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## Keys to the Spiders of Northwestern Iowa

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## Keys to the Spiders of Northwestern Iowa

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Spiders were collected from various habitats in 7 counties of northwestern Iowa during the summer of 1985. Nineteen families and 69 genera were identified; these comprised 154 species. An additional 19 species in Families Linyphiidae and Micryphantidae were not identified to genus. Morphological keys to local families and genera are presented. A field key to some common spiders, based on ecological and behavioral characteristics, is also included.

INDEX DESCRIPTORS: Spiders, Araneida, Araneae, families, genera, identification, keys, Iowa.

Spiders are abundant and diverse in northwestern Iowa and therefore likely to be noticed by many non-arachnologists. Existing keys to spiders are technical, hard to find, or include species not found in Iowa. The purpose of this paper is to provide an aid to identification of the spiders of northwestern Iowa which can be used by the non-specialist, whether student, extension agent, or householder. The serious student will wish to consult general references such as Kaston (1978, 1981) or Roth (1985), in which he will find more detail and references to additional literature.

None of the spiders in these keys has a bite which is normally dangerous to man (excluding allergic reactions); however, adverse symptoms of the bites of some members of the genus *Chiracanthium* and *Herpyllus ecclesiasticus* have been reported (Levi and Levi 1968, Kaston 1978, Harwood and James 1979).

The only two kinds of spiders in the U.S. which are seriously venomous to man are recluses and widows (Levi and Levi 1968, Kaston 1978). Neither the brown recluse nor the black widow was found in this study, although several bites probably caused by the brown recluse were reported in the area during the summer (V. Strickland personal communication, Anonymous 1985). Spiders can travel in or on automobiles or lumber carried from southern states where they are prevalent; bites reported in an area do not necessarily mean an indigenous population of venomous spiders. One should try to collect any spider which has caused a bite; a physician will not assume a venomous bite if it occurs outside the spider's normal geographic area.

### MATERIALS AND METHODS

This study was conducted between 9 June and 17 August 1985. Surveys of spiders in other areas (Abraham 1983, Abraham unpublished data) have shown that although species of adult spiders present in an area vary seasonally, usually some stage of the life cycle of each species is present during the summer. These keys therefore probably account for the genera of the great majority of species present in the area.

Voucher specimens will be deposited in the insect collections of the Department of Entomology, Iowa State University, Ames, when species have been verified.

Most spiders were collected with a sweep net. Additional methods included hand-picking of spiders under rocks, bark, and logs, in flowers, in and on buildings, etc., and pitfall trapping.

I attempted to survey all types of habitats within the northwestern part of the state. Habitats listed in the keys are only those in which spiders were found in this study. Appendix 1 is a list of localities and habitats in which spiders were collected.

Abundance of members of most genera was estimated. Estimates are: abundant (numerous specimens likely to be collected by sweeping or observation in the proper habitat); common (one or more specimens likely to be collected by sweeping or observation in the proper habitat); uncommon (may not be found in the proper habitat by

collecting on a single occasion); rare (probably will not be found by collecting on a single occasion).

The family and genus keys include all identified spiders; the field key includes only spiders with characters making them easily identifiable in the field. The field key to live spiders in their habitat is meant to correct the problem with many morphological keys in which ecological or behavioral characters are included, but not observable for preserved specimens in the laboratory. Use of the field key, then preservation of the specimen and use of the family and genus keys back in the laboratory, is recommended for most accurate identification. Emphasis has been placed on characters visible to the naked eye wherever possible; however, a dissecting microscope will be necessary for most determinations.

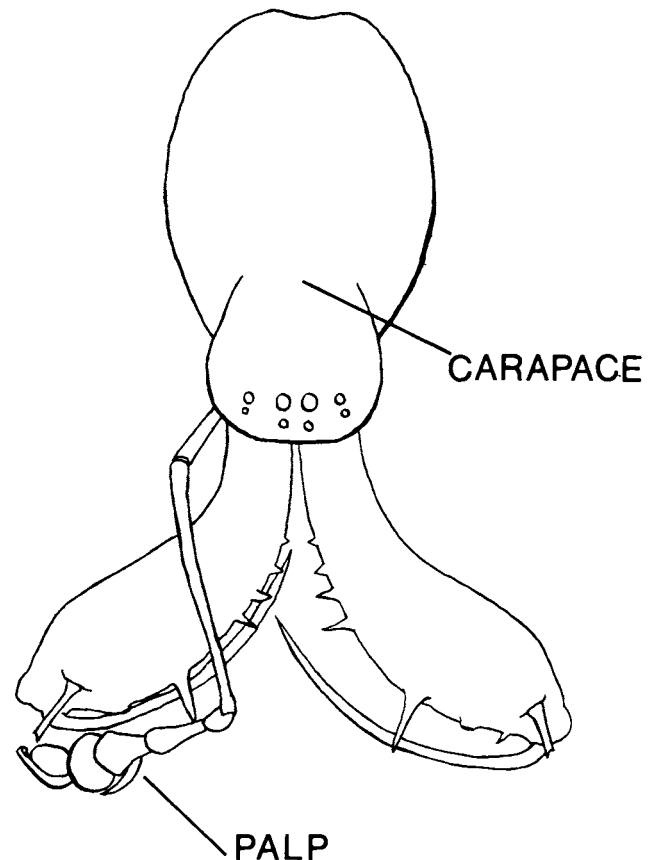


Fig. 1. *Tetragnatha*, Family Tetragnathidae, male showing palp and elongate jaws with teeth.

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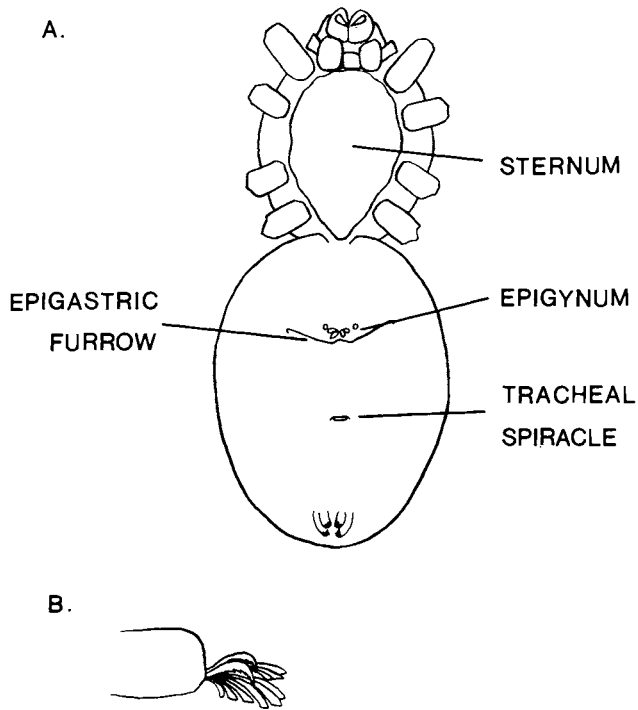


Fig. 2. a. *Wulfila*, Family Anyphaenidae, ventral view of female, showing epigynum, epigastric furrow and tracheal spiracle. b. Anyphaenid, showing diagnostic claw tuft of lamelliform (flattened) hairs.

All keys are to adult spiders, which are recognizable by the enlarged palps in the male (Fig. 1) or epigynum in the female (Fig. 2).

Sizes (rounded to the nearest mm) are from the clypeus (Fig. 3) to the end of the abdomen excluding the spinnerets (Fig. 4). Only the range of lengths for adult specimens collected in this study is given.

I have used non-technical terminology wherever possible. Most specialized terms are defined in the keys or illustrated in the figures. The reader is referred to Roth (1985), Kaston (1978), Levi and Levi (1968), or Comstock (1940) for additional definitions and illustrations. References cited in the genus keys include keys to genera; many additional keys to species within single genera have been omitted.

**RESULTS**

Nineteen families and 69 genera were collected and identified. These represented 154 species; verification will appear in a later paper. In the keys, "spp." after the genus means that more than one species was collected.

Three species in Family Linyphiidae could not be identified to genus, and keys to the genera of Family Micryphantidae are not provided. These spiders are very small and difficult to identify, and literature is scant. Sixteen possible species of micryphantids (males and females not paired) were collected. Identified genera are listed under the family description.

**Part I. Morphological Key to Families**

- 1a Legs laterigrade (rotated so that the normally dorsal surface is posterior; front legs curve forward like a crab's; Figs. 3, 5) . . . . . 2
- 1b Legs of the usual prograde type (Figs. 6, 7) . . . . . 3
- 2a Legs I and II much longer and thicker than III and IV, without

- brushes of hair (scopulae) beneath distal segments (Fig. 3) . . . . . Family Thomisidae
- 2b Legs about the same length and thickness, with scopulae beneath distal segments (Fig. 5) . . . . . Family Philodromidae
- 3a Legs extremely long and slender compared to size of body (resembles a daddy-long-legs), chelicerae (jaws) not enlarged . . . . . Family Pholcidae
- 3b Legs shorter and stouter compared to size of body (Figs. 4, 6); or not resembling a daddy-long-legs (Fig. 8) . . . . . 4
- 4a Tibia and metatarsus I and II with a prolateral row of long spines, between each pair of long spines a row of curved, short spines increasing in length distally; usually white with black markings; abdomen pointed (Fig. 9) . . . . . Family Mimetidae
- 4b Spination not as above . . . . . 5
- 5a Eyes in three or four rows (Figs. 6, 10-12) . . . . . 6
- 5b Eyes in two rows of four each (rows may be procurved or recurved); (Figs. 1, 4, 13-15) . . . . . 9
- 6a Six larger eyes forming a hexagon visible dorsally, with two smaller eyes below on face; legs very spiny; abdomen pointed behind (Fig. 10) . . . . . Family Oxyopidae
- 6b Two rows of two eyes each visible dorsally; row of four eyes below on face (Figs. 6, 11, 12) . . . . . 7
- 7a First row of four eyes (on face) with medians very large; second (middle) row of two very small eyes and third (posterior) row of two medium-sized eyes on dorsal surface of carapace (Fig. 11) . . . . . Family Salticidae
- 7b First row of four eyes similar in size (Figs. 6, 12) . . . . . 8

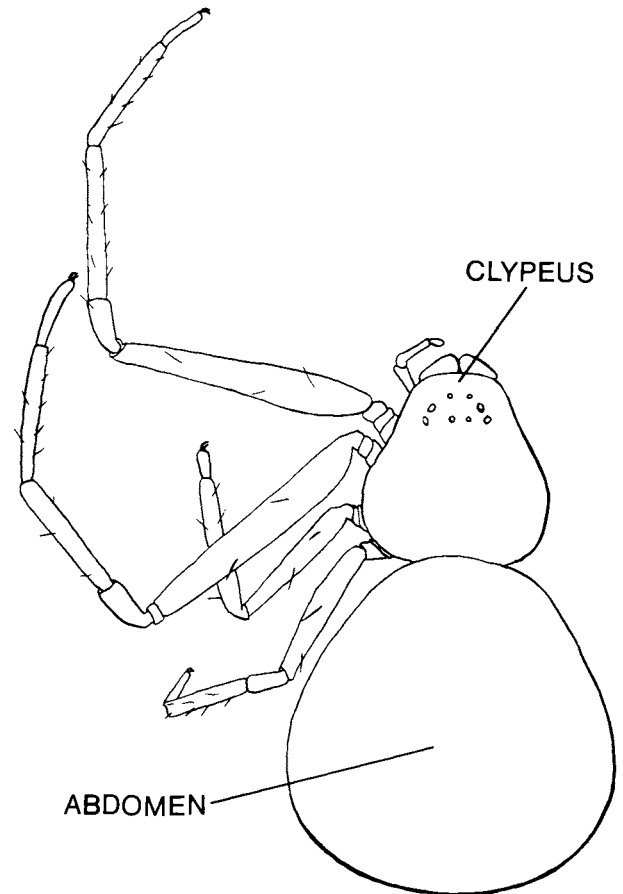


Fig. 3. *Misumenops*, Family Thomisidae, showing laterigrade legs.

- 8a Eyes of first row smallest; second row of two large eyes and third row of two medium-sized eyes dorsally on carapace (Fig. 6) ..... Family Lycosidae
- 8b Eight eyes similar in size; four eyes on dorsal surface of carapace recurved, not forming two distinct rows; adults 11-19 mm (Fig. 12)..... Family Pisauridae
- 9a With a cribellum in front of spinnerets (Fig. 16) and a calamistrum on metatarsus IV (Figs. 13, 16)..... 10
- 9b Having neither cribellum (Fig. 16) nor calamistrum (Fig. 17) ..... 11
- 10a Eyes all light in color; adults 6-10 mm (Fig. 13) ..... Family Amaurobiidae
- 10b Eyes heterogeneous: anterior medians dark and others light; adults less than 5 mm..... Family Dictynidae

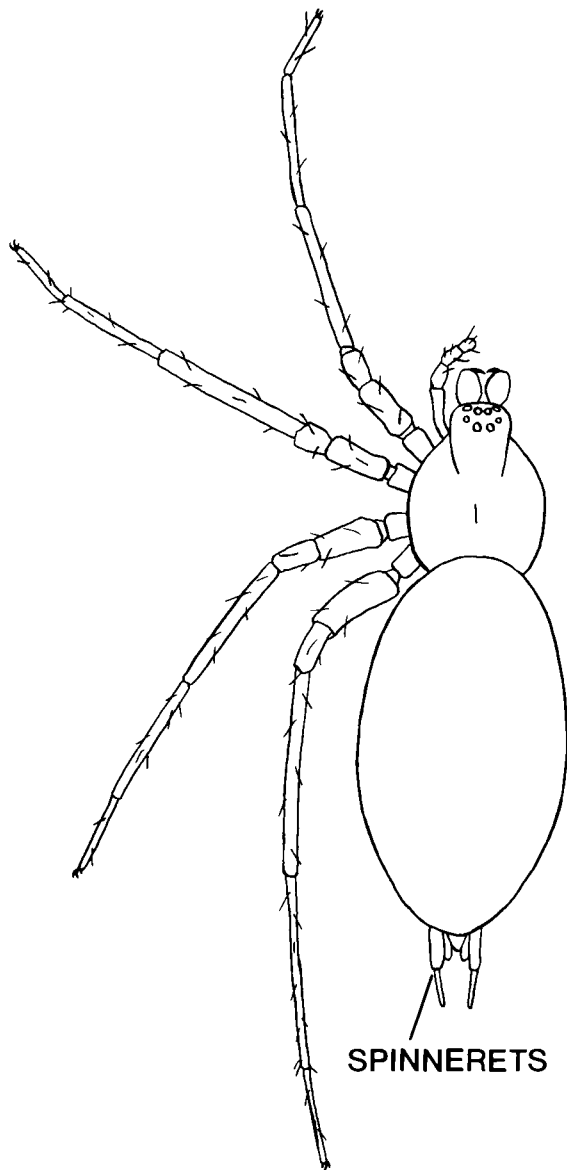


Fig. 4. *Agelenopsis*, Family Agelenidae, showing elongate spinnerets.

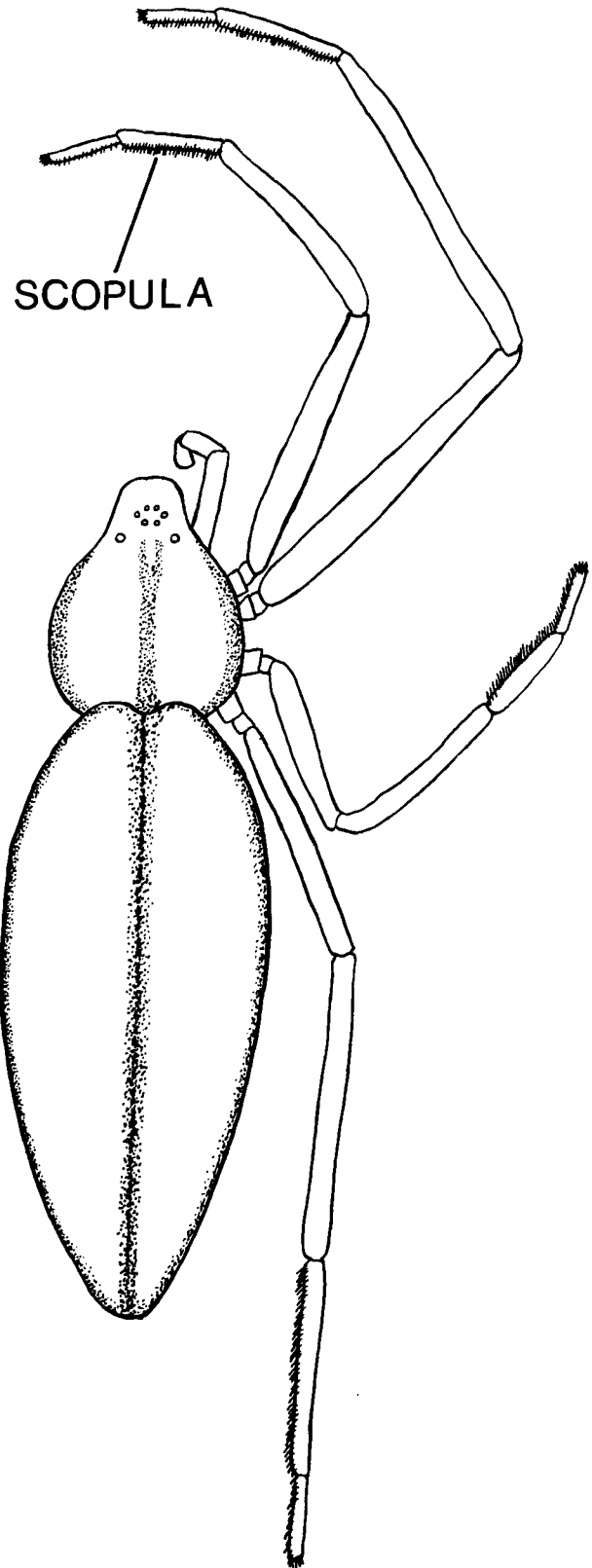


Fig. 5. *Tibellus*, Family Philodromidae, showing laterigrade legs (first three pairs).

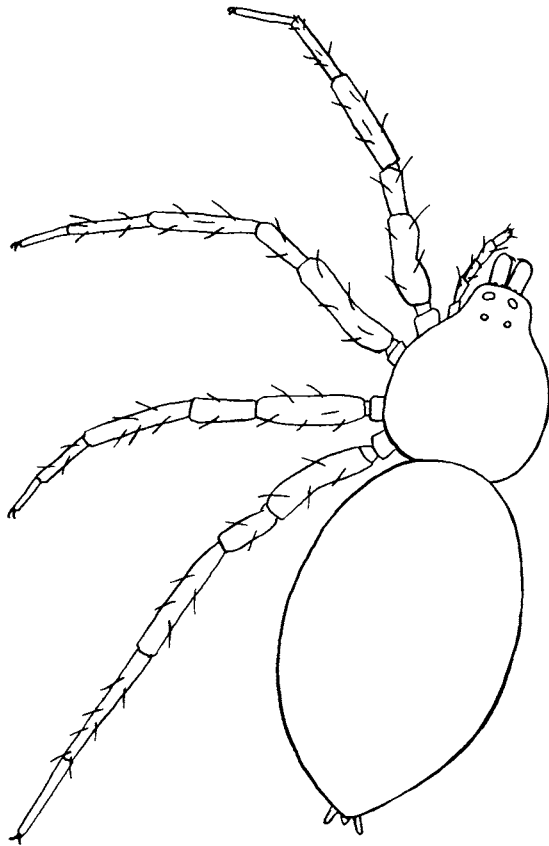


Fig. 6. Lycosid, showing diagnostic eye arrangement.

- 11a Abdomen and legs elongate; leg III much shorter than others; chelicerae elongate, usually very large, especially in males (Figs. 1, 8) . . . . . **Family Tetragnathidae**
- 11b Lacking the above combination of characters . . . . . 12
- 12a Tarsi with two claws, with (Fig. 2) or without (Fig. 17) tufts of hair near the claws . . . . . 13
- 12b Tarsi with three claws, claw tufts absent . . . . . 15
- 13a Anterior (ventral) spinnerets cylindrical, much larger than the posterior, separated at base by about one diameter (Fig. 18); eyes heterogeneous: anterior medians dark and others light; posterior medians often oval . . . . . **Family Gnaphosidae**
- 13b Anterior spinnerets conical, contiguous, similar in size to posterior (Fig. 19); all eyes round, usually homogeneous. . . 14
- 14a Tracheal spiracle at least one third of the distance between spinnerets and epigastric furrow; claw tufts of broad, flat hairs (Fig. 2) . . . . . **Family Anyphaenidae**
- 14b Tracheal spiracle just anterior to spinnerets; hair of claw tufts not flattened . . . . . **Family Clubionidae**
- 15a Chelicerae relatively to strongly robust; spinnerets somewhat to quite elongate; abdomen not globose; legs strong, spiny (Fig. 4) . . . . . **Family Agelenidae**
- 15b Chelicerae relatively small and slender; spinnerets not elongate; abdomen variable, sometimes globose; legs may be delicate (Figs. 7, 14, 15) . . . . . 16
- 16a Tarsus IV bearing a ventral row of curved, serrated bristles, larger than other bristles of tarsus, which form a comb (absent or difficult to see in some; Fig. 17); most without spines on legs;

- usually small spiders with globose abdomens. . . . .
- . . . . . **Family Theridiidae**
- 16b No comb on tarsus IV; most with spines on legs; size variable (Figs. 7, 14, 15) . . . . . 17
- 17a Adults usually less than 2 mm, not exceeding 3.5 mm; ocular area of males often with large bulges; abdomen usually unpatterned (Fig. 14) . . . . . **Family Micryphantidae**
- 17b Adults usually more than 2 mm, frequently much larger; ocular area without large bulges (eyes may be on tubercles); abdomen usually patterned (Figs. 7, 15) . . . . . 18
- 18a Adults usually less than 4 mm, not exceeding 7 mm; abdomen longer than wide; legs delicate; eyes not on tubercles (Fig. 7) . . . . . **Family Linyphiidae**
- 18b Adults usually more than 4 mm; abdomen variable, sometimes with tubercles or spines; eyes may be on tubercles (Fig. 15) . . . . . **Family Araneidae**

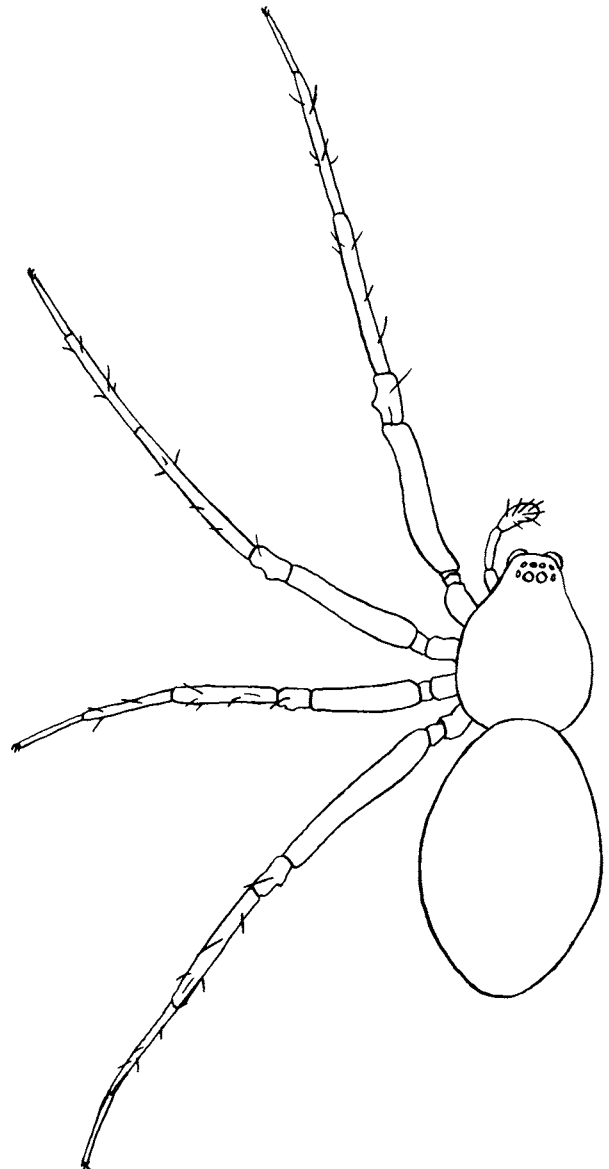


Fig. 7. Linyphiid, showing delicate legs with spines.

Part II. Field Key to Spiders of Northwestern Iowa

- 1a Inside building . . . . . 2
- 1b Not in building . . . . . 8

- 2a In web . . . . . 3
- 2b Not in web (males of web spiders may be collected off the web; if a web is disturbed, a female may also be found off the web) . . . . . 7
- 3a Very common in basements; female carries egg sac with fangs; when web is disturbed, spider vibrates it rapidly; pale, with extremely long, slender legs (resembles daddy-long-legs); 9 mm. . . . . *Pholcus phalangioides* (Fuesslin) (daddy-long-legs spider or long-bodied cellar spider, Family Pholcidae)
- 3b In basements or upstairs; does not resemble a daddy-long-legs . . . . . 4
- 4a Usually near a window, hanging head downward in more or less vertical orb web; gray to brown, with spinose legs and design on back of abdomen; 5-11 mm . . . . . *Nuctenea* spp., Family Araneidae.  
These spiders are also commonly found under bridges and around buildings.
- 4b In basement or upstairs; hanging beneath cobweb or in sheet web with a funnel off one edge . . . . . 5

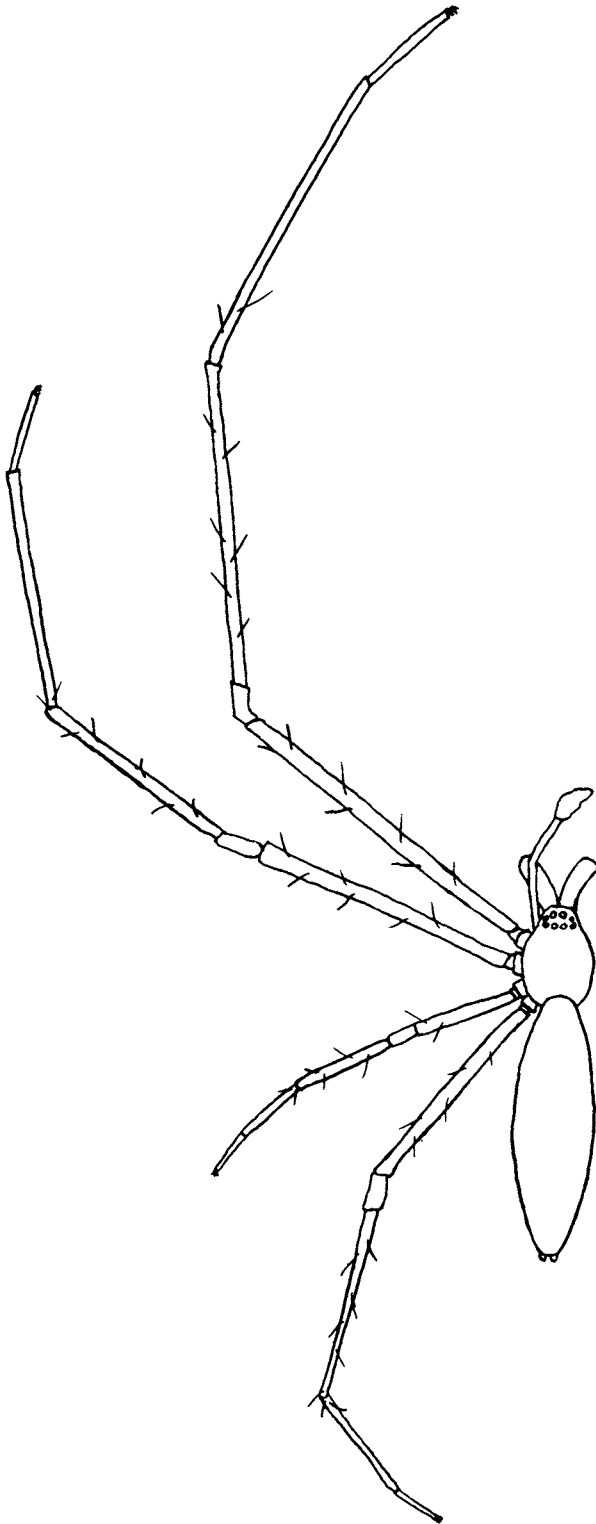


Fig. 8. *Tetragnatha*, Family Tetragnathidae, showing extremely elongate legs and jaws.

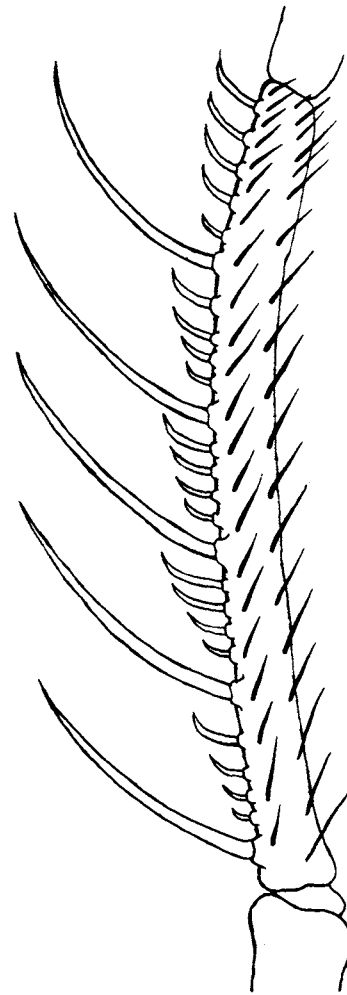


Fig. 9 *Mimetus*, Family Mimetidae, showing unique spination on metatarsus.

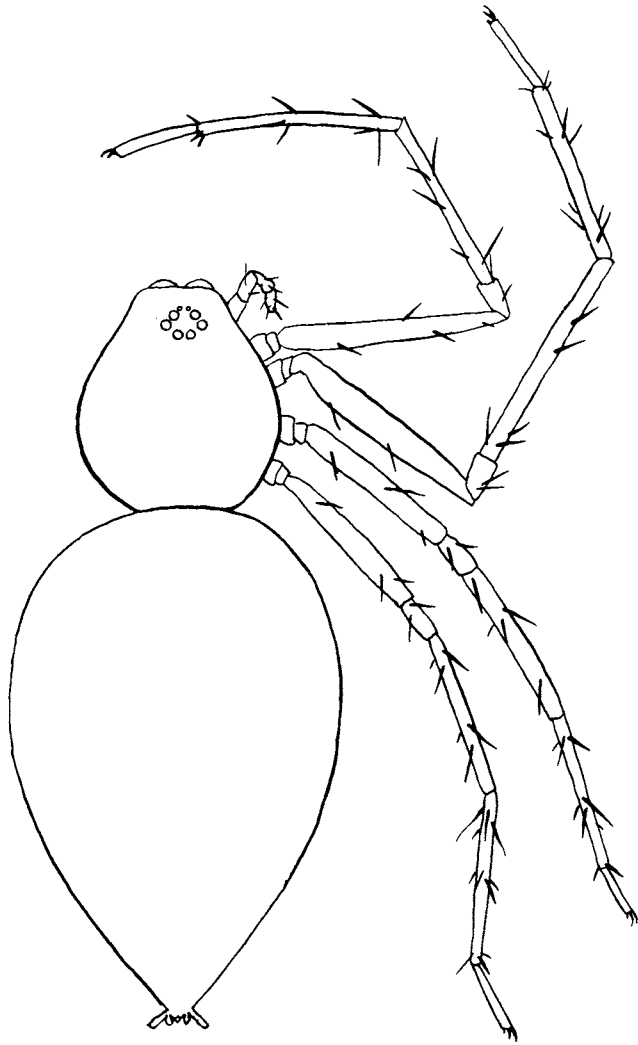


Fig. 10. *Oxyopes*, Family Oxyopidae, showing hexagonal eye arrangement, spinose legs, and pointed abdomen.

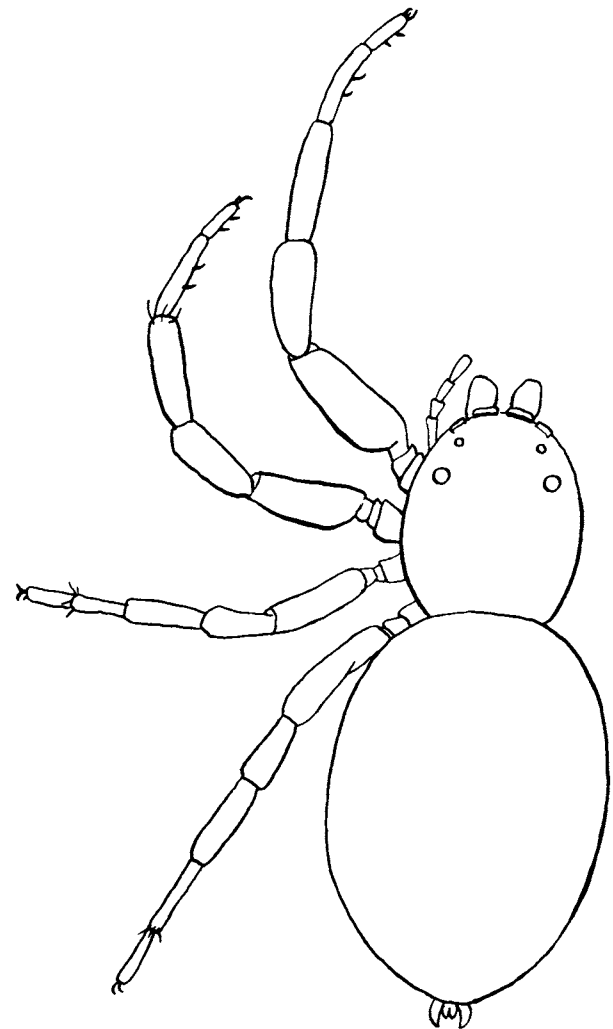


Fig. 11. *Phidippus*, Family Salticidae, showing diagnostic eyes and stocky legs.

- 5a In basement in sheet web with funnel; brown, hairy; 8 mm . . . . . *Tegenaria domestica* (Clerck)  
(European house spider, Family Agelenidae)
- 5b In basement or upstairs; hanging beneath cobweb (Family Theridiidae) . . . . . 6
- 6a Purplish-brown, sometimes with white markings on dorsum of abdomen; 5-7 mm. . . . . *Steatoda*  
This genus is commonly mistaken for the black widow, *Latrodectus*. The abdomen is neither as globose nor as shiny black and there are no red markings on the underside, as in the widow. *Steatoda* is very common in buildings; I have not collected any black widows in this area.
- 6b Females gray-brown, 5-6 mm; males orange, 4-5 mm, with longer legs, frequently in web with female. . . . .  
. . . . . *Achaearanea tepidariorum* (C. L. Koch)  
(American house spider). This spider is very common both inside buildings and in corners outside.

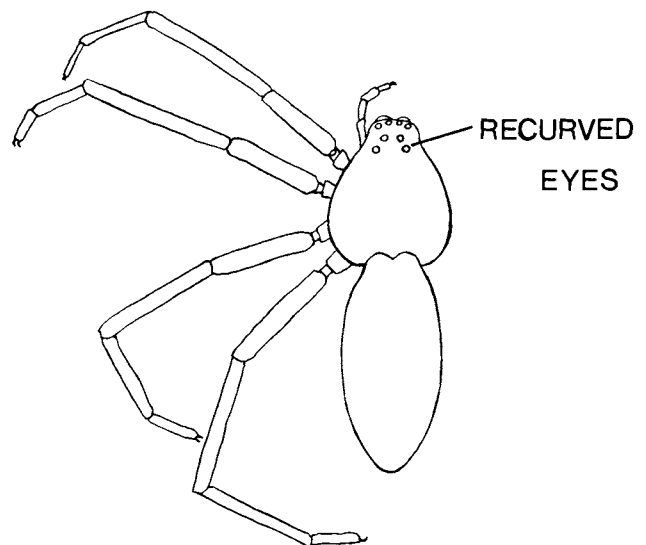


Fig. 12. *Pisaurina*, Family Pisauridae, showing recurved posterior eye row.

- 7a Hairy, gray to black with lighter markings on back of abdomen; runs on floor and walls; 6-9 mm ..... *Herpyllus ecclesiasticus* Hentz (parson spider, Family Gnaphosidae)
- 7b Flat, brown, with laterigrade legs; walks slowly, sometimes sideways; 6 mm ..... *Coriarachne*, Family Thomisidae
- 8a Not in web (males of web spiders may be collected off the web) or silken nest (retreat) ..... 9
- 8b In web (may be at end of threat or in nest at edge of web); or in retreat ..... 19
- 9a Female with egg sac; or young on abdomen ..... 10
- 9b Female without egg sac, or male ..... 11
- 10a Egg sac attached to spinnerets; or young on abdomen ..... Family Lycosidae (wolf spiders)
- 10b Egg sac carried under body, in jaws; adults large (9-26 mm) ..... Family Pisauridae (nursery web spiders)
- 11a Ant-mimic (resembling an ant or velvet ant in shape, color and movement) ..... *Castianeira* spp. (Family Clubionidae), *Micaria* (Family Gnaphosidae), *Peckhamia* and *Synemosyna* (Family Salticidae)
- 11b Not resembling an ant ..... 12
- 12a On vegetation ..... 13
- 12b Not on vegetation ..... 17
- 13a Sedentary; legs crablike, or elongate and stretched along leaf or stem ..... 14
- 13b Usually active, running or jumping ..... 15
- 14a Sedentary in flower or inflorescence; sidles away (does not run) when disturbed; legs I and II enlarged, crablike; color yellow to white, sometimes with pink or red markings; 3-8 mm (Fig. 3) ..... *Misumenops*, Family Thomisidae.  
This genus is very common in prairies, old fields, roadsides, etc.
- 14b Sedentary along blade of grass, stem, etc., with first two pairs of

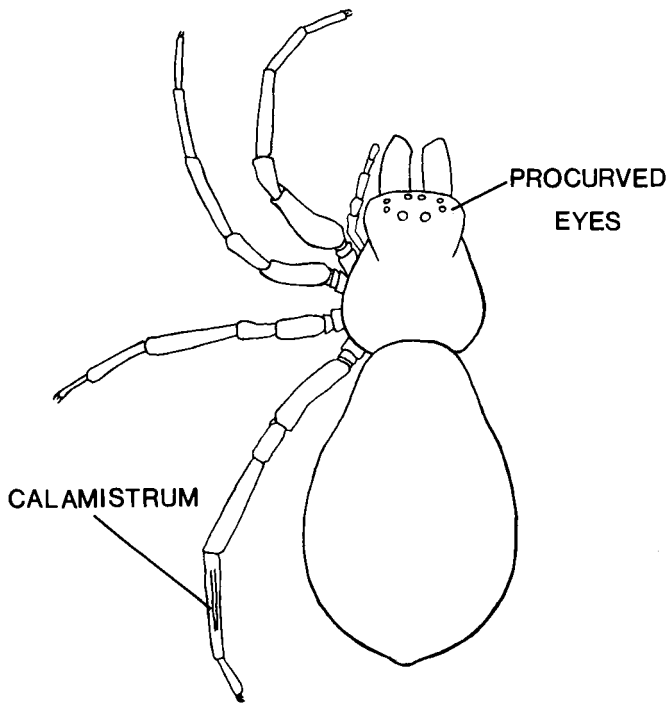
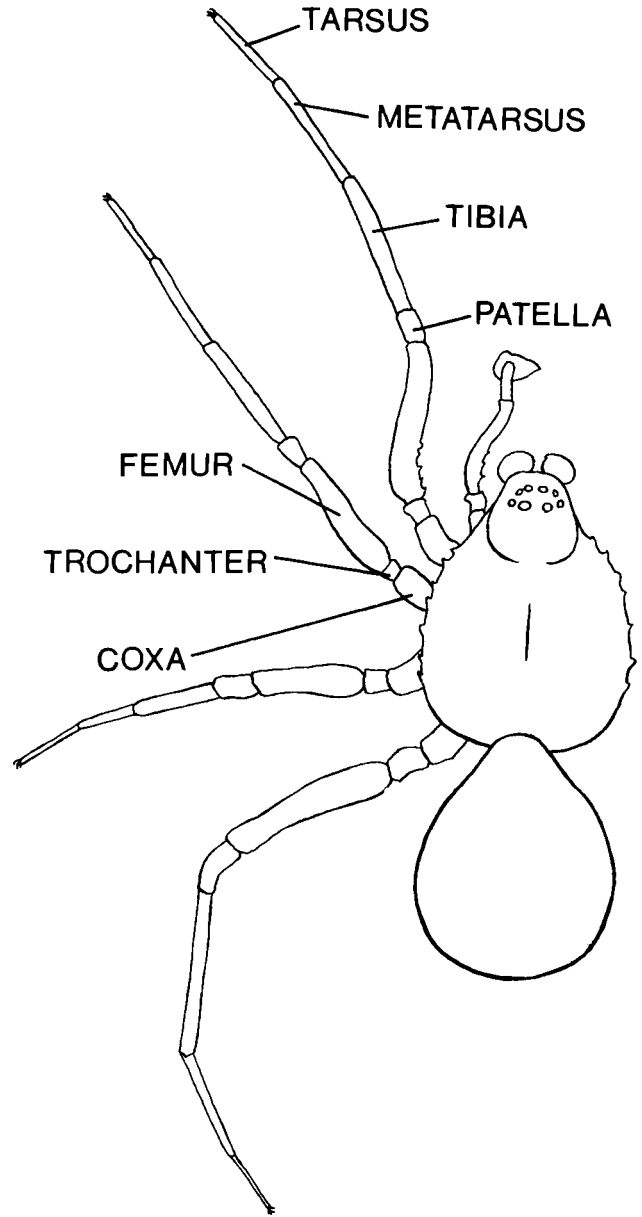


Fig. 13. *Callobius*, Family Amaurobiidae, showing procurved posterior eye row.

Fig. 14. *Erigone*, Family Micryphantidae.

- legs stretched forward, others backwards; runs when disturbed; body elongate, 6-11 mm, color cream to yellow (color never silvery, jaws not enlarged; Fig. 5) ..... *Tibellus* spp., Family Philodromidae (see also 20a)
- 15a Middle pair of eyes on face very large; short, robust legs (Fig. 11); may be brightly colored; frequently orients toward observer's movement; jumps to escape ..... Family Salticidae (jumping spiders). These spiders are also commonly found on the ground or on buildings.
- 15b Without above combination of characters ..... 16
- 16a All eyes small; long, slender, spiny legs; abdomen pointed (Fig. 10); yellow-brown color; runs very fast, but may also jump; 4-8 mm ..... *Oxyopes* spp., Family Oxyopidae
- 16b Active or sedentary, running when disturbed; legs laterigrade, all about the same length (Fig. 5), not spinose to the unaided



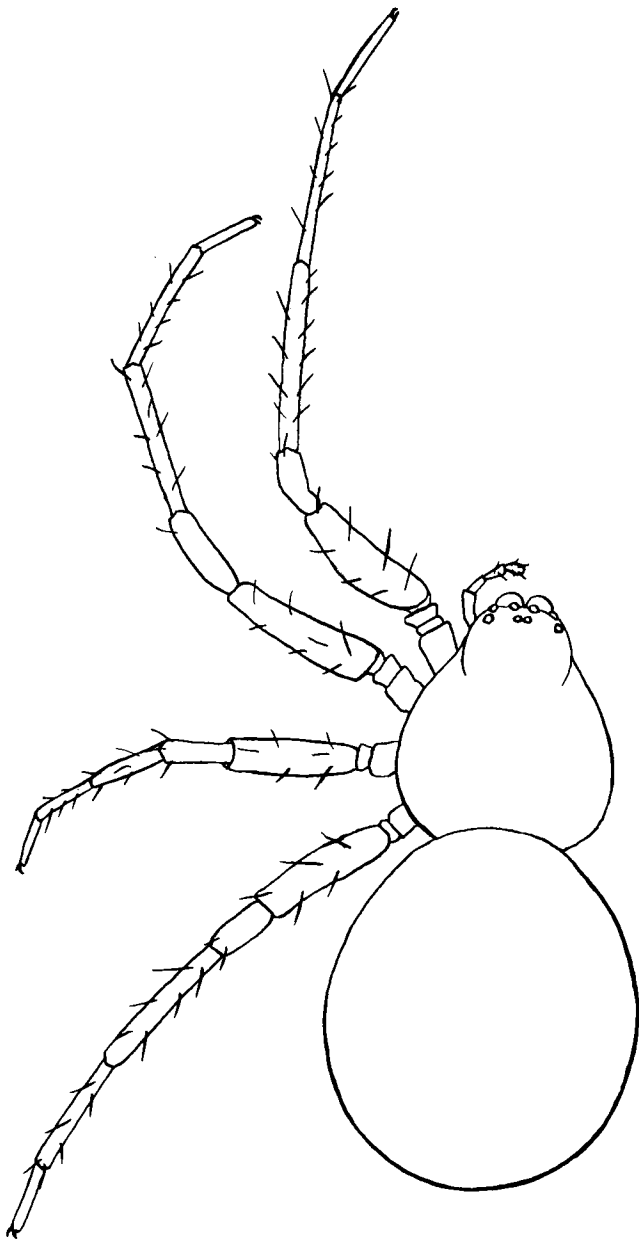


Fig. 15. Araneid.

- eye; color usually brownish-gray; 3-7 mm . . . . .
- . . . . . *Philodromus* spp., Family Philodromidae
- 17a On or near water. . . . . Families Pisauridae
- (*Dolomedes*, fishing spiders) and Lycosidae (wolf spiders:
- Pirata* and others). Use morphological key to distinguish these
- families. . . . . 18
- 17b Not on or near water . . . . . 18
- 18a Active on sunny walls . . . . . *Salticus scenicus* (Clerck)
- (zebra spider, *Habrocestum*, and *Sitticus*, Family Salticidae.
- Other members of this family are commonly found in trees and
- herbaceous vegetation. . . . . 18
- 18b Active on the ground at night . . . . . Families Lycosidae
- (wolf spiders — some), Clubionidae (sac spiders), and
- Gnaphosidae. Use morphological key to distinguish these

- hunting spiders.
- 19a In orb web . . . . . 20
- 19b In cobweb, sheet web, funnel web, etc.; or in retreat . . . . 21
- 20a Body, legs and jaws elongate (Figs. 1, 8); body more or less
- silvery or silvery-yellow; 5-12 mm; web with few radii and hole
- in middle; spider frequently on vegetation near web . . . . .
- . . . . . *Tetragnatha* spp., Family Tetragnathidae.
- This genus is ubiquitous and abundant in the area. It also
- accidentally occurs in buildings.
- 20b Body and legs variable; jaws not extremely elongate (Fig. 15);
- orb with more radii; spider usually hanging head downward at
- hub of web. . . . . Family Araneidae (orb weavers)
- 21a In retreat. . . . . Families Gnaphosidae and Clubionidae
- are found in retreats under logs, rocks, or bark or in rolled leaves
- or petals during the day and when the female is guarding eggs.
- Females of Family Salticidae guard eggs in nests in rolled leaves
- or under stones; salticids also build a nest at night and during
- cool weather. Some females of Family Thomisidae guard eggs
- in a rolled leaf tied together with silk, but are not otherwise
- found in nests. . . . . 22
- 21b In web other than orb . . . . . 22
- 22a Female at least 12 mm (Fig. 12); guarding nursery web with egg
- sac or young in rolled leaf . . . . . Family Pisauridae (nursery web spiders)
- . . . . . 23
- 22b Smaller females in webs with egg sacs or spiderlings, or no egg
- sacs or young present in web, or males . . . . . 23

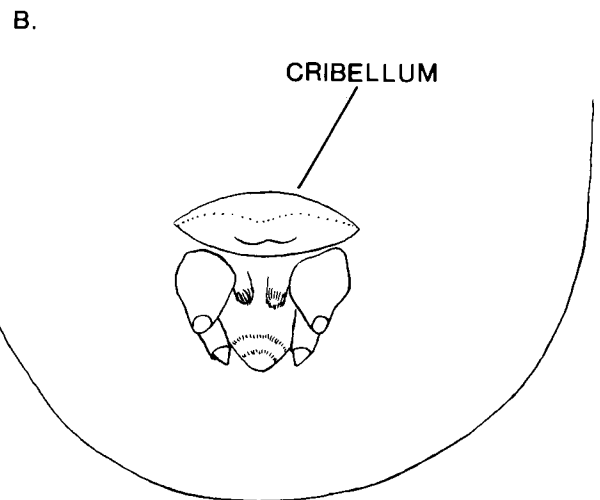
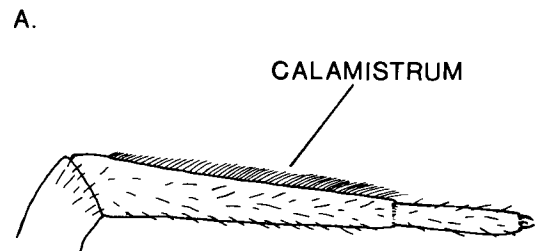


Fig. 16. a. *Dictyna*, Family Dictynidae, calamistrum. b. *Dictyna*, Family Dictynidae, cribellum.

- 23a Adults 2-4 mm; in dense, three-dimensional webs in the tips of inflorescences, tree branches, etc. Eggs or young may be present . . . . . *Dictyna* spp., Family Dictynidae. Also found under window sills and in cracks of walls.
- 23b Webs not dense, three-dimensional and in tips of vegetation . . . . . 24
- 24a In funnel of sheetlike web in grass, or litter of forest floor; spider upright on top of web (Fig. 4) . . . . . Family Agelenidae (funnel-web weavers)
- 24 b Web not funnel-shaped . . . . . 25
- 25a In loose irregular, coarse web in litter or under stones, logs, or bark; spider upright on web (Fig. 13) . . . . . Family Amaurobiidae (hackled-band weavers)
- 25b Web not as above; spider hangs beneath web . . . . . 26
- 26a In web with more regular structure, usually a horizontal platform or dome under a tangle; in vegetation or litter; small delicate spiders with abdomen longer than wide, usually patterned (Fig. 7) . . . . . Family Linyphiidae (sheetweb weavers). Members of Family Micryphantidae (dwarf spiders; Fig. 14),



Fig. 18. Gnaphosid, showing cylindrical, separated anterior (ventral) spinnerets.

which are tiny, usually dark-colored and unpatterned, also build a dome or sheet web.

- 26b In irregular cobweb in vegetation, litter, or buildings; abdomen usually globose . . . . . Family Theridiidae (cobweb weavers).

**Part III. Family Descriptions and Keys to Common Genera**

**Family Thomisidae**  
"typical" crab spiders

Reference: Dondale and Redner (1978)

Thomisids resemble small crabs, with flattened bodies and laterigrade (rotated so that the normally dorsal surface is posterior) legs, the first two pairs of which are enlarged and curved forward. *Misumenops* and *Misumenoides* ("flower spiders") can slowly, reversibly, change color to match white or yellow flowers in which they sit to ambush bees, flies and other flower visitors (Kaston 1981). *Xysticus*, *Tmarus*, *Ozyptila*, and *Coriarachne* are found respectively on the ground, on woody twigs, under bark, and on walls, where their mottled brown color is cryptic.



Fig. 17. Theridiid, tarsus of fourth leg, showing diagnostic comb of serrate hairs.

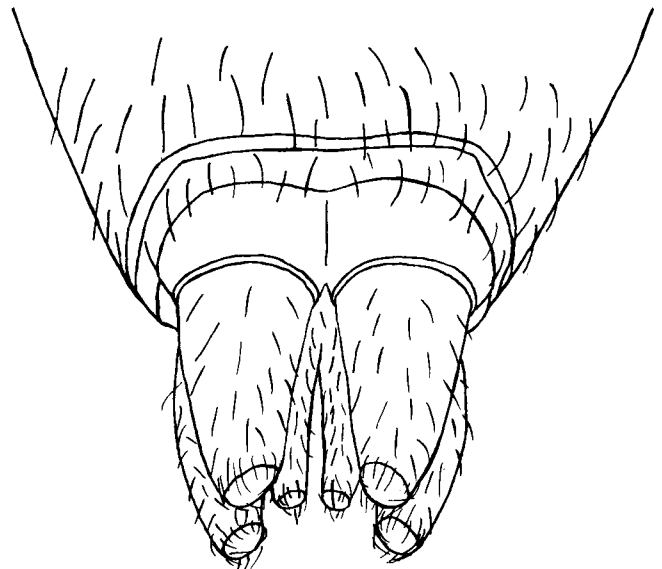


Fig. 19. Clubionid, showing conical, contiguous anterior spinnerets.

- 1a Abdomen with dorsal tubercle at posterior end; carapace convex; clypeus protruding forward; 4.5 mm; rare in forests . . . . . *Tmarus* Simon 1875
- 1b Abdomen flat, evenly rounded at posterior end; carapace flat to convex; clypeus vertical (Fig. 3) . . . . . 2
- 2a White, cream or yellow, sometimes with pink, red or brown markings . . . . . 3
- 2b Gray or brown, usually mottled with darker and/or lighter markings . . . . . 4
- 3a Body and legs spinose; eyes on white confluent tubercles (Fig. 3); color white to yellow; male with red to brown bands on legs and brown to black spots on the abdomen; female plain or with pink or red markings on abdomen; 3-8 mm; abundant in grasslands . . . . . *Misumenops* F.O.P.-Cambridge 1900
- 3b Body without spines; white ridge on clypeus; color white to yellow; male with legs I and II brown; 4-5 mm; common in restricted habitat (see Appendix 1) . . . . . *Misumenoides* F.O.P.-Cambridge 1900
- 4a Body spines clavate (clubbed); tibia II with two pairs of ventral spines; 3 mm; uncommon in grassland . . . . . *Ozyptila* Simon 1864
- 4b Body spines setose (pointed); tibia II with three or more pairs of ventral spines . . . . . 5
- 5a Very flat; carapace and legs I and II of male chocolate brown; 4-6 mm; uncommon in and on buildings . . . . . *Coriarachne* Thorell 1870
- 5b Not as flat; carapace convex; mottled gray-brown; 3-8 mm; occurs in many habitats, common in some grasslands . . . . . *Xysticus* spp. C.L. Koch 1835

**Family Philodromidae**

crab spiders

Reference: Dondale and Redner (1978)

Philodromids differ in appearance and habits from thomisids, but also have laterigrade legs, which are all about the same length in local genera. Philodromids are more active than thomisids and run very quickly when disturbed; however, they also sit still for long periods of time. *Philodromus* is found on woody stems or inflorescences; *Tibellus* stretches along blades of grass or herbaceous stems; *Thanatus* runs on vegetation and the ground.

- 1a Posterior median eyes obviously farther from one another than from posterior laterals; color gray-brown to red-brown; 3-7 mm; occurs in many habitats, abundant in grasslands . . . . . *Philodromus* spp. Walckenaer 1825
- 1b Posterior eyes equidistant or medians farther from laterals than from one another . . . . . 2
- 2a Abdomen elongate; color cream to yellow; 6-11 mm; common in grasslands (Fig. 5) . . . . . *Tibellus* spp. Simon 1875
- 2b Abdomen oval; color brown with lance-shaped heart mark on abdomen; 4-6 mm; rare in grasslands . . . . . *Thanatus* spp. C.L. Koch 1837

**Family Mimetidae**

pirate spiders

Mimetids are predators of other spiders, sometimes invading webs to eat their occupants (Levi and Levi 1968). The spination of tibia and metatarsus I and II is unique: there is a prolateral row of long spines; between each pair of long spines is a row of short, curved spines which increase in length distally (Fig. 9). The local species of *Mimetus* Hentz 1832 is white with black markings on the body and legs, has shoulder humps on a pointed abdomen, and is 4-7 mm long. I have taken an active male in a web by a light at night and an inactive female in a rolled leaf of a tree during the daytime. Mimetids are rare.

**Family Oxyopidae**

lynx spiders

Reference: Brady (1964)

Oxyopids have a unique eye arrangement: a hexagon visible dorsally, with two smaller eyes below (Fig. 10). The legs have many long spines and the abdomen is pointed. The local genus, *Oxyopes* Latreille 1804, is yellow-brown with darker markings and 4-8 mm long. The face and jaws have dark lines or bands. Two species occur locally; both are common in some grasslands, rare in others.

**Family Salticidae**

jumping spiders

References: Edwards and Hill (1978), Richman (1978), Richman and Cutler (1978)

Salticids are easily recognized by their hairy bodies, short, stout legs and large eyes on the front of the face (Fig. 11), as well as by their typical behavior of turning to look at an observer, then jumping away. Many jumping spiders have brightly colored hairs or iridescent scales. Chelicerae (jaws) of males are sometimes enlarged.

- 1a Ant mimic; body narrow, with pedicel (cylindrical stalk connecting cephalothorax and abdomen) visible from above; 2-5 mm long (rare) . . . . . 2
- 1b Not an ant mimic, size variable . . . . . 3
- 2a Posterior part of cephalothorax narrowed and parallel-sided, cephalic and thoracic portions separated by a deep groove; another groove near front of abdomen (grooves best seen from the side); forest understory . . . . . *Synemosyna* Hentz 1846
- 2b Posterior part of carapace not narrowed and parallel-sided; ocular area occupying about half the length of carapace, which is grooved just behind rear eyes; grassland . . . . . *Peckhamia* Simon 1901
- 3a Black with three transverse white stripes on abdomen (posterior two broken in middle); two spots of white scales on carapace just behind third row of eyes; tibia I without ventral spines; jaws of male elongate; 4-6 mm; abundant on sunny walls . . . . . *Salticus scenicus* (Clerck) (zebra spider)
- 3b Lacking above combination of characters . . . . . 4
- 4a Abdomen slightly elongate; color brown to black with iridescent scales; legs pale, with distinct longitudinal black lines; male with tufts of hair near eyes and fringe of hair on tibia I; 4-6 mm; uncommon in grassland . . . . . *Tutelina* spp. Simon 1901
- 4b Lacking above combination of characters . . . . . 5
- 5a Ocular area occupying one-half the length of the dark brown carapace; abdomen lighter, with brown markings and iridescent scales; both sexes with fringe of hair on tibia I (on male also on patella I); no black lines on legs or eyebrows tufts; 4-5 mm; rare . . . . . *Icius* Simon 1876
- 5b Lacking the above combination of characters . . . . . 6
- 6a Gray-brown with black ocular area and indistinct light areas on abdomen; male with sternum (Fig. 2) and coxae (Fig. 14) yellow with black stripes, female with venter yellow, black stripe on sternum and black rings on leg segments; 4-5 mm; common on sunny walls . . . . . *Habrocestum* Simon 1876
- 6b Lacking the above combination of characters . . . . . 7
- 7a No teeth on rear margin of cheliceral fang furrow; leg 4 longest; gray-brown with distinct cream-colored patches near posterior abdomen; female with venter yellow and legs yellow, indistinctly ringed; 5 mm; rare on walls . . . . . *Sitticus* Simon 1901
- 7b Lacking the above coloration . . . . . 8
- 8a First pair of legs much thicker than others; at least legs II, III, and IV pale and translucent; tooth on rear margin of fang furrow with two or more cusps, at least in females; 4.5 mm; rare in trees . . . . . *Hentzia* Marx 1883
- 8b Legs and teeth not as above . . . . . 9

- 9a Males usually over 6 mm; females usually over 8 mm; hairy (males frequently with eyebrow tufts); jaws often metallic blue or green; sides of carapace bowed outward; small eyes of second row closer to anterior laterals than to third eye row; abundant in grasslands (Fig. 11) . . . . . *Phidippus* spp. C.L. Koch 1846
- 9b Resembling the above in general appearance, but not as hairy, carapace not as bowed out; either females less than 8 mm and males less than 6 mm, or male with jaws enlarged, fangs sinuate, and leg I fringed . . . . . 10
- 10a Small eyes of second row closer to eyes of third row than to anterior laterals; 4-7 mm; common in grasslands. . . . . *Metaphidippus* F.O.P.-Cambridge 1901
- 10b Small eyes of second row closer to anterior laterals than to eyes of third row; jaws of male enlarged, fangs sinuate; leg I of male fringed; 5-6 mm; rare in various habitats . . . . . *Eris* C. L. Koch 1846

#### Family Lycosidae wolf spiders

Lycosids are dark-colored, hairy, small to large spiders with strong, spiny legs and three tarsal claws. The eye arrangement is diagnostic: four small eyes on the face; on the dorsal carapace, two large eyes at the forward margin and two medium-sized eyes behind them (Fig. 6). The egg sac is attached to the spinnerets; after hatching, the young ride on the mother's back for a time before dispersal. Wolf spiders are most commonly found hunting prey on the ground at night. I have taken *Pirata* under logs in the daytime, but *Schizocosa* and *Trochosa* are active during the day.

- 1a Carapace as high in thoracic region as cephalic; Y-shaped black mark in yellow median stripe of carapace; small (4-6 mm); common in moist places . . . . . *Pirata* spp. Sundevall 1833
- 1b Carapace higher in head region than in thoracic; Y-shaped mark absent; size usually over 6 mm. . . . . 2
- 2a Legs relatively short and stocky; proximal dorsal spine on tibia IV thinner than distal spine; dorsal ocular area narrow, occupying about one-half width of carapace; indistinctly marked: carapace with light median and submarginal bands, two darker spots behind eyes, lanceolate heart mark on abdomen, legs indistinctly ringed; 7-8 mm; common in various habitats . . . . . *Trochosa* C.L. Koch 1848
- 2b Legs relatively long and slender; two dorsal spines on tibia IV about the same thickness; dorsal ocular area occupying more than one-half width of carapace . . . . . 3
- 3a Metatarsus IV longer than tibia plus patella IV; jaws small; sides of face nearly vertical when viewed from the front; 3-10 mm; common in various habitats . . . *Pardosa* spp. C.L. Koch 1848
- 3b Metatarsus IV not longer than tibia plus patella IV; jaws larger; face narrower at top than at clypeus; both sexes with a median band of white hairs on carapace, males with wide band of white hairs on abdominal dorsum and brushes of black hair on front legs; 7-11 mm; common in and around habitations . . . . . *Schizocosa* Chamberlin 1904

#### Family Pisauridae nursery web spiders

Pisaurids may be mistaken for large lycosids until the eyes are examined more closely. In pisaurids the eight eyes are similar in size, and the eyes on top of the carapace are in one recurved row, rather than two rows (Fig. 12). There are three tarsal claws. The egg sac is carried in the jaws, under the body; before the young hatch, it is hung in a nursery web. The female guards the egg sac, then the young, until they disperse. *Dolomedes* fishing spiders live near water, and eat small fish as well as arthropods (Kaston 1981).

- 1a Ground color yellow; height of clypeus less than length of median ocular area; rear margin of fang furrow with three evenly-spaced teeth; 17-19 mm; uncommon near water . . . . . *Dolomedes* Latreille 1804
- 1b Ground color dark; height of clypeus equal to length of median ocular area; rear margin of fang furrow with four teeth; 11-17 mm; common in forest understory . . . *Pisaurina* Simon 1898

#### Family Amaurobiidae cribellate spiders

The dark-colored amaurobiids resemble agelenids (Fig. 13). They are found on the ground under bark, logs, rocks, and in litter. The webs are loose and the silk is noticeably coarse (hackled band).

- 1a Calamistrum about as long as metatarsus IV; tarsal trichobothria (fine hairs perpendicular to the leg) inconspicuous; 6-7 mm; common in litter on the ground . . . *Titanoeca* Thorell 1870
- 1b Calamistrum about half the length of metatarsus IV, apparently double (Fig. 13); tarsal trichobothria conspicuous, length increasing distally; 10 mm; rare under tree bark . . . . . *Callobius* Chamberlin 1947

#### Family Dictynidae cribellate spiders

Reference: Chamberlin and Gertsch (1958)

Dictynids are common in irregular webs on the tips of plants, in litter, and on buildings. *Dictyna* Sundevall 1833 is 2-4 mm long, with the carapace brown and the abdomen lighter brown or gray, usually with a design. Males are smaller and darker than females, and have enlarged, bowed jaws which they use to hold the female's jaws closed during mating (Kaston 1981). At least 5 species occur in the area.

#### Family Tetragnathidae long-jawed orbweavers Reference: Levi (1981)

Tetragnathids weave a web which resembles that of "typical" orbweavers, but has an open hub and fewer radii. *Tetragnatha* Latreille 1804 has an elongate, silvery or shiny yellow abdomen, very long, thin legs, and elongate jaws, especially in males (Figs. 1, 8). Females have no epigynum. These are perhaps the most widespread and abundant spiders in the area; they are found in grasslands, forests, and buildings (accidentally, but frequently). About eight species occur in the area; these range from 5-12 mm in length.

#### Family Gnaphosidae gnaphosids

Gnaphosids live on the ground. They may be collected with a light at night, by pitfall trapping, or by turning over logs and rocks to discover them in their tubular retreats during the daytime. Gnaphosids are usually dark-colored, with an oval, slightly flattened abdomen and long, cylindrical, well-separated anterior (ventral) spinnerets (Fig. 18). The tarsi have two claws and claw tufts (of hair); there is a scopula (thick brush of short hair, Fig. 5) on the tarsus and metatarsus. The posterior median eyes are often oval and slanted. Males usually have a scute (sclerotized plate) at the anterior end of the abdomen.

- 1a With iridescent scales and/or light markings on the abdomen . . . . . 3
- 1b No iridescent scales or light markings present . . . . . 2
- 2a Distal end of metatarsus III and IV with a ventral grooming comb of short spines; spider black without markings; 5 mm; uncommon in grassland. . . . . *Zelotes* Gistel 1848
- 2b No grooming comb on metatarsus III and IV; tibia III and IV each with two median dorsal spines; carapace and distal leg

- segments dusky brown, dorsum of abdomen and proximal leg segments black, venter of abdomen light gray; 5-6 mm; uncommon in buildings . . . . . *Sosticus* Chamberlin 1922
- 3a Carapace and legs brown; dorsum of abdomen dark gray with light median band; venter of abdomen light gray; tibia III and IV each with one median dorsal spine; 6-9 mm; common in buildings . . . *Herpyllus ecclesiasticus* Hentz (parson spider)
- 3b Carapace and legs orange to orange-brown; dorsum of abdomen black with iridescent scales and/or transverse white markings. . . . . 4
- 4a Femora of legs I and II dark brown; abdomen with three transverse bands of white scales and a T-shaped mark between the first and second bands; 4.5 mm; rare in grassland. . . . . *Poecilochroa* Westring 1874
- 4b Legs orange; abdomen with iridescent scales and one white transverse band which is broken at the midline; 3-5 mm; rare in various habitats . . . . . *Micaria* Westring 1851

**Family Clubionidae**  
sac spiders

References: Edwards (1958), Reiskind (1969),  
Dondale and Redner (1982)

Clubionids are found on the ground or in vegetation. Most are active at night and build a saclike retreat in a rolled leaf or under a log or rock during the day. Clubionids resemble gnaphosids, but the anterior spinnerets are conical and closely set (Fig. 19). There are two claws, scopulae, and claw tufts.

- 1a Creamy yellow with brown jaws; spinnerets resemble those of a gnaphosid; 3-9 mm; common in various habitats . . . . . *Clubiona* spp. Latreille 1804
- 1b Color and spinnerets not as above. . . . . 2
- 2a Carapace outlined in black and with black markings; iridescent scales on body; males sometimes with brush of hairs under tibia I; 2-3 mm; rare on the ground. . . . . *Phrurotimpus* spp. Chamberlin & Ivie 1935
- 2b Carapace convex, evenly colored dark brown to black; no iridescent scales, but bands of white or red scales on black abdomen; 5-6 mm; rare on the ground . . . . . *Castianeira* spp. Keyserling 1879

**Family Anyphaenidae**  
sac spiders

References: Platnick (1974), Dondale and Redner (1982)

Anyphaenids are similar to clubionids in morphology and habits, but have claw tufts of lamelliform hairs (Fig. 2); The tracheal spiracle (opening into the respiratory system) is forward on the abdominal venter (Fig. 2), instead of just anterior to the spinnerets.

- 1a First pair of legs at least twice as long as body; spiracle midway between epigastric furrow and spinnerets (Fig. 2); 3-4 mm; uncommon in restricted habitat (Appendix 1) . . . . . *Wulfila* O.P.-Cambridge 1895
- 1b First pair of legs not twice as long as body; spiracle much nearer to epigastric furrow than to spinnerets; 6-7 mm; uncommon in restricted habitat . . . . . *Aysba* Keyserling 1891

**Family Agelenidae**  
funnel-web weavers

Reference: Roth and Brame (1972)

Agelenids build sheet-like webs with a funnel in which the spider waits. When a prey strikes the web, the spider runs out, bites it, and carries it back into the tunnel to feed (Levi and Levi 1968). Most species have long, spiny legs and obviously segmented, sometimes very long, spinnerets (Fig. 4). The tarsi have three claws, as in other

web-spinning families. Plumose (feathery) hairs occur on the body and legs of some; these can be seen at magnifications of about 35x.

- 1a Posterior spinnerets not elongate (apical segment much shorter than basal); no plumose hairs present; eye rows not strongly procurved; 5-6 mm; uncommon on the ground . . . . . *Circurina* Menge 1871
- 1b Posterior spinnerets elongate (apical segment at least as long as basal); plumose hairs on carapace and legs . . . . . 2
- 2a Both eye rows strongly procurved (posterior laterals and anterior medians form a nearly straight line); dark V-shaped mark on sternum; abdomen with dorsal light median band and darker median band on venter; 9-12 mm; abundant in various habitats . . . . . *Agelenopsis* Giebel 1869 (grass spider)
- 2b Only posterior eye row slightly procurved (Fig. 13; abdomen with indistinct gray spots; 7.5 mm; common in basements . . . . . *Teegenaria domestica* Clerck (European house spider)

**Family Theridiidae**  
cobweb weavers

References: Levi and Levi (1962), Levi and Randolph (1975)

Theridiids are usually small, although two of the most common house spiders belonging to this group are fairly large. Theridiids have more or less globose abdomens, which frequently bear a folium (pigmented pattern on the dorsum). The legs of most lack spines, and the tarsi of the fourth pair of legs have combs of curved, serrated bristles (Fig. 17), which are used for throwing sticky silk over prey (Kaston 1981). The jaws are small, and the fang furrows usually lack teeth. Theridiids hang upside down in their irregular cobwebs, which makes it easy to see the red "hourglass" marking on the venter of the black widow, a member of this family. Two of the most common house spiders in the area are cobweb weavers: *Achaearanea tepidariorum*, the American house spider, and *Steatoda*, which is often mistaken for a black widow. I have not found black widows anywhere in this area; *Steatoda* has a more flattened, elongate abdomen which lacks red markings, and is more purplish-brown than shiny black.

- 1a Adults under 2 mm; both males and females with orange dorsal scute on pale abdomen; common in forests, also in grasslands . . . . . *Pholcomma* Thorell 1869
- 1b Adults over 2 mm; no dorsal scute . . . . . 2
- 2a Abdomen triangular, pointed behind, with black area bordered by silver; carapace very wide; 3 mm; rare in grassland. . . . . *Euryopsis* Menge 1868
- 2b Lacking above combination of characters. . . . . 3
- 3a Shiny black; abdomen longer than high . . . . . 4
- 3b Lighter colored and/or with a design on the abdomen . . . . . 5
- 4a Eye region projecting over concave clypeus; abdomen dark gray to black, unmarked; legs yellow proximally, brown distally; 2-4 mm; uncommon in forests . . . . . *Dipoena* Thorell 1869
- 4b Clypeus not concave, eyes not projecting; no teeth on retromargin of fang furrow; abdomen purple-brown to black, often with a T-shaped white band around the anterior margin and down the middle; legs yellow with dusky markings; male with stridulating organ on abdomen where it overhangs pedicel; 3-8 mm; abundant in and around buildings and woodpiles . . . . . *Steatoda* Thorell 1869
- 5a Abdomen longer than high, hairy, off-white with purplish-brown, wavy-sided, rectangular design covering most of dorsum; legs and carapace dusky yellow; jaws of male robust; 5 mm; rare in forests . . . . . *Enoplognatha* Pavesi 1880
- 5b Abdomen globose to higher than long; legs delicate . . . . . 6
- 6a Female: abdomen higher than long, cream with gray blotches on sides and posterior, carapace dusky yellow, legs yellow; male: carapace and legs orange, 4-9 mm; abundant in and on buildings . . . . . *Achaearanea tepidariorum* (C. L. Koch) (American house spider)

- 6b Abdomen of female not higher than long; color frequently white with black, wavy-sided design on abdomen; sometimes with black markings from posterior carapace to eyes; 3-5 mm; abundant in vegetation . . . *Theridion* spp. Walckenaer 1805

**Family Linyphiidae**  
sheetweb weavers

Linyphiids are small and delicate (Fig. 7). The abdomen is longer than wide, usually patterned; the legs are thin and spiny. The fang furrows have teeth. Linyphiids hang upside down beneath sheet or dome webs which have a tangle above. Additional genera of linyphiids occur in the area.

- 1a Epigynum (Fig. 2) without scape (median appendage); male with long, narrow cephalothorax, elevated in front, and greatly elongated jaws which are directed backward; abdomen dark with white spots along edges and near pedicel; 4-5 mm; common in horizontal sheet web near the ground in grass . . . . . *Microlinyphia mandibulata* (Emerton) (platform spider)
- 1b Epigynum with a long scape; male not as above . . . . . 2
- 2a Tibia of male palp with short lateral process bearing three stout hairs; carapace and legs yellow; abdomen gray, cream or orange-pink, with faint gray transverse stripes at the posterior end and sides; 3-5 mm; abundant in forest understory and trees . . . . . *Helophora* Menge 1866
- 2b No lateral process on palpal tibia; no spines on metatarsus; tibia with lateral spines; metatarsus I at least as long as tibia I; female palp with claw; abdomen black with broken transverse white stripes or unmarked; 2-3 mm; rare in forest . . . . . *Bathyphantes* spp. Menge 1866

**Family Micryphantidae**  
dwarf spiders

Micryphantids resemble linyphiids and small theridiids, but the abdomen seldom has a pattern and may have a hard plate (scute). Micryphantids are frequently black or orange, with yellow or orange spiny legs. There are teeth on the fang furrows, and the heads of some males have large protuberances in the eye region. Adult micryphantids collected in this study (about 16 species) were 1.5-2.5 mm in length; identified genera were *Eperigone* Crosby & Bishop 1928, *Eridantes* Crosby & Bishop 1933, *Erigone* Audouin 1826 (Fig. 14), and *Grammonota* Emerton 1882. Many micryphantids build their webs in litter or cracks near the ground, some in vegetation. This family is also called Erigonidae, or Subfamily Erigoninae of the Linyphiidae.

**Family Araneidae**  
typical orbweavers

This family, also called Argiopidae, contains some of the largest, best-known web-spinning spiders, for example, the black and yellow *Argiope*, or garden spider. Many araneids are brightly colored and hang head-downward in the center of vertical orb webs. Webs are usually attached to woody vegetation or stiff forbs, seldom to grasses. Many araneids have extreme sexual dimorphism, with males much smaller and sometimes differently colored than females.

- 1a Tibia III with prolateral fringe of long feathery hairs; legs off-white to yellow with strong spines and black line under femur I and II; carapace off-white to yellow with median black line; abdomen gray to yellow with two longitudinal black lines on posterior half, and three black dots anteriorly; 3.5 mm; restricted habitat (See Appendix 1) . . . . . *Mangora* O.P.-Cambridge 1889
- 1b Tibia III lacks feathery hairs . . . . . 2

- 2a Abdomen elongate, pointed, with posterior tubercle; carapace with silvery hairs; abdomen marked with black and yellow or orange; or abdomen with thin transverse lines of silvery-yellow alternating with black; common in early autumn in grassland, gardens and roadsides . . . . . *Argiope* spp. Audouin 1827
- 2b Abdomen not elongate and pointed; females smaller . . . . . 3
- 3a Abdomen oval, narrowed behind, white, yellow or pink, its only markings three pairs of black dots on posterior half; carapace and legs yellow; 2-3 mm; rare . . . . . *Araniella displicata* (Hentz)
- 3b Abdomen not marked as above . . . . . 4
- 4a Abdomen oval, shiny, with alternating white and black longitudinal bands (median white band does not reach anterior end); legs orange; carapace orange with black eye area extending posteriorly in a V; 4.5 mm; rare in grassland . . . . . *Singa* C.L. Koch 1836
- 4b Markings not as above . . . . . 5
- 5a Abdomen triangular oval when viewed dorsally, with wavy-sided design, flat on top and truncated posteriorly when viewed from the side; color gray; epigynum with scape directed forward; 4 mm; rare in trees . . . . . *Eustala* Simon 1895
- 5b Not as above . . . . . 6
- 6a Thoracic groove longitudinal; lateral eyes not on distinct tubercles; carapace hairy; abdomen higher near anterior end, with design; tibia II of male with series of short, strong spines beneath; 5-7 mm; abundant in many habitats . . . . . *Neoscona* spp. Simon 1864
- 6b Thoracic groove transverse or a circular pit . . . . . 7
- 7a Abdomen oval, with wavy-sided design; venter with white parentheses enclosing dark spot anterior to spinnerets; spines on legs stout; carapace hairy; color yellow and brown; 8-12 mm; common around buildings . . . . . *Nuctenea* spp. Simon 1864
- 7b Abdomen triangular oval when viewed dorsally, with shoulder humps and five pairs of red dots; color yellow-green in life; spines on legs slender; carapace without hair; 5-6 mm; rare in trees . . . . . *Araneus* Clerck 1757

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**Appendix 1. Localities and habitats in northwestern Iowa from which spiders were collected.**

Locality	County	Habitat type
Milford Woods	Dickinson	forest
Fort Defiance St. Pk.	Emmet	forest, shore
Iowa Lakeside Lab.	Dickinson	forest, shore, grassland, bldgs.
W of Wahpeton	Dickinson	cellar
N of Cherokee	Cherokee	sand draw <sup>a</sup>
Gitche Manitou St. Preserve	Lyon	grassland, forest
Cayler Prairie	Dickinson	grassland
Kalsow Prairie	Pocahontas	grassland
Bergman Prairie	Dickinson	grassland
Kirschner Prairie	Clay	grassland
Anderson Prairie	Emmet	grassland
Dewey's Pasture	Clay	grassland
Frieda Hafner Kettlehole	Dickinson	grassland
Steele Prairie	Cherokee	grassland
SE of Laurens	Pocahontas	roadside
W of Spirit Lake	Dickinson	roadside
Silver Lake Fen	Dickinson	wetland
Smith's Slough	Clay	wetland
N of Wahpeton	Dickinson	wetland
Jemmerson Slough	Dickinson	wetland, forest
Hale's Slough	Dickinson	wetland, shore
Diamond Lake	Dickinson	shore, forest
Lost Island Lake	Clay	shore
Big Spirit Lake	Dickinson	shore
Little Spirit Lake	Dickinson	shore
Boone River	Wright	shore
Pillsbury Creek	Dickinson	shore

<sup>a</sup> Listed as "restricted habitat" in the keys.