 (J. H. Emerton), males and females from under leaves on ground. *Connecticut:* Norwalk, July 2, 1933 (W. J. Gertsch), females. *New Jersey:* Ramsey, May 12, June 5 (W. J. Gertsch), males, females. Waretown, May 12, 1949 (W. J. Gertsch), male. Four miles west of Lakehurst, May 14, 1949 (W. J. Gertsch), male, females. Jamesburg, females. *New York:* East of Ithaca, June 20, 1933, females. *Michigan:* Albion, June 16, 1933, female. *Delaware:* Bombay Hook, male. *Georgia:* Demorest, April 26, 1943 (W. Ivie), female.

Dictyna saylori Chamberlin and Ivie

Plate 30, figures 8–12; text figure 26

Dictyna saylori CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 8, pl. 2, figs. 12–15. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

DIAGNOSIS: Female: Total length, 1.95 mm. Carapace, 0.82 mm. long, 0.65 mm. wide. Abdomen, 1.25 mm. long, 0.9 mm. wide. Male: Total length, 1.7 mm. Carapace, 0.85 mm. long, 0.62 mm. wide. Abdomen, 0.95 mm. long, 0.7 mm. wide.

The yellowish brown carapace is heavily shaded with dusky on the sides of the head and the pars thoracica, which also shows the dark radial lines and a black mark at the position of the obsolete median groove. The dusky brown sternum is darkest along the side margins. The dull yellowish legs show faint apical dusky rings on some of the legs. The abdomen is mostly dusky on the sides

and presents a broad whitish band on the full length of the dorsum, occupying half or more of the width, which is dentate along the sides and encloses a dusky streak from base to middle in dark specimens.

The weakly recurved posterior eye row has the eyes fairly large and close together, so that the median eyes are separated by a little less than the full diameter. The pars cephalica is of average height, with the clypeal height equaling the full diameter of the anterior lateral eye in the female and two full diameters of the small anterior median eye in the male. The male chelicerae are slightly concave as seen from the side, are bowed in front to leave a fusiform opening, and have the basal angle weakly developed.

The epigynum (pl. 30, fig. 10) has the large median atria well advanced from the genital groove and the conspicuous lateral foveae separated by less than the width of the genital groove or the sternum.

The male palpus (pl. 30, figs. 8, 9, 11, 12) has a thick embolus which in the terminal portion forms a rather thin twisted rod, with a right-angled spine at the apex. The basal portion of the conductor is greatly enlarged and ends as a sharp spur. The tibia is about as broad as long in dorsal view, broadest at the juncture with the cymbium, and bears a short spine tipped with two black ctenidia.

TYPE LOCALITY: Ben Lomond, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: Coastal ranges of California (see fig. 26).

KNOWN RECORDS: *California:* Ben Lomond, April, 1934 (L. W. Saylor), male holotype. Tapia Park, Santa Monica Mountains, May, 1954 (R. Schick), males and females. Hastings Natural History Reservation, Monterey County (J. Linsdale), males, females.

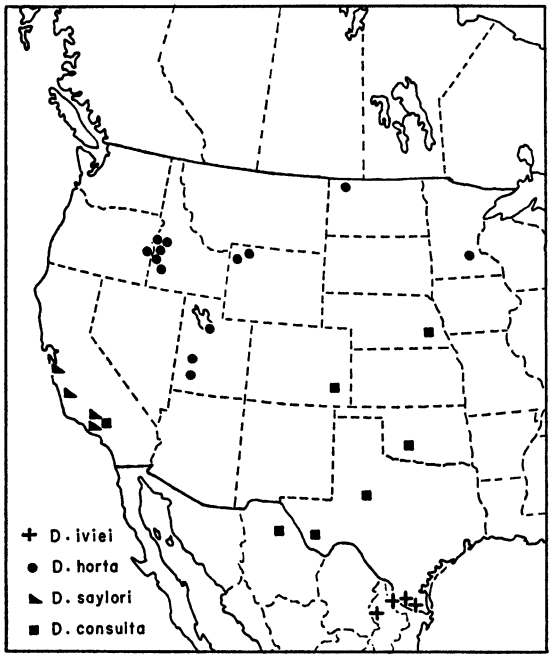


FIG. 26. Distribution of *Dictyna iviei, horta, saylori,* and *consulta.*

Dictyna nanda, new species

Plate 30, figure 13

FEMALES: Total length, 2 mm. Carapace, 0.8 mm. long, 0.65 mm. wide. Abdomen, 1.4 mm. long, 0.95 mm. wide.

Carapace orange-brown, with the sides of the head and the pars thoracica marked with brown bands and radiations. Sternum dusky orange. Legs yellow, with very faint dusky rings at the distal ends of some segments. Abdomen yellowish, the dorsum with a dentate basal brown stripe and rows of brown spots behind, and the venter with a central brownish band flanked by white patches.

Structure quite typical, similar to that of *saylori* and related species, the carapace being of moderate elevation. Clypeus equal in height to one and one-half diameters of an anterior median eye. Posterior eye row slightly recurved, the median eyes separated by their full, long diameter or slightly more.

Epigynum (pl. 30, fig. 13) of very distinctive form, resembling that of *saylori* in the advanced position of the median atria, which are relatively small and separated by a modest septum. Lateral foveae conspicuous semilunar carinae widely separated to a distance considerably more than the width of the sternum or genital groove. The internal receptacles and tubes are usually visible through the integument as a U-shaped or M-shaped figure.

TYPE LOCALITY: Female holotype and paratype from Guatay, San Diego County, California, July 9, 1953 (W. J. and J. W. Gertsch).

OTHER LOCALITIES: *California:* McCloud,

Siskiyou County, July 5, 1952 (W. J. Gertsch), three female paratypes.

Dictyna joaquina, new species

Plate 30, figure 7

FEMALE: Total length, 1.83 mm. Carapace, 0.75 mm. long, 0.6 mm. wide. Abdomen, 1.10 mm. long, 0.97 mm. wide.

Carapace rusty red-brown to orange, lightest on the top of the head, with the sides of the head and the pars thoracica marked with dusky radiations and the margin narrowly lined with black. Sternum dusky orange, darkened widely around the margins. Legs orange-brown, with duskiness on the femora but without dark contrasting markings. Sides of the abdomen and much of the dorsum dusky brown, the dorsum with a central yellowish stripe enclosing a large basal band in front and narrow chevrons behind, the venter dusky yellow, without distinct pattern.

Structure quite similar to that of *saylori*, which this new species resembles superficially in coloration. Eyes of the posterior row in a weakly recurved line, the median eyes separated by the full diameter. Carapace of average height, with the clypeus equaling scarcely one and one-half diameters of the anterior median eye.

Epigynum (pl. 30, fig. 7) presenting two suboval atria narrowly separated by a very thin septum, and lateral atria separated by the full width of the sternum. Internal receptacles visible as large round bodies behind the atria.

TYPE LOCALITY: Female holotype from Shaver Lake, Madera County, California (W. J. Gertsch).

Dictyna stulta Gertsch and Mulaik

Plate 31, figures 1–50 text figure 27

Dictyna stulta GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 7, fig. 9; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 329. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 14. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1450.

Emblyna sanfrana CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 12, fig. 50.

DIAGNOSIS: Female: Total length, 3.1 mm. Carapace, 1.1 mm. long, 0.9 mm. wide. Abdomen, 2.2 mm. long, 1.9 mm. wide. Male: Total length, 2.5 mm. Carapace, 1.1 mm. long, 0.9 mm. wide. Abdomen, 1.5 mm. long, 1.2 mm. wide.

This brightly colored species shows considerable variation in color from whitish to yellow or bright orange or even pinkish. In average specimens the carapace is bright orange to dark reddish brown, is darker on the sides of the head, and has dusky radiating lines on the pars thoracica. The sternum is orange-brown and may be dusky on the borders. The orange legs lack contrasting markings. The whitish to orange abdomen is reticulated with gray on the dorsum, where there is usually a very vague median stripe beginning as a faint line at the base and gradually widening behind. The venter is pale, mostly white or yellowish, but a darker mark encloses the spinnerets.

The slightly recurved posterior eye row has the median eyes separated by the full diameter. The clypeus of the female equals about one and one-half diameters of the dark median eye. The pars cephalica of the male is of medium elevation, and the sloping clypeus is equal to two full diameters of the anterior median eye. The male chelicerae are of

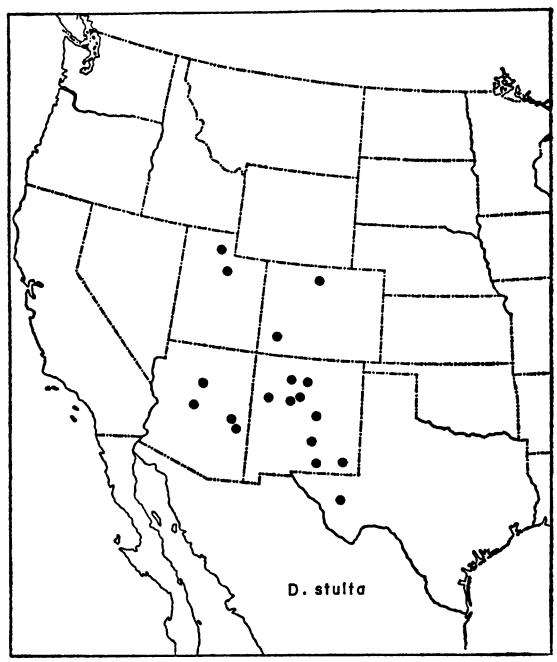


FIG. 27. Distribution of *Dictyna stulta*.

moderate length, the two together being five-sixths as wide as long, are convex in front and slightly bowed apart to leave a long fusiform opening about two-thirds as wide as the chelicera, and have the basal angle weakly developed to a rounded spur.

The epigynum (pl. 31, figs. 2, 3) presents medium-sized atria separated by a septum about equal to the diameter of one atrium. The lateral foveae are quite close together, with their greatest separation equaling only two-thirds of the width of the genital furrow or the sternum.

The male palpus (pl. 31, figs. 1, 4, 5) is rather short and stout. The thick embolus originates near the distal edge of the tegulum, makes a quite sharp turn to curve flatly across to the quite expansive conductor, is flattened in the distal portion, and then ends in a twisted right-angled hook. The thick conductor is twisted at base into a beak-shaped, laterally directed spur. The short tibia is as broad as long, narrowed at the base, where the short tibial spur is located on the retrolateral edge.

TYPE LOCALITIES: Of *Dictyna stulta*, Fort Davis, Jeff Davis County, Texas, male holotype in the American Museum of Natural History; of *Emblyna sanfrana*, Aspen Springs, San Francisco Mountains, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains, south to west Texas (see fig. 27).

SELECTED RECORDS: *Utah:* Ogden Canyon, October 9, 1937 (D. M. Hammond), male. Aspen Grove Camp, Mt. Timpanogos, 6800 feet, July 29, 1940, male, female. *Colorado:* Beaver Creek, 8000 feet, San Juan Mountains, Rio Grande County, July 13, 1952 (H. Levi), male. Pingree Park, August 20, 1924 (C. R. Crosby), male, females. *Arizona:* Baldy Peak, 8800 feet, White Mountains, June 18, 1936 (E. D. Ball), male, two females. Fourteen miles northeast of Whiteriver, September 20, 1950 (W. J. Gertsch), female. San Francisco Mountains, near Flagstaff, 8000 feet, April 25, 1936 (S. C. Bishop), immature males, females. *New Mexico:* East of Cuba, Jemez Mountains (C. C. Hoff), males, female. Near top of Mt. Taylor (C. C. Hoff), two females. Tejano Canyon, Sandia Mountains (C. C. Hoff), female. Northeast of Santa Fe (C. C. Hoff), female. *Texas:* Fort Davis, July, 1934 (S. Mulaik), male.

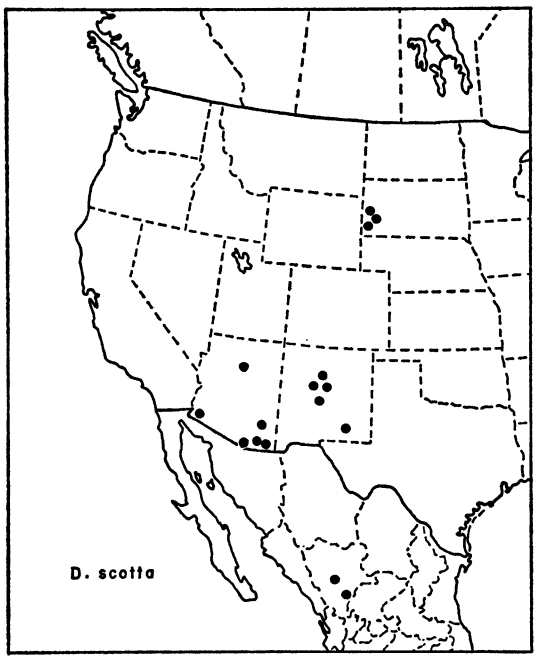


FIG. 28. Distribution of *Dictyna scotta*.

Dictyna scotta Chamberlin

Plate 32, figures 1–5; text figure 28

Emblyna scotta CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 12, fig. 49.

Dictyna scotta ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325.

Dictyna cognata CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 9, fig. 51.

Dictyna chamberlini ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319 (new name for *cognata* Chamberlin).

This small, dusky brown species is related to *sinaloa* and other Mexican species and somewhat more remotely to *stulta*. The carapace is dark chestnut, darkest on the pars thoracica which shows the usual radiating dark lines. The sternum is chestnut brown and usually dark along the borders. The dusky yellowish brown legs have broad dusky rings on the femora and tibiae. The abdomen varies from tan to dark brown and usually has a blackish pattern as follows: dorsum with a rather narrow median basal mark presenting three prongs behind and followed by a series of chevron marks, elsewhere in the

middle part of dorsum white or silvery, the lateral part of dorsum on each side yellowish or orange; lower part of sides brown, with enclosed lighter spots and streaks; and the venter yellow at the sides and in front of genital furrow, the middle region occupied by a more or less distinct light brown band.

The posterior eye row is slightly recurved, and the median eyes are separated by the full diameter to half as much more, a little less in the males. The pars cephalica is moderately elevated, with the clypeus being equal in height to one and one-half diameters of the anterior median eye in both sexes. The chelicerae of the male are of medium development as in *stulta*.

The epigynum (pl. 32, fig. 2) presents rather large suboval atria separated by a quite broad septum which is wider than the two round dark receptacles usually visible through the integument. The lateral atria are separated by a distance only a little less than the width of the genital groove or the sternum. The epigynum of the somewhat paler specimen described as *cognata* is shown in plate 32, figure 3.

The male palpus (pl. 32, figs. 1, 4, 5) shows similarities to that of *stulta*, but it is less stout. The thick embolus is more evenly curved and, after flattening in the distal half, abruptly narrows to continue as a long thin spine. The short tibia is broadest apically and bears the short dorsal tibial spur, tipped with two ctenidia, near the base.

TYPE LOCALITIES: Of *scotta*, Scott Able Canyon, 9000 feet, New Mexico, female holotype in the American Museum of Natural History; and of *cognata*, San Francisco Mountains, timberline to peak, 12,600 feet, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains from South Dakota to New Mexico and Arizona, and into Durango, Mexico (see fig. 28).

SELECTED RECORDS: *South Dakota:* Horsethief Lake, Pennington County, June 21, 1952 (H. Levi), two males. *New Mexico:* Three miles south of Cowles (C. C. Hoff), male. Gallinas Canyon, north of Las Vegas (C. C. Hoff), females. *Arizona:* Portal, June 8, 1955 (M. Statham), male and female. Rustler's Park, Chiricahua Mountains, June 22, 1955 (M. A. Cazier and E. Ordway), male, females. *Durango:* Palos Colorados, August 5, 1947 (W. J. Gertsch), male. Nombre de Dios, August 14, 1947 (W. J. Gertsch), two males.

Dictyna melva, new species

Plate 32, figures 6–9

FEMALE: Total length, 1.9 mm. Carapace, 0.75 mm. long, 0.6 mm. wide. Abdomen, 1.15 mm. long, 0.8 mm. wide.

General appearance as in dark specimens of *scotta*. Carapace quite uniform rusty red-brown, dusky on the pars thoracica, and with a narrow black marginal seam. Sternum dark brown, with a distinct black seam on the margins; labium concolorous but the maxillae paler. Legs reddish brown, with dusky rings. Abdomen pale brown on the venter, dusky brown on the sides, and the dorsum with a broad median whitish stripe largely filled with brown markings as follows: a basal stripe widened behind to a triangular form and followed behind by a large spot and a series of narrow chevrons.

Structure typical, in close agreement with that of *scotta* and relatives. Pars cephalica of moderate height as indicated by the height to the sloping clypeus which is the full diameter of the anterior lateral eye. Posterior eye row slightly recurved, the median separated by the full diameter.

Epigynum (pl. 32, fig. 9) essentially as in *scotta*, but the median septum is typically narrower, and the lateral foveae are more widely separated to the full width of the genital groove or the sternum.

MALE: Total length, 1.65 mm. Carapace, 0.73 mm. long, 0.6 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide.

Coloration as in the female except as follows: Carapace darker brown, the sides dusky, with dark radiating markings and with faint indication of the dark marginal seam. Abdomen darker brown, the median band yellowish, and the dusky enclosed pattern obscure.

Structure essentially as in the female. Clypeus equal in height to one and one-half diameters of the anterior lateral eye. Chelicerae of average length, moderately curved as seen from the side, bowed apart in front to leave fusiform opening, and the basal angle a slight rounded spur.

Male palpus (pl. 32, figs. 6–8) most closely

related to that of *branchi*. Embolus originating at about the middle of the tegulum, of moderate thickness, with a black spine in the distal third, and ending as a thin thread. Basal spiral of the conductor rather small, and the point directed forward and outward. Tibial apophysis a short dorsal spur directed nearly at right angle to the segment, and with the two black ctenidia distinct.

TYPE LOCALITY: Male holotype from Cienega, 30 miles northeast of Globe, Arizona, July 12, 1954 (W. J. Gertsch).

DISTRIBUTION: Arizona. Known from the male holotype and female recorded below.

OTHER RECORD: *Arizona:* Forestdale, 15 miles south of Showlow, July 12, 1954 (W. J. Gertsch), female allotype.

Dictyna branchi, new species

Plate 32, figures 10–12

MALE: Total length, 2 mm. Carapace, 0.95 mm. long, 0.8 mm. wide. Abdomen, 1.2 mm. long, 0.9 mm. wide.

Carapace dusky yellowish brown, darkest on the pars thoracica, with a dusky band along the sides of the pars cephalica and a median dusky streak running back from the median eyes. Sternum orange-brown, with the borders blackish. Legs uniform dull yellow-brown, without contrasting markings. Abdomen bright orange on the dorsum, brownish on the sides, with a distinct black stripe from base to middle, at which point the band enlarges and forms a black spot. Venter of the abdomen golden yellow, dusky at the base and around the spinnerets.

Structure quite similar to that of *stulta* and relatives. Carapace strongly elevated so that the sloping clypeus is as high as about three diameters of the median eye. Posterior eye row distinctly recurved, the median eyes separated by the full diameter, about as far from the subequal lateral eye. Chelicerae of average length, the two together about as broad as long, strongly concave as viewed from the side, bowed in front to leave a fusiform opening nearly as broad as the width of the chelicera, and the basal angle developed to a weak rounded spur. Tibia and patella of the first leg, 1.15 mm. long.

Palpus (pl. 32, figs. 10–12) similar to that of *stulta* but proportionately much larger and with the embolus and conductor much longer. Embolus thick at base near the front edge of the tegulum, broadly rounded around the expansive bulb, with a distinct rounded enlargement in distal third, and from there tapering gradually to a point. Basal element of a conductor transversely wide, spiraled, and laterally directed as a short spur. Tibial apophysis a short dorsal spine tipped with two black ctenidia.

TYPE LOCALITY: Male holotype from Twentynine Palms, California, May 7 (Jefferson H. Branch).

DISTRIBUTION: Only a single, rather poorly preserved male of this interesting species is known.

Dictyna ardea, new species

Plate 31, figures 6–9

FEMALE: Total length, 2.6 mm. Carapace, 1.1 mm. long, 0.93 mm. wide. Abdomen, 1.75 mm. long, 1.4 mm. wide.

General appearance as in *stulta* but colors somewhat brighter. Carapace bright orange, somewhat dusky on the pars thoracica which shows faint, dusky radial lines. Sternum bright orange; labium dusky orange, without darker markings. Abdomen varying from pale yellow to bright orange, reticulated with gray, particularly above where there may be a faint reddish or brown smudge from middle to caudal end. Venter of the abdomen yellow, whitish on the sides, dusky around the spinnerets. Dorsum of the abdomen in some males darker orange-brown.

Structure very similar to that of *stulta*. Carapace well elevated, convex, the clypeus equal in height to one and one-half diameters of the anterior median eye. First eye row essentially straight, the median eyes separated by the full diameter, half as far from the slightly larger lateral eyes. Posterior eye row slightly recurved, the median eyes separated by the full diameter, about as far from the lateral eyes. Median ocular quadrangle slightly broader than long and slightly narrower in front.

Epigynum (pl. 31, fig. 8) with large round atria separated by a rather narrow septum. Lateral foveae quite near the atria and at the greatest separation equaling the width of the sternum.

MALE: Total length, 2.2 mm. Carapace,

1.05 mm. long, 0.85 mm. wide. Abdomen, 1.25 mm. long, 1 mm. wide.

Structure essentially as in the female. Clypeus sloping, broad, nearly as wide as three diameters of the anterior median eye. Chelicerae of moderate development as in *stulta*.

Male palpus (pl. 31, figs. 6, 7, 9) very large and distinct from that of all known species in having distinct lobes developed at the distal end of the femur (pl. 3, fig. 9). Embolus thick, arising from near middle of the tegulum, with a sinuous bend in basal third, evenly curved, and gradually narrowing to a small T-shaped tip. Conductor very large, flared far outside the limits of the cymbium, twisted at base, and with a bilobed process. Tibial spur short and bearing two black ctenidia as shown in plate 31, figure 9.

TYPE LOCALITY: Male holotype, female allotype, and male and female paratypes from Shannon Camp, Graham Mountain, 9000 feet, Arizona.

DISTRIBUTION: Arizona and New Mexico.

KNOWN RECORDS: *Arizona:* Shannon Camp, Graham Mountain, 9000 feet, September 13, 1950 (W. J. Gertsch), 11 males, 30 females. *New Mexico:* Lincoln County (C. C. Hoff), two males, one female.

Dictyna callida Gertsch and Ivie

Plate 31, figures 10–13

Dictyna callida GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 4, figs. 6, 7, 8. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 331. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319.

DIAGNOSIS: Female: Total length, 1.95 mm. Carapace, 0.65 mm. long, 0.57 mm. wide. Abdomen, 1.5 mm. long, 1.15 mm. wide. Male: Total length, 1.5 mm. Carapace, 0.85 mm. long, 0.63 mm. wide. Abdomen, 0.9 mm. long, 0.63 mm. wide.

This small species has much the same appearance as *melva*, *scotta*, and various Mexican species of this series. The carapace is dark rusty red-brown and has the usual dusky radiating lines on the pars thoracica. The sternum is yellow to orange-brown and is dusky along the margins. The abdomen is whitish on the venter, has the sides dusky brown and the dorsum with a more or less distinct yellowish stripe on the whole length which encloses a vague brownish pattern of basal bands and chevrons.

The structure is typical for this series of small species. The slightly recurved posterior eye row has the oval median eyes separated by the full diameter in the male and by the narrow diameter in the female. The moderately elevated pars cephalica has the clypeal height equaling the full diameter of the anterior lateral eye in both sexes. The male chelicerae are of moderate length, the two together being about five-sixths as wide as the length, are moderately concave in side view, are bowed apart in front to leave a fusiform opening, and have the basal angle developed into a spur tipped with a small, ventrally directed tooth.

The epigynum (pl. 31, fig. 10) presents suboval atria separated by a small septum and the lateral foveae quite nearby, their widest separation being about five-sixths of the width of the genital groove or the sternum.

The male palpus (pl. 31, figs. 11–13) is one of the most distinctive in the series. The thick embolus, which arises at the distal end of the tegulum, makes a short curve into the fold of the conductor where it enlarges and twists and gives rise to the thin spine which forms a full spiral. The basal spiral of the conductor forms a small, laterally directed spur. The dorsal tibial apophysis is a short spur bearing two distinct black ctenidia and lies near the base on the retrolateral edge.

TYPE LOCALITY: Edinburg, Texas, male holotype in the American Museum of Natural History.

DISTRIBUTION: Rio Grande Valley of southern Texas and adjacent Tamaulipas.

KNOWN RECORDS: *Texas:* Edinburg, October 22, 1934 (S. Mulaik), male holotype. Harlingen, June (L. I. Davis), female. *Tamaulipas:* Padilla, May 17, 1952 (W. J. Gertsch), male.

Dictyna pinalia, new species

Plate 32, figure 13

FEMALE: Total length, 2.4 mm. Carapace, 0.9 mm. long, 0.75 mm. wide. Abdomen, 1.5 mm. long, 1.1 mm. wide.

Carapace orange-brown, darkest on the sides of the head and the pars thoracica, which shows the usual narrow blackish seam

and radiating streaks. Sternum dusky orange-brown. Legs orange-brown, the femora somewhat dusky, and the other segments showing very faint traces of dusky bands. Abdomen dusky brown on the side, the dorsum with a yellowish longitudinal stripe enclosing the typical basal band and caudal chevrons, the venter pale yellowish brown but the epigynal area darker and a dusky bar on each side of the spinnerets.

Coloration and structure quite similar to those of *scotta* and *joaquina*. Posterior eye row weakly recurved, the median eye separated by slightly more than the full diameter. Carapace of average elevation, the clypeus equaling one and one-half diameters of the anterior median eyes.

Epigynum (pl. 32, fig. 13) presenting atria of medium size, separated by a septum equaling the width of an atrium, and carinate lateral foveae separated by the width of the sternum.

TYPE LOCALITY: Female holotype from near Coolidge Dam, Arizona, July 12, 1954 (W. J. Gertsch).

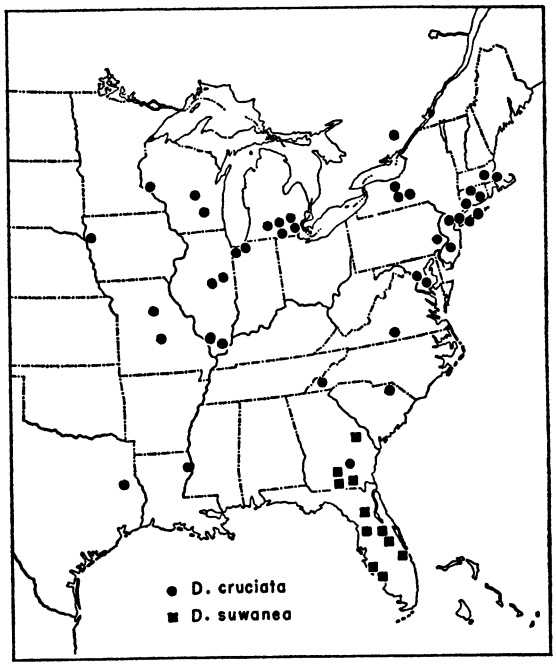


FIG. 29. Distribution of *Dictyna cruciata* and *suwanea*.

Dictyna cruciata Emerton

Plate 33, figures 1–40; text figure 29

Dictyna cruciata EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 448, pl. 9, fig. 6. BANKS, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509; 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue); 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509 (catalogue). BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 3 (list). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108 (catalogue). CROSBY AND BISHOP, 1936, Jour. New York Ent. Soc., vol. 44, p. 44. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1434.

DIAGNOSIS: Female: Total length, 2 mm. Carapace, 0.73 mm. long, 0.6 mm. wide. Abdomen, 1.4 mm. long, 1.1 mm. wide. Male: Total length, 1.7 mm. Carapace, 0.8 mm. long, 0.64 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide.

The dull yellow to orange carapace has the sides of the head darker and the pars cephalica dusky brown, with the usual radiating streaks. The sternum is dusky yellow or orange and may be margined by a narrow dusky band. The pale yellow legs are unmarked except for occasional faint broken dusky rings at the distal ends of the tibiae. The abdomen is dusky on the sides, pale beneath, and has the dorsum mostly white, reticulated with gray, and occasionally with inconspicuous dusky markings.

The slightly recurved posterior eye row has the rather small eyes typically wells eparated by one and one-half to nearly two diameters of the median eyes. The carapace is moderately elevated, with the clypeus equaling the full diameter of the anterior lateral eye in the female and nearly two diameters in the male. The male chelicera is of average development, bowed in front to leave a fusiform opening half as wide as the chelicera, and has the basal angle a slightly rounded carina.

The epigynum (pl. 33, fig. 3) is similar to that of *suwanea*, but the median atria are closer together. The lateral foveae are moderately sparated by a distance not fully equal to the width of the sternum.

The male palpus (pl. 33, figs. 1, 2, 4) has the tegulum bulbous and the embolus, which originates from the tegulum near its middle on the prolateral side, a moderately heavy

tube. The distal half of the embolus presents a well-marked ventral curve and then narrows to the apex. The basal spiral of the conductor forms a small lateral spur. The tibial apophysis is a small spur at the base and bears two black ctenidia.

TYPE LOCALITY: New Haven, Connecticut, male and female cotypes in the Museum of Comparative Zoölogy.

DISTRIBUTION: Eastern United States and the Great Lakes states south to Florida and Alabama, and westward to western Iowa and eastern Texas (see fig. 29).

SELECTED RECORDS: *Ontario:* Mer Bleu, east of Ottawa, June 3, 1931 (T. B. Kurata), two females. *Michigan:* Fourteen miles east of Jackson, May 29, 1949 (A. M. Chickering), male and females. *Missouri:* Beaver Creek, 10 miles south of Rolla, June 11, 1950 (D. L. and H. E. Frizzell), male and females. *North Carolina:* Deep Creek, north of Bryson City, July 8, 1933 (W. Gertsch; (W. W. Ivie), females. *Texas:* San Augustine, June, 1936 (S. Mulaik), two females. *Louisiana:* Tallulah, May and June, 1930 (P. A. Glick), two males taken by airplane, one at 200 feet and one at 2000 feet. *Florida:* Okeechobee, March 26, 1938 (W. J. Gertsch), male.

Dictyna coweta, new species

Plate 33, figures 7–10

FEMALE: Total length, 1.5 mm. Carapace, 0.67 mm. long, 0.53 mm. wide. Abdomen, 0.9 mm. long, 0.6 mm. wide.

Color pattern and general appearance essentially as in *cruciata.*

Carapace dull yellow, the sides of the head and the pars thoracica dusty brown, with radiating darker lines, but the side margins pale. Sternum whitish; labium and maxillae dusky. Legs whitish, with incomplete narrow black rings at distal ends of all tibiae but only the one on the fourth tibia and one at distal end of fourth femur visible from above. Abdomen blackish on the sides, with a dorsal gray or white band broadest at base and narrowed at apex, which may enclose a small black basal spot and show indistinct dusky chevrons behind. Venter of abdomen whitish.

Structure as in *cruciata,* the carapace being of moderate elevation and the clypeal height equaling the full diameter of an anterior lateral eye. Posterior eye row slightly recurved, the median eyes separated by slightly more than their long diameter, as far from the subequal lateral eyes.

Epigynum (pl. 33, fig. 7) similar to that of *suwanea* and *cruciata* in the quite wide separation of the atria, which are small round orifices. Lateral foveae on each side connected with a carina from the fovea and with their greatest separation being about three-fourths of the width of the sternum.

MALE: Total length, 1.3 mm. Carapace, 0.6 mm. long, 0.5 mm. wide. Abdomen, 0.78 mm. long, 0.6 mm wide.

Coloration and general structure essentially as in the female. Pars cephalica moderately elevated, the clypeus slightly sloping and equal in height to one and one-half diameters of the anterior lateral eye. Chelicerae rather short, slightly concave as seen from the side, moderately bowed in front to leave a narrow fusiform opening, the basal angle inconspicuous. Eyes somewhat closer together, the posterior median eyes separated by the short diameter. Tibia and patella of first leg, 0.65 mm. long.

Male palpus (pl. 33, figs. 8–10) essentially as in *cruciatus.* Embolus of moderate thickness throughout the length, evenly curved in the sheath of the conductor and with the apex as shown in plate 33, figure 9. Basal spiral of conductor produced into a sharp, caudally directed spur. Dorsal process of tibia a short spur bearing two black ctenidia.

TYPE LOCALITY: Male holotype and female allotype from Sarasota, Florida, December 26, 1950 (A. M. Nadler).

DISTRIBUTION: Florida.

KNOWN RECORDS: *Florida:* Hillsborough River State Park, April 8, 1938 (W. J. Gertsch), female paratype. Eustis, June, 1933 (W. J. Gertsch), male paratype. Saint Petersburg, April 8, 1933, three female paratypes. Polk County, June 28, 1935 (H. K. Wallace), female paratype. Calhoun County, April 12, 1935 (H. K. Wallace), female paratype. Weirsdale, February 20, 1952 (M. H. Muma), male and female paratypes from web on orange leaf. *Alabama:* Hammock Woods, Lagoon, October 29, 1949 (A. F. Archer), male paratype.

Dictyna suwanea Gertsch

Plate 33, figures 11–14; text figure 29

Dictyna suwanea CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 122 (*nomen nudum*). GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 14, figs. 25–27. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318.

DIAGNOSIS: Female: Total length, 1.7 mm. Carapace, 0.68 mm. long, 0.55 mm. wide. Abdomen, 1.6 mm. long, 0.8 mm. wide. Male holotype: Total length, 1.5 mm. Carapace, 0.75 mm. long, 0.57 mm. wide. Abdomen, 0.86 mm. long, 0.7 mm. wide.

This small species resembles *cruciata* in size and general appearance. The reddish brown carapace is darker on the side of the head and usually shows darker radiating lines on the pars thoracica. The sternum is light brown, and the yellow legs lack darker markings. The abdomen is whitish, reticulated with gray, may be uniformly pale above or indistinctly marked with a series of chevrons or separated spots behind and a median spot at the base in front.

The posterior eye row is slightly recurved, and the median eyes are separated by their full diameter. The pars cephalica is moderately elevated in both sexes, with the clypeus equaling the full diameter of the the anterior median eye in the female and one and one-half diameters in the male. The male chelicerae are slightly concave as seen from the side, are moderately bowed in front to leave a fusiform opening half the width of the chelicera, and have the basal angle developed to a rounded carina.

The epigynum (pl. 33, fig. 14) differs little from that of *cruciata*. The median atria are usually more widely separated and form, with the lateral foveae, a suboval figure. The greatest separation of the lateral foveae is less than the sternal width.

The male palpus (pl. 33, figs. 11–13) is similar to that of *cruciata*, but the embolus is proportionately shorter, heavier, and lacks a curve in the distal half.

TYPE LOCALITY: Englewood, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Florida and Georgia (see fig. 29).

KNOWN RECORDS: *Florida:* Englewood, April 1, 1938 (W. J. Gertsch), males, females. Winter Park, March 21, 1938 (W. J. Gertsch), males, females. Five miles south of Clara, April 11, 1938 (W. J. Gertsch), males, females. North of Olney March 27 (W. J. Gertsch), male, females. Ten miles south of Zephyrhills, April 7, 1938 (W. J. Gertsch), females. Indian Town, March 28, 1938 (W. J. Gertsch), males, females. Fort Myers, February, 1935 (W. M. Barrows), females. *Georgia:* Near Waycross, April 21, 1938 (W. J. Gertsch), male, females. Nine miles north of Sylvania, April 7–12, 1943 (W. Ivie), males, females. South of Lake Park, June 15, 1935 (W. Ivie), males, females.

Dictyna manitoba Ivie

Plate 33, figure 15; plate 34, figures 1–5

Dictyna manitoba IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published). ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322.

Emblyna utona CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 13, fig. 48.

Emblyna siwa CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 12, fig. 25.

DIAGNOSIS: Female: Total length, 2.25 mm. Carapace, 0.8 mm. long, 0.65 mm. wide. Abdomen, 1.6 mm. long, 1.2 mm. wide. Male: Total length, 2 mm. Carapace, 0.95 mm. long, 0.8 mm. wide. Abdomen, 1.05 mm. long, 0.7 mm wide.

The carapace varies from yellowish brown to dark chestnut, is darkest in the males, and has the pars thoracica dusky and marked with dark radiating lines. The sternum is light to dusky chestnut brown. The yellowish legs rarely show signs of narrow dusky rings. The abdomen is whitish, reticulated with gray, and has at the base above an indistinct rusty maculation which is enlarged behind and on the venter a faint rusty band from base to spinnerets. Northern specimens are darker.

The posterior eye row is weakly recurved, and the median eyes are separated by a little more than the full diameter. The carapace is moderately elevated in both sexes, the clypeus equaling the full diameter of the anterior lateral eye in the female and not fully two diameters in the male. The male chelicerae are concave as seen from the side, are

bowed in front to form a median broad fusiform opening about as wide as the width of a chelicera at that level, and have the basal angle an obtuse, subconical spur.

The epigynum (pl. 33, fig. 15; pl. 34, fig. 3) presents rather small median atria separated by a septum of medium width. The lateral foveae are nearby, and their greatest separation is equal to about four-fifths of the width of the genital groove or the sternum.

The male palpus (pl. 34, figs. 1, 2, 4, 5) resembles that of *coweta* but is quite distinctive in the form of the distal portion of the embolus and other details. The embolus is of moderate size, is apically twisted, and ends in a rather broad loop as shown in the plate.

TYPE LOCALITIES: Of *manitoba*, Warren, Minnesota, male holotype in the American Museum of Natural History; of *siwa*, Waskisk, Minnesota, female holotype in the American Museum of Natural History; of *utona*, Scottsdale, Arizona, female holotype in the American Museum of Natural History.

DISTRIBUTION: Northern United States and Canada; Florida.

KNOWN RECORDS: *Mackenzie:* Fort Resolution, Great Slave Lake, July 23, 1947 (D. S. Rawson), female. *Alberta:* Seba, June 3 to July 6, two females. *Ontario*: Fort Albany, June 26, 1942 (F. Urquhart), females. Toroonto, September, 1946 (W. J. Gertsch), male and female. *Oregon:* Twelve miles south of Corvallis, April 10, 1951 (V. Roth), male. *Minnesota:* Eight miles southeast of Warren, June, 1945 (W. Ivie), males and females. Lake Minnetonka, June 4, 1932 (W. J. Gertsch), male and females. Savage, May 20, June 4, 1932 (W. J. Gertsch), females. Itasca Park, May 29, 1932 (W. J. Gertsch) female. *Michigan*: McLain State Park, July 5, 1936 (M. H. Hatch), female. *Illinois:* Volo, May 16, 1936 (D. C. Lowrie), male and females. *Florida:* Okeechobee, March 26, 1938 (W. J. Gertsch), male.

Dictyna seminola, new species

Plate 33, figure 5

FEMALE: Total length, 1.45 mm. Carapace, 0.6 mm. long, 0.5 mm. wide. Abdomen, 0.9 mm. long, 0.6 mm. wide.

Carapace dull yellow, with the sides of the head dusky but the normal dusky radiations on pars cephalica only faintly visible. Sternum whitish, with a faint dusky marginal seam. Legs pale yellow, unmarked. Abdomen yellow above, with a dusky dentate basal band and caudal chevrons rather faintly indicated and quite uniform white below.

Structure typical, much as in *altamira* and *suwanea*. Posterior eye row weakly recurved, the median separated by the long diameter, nearer the subequal lateral eyes, from which they are separated by the short diameter. Carapace of average height and convexity, with the clypeus as high as one and one-fourth diameters of the anterior median eye.

Epigynum (pl. 33, fig. 5) presenting two shallow, suboval atria, separated by a septum of medium width, and gently curved lateral foveae separated by less than the width of the sternum. The shadow of the internal receptacles forms a broad U-shaped figure.

TYPE LOCALITY: Female holotype from 2 to 5 miles south of Florida City, Florida (R. Forster and W. J. Gertsch).

This species has the appearance of *altamira* or *suwanea*, but it is somewhat more slender, delicate, and paler as well as being very much smaller. The epigynum is similar to that of *suwanea*, but the median septum is narrower, the atria are less advanced, and the lateral foveae are essentially transverse in position.

Dictyna osceola, new species

Plate 33, figure 6

FEMALE: Total length, 1.7 mm. Carapace, 0.65 mm. long, 0.55 mm. wide. Abdomen, 1.15 mm. long, 0.95 mm. wide.

Carapace yellowish brown, the pars thoracica and sides of the head with linear black radiations, the pars cephalica paler above but dusky in the ocular area and with linear black lines behind the eyes, which have their tubercles reddish in color. Sternum dusky brown, blackish on the margins and especially behind. Legs whitish to pale yellow, with distinct basal and apical rusty brown rings on most of the segments and a distinct median ring on the tibiae of the first and second legs. Abdomen mostly white, marked as follows: dorsum with narrow reticular brown lines and a pattern of small brown markings consisting of a thin basal stripe and paired spots behind; sides mottled with

dusky; and the venter quite uniform dusky.

Structure similar to that of *angulata*, which this new species further resembles in size and general appearance. Posterior eye row moderately recurved, the quite round median eyes separated by the full diameter, as far from the subequal lateral eye. Carapace typically elevated, the head convex, and the vertical clypeus equal in height to about one and one-half diameters of an anterior median eye.

Epigynum (pl. 33, fig. 6) similar to that of *angulata* and *hentzi* but differing in the details. Atria of medium size, separated by widely carinate margins forming a quite narrow septum, and the lateral foveae separated by the full width of the sternum.

TYPE LOCALITY: Female holotype from near Trilby, Florida, March 8, 1938 (W. J. Gertsch).

OTHER LOCALITY: *Florida:* Alachua County, November 8, 1949 (H. K. Wallace), female paratype.

The conspicuous rusty brown annulations on the legs, the discrete linear markings on the carapace, and the spotting on the abdomen easily separate this species from the unicolored, more somber *angulata* and *hentzi*.

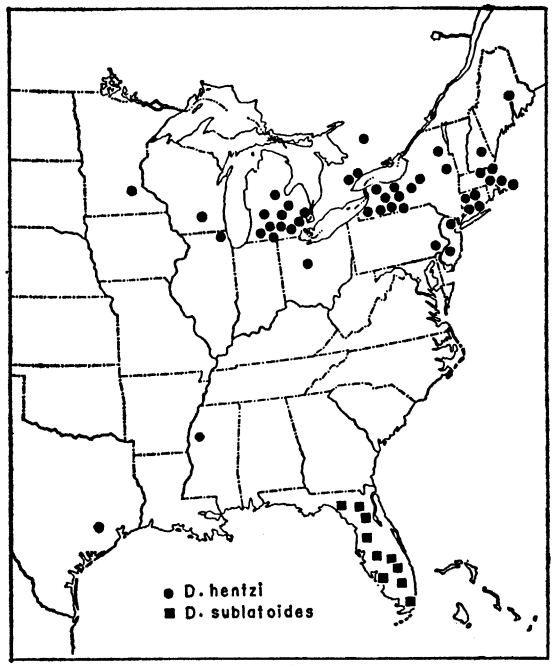


FIG. 30. Distribution of *Dictyna hentzi* and *sublatoides*.

Dictyna hentzi Kaston

Plate 34, figures 11–15; text figure 30

Dictyna muraria EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 445 (part); 1902, The common spiders of the United States, p. 210, fig. 486 (part).

Dictyna hentzi KASTON, 1945, Amer. Mus. Novitates, no. 1292, p. 4, figs. 4–6; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 507, pl. 102, fig. 1892, pl. 103, figs. 1917–1918. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321.

Dictyna curvata JONES, 1948, Field and Lab., vol. 16, p. 34, figs. 3, 11–14.

Emblyna tosa CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 13.

DIAGNOSIS: Female: Total length, 2.1 mm. Carapace, 0.86 mm. long, 0.7 mm. wide. Abdomen. 1.3 mm. long, 0.95 mm. wide. Male: Total length, 2 mm. Carapace, 0.9 mm. long, 0.72 mm. wide. Abdomen, 1.2 mm. long, 0.85 mm. wide.

The very dark, dusky brown carapace is darkest on the sides of the pars thoracica and shows faintly the typical radiating black lines. The blackish carapace is darkest on the margins. The yellow to orange legs usually have narrow dusky rings. The base color of the abdomen is dull yellow, but it is typically marked by a heavy brown or black pattern as follows: dorsum with a dentate stripe from base to middle which is followed by a series of transverse chevrons often confluent behind to form a subcaudal maculation; sides with mixed spots and dashes; and the venter with a black median band from base to spinnerets in dark specimens, flanked with yellow side bands, but the dark stripe may be broken up into a series of spots.

The posterior eye row is moderately recurved, and the median eyes are separated by the full diameter, or slightly more. The pars cephalica is typically elevated, so that the height of the clypeus is about the full diameter of the anterior lateral eye in the female and scarcely two full diameters of the small anterior median eye in the male. The male chelicerae are of moderate length, the two together being only slightly longer than their breadth, are distinctly concave as seen from the side, are moderately bowed apart in front to form a long fusiform opening, and

the basal angle is developed into a low conical spur.

The epigynum (pl. 34, fig. 13) presents two medium-sized atria separated by a septum of modest width. The lateral foveae are separated by the width of the genital groove or the sternum.

The male palpus (pl. 34, figs. 11–12, 14–15) is representative of a group in which the embolus, which arises at the middle of the tegulum, is quite heavy, becomes broader and flattened apically where it ends in a trifid process of which the median point continues as a coiled spine. This small curl of the embolus is usually plainly visible in the resting palpus. The short tibial apophysis bears two large, black ctenidia.

This species has been misidentified variously as both *Dictyna muraria* Emerton (by Emerton himself and others who followed him) and *Dictyna sublata* Hentz.

TYPE LOCALITIES: Of *Dictyna hentzi*, Cheshire, Connecticut, male holotype in the American Museum of Natural History; of *Dictyna curvata*, St. Claire Shore, Macomb County, Michigan, male holotype in the Museum of Comparative Zoölogy; and of *Emblyna tosa*, Fort Albany, Ontario, female holotype in the American Museum of Natural History.

DISTRIBUTION: Eastern United States and Canada from Maine and Ontario westward to Minnesota, south into Mississippi and eastern Texas (see fig. 30).

SELECTED RECORDS: *Ontario:* Fort Albany, June 26, 1942 (W. Ivie), three females. Sproule Bay, Lake Opeongo, Algonquin Park, June 26 to July 7, 1945 (W. Ivie, T. B. Kurata), males, females. High Park, Toronto, June, 1947 (W. Ivie), males, females. *Maine:* Bangor, June 29, 1910 (J. H. Emerton), three males. *Minnesota:* Lake Minnetonka, May 5, 1932 (W. J. Gertsch), male, female. *Mississippi:* Humphreys County, October 30, 1937 (Bishop collection), male. *Texas:* Sugar Land, June 10, 1937 (S. Mulaik), female. Garrison, May 8, 1952 (W. J. Gertsch), female.

Dictyna sublatoides Ivie and Barrows

Plate 34, figures 6–10; text figure 30

Dictyna sublatoides IVIE AND BARROWS, 1955, Bull. Univ. Utah, biol. ser., vol. 3, no. 2, p. 4, pl. 2, fig. 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1316. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1451.

DIAGNOSIS: Female: Total length, 2.2 mm. Carapace, 0.84 mm. long, 0.72 mm. wide. Abdomen, 1.55 mm. long, 1.1 mm. wide. Male: Total length, 1.75 mm. Carapace, 0.8 mm. long, 0.67 mm. wide. Abdomen, 1 mm. long, 0.7 mm. wide.

This somewhat pale species is a very close ally of *hentzi* and differs from it mainly in genitalic characters. The carapace is a lighter dusky orange or red-brown. The abdomen is white or yellow above and has the typical pattern of *hentzi* reduced in size and dusky in tone. The venter is paler, gray or white, and usually lacks a distinct dark median band.

The eye pattern and the structure of the carapace and chelicerae agree closely with these features in *hentzi*.

The epigynum (pl. 34, fig. 6) has the median atria obviously larger than in *hentzi* and separated by a septum of medium breadth. The lateral foveae are separated by a distance equal to the width of the median groove or the sternum.

The male palpus (pl. 34, figs. 7–10) differs from that of *hentzi* in the following details: the terminal portion of the embolus is trifid, and the middle point is continued in a much larger loop; the basal portion of the conductor is of different form, and the spiraled spur is distinct in detail.

This species was named *Dictyna sublatoides* because of its close relationship to the preceding one, *hentzi*, which was then regarded by Ivie and Barrows and other American authors as being the true *Dictyna sublata* of Hentz.

TYPE LOCALITY: Fort Myers, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Florida (see fig. 30).

SELECTED RECORDS: *Florida:* Okeechobee, March 26, 1938 (W. J. Gertsch), males, females. Port Mayaca, Lake Okeechobee, March 29, 1938 (W. J. Gertsch), female. Gainesvelle, June 12, 1935 (W. J. Gertsch), males, females.

Dictyna altamira Gertsch and Davis

Plate 35, figures 1–4; text figure 25

Dictyna altamira GERTSCH AND DAVIS, 1942,

Amer. Mus. Novitates, no. 1158, p. 15, fig. 29. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1316.

Dictyna savanna CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 21, figs. 161–169. MUMA, 1944, Proc. Biol. Soc. Washington, vol. 58, p. 93.

Dictyna bryantae JONES, 1947, Field and Lab., vol. 15, p. 13, figs. 31–34; 1948, Field and Lab., vol. 16, p. 30.

DIAGNOSIS: Female: Total length, 2.2 mm. Carapace, 0.9 mm. long, 0.75 mm. wide. Abdomen, 1.4 mm. long, 1.1 mm. wide. Male: Total length, 2 mm. Carapace, 0.95 mm. long, 0.8 mm. wide. Abdomen, 1.2 mm. long, 0.85 mm. wide.

This species was thoroughly described by Chamberlin and Ivie, who illustrated it with colored and black and white figures under the name *savanna*. The bright orange-brown carapace is somewhat darker on the sides and faintly marked with dusky radiating lines on the pars thoracica. The sternum varies from orange to dusky reddish brown. The yellowish legs most often lack contrasting markings. The abdomen is yellowish, reticulated with gray, is often completely unmarked, but frequently shows dusky traces of or a distinct blackish pattern as follows: dorsum with the usual basal stripe often trifurcate behind and a series of irregular black spots behind incompletely joined by chevrons; sides spotted and streaked with dusky; and the venter mostly pale but sometimes showing a dusky mark in the center.

The posterior eye row is slightly recurved and the rather small eyes are separated by about one and one-fourth diameters of the median eye. The pars cephalica is typically elevated and arched behind the eyes, as indicated by the height of the clypeus which equals about one and one-half diameters of the anterior median eye in the female and two full diameters in the male. The male chelicerae are of moderate length, the two together being only a little longer than their breadth, are concave in front and bowed apart to leave a fusiform opening, and the basal angle is a weak rounded spur.

The epigynum (pl. 35, fig. 3) has rather small, moderately separated median atria, which are advanced well in front of the lateral foveae and open into sclerotized conical chambers. The lateral foveae are separated by the width of the genital groove or the sternum.

The male palpus (pl. 35, figs. 1, 2) is of the same type as that of *hentzi*. The broadened terminal portion of the thick embolus presents two spurs of which one is prolonged into a quite large S-shaped hook. The basal process of the conductor is transversely spiraled and ends as a sharply pointed, laterally directed spine. The dorsal process on the tibia is short and bears two black ctenidia.

This species is a very close relative of *Dictyna cambridgei* Gertsch and Davis, which was described from Chiapas, Mexico, and is still known from very few specimens. Small differences in the terminal portion of the embolus warrant the continued maintenance of *altamira* as a distinct species.

TYPE LOCALITIES: Of *altamira*, Altamira, Tamaulipas, Mexico, male holotype in the American Museum of Natural History; of *savanna*, Savannah Beach, Georgia, male holotype in the American Museum of Natural History; and of *bryantae*, Duxbury, Massachusetts, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Eastern United States from New England, New York, and Michigan south to Florida, Texas, Mexico, and the West Indies (see fig. 25).

SELECTED RECORDS: *Massachusetts:* Duxbury, June 4, 1921 (E. B. Bryant), male holotype of *bryantae*. *Connecticut:* New Haven, October 5, 1937. Norwalk, June 15, 1933 (W. J. Gertsch), male. *New York:* Orient, Long Island, April 4, 1931, male, two females. *Michigan:* Selfridge Field, May 20, 1944 (B. Malkin), male. *Maryland:* Denton, August 11, 1944 (M. H. Muma), male, female. *North Carolina:* North River, Carteret County, August 15, 1951 (R. D. Barnes), males, females. *Georgia:* Waycross, April 15, 1938 (W. J. Gertsch), males, females. *Alabama:* Hammock Woods, Lagoon, October 29, 1949 (A. F. Archer), female. *Florida:* Okeechobee, March 26, 1938 (W. J. Gertsch), males, females. *Cuba:* Soledad, August, 1931 (N. Banks collection), male. *Tamaulipas:* Altamira, April 8, 1939 (A. M. and L. I. Davis), female holotype of *altamira*. *Jalisco:* Chapala, June 22, 1941 (A. M. Davis), female.

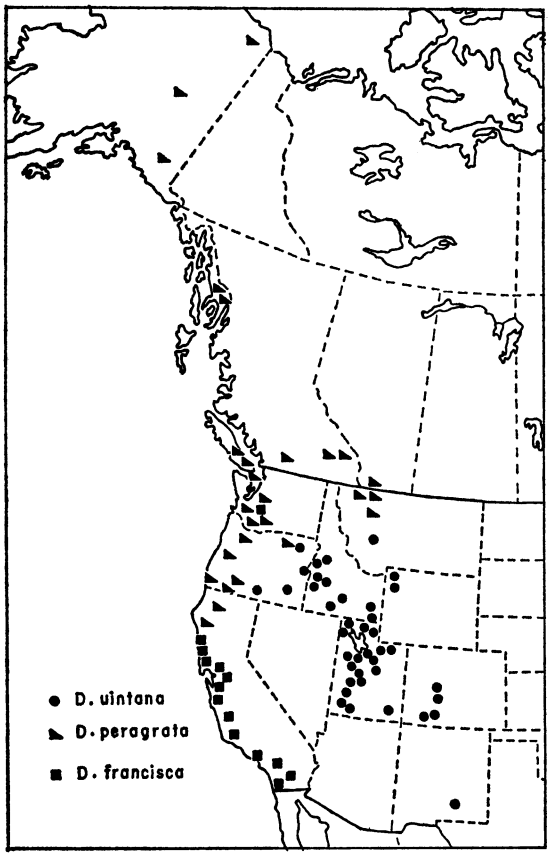


FIG. 31. Distribution of *Dictyna uintana*, *peragrata*, and *francisca*.

Dictyna uintana Chamberlin

Plate 35, figures 12–16; text figure 31

Dictyna uintana CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 240, pl. 14, figs. 3–5. CHAMBERLIN AND GERTSCH, 1928, Proc. Biol. Soc. Washington, vol. 41, p. 175. CHAMBERLIN AND IVIE, 1933, Bull. Univ. Utah, biol. ser., vol. 2, no. 2, p. 4. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 331. GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 13. JONES, 1948, Field and Lab., vol. 16, p. 31. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1326. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1452.

Dictyna socarnia CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 8, fig. 6.

DIAGNOSIS: Female: Total length, 2.6 mm. Carapace, 1.05 mm. long, 0.8 mm. wide. Abdomen, 1.7 mm. long, 1.2 mm. wide. Male: Total length, 2.3 mm. Carapace, 1.2 mm. long, 0.85 mm. wide. Abdomen, 1.2 mm. long, 0.8 mm. wide.

The dorsal view of a typical female is shown in plate 35, figure 16. The carapace varies from light brown to dark chestnut, is dusky to blackish on the sides, and shows the radiating darker lines faintly. The sternum is quite uniform dusky brown. The yellowish legs are distinctly marked with dusky rings in the females, but they may be largely missing in the males. The abdomen has a bold brown pattern on a yellowish base as follows: dorsum yellow to orange, with a broad, basal, dentate band from base to near middle, with a few small spots near side edges and with a large dark caudal mark rarely broken up into the several chevrons that compose it; sides mottled with brown spots and dashes; and the venter yellow, with an indistinct median dusky stripe most often fragmented. Males may be colored as the females but are usually darker, with the abdomen gray or largely dusky over a weak pattern.

The slightly recurved posterior eye row has the eyes separated by the full diameter. The carapace of the female is well elevated, and the clypeus equals about one and one-half diameters of an anterior median eye. The carapace of the male is long and the pars cephalica prominent, the sloping clypeus equaling about two and one-half diameters of the anterior median eye. The male chelicerae are of moderate length, the two together being one-fifth longer than broad, are quite deeply concave as seen from the side, are well bowed apart in front to leave a fusiform opening as wide as the cheliceral width, and have the basal angle developed into a prominent triangular horn with typically quite long, downwardly directed tooth.

The epigynum (pl. 35, fig. 15) presents the oval atria separated by a narrow septum and the lateral foveae well apart to a distance nearly equaling the width of the genital groove or sternum.

The male palpus (pl. 35, figs. 12–14) typifies this group of species. The thick embolus begins near the base of the tegulum on the prolateral side, forms an even curve to the apex, just beyond which it flattens out, and then makes a sharp round curve to lie at a right angle to the segment. The tip of the embolus (pl. 35, fig. 13) has two black points and a whitish spur between them. The somewhat longer than broad tibia is narrow bas-

ally, enlarged at the juncture with the cymbium, and bears a small dorsal spur tipped with two black ctenidia.

TYPE LOCALITIES: Of *uintana*, Chalk Creek, Uintah Mountains, Utah, male and female types in the Museum of Comparative Zoölogy; of *socarnia*, 4 miles up City Creek, Salt Lake City, Utah, female holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountains from Idaho, Montana, and eastern Oregon south to southern New Mexico (see fig. 31).

SELECTED RECORDS: *Oregon:* Snake River, east of Ontario, June, 1943, male, females. Emigrant Hill State Park, Blue Mountains, males, females. Diamond Lake, 5200 feet, July 15, 1935 (F. Lawrence), male. Frenchglen, Harney County, June 26, 1951 (B. Malkin), male, female. Ten miles northwest of Klamath Falls, June 16, 1952 (V. Roth), male, female. In marsh, Spring Creek, Baker County, June 26, 1955 (J. H. Baker), male, females. *Idaho:* Northeast of Fruitland, May 20, 1946, males, females. *Montana:* Goldcreek, August 13, 1929 (R. V. Chamberlin), females. *Utah:* Richfield, May 25, 1930 (W. J. Gertsch), male, female. *New Mexico:* Camp Mary White, Otero County, August 9–12, 1935 (S. Mulaik), female.

Dictyna peragrata Bishop and Ruderman

Plate 35, figures 9–11; text figure 31

Dictyna peragrata BISHOP AND RUDERMAN, 1946, Proc. Ent. Soc. Washington, vol. 59, p. 3, figs. 5–8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

Dictyna bifida JONES, 1947, Field and Lab., vol. 15, p. 8, figs. 19–23; 1948, Field and Lab., vol. 16, p. 30. CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 3.

Dictyna dyea CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 14, figs. 4–6.

DIAGNOSIS: Female: Total length, 2.5 mm. Carapace, 0.8 mm. long, 0.7 mm. wide. Abdomen, 1.6 mm. long, 1.2 mm. wide. Male: Total length, 2.1 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.35 mm. long, 0.95 mm. wide.

This species is a very close relative of *uintana* and agrees with it closely in structure and in coloration (see pl. 35, fig. 16) except as follows: Specimens from high mountains and northern areas are usually more dusky and have the abdominal pattern less distinct. In one of the very common varieties occurring from British Columbia to Alaska the dorsum of the abdomen is white, with a very distinct brown basal band or triangular spot.

The epigynum (pl. 35, fig. 11) is very similar to that of *uintana* and differs externally only in having the lateral foveae slightly less separated.

The male palpus (pl. 35, figs. 9–10) is similar to that of *uintana* and differs only in having the distal half of the embolus evenly curved. The tip of the embolus, which is directed caudad, has two black points and a median pale spine.

TYPE LOCALITIES: Of *peragrata*, Edmonds, Washington, male holotype in Cornell University collection; of *bifida*, Lake Louise, Alberta, Canada, male holotype in the Museum of Comparative Zoölogy; of *dyea*, Haines, Alaska, male holotype in the American Museum of Natural History.

DISTRIBUTION: California and coastal states north into western Canada and Alaska, eastward into northern Montana; Quebec (see fig. 31).

SELECTED RECORDS: *Alaska:* Duncan Canal, Big Castle Island, August 17, 1951 (B. Malkin), females. *British Columbia:* Forbidden Plateau, 4000 feet, Vancouver Island, August 6, 1950 (R. Guppy), male. *Quebec:* Rousseau Bay, Tchapahipane Island, August 23, 1946 (J. Rousseau), one female, probably this species. *Montana:* Bowman Lake, 4100 feet, and Josephine Lake, 4800 feet, Glacier National Park, July and August, 1953 (H. Levi), male and females. *Oregon:* Odell Lake, Klamath County, October 23, 1947 (I. M. Newell), male and immature on conifers. *California:* Strawberry Canyon, Alameda County, April 27, 1940 (W. M. Pearce), females. Squaw Creek, July 15, 1937 (R. V. Chamberlin).

Dictyna chitina, new species

Plate 36, figures 8, 9

MALE: Total length, 1.95 mm. Carapace, 0.9 mm. long, 0.73 mm. wide. Abdomen, 1.15 mm. long, 0.85 mm. wide.

Appearance and structure in close agreement with those of *uintana* and of *peragrata*. Abdomen quite dusky, but the dorsal pattern

distinct. Sternum dusky brown, bordered with black and with a faint linear streak the length.

Carapace of typical proportions, with the pars cephalica of moderate size and prominence, the width at the second eye row being four-sevenths of the width of the carapace. Clypeus sloping, equal in height to two full diameters of the anterior lateral eye. Front eye row weakly procurved, the smaller median eyes separated by the diameter, about half as far from the lateral eyes. Posterior eye row slightly recurved, the median eyes separated by about one and one-half diameters, as far from the slightly larger lateral eyes. Median ocular quadrangle nearly square, only slightly wider behind and the anterior median eyes slightly smaller. Chelicerae rather slender, the two together being three-fourths as broad as long, moderately concave as viewed from the side, only slightly bowed apart in front to leave a long, fusiform opening two-thirds as wide as a chelicera, and the basal angle developed into a small but distinct tooth.

Palpus (pl. 36, figs. 8, 9) similar to that of *uintana* but differing in the following points: distal part of the embolus more evenly rounded but terminated in the same fashion, the tip bearing two black points and a median pale spine; basal spiral similar in shape, but the spur directed backward and outward.

TYPE LOCALITY: Male holotype from Chitina Valley, 30 miles north of Mt. St. Elias, May to June, 1912, in the United States National Museum.

Dictyna francisca Bishop and Ruderman

Plate 35, figures 5–8; text figure 31

Dictyna francisca BISHOP AND RUDERMAN, 1946, Proc. Biol. Soc. Washington, vol. 59, p. 4, figs. 9–11. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321.

DIAGNOSIS: Female: Total length, 2.25 mm. Carapace, 1.05 mm. long, 0.8 mm. wide. Abdomen, 1.4 mm. long, 1.1 mm. wide. Male: Total length, 2.2 mm. Carapace, 1.05 mm. long, 0.8 mm. wide. Abdomen, 1.3 mm. long, 0.9 mm. wide.

This is a close relative of *uintana*, to which it is quite similar in size and general appearance. The dusky to orange-brown carapace is darkest on the sides and shows the dusky radiating lines and marginal line rather distinctly. The sternum varies from uniform dusky yellowish brown to orange-brown with dusky margins. The whitish to yellow legs are faintly marked with dusky rings. The abdomen is gray to whitish, is pale on the venter, dusky or even blackish on the sides, and usually has the dorsum whitish or gray, with a smudgy pattern as follows: a basal band running back half of the length which may be somewhat dentate on the sides but which is usually the darkest mark on the dorsum; and behind this usually only faint suggestions of a caudal series of dusky chevrons.

The slightly recurved posterior eye row has the average median eyes separated by the full diameter to one-half as much more. The carapace is well elevated in both sexes, with the clypeus equal in height to one and one-half diameters of the anterior median eye in the female and two diameters in the male. The male chelicerae are of average length, the two together being five-sixths as broad as long, are quite strongly convex as seen in side view, are bowed apart in front to leave a long fusiform opening not fully the width of a chelicera, and have the basal angle developed into a quite heavy horn.

The epigynum (pl. 35, fig. 5) is similar to that of *uintana*. The suboval atria are separated by a septum of moderate width, and the lateral foveae are separated by a distance not fully the width of the genital groove or the sternum.

The male palpus (pl. 35, figs. 6–8) is similar in type to that of *uintana*. The thick embolus arises below the middle of the tegulum on the prolateral side and forms a regular oval, with the distal portion curled to hook form and ending in two distinct points. The basal spiral of the conductor is narrowly turned, and the terminal spur is directed nearly caudad. The tibia is about twice as long as wide, is deeply emarginated on the retrolateral side, and bears near the base the short dorsal spur tipped with two ctenidia.

TYPE LOCALITY: San Francisco, California, male holotype in the Cornell University collection.

DISTRIBUTION: California and Washington (see fig. 31).

SELECTED RECORDS: *California:* Pacific Grove, August 3, 1932 (S. D. Durrant),

male, female. San Diego River, near mouth, July 12, 1931, female. Gualala, male, female paratypes. Santa Barbara, April 18, 1948 (H. L. Shantz), males, females. Cleveland National Forest, near Henshaw Reservoir, San Diego County, July 30, 1936 (V. Roth, W. J. Gertsch), males, females. *Washington:* Longmire, August 19, 1929 (R. V. Chamberlin), male.

Dictyna crocana Chamberlin

Plate 34, figures 16, 17

Emblyna crocana CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 10.
Dictyna crocana ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

DIAGNOSIS: Male: Total length, 2 mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.15 mm. long, 0.75 mm. wide.

This species is closely allied to *uintana* and *peragrata* and differs from these chiefly in genitalic features. The carapace is quite uniform chestnut brown and is darkest on the pars thoracica. The dusky brown sternum is darkened along the borders. The dull yellowish legs are marked with narrow black rings. The venter of the abdomen has a broad, median, dark band irregularly interrupted with lighter color. The dorsum of the abdomen has a black basal mark, which is moderately constricted at the middle and expanded in deltoid form caudally, followed behind by a series of partially connected chevron marks.

The posterior eye row is slightly procurved, and the median eyes are nearly two full diameters apart. The pars cephalica of the male is prominent and moderately elevated, the clypeal height equaling two diameters of an anterior median eye. The male chelicerae are of moderate length, are quite strongly concave as viewed from the side, are moderately bowed apart in front to leave a fusiform opening, and the basal angle is developed to a conspicuous conical horn.

The only known female, the allotype, has been mislaid, so that the proper placement of this female with the holotype must be deferred.

The male palpus (pl. 34, figs. 16, 17) is very similar to that of *peragrata*. The distal portion of the embolus is more slender, and the two branches are equal in length instead of being unequal. The basal spiral of the conductor forms a bluntly rounded spur.

TYPE LOCALITY: Crow Canyon, Alameda County, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: California.

KNOWN RECORD: *California:* Crow Canyon, California, April 21, 1940 (W. M. Pearce), male, female.

Dictyna decaprini Kaston

Plate 36, figures 5–7

Dictyna decaprini KASTON, 1945, Amer. Mus. Novitates, no. 1292, p. 3, fig. 10; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 512, pl. 105, fig. 1955. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

DIAGNOSIS: Female holotype: Total length, 1.55 mm. Carapace, 0.65 mm. long, 0.49 mm. wide. Abdomen, 0.97 mm. long, 0.58 mm. wide. Male: Total length, 1.45 mm. Carapace, 0.66 mm. long, 0.54 mm. wide. Abdomen, 0.9 mm. long, 0.65 mm. wide.

The orange-brown carapace is dusky on the pars cephalica, which is margined by a more or less distinct dusky line. The sternum is dull yellow and is dusky along the borders. The yellowish legs are without contrasting markings. The abdomen is grayish, somewhat darker above but without trace of pattern.

The slightly curved posterior eye row has the eyes separated by the full diameter of the median eyes. The pars cephalica is of moderate elevation as indicated by the clypeal height, which equals about the diameter of the anterior median eyes in the female and not fully two diameters in the male. The male chelicerae are of moderate length, moderately concave as seen from the side, are bowed apart in front to leave a long fusiform opening, and the basal angle is rounded.

The epigynum (pl. 36, fig. 5) is similar to that of *capens*. The suboval, advanced atria are proportionately large, separated by a moderate septum, and the lateral foveae are quite nearby, their greatest separation being about five-sixths of the width of the genital groove or sternum.

The male palpus (pl. 36, figs. 6, 7) is similar to that of *capens*. The thick embolus originates at the front end of the tegulum, is relatively short, and curved broadly at the distal

end to form a hook. The conductor is large, and the basal spiral forms a rounded lobe. The dorsal process of the tibia is short and bears the two black ctenidia.

TYPE LOCALITY: Branford, Connecticut, female holotype in the American Museum of Natural History.

DISTRIBUTION: Connecticut and New York.

KNOWN LOCALITIES: *Connecticut:* Branford, July 2, 1937 (B. J. Kaston), female holotype. *New York:* Rochester, May (S. C. Bishop), one male.

Dictyna evicta Gertsch and Mulaik

Plate 36, figures 1–4

Dictyna evicta GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 332, fig. 18. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

DIAGNOSIS: Female: Total length, 1.95 mm. Carapace, 0.75 mm. long, 0.55 mm. wide. Abdomen, 1.3 mm. long, 0.95 mm. wide. Male holotype: Total length, 1.8 mm. Carapace, 0.9 mm. long, 0.65 mm. wide. Abdomen, 1 mm. long, 0.72 mm. wide.

The dull orange-brown carapace is dusky on the pars thoracica where the usual dusky radiating lines are present, and the margin has a distinct narrow black seam. The sternum is a quite uniform dusky orange-brown. The dusky yellowish legs show faint traces of darker rings. The abdomen varies from dusky yellow to nearly black and shows no dorsal pattern except a few small pale spots.

The posterior eye row is slightly recurved, and the median eyes are separated by the full diameter. The carapace is of moderate elevation, with the clypeus equaling the diameter of the anterior median in the female and not fully two diameters in the male. The male chelicerae are of moderate length, the two together being only slightly longer than the width, are typically concave from the side, bowed in front to leave a fusiform opening, and have the basal angle a rounded carina.

The epigynum (pl. 36, fig. 3) presents the advanced suboval atria separated by a small septum and the lateral foveae quite widely separated to a distance equal to the width of the sternum or the genital groove.

The male palpus (pl. 36, figs. 1, 2, 4) is one of the most distinctive of the series. The thick embolus arises near the front edge of the tegulum, makes a short spiral into the conductor, and is then broadly curved to end in a wide truncated blade. The spiraled base of the conductor presents two distinct lobes. The tibia is narrow basally, is enlarged to three-fourths of the length at apex, and bears above near the base a short spur bearing two black ctenidia.

TYPE LOCALITY: Hays County, Texas, April 15, 1939 (D. and S. Mulaik), male holotype in the American Museum of Natural History.

DISTRIBUTION: Eastern Texas and Alabama.

OTHER RECORD: *Alabama:* Tuscaloosa, 1941 (A. F. Archer), male, female.

Dictyna capens Chamberlin

Plate 36, figures 10–14

Emblyna capens CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., 10, no. 6, p. 9, figs. 58, 65. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1314.

DIAGNOSIS: Female: Total length, 1.9 mm. Carapace, 0.7 mm. long, 0.57 mm. wide. Abdomen, 1.25 mm. long, 0.87 mm. wide. Male: Total length, 1.8 mm. Carapace, 0.85 mm. long, 0.67 mm. wide. Abdomen, 0.95 mm. long, 0.65 mm. wide.

This species is a close ally of *evicta*, but it is easily differentiated by color pattern and genitalic features. The dorsal view of a female is shown in plate 36, figure 13. The dusky orange to chestnut carapace is darkest on the pars thoracica which shows the dark radiating lines faintly. The sternum is dusky over a yellow or orange ground. The dusky yellowish legs show faint dark rings. The dorsum of the abdomen is typically dusky to solid black on the sides and shows a distinct white stripe from base to apex which encloses a black dash at base and is reticulated with dusky. The venter is mostly gray and may have dark patches in front of the spinnerets.

The structure is very similar to that of *evicta*. The posterior eye row is slightly recurved, and the median eyes are separated by the full diameter. The carapace of the female is moderately elevated, with the clypeal height equaling the full diameter of the lateral eye. The pars cephalica of the male is prominent, and the sloping clypeus is equal

in height to two diameters of the anterior median eye. The male chelicerae are of moderate length, are quite strongly convex as seen from the side, are bowed in front to leave a fusiform opening about equal to the cheliceral width, and have the basal angle a quite prominent rounded carina.

The epigynum (pl. 36, fig. 10) is similar to that of *evicta*, but the septum between the suboval atria is usually broader and the lateral foveae are nearer together, their greatest separation being somewhat less than the width of the genital groove or sternum.

The male palpus (pl. 36, figs. 11, 12, 14) is very similar to that of *evicta* and differs from it in the details of the embolus, which ends as a quite thin blade, and in the proportionately shorter tibia.

TYPE LOCALITY: Gainesville, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from Florida.

KNOWN RECORDS: *Florida:* Lake Alfred, October 1, 1951 (M. Muma), male from orange leaf. Key West, February 17, 1951 (A. M. Nadler), female. Gainesville, February 28, 1925 (W. M. Barrows), male. Calhoun County, April 12, 1935 (H. K. Wallace), male. Everglades, December 27, 1950 (A. M. Nadler), female. Auburndale, March 4, 1936 (S. C. Bishop), female. Kendall, March 4–31, 1953, male, five females, November 3, 1952 (A. M. Nadler), four females.

Dictyna jonesae Roewer

Plate 37, figures 10–13

Dictyna montana JONES, 1948, Field and Lab., vol. 16, p. 37, figs. 18–20.

Dictyna jonesae ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322 (new name for *montana* Jones.)

DIAGNOSIS: Male: Total length, 2.3 mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.3 mm. long, 0.8 mm. wide.

The golden brown carapace is dusky on the sides of the head and has faint radiating thoracic lines and a narrow dusky marginal seam. The golden sternum is shaded on the margins. The yellowish legs lack darker markings. The yellowish abdomen is somewhat iridescent and has the typical basal band and caudal chevrons above.

The slightly recurved posterior eye row has the eyes separated by one and one-half diameters. The head is typically elevated, and the clypeal height is slightly greater than two diameters of an anterior median eye. The chelicerae are long, concave in front, slightly bowed apart to form a long fusiform opening, and have a rounded angle outside near the base.

The male palpus (pl. 37, figs. 10–13) is a very distinctive one. The thick embolus is angled at its origin at about the middle of the tegulum, forms an even narrow loop, and is enlarged and twisted apically. The lateral sclerotized band of the conductor is thin and the small basal spiral ends in a caudally directed, truncated spur. The longer than broad tibia is curved, narrowed at the base, and bears above a thin sharp spur bearing small black ctenidia.

TYPE LOCALITY: Hyalite Canyon, Bozeman, Montana, June 22, 1936 (M. H. Hatch), male holotype in the Museum of Comparative Zoölogy. This is the only known specimen.

Dictyna annulipes Blackwall

Plate 37, figures 1–5; text figure 32

Ergatis annulipes BLACKWALL, 1846, Ann. Mag. Nat. Hist., vol. 17, p. 42.

Ergatis diligens BLACKWALL, 1871, Ann. Mag. Nat. Hist., ser. 5, vol. 8, p. 434.

Dictyna annulipes MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509. BANKS, 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 107 (catalogue). LEVI AND LEVI, 1951, Zoologica, vol. 36, p. 235. LEVI AND FIELD, 1954, Amer. Midland Nat., vol. 51, no. 2, p. 464. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1310. HACKMAN, 1954, Acta Zool. Fennica, vol. 79, pp. 9, 92. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1426.

Dictyna diligens MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509. BANKS, 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108 (catalogue).

Dictyna mitis THORELL, 1875, Svenska Vetensk. Akad. Handl., vol. 13, no. 5, p. 72. HOLM, 1945, Arkiv for Zool., vol. 36A, no. 15, p. 73, figs. 24a–24d.

Dictyna arundinaceoides KEYSERLING, 1884, Verhandl. Zool. Bot. Gesell. Wien, vol. 33, p. 665, pl. 21, fig. 15. JONES, 1947, Field and Lab., vol.

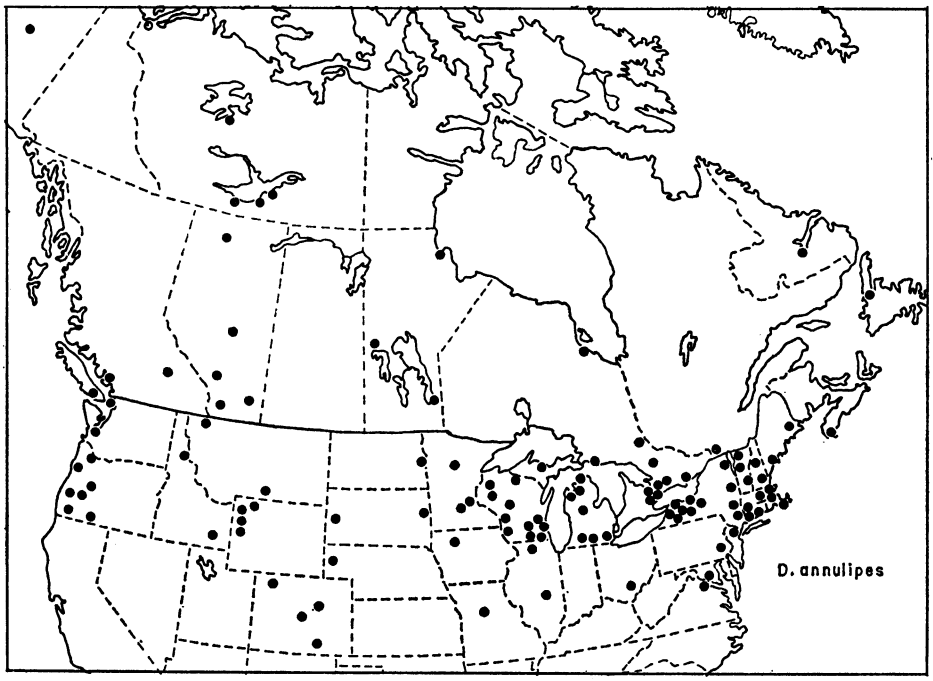


FIG. 32. Distribution of *Dictyna annulipes*.

15, p. 21, figs. 57–61; 1948, Field and Lab., vol. 16, p. 29.

Dictyna muraria EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 445, pl. 9, figs. 1–1g (part). MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509 (catalogue). BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 27; 1904, Jour. New York Ent. Soc., vol. 12, p. 83; 1910, Bull. U. S. Natl. Mus., no. 72, p. 18 (catalogue; in part). EMERTON, 1902, The common spiders of the United States, p. 210 (in part, not fig. 486). BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 4 (catalogue); 1924, Canadian Ent., vol. 56, p. 124. BARROWS, 1918, Ohio Jour. Sci., vol. 18, p. 320. KASTON, 1945, Amer. Mus. Novitates, no. 1292, p. 2, figs. 1–3; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 506, pl. 102, fig. 1893, pl. 103, figs. 1919–1926, pl. 136, figs. 2073–2074. CHAMBERLIN AND IVIE, 1947, Bull. Univ. Utah, biol. ser., vol. 10, no. 3, p. 15.

Dictyna sublata BANKS, 1891, Ent. News, vol. 2, p. 85. COMSTOCK, 1912, The spider book, p. 281, figs. 263–266; 1940, *op. cit.*, rev. ed., p. 282, figs. 263–266. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 328.

Dictyna insolens CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 242, pl. 15, fig. 6. WORLEY, 1932, Univ. Washington Publ. Biol., vol. 1, p. 18.

Dictyna vigilans GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 11, fig. 25. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. MUMA, 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6.

Dictyna emertoni JONES, 1947, Field and Lab., vol. 15, p. 15, figs. 38–41.

DIAGNOSIS: Females vary from 1.7 mm. to 4.5 mm., and average 3 mm. in total length. Males average 2.5 mm. Carapace of a typical female, 1.2 mm. long, 1 mm. wide.

The carapace is dull reddish brown, darkest on the sides of the head, and the pars thoracica has a narrow brown marginal seam and the usual series of radial streaks. The sternum varies from orange to dusky brown and is usually quite uniform in tone. The yellow to orange-brown legs are provided with distinct dusky rings, usually incomplete above. The dull to bright yellow abdomen is marked with a dusky to black pattern as follows: dorsum with a broad basal stripe, broadest behind and slightly dentate on the sides, and a series of quite heavy chevrons behind; sides with irregular spotting; and the venter usually with a broad median dark band usually indistinct and in some specimens enclosing pale spots and lines. The

males usually have unmarked legs, and the abdomen is darker, the dorsal patterns often run together to form a solid dusky brown color.

The rather small posterior eyes lie in a slightly recurved row, and the median eyes are separated by the full diameter to half again more. The carapace of the female is of average elevation, with the clypeal height equaling one and one-fourth diameters of an anterior median eye. The pars cephalica of the male is prominent, quite broad in front, strongly elevated, and the sloping clypeus equals two or slightly more diameters of the median eye in height. The male chelicerae are quite long, the two together being only three-fourths as wide as long, are deeply concave in front, lightly bowed apart on the sides to form a long fusiform opening, and the basal angle forms a small nodule. In minor males the clypeus is subvertical, and the chelicerae are proportionately shorter and less concave.

The epigynum (pl. 37, fig. 3) presents two shallow round atria, largely margined by conspicuous brown carinae and lateral foveae which are variably separated to a distance clearly less than, to nearly the full width of, the sternum or genital groove.

The male palpus (pl. 37, figs. 1, 2, 4, 5) is quite similar to that of *phylax*. The thick embolus originates at the middle of the tegulum and forms a quite regular oval loop, tighter than in *phylax*, and lies hidden in the large conductor, which forms a twisted, truncated spur on the side. The distal part of the embolus is grooved and twisted and in prolateral view is considerably flattened (pl. 37, figs. 4, 5). The tibia is nearly as broad apically as the length, is somewhat narrow basally, and armed above with a short stout spur tipped with two black ctenidia.

TYPE LOCALITIES: Of *Ergatis annulipes*, vicinity of Toronto, Ontario, female type presumed lost; of *Ergatis diligens*, Montreal, Quebec, immature female type presumed lost; of *Dictyna mitis*, Jekaterinoslaw, Russia, type material probably in the Stockholm Museum; of *Dictyna muraria*, Massachusetts, male and female cotypes in the Museum of Comparative Zoölogy; of *Dictyna arundinaceoides*, Canyon City, Colorado, female type in the United States National Museum; of *Dictyna insolens*, Olympia, Washington, male holotype in the Museum of Comparative Zoölogy; of *Dictyna vigilans*, Minneapolis, Minnesota, male holotype in the American Museum of Natural History; of *Dictyna semota*, Waterloo, Wisconsin, male holotype in the American Museum of Natural History; of *Dictyna emertoni*, Franconia, New Hampshire, male holotype in the Museum of Comparative Zoölogy; and of *Emblyna eugenia*, Eugene, Oregon, female holotype in the American Museum of Natural History.

The common Holarctic *Dictyna annulipes* Blackwall has been given 10 different specific names during its long and checkered bibliographic career. Until half a dozen years ago American authors used a variety of names to cover this not so variable or difficult species. Some of the synonyms were the result of early misidentifications of the older names. Keyserling's *arundinaceoides* was applied erroneously to the species now bearing the name *coloradensis*. Emerton misidentified his own *muraria* with the species called *hentzi* by Kaston. In "The spider book," J. H. Comstock described and figured this spider and its web under the name *sublata*, a much-used pigeonhole for several other species.

DISTRIBUTION: A species of Holarctic range, known from Scandinavia, Russia, and Siberia in Eurasia; in North America, widespread in the northern United States, over a large part of Canada and into Alaska (see fig. 32).

SELECTED RECORDS: *Newfoundland:* Humber River, September, 1912 (G. C. Shaltuck), female. *Ontario:* Fort Albany, June 26, 1942 (F. A. Urquhart), male. *Mackenzie:* Fort Resolution, Great Slave Lake, June 24, 1945, females. *Alaska:* One male without specific locality labeled *polaris* by Marx. College, June 26, 1945 (J. C. Chamberlin), males. *British Columbia:* Salmon Arm, May 25, 1938 (H. B. Leech), males and females. *Missouri:* Columbia, 1906, female. *Florida:* Enterprise, one female labeled *arundinaceoides* by Marx, possibly a spurious locality.

Dictyna phylax Gertsch and Ivie

Plate 37, figures 6–9; text figure 33

Dictyna phylax GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 7, figs. 29–30. KU-

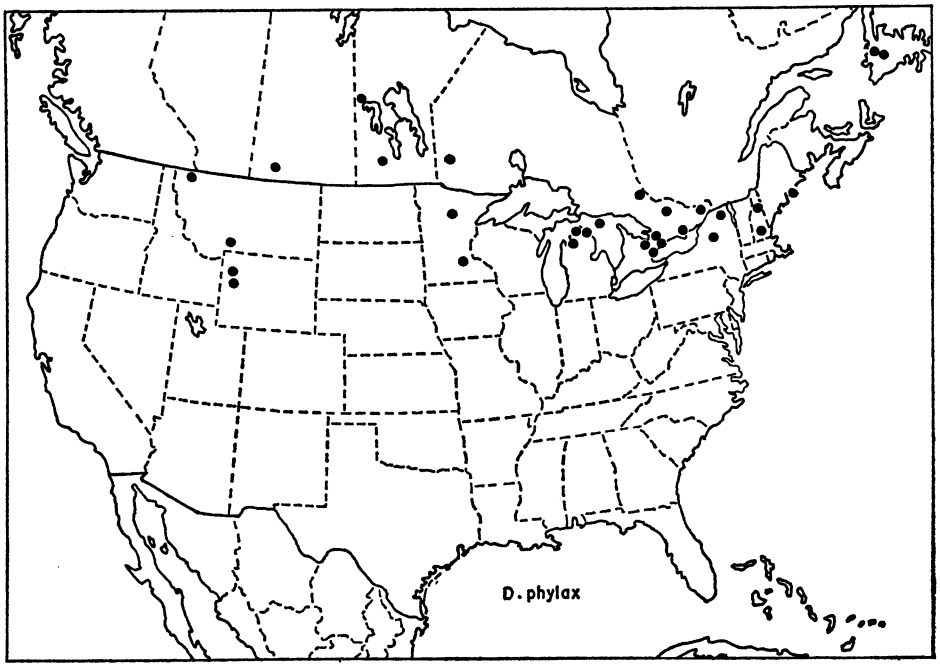


FIG. 33. Distribution of *Dictyna phylax*.

RATA, 1939, Canadian Field Nat., vol. 53, p. 81. LEVI AND LEVI, 1951, Zoologica, vol. 36, p. 235. HACKMAN, 1954, Acta Zool. Fennica, vol. 79, pp. 9, 93. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1447.

Dictyna contorta JONES, 1947, Field and Lab., vol. 15, p. 6, figs. 14–18.

DIAGNOSIS: Female: Total length, 3.2 mm. Carapace, 1.25 mm. long, 1 mm. wide. Abdomen, 1.9 mm. long, 1.4 mm. wide. Male: Total length, 2.8 mm. Carapace, 1.4 mm. long, 1 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

The carapace is bright orange-brown, with the sides of the head darker and the pars thoracica faintly marked with radiating brown streaks. The sternum varies from clear yellow to bright orange. The dusky yellow to orange legs lack contrasting markings. The base color of the abdomen varies from whitish to orange, or even pinkish, and has an obscure pattern as follows: dorsum with a broad basal band widest behind and indistinct chevrons behind; sides heavily spotted with brown; and the venter whitish on the sides and with a faint median brownish band. The male is darker in color, the carapace often being quite uniform reddish or orange-brown and the abdomen dusky reddish brown without trace of dorsal pattern.

The slightly recurved posterior eye row has the rather small eyes separated by one and one-half diameters of the median eyes. The carapace of the female is quite strongly elevated, and the clypeus is about twice as high as the diameter of the anterior median eye. The pars cephalica of the male is very high and convex, is broad in front, and the inclined clypeus equals about three diameters of the anterior median eye, or the full length of the median ocular quadrangle. The male chelicerae are long, the two together being three-fourths as wide as the length, strongly curved as seen from the side, slightly bowed apart to leave a long fusiform opening, and has the basal angle developed to a weak nodule.

The female epigynum (pl. 37, fig. 8) presents two suboval atria of medium size, with a distinct angle at the front edge, and lateral foveae separated by almost the width of the sternum or genital groove.

The male palpus (pl. 37, figs. 6, 7, 9) is

similar in general appearance to that of *annulipes* but is proportionately larger in size. The thick embolus begins at the middle of the tegulum on the prolateral side, forms a regular oval, and is twisted and modified in the distal portion as shown in plate 37, figure 7. The twisted conductor is produced into a small triangular spur. The tibia is clearly longer than the broad apical width and is narrowed at the base where is situated the short dorsal spur tipped with two black ctenidia.

TYPE LOCALITIES: Of *phylax*, Itasca Park, Minnesota, male holotype in the American Museum of Natural History; and of *contorta*, Randolph, New Hampshire, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Extreme northern United States and adjacent Canada from Newfoundland to Wyoming, Montana, and Alberta (see fig. 33).

SELECTED RECORDS: *Newfoundland:* Kittys Brook and Gaff Topsail, August, 1954 (Hackman), subadult specimens from bogs. *Maine:* Mt. Desert Island, June 23, 1943 (W. M. Procter), female. *Ontario:* Minaki, July 23, 1931 (T. B. Kurata), females. *Saskatchewan:* Lac La Ronge, July 10, 1947 (T. B. Kurata), females. *Manitoba:* The Pass, July 7, 1931 (T. B. Kurata), females. *Montana:* Bowman Lake, 4100 feet, Glacier National Park, August 4, 1953 (H. Levi), male, females.

THE *sublata* GROUP

In this interesting group and the one that follows are placed about 40 species in which the chelicerae are of the conventional type. They are more slender, curved in lateral view to leave a frontal concavity, and are moderately to considerably bowed apart to leave a fusiform, or more rarely an elongated oval, opening. The inner margins of the opening are often conspicuously carinate, but no teeth are present at the apex. The basal angle is rounded and never produced into a conspicuous spur or horn. Typical examples of these chelicerae are shown in plate 38, figures 1 and 2 (*sublata*), and plate 35, figure 4 (*altamira*).

The present group is based arbitrarily on the basal origin of the embolus from the tegulum and brings into the group three or four borderline types. In one of these (*iviei*) the thick embolus is thinned apically and ends with a wide transverse bar. In the others the thick embolus is enlarged and strikingly modified in the apical portion. The acme of specialization is reached in such species as *sublata* and *suprenans* (pl. 39, figs. 3, 4, 7, 8) in which the heavily ribbed emboli are produced into twisted spines and lobes. The tibiae of the palpi are rather slender and present above at the base a short spur set with two black ctenidia. The epigyna are similar to those of the *borealis* group in presenting large oval atria and moderately well-separated lateral foveae, as can be seen in plate 38, figure 5 (*sublata*), and figure 9 (*maxima*). In the *olympiana* series (pl. 41, fig. 2) and in *iviei* (pl. 40, fig. 11) the epigyna have much smaller atria.

The typical species of this group (*sublata*, *suprenans*, *orbiculata*, *maxima*, and *zaba*) are distributed in the eastern United States. Two species from the Pacific coast (*olympiana* and *serena*) are of fairly close alliance.

Dictyna sublata Hentz

Plate 38, figures 1–8; plate 39, figures 1–5; text figure 34

Theridion sublatum HENTZ, 1850, Jour. Boston Soc. Nat. Hist., vol. 6, p. 276, figs. 9–10.

Theridion hypophyllum FITCH, 1869, Trans. New York State Agr. Soc., vol. 29, p. 564.

Tegenaria philoteichus MCCOOK, 1876, Proc. Acad. Nat. Sci. Philadelphia, p. 201; 1893, American spiders, vol. 3, pl. 29, figs. 4–5.

Dictyna sedentaria KEYSERLING, 1880, Verhandl. Zool. Bot. Gesell. Wien, vol. 30, p. 573, pl. 16, fig. 20. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510 (catalogue).

Dictyna volupis KEYSERLING, 1881, Verhandl. Zool. Bot. Gesell. Wien, vol. 31, p. 285, pl. 11, fig. 10. EMERTON, 1888, Trans. Connecticut Acad. Arts Sci., vol. 7, p. 448, pl. 9, figs. 8–8e. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 510. BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28; 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 5. BARROWS, 1918, Ohio Jour. Sci., vol. 18, p. 302.

Dictyna decorata BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28, pl. 1, fig. 81, pl. 7, fig. 81; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue); 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108 (catalogue).

Dictyna dubia BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 29, pl. 1, fig. 82.

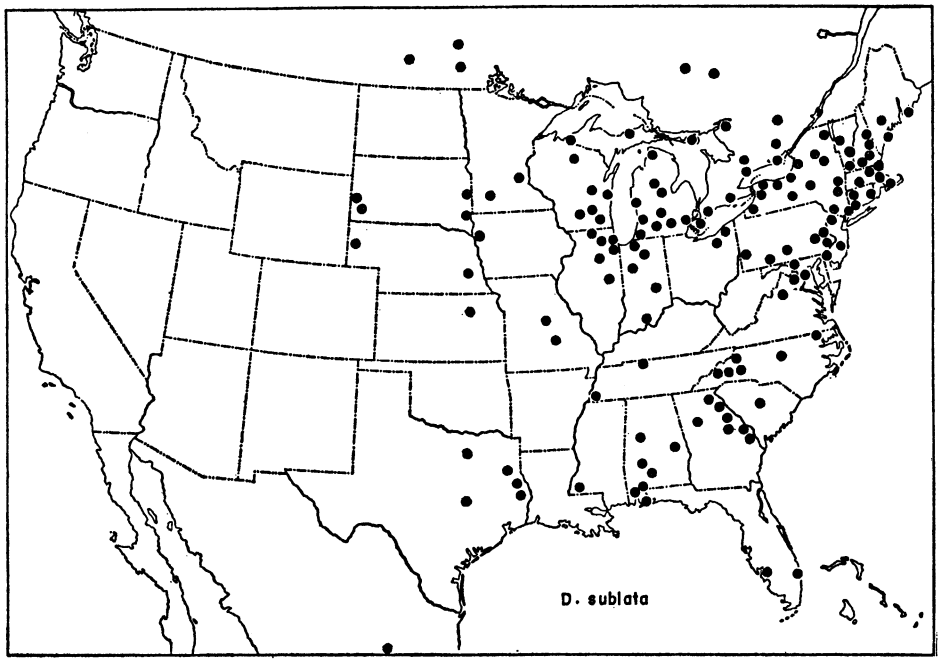


FIG. 34. Distribution of *Dictyna sublata.*

Dictyna civica SIMON, 1892, Histoire naturelle des araignées, vol. 1, p. 235 (*philoteichus* only; not *civica* Lucas). BANKS, 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 18 (catalogue).

Dictyna foliacea BANKS, 1900, Proc. Acad. Nat. Sci. Philadelphia, p. 534; 1904, Jour. New York Ent. Soc., vol. 12, p. 83; 1904, Proc. Acad. Nat. Sci. Philadelphia, p. 124; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue); 1911, Proc. Acad. Nat. Sci. Philadelphia, p. 443; 1932, *in* Banks, Newport, and Bird, Publ. Univ. Oklahoma, vol. 4, p. 20. SCHEFFER, 1905, Kansas Univ. Sci. Bull., vol. 3, no. 3, p. 117. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109. BISHOP AND CROSBY, 1926, Jour. Elisha Mitchell Sci. Soc., p. 172. JONES, 1936, Field and Lab., vol. 4, p. 69; 1947, Field and Lab., vol. 15, no. 1, p. 30, figs. 73–77. GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 17. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 329.

Dictyna foliata MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509 (catalogue).

Dictyna sublata BANKS, 1895, Ann. New York Acad. Sci., vol. 8, p. 422; 1904, Proc. Acad. Sci. Philadelphia, p. 125; 1910, Bull. U. S. Natl. Mus., no. 72, p. 18 (catalogue); 1911, Proc. Acad. Nat. Sci. Philadelphia, p. 443. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 111 (catalogue). WORLEY AND PICKWELL, 1931, Publ. Zool. Univ. Nebraska, vol. 28, no. 135, p. 114, p. 12. KASTON, 1938, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 60, p. 178 (catalogue); 1945, Amer. Mus. Novitates, no. 1292, p. 2, figs. 7–9; 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 504, pl. 102, fig. 1891, pl. 103, figs. 1909–1912, 1914–1916. KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 122. MUMA, 1945, Bull. (Tech.) Univ. Maryland Agr. Exp. Sta., no. A38, p. 6. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1325. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1450.

DIAGNOSIS: Females and males vary from 2 mm. to 3.5 mm. in total length and average about 2.7 mm. Carapace of an average female, 1.1 mm. long, 0.9 mm. wide. Carapace of an average male, 1.2 mm. long, 0.95 mm. wide.

The carapace of the female is dark brown on the sides, sometimes almost black, with darker radiating lines usually well indicated, and the head much paler, varying from yellow to dusky orange. The sternum varies from yellow to orange. The white to pale yellow legs have no contrasting markings.

The abdomen is quite variable in color. In some examples the dorsum is broadly pale in the middle, sometimes with a faint pattern, and on each side there is a broad reddish brown stripe. In others the median band is broken behind by reddish brown chevrons. Occasionally the whole dorsum is dusky to black, without trace of paler pattern. The venter is usually white to yellow, with a faint dusky reddish stripe from epigynum to spinnerets.

The carapace of the male is quite uniform bright orange, with only faint traces of the darker radiating lines. The legs are yellowish, and the first two pairs may be orange. The abdomen is also bright orange, with a purplish iridescence, and may show traces of a paler pattern of spots on the dorsum.

The slightly recurved posterior eye row has the rather small eyes well separated by about one and one-half times the long diameter of the median eye. The head of the female is typically elevated, with the clypeal height equaling two full diameters of the small anterior median eye. The carapace is proportionately longer in the male, with the head strongly elevated, quite broad in front and prominent, and the sloping clypeus equaling three full diameters. The male chelicerae (pl. 38, fig. 3) are of moderate length, the two together being only three-fourths as wide as long, are strongly concave in front, are bowed slightly apart to form a median fusiform opening, and the basal angle is a sharp longitudinal ridge forming a rounded tooth or nodule.

The epigynum (pl. 38, figs. 5, 6) presents two large oval atria separated by a narrow septum and lateral foveae separated by about the width of the sternum. The internal tubes and receptacles are usually visible through the integument as shown in the plate. The details of the internal genitalia are illustrated in plate 38, figures 7 and 8.

The male palpus (pl. 39, figs. 1–5) is one of the most distinctive of the entire series. The embolus arises near the base of the small tegulum as a thick black rod, which curves evenly around the cymbium, where it is flattened and strengthened with three black ribs, and then curves ventrad to become hidden in the cymbium. The tip of the embolus gives off two long, curved, thin rods as shown in the plate. The large and complicated conductor is greatly inflated at the base and hides the curved ventral tooth. The long tibia is curved strongly ventrad, is greatly widened distally, and bears above the narrow base a low process bearing two black ctenidia.

TYPE LOCALITIES: Of *Theridion sublatum*, Alabama, the original material destroyed; of *Theridion hypophyllum*, New York State, the original material probably destroyed; of *Tegenaria philoteichus*, eastern Pennsylvania, types in the Academy of Natural Sciences of Philadelphia, if extant; of *Dictyna sedentaria*, Baltimore, Maryland, female type probably in the British Museum (Natural History) (L. Koch collection); of *Dictyna volupis*, Massachusetts, female type in the Museum of Comparative Zoölogy; of *Dictyna decorata*, upper Cayuga Lake basin, New York, three female and immature cotypes in the Museum of Comparative Zoölogy; and of *Dictyna dubia*, upper Cayuga Lake basin, New York, female type in the Museum of Comparative Zoölogy.

DISTRIBUTION: Widespread in the eastern United States and adjacent Canada from Labrador to Manitoba, south into Texas, eastern Mexico, and Florida (see fig. 34).

SELECTED RECORDS: *Manitoba:* Victoria Beach, June 29, 1931 (T. B. Kurata), males and females. *South Dakota:* Horsethief Lake, Pennington County, June 21, 1952 (H. Levi), male, female. *Alabama:* Lagoon, April 24, 1951 (A. F. Archer), males and females. *Mississippi:* Centreville, January to June, 1944 (A. F. Archer), males and females. *Texas:* Brazos River, 5 miles west of Hearne, July 19, 1938 (L. I. Davis), female. *Nuevo Leon:* Horsetail Falls, 25 miles south of Monterrey, June 11, 1936 (A. M. and L. I. Davis), female.

The vicissitudes in the use of the name *sublata* have been responsible for great confusion in the literature. The name was used quite consistently for the following eastern species of the genus: *annulipes* (by Banks and Comstock): *foliacea* (by Banks, Jones, and many others); *hentzi* (by Emerton, Gertsch, and others); and for the true *sublata* by Banks, Kaston, Chamberlin, Ivie, and many others). In addition, Banks used the name for specimens from British Columbia (probably *peragrata*), from California (*francisca* and possibly other species), and for unknown species from Colorado, Arizona,

and Baja California. Because of this uncertainty, quite a number of records have been disregarded, so to that extent the bibliography of this species is incomplete.

This handsome species, which is not known to occur west of the Rocky Mountains, was well illustrated by Hentz under the name *Theridion sublatum*. In 1947, Jones reversed the current interpretation of this name and assigned it to the species herein known as *foliacea* (=*frondea*). Furthermore, male and female neotypes from Falls Church, Virginia, were designated to stabilize the name *sublata*. These neotypes, which in any case were of doubtful validity in their establishment, are spurious.

Dictyna suprenans Chamberlin and Ivie

Plate 38, figure 10; plate 39, figures 6–9

Dictyna suprenans CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah, biol. ser., vol. 2, no. 8, p. 28, pl. 12, fig. 92. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1316. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1451.

DIAGNOSIS: Female: Total length, 3.5 mm. Carapace, 1.35 mm. long, 1.05 mm. wide, Abdomen, 2.5 mm. long, 2 mm. wide. Male: Total length, 2.5 mm. Carapace, 1.2 mm. long, 0.9 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

This handsome species agrees closely in coloration with *sublata* and exhibits the typical color patterns as well as the melanic forms. The size average for the species is greater in *suprenans*, but the species parallels *sublata* closely in structure except for the genitalia.

The epigynum (pl. 38, fig. 10) is similar to that of *sublata*, but the shallow atria are nearly round, instead of oval, and the lateral foveae are less widely separated, being clearly narrower than the genital groove.

The male palpus (pl. 39, figs. 6–9) is proportionately larger and flatter than that of *sublata*, with the longer embolus forming a larger loop. The distal part of the embolus is similar to that of *sublata*, but the elements are distinct in form as shown in plate 39, figures 7 and 8. The conductor is about the same size and lies in much the same position as in *sublata*. The tibia is longer than in *sublata* but bears the rather small dorsal spur in the same position.

TYPE Locality: Gainesville, Florida, male holotype in the American Museum of Natural History.

DISTRIBUTION: Florida.

KNOWN RECORDS: *Florida:* West of Gainesville, April 18, 1938 (W. J. Gertsch), males and females. Hillsborough River State Park, April 8, 1938 (W. J. Gertsch), female. Torreya Ravine State Park, April 4, 1957 (W. J. Gertsch and R. Forster), males and females.

Dictyna maxima Banks

Plate 38, figure 9; plate 40, figures 1–4; text figure 35

Dictyna maxima BANKS, 1892, Proc. Acad. Nat. Sci. Philadelphia, p. 28, pl. 1, fig. 79, pl. 2, fig. 79a; 1910, Bull. U. S. Natl. Mus., no. 72, p. 17 (catalogue); 1916, Proc. Acad. Nat. Sci. Philadelphia, p. 71, pl. 10, fig. 15. BRYANT, 1908, Occas. Papers Boston Soc. Nat. Hist., vol. 7, p. 3 (catalogue). PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 110 (catalogue). KURATA, 1939, Canadian Field Nat., vol. 53, p. 81. JONES, 1947, Field and Lab., vol. 15, p. 23, figs. 62–66. KASTON, 1948, Connecticut State Geol. Nat. Hist. Surv. Bull., no. 70, p. 509, pl. 102, fig. 1895, pl. 104, figs. 1932–1933. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1445.

DIAGNOSIS: Female: Total length, 3.4 mm. Carapace, 1.5 mm. long, 1.1 mm. wide. Abdomen, 2 mm. long, 1.4 mm. wide. Male: Total length, 3.3 mm. Carapace, 1.55 mm. long, 1 mm. wide. Abdomen, 1.8 mm. long, 1.2 mm. wide.

This large species of the *sublata* group agrees quite closely in coloration and pattern with the typical species. The carapace of the female is quite uniform dusky brown and not much lighter on the head. The sternum is dark dusky brown and may have an indistinct dark stripe in the middle behind. The whitish or yellow abdomen has the lateral dark brown stripes distinct, often broken up irregularly, and the ventral band is usually very well marked. The male is much darker than its counterpart in *sublata*, with the carapace dark dusky brown and the abdomen purplish brown, with a central yellowish stripe or series of pale chevrons.

The structure of this species is essentially identical with that of *sublata* in both sexes.

The epigynum (pl. 38, fig. 9) is proportionately broader and distinct in details from that

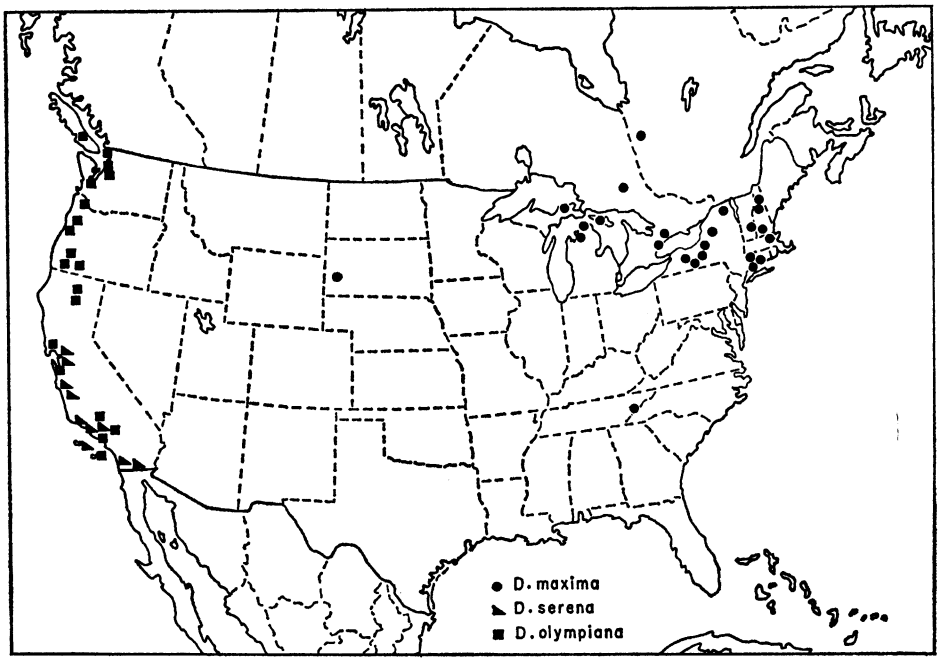


FIG. 35. Distribution of *Dictyna maxima, serena,* and *olympiana.*

of *sublata.* The median atria are large, oval in shape, separated by a narrow septum, and the lateral foveae are separated by a distance slightly exceeding the width of the genital groove or the sternum.

The male palpus (pl. 40, figs. 1–4) is larger, flatter, and has the embolus more widely looped than in *sublata* or *suprenans.* The thick embolus originates near the base of the tegulum, forms a broad oval, and far exceeds the margin of the cymbium, leaving a large open space. The embolus is much flattened at the apex of the cymbium and is twisted and deeply grooved distally, the tip being curved downward and ending in two black spurs. The conductor is much thinner than that of *sublata* but hides the basal hook in ventral view. The tibia is not fully twice as long as the apical width, which is widely lobed on the retrolateral side, and is quite narrow at the base where it is situated above the short spur bearing two black ctenidia.

TYPE LOCALITY: Ithaca, New York, male and female cotypes in the Museum of Comparative Zoölogy.

DISTRIBUTION: Northeastern United States and adjacent Canada, southward in the eastern mountains to Tennessee and westward to South Dakota (see fig. 35).

SELECTED RECORDS: *New Hampshire:* Randolph, July 1 (J. H. Emerton and N. Banks), males and females. *Ontario:* Favourable Lake Mine, latitude 53° N., July 8, 1938, female. Temagami, August, 1953 (S. Harrod), female. *New York:* McLean, May 29, 1937 (G. Gerberg), males and females. *Michigan:* Grand Marais, July 9, 1932 (A. M. Chickering), male. *Tennessee:* Newfound Gap, 5200 feet, Great Smoky Mountains, June 14, 1942 (C. H. Seevers), male. *South Dakota:* Hill City, male.

Dictyna orbiculata Jones

Plate 39, figures 10–13

Dictyna orbiculata JONES, 1947, Field and Lab., vol. 15, p. 5, figs. 10–13. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Male: Total length, 1.6 mm. Carapace, 0.8 mm. long, 0.5 mm. wide. Abdomen, 0.9 mm. long, 9.6 mm. wide.

This is a small, distinctive species of the *sublata* group. The dark brown carapace is faintly marked with black radiating lines on the pars thoracica and a thin black marginal seam. The light brown sternum is darkened around the edges. The yellowish legs are

marked with dusky rings. The pale abdomen is marked as follows: dorsum with a basal brown band constricted at its midlength, with a transverse dark band in the posterior half, and paired dark spots, two before and two behind the transverse band; sides mostly dull brown; and the venter pale, a little darker in front of the cribellum.

The slightly recurved posterior eye row has the median eyes separated by one and one-third diameters. The clypeus is of average height, equaling about two diameters of an anterior median eye. The quite long chelicerae are concave in front, are bowed apart to leave a long oval opening, and have the basal angle developed into a distinct short horn.

The male palpus (pl. 39, figs. 10–13) is similar to that of *sublata*. The thick embolus originates quite near the base of the tegulum, forms an expansive orbiculate coil about twice as broad as the width of the cymbium, and lies apically in the deep long fold of the conductor. The embolus is thick throughout its length, is convoluted in the distal half, and ends in the manner illustrated in plate 39, figures 11 and 12. The conductor is long and heavy in the basal portion, and the small basal spiral is largely hidden from above. The tibia is twice as long as broad and is narrowed at the base and armed above with a short spur bearing two small black ctenidia.

TYPE LOCALITY: Elm Fork of Trinity River, Dallas County, Texas, January 20, 1940 (Sarah Jones), male holotype in the Museum of Comparative Zoölogy. Only the type specimen is known.

Dictyna zaba Barrows and Ivie

Plate 40, figures 5–8

Dictyna zaba BARROWS AND IVIE, 1942, Ohio Jour. Sci., vol. 42, p. 21, pl. 1, fig. 10. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1326.

Dictyna toccoa CHAMBERLIN AND IVIE, 1944, Bull. Univ. Utah, biol. ser., vol. 8, no. 5, p. 123, fig. 172.

DIAGNOSIS: Female: Total length, 1.7 mm. Carapace, 0.7 mm. long, 0.6 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide. Male: Total length, 1.8 mm. Carapace, 0.8 mm. long, 0.63 mm. wide. Abdomen, 1.1 mm. long, 0.8 mm. wide.

The carapace is dark dusky brown, only slightly paler on the head, and the pars thoracica shows the usual darker pattern of radiating lines. The sternum is dark dusky brown. The pale yellowish legs have distinct brown rings or shadings at the joints. The abdomen is gray or whitish but patterned as follows: dorsum with a basal dark brown band back to the middle where it joins a series of transverse bars, also dark brown, which end near the apex where there is a distinct triangular yellow spot; sides with dark brown spots and dashes; and the venter broadly dusky along the middle but lighter on the sides. In the male the pattern is coalesced to a more even tone, but the yellow mark above the spinnerets is distinct.

The posterior eye row is slightly recurved, and the rather large eyes are separated by about three-fourths of the long diameter of the median eye. The pars cephalica is typically elevated in both sexes, with the clypeus equaling the full diameter of the anterior lateral eye in the female and two full diameters of the smaller median eye in the male. The male chelicerae are of medium length, the two together being five-sixths as wide as long, are moderately concave and laterally bowed in front to leave a long fusiform opening not fully as wide as a chelicera at its widest point, and have the basal angle developed to a rounded spur.

The epigynum (pl. 40, fig. 6) is proportionately quite large, with the large, oval, median atria well separated by a quite broad septum. The conspicuous lateral foveae are separated by a distance somewhat wider than the width of the median groove or the sternum.

The male palpus (pl. 40, figs. 5, 7, 8) is similar to those of the *sublata* group. The very heavy embolus arises near the middle of the tegulum on the prolateral side, is broader and flattened in the distal half, and in the apical portion is twisted at right angle to form a narrow loop. The tibial apophysis is a short dorsal spur bearing the usual two black ctenidia.

TYPE LOCALITIES: Of *zaba*, Hocking County, Ohio (M. M. Barrows), male holotype in the American Museum of Natural History; of *toccoa*, between Clarksville and Toccoa, Georgia, April 29, 1943 (W. Ivie), female holotype in the American Museum of Natural History.

DISTRIBUTION: Known only from the two types noted above.

Dictyna horta Gertsch and Ivie

Plate 41, figures 11–14; text figure 26

Dictyna horta GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 4, figs. 10, 11. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1440.

DIAGNOSIS: Female: Total length, 1.4 mm. Carapace, 0.6 mm. long, 0.45 mm. wide. Abdomen, 0.85 mm. long, 0.65 mm. wide. Male: Total length, 1.2 mm. Carapace, 0.6 mm. long, 0.48 mm. wide. Abdomen, 0.7 mm. long, 0.55 mm. wide.

The carapace is quite uniform orange to bright reddish brown and has only inconspicuous dusky shading along the sides of the pars cephalica. The sternum is clear orange. The legs are yellow to orange, darkest on the femora, and lack contrasting markings. The abdomen is yellow to dull orange and completely lacks darker pattern.

The posterior eye row is weakly recurved, and the rather small eyes are separated by at least the full diameter and up to half as much more. The pars cephalica is of moderate height in both sexes, with the clypeal height equaling one and one-half diameters of the anterior median eye in the female and two full diameters in the male. The chelicerae of the male are of medium length, the two together being only slightly longer than their breadth, are only slightly concave as seen from the side, and are moderately bowed apart in front to leave a long fusiform opening. The basal angle is only slightly enlarged, but a distinct triangular spur is present well below it on the outer side.

The epigynum (pl. 41, fig. 13) is quite distinctive in the forward position of the suboval median atria, which may be difficult to discern, and the semi-lunar lateral foveae which are separated by much less than the width of the genital groove or the sternum.

The male palpus (pl. 41, figs. 11, 12, 14) features a thick embolus arising near the base of the tegulum on the prolateral side, which forms a broad oval and ends in an enlarged spatulate spur. The basal spur of the conductor forms a small spiral and ends in a small, rounded, laterally directed point. The tibia is thin at the base, where the short spur tipped with two closely appressed ctenidia lies in subdorsal position, and enlarged at the apex with a heavy lobe on the retrolateral side.

TYPE LOCALITY: Notus, Canyon County, Idaho, male holotype in the American Museum of Natural History.

DISTRIBUTION: Western United States from Minnesota (Itasca Park) to Wyoming and Idaho, southward into Utah (see fig. 26).

KNOWN RECORDS: *Minnesota:* Itasca Park, Lake Minnetonka, Minneapolis, June 4, 1932 (W. J. Gertsch), male. *North Dakota:* Divide County (Joe Davis), female. *Idaho:* Notus, Canyon County, September 18, 1933 (W. Ivie), male holotype, female allotype, and paratype. Two miles northeast of Fruitland, June 30, 1943, males, females. Five miles north of Payette, October 16, 1944, males, females. West of Grandview (J. C. Chamberlin), female. Parma, April 10, 1937, female. Five miles northwest of Weiser, July 1, 1943. *Wyoming:* Mount Washburn, August 13, 1940, and Madison Junction, Yellowstone National Park, June 22, 1938. Top of Brooks Peak, Togwotee Pass, August 8, 1950 (D. C. Lowrie), two females from under rocks. *Utah:* Layton, March 29, 1935 (C. F. Smith and G. F. Knowlton). City Creek Canyon, July 7, 1947, females. Richfield, September 21, 1935 (R. V. Chamberlin), males. *Oregon*: Three miles south of Adrian, September 19, 1943. Glenada, July 20, 1941 (B. Malkin).

Dictyna iviei Gertsch and Mulaik

Plate 40, figures 9–12; text figure 26

Dictyna iviei GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 7, figs. 6, 7; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327. GERTSCH AND DAVIS, 1937, Amer. Mus. Novitates, no. 961, p. 12. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1440.

Dictyna texana JONES, 1948, Field and Lab., vol. 16, p. 42, figs. 30–32 (not *Dictyna texana* Banks, a *nomen nudum*).

DIAGNOSIS: Female: Total length, 1.85 mm. Carapace, 0.76 mm. long, 0.6 mm. wide. Abdomen, 1.25 mm. long, 0.8 mm. wide. Male: Total length, 1.75 mm. Carapace, 0.76 mm. long, 0.58 mm. wide. Abdomen, 1 mm. long, 0.8 mm. wide.

The bright orange-brown carapace is darkened on the sides of the head and marked faintly with radiating dusky streaks on the pars thoracica. The sternum is clear yellow or orange, and the yellowish legs lack darker markings. The white or grayish abdomen is rather evenly flecked above with small black markings that tend to join into chevrons behind and has the sides and venter dusky except around the epigynum and the spinnerets. In some specimens the whole body is tinged with red.

The eyes of the second row are very weakly recurved, essentially straight, and the median eyes are separated by scarcely the full diameter in the female and by more than the full diameter in the freshly molted male. The pars cephalica is slightly elevated, and the clypeus in both sexes is equal to only about the diameter of an anterior lateral eye. The male chelicerae are not fully developed in the only male so far studied but indicate a less than average development of the median opening and basal angle.

The epigynum (pl. 40, fig. 11) is faintly sclerotized and difficult to study. The shallow median atria are separated by a narrow septum, and the indistinct lateral foveae are moderately separated by less than the width of the genital groove.

The male palpus (pl. 40, figs. 9, 10, 12) is very distinctive. The heavy embolus arises near the base of the oval tegulum, continues in a long oval around the periphery of the bulb, narrows markedly in the distal fourth, and ends as an asymmetrical T-shaped process. The basal portion of the conductor is turned at a right angle to the principal fold and ends as a pointed spur. The dorsal tibial process is very short and bears the two black ctenidia.

TYPE LOCALITIES: Of *iviei*, Edinburg, Texas, male holotype in the American Museum of Natural History; of *texana*, Mt. Barker, Austin, Texas, male holotype in the Museum of Comparative Zoölogy. Banks used the name *texana* for another species (later described by Chamberlain as *mulegensis*), but he never offered a legal description.

DISTRIBUTION: Texas and northeastern Mexico (see fig. 26).

KNOWN RECORDS: *Texas:* Edinburg, May 2, 1935 (S. Mulaik), male holotype. December 1, 5 (S. Mulaik), females. Five miles east of Rio Grande City, January 1, May 1 (S. Mulaik), two females. Seventeen miles north of Alice, December, 1939 (D. and S. Mulaik), female. *Nuevo Leon:* Fifty-four miles south of Laredo, Texas, July 7, 1936 (L. I. Davis), two immature males. *Tamaulipas:* San Pedro, May, 1936 (W. A. Green), female.

Dictyna serena, new species

Plate 41, figures 6–10; text figure 35

FEMALE: Total length, 2.5 mm. Carapace, 0.82 mm. long, 0.7 mm. wide. Abdomen, 1.7 mm. long, 1.3 mm. wide. Male: Total length, 2.2 mm. Carapace, 1.05 mm. long, 0.95 mm. wide. Abdomen, 1.4 mm. long, 0.9 mm. wide.

Coloration and structure in very close agreement with those of *olympiana*, of which this species is a near relative.

Epigynum (pl. 41, fig. 10) essentially as in *olympiana*, but the seminal receptacles, usually evident through the integument, large and quite close together.

Male palpus (pl. 41, figs. 6–9) similar to that of *olympiana* except as follows: embolus thick, forming a broad oval, with a distinct circular projection at the point of narrowing of the embolus, with the twisted apical portion of the embolus much longer than in *olympiana*.

TYPE LOCALITY: Male holotype from Stanford, Palo Alto, California.

DISTRIBUTION: Coastal ranges of California from near San Francisco to San Diego (see fig. 35).

KNOWN RECORDS: *California:* San Francisco, two males, two females. Stanford, Palo Alto, June 29, 1947 (J. W. Tilden), males and females. Vicinity of Stanford (L. W. Swan), male and females. Hastings Natural History Reservation, Monterey County, May 13, 1950 (Jean Linsdale), male. Big Sur, August 1 (H. L. Shantz), one female. Goleta, May 4, 1937, one male. Santa Barbara Island, Channel Islands (L. Martin), males and females. West Los Angeles, March–August, 1945 (C. B. Cowles), two females. Tapia Park, Santa Monica Mountains, May 15, 1954 (R. X. Schick), male and three females. Beverly Glen Canyon, Santa Monica Mountains, May 24, 1952 (R. X. Schick), male. El Cajon, May 16, 27, 1947 (W. M. Pearce), two males. Lakeview District, San Diego County, June 15, 1947 (W. M. Pearce), two females.

Dictyna olympiana Chamberlin

Plate 41, figures 1–5; text figure 35

Dictyna olympiana CHAMBERLIN, 1919, Ann. Ent. Soc. Amer., vol. 12, p. 243, pl. 15, fig. 7. WORLEY, 1932, Univ. Washington Publ. Biol., vol. 1, no. 1, p. 18. CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 7, pl. 1, figs. 9–11. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1446.

Dictyna exlineana JONES, 1948, Field and Lab., vol. 16, p. 36, figs. 4, 15–17.

DIAGNOSIS: FEMALE: Total length, 2 mm. Carapace, 0.7 mm. long, 0.6 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide. Male: Total length, 2. mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.2 mm. long, 0.9 mm. wide.

The dark brown carapace is darkest on the pars thoracica, which shows the radiating darker streaks and marginal seam rather indistinctly, and is somewhat lighter on the head. The brown sternum is usually plain, but in lighter specimens a thin median darker streak is evident. The yellowish legs are usually marked with narrow dusky rings. The dusky white or yellow abdomen has a speckled appearance because of the dark reticulations and markings. The dorsum usually shows a basal dusky streak or toothed band and caudal chevrons or pairs of dusky spots. The sides and venter are gray except for a whitish band or patch on each side of the venter.

The slightly recurved posterior eye row has the rather small eyes separated by somewhat more than the full diameter. The pars cephalica of the female is of average height, and the clypeus equals one and one-half diameters of the anterior median eye. The carapace of the male is more strongly elevated but only of average length, and the sloping clypeus is equal to three full diameters of the anterior median eye. The male chelicerae are fairly long, the two together being one-sixth longer than broad, are slightly curved as seen from the side, are only moderately bowed apart to leave a narrow fusiform central opening, scarcely as wide as the width of the segment, and the basal angle is developed into a rounded nodule.

The epigynum (pl. 41, figs. 2, 3) presents two shallow atria of quite small size, difficult to ascertain because of the weakly developed carinae defining them, and conspicuous lateral foveae separated by a distance greater than the width of the genital groove or sternum. The presence of widely separated internal receptacles, usually discernible, makes identification of this female easy.

The male palpus (pl. 41, figs. 1, 4, 5) is large for the size of the spider and has the tarsal elements strikingly modified. The quite flat, sagittate cymbium is twice as long as broad. The embolus, which is very heavy and laterally grooved, originates near the base of the tegulum and forms an even spiral, the end of which lies deeply buried in the expansive conductor. The tip of the embolus is twisted and narrowed into a convoluted thread bearing a small distal prong. The tibia, which is not fully twice as long as the apical width, is narrowed at the base and presents above a thin erect spur tipped with two black ctenidia.

TYPE LOCALITIES: Of *olympiana*, Olympia, Washington, male holotype, in the Museum of Comparative Zoölogy; of *exlineana*, Martha Lake, Edmunds, Washington, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Pacific coast states from southern British Columbia to southern California (see fig. 35).

SELECTED RECORDS: *British Columbia:* Wellington, Vancouver Island, July 1–11, 1955 (R. Guppy), male and female. *Washington:* Martha Lake, Edmunds, June 2, 1935 (M. H. Hatch), males and females. Olympia, May 26, 1931 (H. Exline), males and females. *Oregon:* Alsea, Mary 5, 1935 (J. M. Pierson), two females. O'Brien, Josephine County, May 30, 1952 (V. Roth), male. Sunny Valley, Josephine County, May 30, 1952 (B. Malkin), males and females. *California:* Longvale, June 30, 1952 (W. J. Gertsch), females. Mill Valley, June, 1951 (D. E. Hardy), two females. Soledad Canyon, San Gabriel Mountains, May 22, 1954 (R. X. Schick), male. Avalon, Santa Catalina Island, 1939 (T. D. A. Cockerell), female. McCloud, July 5, 1952 (W. J. Gertsch), females. Weed, July 4, 1952 (W. J. Gertsch), females.

THE *borealis* GROUP

Striking changes in the male chelicerae distinguish this large series from other members of the section. These are relatively shorter,

stouter, and flatter in front and more widely bowed apart to leave a generous oval space. An innovation is the development of opposing subapical carinal teeth which project forward somewhat and are presumed to be used during the mating. Typical examples of these derivative chelicerae are those illustrated for *completa* (pl. 42, figs. 10–11) and *oregona* (pl. 44, figs. 4–5). The basal angle is hardly at all developed. The *varyna* group of the section *Dictyna* has chelicerae of similar design, but they are not indicative of close relationship and are presumed to be a normal parallel development. In *varyna* the basal angle is a well-developed horn.

In two of the species assigned to this group (*reticulata* and *consulta*) the chelicerae are not so strongly modified as in the average species, but their relationship to the group is undoubted.

The male palpi of this series are large and of quite stereotyped design. The embolus is thick at its point of origin, usually well forward on the prolateral edge of the tegulum, and remains about the same width until the apical third, where it becomes enlarged, twisted, and modified in the fashion of the species. Two principal subdivisions are usually discernible in the tips of the emboli, one a thin spine ending in a small triangular or T-shaped head and the other a shallow lamina or cup ending in a pale spur. Typical emboli are shown on plates 42–45. The emboli are often clearly visible in the transparent conductor, but they should be freed from this fold by gentle lifting with a fine needle in order to be certain of the details. The emboli of *reticulata* and its near relatives (see pl. 47) are thinner apically, and the thin spine is much longer than the spatulate element. The species *littoricolens* is presumed to belong here even though the embolus is much thinner apically (pl. 46, fig. 5). The tibial apophysis is usually a small spur bearing two ctenidia at the base of the tibia on the dorsal side. The epigyna are all quite similar, with moderate to large oval atria and conspicuous lateral foveae about as wide apart as the width of the sternum.

The distribution center of this group is in the mountains of the western United States, where most of the species occur, some of them at very high altitudes. Only one of the species (*completoides*) ranges east of the Rocky Mountains into North and South Dakota and Ontario. The nominate species of the group (*borealis*) occurs in Greenland, northern Canada, and Colorado.

Dictyna borealis O. P.-Cambridge

Plate 42, figures 1–4

Dictyna borealis O. P.-CAMBRIDGE, 1877, Ann. Mag. Nat. Hist., ser. 4, vol. 20, p. 273, pl. 8, fig. 1. MARX, 1889, Proc. U. S. Natl. Mus., vol. 12, p. 509 (catalogue); 1892, Proc. Ent. Soc. Washington, vol. 2, p. 190. VANHOFFEN, 1897, *in* E. von Drygalski, Grönland-Expedition der Gesellschaft für Erdkunde zu Berlin, vol. 2, no. 1, p. 158. STRAND, 1906, Fauna Arctica, vol. 4, p. 438. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 108 (catalogue). JACKSON, 1937, Proc. Zool. Soc. London, vol. 107, pp. 545–547. CARPENTER AND HOLM, 1939, Ann. Mag. Nat. Hist., ser. 11, vol. 3, p. 60. BRAENDEGAARD, 1946, Meddel. Grønland, vol. 121, no. 15, p. 25. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1431.

Dictyna groenlandica LENZ, 1897, Bibliog. Zool., no. 20, p. 75, fig. 7. VANHOFFEN, 1897, *in* E. von Drygalski, Grönland-Expedition der Gesellschaft für Erdkunde zu Berlin, vol. 2, no. 1, p. 155. PETRUNKEVITCH, 1911, Bull. Amer. Mus. Nat. Hist., vol. 29, p. 109 (catalogue).

Dictyna hamifera EMERTON, 1919, Report of the Canadian Artic expedition 1913–18, vol. 3, pt. H, p. 4H; 1919, Vidensk. Meddel. Dansk Naturhist. For., vol. 70, pp. 143–145. BRAENDEGAARD, 1940, Meddel. Grønland, vol. 125, no. 8, p. 7, figs. 1, 3.

DIAGNOSIS: Female: Total length, 2.7 mm. Carapace, 1 mm. long, 0.8 mm. wide. Abdomen, 1.9 mm. long, 1.5 mm. wide. Male: Total length, 2.2 mm. Carapace, 1 mm. long, 0.82 mm. wide. Abdomen, 1.35 mm. long, 0.9 mm. wide.

The above measurements were based on a typical male and female from eastern Greenland. The base color is yellow, but it is largely masked by a dusky to black pattern. The dusky orange-brown carapace has the sides of the head darkened, the pars thoracica light brown, with narrow dusky radiations and a narrow black marginal seam, and the dorsum of the head orange-brown, with indistinct dusky marks. The sternum varies from yellow to bright orange-brown, has the sides narrowly blackened and a median dusky streak.

The yellow to orange legs have faint dusky rings, largely incomplete above. The yellow to orange-brown abdomen is marked with the following pattern: dorsum with a black stripe at the base which often enlarges behind to join the series of black chevrons in the caudal half; sides heavily marked with black spots continuous to the margins of the dorsum; venter with a series of central black spots forming an indistinct band, black all around the epigynal atria, and with an irregular side band running from base of abdomen to sides of cribellum.

Specimens form Colorado average 0.5 mm. larger in size and are more drably colored than those from Greenland. The carapace varies from dark brown to nearly black. The abdomen is dull yellow or orange, with the dorsal dusky pattern less distinct.

The slightly recurved posterior eye row has the median eyes separated by the full diameter. The head is of moderate elevation in both sexes, and the clypeal height equals one and one-half diameters in the female, two full diameters in the male. The chelicerae are modified as in *completa* and related species, the two together being as broad as long, flattened in front, bowed apart to leave a suboval or round opening with carinate margins, produced into fairly large opposing teeth at apex.

The epigynum, which is similar to that of *cavernosa*, has relatively large oval atria, separated by a small septum, and carinate lateral foveae separated by the width of the sternum.

The male palpus (pl. 42, figs. 1–4) is similar in general appearance to that of *completa*, which is the best-known species of this series.

The embolus originates near the front end of the tegulum on the prolateral side, is relatively short but forms an even spiral, and is much thicker apically. The distal end of the embolus is deeply grooved on the outer side and has two principal apical processes, the larger one a flattened cup ending as a sharp spur, the second one a thin curved rod lying at a 45-degree angle from the long axis and ending in a somewhat asymmetrical T-shaped form. This process is larger than the similar one in *completa*.

TYPE LOCALITIES: Of *borealis*, near Illartlek Glacier, north Greenland, July, 1867, female type presumably in the British Museum (Natural History); and of *groenlandica*, Umanak, Greenland, female type, the depository unknown.

DISTRIBUTION: Greenland, northern Canada, and Colorado.

Dictyna borealis is widely distributed in Greenland as shown by Braendegaard (1940, 1946) and occurs at least up to latitude 77° N. Immature specimens from the Northwest Territories in the Canadian National Collection, mentioned by Emerton (1919, Report of the Canadian Arctic expedition 1913–18, vol. 3, pt. H, p. 4H) and tentatively called *hamifera*, are definitely this boreal species. The Colorado specimens here assigned to *borealis* come from the high mountains of the southwestern portion of the state.

SELECTED RECORDS: *Greenland:* Mesters's Vig, Kong Oscars Fjord, June–August, 1955–1956 (A. L. and T. Washburn), male, females, and immature. Danmarks Havn, June 20, 1907 (Emerton, 1919, Vidensk. Meddel. Dansk Naturhist. For., vol. 70, pp. 143–145) male. *Northwest Territories:* Bernard Harbour and Cockburn Point, Dolphin and Union Strait (Emerton, 1919b), two immature males and one immature female. *Colorado:* Snodgrass Trail, near Gothic, 10,000 feet, July 14, 1956 (H. and L. Levi), male, females. Virginia Basin, 11,800 feet, Elk Mountains, July 8, 1956 (H. and L. Levi), male. Beaver Creek, 8,000 feet, San Juan Mountains, July 11, 1952 (H. Levi), male in dry meadow.

Dictyna borealis cavernosa Jones

Plate 42, figures 5–8

Dictyna cavernosa JONES, 1947, Field and Lab., vol. 15, p. 12, figs. 28–30. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1319.

Dictyna borealis LEVI AND LEVI, 1951, Zoologica, vol. 36, p. 235. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4.

DIAGNOSIS: Female: Total length, 3.3 mm. Carapace, 1.13 mm. long, 0.84 mm. wide. Abdomen, 2.2 mm. long, 1.6 mm. wide. Male: Total length, 2.6 mm. Carapace, 1.1 mm. long, 0.87 mm. wide. Abdomen, 1.5 mm. long, 1.1 mm. wide.

This name is assigned to subspecific status under *borealis* with some reluctance, but, until more information on the typical species is available, it seems logical to take this course. *Dictyna cavernosa* is somewhat paler than

borealis and rather closely approximates *completa* in appearance.

The epigynum (pl. 42, figs. 5, 6) agrees closely with that of *borealis*.

The male palpus is very similar to that of *borealis* (pl. 42, figs. 7, 8) and differs from it chiefly in the form of the distal portion of the embolus which has the rounded element covering the T-shaped spine prolonged into a transparent spatulate lobe, instead of ending as a short spur. The embolus shown in plate 42, figure 8, was drawn from a specimen from Bishop, Inyo County, California.

TYPE LOCALITY: Spokane, Washington, male holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Western mountain states from Utah and Wyoming westward into California, Oregon, and Washington.

KNOWN RECORDS: *Utah:* Salt Lake City, July, 1947 (W. Ivie), two males. *Wyoming:* Moran, August 4, 1952 (H. Levi), female. Twenty miles south of Jackson, June, 1938, males, females. Head of South Cascade Canyon, Grand Teton National Park, 10,000 feet, August 20, 1950 (D. C. Lowrie), female. Bear Valley, Yellowstone National Park, July 12, 1935, female. *Oregon:* Ten miles northwest of Baker, July 11, 1953 (Roth and Beer), female. Steens Mountains, 8000 feet, June 22, 1951 (B. Malkin), two males. Fish Lake, Steens Mountains, July 14, 1953 (Roth and Beer), male and female. Green Lake, Sisters Mountains, August 28, 1952 (V. Roth), female. Frenchglen, Harney County, June 26, 1951 (B. Malkin), female. *Washington:* Yakima Park, Mt. Rainer National Park, July 6, 1938 (W. Ivie), females. *California:* Bishop, June 26, 1951 (W. M. Pearce), males and females. Benton, May 22, 1941 (W. M. Pearce), female. Benton Station, July 10, 1941 (W. M. Pearce), females. Putah Creek, Yolo County, April 25, 1948 (E. I. Schlinger). Clio, July 8, 1952 (W. J. Gertsch), female.

Dictyna completa Chamberlin and Gertsch

Plate 42, figures 9–11; plate 43, figures 1–3; text figure 36

Dictyna completa CHAMBERLIN AND GERTSCH, 1928, Proc. Biol. Soc. Washington, vol. 41, p. 175 (*nomen nudum*); 1929, Jour. Ent. Zool., Pomona College, vol. 21, p. 1, fig. 1. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 330. JONES, 1947, Field and Lab., vol. 15, p. 20, figs. 29–52; 1948, Field and Lab., vol. 16, p. 30. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320. LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1433.

Emblyna completa CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 9, figs. 17 and 18.

Emblyna rena CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 11, pl. 2, figs. 21–22.

Dictyna rena ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

DIAGNOSIS: Female: Total length, 3.8 mm. Carapace, 1.2 mm. long, 1 mm. wide. Abdomen, 2.6 mm. long, 2 mm. wide. Male: Total length, 2.3 mm. Carapace, 1.05 mm. long, 2 mm. wide. Male: Total length, 2.3 mm. Carapace, 1.05 mm. long, 0.9 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

The carapace is orange-brown on the sides of the head and the pars thoracica, the latter being narrowly margined with dark brown and provided with narrow, brown, radiating streaks, and the upper part of the head is yellowish brown. The dull yellowish brown sternum is margined with dusky or black and provided with a median black streak or distinct band. The yellowish brown legs lack contrasting rings or markings. The whitish abdomen usually shows distinct gray reticulations and is usually provided with a dusky pattern as follows: dorsum with a basal streak or band, with small side branches, running back to the middle and a series of chevrons or spots behind; sides with scattered dark spots; venter with a central streak or stripe from base to spinnerets and a thin band on each side of similar length, which is often broken up into paired spots opposite the epigynum and cribellum. Specimens from Yellowstone National Park are darker, with dusky yellowish abdomens and bold brown or black patterns of chevrons on the dorsum of the abdomen.

The slightly recurved posterior eye row has the eyes separated by the full diameter. The carapace of the female is typically elevated, and the clypeus is equal in height to one and one-half diameters of an anterior median eye. The carapace of the male is somewhat higher and distinctly longer than

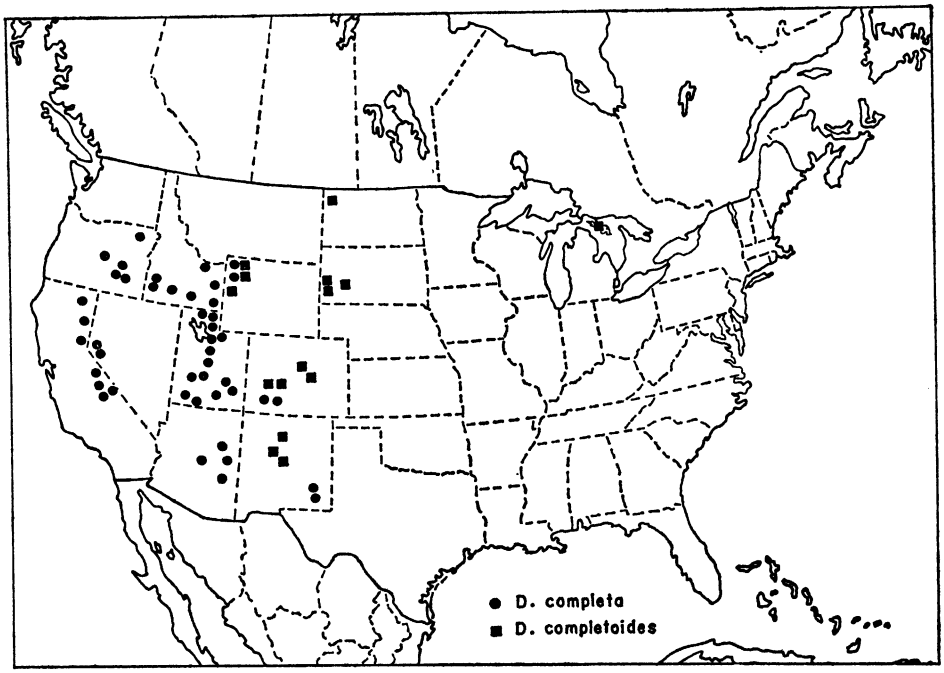


FIG. 36. Distribution of *Dictyna completa* and *completoides*.

that of the female, and the clypeus is scarcely two full diameters of the median eye. The male chelicerae (pl. 42, figs. 10–11) are of average length, the two together being nearly as broad as long, are quite straight in front but strongly bowed on the sides to form a central suboval opening carinate on the margins and developed beyond the middle of the opening into sharp opposing teeth, and the basal angle is an inconspicuous nodule.

The epigynum (pl. 43, fig. 2) presents two large rounded atria separated by a septum about half of the width of an atrium, and conspicuous lateral foveae well separated to a distance equal to the genital groove or the full sternal width. The internal receptacles are of small size and round in shape.

The male palpus (pl. 43, figs. 1, 3) is typical of this group of species and similar to that of *borealis*. The thick embolus begins well beyond the middle of the tegulum on the prolateral side, forms an even spiral, and is thickened and twisted apically as illustrated. The bifid tip of the embolus (pl. 43, fig. 3) terminates in an inverted T-shaped process lying at a 45-degree angle from the long axis and a thin clear lobe.

TYPE LOCALITIES: Of *Dictyna completa*, Moab, Utah, female holotype in the American Museum of Natural History; of *Emblyna rena*, Reno, Nevada, male holotype in the American Museum of Natural History.

DISTRIBUTION: Rocky Mountain states westward to California and Oregon (see fig. 36).

SELECTED RECORDS: *New Mexico:* Camp Mary White, Otero County, August 9–12, 1935 (S. Mulaik), males and females. Mt. Baldy, Ruidosa Mountains, 9000–12,000 feet, August 12, 1934 (S. Mulaik), two females. *Colorado:* Weminuche Creek, 35 miles south of Creede, San Juan Mountains, 10,100 feet, July 19, 1952 (H. Levi), male. *Arizona:* White Mountain Reservation, east of McNary, July 8, 1940 (J. M. and W. J. Gertsch), male. *Wyoming:* South of Jackson, June 24, 1938 (W. Ivie), males and females. *California:* McArthur, June 30, 1940 (W. M. Pearce), male and females. *Oregon:* Two miles south of Worden, July 3, 1952 (W. J. Gertsch), male and females. Richmond, July 10, 1953 (V. Roth), male.

Dictyna completoides Ivie

Plate 43, figures 4–7; text figure 36

Dictyna completoides IVIE, 1947, Some new

spiders of the genus Dictyna, New York (privately published), p. 1. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.2 mm. long, 0.95 mm. wide. Abdomen, 2 mm. long, 1.3 mm. wide. Male: Total length, 2.5 mm. Carapace, 1.2 mm. long, 0.95 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

The coloration and pattern agree closely with those of dark examples of *completa*. The carapace is quite dark brown, except for the yellowish brown head of the females, and the dusky yellow abdomen is marked with the typical pattern of spots and chevrons.

The structure agrees closely with that of *completa* except for the details of the male genitalia.

The epigynum (pl. 43, fig. 7) seems to differ in no important details from that of *completa*.

The male palpus (pl. 43, figs. 4–6) is very similar to that of *completa* except in the details of the tip of the embolus. The embolus originates at about the middle of the tegulum on the prolateral side, thus being slightly longer than in *completa*, forms a symmetrical spiral, and lies in the expansive conductor. The apical part of the embolus is twisted, quite thin, and ends in the usual two elements. The inverted, T-shaped process lies parallel to the embolus and is scarcely visible in ventral, resting position. The pale terminal spur is curved laterad and then caudally.

TYPE LOCALITY: Electra Lake, Colorado, male holotype in the American Museum of Natural History.

DISTRIBUTION: Mountains of New Mexico northward into North Dakota and Ontario (see fig. 36).

KNOWN RECORDS: *New Mexico:* Tejano Canyon, Sandia Mountains (C. C. Hoff), four females. Two miles west of Red River Village (C. C. Hoff), females. Three miles north of Tres Piedras (C. C. Hoff), female. Nine miles northeast of Eagle Nest (C. C. Hoff), males and female. *Colorado:* Montrose, June 18, 1940 (W. Ivie), males and females. Four miles east of Gunnison, June 20, 1940 (W. Ivie), males and females. Fountain Valley, near Colorado Springs, June 23, 1940 (W. J. Gertsch), male. Lump Gulch, Gilpin, August 1, 1934 (H. Rodeck), female. *Wyoming:* Snake River, 18 miles east of Alpine, August 12, 1949 (W. J. and J. W. Gertsch), female. Upper Falls, Yellowstone National Park, June 21, 1938 (W. Ivie), males. *South Dakota:* Big Badland, July, 1939, male. Near the Needles, Black Hills, 5700 feet, June 24, 1954 (H. Levi), male. Haselbrodt Picnic Grounds, Black Hills, 5000 feet, August 7, 1954 (H. Levi), female. *North Dakota:* Divide County (Joe Davis), female. *Ontario:* Mindemoya, Manitoulin Island, July 7, 1939 (T. B. Kurata), male.

Dictyna aiko, new species

Plate 42, figures 12, 13

MALE: Total length, 2.2 mm. Carapace, 1 mm. long, 0.82 mm. wide. Abdomen, 1.3 mm. long, 0.8 mm. wide.

Carapace mostly dusky brown, the pars thoracica with well-marked, black, radiating streaks and a distinct narrow black marginal seam, the top of the head orange-brown. Sternum dusky yellowish brown, irregularly blackened along the margins and with an indistinct median black streak. Legs dull yellowish brown, marked with incomplete dusky rings. Abdomen dull orange-brown, the dorsum with the usual basal black stripe and irregular chevrons behind it, and the venter rather heavily spotted with black largely to obscure the indistinct median dark band.

Structure in close agreement with that of *completa* and other species of this complex. Second eye row slightly recurved, and the median eyes separated by about three-fourths of their diameter. Chelicerae of the male strongly bowed and modified as usual, the apical teeth well developed.

Male palpus (pl. 42, fig. 12) similar to that of *completa*. Embolus originating at about the middle of the tegulum on the prolateral side, thick and quite long, forming as regular spiral, thickened and twisted apically as shown in plate 42, figure 12.

TYPE LOCALITY: Male holotype from Table Mountain, Los Angeles County, California, June 1, 1957 (R. X. Schick).

Only the single male of this interesting species, which is named for Mrs. Aiko Schick, has been taken.

Dictyna cornupeta Bishop and Ruderman

Plate 43, figures 8–10

Dictyna cornupeta BISHOP AND RUDERMAN, 1946, Proc. Biol. Soc. Washington, vol. 59, p. 1, figs. 1–2. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320.

DIAGNOSIS: Female: Total length, 3.1 mm. Carapace, 1.2 mm. long, 0.95 mm. wide. Abdomen, 2.1 mm. long, 1.5 mm. wide. Male: Total length, 2.1 mm. Carapace, 1.2 mm. long, 0.95 mm. wide. Abdomen, 1.55 mm. long, 1.1 mm. wide.

Few examples of this distinct species are known in collections. The color pattern is quite similar to that of boldly marked examples of *completa*. A well-preserved female from northern Utah has the carapace all dusky brown, except for a V-shaped yellow marking running forward from the center to the side eyes. The sternum is dusky brown, with only a faint indication of a darker median streak. The grayish abdomen is strongly marked with black above in the typical pattern of the group, is heavily blotched with black on the sides, and thickly speckled beneath with blackish markings, instead of presenting a distinct median band. A male from northern Utah is paler but has essentially the same pattern as the female.

This species parallels *completa* closely in structure. The slightly recurved posterior eye row has the eyes separated by the full diameter in the female but by not quite so much in the male. The clypeal height in both sexes and the structure of the chelicerae are the same as in *completa*.

The epigynum (pl. 43, fig. 10) is very similar to that of *completa*.

The male palpus (pl. 43, figs. 8–9) is shorter and stouter than in *completa*. The thick but quite short embolus originates at the front end of the tegulum on the prolateral side and forms a nearly round figure. The distal part of the embolus is very broad and spatulate, and lying on it is a long, curved, apically divided spine. The tibia is about as long as broad and bears above a short stout spur bearing two black ctenidia.

TYPE LOCALITY: Texas Pass, Dragoon Mountains, Arizona, male holotype in the collection of Cornell University.

DISTRIBUTION: Northern Utah to southern Arizona and Chihuahua. [The male paratype from Yellowstone Lake, Wyoming, assigned to this species by Bishop and Ruderman, belongs with *Dictyna littoricolens* (Chamberlin and Ivie).]

KNOWN RECORDS: *Utah:* West of Salt Lake City, March 30, 1941 (W. Ivie), male and female. Richfield, May 25, 1930 (W. J. Gertsch), one male. *Arizona:* Santa Rita Mountains (W. Ivie), one male. *Chihuahua:* San Jose Babicora, July 4, 1947 (W. J. Gertsch), male.

Dictyna ampla Chamberlin

Plate 43, figures 11–13

Emblyna ampla CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 9, pl. 5, figs. 55–56.

Emblyna mariae CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 10, pl. 3, fig. 26. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322.

DIAGNOSIS: Female: Total length, 2.9 mm. Carapace, 1.2 mm. long, 0.93 mm. wide. Abdomen, 1.8 mm. long, 1.4 mm. wide. Male: Total length, 2.4 mm. Carapace, 1.05 mm. long, 0.9 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide.

This rather uncommon species resembles drably colored examples of *completa*, of which it is a close relative. The carapace is quite uniform orange or reddish brown in both sexes and shows faint, dusky, radiating lines on the pars thoracica in addition to a narrow black marginal seam. The sternum is dusky orange-brown, with blackish margins and a median dark line or patch in the center. The dull yellowish brown legs do not have contrasting rings or markings. The abdomen is dull yellowish brown, quite dusky, ordinarily showing only faint traces, above and below, of the typical *completa* pattern. The male from Durango, Mexico, is light colored and boldly marked with black, but all other examples are drab.

The structure of *ampla* closely parallels that of *completa* in all details except those of the genitalia.

The epigynum (pl. 43, fig. 13) presents two shallow atria of medium size, separated by a narrow septum, and lateral foveae which are

scarcely as far apart as the width of the genital groove or sternum.

The male palpus (pl. 43, figs. 11–12) resembles that of *cornupeta* but differs in the details of the embolus. The distal portion of the embolus is broad, spatulate, and presents a long, apically barbed spine as a prominent feature.

TYPE LOCALITIES: Of *mariae*, Grand Mesa, Colorado, male holotype in the American Museum of Natural History; of *ampla*, near Rock Springs, Wyoming, male holotype in the American Museum of Natural History.

DISTRIBUTION: Mountain states from Wyoming south into Durango, Mexico.

KNOWN RECORDS: *Wyoming:* Near Rock Springs, male holotype of *ampla*. *Colorado:* Alpine Meadow, Grand Mesa, July 26, 1941 (C. and M. Goodnight), male holotype of *mariae*. Berthoud Pass, 12,000 feet, July 14, 1949 (D. Bolinger), female. *New Mexico:* Two miles east of Grants (C. C. Hoff), one female. *Arizona:* Baldy Peak, 8800 feet, White Mountains, June 18, 1936 (E. D. Ball), two females. North Rim, Grand Canyon National Park, July 5–7, 1940 (W. J. Gertsch and L. Hook), male and females. *Durango:* Rodeo, July 30, 1947 (W. J. Gertsch), male.

Dictyna lina Gertsch

Plate 43, figures 14–16

Dictyna lina GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 16, fig. 24. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322.

DIAGNOSIS: Female: Total length, 3 mm. Carapace, 1.15 mm. long, 0.9 mm. wide. Abdomen, 2 mm. long, 1.3 mm. wide. Male: Total length, 2.9 mm. Carapace, 1.2 mm. long, 1 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

This is another uncommon species of the *completa* group which agrees with it quite closely in coloration and structure. The carapace of the only female so far assigned to the species is nearly black on the sides and has the yellowish brown head marked with a pair of dusky streaks. The orange-brown sternum is irregularly margined with black and has a median, irregular, blackish mark. The yellowish brown legs are provided with narrow, broken, black rings. The abdomen is yellowish gray and has the following pattern: dorsum with a thin black stripe back to the middle and a series of narrow black chevrons behind; sides thickly spotted with black; venter with an indistinct median stripe consisting of numerous black spots and an irregular black linear stripe on each side from base to near the spinnerets. The males have the carapace quite uniform orange-brown and lack annuli on the legs. The whole abdomen is grayish, with an indistinct pattern of dusky spots and chevrons on the dorsum much as in the female and a quite uniform duskiness on the venter.

This species agrees closely in structure with *completa* and other species of this group. The slightly recurved posterior eye row has the eyes separated by the diameter in both sexes. The chelicerae of the male are somewhat more robust and modified, the two together being as broad as long, strongly angled on the sides, and bowed apart to form a nearly round opening.

The epigynum agrees closely with that of *completa* (see pl. 43, fig. 2), but the lateral foveae are not quite so widely separated.

The male palpus (pl. 43, fig. 16) is a very distinctive one. The thick embolus originates near the middle of the tegulum on the prolateral side and forms an even spiral into the expansive conductor, which is very broad and has the large terminal spur quite sharply angled. The distal part of the embolus is angled and twisted as shown in plate 43, figures 14 and 15.

TYPE LOCALITY: Mt. Lemmon, Santa Catalina Mountains, Arizona, male holotype in the American Museum of Natural History.

DISTRIBUTION: Arizona, New Mexico, and Chihuahua.

KNOWN RECORDS: *Arizona:* Forestdale, 15 miles south of Showlow, July 12, 1954 (W. J. Gertsch), male and female. Ranger Station on Mt. Lemmon, Santa Catalina Mountains, July 12–15, 1940, male holotype and paratype. *New Mexico:* Near The Lilies, Mt. Taylor (C. C. Hoff), male. *Chihuahua:* San Jose Babicora, July 4, 1947 (W. J. Gertsch), male.

Dictyna artemisia Ivie

Plate 45, figures 6–8

Dictyna artemisia IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately pub-

lished), p. 1. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1318.

DIAGNOSIS: Female: Total length, 2.5 mm. Carapace, 0.85 mm. long, 0.77 mm. wide. Abdomen, 1.8 mm. long, 1.2 mm. wide. Male: Total length, 1.9 mm. Carapace, 0.8 mm. long, 0.65 mm. wide. Abdomen, 1.1 mm. long, 0.7 mm. wide.

The carapace varies from dusky brown to blackish, is darkest on the pars thoracica and paler on the pars cephalica, especially in the females. The dusky brown sternum is blackish on the borders and usually has a more or less distinct median band or streak running the full length. The yellowish legs show faint dusky rings on the ends of some of the segments, but these are less distinct in the males or lacking. The abdomen is whitish in base color, is thickly reticulated with gray, and may show a dusky basal mark above, faint caudal chevrons behind, and an indistinct median dusky band on the venter.

The slightly recurved posterior eye row has the eyes separated by scarcely the full diameter. The pars cephalica is moderately elevated as indicated by the clypeal height, which equals the full diameter of the anterior lateral eye in the female and half again more in the male. The male chelicerae are average for this group as follows: the two together are as broad as long, quite flat in front, widely bowed apart to leave a subround opening, the lower carinal edges of which form conspicuous opposing teeth, and the basal angle is a weak rounded lobe.

The epigynum (pl. 45, fig. 7) presents large round atria quite widely separated by a broad septum and lateral foveae which are separated by somewhat less than the width of the genital furrow or the sternum. The dark seminal receptacles are usually visible through the integument as oval or rounded bodies, contiguous on the midline.

The male palpus (pl. 45, figs. 6, 8) presents a thick embolus which arises at the distal corner of the tegulum, makes a flat curve around and into the conductor, is bent in the apical fourth, at which point there is a distinct black spur, and terminates in a spatulate spur. The tibia is somewhat longer than broad and bears at the base the dorsal process, a small spur tipped with two black ctenidia.

TYPE LOCALITY: Wasatch Mountains, near Salt Lake City, Utah, male holotype in the American Museum of Natural History.

DISTRIBUTION: Wasatch Mountains of Utah.

KNOWN RECORDS: *Utah:* Provo River at North Fork, June 18, 1941 (W. Ivie), males, females. Scipio, May 25, 1947 (D. E. Beck), three females. Wasatch Mountains, near Salt Lake City, July, 1947 (W. Ivie), male holotype and female allotype.

Dictyna piratica Ivie

Plate 45, figures 1–5

Dictyna piratica IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published), p. 3. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324.

Emblyna utesca CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 13, pl. 2, figs. 19–20.

Dictyna monoca CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 10, pl. 2, fig. 24.

Dictyna artemisia LOWRIE AND GERTSCH, 1955, Amer. Mus. Novitates, no. 1736, p. 4.

DIAGNOSIS: Female: Total length, 2.4 mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.5 mm. long, 1.1 mm. wide. Male: Total length, 2 mm. Carapace, 0.9 mm. long, 0.75 mm. wide. Abdomen, 1.2 mm. long, 0.8 mm. wide.

This is a very close ally of *artemisia* but differs from it in genitalic features. The carapace varies from dusky brown to blackish, especially in northern specimens, and usually has the head lighter in the females. The dusky brown sternum has the margins more or less broadly bordered with black and a median black stripe or smudge. The yellowish to dusky orange legs have distinct narrow black rings, but they are often incomplete above. The white or grayish abdomen may be completely unmarked but usually has a distinct dusky pattern on the dorsum consisting of a median longitudinal dark line, which shows a diamond-shaped expansion at the anterior end, and followed by a truncate deltoid expansion and a series of chevrons connected at the apices by the median dark line. The venter is yellow at the sides, and the median dark band is considerably broken. The female types of *piratica* and *monoca* are pale-colored specimens.

The structure of this species differs in no important respects from that of *artemisia*.

The epigynum (pl. 45, figs. 3–5) differs from that of *artemisia* chiefly in the larger size of the internal receptacles which are on the midline as oval or kidney-shaped bodies.

The male palpus (pl. 45, figs. 1–2) is similar to that of *artemisia* except that the embolus is slightly bent near the end and bears the lateral black spur much nearer the club-shaped terminal portion.

TYPE LOCALITIES: Of *Dictyna piratica*, Salt Lake City, Utah, female holotype in the American Museum of Natural History; of *utesca*, East Canyon, near Salt Lake City, Wasatch Mountains, Utah, male holotype in the American Museum of Natural History; and of *monoca*, Benton Station, Mono County, California, female holotype in the American Museum of Natural History.

DISTRIBUTION: Mountains of Utah and Wyoming westward into California.

SELECTED RECORDS: *Utah:* East Canyon, June 12, 1943 (W. Ivie), males, females. Dry Canyon, Salt Lake City, June 14, 1929 (W. J. Gertsch), male. *Wyoming:* Grand Teton National Park, June 26, 1950 (D. C. Lowrie), male. *Idaho:* North shore of Bear Lake, July 6, 1952 (B. Malkin), males, females. McCammon, July 16, 1952 (B. Malkin), female. Sublett Reservoir, Cassia County, July 13, 1952 (B. Malkin), two females. *California:* Grass Lake, Siskiyou County, July 4, 1952 (W. J. Gertsch), male. Benton, May, 1941 (W. M. Pearce), male. Ten miles south of Palm Desert, San Jacinto Mountains (R. Schick), male. *Oregon:* Cline Falls State Park, Deschutes County, June 13, 1951 (B. Malkin), female.

Dictyna oregona Gertsch

Plate 44, figures 1–6

Dictyna oregona GERTSCH, 1946, Amer. Mus. Novitates, no. 1319, p. 11, figs. 9–10. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

Dictyna rotunda JONES, 1948, Field and Lab., vol. 16, p. 40, figs. 6, 21–24.

DIAGNOSIS: Female: Total length, 2.7 mm. Carapace, 1.05 mm. long, 0.85 mm. wide. Abdomen, 1.7 mm. long, 1.3 mm. wide. Male: Total length, 2.3 mm. Carapace, 1.1 mm. long, 0.92 mm. wide. Abdomen, 1.3 mm. long, 0.9 mm. wide.

The dusky brown carapace is brown on the sides of the head and dusky to dark brown on the pars thoracica. The dusky orange sternum is blackish on the borders and usually shows a distinct median dusky streak or patch. The yellowish legs may be unmarked but also may show faint, narrow, distal rings on some of the segments. The abdomen is usually whitish, reticulated with gray, and with the following pattern: dorsum with a basal line or stripe, with two or four short lateral extensions behind and a series of chevrons most often reduced to lateral spots or dashes; sides mottled with dusky; and the venter with a broken middle stripe flanked with white and an irregular black line on each side from base to spinnerets.

The slightly recurved posterior eye row has the median eyes separated by four-fifths to the full diameter. The pars cephalica is typically elevated, and the clypeal height equals one and one-half diameters of the anterior median eye in both sexes. The male chelicerae (pl. 44, figs. 4–5) are average for this group, the two together being somewhat broader than long, are quite flat in front and widely bowed apart to form an oval opening, of which the margins are strongly angled and developed into blunt opposing teeth in front, and the basal angle is a weak rounded lobe.

The epigynum (pl. 44, fig. 6) presents oval median atria separated by a septum of medium width and conspicuous lateral foveae which are separated by a distance about equal to the width of the genital furrow or sternum. The internal receptacles are small.

The male palpus (pl. 44, figs. 1–3) is of large size and striking development. The thick embolus arises near the base of the tegulum and forms a regular oval around to the apical fourth, where it is strongly bent and ends in a club-shaped process with three principal spurs. The conductor is quite broad at the base, and the spiral process is directed laterad. The tibia is somewhat longer than the greatest width in front and is narrowed at the base where the short dorsal spur tipped with two ctenidia lies on the retrolateral edge.

TYPE LOCALITIES: Of *oregona*, Rogue River Valley, 1300 feet, Oregon, male holotype in the American Museum of Natural History; and of *rotunda*, Crater Lake, Oregon, male

holotype in the Museum of Comparative Zoölogy.

DISTRIBUTION: Oregon and California.

SELECTED RECORDS: *Oregon:* Chetco River, 7 miles east of Brookings, May 29, 1952 (B. Malkin), males, females. Peavine Ridge, near McMinnville, May, 1947 (K. M. Fender), males, females. Sunny Valley, Josephine County, May 30, 1952 (B. Malkin), two females. *California:* Hastings Natural History Reservation, Monterey County (J. Linsdale), males, females. Hopland, July 23, 1953 W. J. and J. W. Gertsch), female. Davis, June, 1949 (E. I. Schlinger), male, females. Big Pines, Los Angeles County, June 1, 1957 (R. X. Schick), males, females.

Dictyna klamatha, new species

Plate 44, figures 7–10

FEMALE: Total length, 2.9 mm. Carapace, 1.35 mm. long, 1.05 mm. wide. Abdomen, 1.7 mm. long, 1.3 mm. wide.

Coloration and structure in very close agreement with those of *oregona*. Carapace dusky brown on the pars thoracica, but the head portion clear yellowish, with the usual rows of white hairs inconspicuous against the pale ground. Sternum yellowish, dusky along the borders, and with a linear smudge most of the length. Legs white to dull yellow, with faint traces of broken, narrow, dusky rings. Abdomen whitish, the dorsum with the typical *oregona* pattern well marked, and the venter largely lacking the median dusky band.

Clypeus equal in height to two diameters of the anterior median eye. First eye row gently procurved, the dark median eyes separated by the diameter, about half as far from the larger lateral eyes. Posterior eye row slightly recurved, the round median eyes separated by one and one-half diameters, about as far from the equal lateral eyes. Median ocular quadrangle broader than long (35/30), narrowed in front in the same ratio, the front eyes slightly smaller.

Epigynum (pl. 44, fig. 9) very similar to that of *oregona*.

MALE: Total length, 2.8 mm. Carapace, 1.3 mm. long, 1 mm. wide. Abdomen, 1.6 mm. long, 1.15 mm. wide.

Coloration essentially as in the female except for the darker pars cephalica.

Clypeus sloping, equal in height to three full diameters of the anterior median eyes. Eyes somewhat closer together, the posterior median eyes being separated by little more than the full diameter. Chelicerae as in *oregona*, but the two together proportionately a little longer than broad.

Male palpus (pl. 44, figs. 7, 8, 10) similar to that of *oregona*. Embolus thick at base, curved widely beyond the edge of the cymbium to leave a large open space, proportionately thinner than in *oregona*, with a distinct angle at the bend and the club-shaped process longer and thinner. The dorsal tibial apophysis is a short spur as in *oregona*.

TYPE LOCALITY: Male holotype, female allotype, and paratypes of both sexes from Klamath, California, June, 1953 (W. J. and J. W. Gertsch).

This interesting species is a close relative of *Dictyna oregona*, but differs from it in the large size, higher clypeus, and in the details of the palpus.

Dictyna hoya Chamberlin and Ivie

Plate 44, figures 11–14

Dictyna hoya CHAMBERLIN AND IVIE, 1941, Bull. Univ. Utah, biol. ser., vol. 6, no. 3, p. 7, pl. 1, fig. 8. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1321.

DIAGNOSIS: Female: Total length, 2.6 mm. Carapace, 0.9 mm. long, 0.7 mm. wide. Abdomen, 1.8 mm. long, 1.4 mm. wide. Male: Total length, 2.5 mm. Carapace, 1.15 mm. long, 0.95 mm. wide. Abdomen, 1.4 mm. long, 1.1 mm. wide.

This distinct species probably is most closely allied to *oregona*. The carapace is reddish brown, is darkest on the sides of the head and the pars thoracica, which shows the usual radiating dark brown streak, and pale yellowish brown on the top of the head in the females. The sternum is yellow to orange-brown and has the sides narrowly and irregularly margined with black and a distinct narrow dusky streak running most of the length. The yellowish brown legs show no traces of dark annuli or other markings. The abdomen, which varies from dirty white to light yellow in base color, may be unmarked above, but usually shows a faint dusky pattern of basal streaks and caudal chevrons. The venter is somewhat variable, but usually has narrow side lines from base

to near spinnerets and a more or less distinct median dusky band.

The structure in both sexes is very similar to that of *oregona*. The slightly recurved eyes of the posterior row are separated in most cases by the full diameter. The carapace of the female is of typical elevation, and the clypeus is equal in height to one and one-half diameters of the anterior median eye. In the male the clypeal height is equal to two diameters, and the head is, as usual, more strongly elevated. The chelicerae of the male are strongly modified as in *oregona* and *completa*.

The epigynum (pl. 44, fig. 13), which is similar to that of *oregona* and that of *klamatha*, has smaller atria set forward and has the lateral foveae separated by a distance somewhat less than the width of the genital groove.

The male palpus (pl. 44, figs. 11, 12, 14) is quite similar to that of *completa* in ventral aspect. The thick embolus originates at about the middle of the tegulum on the prolateral side, forms an even spiral, is twisted apically, and divided into two subequal pieces as shown in plate 44, figure 12. The short tibia is somewhat longer than broad and bears above at the base a short, erect spur with two black ctenidia.

TYPE LOCALITY: Ben Lomond, California, female holotype in the American Museum of Natural History.

DISTRIBUTION: Coast ranges of southern California.

KNOWN RECORDS: *California:* Ben Lomond, April, 1934 (L. W. Saylor), female holotype. Goleta, May 4, 1955 (W. J. Gertsch), two males, females. Tapia Park, Santa Monica Mountains, April 3, May 1, 1954 (R. X. Schick), two females. Pine Valley, San Diego County, July 10, 1953 (W. J. and J. W. Gertsch), female. San Diego, June 27, 1939 (L. I. Davis), three females.

Dictyna consulta Gertsch and Ivie

Plate 45, figures 9–11; text figure 26

Dictyna consulta GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 6, figs. 12, 13; 1942, Amer. Mus. Novitates, no. 1158, p. 16. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1320. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1434.

Dictyna montgomeryi GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 328, fig. 31.

DIAGNOSIS: Female: Total length, 2.3 mm. Carapace, 0.8 mm. long, 0.7 mm. wide. Abdomen, 1.4 mm. long, 1 mm. wide. Male: Total length, 2 mm. Carapace, 0.85 mm. long, 0.67 mm. wide. Abdomen, 1.15 mm. long, 0.8 mm. wide.

The pale yellowish brown carapace is dusky on the sides of the head and on the pars thoracica which shows a narrow marginal black seam and the blackish radial lines. The yellowish sternum is bordered with black and marked with a black streak or distinct stripe from the labium to the caudal edge of the sternum. The yellowish legs have narrow, indistinct, dusky rings particularly noticeable at the distal ends of some of the segments. The abdomen is whitish, reticulated with gray, and marked as follows: dorsum with a basal, dusky, laterally branched streak and three or four pairs of small dusky spots behind, which may be joined to form a longitudinal stripe on each side; sides of the abdomen with scattered dusky spots; and the venter with a faint dusky median band and a distinct dusky stripe on each side from the base to the side of the spinnerets.

The structure is similar to that of other species of the *reticulata* group, of which this is one of the smallest and most distinctive. The posterior eye row is slightly recurved, and the eyes are separated by about two-thirds of their diameter. The pars cephalica is of average elevation, and the clypeus equals one and one-half diameters of the anterior median eye in both sexes. The male chelicerae are of moderate length, the two together being only slightly longer than broad, are essentially straight in front, have the sides bowed out to leave a suboval opening about as wide as the width of a chelicera, and have the lateral angle a slight rounded spur.

The epigynum (pl. 45, fig. 10) presents large suboval atria separated by a septum of medium width, beneath which two small rounded receptacles are plainly evident. The lateral foveae are quite close to the atria and are separated by a distance not fully equal to the width of the genital groove or sternum.

The male palpus (pl. 45, figs. 9, 11) is very distinctive in the details of the thick em-

bolus. This begins near the base of the tegulum on the prolateral side and closely margins the bulb in a regular oval around to the retrolateral side where it turns at nearly a right angle to form a heavy spiral. The tibial apophysis is a small dorsal spur set with two ctenidia, near the base of the segment.

TYPE LOCALITIES: Of *consulta*, Lake Minnetonka, near Minneapolis, Minnesota, male holotype in the American Museum of Natural History; of *montgomeryi*, 25 miles south of Alpine, Brewster County, Texas, female holotype in the American Museum of Natural History.

DISTRIBUTION: Ontario and Minnesota south to Texas and western Mexico (see fig. 26).

KNOWN RECORDS: *Ontario:* Hyde Park, Toronto, June 14, 1931 (T. B. Kurata), female. *Minnesota:* Lake Minnetonka, near Minneapolis, June 4, 1932 (W. J. Gertsch), male. *Nebraska:* Lincoln, September 18, 1938 (E. Fichter), male. *Oklahoma:* Comanche County, 1925, male. *Texas:* Twenty-five miles south of Alpine, June 12, 1938 (Gertsch and Mulaik), female holotype. Blackwell, August 16, 1929 (Gertsch and Ivie), male. *New Mexico:* Mescalero Sands, Taprock, July 9, 1954 (W. J. Gertsch), male. *Arizona:* Painted Canyon Ranch, 5 miles west of Portal, July 4, 1954 (W. J. Gertsch), female. *California:* Big Tujunga Canyon, San Gabriel Mountains, March, 1953 (R. Schick), male. *Chihuahua:* Forty-four miles north of Chihuahua, June 13, 1939 (A. M. and L. I. Davis), male. *Nayarit:* Arroyo Santiago, 3 miles northwest of Jesus Maria, July 4, 1955 (B. Malkin), two males.

Dictyna marissa, new species

Plate 45, figure 12

FEMALE: Total length, 1.6 mm. Carapace, 0.75 mm. long, 0.6 mm. wide. Abdomen, 1 mm. long, 0.75 mm. wide.

Coloration and structure in very close agreement with those of *consulta*. Carapace yellowish brown except for dusky brown radiations on the pars thoracica and the sides of the head. Sternum yellowish, dusky along the margins, and with a dusky band in caudal half. Legs pale yellow and unmarked. Abdomen whitish, reticulated with fine gray lines, the venter with a pair of dusky spots opposite the epigynum and another pair flanking the cribellum.

Posterior eye row slightly recurved, the median eyes separated by the full diameter.

Epigynum (pl. 45, fig. 12) resembling that of *consulta* and related species, but with the shallow suboval atria proportionately larger. Internal receptacles forming an M-shaped figure.

TYPE LOCALITY: Female holotype from Marysville, California, July 12, 1937 (R. V. Chamberlin).

This is a very small "edition" of *consulta* (which is rarely less than 2.5 mm. in length) and presents epigynal differences that quite likely are of specific value.

Dictyna littoricolens Chamberlin and Ivie

Plate 46, figures 1–6

Dictyna littoricolens CHAMBERLIN AND IVIE, 1935, Bull. Univ. Utah., biol. ser., vol. 2, no. 8, p. 30, pl. 3, figs. 19, 20. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1322. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1443.

Dictyna cornupeta, BISHOP AND RUDERMAN, 1946, Proc. Biol. Soc. Washington, vol. 59, p. 1 (part).

Dictyna acuta JONES, 1948, Field and Lab., vol. 16, p. 33, figs. 2, 8–10.

DIAGNOSIS: Female: Total length, 3.5 mm. Carapace, 1.3 mm. long, 1 mm. wide. Abdomen, 2.2 mm. long, 1.5 mm. wide. Male: Total length, 2.5 mm. Carapace, 1.3 mm. long, 1.05 mm. wide. Abdomen, 1.9 mm. long, 1.2 mm. wide.

This is a large, light-colored species which is said to live mainly on the ground near the water. The yellowish carapace has dusky brown shadings on the pars cephalica, and the sides of the head and the five rows of white hairs on the pars cephalica are conspicuous. The yellow sternum almost always has a faint black streak down the center. The yellowish legs are unmarked. The white or yellowish abdomen, which is covered with whitish hairs, usually has a dorsal pattern consisting of a basal blackish stripe crossed behind and a series of four or five chevrons or pairs of spots.

The carapace is of moderate height in both sexes as reflected in the clypeal height, which in the female is the full diameter of the lateral eye and in the male nearly one and

one-half diameters. The eyes of the slightly procurved posterior row are separated by the full diameter. The male chelicerae (pl. 46, fig. 4) are essentially straight in front, are moderately bowed to form an oval opening, and have at the lower edge of this opening one short spur on each side, one opposing the other. The angle at the base of the chelicera is not developed to a distinct horn.

The epigynum (pl. 46, fig. 2) presents two relatively large suboval atria separated by a narrow septum and lateral foveae moderately separated to about the width of the sternum.

The male palpus (pl. 46, figs. 1, 3, 5, 6) features a very thick embolus which forms a broad oval to lie partially hidden in the conductor. The distal portion of the embolus (pl. 46, fig. 5) is relatively thick and bears a clear, membranous pars pendula. The tibial apophysis is a short spur armed with two black ctenidia.

TYPE LOCALITIES: Of *littoricolens*, west side of Utah Lake, Utah, male holotype in the American Museum of Natural History; of *acuta*, beach of north shore of Soap Lake, Washington, in the Museum of Comparative Zoölogy.

DISTRIBUTION: Western United States as indicated in the references below.

KNOWN RECORDS: *Idaho:* Notus, June 11, 1931, female. Northeast of Fruitland, June 30, 1943 (W. Ivie), males and females. *Utah:* West side of Utah Lake, May 27, 1934 (W. Ivie), males and females. Salt Lake City, various dates, male and females. Black Rock, Great Salt Lake, August 28, 1931 (R. V. Chamberlin), male and females. *Washington:* Beach of north shore of Soap Lake, May 7, 1938 (M. Hatch), male. *Wyoming:* Yellowstone Lake, Yellowstone National Park, August 29, 1927, male paratype of *cornupeta*. *Oklahoma:* Lake Altus, August 25, 1948 (P. Vaurie), female.

Dictyna linda, new species

Plate 45, figures 13, 14

FEMALE: Total length, 2.35 mm. Carapace, 0.95 mm. long, 0.8 mm. wide. Abdomen, 1.4 mm. long, 1.05 mm. wide.

Dorsal view of this brightly colored species as shown in plate 45, figure 14. Carapace bright red, lightest on the head, somewhat duller on the pars thoracica. Sternum and maxillae orange-brown, dusky on the margins; the labium dusky reddish brown. Femora of the legs blackish, the other segments yellow in base color but dusky at ends. Abdomen mostly blackish above, with a series of whitish spots or broken chevrons in caudal half; the venter pale gray below, with a few dusky spots.

Structure essentially typical, with the pars cephalica well elevated, the eye group rather small, and the somewhat inclined clypeus equaling two full diameters of the anterior median eye. Front eye row weakly procurved, the median separated by about two-thirds of their diameter, one-third as far from the clearly larger lateral eyes. Posterior eye row gently recurved, the median eyes separated by the short diameter, about as far from the equal lateral eyes. Median ocular quadrangle slightly broader than long and slightly narrowed in front. Tibia and patella of the first leg, 0.84 mm. long.

Epigynum (pl. 45, fig. 13) with quite large round atria separated by a narrow septum. Lateral foveae wide apart to a distance slightly exceeding the width of the sternum.

TYPE LOCALITY: Female holotype from Tanbark Flats, San Gabriel Mountains, Los Angeles County, California, June 20, 1952 (W. J. Gertsch).

DISTRIBUTION: Southern California.

KNOWN RECORDS: *California:* Goleta, May 4, 1937 (S. C. Bishop), female paratype. Desert side of Cajon Pass, May 3, 1936 (Bishop collection), female paratype. Tecate, San Diego County, March 28, 1947 (W. M. Pearce), male paratype in the penultimate stage.

Without the adult male the position of this colorful species remains doubtful. The black femora, dusky abdomen, and the red or pinkish carapace distinguish it quickly from all other species.

Dictyna reticulata Gertsch and Ivie

Plate 46, figure 12; plate 47, figures 1–7; text figure 37

Dictyna reticulata GERTSCH AND IVIE, 1936, Amer. Mus. Novitates, no. 858, p. 7, fig. 27. GERTSCH AND DAVIES, 1937, Amer. Mus. Novitates, no. 961, p. 17; 1942, Amer. Mus. Novitates, no. 1158, p. 16. GERTSCH AND MULAIK, 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 327.

ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1324. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1449.

Dictyna declarata GERTSCH AND MULAIK, 1936, Amer. Mus. Novitates, no. 851, p. 9, fig. 11; 1940, Bull. Amer. Mus. Nat. Hist., vol. 77, p. 331. BONNET, 1956, Bibliographia araneorum, vol. 2, pt. 2, p. 1434.

Dictyna californica JONES, 1947, Field and Lab., vol. 15, p. 11, figs. 24–27; 1948, Field and Lab., vol. 16, p. 32, fig. 1.

Emblyna rosana CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 12, fig. 29.

DIAGNOSIS: Females vary from 2.5 to 4 mm. in total length and average 3 mm. Carapace of a typical female, 1 mm. long, 0.8 mm. wide. Males are proportionately smaller.

This pale species, a female of which is shown in plate 46, figure 12, is rather uniform in color. The pale yellowish brown carapace is darker on the sides of the head, and the pars thoracica and the latter may have distinct brownish radiating bands. The yellow sternum may be unmarked but usually shows a duskiness around the margins and a central linear dusky streak. In dark specimens the sternum is often broadly margined in black, and the central band is broad. The whitish to yellow brown legs are usually unmarked. The typically unmarked abdomen varies from milky white to gray and is reticulated in gray or dusky. Darker markings may not be present, but traces of a dusky or bold pattern are evident in some specimens as follows: dorsum with a dusky basal, branched figure; dorsum with a black basal maculation and a series of spots or chevrons behind; sides with a few small blackish spots; venter with a more or less distinct black spot on each side of the epigynal area, on each side of the cribellum, and a dusky central band from pedicel to spinnerets. Males agree closely in color with the females and exhibit the various color variations.

The slightly recurved posterior eye row has the median eyes separated from two-thirds to the full diameter. The carapace of the female is of average elevation, and the clypeal height is not fully one and one-half diameters of the anterior median eyes. The carapace of the male is more strongly elevated, but not conspicuously so, and the clypeal height is not fully two diameters of an anterior median eye. The male chelicerae are of moderate length, the two together being distally longer than broad in the ratio of 7/5, are moderately rounded on the sides to leave a median fusiform opening margined by a weak carina, and have the basal angle developed into a distinct rounded nodule.

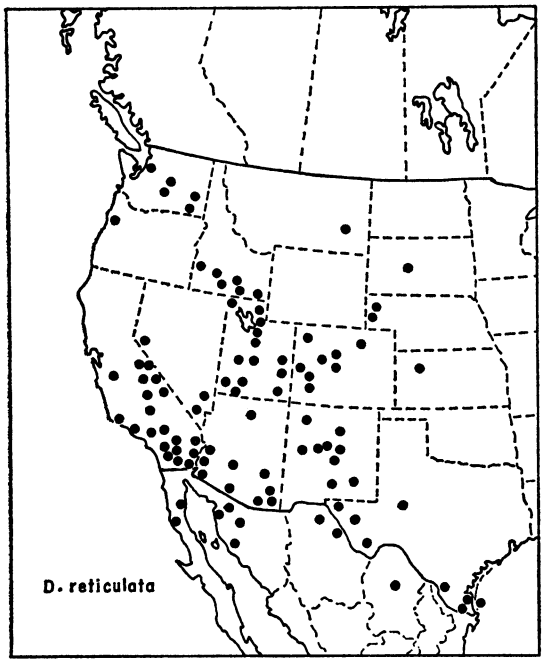


FIG. 37. Distribution of *Dictyna reticulata*.

The epigynum (pl. 47, fig. 7) presents two rounded atria separated by a septum equal to their width, and lateral foveae of moderate separation not fully equal to the genital groove but almost equal to the width of the sternum.

The male palpus (pl. 47, figs. 1, 2, 6) typifies this group of species. The thick embolus originates near the front of the tegulum on the prolateral side, forms a short rounded spiral, and fits into the groove of the elongated conductor. The embolus (pl. 47, figs. 3–5) is apically divided into a spatulate element of moderate size and a thin black spine which lies in the long fold and exceeds it by about one-third of its length. The somewhat longer than broad tibia (pl. 47, fig. 2) is narrowed at the base and bears above a short spur with two black ctenidia.

TYPE LOCALITIES: Of *reticulata*, Richfield, Utah, male holotype in the American Mu-

seum of Natural History; of *declarata*, 30 miles southeast of Laredo, Texas, female holotype in the American Museum of Natural History; of *californica*, Claremont, California, male holotype in the Museum of Comparative Zoölogy; and of *rosana*, Santa Rosa, New Mexico, female holotype in the American Museum of Natural History.

DISTRIBUTION: Western United States from South Dakota and Montana to Washington, southward through the coast and Rocky Mountain states and Texas into Baja California and Mexico (see fig. 37).

SELECTED RECORDS: *South Dakota:* Ten miles south of Fort Pierre, August 5, 1937, female. *Kansas:* Russell, August 23, 1935, females. *Montana:* Miles City, July 14, 1939, females. *Washington:* Cheney, July 16, 1945, female. Seattle, 1946 (H. Exline), females. *Texas:* Big Springs, June 21, 1953 (W. J. Gertsch), two males. *Baja California:* El Mayor, June 15, 1952 (W. J. Gertsch), males and females. *Sonora:* La Choya, June 12, 1952 (W. J. Gertsch), males and females. *Tamaulipas:* San Pedro, July 5, 1936 (E. J. Davis), female. *Durango:* One mile west of Lerdo, July 4, 1936 (L. I. Davis), male.

Dictyna shasta, new species

Plate 47, figure 8

FEMALE: Total length, 3 mm. Carapace, 1.05 mm. long, 0.87 mm. wide. Abdomen, 2.2 mm. long, 1.6 mm. wide. Male: Total length, 2.5 mm. Carapace, 11. mm. long, 0.9 mm. wide. Abdomen, 1.5 mm. long, 1 mm. wide.

Carapace dark dusky brown, the pars cephalica with narrow black radiating streaks and a narrow marginal seam, the head brown in the male but mostly yellowish in the female and enclosing a pair of longitudinal brown streaks. Sternum yellowish brown, broadly margined with dusky and with a central dusky stripe on the length. Legs yellowish brown, more or less distinctly ringed with dusky. Abdomen dirty white, reticulated in gray, marked as follows: dorsum with a basal, black, branched stripe to the center and a series of paired black spots or chevrons in distal half; venter with a dusky, somewhat irregular stripe from epigynum to spinnerets which is flanked by side spots opposite epigynum and spinnerets.

Structure in very close agreement with that of *reticulata*.

Epigynum seemingly identical with that of *reticulata* (pl. 47, fig. 7).

Male palpus (pl. 47, fig. 8) differing from that of *reticulata* mainly in the form of the embolus, which has the spatulate element thinner apically and the free spine proportionately shorter.

TYPE LOCALITY: Male holotype, female allotypes, and paratypes of both sexes from Grass Valley, Siskiyou County, California, July 4, 1952 (W. J. Gertsch).

DISTRIBUTION: Mountains of northern California and Oregon.

KNOWN RECORDS: *California:* Hebron Summit, 10 miles north of Dorris, July 27, 1953 (W. J. and J. W. Gertsch), male and female paratypes. Lake Tahoe, July 11, 1952 (W. J. Gertsch), males and female paratypes. *Oregon:* Sprague River, 12 miles east of Chiloquin, July 1, 1951 (B. Malkin), male paratype. Lakeview, June 27, 1951 (B. Malkin), three female paratypes.

This dark species has the structure and size of the light-colored *reticulata* and may be only the geographical representative of it in the Cascade Mountains. The small differences in the embolus of the male palpus make it desirable to hold it separate as a full species until fuller information is available. *Dictyna shasta* is also closely allied to *shoshonea*, but this latter species is a larger, much paler, and proportionately stouter species.

Dictyna shoshonea, new species

Plate 47, figures 13–16

FEMALE: Total length, 3.5 mm. Carapace, 1.5 mm. long, 1.15 mm. wide. Abdomen, 2.3 mm. long, 1.5 mm. wide. Male: Total length, 3 mm. Carapace, 1.4 mm. long, 1.2 mm. wide. Abdomen, 1.8 mm. long, 1.2 mm. wide.

Coloration and structure in very close agreement with those of *reticulata* and *palomara*.

Epigynum (pl. 47, fig. 15) very similar to that of *reticulata*.

Male palpus (pl. 47, figs. 13, 14, 16) a little shorter and stouter than that of *reticulata*. Embolus thick, originating from distal edge of tegulum on prolateral side, gently curved to opposite side where it forms a

rounded angle, immediately enlarged at position of division, and then tapering to end. Tibia somewhat longer than width at apex, narrow at base, and bearing above a short spur tipped with two black ctenidia.

TYPE LOCALITY: Male holotype and female allotype from 5 miles north of Payette, Idaho, August 4, 1943 (W. Ivie).

DISTRIBUTION: Idaho and Oregon.

KNOWN RECORDS: *Idaho:* Shoshone (W. Ivie), females. *Oregon:* Service Creek, July 10, 1953 (V. Roth), male paratypes. Richmond, August 3, 1951 (V. Roth), three female paratypes from heads of brush.

Dictyna oasa Ivie

Plate 46, figures 7–11

Dictyna oasa IVIE, 1947, Some new spiders of the genus Dictyna, New York (privately published), p. 1. ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Female: Total length, 3.7 mm. Carapace, 1.4 mm. long, 1.15 mm. wide. Abdomen, 2.4 mm. long, 1.8 mm. wide. Male: Total length, 3 mm. Carapace, 1.4 mm. long, 1.2 mm. wide.

A dorsal view of a typical female is shown in plate 46, figure 9. The carapace is dull yellow in base color, has the sides brownish, with distinct radiating brown streaks, the sides of the head brown, and the upper part of the head pale, with four brown stripes running back from the eyes. In dark specimens the pars thoracica is quite uniform brown, except for a narrow pale marginal stripe, and the paler, striped head is very conspicuous. The conspicuous bands of white hairs on the head lie on the pale areas between the darker stripes. The yellow to light brown sternum is sometimes unmarked but usually shows a central dusky streak, and in well-marked specimens has the sides margined with black and the longitudinal marking a distinct stripe. The yellowish legs are often unmarked, but black rings, usually incomplete above, are present in specimens from higher attitudes. The whitish abdomen has only a faint pattern of gray reticulations and a series of faint dusky spots on the dorsum in specimens from eastern California. Examples from New Mexico show the following bold pattern on the whitish abdomen: dorsum with a narrow median black band, branched behind, running back to the middle, and a median folium behind margined by subconfluent black dashes; sides with irregular dusky markings; venter with a black patch on each side of the epigynum and a more or less distinct black stripe from the epigynum back to the cribellum.

The slightly recurved posterior eye row has the eyes separated by the full diameter. The carapace of the female is of moderate elevation, and the height of the clypeus is scarcely more than the full diameter of the anterior median eye. The carapace of the male is of average height and elevation, with the clypeus equaling about one and one-half diameters of an anterior median eye. The male chelicerae are of average length, are strongly angled on the sides so that the two together are as broad as long, are well bowed apart in front to form an oval opening, and are margined by a carina which is formed apically into distinct opposing spurs and has a weakly developed nodule at the basal angle.

The epigynum (pl. 46, fig. 11) is distinctive within this group by the large size of the shallow rounded atria, which are separated by a septum equaling half of the width. The lateral foveae are scarcely as wide apart as the width of the sternum.

The male palpus (pl. 46, figs. 7, 8, 10) is the most derivative within this series. The thick embolus originates near the apex of the tegulum on the outer side and forms a short oval to lie hidden in the expansive basal portion of the conductor. The distal part of the embolus is heavy, spatulate, and presents a transparent, curved spine which lies in the broad spoon. The tibia is about as broad at the apex as the length, is narrow at the base where it is armed above by a short but quite heavy spur bearing two black ctenidia.

TYPE LOCALITY: Owens Lake, California, male holotype in the American Museum of Natural History.

DISTRIBUTION: New Mexico to California.

KNOWN RECORDS: *New Mexico:* Grants, June 6, 1933 (W. Ivie), many immature specimens. San Fidel, September 4, 1941 (W. Ivie), females. Near Correo, Valencia County (C. C. Hoff), females. New Capulin (C. C. Hoff), female. Pecos River, east of Artesia, July 9, 1954 (W. J. Gertsch), males

and females. *Arizona:* Between Winslow and Holbrook, June 16, 1934, immature specimens in marsh. *California:* Furnace Creek, Death Valley, March 23, 1941 (W. Ivie), females. Cartago, August 6, 1931 (W. Ivie), females; July 19, 1952 (W. J. Gertsch), many males and females. Tulare County, females. Little Lake, August 6, 1931 (W. Ivie), males and females from short grass near lake.

Dictyna palomara Chamberlin

Plate 47, figures 9–12

Emblyna palomara CHAMBERLIN, 1948, Bull. Univ. Utah, biol. ser., vol. 10, no. 6, p. 11, fig. 23.
Dictyna palomara ROEWER, 1954, Katalog der Araneae, vol. 2, pt. B, p. 1323.

DIAGNOSIS: Female: Total length, 3.5 mm. Carapace, 1.1 mm. long, 0.9 mm. wide. Abdomen, 2.3 mm. long, 1.7 mm. wide. Male: Total length, 3 mm. Carapace, 1.4 mm. long, 1.1 mm. wide. Abdomen, 1.9 mm. long, 1.2 mm. wide.

This is a somewhat larger, more strongly marked species than *reticulata*, of which it is a close relative. The carapace is usually darker brown, particularly on the pars cephalica. The sternum is broadly margined with black and has a broad, median, black stripe most of the length. The abdomen is rarely unmarked and usually has the following pattern: dorsum reticulated in dusky, with a linear maculation at the base with two or more short side branches; sides with scattered black dashes; venter with a dark patch on each side opposite the epigynum, a similar smaller patch on each side of the cribellum, and a median band from the epigynum to cribellum. The type specimens from Mt. Palomar are relatively pale, but other examples from there are boldly marked.

The structure of this species agrees closely with that of *reticulata* in both sexes.

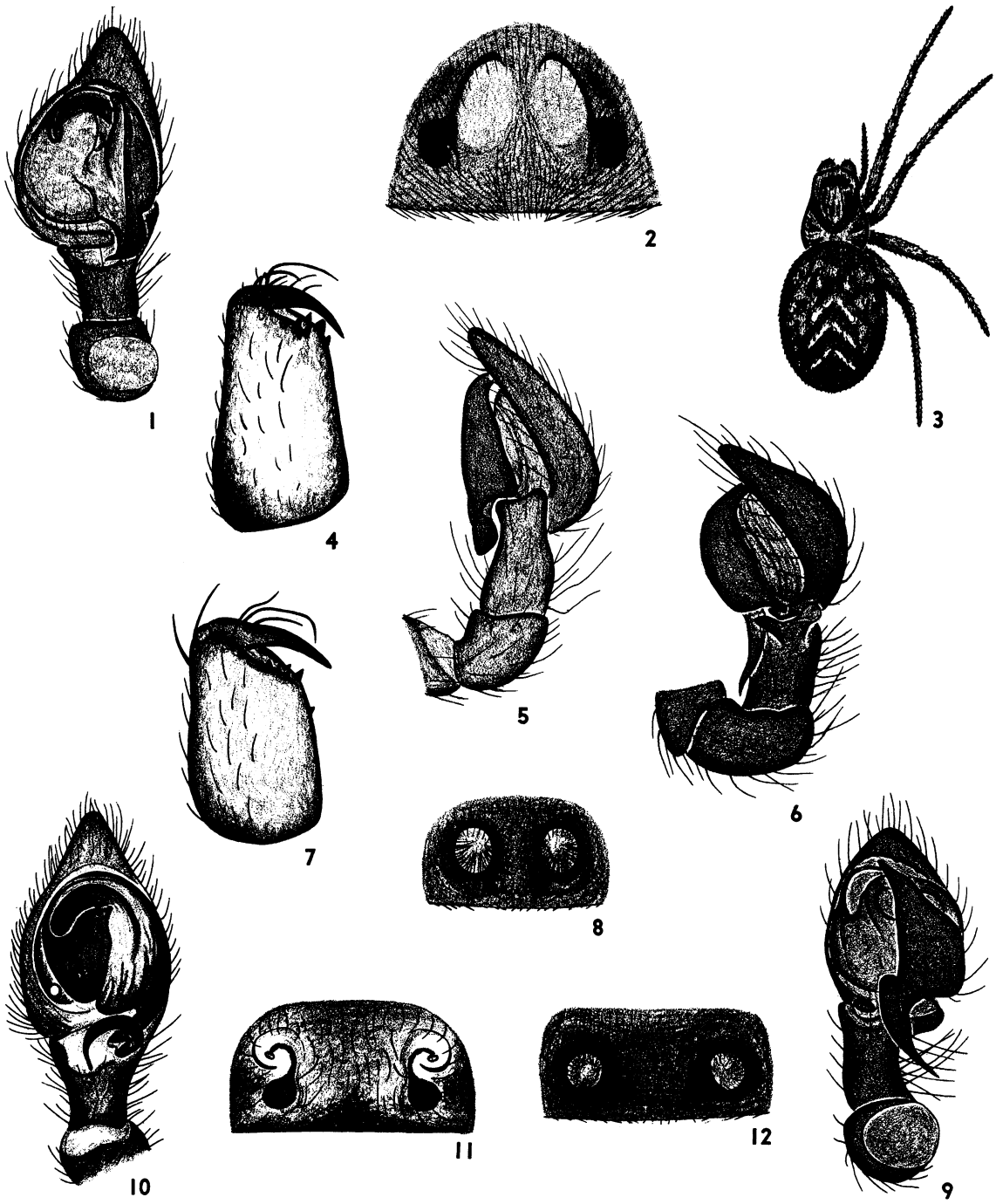
The epigynum is similar to that of *reticulata* and *shoshonea* (see pl. 47, figs. 7, 15).

The male palpus (pl. 47, figs. 9–12) is somewhat more elongated than that of *reticulata*. The thick embolus originates near the front of the tegulum on the prolateral side, passes straight across the bulb where it is strongly bent twice to form two right angles (pl. 47, fig. 11), and then terminates in the typical appressed, spatulate, and spinate elements. The tibia is proportionately longer than in *reticulata*, being only two-thirds as broad at the base above as the length, is narrowest at the base where is found above the short, thin apophysis bearing two black ctenidia.

TYPE LOCALITY: Mount Palomar, San Diego County, California, male holotype, in the American Museum of Natural History.

DISTRIBUTION: Mountains of southern California north into the Sierras and adjacent ranges in Idaho.

KNOWN RECORDS: *California:* Guatay, July 9, 1953 (W. J. and J. W. Gertsch), male. Pine Valley, July 10, 1953 (W. J. and J. W. Gertsch), male. Mount Palomar State Park, July 13, 1953 (W. J. and J. W. Gertsch), females. Mount Palomar, July 26, 1931 (W. Ivie), male and females. Peavine, Sierra County, June 18, 1940 (W. M. Pearce), male. *Idaho:* Wood River, 5 miles north of Shoshone, July 20, 1952 (B. Malkin), male, four females. Twin Creek Camp, 5000 feet, Bitterroot Mountains, July 26, 1952 (B. Malkin), male and female.

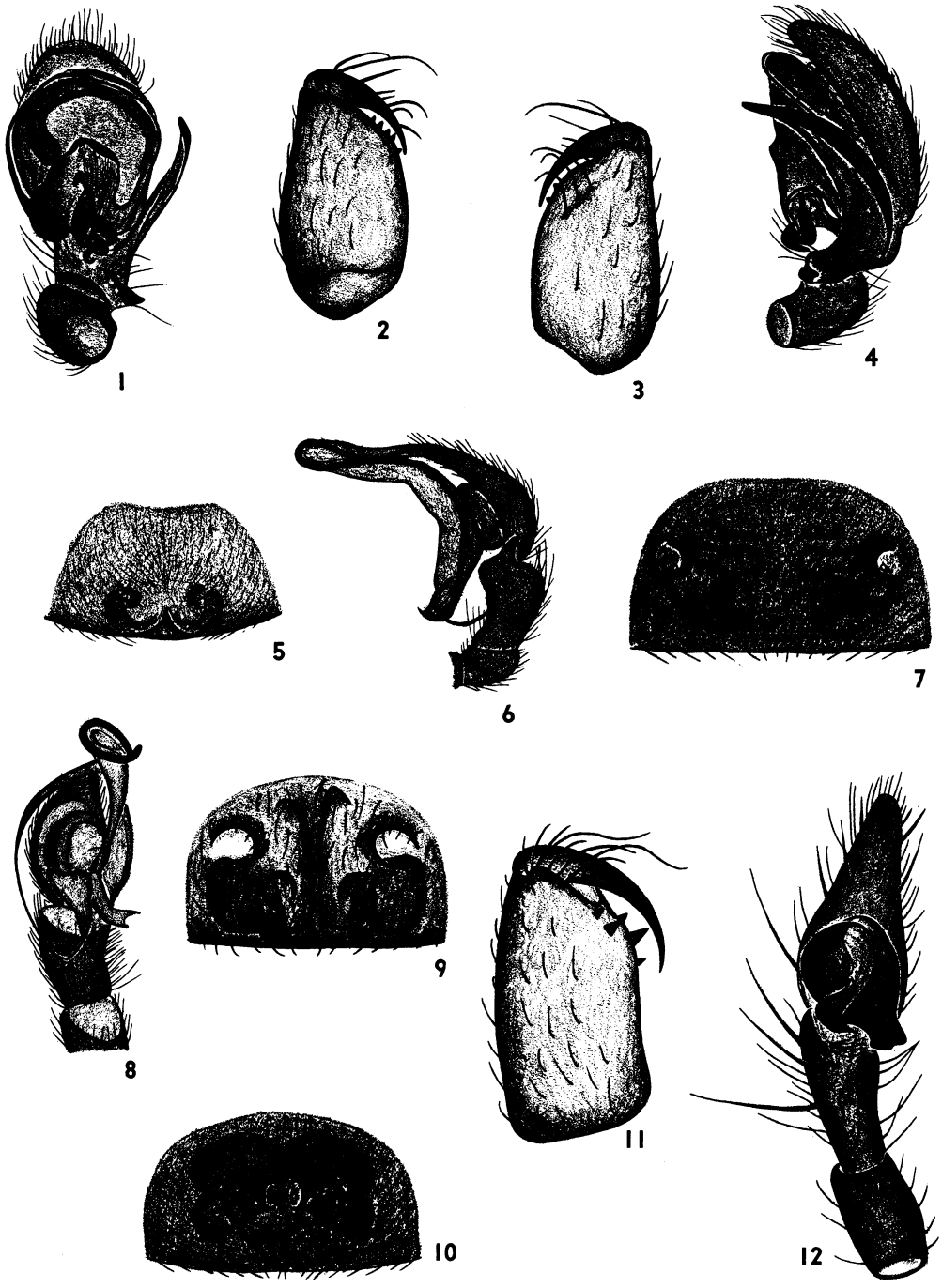


1–5. *Argenna obesa* Emerton. 1. Male palpus, ventral view. 2. Epigynum. 3. Dorsal view of female. 4. Chelicera, ventral view. 5. Male palpus, retrolateral view

6–9. *Argenna saphes* Chamberlin. 6. Male palpus, retrolateral view. 7. Chelicera of female, ventral view. 8. Epigynum. 9. Male palpus, ventral view

10, 11. *Argenna yakima*, new species. 10. Male palpus, ventral view. 11. Epigynum

12. *Argenna lorna*, new species, epigynum



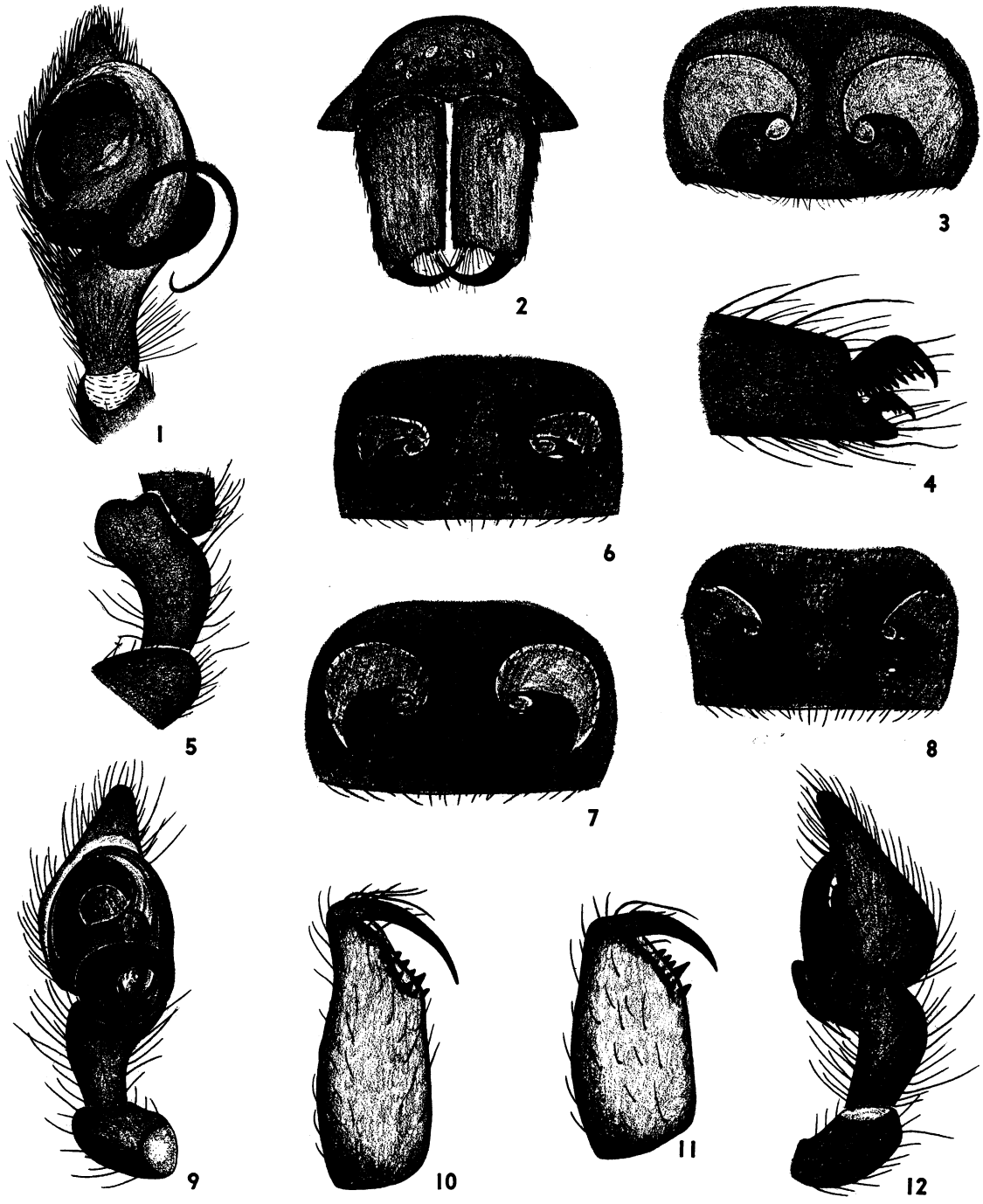
1–5. *Pagomys monticola* Gertsch and Mulaik. 1. Male palpus, ventral view. 2. Chelicera, ventral view. 3. Chelicera, dorsal view. 4. Male palpus, retrolateral view. 5. Epigynum

6–8. *Tricholathys ohioensis* Chamberlin and Ivie. 6. Male palpus, retrolateral view. 7. Epigynum. 8. Male palpus, ventral view

9. *Tricholathys reclusa* Gertsch and Ivie, epigynum

10. *Argennina unica* Gertsch and Mulaik, epigynum

11, 12. *Devade hirsutissima* Simon. 11. Chelicera, ventral view. 12. Male palpus, ventral view

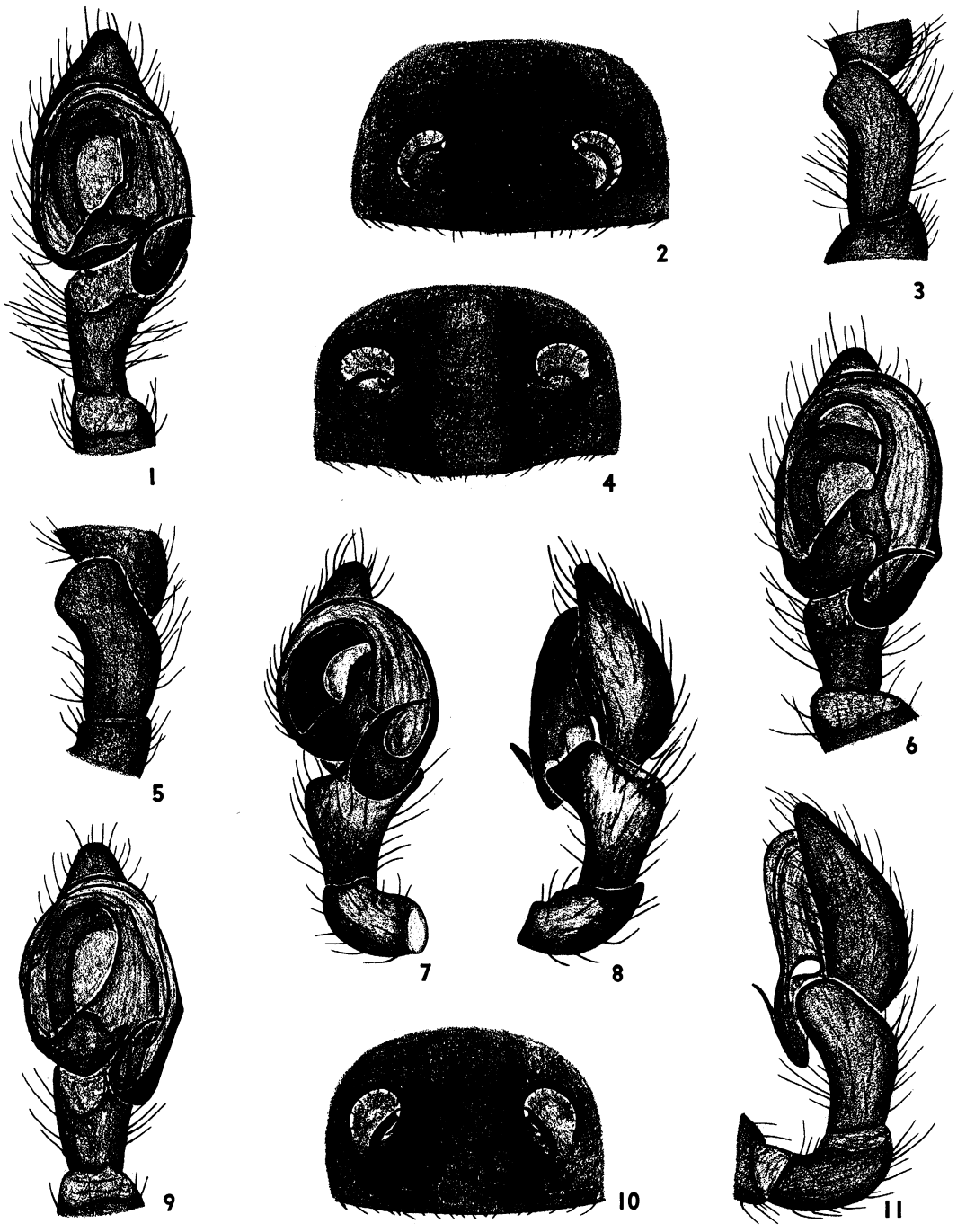


1–5. *Tricholathys spiralis* Chamberlin and Ivie. 1. Male palpus, ventral view. 2. Frontal view of female. 3. Epigynum. 4. Tarsus of female. 5. Tibia of male palpus, retrolateral view

6. *Tricholathys knulli* Gertsch, epigynum

7. *Tricholathys dakota*, new species, epigynum

8–12. *Tricholathys jacinto*, new species. 8. Epigynum. 9. Male palpus, ventral view. 10. Chelicera of male, ventral view. 11. Chelicera of female, ventral view. 12. Male palpus, retrolateral view

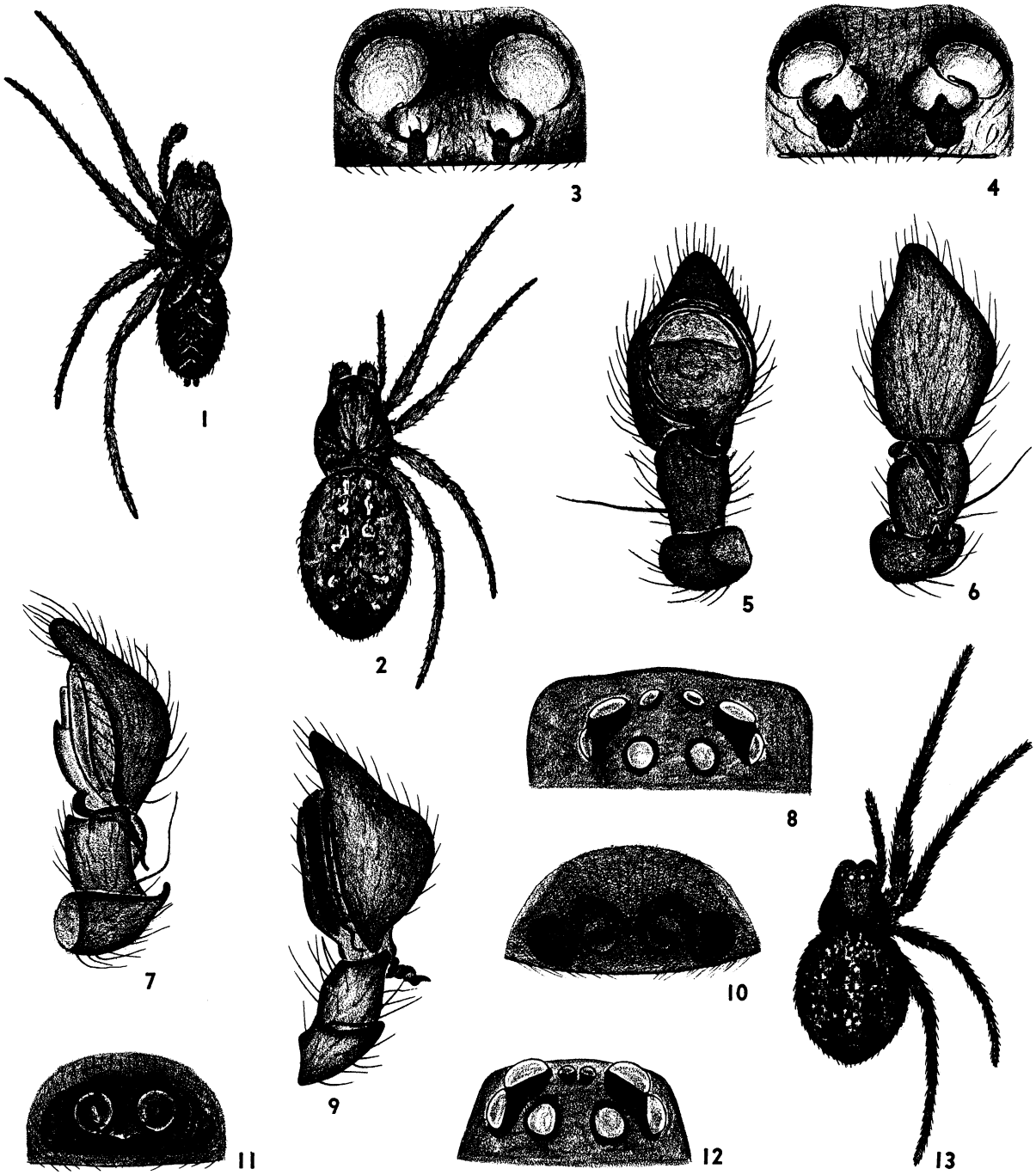


1–3. *Tricholathys hirsutipes* Banks. 1. Male palpus, ventral view. 2. Epigynum. 3. Tibia of male palpus, retrolateral view

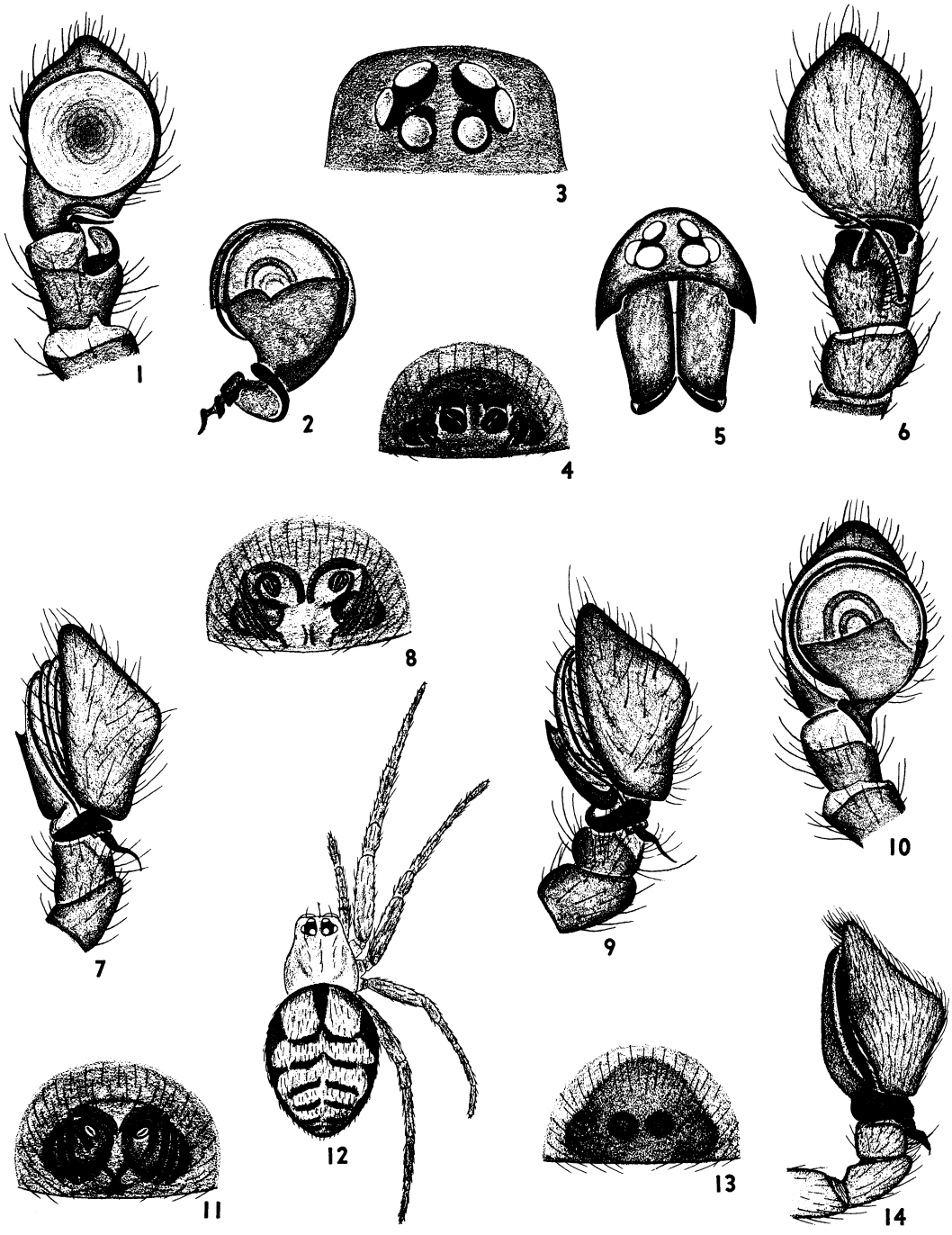
4–6. *Tricholathys monterea*, new species. 4. Epigynum. 5. Tibia of male palpus, retrolateral view. 6. Male palpus, ventral view

7, 8. *Tricholathys rothi*, new species. 7. Male palpus, ventral view. 8. Male palpus, retrolateral view

9–11. *Tricholathys saltona* Chamberlin. 9. Male palpus, ventral view. 10. Epigynum. 11. Male palpus, retrolateral view



1, 2. *Tricholathys jacinto*, new species. 1. Dorsal view of male. 2. Dorsal view of female
3. *Tricholathys rothi*, new species, epigynum
4. *Tricholathys cascadea*, new species, epigynum
5–7. *Lathys coralynae* Gertsch and Davis. 5. Male palpus, ventral view. 6. Male palpus, dorsal view. 7. Male palpus, retrolateral view
8–10. *Lathys alberta* Gertsch. 8. Eyes of female. 9. Male palpus, retrolateral view. 10. Epigynum
11–13. *Lathys dixiana* Ivie and Barrows. 11. Epigynum. 12. Eyes of female. 13. Dorsal view of female

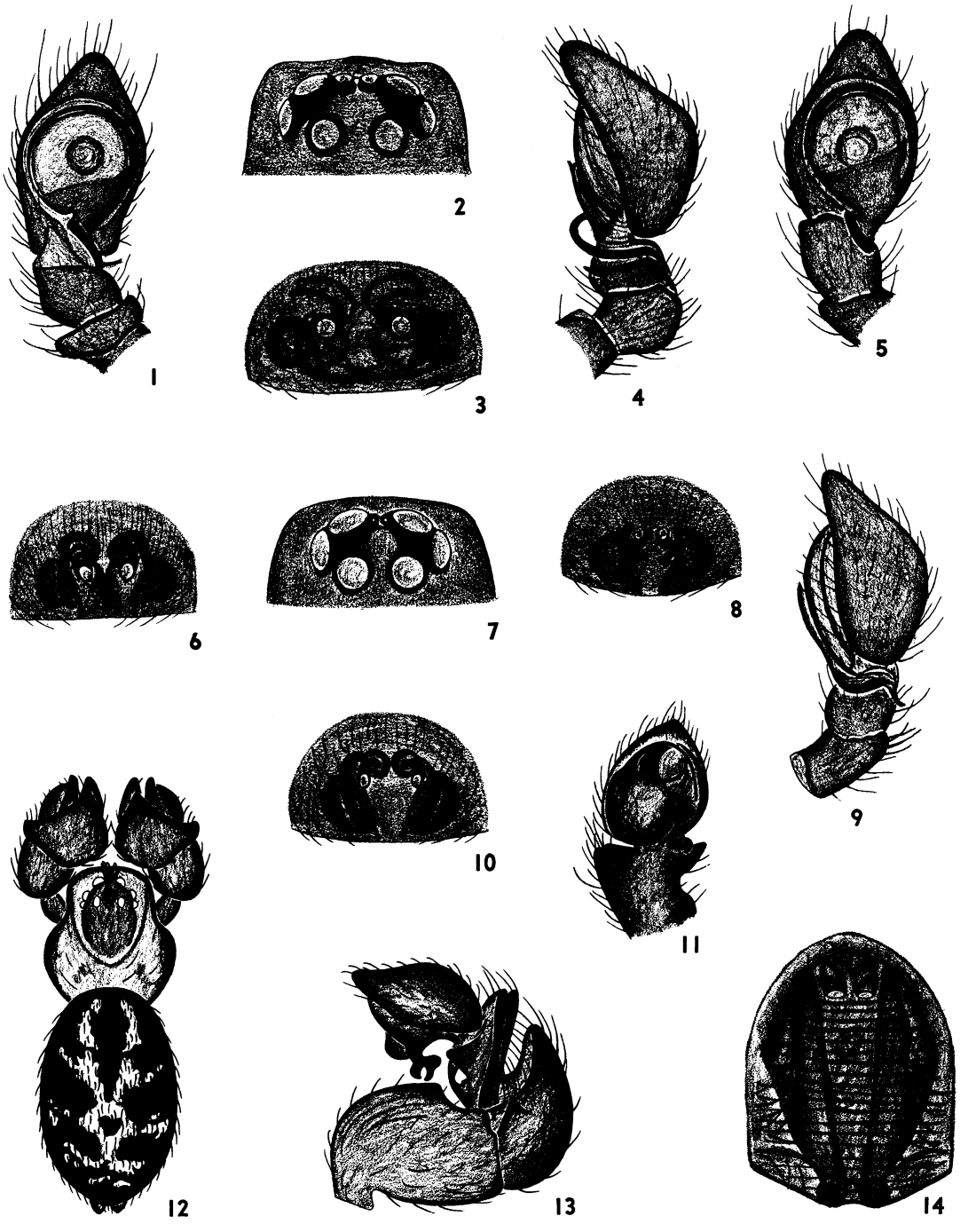


1–6. *Lathys pallida* Marx. 1. Male palpus without bulb, ventral view. 2. Bulb of male palpus, ventral view. 3. Eyes of female. 4. Epigynum. 5. Frontal view of carapace of female. 6. Male palpus, dorsal view

7, 8. *Lathys immaculata* Chamberlin and Ivie. 7. Male palpus, retrolateral view. 8. Epigynum

9–12. *Lathys maculina* Gertsch. 9. Male palpus, retrolateral view. 10. Male palpus, ventral view. 11. Epigynum. 12. Dorsal view of female

13, 14. *Lathys albida* Gertsch. 13. Epigynum. 14. Male palpus, retrolateral view

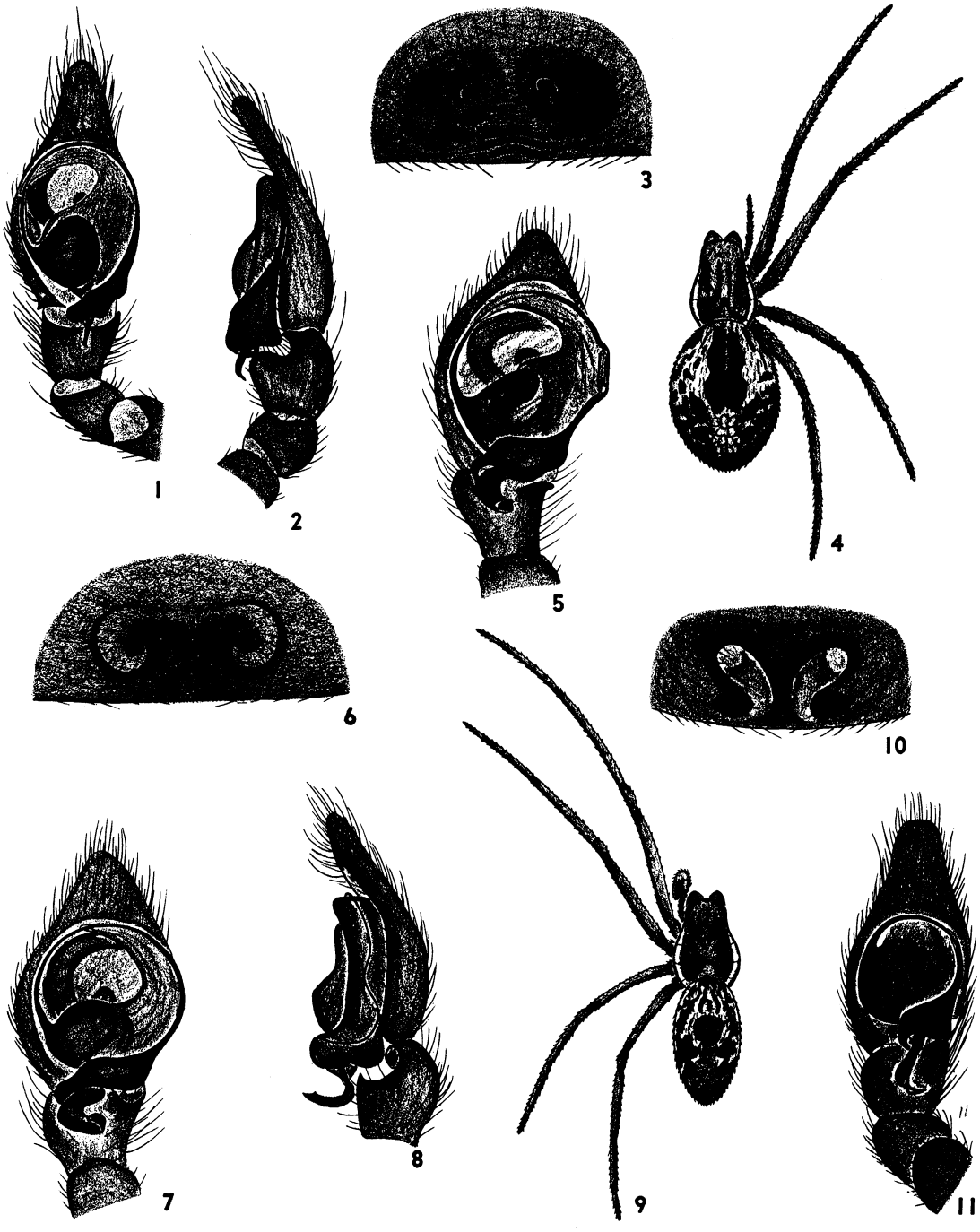


1–4. *Lathys foxi* Marx. 1. Male palpus, ventral view. 2. Eyes of female. 3. Epigynum. 4. Male palpus, retrolateral view

5–9. *Lathys delicatula* Gertsch and Mulaik. 5. Male palpus, ventral view. 6. Epigynum. 7. Eyes of female. 8. Epigynum of another specimen. 9. Male palpus, retrolateral view

10. *Lathys sylvania*, new species, epigynum

11–14. *Thallumetus pineus* Chamberlin and Ivie. 11. Male palpus, ventral view. 12. Dorsal view of male, legs omitted. 13. Male palpus, retrolateral view. 14. Epigynum

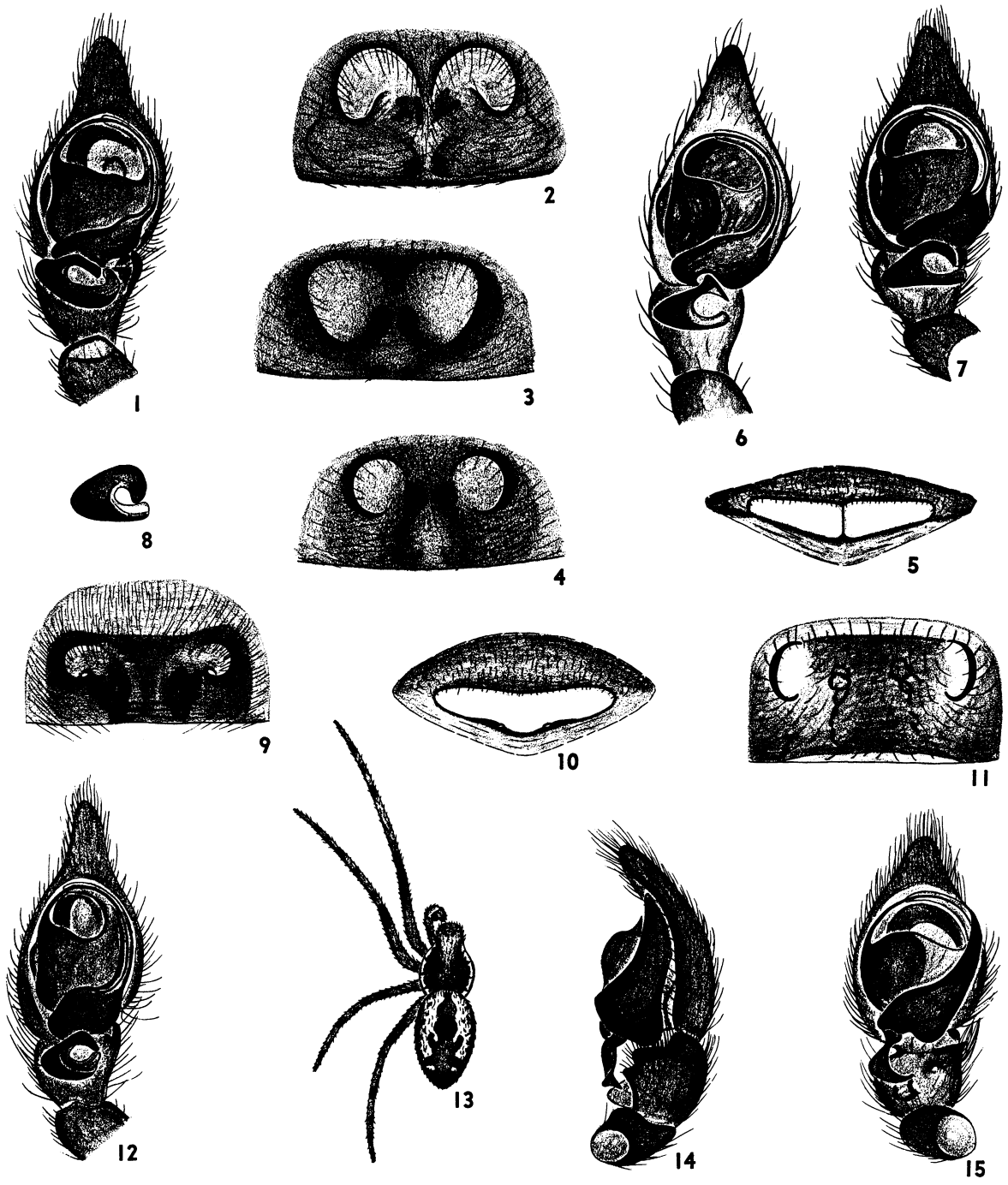


1–4. *Mallos dugesi* Becker. 1. Male palpus, ventral view. 2. Male palpus, retrolateral view. 3. Epigynum. 4. Dorsal view of female

5–8. *Mallos niveus* O. P.-Cambridge. 5. Male palpus of Utah specimen, ventral view. 6. Epigynum. 7. Male palpus of San Luis Potosi specimen, ventral view. 8. Male palpus, retrolateral view

9. *Mallos dugesi* Becker, dorsal view of male

10, 11. *Mallos bryanti* Gertsch. 10. Epigynum. 11. Male palpus, ventral view



1, 2. *Mallos pearcei*, new species. 1. Male palpus, ventral view. 2. Epigynum

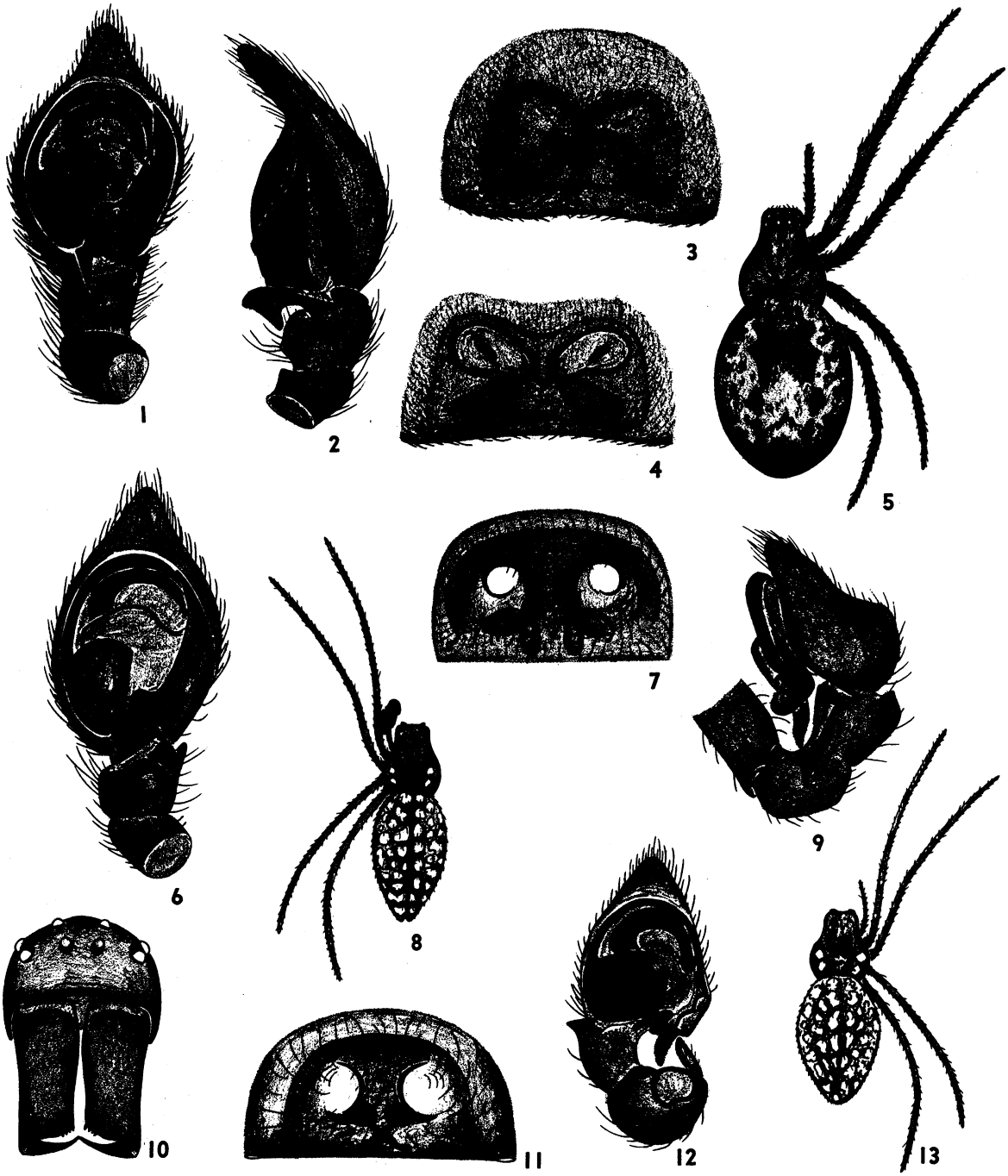
3–8. *Mallos pallidus* Banks. 3. Epigynum of *eutypus* form. 4. Epigynum of *halli* form. 5. Cribellum of female. 6. Male palpus, ventral view of *pallidus* form. 7. Male palpus, ventral view of *eutypus* form. 8. Ventral view of apical spiral of conductor of *pallidus* form

9. *Mallos gregalis* Simon, epigynum

10–12. *Mallos mians* Chamberlin. 10. Cribellum of female. 11. Epigynum. 12. Male palpus, ventral view

13. *Mallos pallidus* Banks, dorsal view of male

14, 15. *Mallos gregalis* Simon. 14. Male palpus, retrolateral view. 15. Male palpus, ventral view

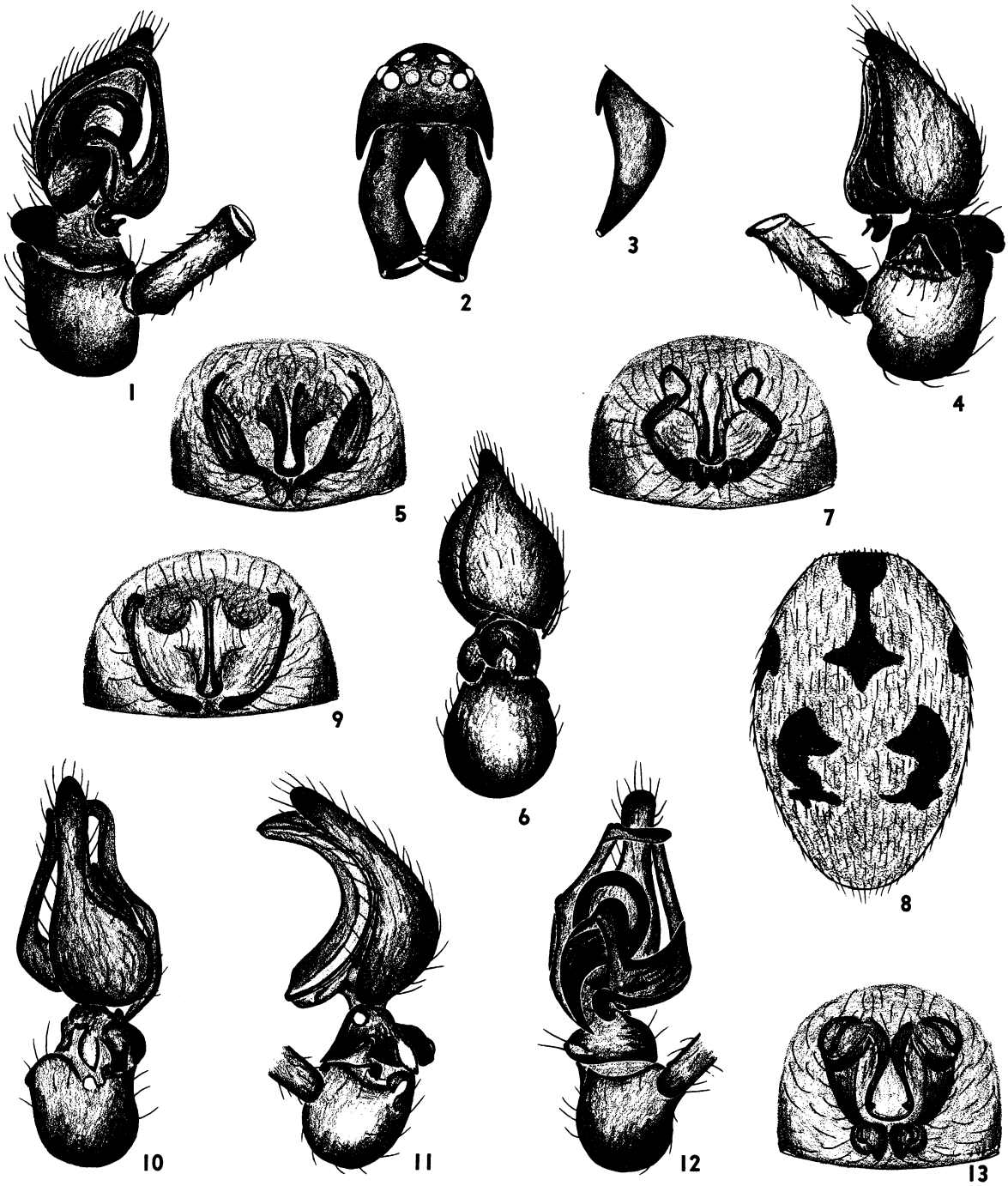


1–5. *Mallos trivittatus* Banks. 1. Male palpus, ventral view. 2. Male palpus, retrolateral view. 3. Epigynum. 4. Epigynum of type of *zionis*. 5. Dorsal view of female

6. *Mallos avara* Banks, male palpus, ventral view

7. *Mallos blandus*, new species, epigynum

8–13. *Heterodictyna linsdalei*, new species. 8. Dorsal view of male. 9. Male palpus, retrolateral view. 10. Frontal view of female. 11. Epigynum. 12. Male palpus, ventral view. 13. Dorsal view of female

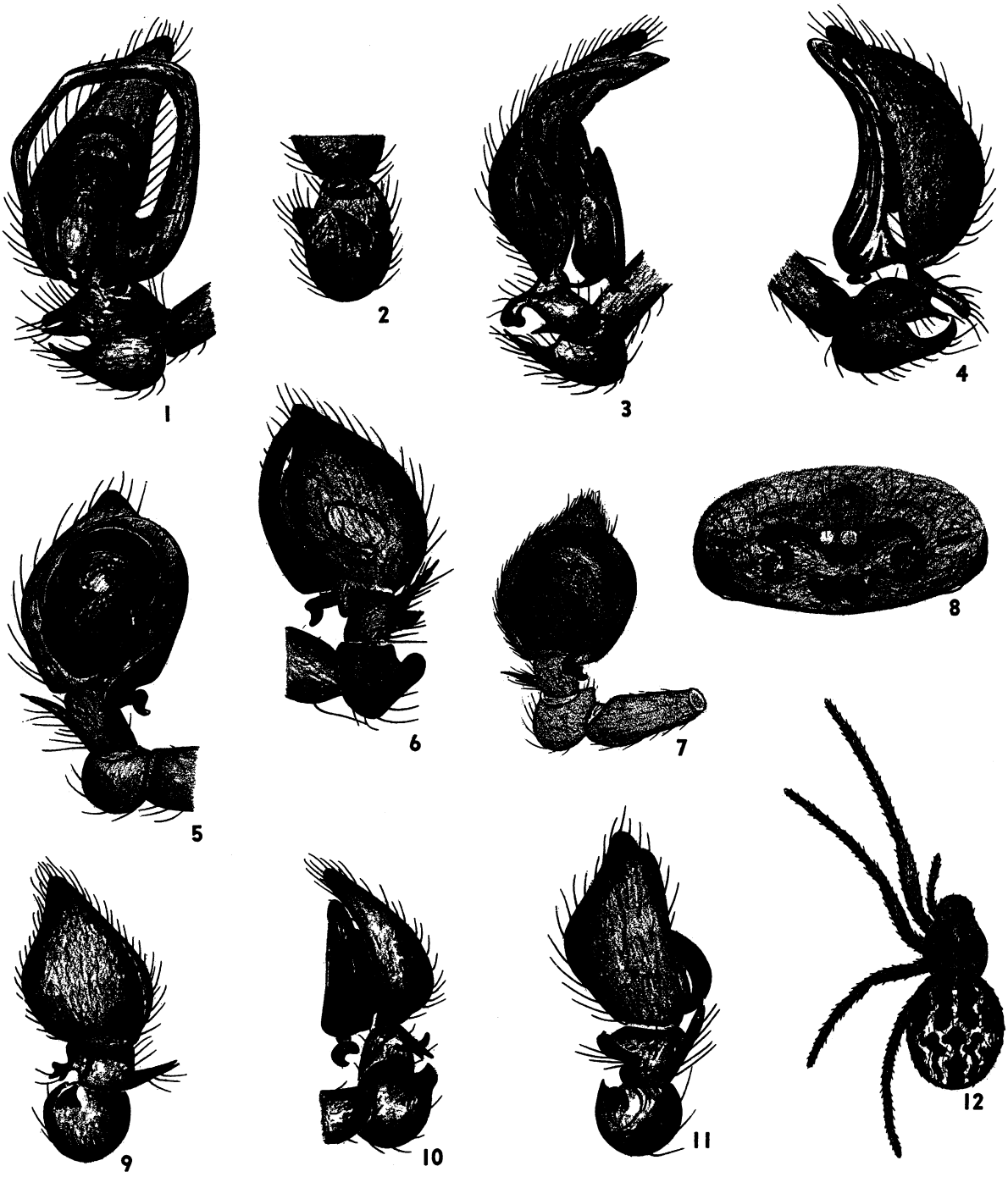


1–6. *Dictyna spathula* Gertsch and Mulaik. 1. Male palpus, ventral view. 2. Frontal view of male. 3. Chelicera of male, retrolateral view. 4. Male palpus, retrolateral view. 5. Epigynum. 6. Male palpus, dorsal view

7, 8. *Dictyna petrunkevitchi* Gertsch and Mulaik. 7. Epigynum. 8. Dorsal view of abdomen

9–12. *Dictyna pallida* Keyserling. 9. Epigynum. 10. Male palpus, dorsal view. 11. Male palpus, retrolateral view. 12. Male palpus, ventral view

13. *Dictyna moaba* Ivie, epigynum

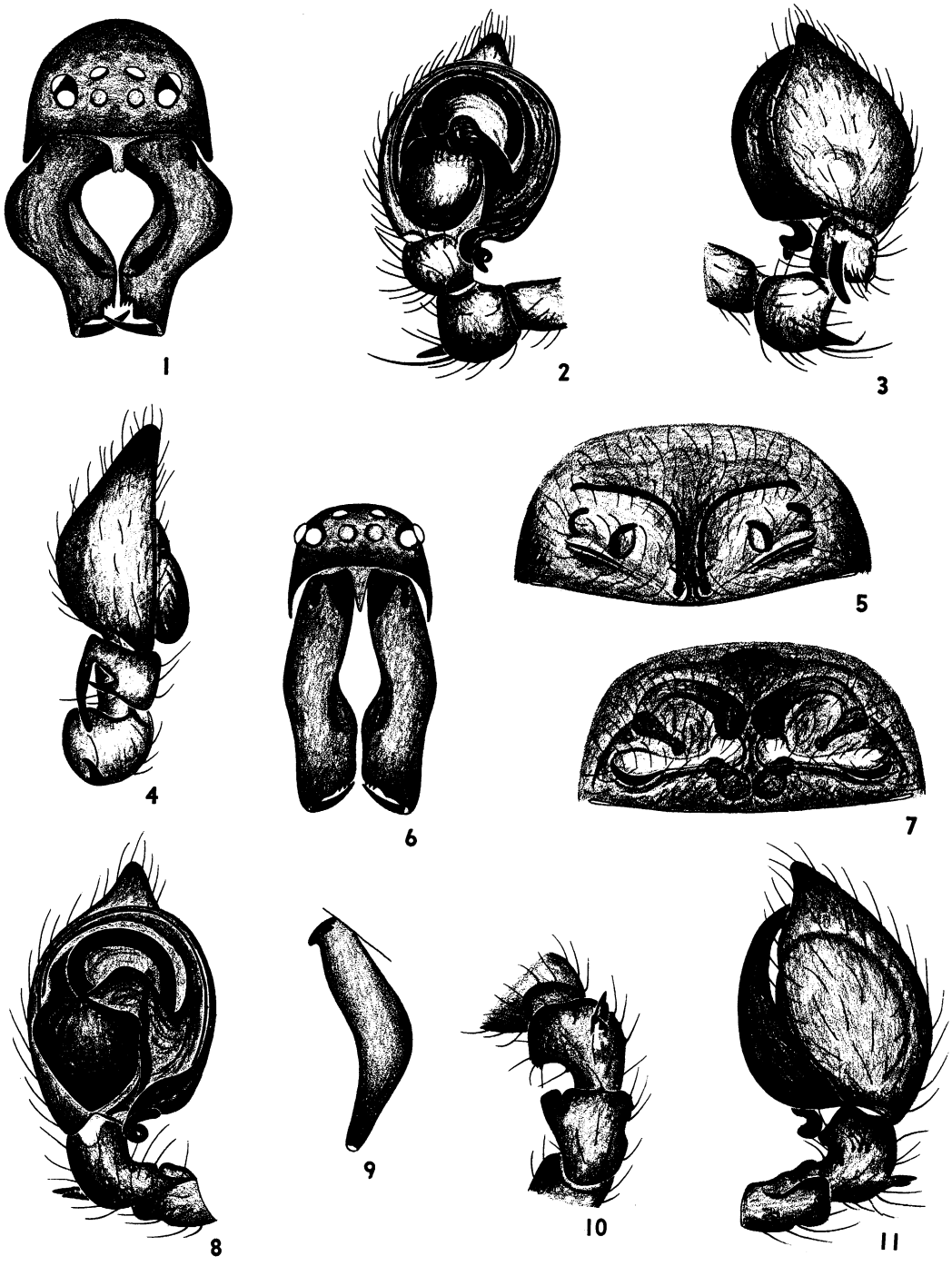


1–4. *Dictyna moaba* Ivie. 1. Male palpus, ventral view. 2. Tibia of male palpus, dorsal view. 3. Male palpus, prolateral view. 4. Male palpus, retrolateral view

5, 6. *Dictyna pixi*, new species. 5. Male palpus, ventral view. 6. Male palpus, retrolateral view

7–10. *Dictyna micro* Chamberlin and Ivie. 7. Male palpus, ventral view. 8. Epigynum. 9. Male palpus, dorsal view. 10. Male palpus, retrolateral view

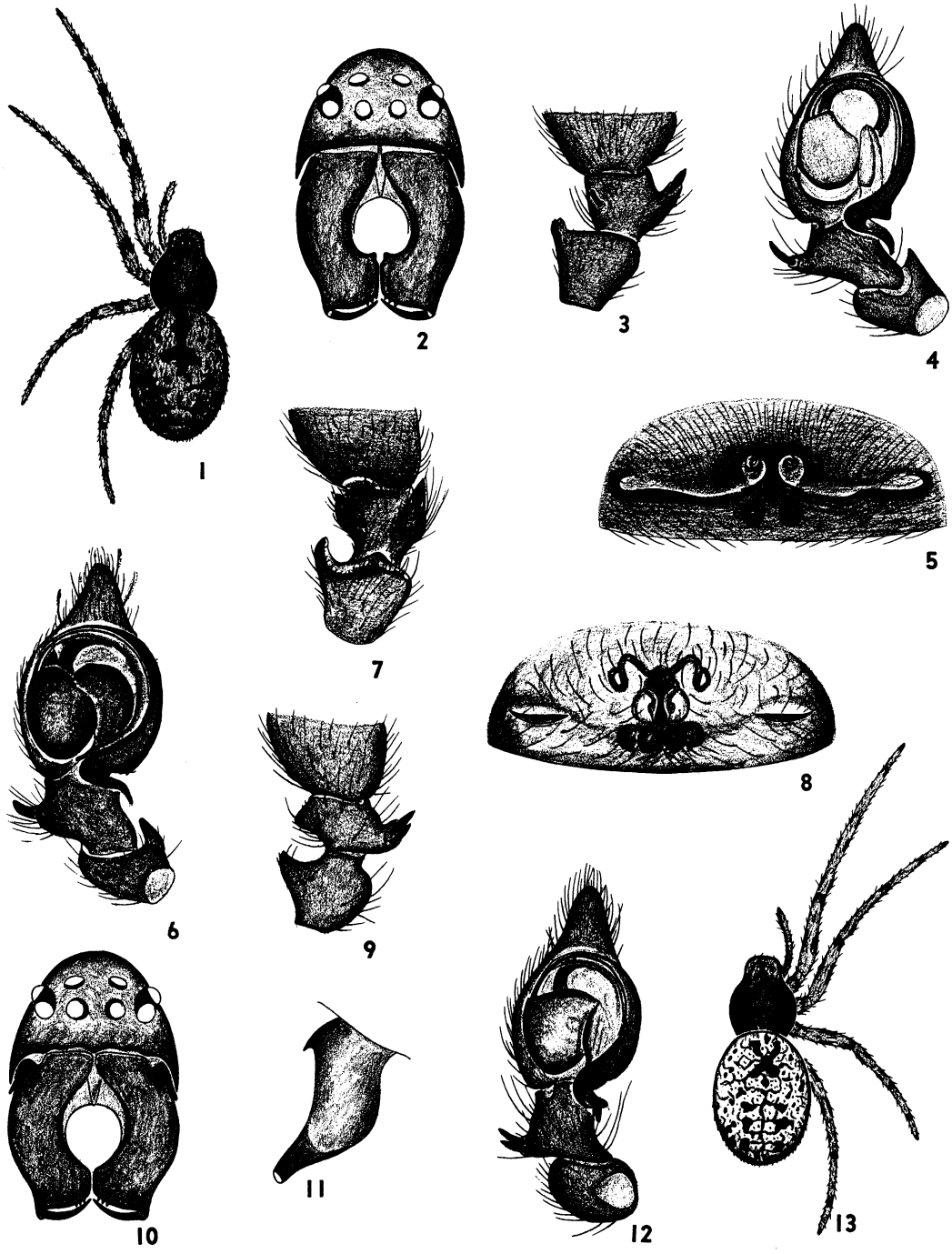
11, 12. *Dictyna pixi*, new species. 11. Male palpus, dorsal view. 12. Dorsal view of female



1. *Dictyna varyna miranda*, new subspecies, frontal view of male

2–5. *Dictyna provida* Gertsch and Mulaik. 2. Male palpus, ventral view. 3. Male palpus, retrolateral view. 4. Male palpus, dorsal view. 5. Epigynum

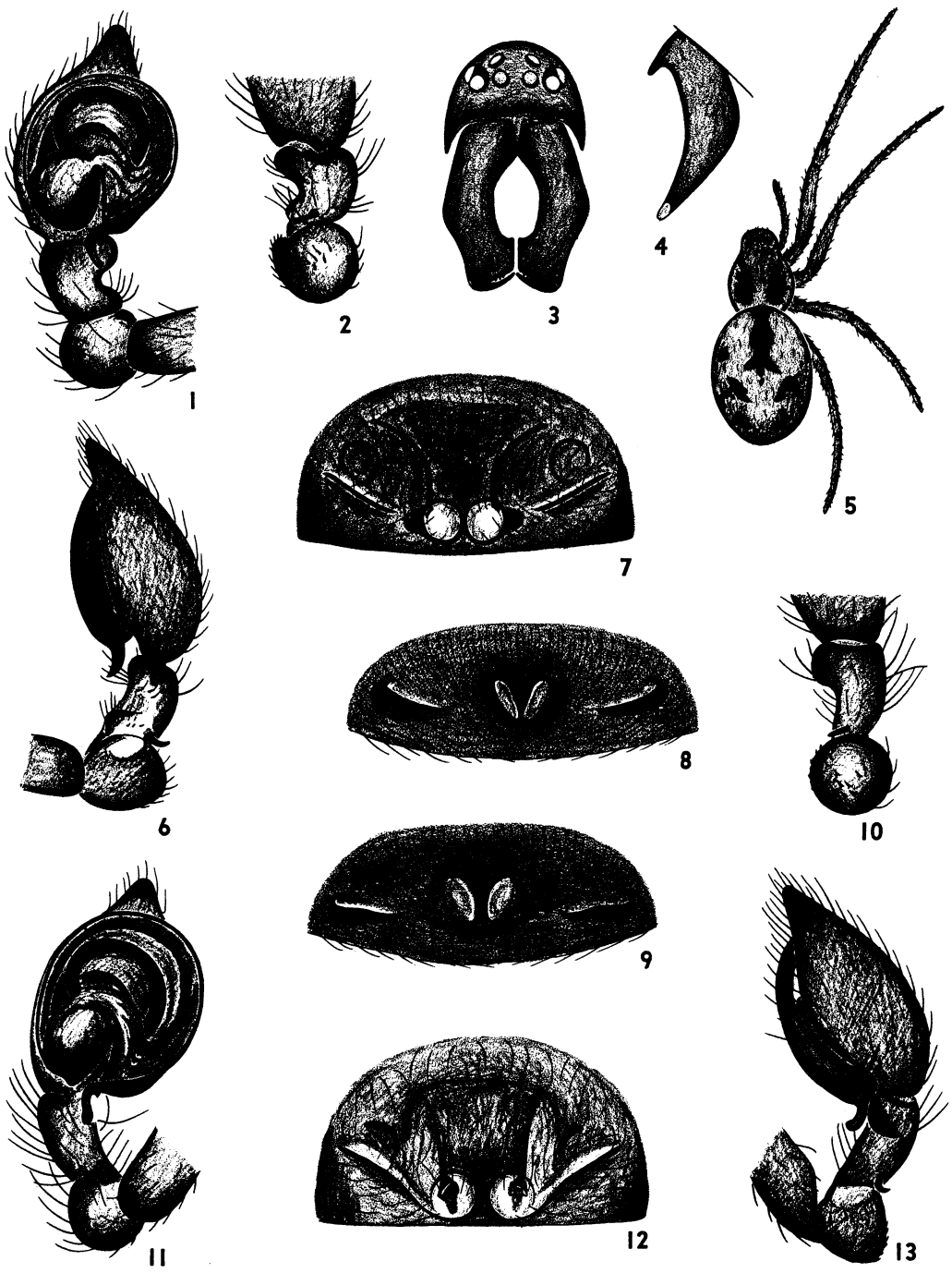
6–11. *Dictyna rita* Gertsch. 6. Frontal view of male. 7. Epigynum. 8. Male palpus, ventral view. 9. Chelicera of male, retrolateral view. 10. Patella and tibia of male palpus, dorsal view. 11. Male palpus, retrolateral view



1–5. *Dictyna segregata* Gertsch and Mulaik. 1. Dorsal view of female. 2. Frontal view of male. 3. Patella and tibia of male palpus, dorsal view. 4. Male palpus, ventral view. 5. Epigynum

6–8. *Dictyna varyna*, new species. 6. Male palpus, ventral view. 7. Patella and tibia of male palpus, dorsal view. 8. Epigynum

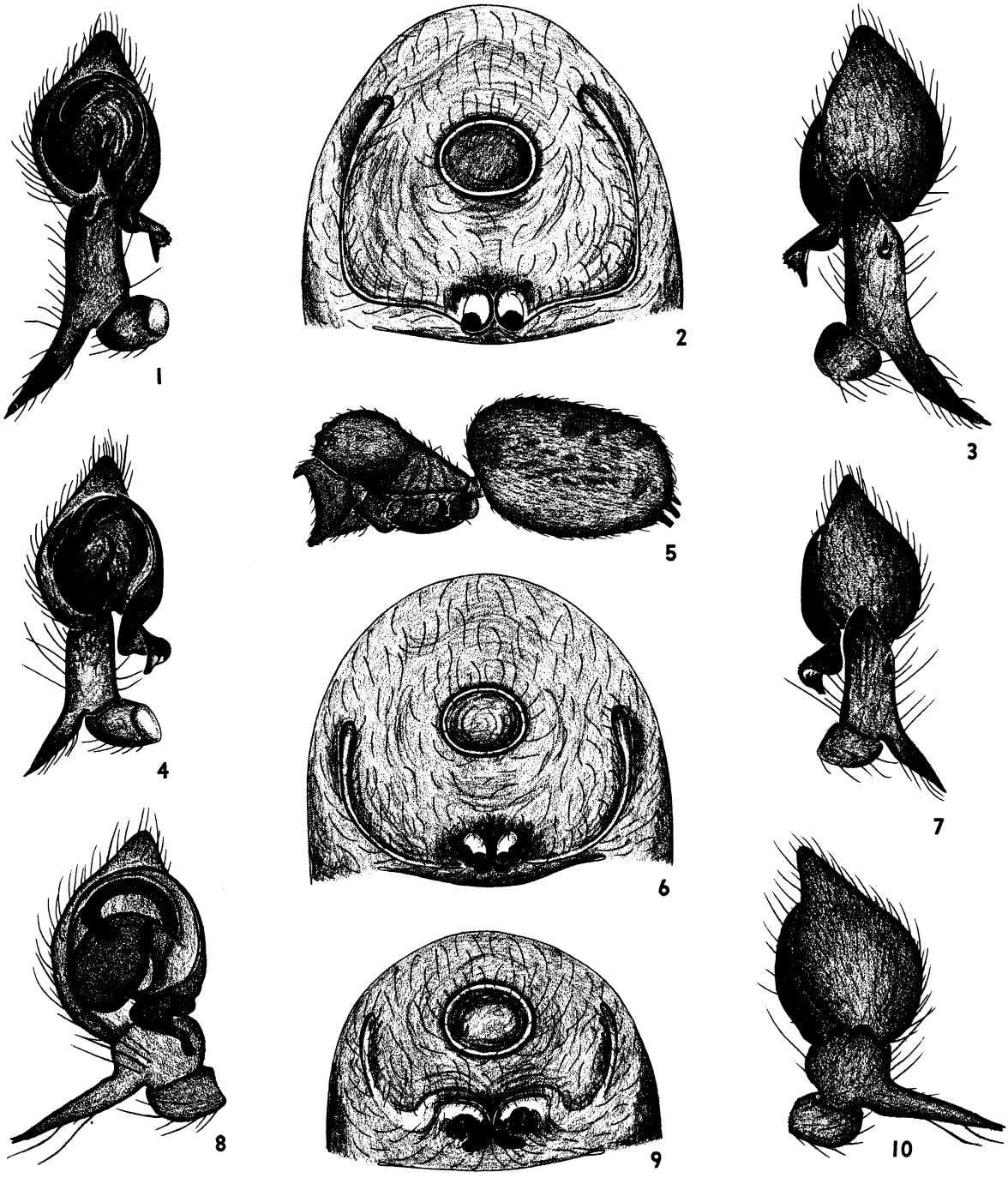
9–13. *Dictyna mulegensis* Chamberlin. 9. Patella and tibia of male palpus, dorsal view. 10. Frontal view of male. 11. Chelicera of male, retrolateral view. 12. Male palpus, ventral view. 13. Dorsal view of female



1–6. *Dictyna bicornis* Emerton. 1. Male palpus, ventral view. 2. Patella and tibia of male palpus, dorsal view. 3. Frontal view of male. 4. Chelicera of male, retrolateral view. 5. Dorsal view of female. 6. Male palpus, retrolateral view. 7. Epigynum

8, 9. *Dictyna mulegensis* Chamberlin. 8. Epigynum of Texas specimen. 9. Epigynum of Sonora specimen

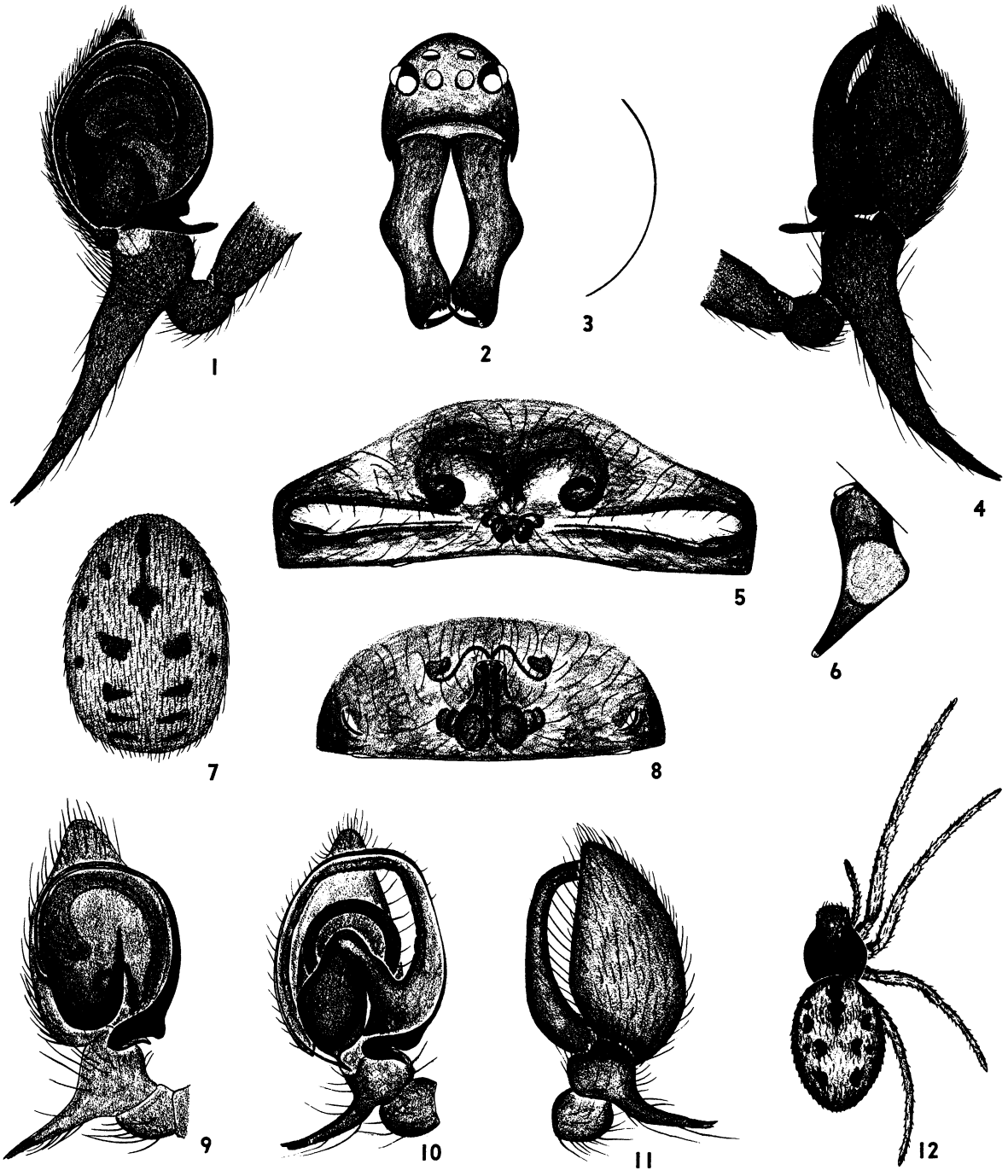
10–13. *Dictyna terranea* Ivie. 10. Patella and tibia of male palpus. 11. Male palpus, ventral view. 12. Epigynum. 13. Male palpus, retrolateral view



1–3. *Dictyna longispina* Emerton. 1. Male palpus, ventral view. 2. Epigynum. 3. Male palpus, subdorsal view

4–7. *Dictyna bellans* Chamberlin. 4. Male palpus, ventral view. 5. Lateral view of male, appendages omitted. 6. Epigynum. 7. Male palpus, subdorsal view

8–10. *Dictyna formidolosa* Gertsch and Ivie. 8. Male palpus, ventral view. 9. Epigynum. 10. Male palpus, subdorsal view

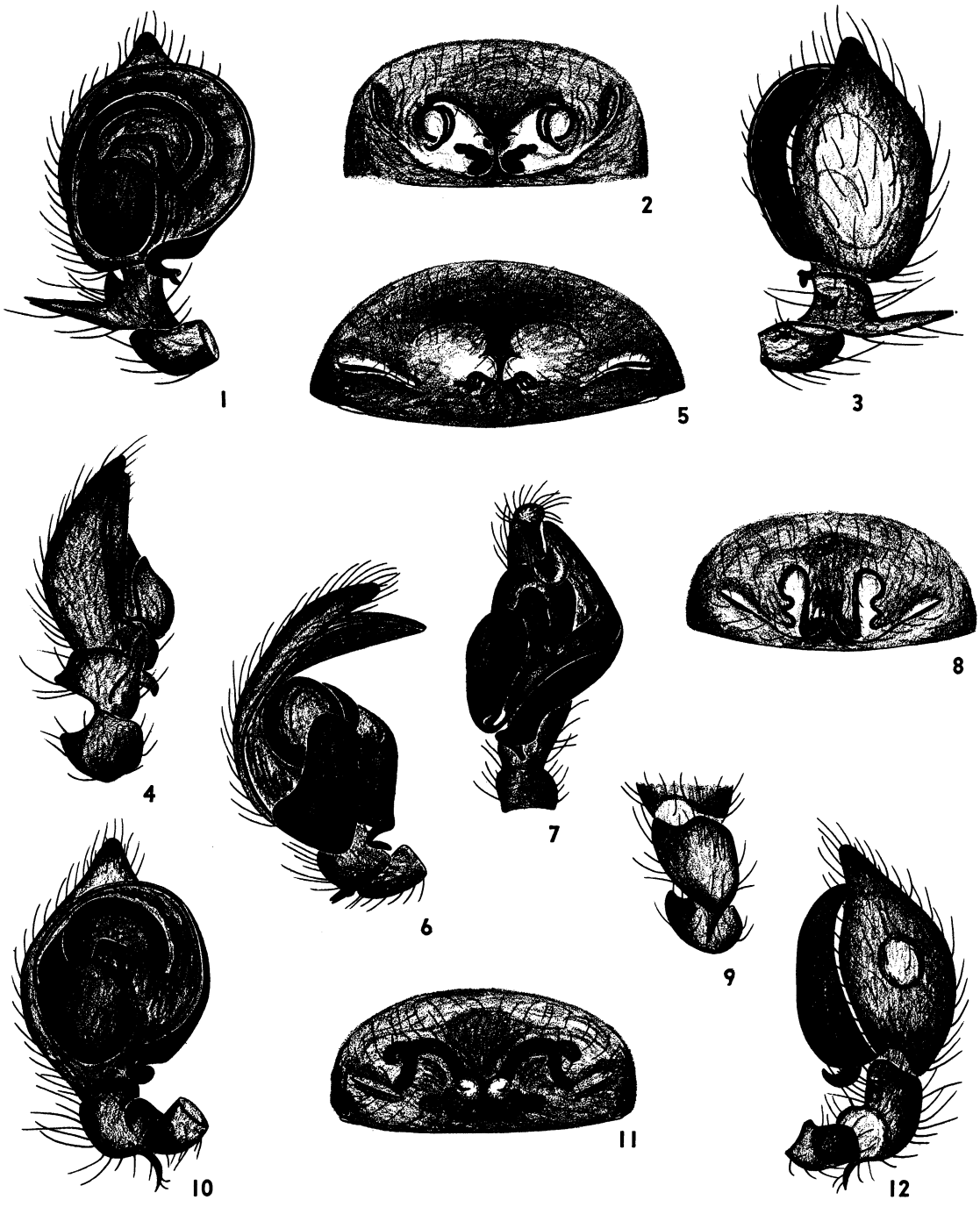


1–6. *Dictyna calcarata* Banks. 1. Male palpus, ventral view. 2. Frontal view of male. 3. Distal part of embolus. 4. Male palpus, subdorsal view. 5. Epigynum. 6. Chelicera of male, retrolateral view

7–9. *Dictyna cholla* Gertsch and Davis. 7. Abdomen of female. 8. Epigynum. 9. Male palpus, ventral view

10, 11. *Dictyna gloria* Chamberlin and Ivie. 10. Male palpus, ventral view. 11. Male palpus, subdorsal view

12. *Dictyna formidolosa* Gertsch and Ivie, dorsal view of female

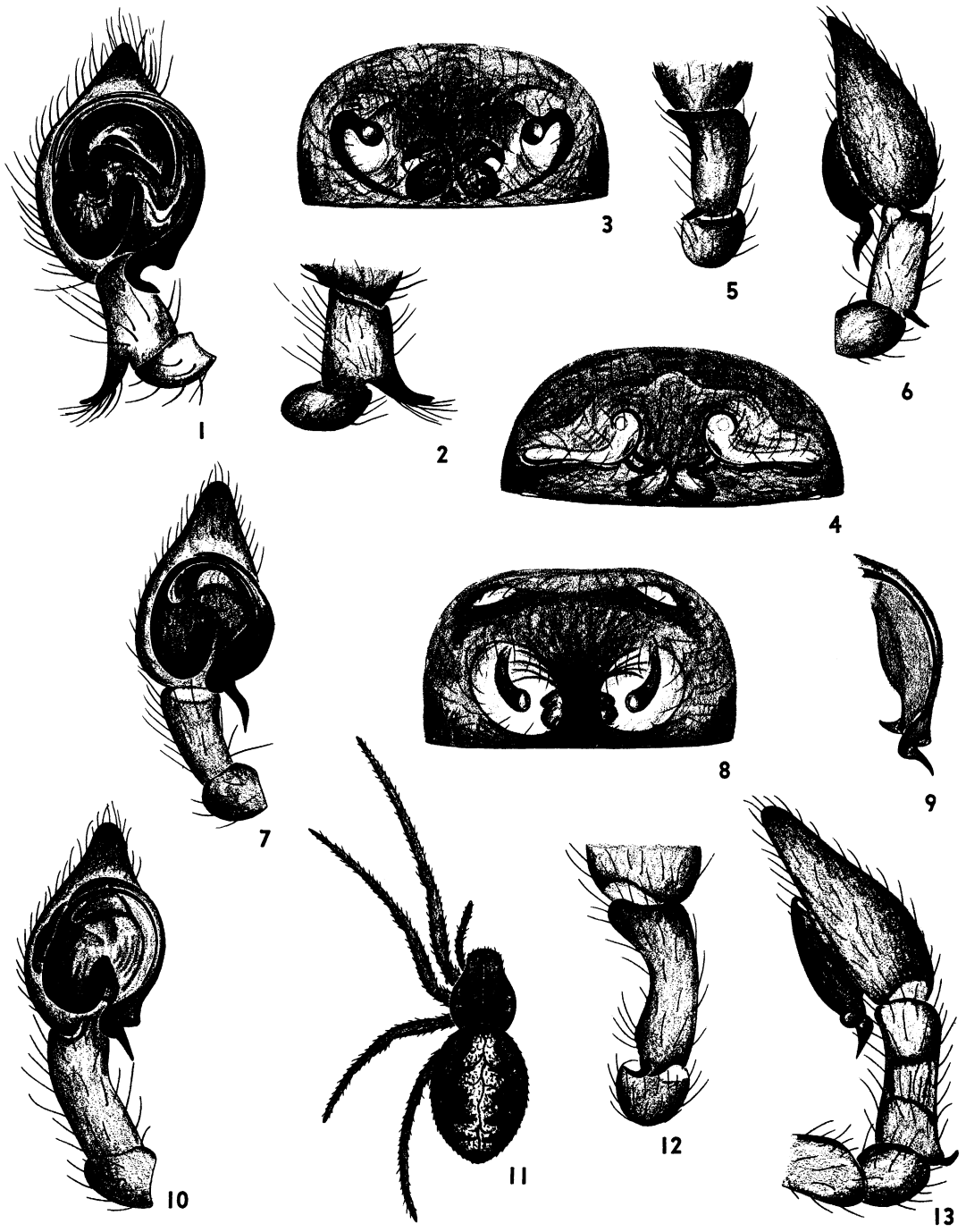


1–4. *Dictyna agressa* Ivie. 1. Male palpus, ventral view. 2. Epigynum. 3. Male palpus, subdorsal view. 4. Male palpus, dorsal view

5. *Dictyna subpinicola* Ivie, epigynum

6–8. *Dictyna terrestris* Emerton. 6. Male palpus, prolateral view. 7. Male palpus, ventral view. 8. Epigynum

9–12. *Dictyna apacheca* Chamberlin and Ivie. 9. Tibia of male palpus, dorsal view. 10. Male palpus, ventral view. 11. Epigynum. 12. Male palpus, retrolateral view

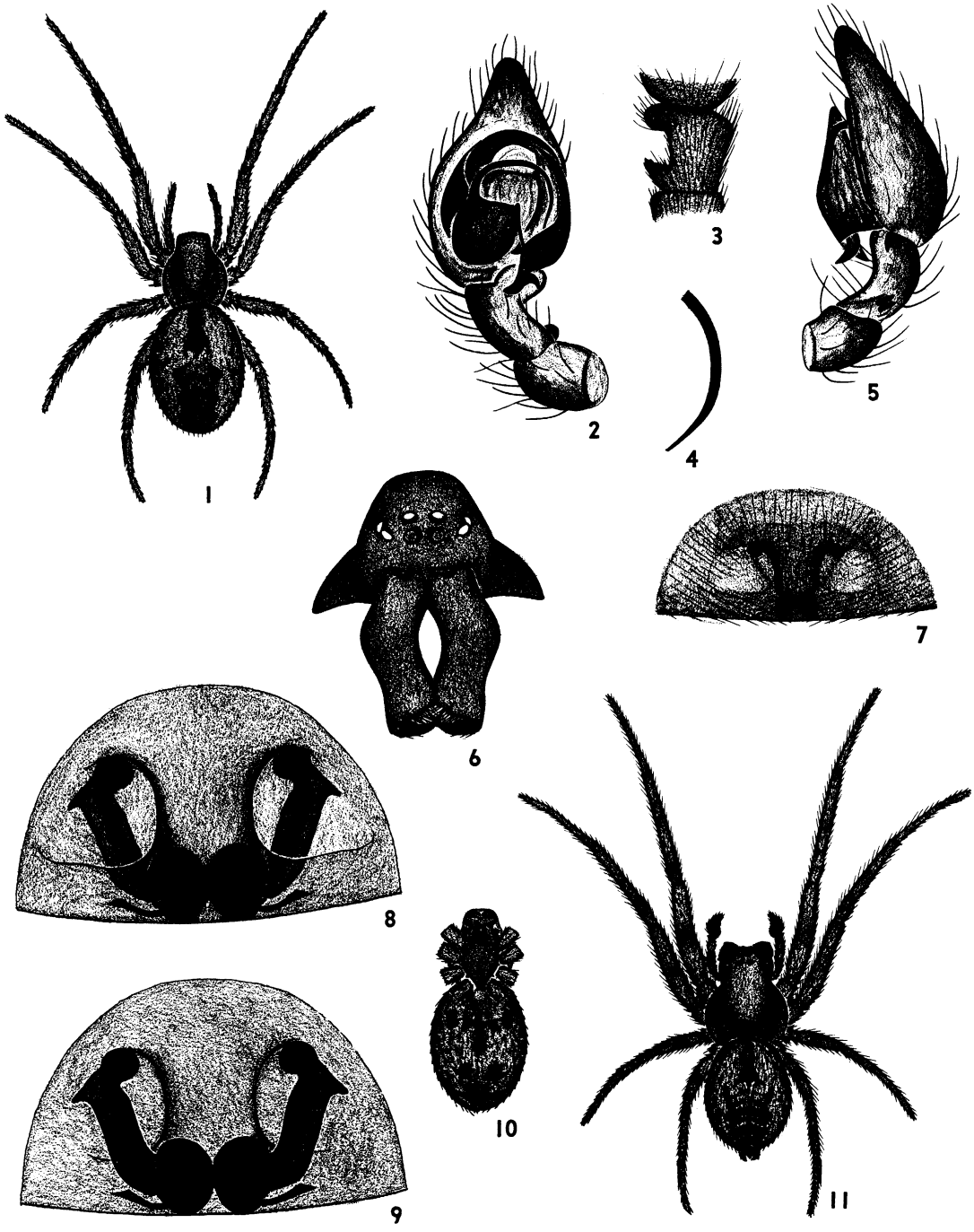


1, 2. *Dictyna subpinicola* Ivie. 1. Male palpus, ventral view. 2. Tibia of male palpus, retrolateral view

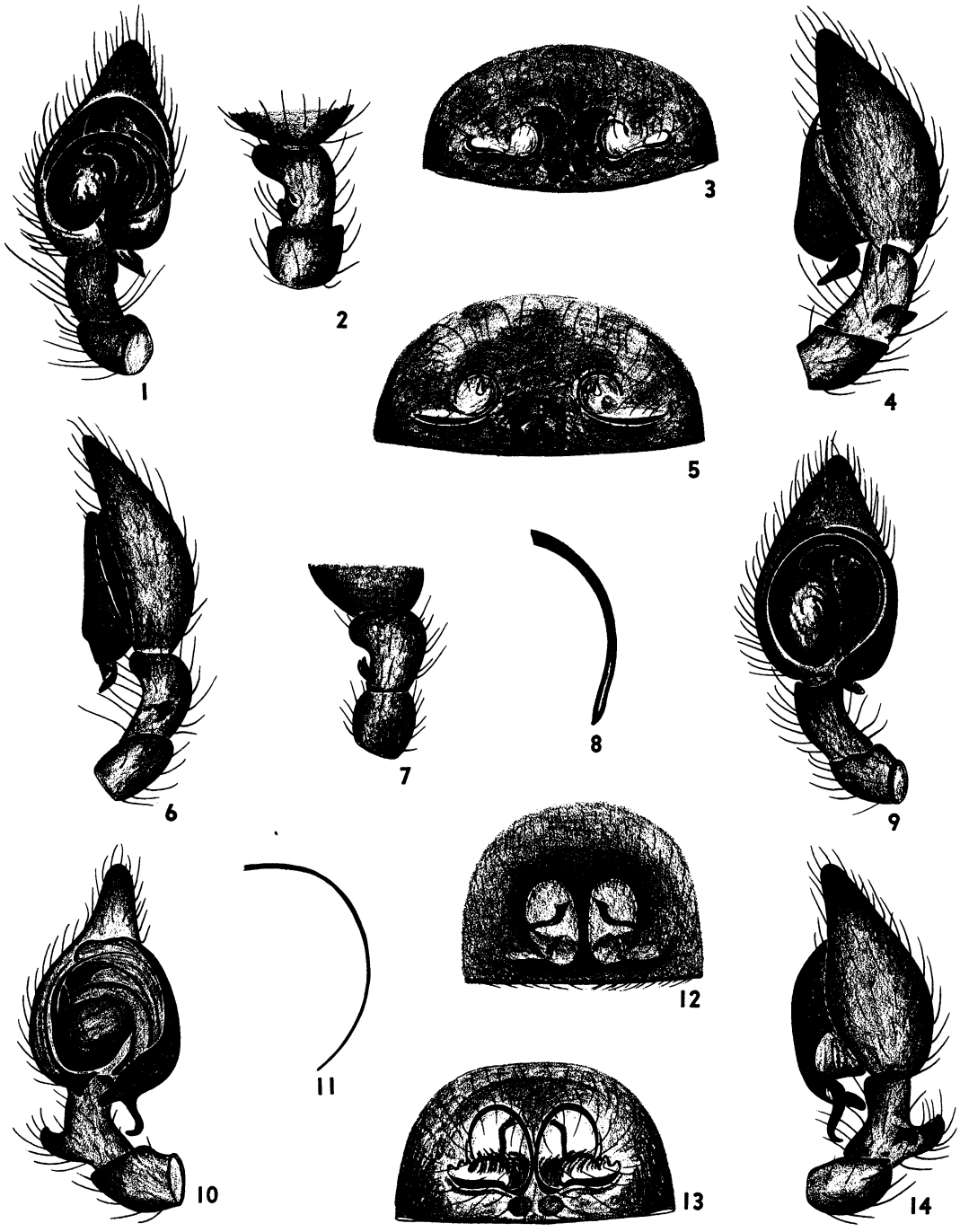
3. *Dictyna mora*, new species, epigynum

4–7. *Dictyna minuta* Emerton. 4. Epigynum. 5. Tibia of male palpus, dorsal view. 6. Male palpus, retrolateral view. 7. Male palpus, ventral view

8–13. *Dictyna foliacea* Hentz. 8. Epigynum. 9. Conductor and embolus. 10. Male palpus, ventral view. 11. Dorsal view of female. 12. Tibia of male palpus, dorsal view. 13. Male palpus, retrolateral view



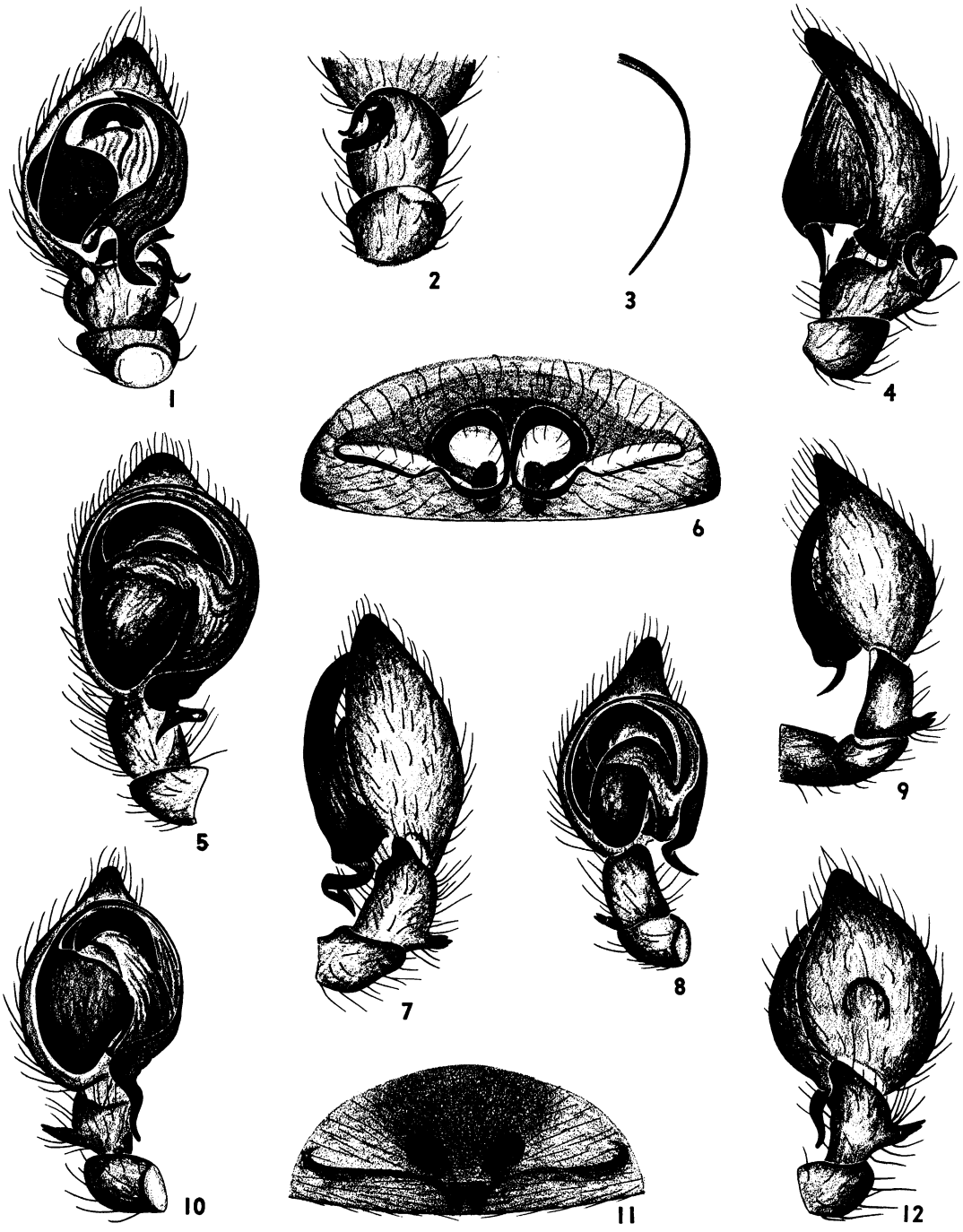
Dictyna bostoniensis Emerton. 1. Dorsal view of female. 2. Male palpus, ventral view. 3. Tibia of male palpus, dorsal view. 4. Distal part of embolus. 5. Male palpus, retrolateral view. 6. Frontal view of male. 7. Epigynum. 8. Cleared genital organ of female, ventral view. 9. Cleared genital organ of female, dorsal view. 10. Ventral view of female, legs omitted. 11. Dorsal view of male



1–4. *Dictyna brevitarsus* Emerton. 1. Male palpus, ventral view. 2. Tibia of male palpus, dorsal view. 3. Epigynum. 4. Male palpus, retrolateral view

5–9. *Dictyna crosbyi* Gertsch and Mulaik. 5. Epigynum. 6. Male palpus, retrolateral view. 7. Tibia of male palpus, dorsal view. 8. Distal part of embolus of male palpus. 9. Male palpus, ventral view

10–14. *Dictyna nebraska* Gertsch. 10. Male palpus, ventral view. 11. Distal part of embolus. 12. Epigynum. 13. Epigynum of another specimen. 14. Male palpus, retrolateral view

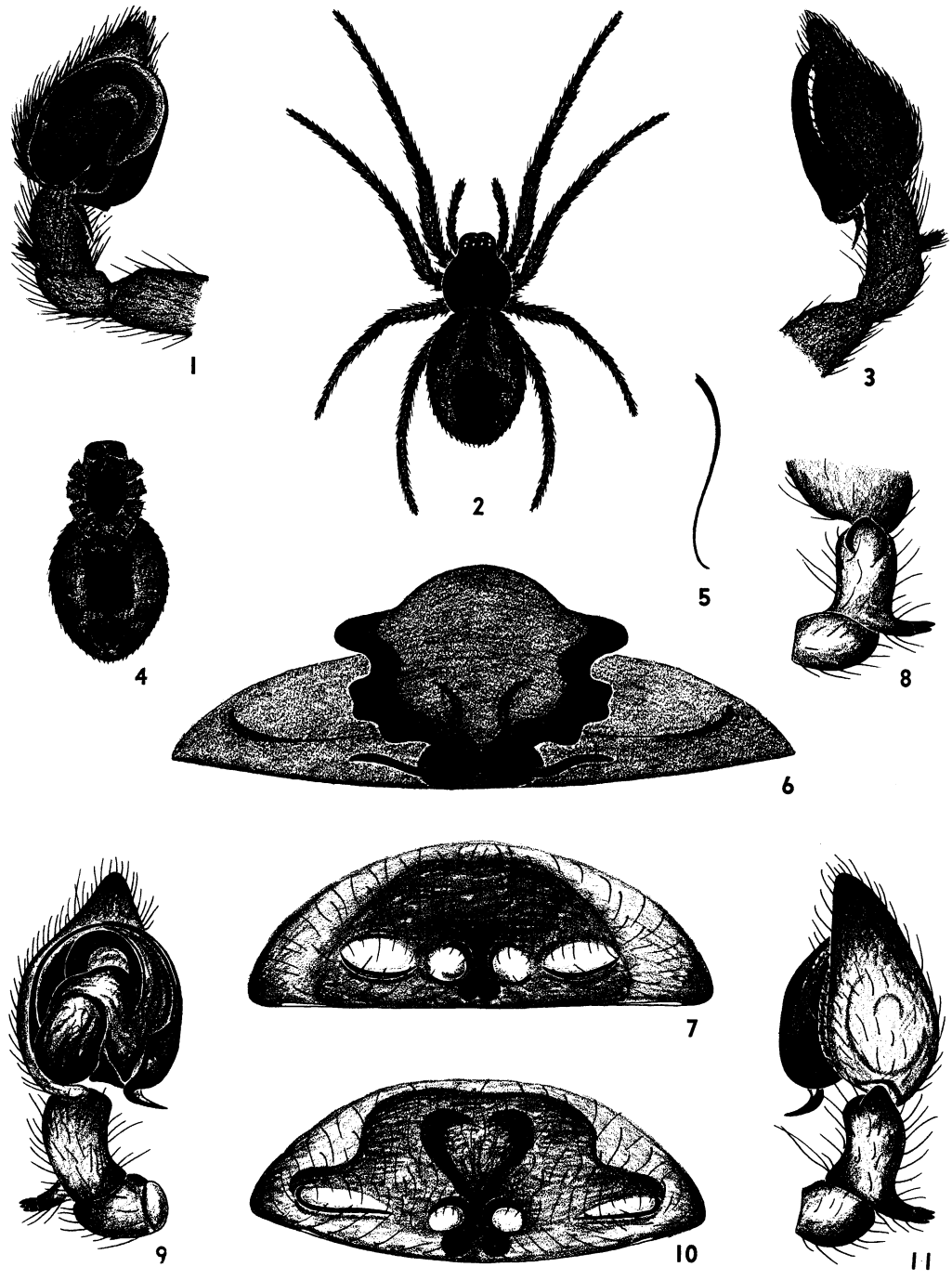


1–4. *Dictyna quadrispinosa* Emerton. 1. Male palpus, ventral view. 2. Tibia of male palpus, dorsal view. 3. Distal part of embolus. 4. Male palpus, retrolateral view

5–7. *Dictyna arundinacea* Linnaeus. 5. Male palpus, ventral view. 6. Epigynum. 7. Male palpus, retrolateral view

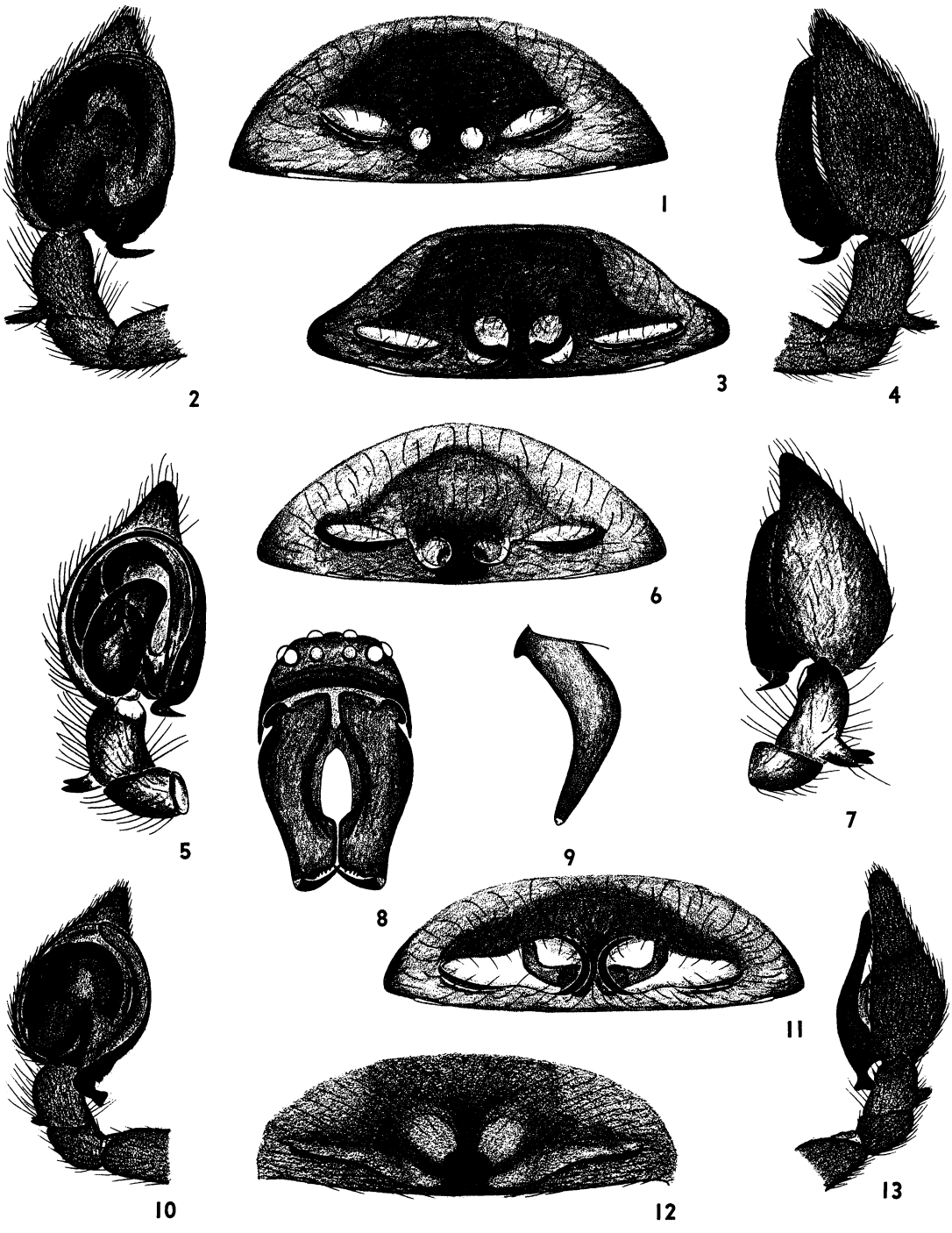
8, 9. *Dictyna sancta* Gertsch. 8. Male palpus, ventral view. 9. Male palpus, retrolateral view

10–12. *Dictyna alaskae* Chamberlin and Ivie. 10. Male palpus, ventral view. 11. Epigynum. 12. Male palpus, retrolateral view



1–7. *Dictyna juno* Ivie. 1. Male palpus, ventral view. 2. Dorsal view of female. 3. Male palpus, retrolateral view. 4. Ventral view of female, legs omitted. 5. Distal part of embolus. 6. Cleared genital organ of female, dorsal view. 7. Epigynum

8–11. *Dictyna tridentata* Bishop and Ruderman. 8. Tibia of male palpus, retrolateral view. 9. Male palpus, ventral view. 10. Epigynum. 11. Male palpus, retrolateral view

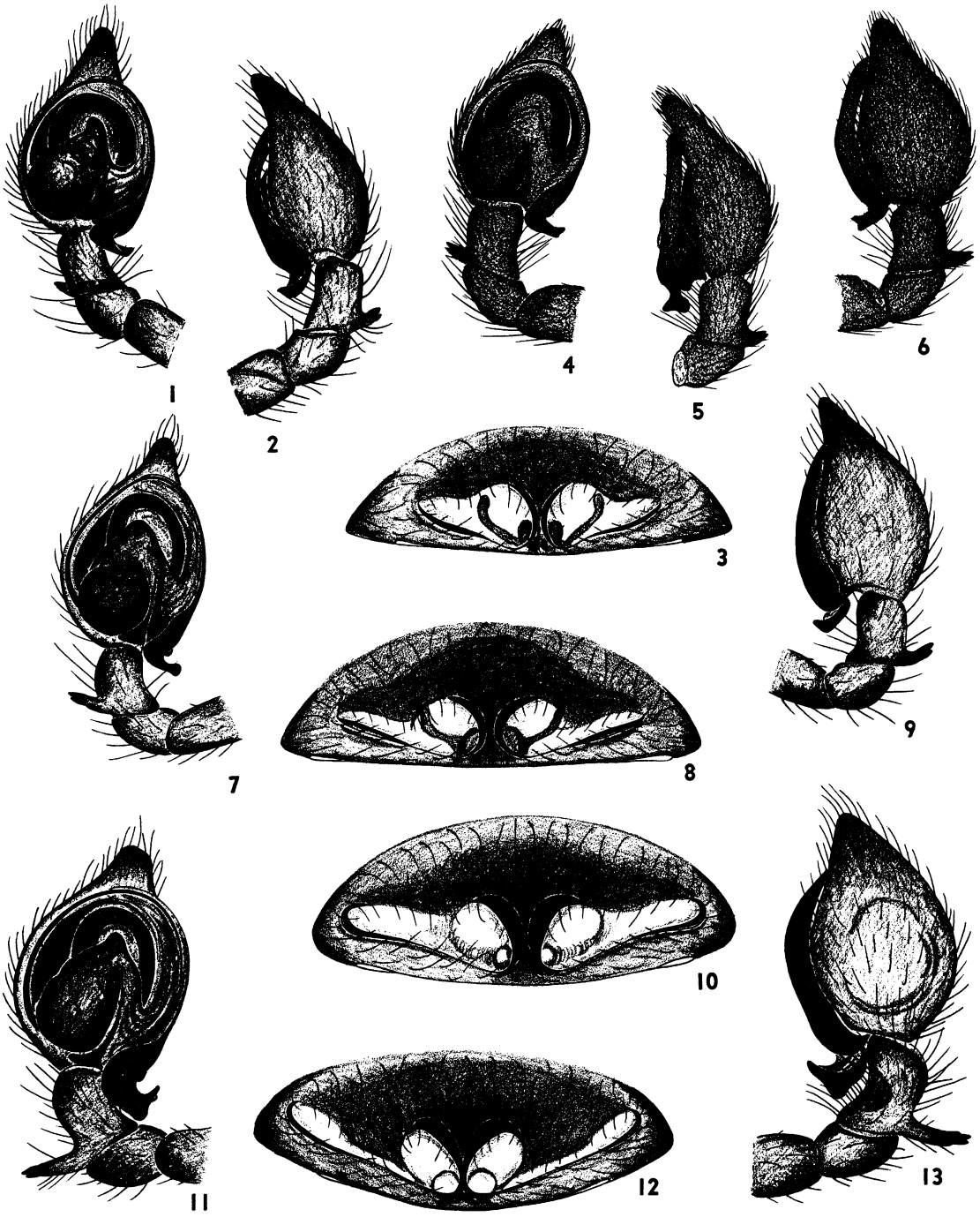


1. *Dictyna sancta* Gertsch, epigynum

2–4. *Dictyna major* Menge. 2. Male palpus, ventral view. 3. Epigynum. 4. Male palpus, retrolateral view

5–7. *Dictyna cebolla* Ivie. 5. Male palpus, ventral view. 6. Epigynum. 7. Male palpus, retrolateral view

8–13. *Dictyna abundans* Chamberlin and Ivie. 8. Frontal view of male. 9. Chelicera of male, retrolateral view. 10. Male palpus, ventral view. 11. Epigynum. 12. Epigynum of another specimen. 13. Male palpus, retrolateral view



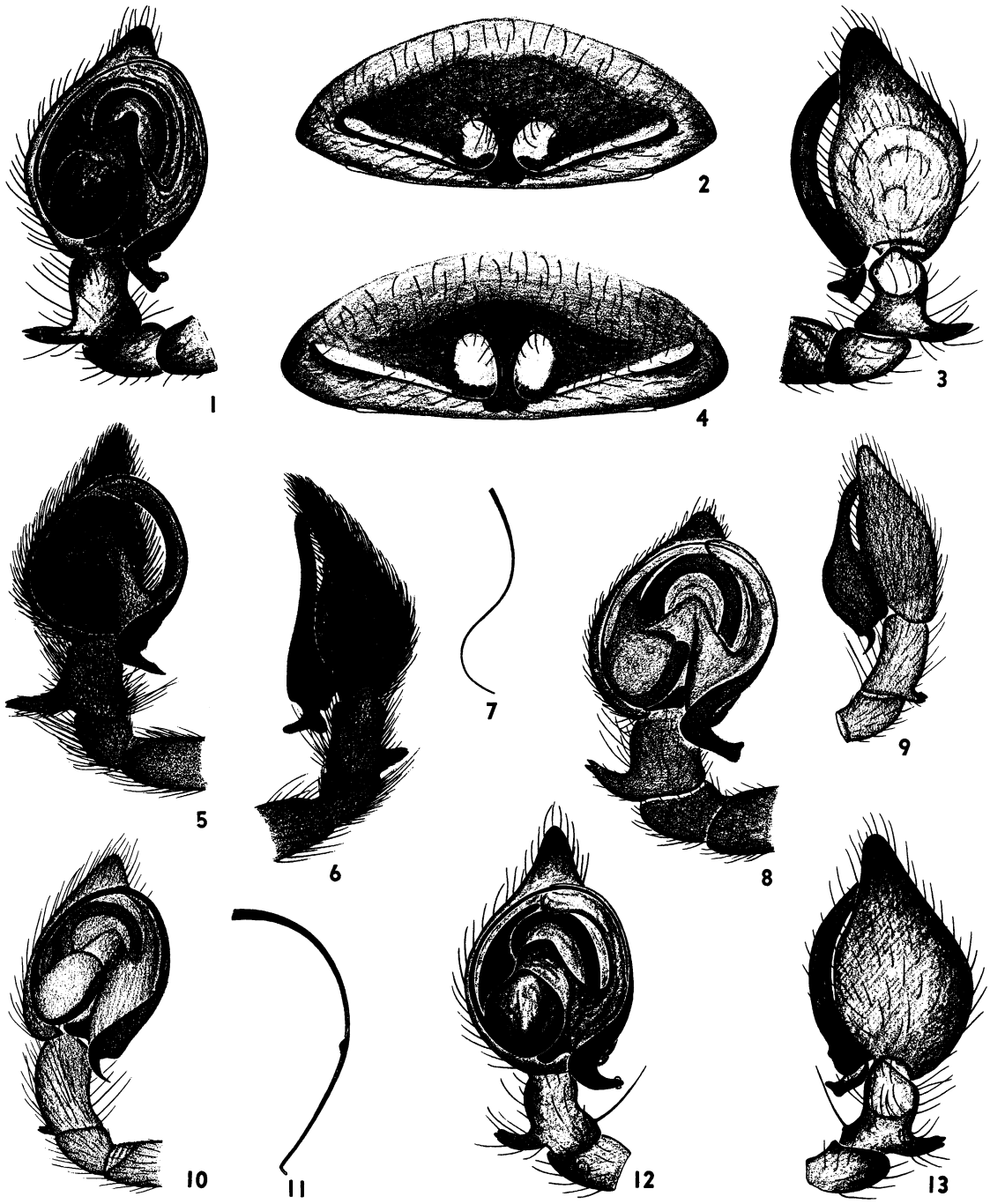
1–3. *Dictyna tucsona* Chamberlin. 1. Male palpus, ventral view. 2. Male palpus, retrolateral view. 3. Epigynum

4–6. *Dictyna saepei* Chamberlin and Ivie. 4. Male palpus, ventral view. 5. Male palpus, retrolateral view. 6. Male palpus, subdorsal view

7–9. *Dictyna annexa* Gertsch and Mulaik. 7. Male palpus, ventral view. 8. Epigynum. 9. Male palpus, retrolateral view

10. *Dictyna idahoana* Chamberlin and Ivie, epigynum

11–13. *Dictyna peon*, new species. 11. Male palpus, ventral view. 12. Epigynum. 13. Male palpus, retrolateral view



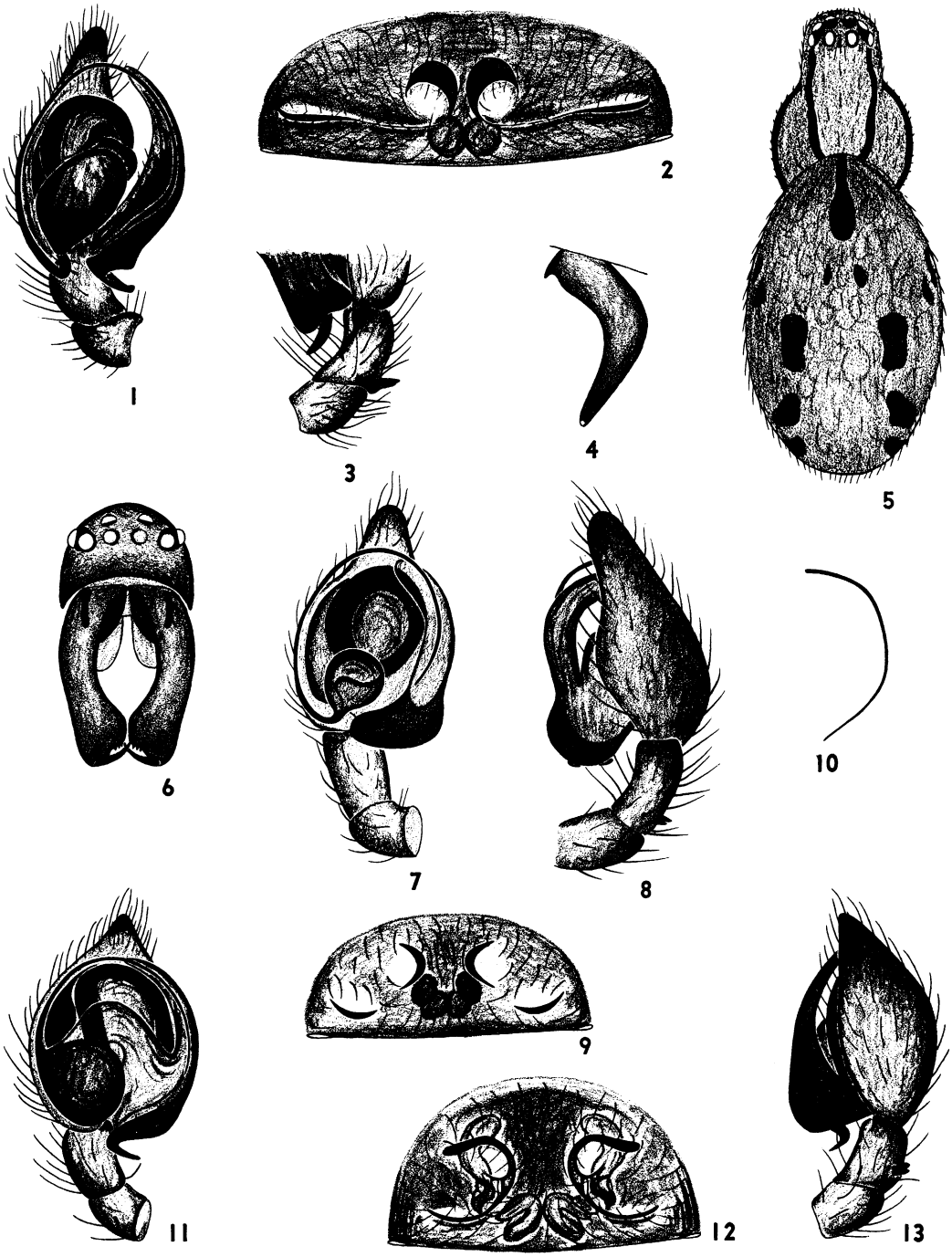
1–3. *Dictyna volucripes* Keyserling. 1. Male palpus, ventral view. 2. Epigynum. 3. Male palpus, retrolateral view

4–7. *Dictyna coloradensis* Chamberlin. 4. Epigynum. 5. Male palpus, ventral view. 6. Male palpus, retrolateral view. 7. Portion of embolus

8. *Dictyna volucripes volucripoides* Ivie, male palpus, ventral view

9–11. *Dictyna sylvania* Chamberlin and Ivie. 9. Male palpus, retrolateral view. 10. Male palpus, ventral view. 11. Distal half of embolus

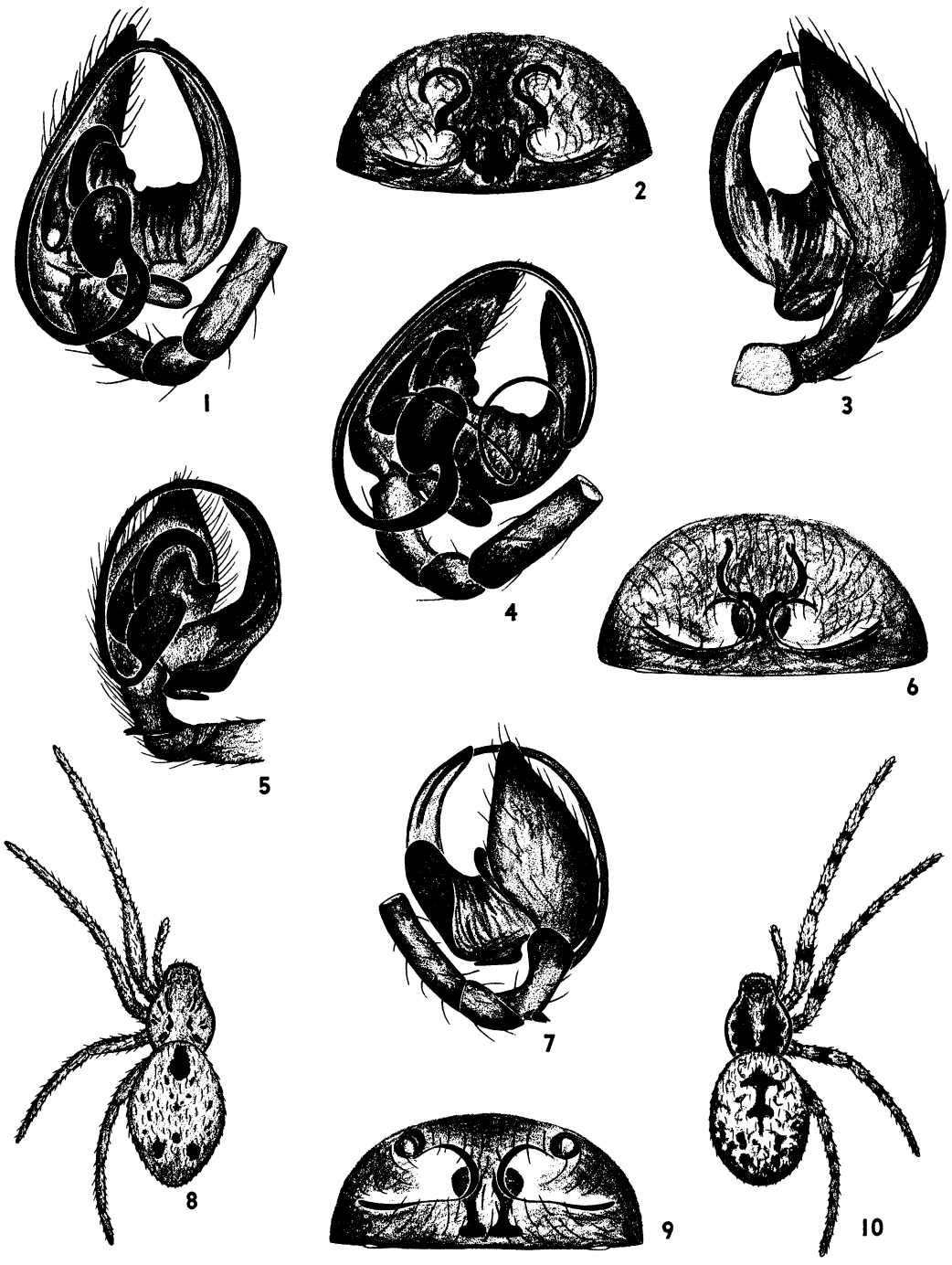
12, 13. *Dictyna idahoana* Chamberlin and Ivie. 12. Male palpus, ventral view. 13. Male palpus, retrolateral view



1–6. *Dictyna secuta* Chamberlin. 1. Male palpus, ventral view. 2. Epigynum. 3. Tibia of male palpus, retrolateral view. 4. Chelicera of male, retrolateral view. 5. Dorsal view of female (*bishopi*) from Texas. 6. Frontal view of male

7–9. *Dictyna saltona*, new species. 7. Male palpus, ventral view. 8. Male palpus, retrolateral view. 9. Epigynum

10–13. *Dictyna dauna*, new species. 10. Distal half of embolus. 11. Male palpus, ventral view. 12. Epigynum. 13. Male palpus, retrolateral view



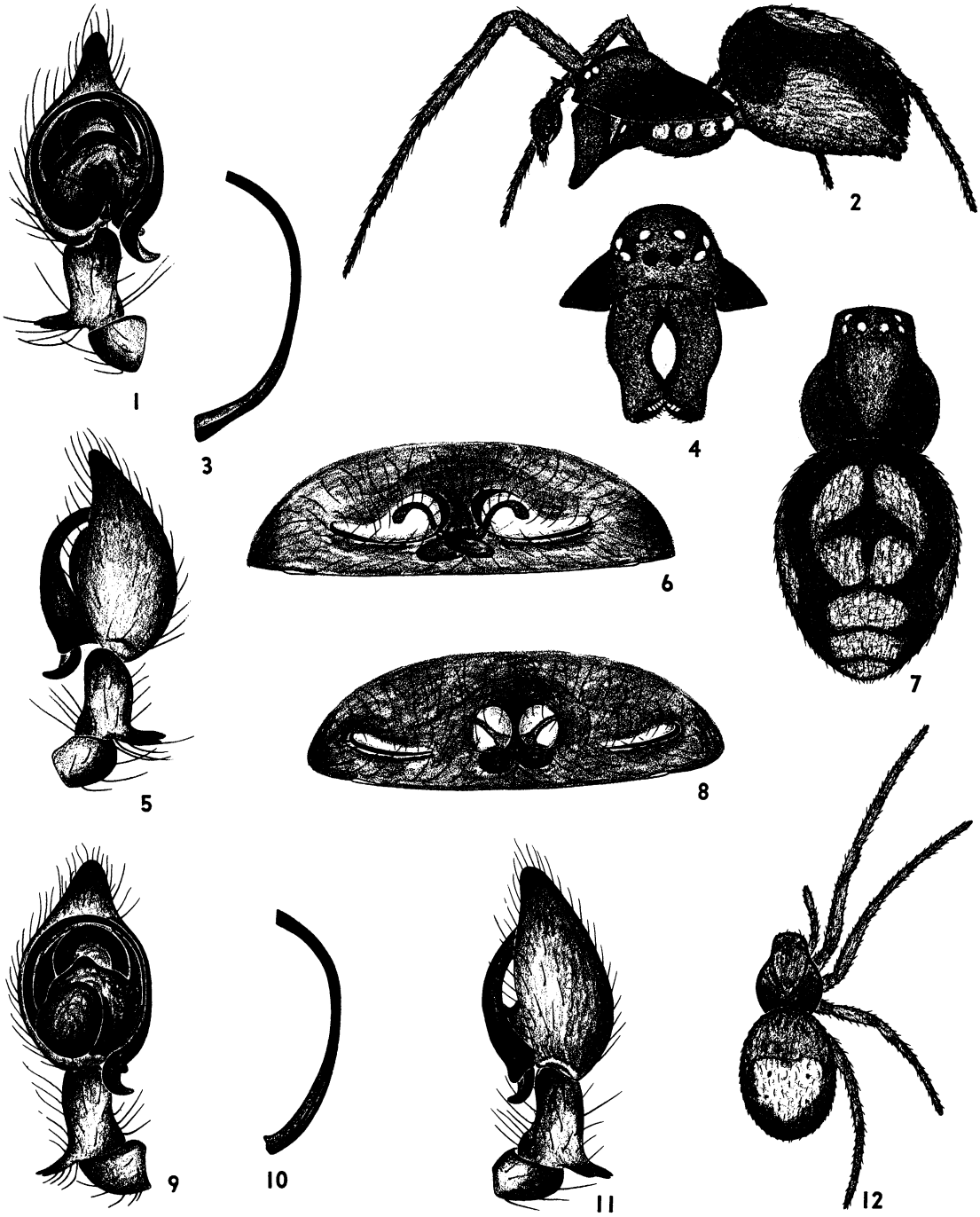
1–4. *Dictyna personata* Gertsch and Mulaik. 1. Male palpus, ventral view. 2. Epigynum. 3. Male palpus, retrolateral view. 4. Male palpus, with embolus freed, ventral view

5–7. *Dictyna sierra* Chamberlin. 5. Male palpus, ventral view. 6. Epigynum. 7. Male palpus, retrolateral view

8. *Dictyna dauna*, new species, dorsal view of female

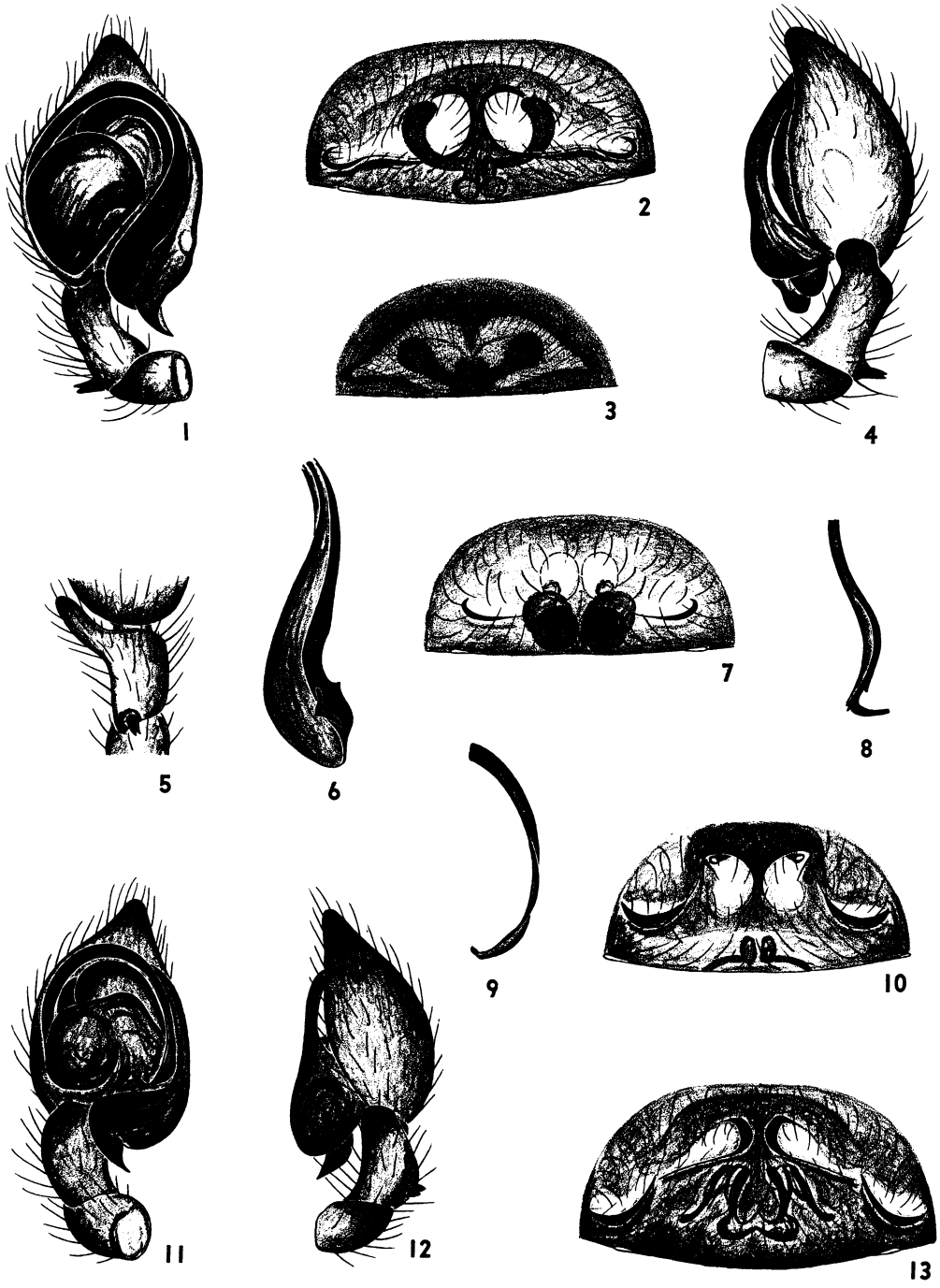
9. *Dictyna pictella*, new species, epigynum

10. *Dictyna personata* Gertsch and Mulaik, dorsal view of female



1–7. *Dictyna florens* Ivie and Barrows. 1. Male palpus, ventral view. 2. Lateral view of male. 3. Distal part of embolus. 4. Frontal view of male. 5. Male palpus, retrolateral view. 6. Epigynum. 7. Dorsal view of female, appendages omitted

8–12. *Dictyna roscida* Hentz. 8. Epigynum. 9. Male palpus, ventral view. 10. Distal part of embolus. 11. Male palpus, retrolateral view. 12. Dorsal view of female

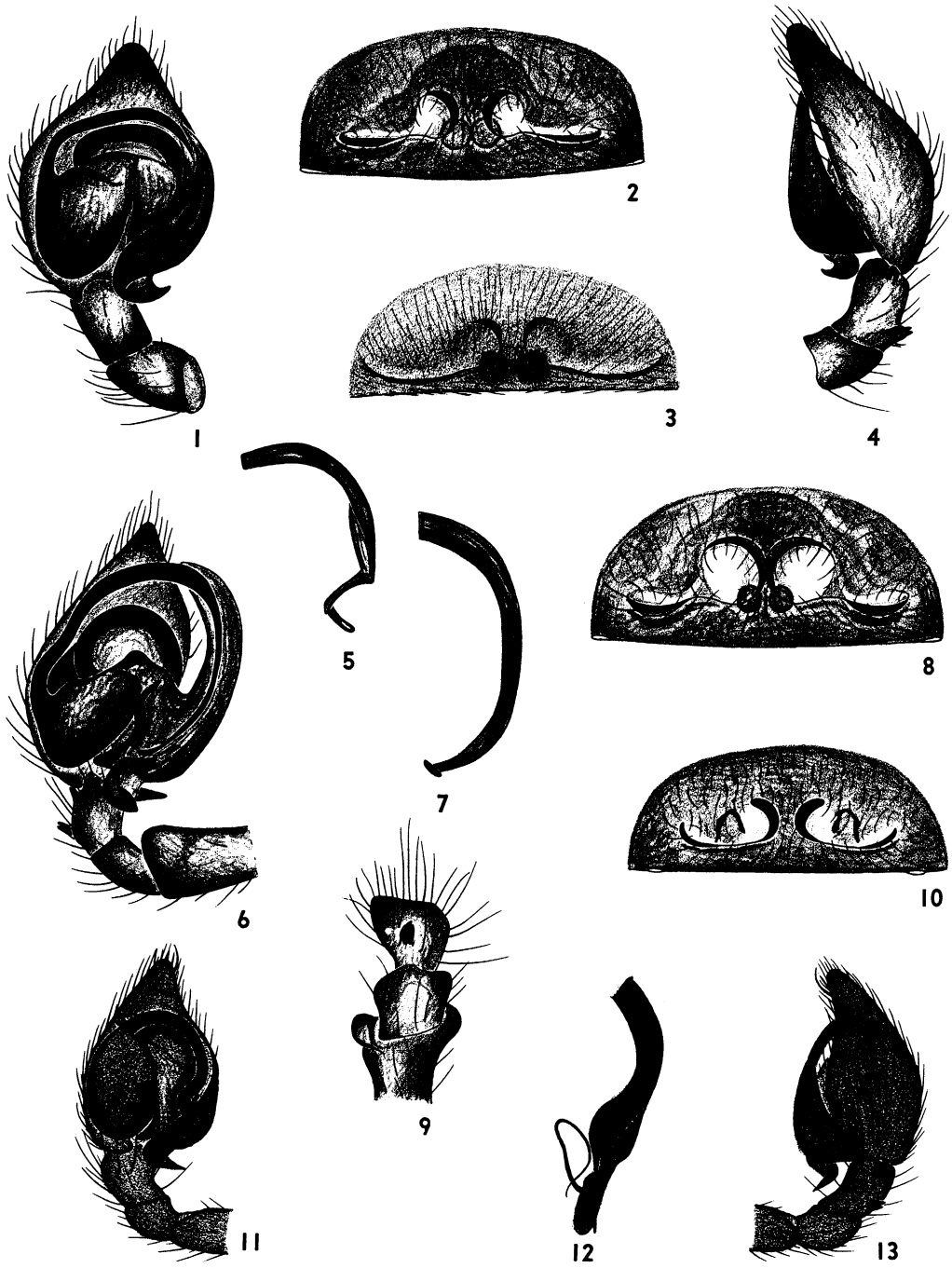


1–6. *Dictyna angulata* Emerton. 1. Male palpus, ventral view. 2. Epigynum. 3. Another epigynum (*demores*). 4. Male palpus, retrolateral view. 5. Tibia of male palpus, dorsal view. 6. Distal part of embolus

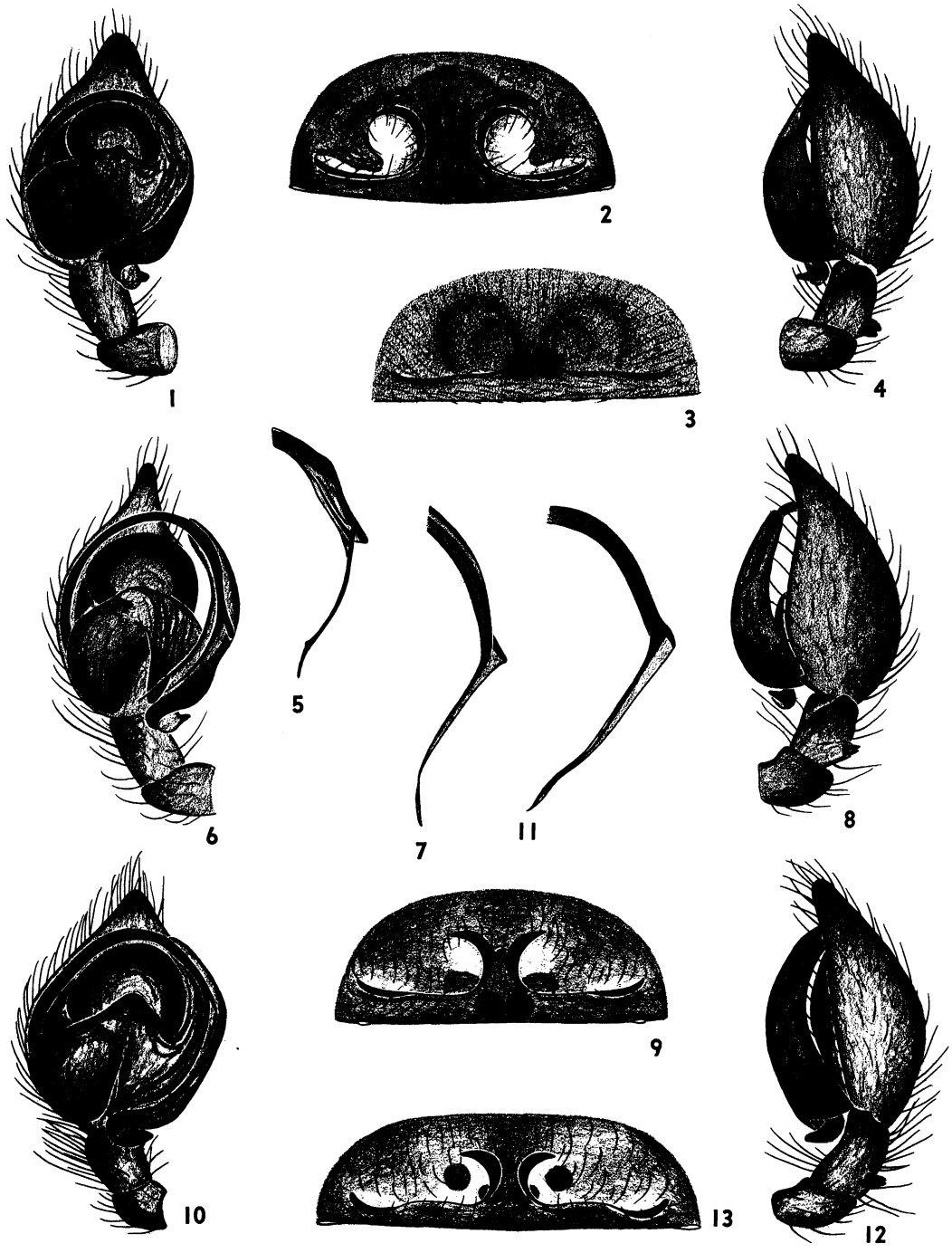
7. *Dictyna joaquina*, new species, epigynum

8–12. *Dictyna saylori* Chamberlin and Ivie. 8. Distal part of embolus, retrolateral view. 9. Distal part of embolus, ventral view. 10. Epigynum. 11. Male palpus, ventral view. 12. Male palpus, retrolateral view.

13. *Dictyna nanda*, new species, epigynum



1–5. *Dictyna stulta* Gertsch and Mulaik. 1. Male palpus, ventral view. 2. Epigynum. 3. Another epigynum (*sanfrana*). 4. Male palpus, retrolateral view. 5. Distal part of embolus
6–9. *Dictyna ardea*, new species. 6. Male palpus, ventral view. 7. Distal part of embolus. 8. Epigynum. 9. Patella and tibia of male palpus, dorsal view
10–13. *Dictyna callida* Gertsch and Ivie. 10. Epigynum. 11. Male palpus, ventral view. 12. Distal portion of embolus. 13. Male palpus, retrolateral view

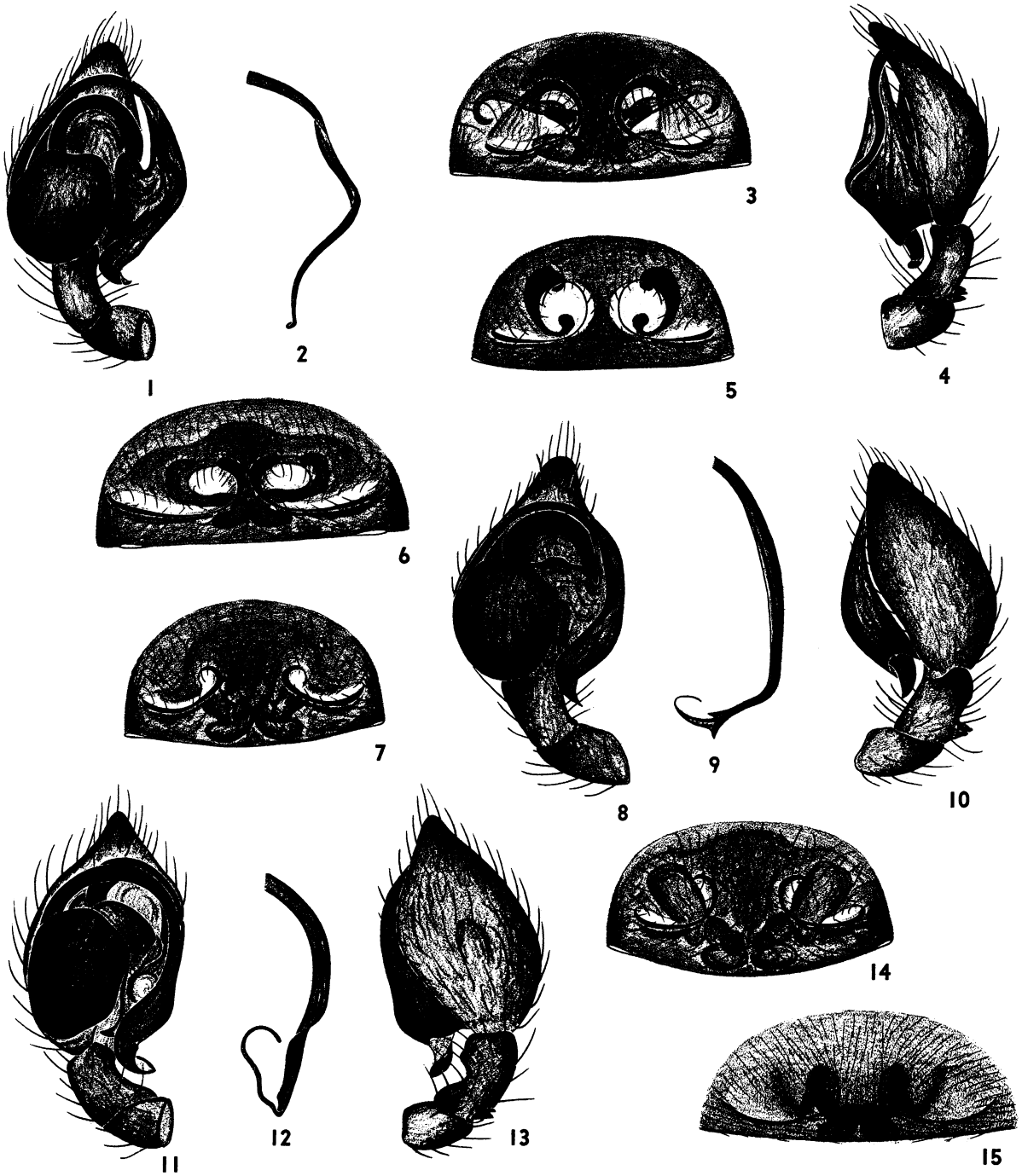


1–5. *Dictyna scotta* Chamberlin. 1. Male palpus, ventral view. 2. Epigynum. 3. Another epigynum (*cognata*). 4. Male palpus, retrolateral view. 5. Distal part of embolus

6–9. *Dictyna melva*, new species. 6. Male palpus, ventral view. 7. Distal part of embolus. 8. Male palpus, retrolateral view. 9. Epigynum

10–12. *Dictyna branchi*, new species. 10. Male palpus, ventral view. 11. Distal part of embolus. 12. Male palpus, retrolateral view

13. *Dictyna pinalia*, new species, epigynum



1–4. *Dictyna cruciata* Emerton. 1. Male palpus, ventral view. 2. Distal part of embolus. 3. Epigynum. 4. Male palpus, retrolateral view

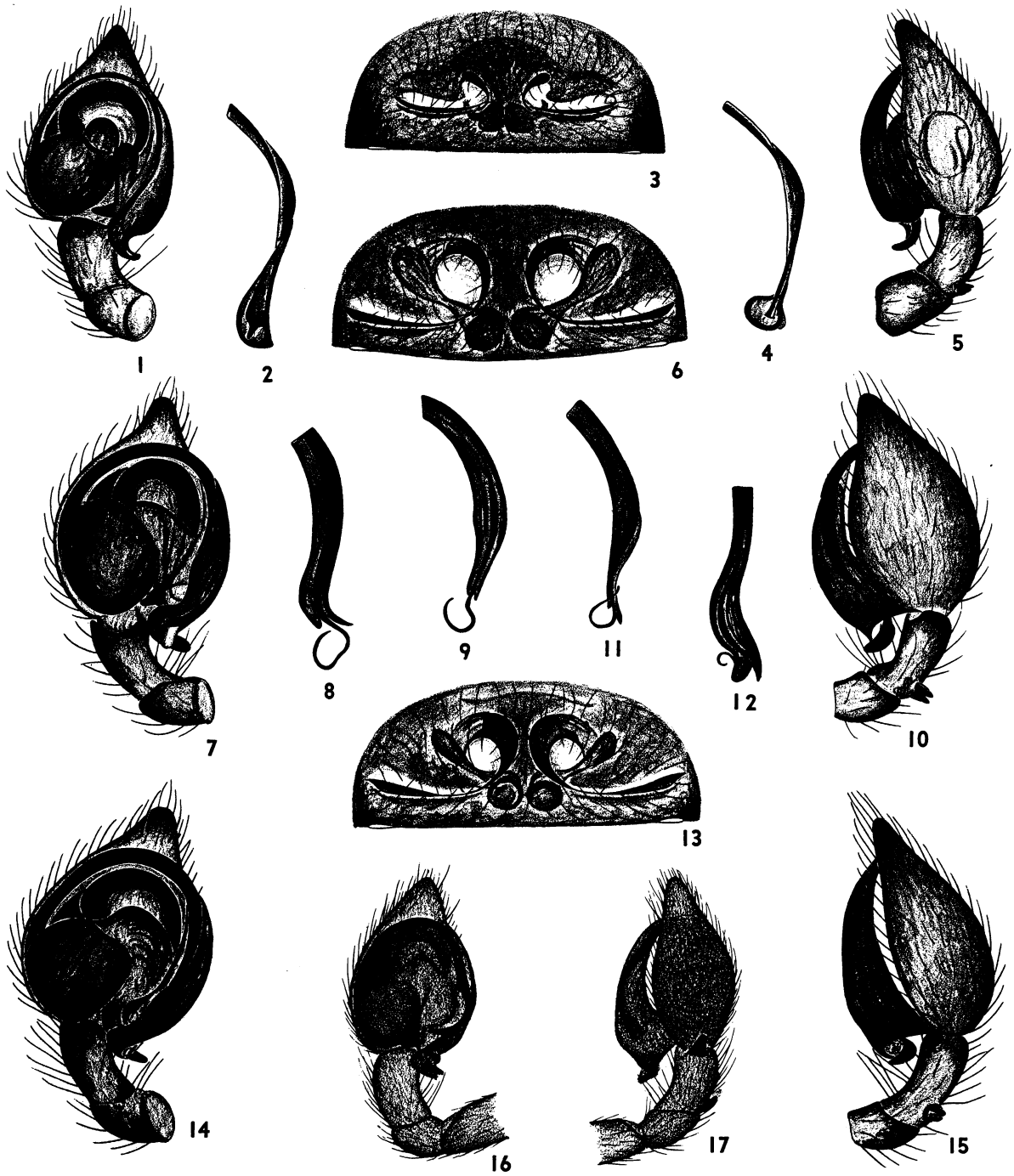
5. *Dictyna seminola*, new species, epigynum

6. *Dictyna osceola*, new species, epigynum

7–10. *Dictyna coweta*, new species. 7. Epigynum. 8. Male palpus, ventral view. 9. Distal part of embolus. 10. Male palpus, retrolateral view

11–14. *Dictyna suwanea* Gertsch. 11. Male palpus, ventral view. 12. Distal part of embolus. 13. Male palpus, retrolateral view. 14. Epigynum

15. *Dictyna manitoba* Ivie, epigynum (type of *utona*)

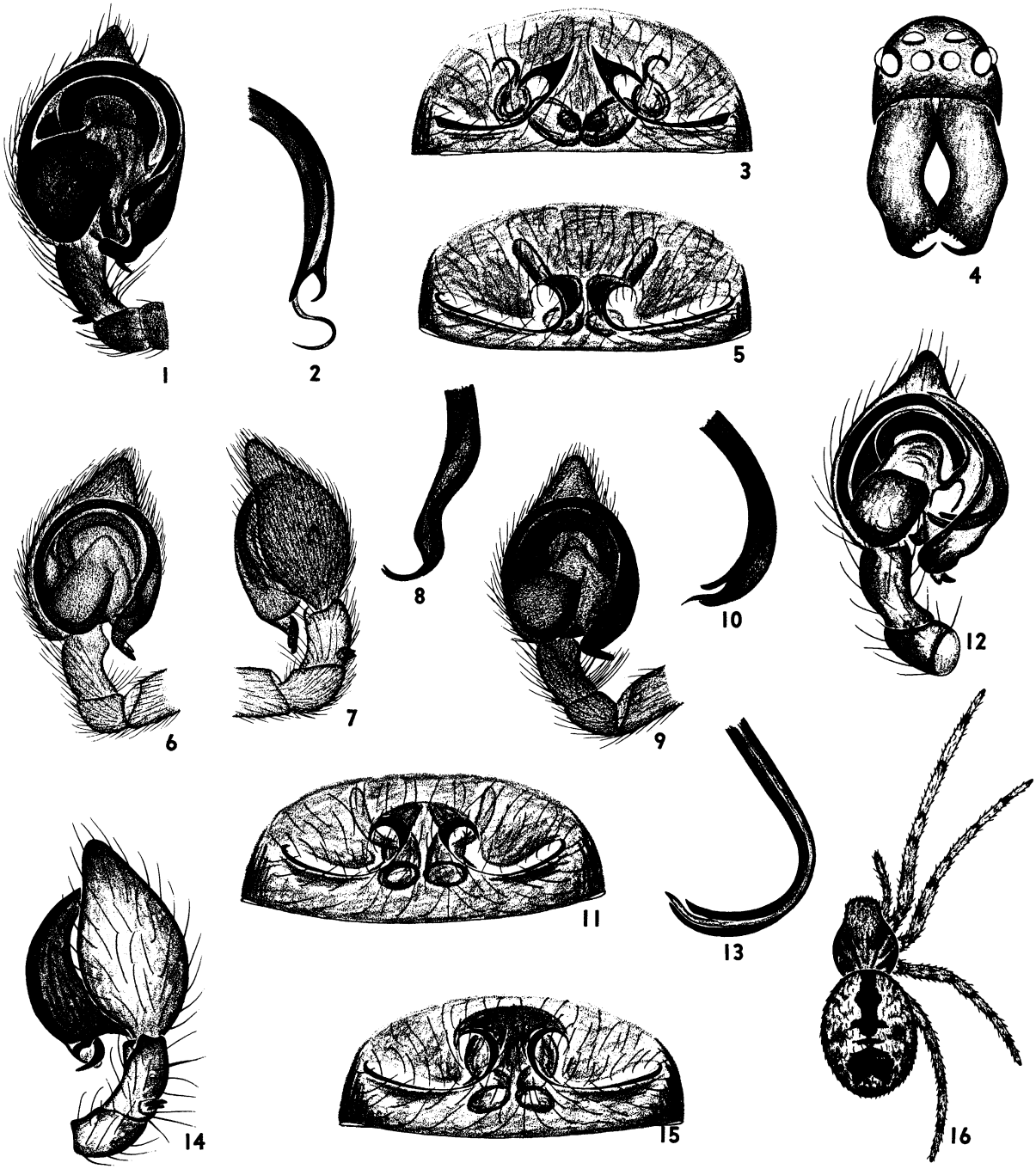


1–5. *Dictyna manitoba* Ivie. 1. Male palpus, ventral view. 2. Distal part of embolus, ventral view. 3. Epigynum. 4. Distal part of embolus, subventral view. 5. Male palpus, retrolateral view

6–10. *Dictyna sublatoides* Ivie and Barrows. 6. Epigynum. 7. Male palpus, ventral view. 8. Distal part of embolus, lateral view. 9. Distal part of embolus, ventral view. 10. Male palpus, retrolateral view

11–15. *Dictyna hentzi* Kaston. 11. Distal part of embolus, ventral view. 12. Distal part of embolus, lateral view. 13. Epigynum. 14. Male palpus, ventral view. 15. Male palpus, retrolateral view

16, 17. *Dictyna crocana* Chamberlin. 16. Male palpus, ventral view. 17. Male palpus, retrolateral view

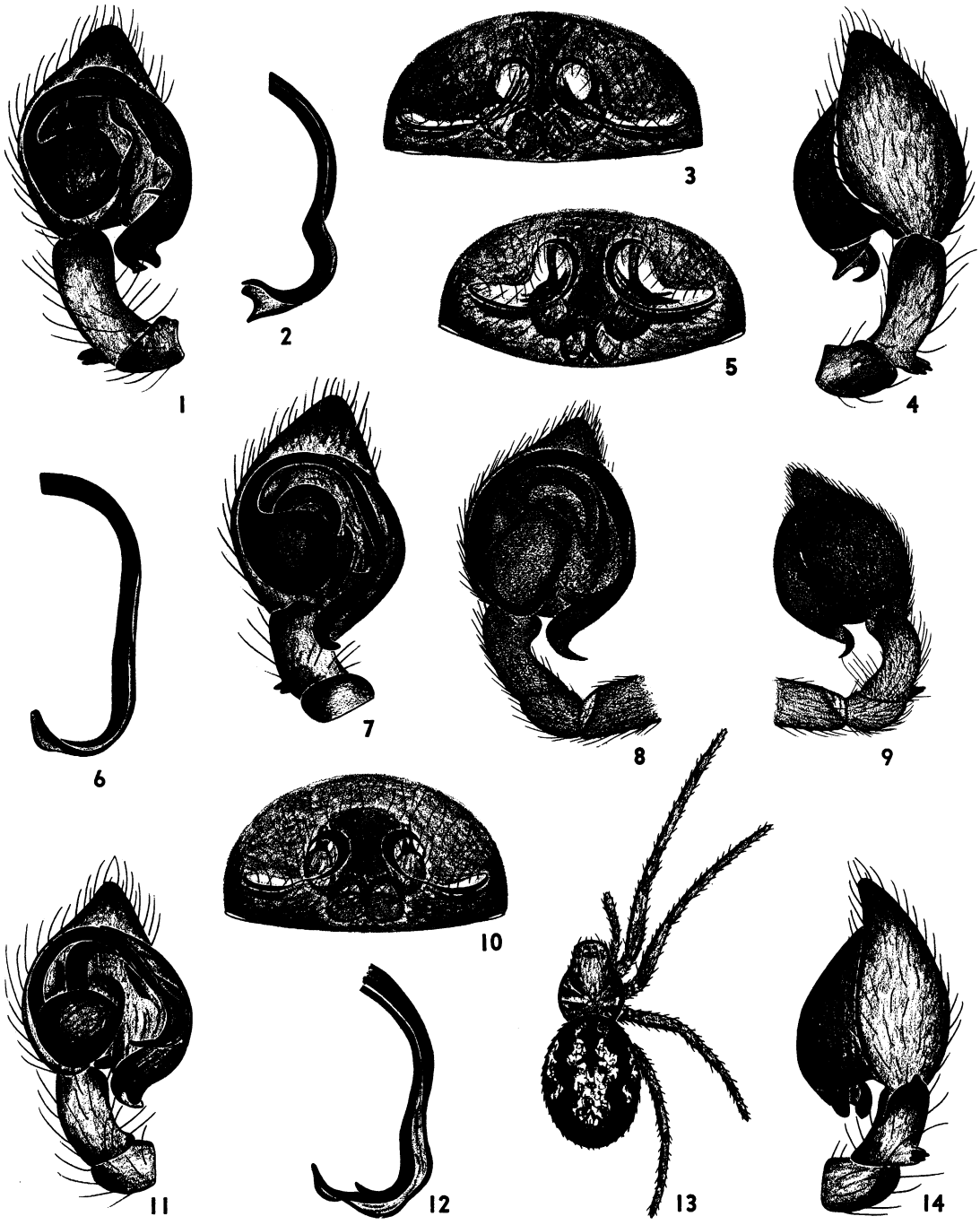


1–4. *Dictyna altamira* Gertsch and Davis. 1. Male palpus, ventral view. 2. Distal part of embolus. 3. Epigynum. 4. Frontal view of male

5–8. *Dictyna francisca* Bishop and Ruderman. 5. Epigynum. 6. Male palpus, ventral view. 7. Male palpus, retrolateral view. 8. Distal part of embolus

9–11. *Dictyna peragrata* Bishop and Ruderman. 9. Male palpus, ventral view. 10. Distal part of embolus. 11. Epigynum

12–16. *Dictyna uintana* Chamberlin. 12. Male palpus, ventral view. 13. Distal part of embolus. 14. Male palpus, retrolateral view. 15. Epigynum. 16. Dorsal view of female

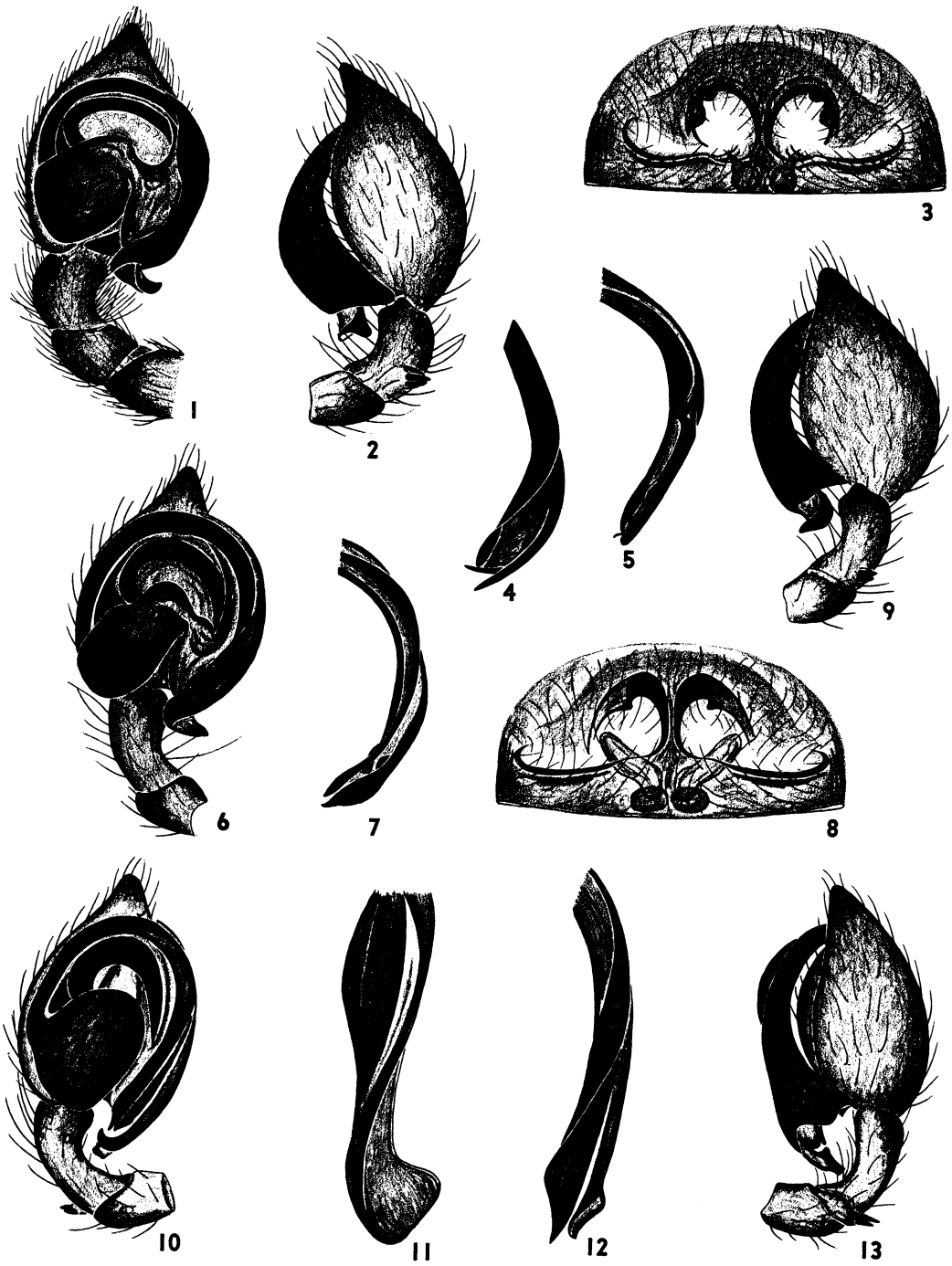


1–4. *Dictyna evicta* Gertsch and Mulaik. 1. Male palpus, ventral view. 2. Distal part of embolus. 3. Epigynum. 4. Male palpus, retrolateral view

5–7. *Dictyna decaprini* Kaston. 6. Epigynum. 6. Distal part of embolus. 7. Male palpus, ventral view

8, 9. *Dictyna chitina*, new species. 8. Male palpus, ventral view. 9. Male palpus, retrolateral view

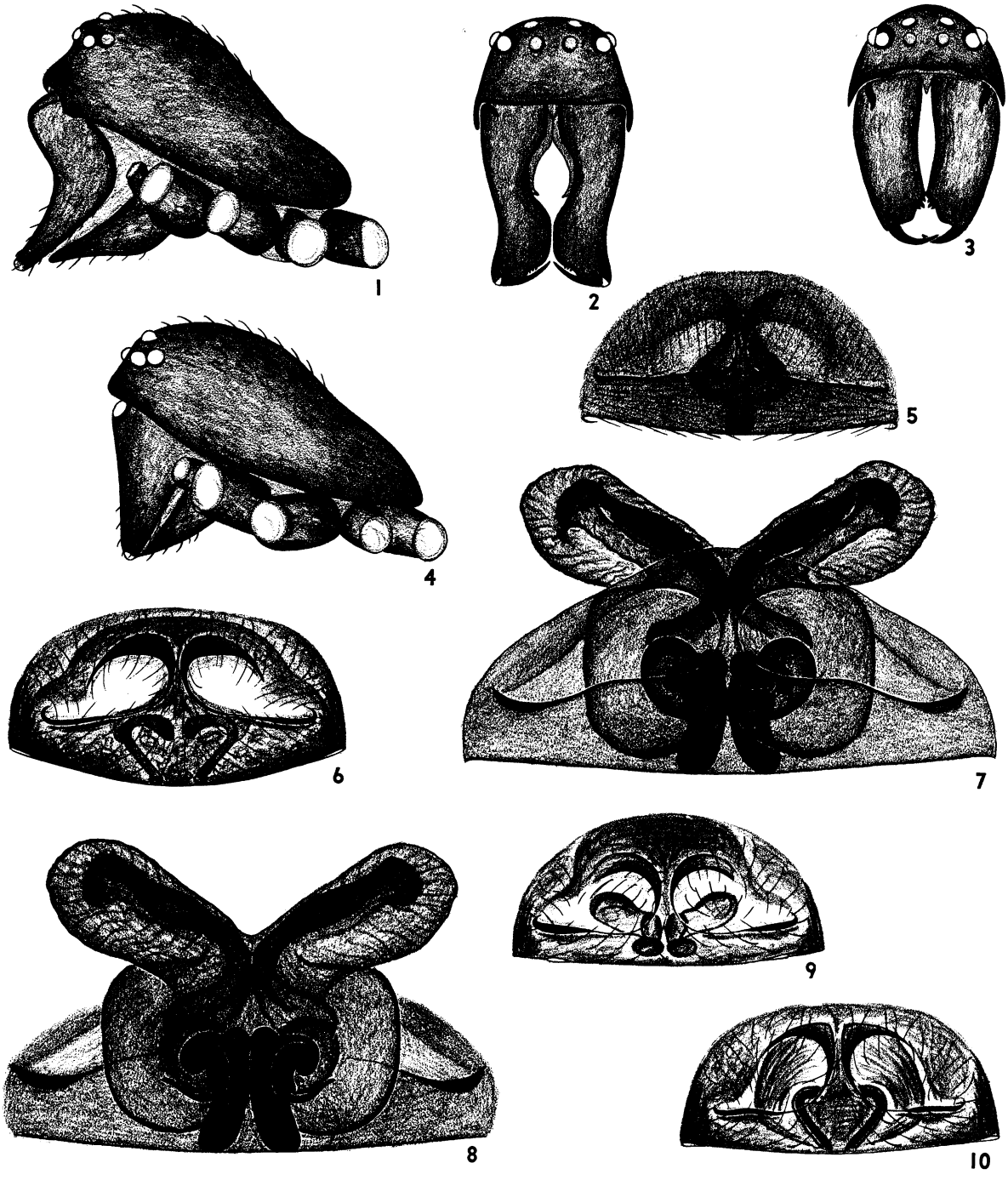
10–14. *Dictyna capens* Chamberlin. 10. Epigynum. 11. Male palpus, ventral view. 12. Distal part of embolus. 13. Dorsal view of female. 14. Male palpus, retrolateral view



1–5. *Dictyna annulipes* Blackwall. 1. Male palpus, ventral view. 2. Male palpus, retrolateral view. 3. Epigynum. 4. Distal part of embolus, prolateral view. 5. Distal part of embolus, ventral view

6–9. *Dictyna phylax* Gertsch and Ivie. 6. Male palpus, ventral view. 7. Distal part of embolus, ventral view. 8. Epigynum. 9. Male palpus, retrolateral view

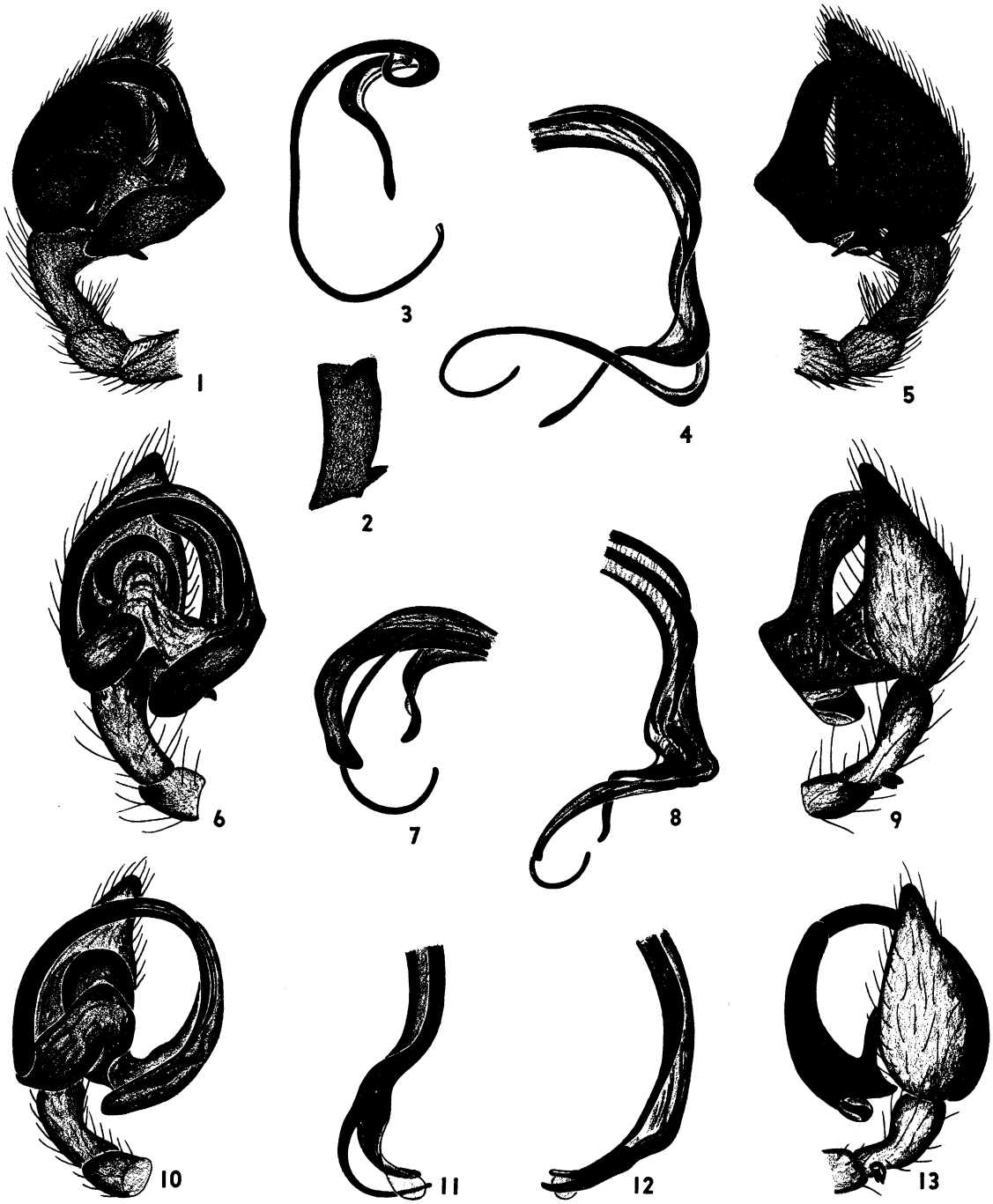
10–13. *Dictyna jonesae* Roewer. 10. Male palpus, ventral view. 11. Distal part of embolus of male palpus, retrolateral view. 12. Distal part of embolus, ventral view. 13. Male palpus retrolateral view



1–8. *Dictyna sublata* Hentz. 1. Lateral view of carapace of male. 2. Frontal view of male. 3. Frontal view of female. 4. Lateral view of carapace of female. 5. Epigynum. 6. Epigynum of another specimen. 7. Genital organ of female, ventral view. 8. Genital organ of female, dorsal view

9. *Dictyna maxima* Banks, epigynum

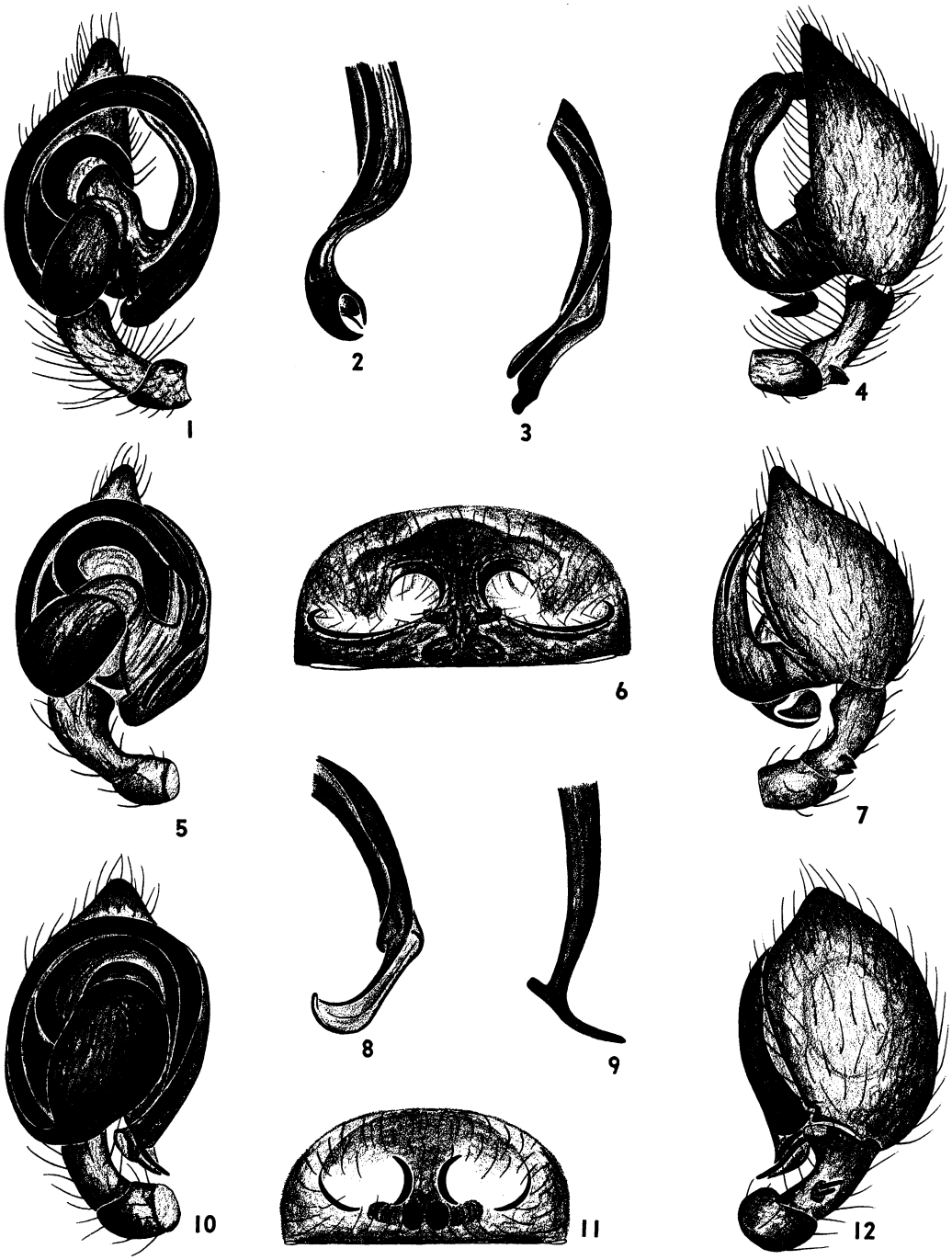
10. *Dictyna suprenans* Chamberlin and Ivie, epigynum



1–5. *Dictyna sublata* Hentz. 1. Male palpus, ventral view. 2. Tibia of male palpus, subdorsal view. 3. Distal part of embolus, caudal view. 4. Distal part of embolus, ventral view. 5. Male palpus, retrolateral view

6–9. *Dictyna suprenans* Chamberlin and Ivie. 6. Male palpus, ventral view. 7. Distal part of embolus, caudal view. 8. Distal part of embolus, ventral view. 9. Male palpus, retrolateral view

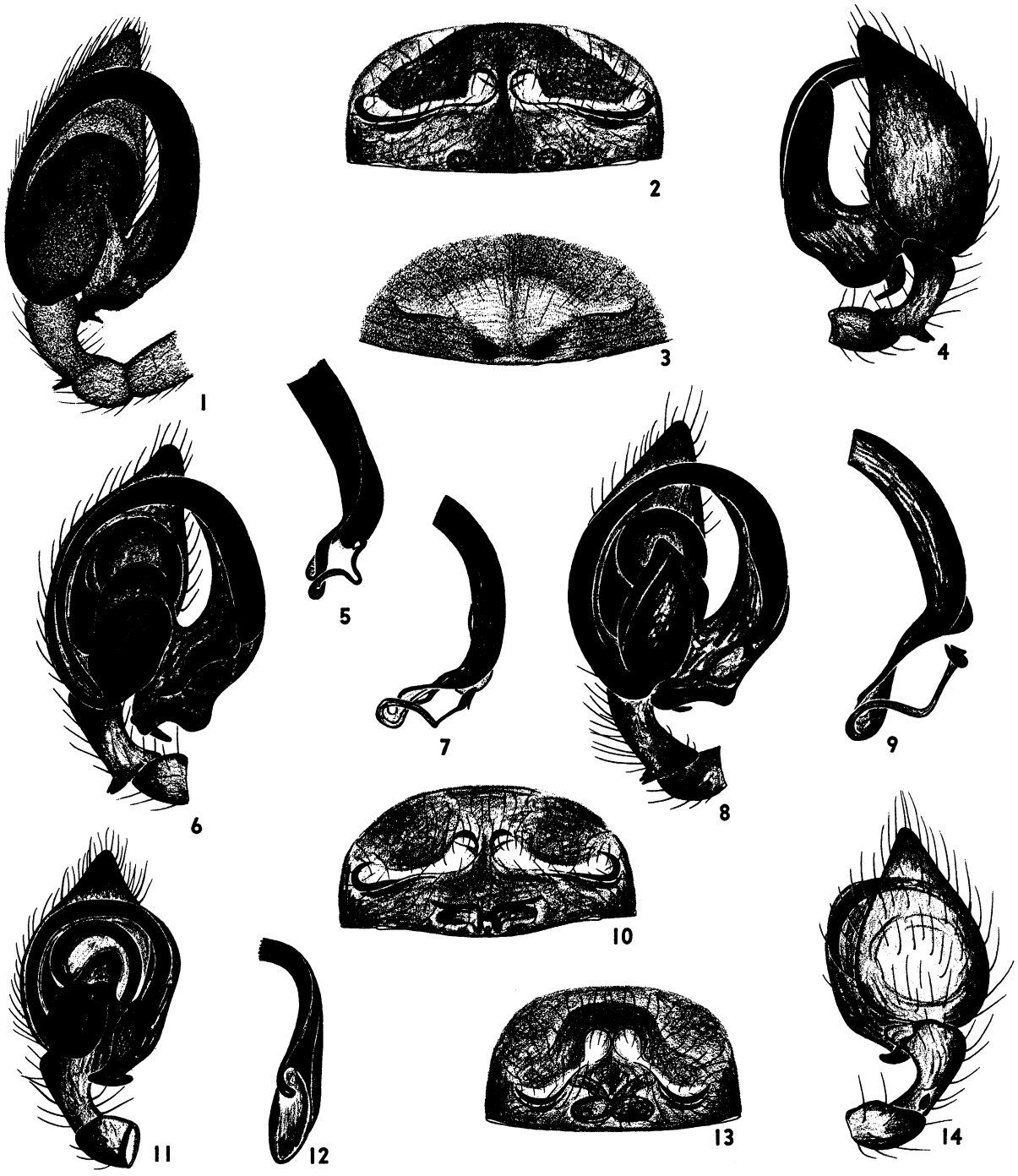
10–13. *Dictyna orbiculata* Jones. 10. Male palpus, ventral view. 11. Distal part of embolus, retrolateral view. 12. Distal part of embolus, ventral view. 13. Male palpus, retrolateral view



1–4. *Dictyna maxima* Banks. 1. Male palpus, retrolateral view. 2. Distal part of embolus, retrolateral view. 3. Distal part of embolus, ventral view. 4. Male palpus, retrolateral view

5–8. *Dictyna zaba* Ivie and Barrows. 5. Male palpus, ventral view. 6. Epigynum. 7. Male palpus, retrolateral view. 8. Distal part of embolus, ventral view

9–12. *Dictyna iviei* Gertsch. 9. Distal part of embolus, ventral view. 10. Male palpus, ventral view. 11. Epigynum. 12. Male palpus, retrolateral view



1–5. *Dictyna olympiana* Chamberlin. 1. Male palpus, ventral view. 2. Epigynum. 3. Epigynum of another specimen. 4. Male palpus, retrolateral view. 5. Distal part of embolus

6–10. *Dictyna serena*, new species. 6. Male palpus, ventral view. 7. Distal part of embolus of palpus shown in 7. 8. Another male palpus, ventral view. 9. Distal part of embolus of palpus shown in 8. 10. Epigynum

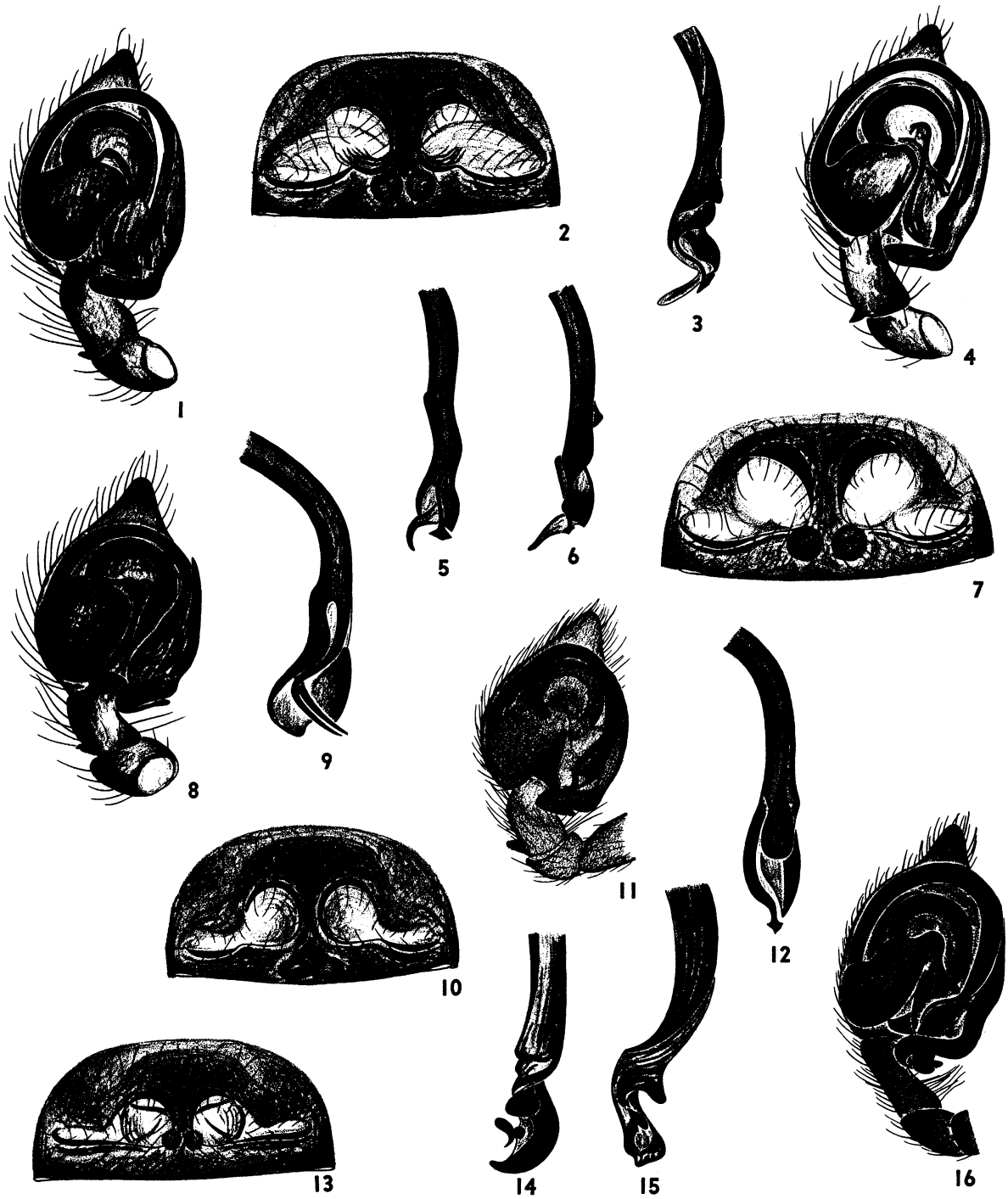
11–14. *Dictyna horta* Gertsch and Ivie. 11. Male palpus, ventral view. 12. Distal part of embolus of male palpus. 13. Epigynum. 14. Male palpus, retrolateral view

1–4. *Dictyna borealis* O. P.-Cambridge. 1. Male palpus, ventral view. 2. Embolus (Greenland). 3. Embolus (Colorado). 4. Male palpus, retrolateral view

5–8. *Dictyna borealis cavernosa* Jones. 5. Epigynum. 6. Epigynum of another specimen. 7. Male palpus, ventral view. 8. Embolus

9–11. *Dictyna completa* Chamberlin and Gertsch. 9. Dorsal view of female (Nevada). 10. Frontal view of male. 11. Chelicera of male, retrolateral view

12, 13. *Dictyna aiko*, new species. 12. Distal part of embolus. 13. Male palpus, ventral view



1–3. *Dictyna completa* Chamberlin and Gertsch. 1. Male palpus, ventral view. 2. Epigynum. 3. Distal part of embolus, ventral view

4–7. *Dictyna completoides* Ivie. 4. Male palpus, ventral view. 5. Distal part of embolus, retrolateral view. 6. Distal part of embolus, ventral view. 7. Epigynum

8–10. *Dictyna cornupeta* Bishop and Ruderman. 8. Male palpus, ventral view. 9. Distal part of embolus, ventral view. 10. Epigynum

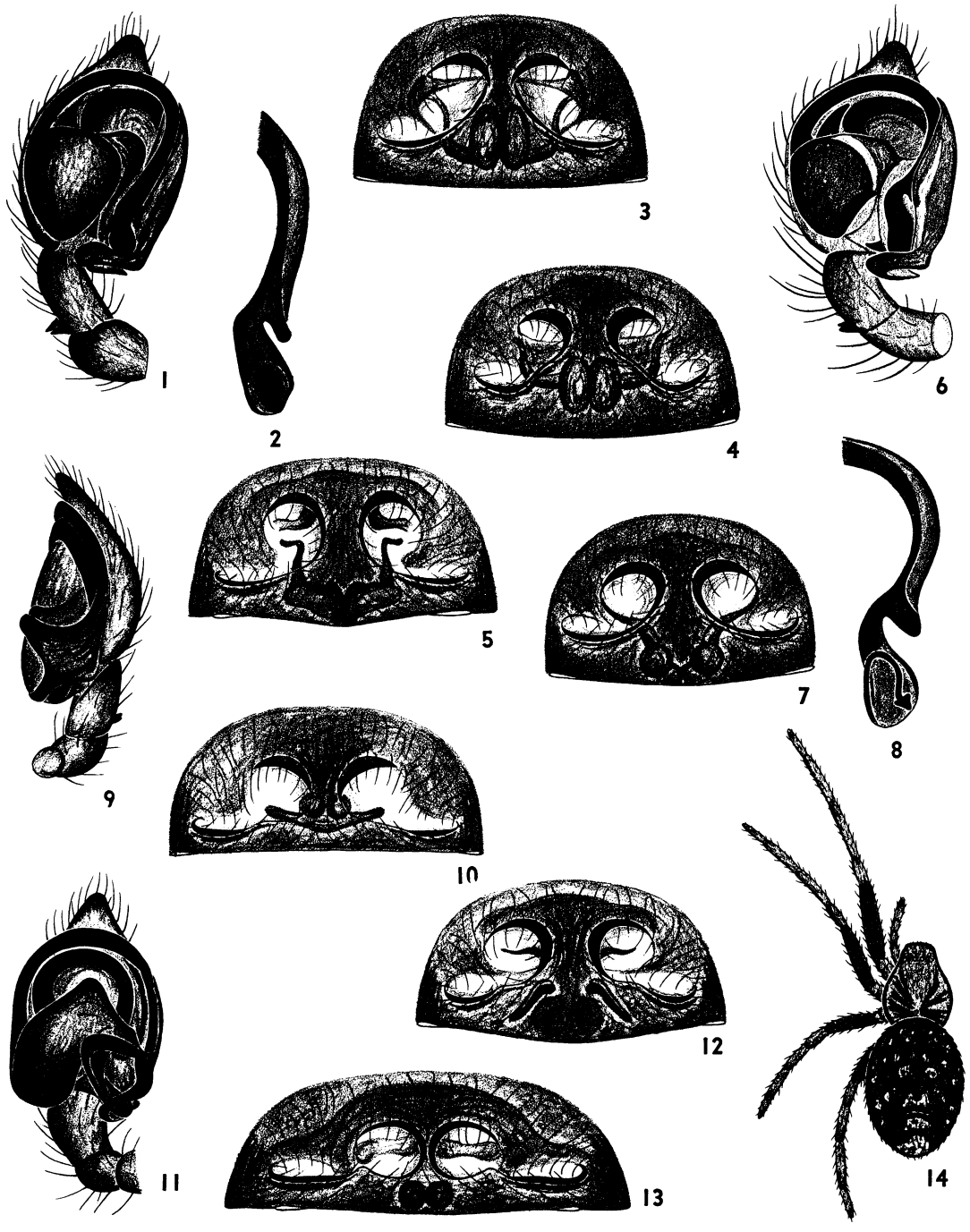
11–13. *Dictyna ampla* Chamberlin. 11. Male palpus, ventral view. 12. Distal part of embolus, ventral view. 13. Epigynum

14–16. *Dictyna lina* Gertsch. 14. Distal part of embolus, retrolateral view. 15. Distal part of embolus, ventral view. 16. Male palpus, ventral view

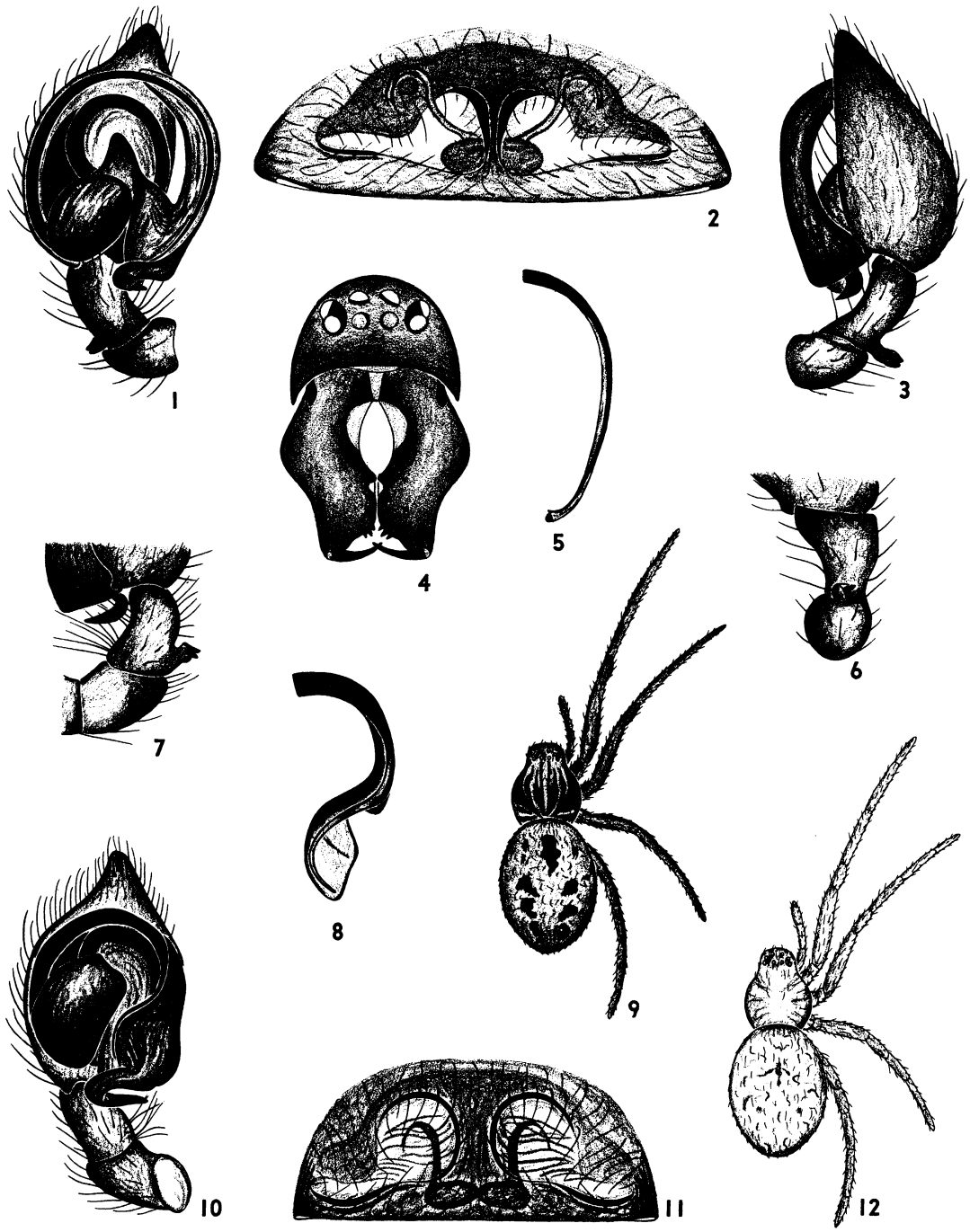
1–6. *Dictyna oregona* Gertsch. 1. Male palpus, ventral view. 2. Distal part of embolus. 3. Male palpus, retrolateral view. 4. Chelicera of male, retrolateral view. 5. Frontal view of male. 6. Epigynum

7–10. *Dictyna klamatha*, new species. 7. Male palpus, ventral view. 8. Distal part of embolus. 9. Epigynum. 10. Male palpus, retrolateral view

11–14. *Dictyna hoya* Chamberlin and Ivie. 11. Male palpus, ventral view. 12. Distal part of embolus. 13. Epigynum. 14. Male palpus, retrolateral view



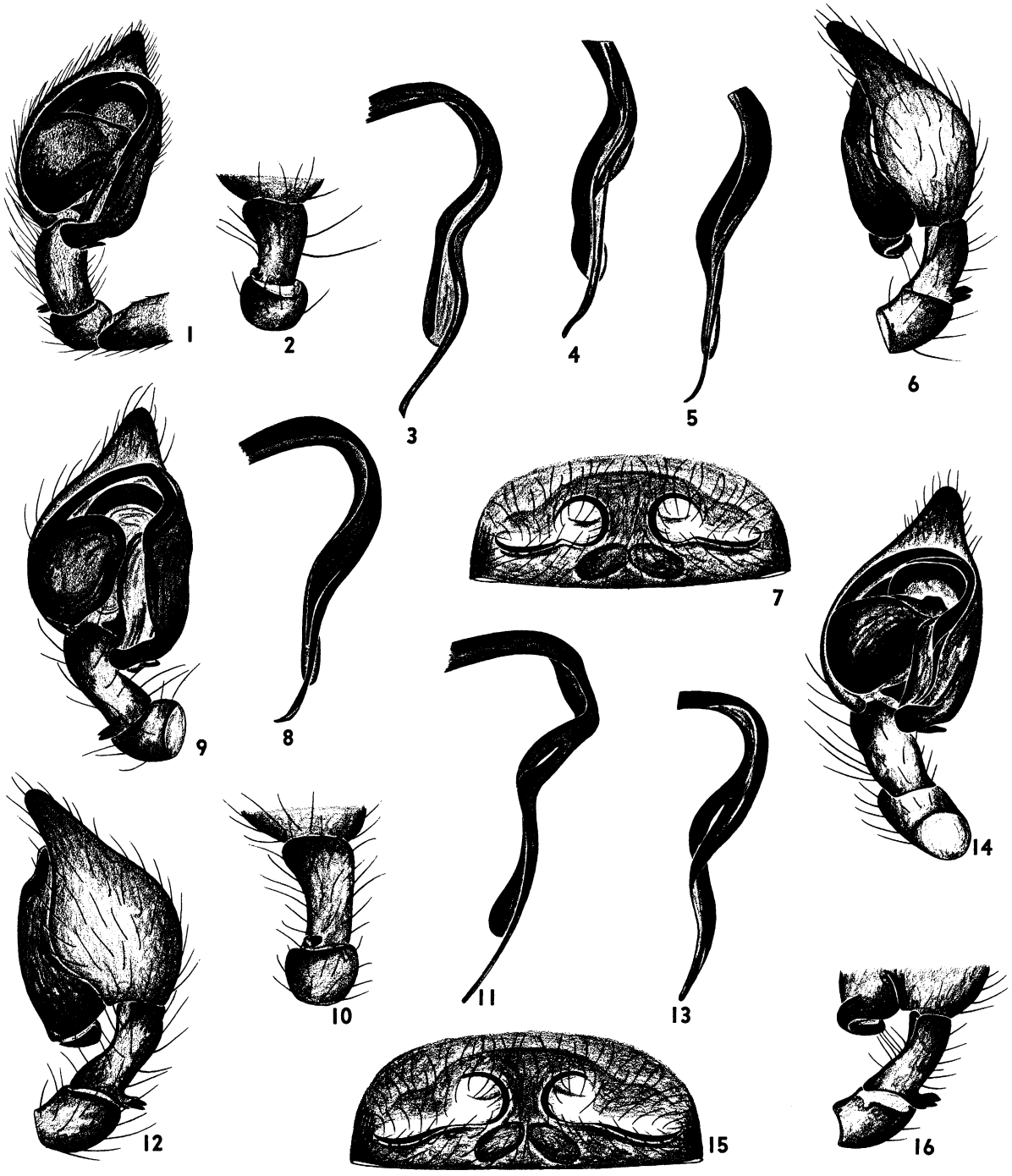
1–5. *Dictyna piratica* Ivie. 1. Male palpus, ventral view. 2. Distal part of embolus. 3. Epigynum. 4. Epigynum of another specimen (*monoca*). 5. Epigynum of another specimen (Scipio, Utah)
6–8. *Dictyna artemisia* Ivie. 6. Male palpus, ventral view. 7. Epigynum. 8. Distal part of embolus
9–11. *Dictyna consulta* Gertsch and Ivie. 9. Male palpus, retrolateral view. 10. Epigynum. 11. Male palpus, ventral view
12. *Dictyna marissa*, new species, epigynum
13, 14. *Dictyna linda*, new species. 13. Epigynum. 14. Dorsal view of female



1–6. *Dictyna littoricolens* Chamberlin and Ivie. 1. Male palpus, ventral view. 2. Epigynum. 3. Male palpus, retrolateral view. 4. Frontal view of male. 5. Distal part of embolus. 6. Tibia of male palpus, dorsal view

7–11. *Dictyna oasa* Ivie. 7. Tibia of male palpus, retrolateral view. 8. Distal part of embolus. 9. Dorsal view of female. 10. Male palpus, ventral view. 11. Epigynum

12. *Dictyna reticulata* Gertsch and Ivie, dorsal view of female



1–7. *Dictyna reticulata* Gertsch and Ivie. 1. Male palpus, ventral view. 2. Tibia of male palpus, dorsal view. 3. Embolus of male palpus, subventral view. 4. Distal part of embolus, retrolateral view. 5. Distal part of embolus, subventral view. 6. Male palpus, retrolateral view. 7. Epigynum

8. *Dictyna shasta*, new species, embolus, ventral view

9–12. *Dictyna palomara* Chamberlin. 9. Male palpus, ventral view. 10. Tibia of male palpus, dorsal view. 11. Embolus of male palpus, ventral view. 12. Male palpus, retrolateral view

13–16. *Dictyna shoshonea*, new species. 13. Embolus of male palpus, ventral view. 14. Male palpus, ventral view. 15. Epigynum. 16. Tibia of male palpus, retrolateral view