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An Annotated Checklist of the Spiders of Northwestern Iowa and the Loess Hills of Western Iowa

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Spiders were collected by the author from various habitats in 16 counties of northwestern Iowa and the loess hills of western Iowa during the summers of 1985 and 1990-1992. Additional donated specimens from the same region in 1981 and 1989 were identified by the author. Twenty-three families, 92 genera and 184 species have been identified.
INDEX DESCRIPTORS: Spiders, Araneae, Iowa, habitat, loess hills.

Literature on spiders of Iowa is sparse; interest is increasing because spiders are natural enemies of agricultural pests (Bechinski and Pedigo 1981; Whitford, Showers and Edwards 1987). Additionally, the continuing northward extension of the range of the venomous brown recluse or violin spider, *Loxosceles reclusa,* has led to reports of bites in the state (e.g., Stoaks 1980).

Most studies of Iowa spiders have been conducted near institutions of higher education (i.e., Ressler 1918b; Kaufman 1962; Stiles and Detwiler 1938; Stiles and Luber 1944; Bechinski and Pedigo 1981; Whitford, Showers and Edwards 1987), and some work is unpublished (e.g., Ressler 1918a). The spiders of eastern Iowa (Stiles and Stevens 1940) and its caves (Peck and Christiansen 1990) have been studied, but no checklist of northwestern Iowa spiders has previously been published. Abraham (1987) published keys to spider families and genera of northwestern Iowa, and Bowles, Roosa, and Abraham (1991) reported on a preliminary checklist of Iowa spiders (largely from the literature).

This paper provides a checklist of the spiders of northwestern Iowa and the loess hills of western Iowa, annotated with habitat and phenology information, state records, and range extensions.

METHODS

The author collected spiders between June 9 and August 17, 1985, June 3 and August 4, 1990, June 5 and July 27, 1991 and June 10 and August 11, 1992 in the following northwestern Iowa counties: Lyon, Osceola, Dickinson, Emmet, Palo Alto, Clay, O'Brien, Plymouth, Cherokee, Buena Vista, and Pocahontas (Table 1). A collection by the author from Pilot Knob State Park (Hancock Co.) is included because, although in north central Iowa, it contains a state record.

Table 1. Study Sites.

County	Site
Buena Vista	Buena Vista Co. Pk.
Cherokee	North of Cherokee; Steele Prairie St. Pres.
Clay	Dewey's Pasture; Kirschner Prairie; Lost Island Lake E of Highway; Smith's Slough; Wanata St. Pk.
Clay/Dickinson	Clay/Dickinson County Line
Dickinson	Beck's Canal; Bergman Prairie; W Shore of Big Spirit Lake; Cayler Prairie St. Pres.; Dewey's Pasture; Diamond Lake; Freda Haffner Kettlehole St. Pres.; Gull Point St. Pk.; Hale's Slough (E of Big Spirit Lake); Hwy 9 Pond; Iowa Lakeside Laboratory; Jemmerson Slough; Kettleson Hogsback Wildl. Mgt. Area; Nr Kettleson Hogsback (T100N R36W); E side Little Spirit Lake; Marble Lake boat ramp; E of Milford; Milford Woods; Okoboji Township, Sect. 5; Pillsbury Creek; Rte. 86, N of Iowa Lakeside Lab.; Shedd's Pond; Silver Lake Fen St. Pres. Smith's Slough; W of Spirit Lake; Spring Run Wildl. Mgt. Area; T98N R35W Sect. 35; T99N R35W NE 1/4 Sect. 20; T99N R37W NW 1/4 Sect. 5; T99N R37W Sect. 6; Three-Corner Pond; N of Wahpeton; W of Wahpeton; West Okoboji Lake
Emmet	Anderson Prairie; Four Mile Marsh; Fort Defiance St. Pk.; Kris's Marshes: #9, #12, #19
Hancock	Pilot Knob St. Pk.
Harrison	DeSoto Bend Nat. Wildl. Ref.
Lyon	Gitchie Manitou St. Pres.
Monona	Loess Hills Wildl. Area; Preparation Canyon St. Pk.; Turin Loess Hills St. Pres.; 1 mi E Turin
O'Brien	Dog Creek Co. Pk.
Osceola	Ely Bauermeister Wildl. Mgt. Area/Wolter's Prairie; Ocheyedan Mound St. Pres.; Rush Lake
Palo Alto	Silver Lake
Plymouth	Five Ridges Prairie; Mount Talbot St. Pres.
Pocahontas	Kalsow Prairie St. Pres.; 1 mi SE Laurens on Route 10
Woodbury	1 mi S Sargeant Bluff
Wright	Boone River; road to Woodstock, 0.7 mi E Rte. 169

Collections were made in the loess hills of Monona County by John Bowles on August 17-18, 1989, and in Woodbury and Monona Counties jointly by the author, John Bowles, and Dean Roosa on August 3, 1990 and July 25, 1991. John Bowles also donated his August 17, 1989 collection from DeSoto Bend National Wildlife Refuge in Harrison County. Jim Christiansen provided slides of the black widow he collected from the loess hills on June 5, 1981 (Tracy Ranch, NW 1/4 NW 1/4 Sec 13, T91N R49W, Plymouth Co.).

Collecting in state parks and nature preserves was emphasized, but buildings, roadsides, and crops were also surveyed. Sampled habitats included native and restored prairie, riparian forest, woodland, dry sandy areas, rock outcrops, lake shores, stream banks, and wetlands (bog, fen, marsh) (Table 1). These sites included four of Iowa's major landform areas: alluvial plains, loess hills, northwest plains, and prairie pothole/Des Moines Lobe (Prior 1991).

Collecting methods included hand-picking of spiders under rocks, bark, litter and logs, in and on buildings; sweep netting; and pitfall trapping. All collecting except pitfall trapping occurred during the daylight hours. Pitfalls were dug only on the grounds of the Iowa Lakeside Laboratory to avoid disturbing natural areas. Therefore, exclusively ground-dwelling species with limited distributions or habitat preferences may have been missed in this study.

Specimens were preserved in 70% ethanol for later identification with a dissecting microscope. Some immature specimens were raised to adulthood for identification to species.

The checklist includes the range of dates, habitats, and counties in which adults of each species were collected, and state records and range extensions are noted. Taxonomy follows Platnick (1993). Some species identifications or verifications were supplied by Dr. C.D. Dondale, Dr. N.I. Platnick (gnaphosids) or Dr. G.B. Edwards (*Phidippus* prob. *cardinalis*). Voucher specimens will be deposited in the insect collection of the Department of Entomology, Iowa State University, Ames.

RESULTS AND DISCUSSION

Taxonomy

Twenty-three families, 92 genera, and 184 species were identified. About 60 additional morphospecies (mostly dictynids, micryphantids, and juveniles) remain unidentified, assuming no overlap between species of unidentified males, females, and juveniles.

For comparison with the above numbers, Rapp (1980) catalogued 22 families, 141 genera, and 342 species of spiders in the entire state of Nebraska. Levi and Field (1954) listed 25 families, 183 genera, and 394 species for Wisconsin.

For all of North America north of Mexico, Roth (1985) counted 55 families, "almost 500 genera with about 3412 species, and at least 230 more species known to be undescribed". Coddington, Larcher and Cokendolpher (1990) listed 64 families, 500 genera, 3400 known species and "300-700?" undescribed species in the same area.

The latter authors, reporting the results of a survey of American arachnologists, estimated that 1/3 to 1/2 of the species in the Linyphiidae (including micryphantids) remain undescribed, and 1/3 to 3/4 of the genera need revision. They also stated that only three large families are well-known (Araneidae, Gnaphosidae, and Theridiidae). In the Clubionidae, Lycosidae, and Salticidae 1/2 to 3/4 of the genera need revision and 1/4 of the species may be undescribed (perhaps as many as 1/2 of the species in Salticidae). Revisions of the Amaurobiidae and Dictynidae are out of date, and many smaller families also need revision.

The above comments should explain why spider distributions are not well known and why identification is a serious problem. This study adds four families and at least 23 genera and 30 species to those found by Abraham (1987) in one summer. However, some of this added "diversity" is merely due to taxonomic "splitting".

Venomous Species

According to the distributions in McCrone and Levi (1964), the black widow collected by Jim Christiansen was probably *Latrodectus variolus* Walckenaer. This is the only record I have of a black widow from the area of this study, even after I searched Christensen's site and nearby areas for two consecutive years. The species is probably rare in the loess hills, and my data do not support its presence in other areas of northwestern Iowa. It does occur in the central part of the state, at least in buildings (e.g., Stiles and Stevens 1940).

No brown recluse spiders (*Loxosceles reclusa* Gertsch & Mulaik) were found. Any members of this species reported in the study area were probably transported (by cars, etc.) from further south. It should be noted, however, that although the species probably cannot survive outdoors through an Iowa winter, viable indoor populations can be established by one pregnant female.

Abundance and Phenology

Only 35 species were taken in all four years of the study. Thirteen species were taken in 5-8 counties and all four years. One hundred seventeen species were taken in only one year and one county, and an additional 7 species were taken in one year in several counties. Of these latter 124 species, 63 were taken only in Dickinson Co., which was collected most thoroughly in terms of different habitats in all years. This leaves 61 species which were possibly habitat-limited (e.g., those in the sandy area in Cherokee Co. or the gallery forest at Ft. Defiance), or at the edge of their range (e.g., those in the loess hills). Some genera and species were represented by only one specimen collected during the study.

The fact that 101 species were collected only in Dickinson Co., but 63 of these were found only in one year (different years), undoubtedly represents rarity and/or population fluctuation, rather than unequal sampling. However, no attempt was made to collect synanthropic species in all counties or years of the study, so they are underestimated by these data.

Ecology

Habitat affects spider distribution and abundance in several ways. First, because spiders are all predators, the abundance and size distribution of prey (mostly insects) is important. However, most spiders are polyphagous; therefore, species composition of insects and their host plants is less important.

Second, environmental factors such as temperature, moisture, wind, and substrate can be limiting. An important parameter is habitat structural diversity (Hatley and MacMahon 1980; Robinson 1981; Abraham 1983). For example, prairies are dominated by wandering spiders, whereas forests have more web-spinning species due to the greater number of rigid supports for webs and relative lack of wind.

Thus, although spiders do not depend directly on particular plant species, both their physical environment and food source are strongly influenced by vegetation. Therefore, one should expect to find some different species of spiders in different plant communities. Conversely, many young and/or small spiders are very mobile due to their ability to disperse on air currents (balloon); this allows them to reach fragmented but suitable habitat. This is probably a major factor in the wide distribution of many species.

In conclusion, the spider fauna of northwestern Iowa contains (1) widely-distributed species (e.g., the synanthropic *Achaearanea tepidariorum*), (2) species with narrow habitat requirements (e.g., *Theridiosoma gemmosum* in moist forests), and (3) species which probably are at the edge of their respective ranges (e.g., *Phidippus* prob. *cardinalis* in the loess hills). The checklist includes 38 state records, 5 range extensions, and a previously undescribed female. Compiling a fauna of the entire state would add greatly to our knowledge of spider distributions.

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Key to Abbreviations:
SR = State Record
RE = Range Extension

Verification:
D = C.D. Dondale
P = N.I. Platnick
E = G.B. Edwards
u = unverified
(specimen lost after identification)

Counties:
Bv = Buena Vista
Ch = Cherokee
Cl = Clay
Di = Dickinson
Em = Emmet
Ha = Hancock
Hs = Harrison
Ly = Lyon
Mo = Monona
Ob = O'Brien
Os = Osceola
Pa = Palo Alto
Pl = Plymouth
Po = Pocahontas
Wo = Woodbury
Wr = Wright

Specimens:
m = male(s)
f = female(s)
fe = female(s) with eggsac
fy = female(s) with young
im = immature(s)
pen m = penultimate instar males(s)

Years:
4 = Collected during 1985, 1990, 1991, and 1992
3, 2, 1 = Collected during any three (two, one) of those years
(89) = Collected in 1989 by John Bowles
(81) = Collected in 1981 by Jim Christiansen

Order Araneae

Suborder Labidognatha ("true" spiders)

I. Cribellate spiders (hackled band weavers)

Dictynidae (dictynids)

Dictyna bostoniensis Emerton. Wetland; Di; 1; f(7/14).
Dictyna brevitarsus Emerton. **SR**/u; marsh; Di; 1; f(6/20).
Dictyna coloradensis Chamberlin. **SR**/D; grassland; Di; 1; f(6/5).
Dictyna foliacea (Hentz). Grassland; Di, Em, Ch; 3; m(7/1) f(6/19-7/14).
Dictyna nebraska Gertsch. **SR**/D; trees near water; Os; 1; f(6/7).
Emblyna annulipes (Blackwall). Roadside, wetland; Di; 2; f(6/12-8/10).
Emblyna cruciata (Emerton). Forest understory; Di; 1; f(6/18-7/1).
Emblyna hentzi (Kaston). **SR**/D; grassland; Di; 3; m(6/19-7/8) f(6/9-7/8).
Emblyna sublata (Hentz). Forest; Di, Pl, Em, Ly, Cl, Bv; 4; m(6/6-20) f(6/6-7/13).
Phantyna bicornis (Emerton). In bldg., tree foliage; Di; 4; m(6/12-7/29) f(6/24-7/6).

Amaurobiidae (amaurobiids)

Callobius bennetti (Blackwall). Under bark; Em; 1; f(7/10).

Titanoecidae

Titanoeca americana Emerton. D; Widespread on ground; Di, Pl; 2; m(6/12) f(6/12-8/5).

II. Ecribellate spiders

A. Higher web weavers

Pholcidae (daddy longlegs or cellar spiders)

Pholcus phalangioides (Fuesslin). In bldg.; Di; 3; f(7/4-8/14).

Theridiidae (cobweb weavers or combfooted spiders)

Achaearanea tepidariorum (C.L. Koch). In/on bldg.; Di, Cl; 4; m(6/6-7/22) f(6/17-8/14).
Crustulina sticta (O.P.-Cambridge). **SR**/D; beach; Di; 1; f(6/15).
Dipoena nigra (Emerton). **SR**/D; widespread; Em, Ly, Ch; 1; f(7/10-25).
Enoplognatha marmorata (Hentz). Forest vegetation; Em; 1; f(7/10).
Euryopis funebris (Hentz). **SR**/u; ground in grassland; Di; 1; f(8/14-15).
Euryopis pepini Levi. **SR/RE/D/female undescribed**; grassland; Ly; 1; f(7/19).
Latrodectus prob. *variolus* Walckenaer. Cow pasture?; Pl; (81); f(6/5/81).
Steatoda albomaculata (DeGeer). Sandy area; Wo; 1; f(8/4).
Steatoda borealis (Hentz). In bldg., rotting wood; Di, Cl, Wr; 4; m(6/3-20) f(6/13-7/19).
Theridion albidum Banks. **SR/RE/D**; forest understory; Em, Cl, Bv; 3; m(7/1-10) f(7/1).
Theridion differens Emerton. D; forest, willow; Di, Bv, Ha; 4; m(7/1) f(6/6-7/30).
Theridion frondeum Hentz. Widespread; Di, Em, Ly, Cl, Pa, Ha; 4; m(6/11-7/30) f(6/18-8/9).
Theridion lyricum Walckenaer. **SR**/D; forest, on bldg.; Di, Pl, Em, Ly; 2; m(6/6-7/13) f(6/17-7/29).
Theridion murarium Emerton. Widespread; Di, Cl; 3; m(7/1) f(6/11-26).
Thymoites unimaculatus (Emerton). Wetland; Di; 2; m(6/6) f(6/23).

Linyphiidae (sheetweb weavers)

Bathyphantes pallidus (Banks). Widespread; Em; 3; f(6/18-7/31).
Ceraticelus emertoni (O.P.-Cambridge). D; grassland; Di; m(7/28).
Ceraticelus fissiceps (O.P.-Cambridge). D; forest understory, grassland; Di, Em; f(7/10-7/29).
Diplostyla concolor (Wider). Ground in forest; Di; 3; m(7/15-29) f(8/6-10).
Eridantes nr. *erigonoides* (Emerton). Grassland; Di; 2; m(6/10-19) f(6/10).
Erigone atra Blackwall. Widespread; Di, Em, Mo; 2; m(6/19-7/26).
Frontinella communis (Hentz). Wetland; Pl, Mo, Hs; 2 (89); m(7/26-8/17) f(7/25-8/17).
Grammonota inornata Emerton. Wetland; Di; 1; m(6/20).
Helophora insignis (Blackwall). Forest; Di, Em; 3; m(7/29) f(7/6-29).
Lepthyphantes leprosus (Ohlert). **SR**/D; in bldg.; Di; 2; f(6/17-7/29).
Lepthyphantes zebra (Emerton). **SR**/D; forest understory; Em; 2; f(6/8-18).
Meioneta simplex (Emerton). D; *Sparganium,* roadside, in bldg.; Di; 1; m(6/13-23) f(6/23-30).
Microlinyphia mandibulata (Emerton). Grassland; Di; 1; m(8/4) f(8/5).
Neriene radiata (Walckenaer). *Equisetum,* understory; Hs, Mo; 1; f(8/17-18).
Pityohyphantes costatus (Hentz). Forest understory; Di, Em; 3; f(6/5-27) fe(6/18).

Araneidae (orbweavers)

Araneus alboventris (Emerton). **SR**/D; woodland; Di, Pl, Ly; 3; m(8/4) f(7/3-22).
Araneus guttulatus (Walckenaer). **SR**/D; shrubs; Di; 1; m(7/11) f(7/1).
Araniella displicata (Hentz). Trees; Di. Pl; 3; m(6/5-12) f(6/4-11).

Argiope prob. *aurantia* Lucas. Grassland; Em, Po; 2; im(7/23).
Argiope prob. *trifasciata* (Forskål). Sandy area, grassland, loess hills; Di, Ly, Em, Ch, Mo; 3(89); im(7/19-8/18).
Cyclosa turbinata (Walckenaer). Grassland; Mo; 1; f(8/3).
Eustala anastera (Walckenaer). Widespread; Di, Pl, Em, Pa; 4; m(6/12-7/28) f(6/11-8/4).
Hypsosinga pygmaea (Sundevall). Grassland, wetland; Di, Cl; 4; m(6/6) f(6/6-20).
Larinioides cornutus (Clerck). D; Roadside vegetation, under bridge; Di; m(7/4-20) f(6/23-7/20).
Larinioides patagiatus (Clerck). **SR**/u; in/on bldg.; Di, Cl, Em; 4; m(6/15-7/3) f(6/12-7/25).
Mangora gibberosa (Hentz). Sandy area, grassland; Mo, Ch; 3(89); m(7/25-8/18) f(7/26-8/18).
Mangora placida (Hentz). Forest understory; Ly, Mo; 1(89); f(6/9-8/18).
Micrathena gracilis (Walckenaer). Understory; Mo; (89); f(8/18).
Micrathena mitrata (Hentz). *Equisetum,* understory; Di, Hs, Mo; 2(89); m(7/23-8/18) f(7/23-8/17).
Neoscona arabesca (Walckenaer). Widespread; Di, Em, Os, Pl, Ly, Mo, Po, Cl, Wo; 4(89); m(6/18-7/20) f(6/23-8/18).
Neoscona prob. *pratensis* (Hentz). Grassland; Di, Pl, Em, Po; 4; im(7/25-28).

Theridiosomatidae (ray spiders)

Theridiosoma gemmosum (L. Koch). Moist forest; Di, Em, Cl; 2; f(7/11) e(6/18-7/21).

Tetragnathidae (long jawed orbweavers)

Leucauge venusta (Walckenaer). Forest; Di, Em; 2; m(6/27-7/15) f(6/23).
Tetragnatha caudata Emerton. Wetland; Di; 3; m(7/14) f(6/6-7/25).
Tetragnatha elongata Walckenaer. Forest, wetland, shore; Di, Em, Cl; 2; m(7/25-8/10) f(7/10-8/10).
Tetragnatha guatemalensis O.P.-Cambridge. **SR**/D; trees, wetland; Di; 2; m(6/29-7/29) f(6/13-8/10).
Tetragnatha laboriosa Hentz. Widespread; Di, Ly, Os, Em, Ob, Cl, Mo, Wo; 4(89); m(6/7-8/4) f(6/6-8/10).
Tetragnatha pallescens F.P.-Cambridge. Wetland; Di, Cl; 3; m(7/14) f(6/20-8/10).
Tetragnatha straminea Emerton. Grassland; Di; 2; f(6/6-7/9).
Tetragnatha vermiformis Emerton. Wetland; Di, Cl; 2; m(8/10) f(7/25-8/10).
Tetragnatha versicolor Walckenaer. Widespread; Di, Em, Ly, Cl, Pa, Ha; 4; m(6/12-8/9) f(6/10-8/10).

Agelenidae (funnel web weavers)

Agelenopsis kastoni Chamberlin & Ivie. In bldg.; Di; 1; m(8/1-8).
Agelenopsis pennsylvanica (C.L. Koch). Forest litter, woodpile; Pl, Hs; 1(89); m(7/27-8/17) f(8/17).
Agelenopsis potteri (Blackwall). D; in/on bldg, forest; Di, Em; 3; m(8/14) f(8/5-14).
Cicurina robusta Simon. Ground in woodland; Di, Em; 2; f(7/3).
Coras medicinalis (Hentz). Woodpile, bldg.; Pl; 1; f(7/27).
Tegenaria domestica (Clerck). Cellar; Di; 1; m(8/14).

Hahniidae (hahniids)

Neoantistea magna (Keyserling). Forest litter; Em; 2; f(7/10-8/3).

B. Three clawed hunting spiders

Mimetidae (pitate spiders)

Mimetus puritanus Chamberlin. Forest; Di, Em; 3; m(6/27-7/10) f(7/22-25).

Pisauridae (nursery web spiders)

Dolomedes scriptus Hentz. Near water; Di, Wr; 3; f(6/26-7/8) e(7/4 in captivity).
Dolomedes striatus Giebel. **SR**/D; sphagnum bog; Ha; 1; m(7/24-26).
Pisaurina prob. *mira* (Walckenaer). Forest understory; Di, Em; 2; im(7/11).

Lycosidae (wolf spiders)

Rabidosa rabida (Walckenaer). Grassland; Mo; 1; m(7/26).
Pardosa distincta (Blackwall). Widespread on ground; Di; 2; m(6/27-7/21).
Pardosa milvina (Hentz). D; ground near water; Wr; 1; f(7/25).
Pardosa modica (Blackwall). Lakeshore; Di; 2; m(8/9-10) f(6/24-8/10) fe(8/9).
Pardosa moesta Banks. D; litter, grassland; Di, Ha, Bv; 3; m(6/12-7/1) f(7/24-8/8) fe(7/26).
Pardosa xerampelina (Keyserling). Lakeshore; Di, Cl; 2; f(8/9) fe(6/18-8/1).
Pirata aspirans Chamberlin. D; marsh; Os; 1; m(6/22) fe(6/22).
Pirata insularis Emerton. Under log, marsh; Di, Ha, Em; 4; m(6/24) f(6/22-7/26).
Pirata minutus Emerton. **SR**/D; under rock, forest; Di, Em; 2; f(7/10) fe(7/20-23).
Pirata montanoides Banks. Widespread on ground; Di, Em; 3; m(7/16-17) f(7/3-11) fe(7/1-29).
Pirata piraticus (Clerck). Marsh, beach; Di, Em, Ha; 4; m(6/16-7/26) f(6/11-8/9) fe(6/11-7/25).
Pirata sedentarius Montgomery. Marsh, under log near water; Cl, Em, Wr; 3; m(6/12-8/9) f(6/10-8/10).
Schizocosa aulonia Dondale. Sandy area; Wo; 1; fe(8/4).
Schizocosa avida (Walckenaer). Lakeshore, wet meadow; Di; 2; f(6/7-10) e(6/14 in captivity).
Schizocosa crassipalpata Roewer. Ground in grassland; Di; 2; f(6/10-7/20).
Schizocosa mccookii (Montgomery). Woodpile; Pl; 1; f(7/27).
Schizocosa ocreata (Hentz). In/on bldg., ground in forest; Di; 3; m(6/12-27) f(6/15-8/8) fe(7/29) fy(7/20).
Trochosa terricola Thorell. Widespread on ground; Di, Cl; 4; f(6/14-7/23) fe(6/18).

Oxyopidae (lynx spiders)

Oxyopes salticus Hentz. Grassland, wetland; Di, Pl, Ly, Em, Ch, Po, Cl, Mo; 4(89); m(7/1-8/3) f(7/1-8/3).
Oxyopes scalaris Hentz. **SR**/D; grassland; Ly; 1; f(7/3-13).

C. Two clawed hunting spiders

Gnaphosidae (ground spiders)

Drassyllus depressus (Emerton). P; in bldg.; Di; 2; m(6/19).
Drassyllus niger (Banks). P; in bldg.; Di; 1; m(6/19).
Gnaphosa parvula Banks. P; in bldg.; Di; 1; f(7/31).
Gnaphosa sericata (L. Koch). **SR**/P; sandy area; Wo; 1; f(8/4).
Herpyllus ecclesiasticus Hentz. P; in bldg., decayed wood; Di; 4; m(6/6-25) f(6/7-7/20).
Micaria gertschi Barrows & Ivie. P; bare ground, grassland; Di; 1; m(6/25) f(7/28).
Sergiolus decoratus Kaston. **SR**/P; grassland; Wo, Po; 2; m(7/25) f(8/4).
Sergiolus montanus (Emerton). P; bare ground; Di; 1; f(7/15).
Sergiolus tennesseensis Chamberlin. **SR**/P; in bldg.; Di; 1; f(7/23).
Sosticus insularis (Banks). P; in bldg.; Di; 4; m(6/17-24) f(6/25-26).
Zelotes fratris Chamberlin. P; ground in grassland; Di; 1; m(7/20).
Zelotes pseustes Chamberlin. **SR**/**RE**/P; under wood on ground; Di; 1; f(8/15).

Clubionidae (sac spiders)

Clubiona abbotii L. Koch. **SR**/u; wetland, understory; Di, Ly; 3; m(6/10-8/5) f(6/10).
Clubiona kiowa Gertsch. **SR**/D; under board on ground; Di; 1; f(6/23).
Clubiona maritima L. Koch. **SR**/D; wet meadow; Em, Ob; 2; m(6/12-7/1).
Clubiona moesta Banks. **SR**/u; woody vegetation; Di; 1; f(6/12).
Clubiona obesa Hentz. Retreat in *Opuntia* flower; Di; 3; m(6/4-24) f(6/28).

Corinnidae

Castianeira cingulata (C.L. Koch). Grassland, forest; Em; 1; f(7/11).
Castianeira descripta (Hentz). Ground in grassland; Di, Wo, Mo; 2; m(8/4-14) f(8/3).
Castianeira longipalpa (Hentz). **SR**/D; ground in grassland; Di; 2; m(8/15).

Liocranidae

Agroeca ornata Banks. Forest; Em; f(7/11).
Phrurotimpus borealis (Emerton). In bldg.; Di, Em; 4; m(6/13) f(7/10-31).
Phrurotimpus certus Gertsch. Litter; Di; 1; f(7/8).

Anyphaenidae (ghost spiders)

Habana sp. Sandy area; Ch; 1; im(7/25).
Wulfila saltabundus (Hentz). **SR**/D; sandy area; Ch; 1; f(7/25).

Thomisidae (crab spiders)

Bassaniana versicolor (Keyserling) × *utahensis* (Gertsch) (hybrid). **SR**/D; on bldg., under bark; Di; 3; m(6/23) f(6/19-7/7).
Misumena vatia (Clerck). Forest understory; Ly; 2; f(7/3).
Misumenoides formosipes (Walckenaer). Sandy area, understory; Ly, Pl, Mo, Ch; 3(89); m(7/19-8/4) f(8/4).
Misumenops asperatus (Hentz). Boxelder foliage; Di; 1; f(6/12).
Misumenops celer (Hentz). Grassland, wetland; Di, Em, Ly, Pl, Mo, Po, Ch, Cl; 4(89); m(6/5-8/10) f(7/2-8/29).
Misumenops oblongus (Keyserling). Grassland, understory; Di, Ly, Mo; 1; m(6/26-7/26).
Ozyptila conspurcata Thorell. Grassland; Di, Em, Ch; 4; m(6/18-7/20) f(6/10-8/15).
Ozyptila georgiana Keyserling. Iris in marsh; Di; 1; f(6/10).
Tmarus angulatus (Walckenaer). **SR**/D; widespread; Ly, Em, Ch, Ha; 4; m(7/10-30).
Xysticus alboniger Turnbull et al. **SR**/**RE**/u; grassland; Em; 1; m(6/11).
Xysticus auctificus Keyserling. **SR**/D; grassland; 2; f(6/6-19).
Xysticus chippewa Gertsch. *Ranunculus* flower; Di; 2; m(6/10-14) f(6/10).
Xysticus elegans Keyserling. Woodland; Di; 3; m(6/10) f(6/16-7/30).
Xysticus ferox (Hentz). Widespread; Di, Cl, Ch, Em; 3; m(6/17-7/5) f(6/20-8/10).
Xysticus funestus Keyserling. In bldg.; Di; 1; f(6/22-23).
Xysticus triguttatus Keyserling. Grassland; Di, Os, Cl, Ly, Ch; 4; m(6/7-7/25) f(6/5-7/25).

Philodromidae (running crab spiders)

Philodromus cespitum (Walckenaer). Widespread; Di, Ly, Po, Cl, Mo, Pa; 4; m(6/6-7/8) f(6/9-8/10).
Philodromus exilis Banks. Vegetation; Ly; 1; f(6/12-7/13).
Philodromus histrio (Latreille). Grassland; Di; 3; f(6/10-18).
Philodromus imbecillus Keyserling. Grassland; Di, Po, Ch; 3; m(7/1) f(6/14-7/25).
Philodromus keyserlingi Marx. On bldg., in vegetation; Di, Ly; 3; m(6/26) f(6/26-7/13).
Philodromus marxi Keyserling. Vegetation; Ly; 1; f(7/13).
Philodromus peninsulanus Gertsch. **SR**/**RE**/D; understory, marsh; Di; 2; m(6/20-23) f(6/20-7/8).
Philodromus pernix Blackwall. Vegetation near trail; Di; 2; f(6/17).
Philodromus placidus Banks. **SR**/D; forest, on bldg.; Di; 3; m(6/17-7/3) f(6/30-8/5).
Philodromus pretariae (Scheffer). Loess hills; Mo; 1; m(7/26).
Philodromus rufus Walckenaer. D; trees, oak foliage; Di; 4; f(6/20-8/10).
Philodromus vulgaris (Hentz). Oak foliage; Di; 2; f(6/5-7/1).
Thanatus formicinus (Clerck). Grassland; Di; 2; m(7/4) f(7/17).
Thanatus rubicellus (Mello-Leitao). **SR**/D; grassland; Di; 1; f(7/1).
Tibellus asiaticus Kulzyński. Grassland; Pl, Cl; 2; f(6/12-8/10).
Tibellus duttoni (Hentz). Grassland; Pl, Em; 2; f(6/12-19).
Tibellus maritimus (Menge). Widespread; Di, Ly, Em, Ch; 4; m(6/11-7/2) f(6/5-7/19).
Tibellus oblongus (Walckenaer). D; Grassland, herbaceous vegetation; Di, Ly, Em, Mo, Cl, Ch; 4; m(6/9-7/29) f(6/23-8/10).

Salticidae (jumping spiders)

Eris militaris (Hentz). Widespread; Di, Ly; 4; m(6/20-7/17) f(7/19).
Habrocestum pulex (Hentz). In/on bldg.; Di, Em, Mo; 4(89); m(6/5-7/7) f(6/5-7/21).
Habronattus prob. *decorus* (Blackwall). Grassland; Cl; 1; pen m(8/10).
Hentzia mitrata (Hentz). On bldg.; Di; 3; m(6/12) f(6/12-8/9).
Hentzia palmarum (Hentz). Vegetation near water; Hs; 1; m(8/17).
Marpissa grata (Gertsch). Grassland; Di; 2; m(7/8) f(6/6).
Marpissa lineata (C.L. Koch). Grassland; Ly; 1; m(6/9) f(6/9).
Marpissa pikei (Peckhams). Grassland, wetlands; Mo; 1(89); m(7/26-8/18) f(7/26-8/18).
Metaphidippus insignis (Banks). Widespread; Di, Em, Ly, Ob, Bv, Po; 4; m(6/5-7/1) f(6/5-7/19).
Metaphidippus protervus (Walckenaer). Widespread; Di, Pl, Ly; 4; m(6/9-20) f(6/5-7/29).
Neon nellii Peckhams. Grassland; Di; 1; f(6/10).
Peckhamia picata (Hentz). Grassland; Ly, Cl; 1; f(7/3).
Phidippus audax (Hentz). In bldg., in vegetation; Di; 2; m(6/29) f(6/28-7/9).
Phidippus prob. *cardinalis* (Hentz). ?**SR**/**RE**/E; loess hills; Mo; 1; pen m(7/26) pen f(7/26).
Phidippus clarus Keyserling. Grassland; Di, Em, Pl, Cl, Ly, Po; 4; m(6/9-7/31) f(7/5-7/31).
Phidippus princeps (Peckhams). Grassland; Ly; 1; f(7/3).
Salticus scenicus (Clerck). On bldg.; Di, Cl; 4; m(6/8) f(6/5-7/5).
Sitticus floricola (C.L. Koch). Beach; Di; 1; f(6/15).
Sitticus prob. *pubescens* (Fabricius). On bldg.; Di; 1; f(6/17).
Synageles noxiosus Hentz. **SR**/D; in bldg.; Di; 2; m(6/22) f(6/10).
Synageles occidentalis Cutler. Wet meadow; Ob; 1; f(7/1).
Synemosyna formica Hentz. Forest understory; Di; 3; f(6/12-7/6).
Tutelina elegans (Hentz). Grassland; Di, Ly, Ch, Bv; 4; m(6/20-7/26) f(7/1-25).
Tutelina prob. *hartii* (Emerton). Oak foliage, on bldg.; Di, Mo; 2; m(6/6-26) f(6/11-26).
Tutelina similis (Banks). Grassland, wetlands; Di, Em, Cl, Ly, Po, Ch; 4; m(6/5-7/1) f(6/5-8/10).