Checklist of Kansas Ground Spiders

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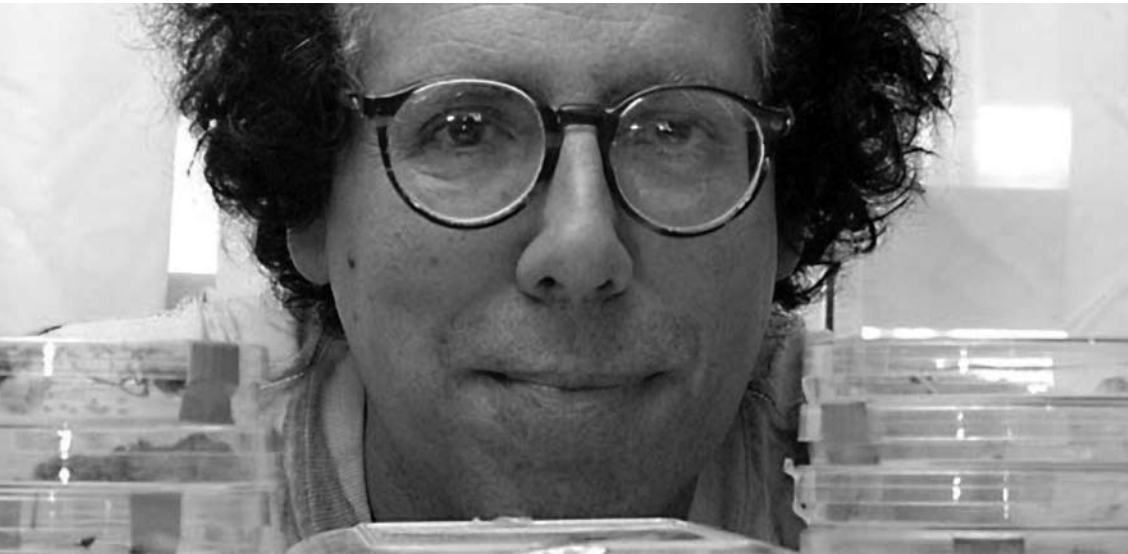
Cover: A male specimen of *Sergolius ocellatus* (entry 47 in this checklist).

Author: Hank Guarisco lives in Lawrence, KS and is an adjunct curator at the Sternberg Museum of Natural History at Fort Hays State University who has studied the natural history of Kansas spiders for the past 30 years. This is the fourth checklist of Kansas spiders he has authored or co-authored with colleagues, the three previous *Kansas School Naturalists* being: *Checklist of Kansas Jumping Spiders, Checklist of Kansas Crab Spiders*, and *Checklist of Kansas Orbweaving Spiders.*



Checklist of Kansas Ground Spiders

by Hank Guarisco

INTRODUCTION

Ground spiders, a common name for members of the family Gnaphosidae, are a successful group of furtive hunting spiders which occur worldwide. Of the approximately 1,500 species living on earth, 330 reside on the North American continent (18). Due to the great climatic and geological diversity of Kansas, our state contains a myriad of habitats scattered throughout several major physiographic provinces, from the Ozark Highlands in the southeast to the High Plains in the northwest. This explains why almost 20% (63 species) of the ground spiders in North America, can be found in Kansas.

A glance at the accompanying photos reveals that ground spiders are somewhat diverse in terms of size, color and general appearance. They are all hunting spiders, meaning that silk is not used in the capture of prey. They are generally active at night and during the twilight hours, and spend the daytime and cold, winter months inside thin, silk sacs constructed in secluded places, such as under rocks, cow pies, loose bark and in the soil. *Zelotes hentzi*, a small, black shiny ground spider, was most frequently encountered while excavating the burrows of moles (*Scalopus aquaticus*) and voles (*Microtus ochrogaster*)(5). A few members of the family, such as the Parson spider, are found in and around homes (9).

There is one report of an Eastern Parson spider (*Herpyllus ecclesiasticus*) biting a 55-year old woman on the back while she was sleeping. Besides experiencing a local inflammatory reaction which included slight swelling and reddening of the bitten area, she also became nauseous and lethargic. After several days, all symptoms were gone and there was no residual tissue destruction at the site of the bite (14).

NATURAL HISTORY

Ground spiders are most numerous in dry, open regions, such as the Shortgrass Steppe of eastern Colorado and western Kansas. Several new Kansas records were discovered during a pitfall trap survey near prairie dog towns in western Kansas (10). One spider collection from this ecoregion contained fifteen species of ground spiders which made up 29% of the total number of spiders collected (36). In northeastern Kansas, severe winters can kill off a large percentage of hibernating spiders. I collected Eastern Parson spiders from silk hibernacula beneath loose bark on trees during late February in 1984 and 1994 in Douglas County. Only 28.7% (27/94) survived in 1984 while 92.2% (59/64)

were alive in the 1994 sample.

Many members of the ground spider family possess a canoe-shaped reflective layer called a "tapetum," in the posterior median eyes. These eyes are oval in shape and are oriented 90º to one another, making them perfect receptors of polarized light. Indeed, experiments on a European species of *Drassodes* revealed that the spider, which hunts at dawn and dusk when polarized light from the sky is oriented in one direction, depends upon polarized light to successfully return to its nest. When the posterior median eyes were covered, this species had great difficulty finding its way back to the nest (3).

Although most ground spiders feed upon a variety of small insects and spiders, members of the genus *Callilepis* appear to be specialized ant predators. Upon encountering an ant, the European *C. nocturna* makes a head-long dash, bites the ant at the base of an antenna, and then retreats while the venom takes effect. Once paralyzed, the spider quickly tucks the ant beneath her body and beats a hasty retreat. Interestingly, if an ant antenna is removed from the head and glued onto the abdomen, the spider will bite the ant at the base of the relocated antenna, which indicates that the antenna is the key stimulus for the spider's bite (7).

Several brightly colored members of the genus *Sergiolus* may be mutilid wasp mimics. The size, pattern, and antlike movements of *S. capulatus* give this species a strong resemblance to some small mutilid wasps (5). It would be interesting to test this hypothesis and determine if the spider gains protection from visual predators by the resemblance.

It is becoming increasingly evident that spiders are a beneficial presence in field crops. Early studies compiled lists of spiders found in various crops (1)(4). More recently, attempts have been made to clearly define their predatory roles and how they interact with insects that become pests when present at high densities (13)(23)(35). Because ground spiders are nocturnal hunters, there is little information about how they influence pest species.

KANSAS GROUND SPIDERS

A total of 63 species of ground spiders are currently known in Kansas. The following checklist is based upon specimens examined by the author, Kansas records in the latest taxonomic revisions, and selected records from the older literature. The current checklist updates an older list of Kansas ground spiders which reported 49 species (11). Because of the recent advances in spider taxonomy, some older literature records are unreliable and are not included in the list. Each entry includes: the currently recognized scientific name of each species followed by its author, the year it was described, and sometimes one

or more outdated names used in the older literature.

Except for a few conspicuous species, most ground spiders do not have common names. One exception is the "Parson Spider," which is black with a distinctive white, median stripe resembling the cravat worn by a parson or minister in the 1800s. Actually, there are two species of parson spider which can be distinguished from each other only by details of the genitalia. Therefore, I propose naming *Herpyllus ecclesiasticus* the "Eastern Parson Spider," since it occurs throughout the eastern half of the US, and its close relative, *Herpyllus propinquus*, the "Western Parson Spider," which can be found throughout the western US. Both species occur in Kansas.

Following the scientific name and the author and year it was described, is a list of Kansas counties where specimens have been collected. Since much more field work is needed to adequately determine the range of each species within the state, the list of counties of known occurrence merely documents its presence in Kansas.

A key is not provided because positive species identification is determined by detailed microscopic examination of the genitalia and other structures. (See images of the male palp and female epigynum of *Drassyllus aprilinus*). However, some ground spiders have distinctive colors, patterns and shapes which enable the careful observer to tentatively identify them. This applies to many members of the genus *Sergiolus*. The iridescent sheen and ant-like shape of spiders belonging to the genus *Micaria* are quite startling.

Figure 1.
Male palp of *Drassyllus aprilinus.*

Figure 2.
Female epigynum of *Drassyllus aprilinus*.

The genus *Cesonia* is characterized by dark stripes contrasted against a light background, while members of the genus *Zelotes* are usually entirely black and shiny. In the ground spider family, males and females of each species are generally similar in size, coloration and pattern. Carefully examine the accompanying color images and pay particular attention to body shape, leg length, color and pattern. For those readers interested in studying these spiders in greater detail, I have provided taxonomic references which include complete descriptions and distinguishing characteristics of each species in this checklist. Also of value are spider catalogues (17), checklists (2)(5)(6)(11)(12)(31)(32) and works which provide detailed keys (18)(34). All photos were taken by the author.

Although a single specimen of *Orodrassus coloradensis* was found in Kansas (8) and included in the previous annotated list of Kansas Gnaphosidae (11), no more specimens have been discovered. Since the nearest population of this common spider can be found in the vicinity of Denver, Colorado, the single Kansas specimen was most likely an accidental introduction (21). Therefore this species is not included in the current checklist. The species *paludis* was historically placed in the genus *Synaphosus*, but a recent revision of this genus indicated that *paludis* was misplaced (15). Since it has not been formally placed in another genus, it is included in this checklist as, "*Synaphosus*" *paludis*, to indicate that it belongs elsewhere.

GNAPHOSIDAE

1. *Callilepis imbecilla* (Keyserling 1887): CHEROKEE, DOUGLAS, LYON, MONTGOMERY, RENO (5)(11)(16)
2. *Callilepis pluto* Banks 1896: DOUGLAS, FRANKLIN, JEFFERSON, JOHNSON (11)(16)
3. *Cesonia* n.sp.?: TREGO (26)
4. *Cesonia sincera* Gertsch and Mulaik 1936: MORTON (10)(26)
5. *Drassodes auriculoides* Barrows 1919: BARTON, DOUGLAS, ELK, JEFFERSON, JOHNSON, LEAVENWORTH, MONTGOMERY, NEMAHA, WILSON (5)(11)(22)
6. *Drassodes gosiutus* Chamberlin 1919: CHAUTAUQUA, COWLEY, ELLIS, LOGAN (11)(22)
7. *Drassodes saccatus* (Emerton 1890): BARBER, BARTON, CHASE, CHEYENNE, COWLEY, ELK, ELLIS, ELLSWORTH, GOVE, HAMILTON, KIOWA, LABETTE, LOGAN, MEADE, MORRIS, REPUBLIC, RILEY, RUSSELL, SALINE, WABAUNSEE (11)(22)

8. *Drassyllus aprilinus* (Banks 1904): DOUGLAS, JEFFERSON(5)(11)(28)
9. *Drassyllus covensis* Exline 1962: CHEROKEE (28)
10. *Drassyllus creolus* Chamberlin and Gertsch 1940: DOUGLAS, GREENWOOD, JEFFERSON (11)(28)
11. *Drassyllus depressus* (Emerton 1890): BARTON, BOURBON, JEFFERSON, THOMAS (11)(28)
12. *Drassyllus dixinus* Chamberlin 1922: DOUGLAS, JEFFERSON (11)(28)
13. *Drassyllus dromeus* Chamberlin 1922: ELK, ELLIS (11)(28)
14. *Drassyllus gynosaphes* Chamberlin 1936: BOURBON, DOUGLAS, JEFFERSON, THOMAS (5)(11)(28)
15. *Drassyllus lepidus* (Banks 1899): BARTON, BOURBON, DOUGLAS, JEFFERSON, LOGAN, MORTON, SALINE (11)(28)
16. *Drassyllus mumai* Gertsch and Riechert 1976: MORTON (10)(28)
17. *Drassyllus nannellus* Chamberlin and Gertsch 1940: DOUGLAS, JEFFERSON, THOMAS, WABAUNSEE (11)(28)
18. *Drassyllus notonus* Chamberlin 1928: THOMAS(11)(28)
19. *Drassyllus novus* (Banks 1895): DOUGLAS, JEFFERSON (11)(28)
20. *Drassyllus orgilus* Chamberlin 1922: ELLIS, RUSSELL (28)
21. *Drassyllus texamans* Chamberlin 1936: BARTON, JEFFERSON, LOGAN (11) (28)
22. *Gnaphosa clara* (Keyserling 1887): LOGAN (10)(20)
23. *Gnaphosa fontinalis* Keyserling 1887: DOUGLAS, ELK, FINNEY, FRANKLIN, MEADE (6)(11)(20)
24. *Gnaphosa saxosa* Platnick and Shadab 1975: BARTON (11)(20)
25. *Gnaphosa sericata* (L. Koch 1866): CHAUTAUQUA, DOUGLAS, ELLSWORTH, FINNEY, GOVE, JEFFERSON, MORTON, RENO, RILEY, SALINE (6)(11) (20)(32)
26. *Haplodrassus bicornis* (Emerton 1909): DOUGLAS, JEFFERSON (5)(11)(21)
27. *Haplodrassus chamberlini* Platnick and Shadab 1975: ELLIS, GRAY (11)(21)
28. *Haplodrassus signifier* (C.L. Koch 1839): BARTON, CHASE, DOUGLAS, ELK, ELLIS, ELLSWORTH, GOVE, JEFFERSON, LOGAN, LYON, RILEY (11)(21) (32)
29. *Herpyllus bubulcus* Chamberlin 1922: BARBER (8)(11)(24)
30. *Herpyllus ecclesiasticus* (Hentz 1832): BARTON, DOUGLAS, ELK, ELLSWORTH, GOVE, HAMILTON, JEFFERSON, JOHNSON, KIOWA, McPHERSON, RILEY, ROOKS (5)(11)(24)
31. *Herpyllus propinquus* (Keyserling 1887): RAWLINS, SCOTT, TREGO (24)
32. *Litopyllus temporarius* Chamberlin 1922: JEFFERSON (25)
33. *Micaria emertoni* Gertsch 1935: BARTON (11)(30)
34. *Micaria laticeps* Emerton 1909: ELLIS, MORTON (30)
35. *Micaria longipes* Emerton 1890: CLARK, DOUGLAS, ELLIS, MEADE, RILEY (5)(6)(11)(30)
36. *Micaria nanella* Gertsch 1935: ELLIS, GOVE (30)

Figure 3.
Callilepis imbecilla

Figure 4.
Callilepis imbecilla on eggs

Figure 5.
Drassodes saccatus female

Figure 6.
Drassyllus lepidus male

Figure 7.
Drassyllus lepidus male

Figure 8.
Gnaphosa fontinalis female

Figure 9.
Gnaphosa sericata female

Figure 10.
Haplodrassus signifer male

Figure 11.
Herpyllus ecclesiasticus under elm bark

Figure 12.
Micaria sp.

Figure 13.
Sergiolus angustus female

Figure 14.
Sergiolus capulatus female

37. *Micaria punctata* Banks 1896: BARTON, BOURBON (11)(30)
38. *Nodocion floridanus* (Banks 1896): DOUGLAS, MONTGOMERY (25)
39. *Nodocion rufithoracicus* Worley 1928: CHEYENNE, FINNEY, HAMILTON, LOGAN (11)(25)
40. *Nodocion utus* (Chamberlin 1936): COWLEY, RILEY (11)(25)
41. *Sergiolus capulatus* (Walckenaer 1837): DOUGLAS, JEFFERSON, RILEY(5) (11)(27)
42. *Sergiolus cyaneiventris* Simon 1893: DOUGLAS, LABETTE, MONTGOMERY (8)(11)(27)
43. *Sergiolus decoratus* Kaston 1945: CHEYENNE, GREENWOOD, JEFFERSON, RILEY (11)(27)
44. *Sergiolus minutus* (Banks 1898): JEFFERSON (27)
45. *Sergiolus montanus* (Emerton 1890): DOUGLAS, JEWELL, RILEY (11)(27)
46. *Sergiolus ocellatus* (Walckenaer 1837): BARTON, DOUGLAS, JEFFERSON, RILEY, SEDGWICK (11)(27)
47. *Sergiolus stella* Chamberlin 1922: CHEYENNE, MORTON (11)(27)
48. *Sergiolus tennesseensis* Chamberlin 1922: BARTON, DOUGLAS (11)(27)
49. *Sosticus insularis* (Banks 1895): DOUGLAS (5)(11)(23)
50. *Sosticus loricatus* (L.Koch 1866): CHEYENNE, DOUGLAS (8)(11)(23)
51. *"Synaphosus" paludis* (Chamberlin and Gertsch 1940): DOUGLAS, JEFFERSON, LEAVENWORTH, LYON (11)(15)(25)
52. *Trachyzelotes lyonneti* (Audouin 1826): FINNEY (19)
53. *Urozelotes rusticus* (L. Koch 1872): BOURBON, COWLEY, DOUGLAS (11) (19)
54. *Zelotes aiken* Platnick and Shadab 1983: BARTON, ELK, JEFFERSON, RILEY (11)(29)
55. *Zelotes anglo* Gertsch and Riechert 1976: JEFFERSON (29)
56. *Zelotes duplex* Chamberlin 1922: DOUGLAS, JEFFERSON, LEAVENWORTH (11)(29)
57. *Zelotes fratris* Chamberlin 1920: JEWELL (29)
58. *Zelotes gertschi* Platnick and Shadab 1983: BARTON (11)(29)
59. *Zelotes hentzi* Barrows 1945: BARTON, BOURBON, DOUGLAS, ELLIS (5) (11)(29)
60. *Zelotes laccus* (Barrows 1919): JEFFERSON (29)
61. *Zelotes lasalanus* Chamberlin 1928: CHEYENNE, FINNEY, HARPER, JEFFERSON, LOGAN, LYON, MORTON, SHERMAN (11)(29)
62. *Zelotes pseustes* Chamberlin 1922: DOUGLAS, JEFFERSON, LOGAN(8)(11) (29)
63. *Zelotes tuobus* Chamberlin 1919: COWLEY, JEFFERSON, RENO (11)(29)

REFERENCES

1. Agnew, C.W., D.A. Dean, and J.W. Smith, Jr. 1985. Spiders collected from peanuts and non-agricultural habitats in the Texas West Cross-Timbers. *The Southwestern Naturalist* 30(1): 1–12.
2. Cragin, F.W. 1886. First contribution to a knowledge of the Arachnida of Kansas. *Bulletin Washburn College, Lab. Nat. Hist*. 1(4): 145–146.
3. Dacke, M., D.E. Nilsson, E.J. Warrant, A.D. Blest, M.F. Land and D.C. O'Carroll. 1999. Built-in polarizers form part of a compass organ in spiders. *Nature* 401: 470–473.
4. Dean, D.A., W.L. Sterling and N.V. Horner. 1982. Spiders in eastern Texas cotton fields. *The Journal of Arachnology* 10(3): 251–260.
5. Fitch, H.S. 1963. Spiders of the University of Kansas Natural History Reservation and Rockefeller Experimental Tract. *University of Kansas Museum of Natural History Miscellaneous Publication* 33: 1–202.
6. Fitch, H.S. and V.R. Fitch. 1966. Spiders from Meade County, Kansas. *Transactions of the Kansas Academy of Science* 69(1): 11–22.
7. Foelix, R.F. 1996. *Biology of Spiders* (2nd ed.). Oxford University Press, NY, 330 pp.
8. Guarisco, H. 1989. Five new additions to the spider fauna of Kansas. *Transactions of the Kansas Academy of Science* 92(1-2): 60–62.
9. Guarisco, H. 1999. House spiders of Kansas. *The Journal of Arachnology* 27(1): 217–221.
10. Guarisco, H., W.M. Cook, and K.R. Nuckolls. 2004. New additions to the spider fauna of Kansas discovered near black-tailed prairie dog towns in Shortgrass prairie. *Transactions of the Kansas Academy of Science* 107(3-4): 175–178.
11. Guarisco, H. and K.E. Kinman. 1990. Annotated list of the spider family Gnaphosidae in Kansas. *Transactions of the Kansas Academy of Science* 93(1-2): 47–54.
12. Heiss, J.S. and R.T. Allen. 1986. The Gnaphosidae of Arkansas. *Arkansas Agricultural Experimental Station Bulletin* 885: 1–67.
13. Hodge, M.A. 1999. The implications of intraguild predation for the role of spiders in Biological control. *The Journal of Arachnology* 27(1): 351–362.
14. Majeski, J.A. and G.G. Durst, Sr. 1975. Bite by the spider *Herpyllus ecclesiasticus* in South Carolina. *Toxicon* 13: 377.
15. Ovtsharenko, V.I., G. Levy, and N.I. Platnick. 1994. A review of the ground spider genus *Synaphosus* (Araneae, Gnaphosidae). *American Museum Novitates* 3095: 1–27.
16. Platnick, N.I. 1975. A revision of the holarctic spider genus *Callilepis* (Araneae, Gnaphosidae). *American Museum Novitates* 2573: 1–32.
17. Platnick, N.I. 2008. The World Spider Catalogue, Version 8.5. American Museum of Natural History, online at "http://research.amnh.org/entomology/spiders/catalog/index.html"
18. Platnick, N.I. and C.D. Dondale. 1992. The insects and arachnids of Canada Part 19. The ground spiders of Canada and Alaska Araneae: Gnaphosidae. *Research Branch Agriculture Canada Publication* 1875, 297 pp.
19. Platnick, N.I. and J.A. Murphy. 1984. A revision of the spider genera *Trachyzelotes* and *Urozelotes* (Araneae, Gnaphosidae). *American Museum Novitates* 2792: 1–30.

Figure 15.
Sergiolus cyaneiventris

Figure 16.
Sergiolus decoratus female.

Figure 17.
Sergiolus montanus female

Figure 18.
Cesonia sincera female

Figure 19.
Sergiolus cyaneiventris male

Figure 20.
Sergiolus montanus male

Figure 21.
Sergiolus decoratus male

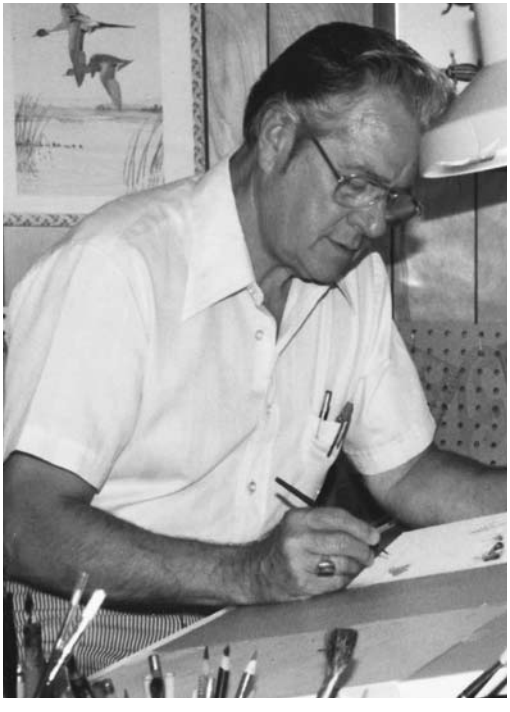
Figure 22.
Urozelotes rusticus female

Figure 23.
Zelotes sp.

20. Platnick, N.I. and M.U. Shadab. 1975a. A revision of the spider genus *Gnaphosa* (Araneae, Gnaphosidae) in America. *Bulletin of the American Museum of Natural History* 155(1): 1–66.
21. Platnick, N.I. and M.U. Shadab. 1975b. A revision of the spider genera *Haplodrassus* and *Orodrassus* (Araneae, Gnaphosidae). *American Museum Novitates* 2583: 1–40.
22. Platnick, N.I. and M.U. Shadab. 1976a. A revision of the spider genera *Drassodes* and *Tivodrassus* (Araneae, Gnaphosidae) in North America. *American Museum Novitates* 2593: 1–29.
23. Platnick, N.I. and M.U. Shadab. 1976b. A revision of the spider genera *Rachodrassus*, *Sosticus*, and *Scopodes* (Araneae, Gnaphosidae) in North America. *American Museum Novitates* 2594: 1–33.
24. Platnick, N.I. and M.U. Shadab. 1977. A revision of the spider genera *Herpyllus* and *Scotophaeus* (Araneae, Gnaphosidae) in North America. *Bulletin of the American Museum of Natural History* 159(1): 1–44.
25. Platnick, N.I. and M.U. Shadab. 1980a. A revision of the North American spider genera *Nodocion*, *Litopyllus*, and *Synaphosus* (Araneae, Gnaphosidae). American Museum Novitates 2691: 1–26.
26. Platnick, N.I. and M.U. Shadab. 1980b. A revision of the spider genus *Cesonia* (Araneae, Gnaphosidae). *Bulletin of the American Museum of Natural History* 165(4): 335–386.
27. Platnick, N.I. and M.U. Shadab. 1981. A revision of the spider genus *Sergiolus* (Araneae, Gnaphosidae). *American Museum Novitates* 2717: 1–41.
28. Platnick, N.I. and M.U. Shadab. 1982. A revision of the American spiders of the genus *Drassyllus* (Araneae, Gnaphosidae). *Bulletin of the American Museum of Natural History* 173(1): 1–97.
29. Platnick, N.I. and M.U. Shadab. 1983. A revision of the American spiders of the genus *Zelotes* (Araneae, Gnaphosidae). *Bulletin of the American Museum of Natural History* 174(2): 97–192.
30. Platnick, N.I. and M.U. Shadab. 1988. A revision of the American spiders of the genus *Micaria* (Araneae, Gnaphosidae). *American Museum Novitates* 2916: 1–64.
31. Scheffer, T.H. 1904. A preliminary list of Kansas spiders. *Industrialist* (Kansas State Agricultural College) 30(24): 371–386.
32. Scheffer, T.H. 1905. Additions to the list of Kansas spiders. *Industrialist* (Kansas State Agricultural College) 31(28): 435–444.
33. Sunderland, K. 1999. Mechanisms underlying the effects of spiders on pest populations. *The Journal of Arachnology* 27(1): 308–316.
34. Ubick, D., P. Paquin, P.E. Cushing, and V. Roth (eds). 2005. *Spiders of North America: An Identification Manual.* American Arachnological Society. 377 pp.
35. Uetz, G.W., J. Halaj, and A.B. Cady. 1999. Guild structure of spiders in major crops. *The Journal of Arachnology* 27(1): 270–280.
36. Weeks, R.D., Jr. and T.O. Holtzer. 2000. Habitat and season in structuring ground-dwelling Spider (Araneae) communities in a Shortgrass steppe ecosystem. *Community and Ecosystem Ecology* 29(6): 1164–1172.

In Memorium: "Bob Boles"

Robert Joe Boles, editor of the *Kansas School Naturalist* from 1968 to 1980, died November 27, 2007 at the age of 92. Bob taught biology 20 years at Manhattan High School before coming to E.S.U. where he was a biology professor for 20 years. He was a charter member of the Phi Kappa Phi Academic Honor Society at E.S.U., a member of the Order of the Mound at Southwestern College, the American Fisheries Society, the Southwest Association of Naturalists, Beta Beta Beta Biology Honor Society, and the Emporia Retired Teachers Association. Dr. Boles started the Biology Club at E.S.U. He retired in December of 1980. Memorial contributions to the Robert J. and Louise Boles Scholarship Fund may be sent to the "E.S.U. Foundation" at Emporia State University.



In Memorium: "Bob Clarke"

Robert F. Clarke, editor of the *Kansas School Naturalist* from 1980 to 1991, died April 2, 2008 at the age of 88. Dr. Clarke taught at Roosevelt High School in 1963 and joined the biology department at K.S.T.C. in 1968. He chaired the Biology Department from 1972 to 1979 and retired from E.S.U. in 1985. Professor Clarke was a respected wildlife artist and illustrated over 100 panels for the series "Something Wild" published in over 25 Kansas newspapers. He was instrumental in starting the Chickadee Check-Off Program to assist Kansas non-game animals. Clarke was president of the Kansas Academy of Science in 1980, an editor for the Southwest Association of Naturalists, member of the Kansas Herpetological Society, and co-founder of the Kansas Conservation Forum. Memorial contributions to the Robert F. Clarke Memorial Biology Scholarship may be sent to the "E.S.U. Foundation" at Emporia State University.

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Herpyllus ecclesiasticus female with eggs.