South Dakota State University
Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange

Agricultural Experiment Station Technical Bulletins | SDSU Agricultural Experiment Station

1989

Squash Bugs of South Dakota

Burruss McDaniel
South Dakota State University

Follow this and additional works at: http://openprairie.sdstate.edu/agexperimentsta_tb

 Part of the Entomology Commons, and the Plant Sciences Commons

Recommended Citation
McDaniel, Burruss, "Squash Bugs of South Dakota" (1989). *Agricultural Experiment Station Technical Bulletins*. 12.
http://openprairie.sdstate.edu/agexperimentsta_tb/12

This Book is brought to you for free and open access by the SDSU Agricultural Experiment Station at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Agricultural Experiment Station Technical Bulletins by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact michael.biondo@sdstate.edu.

TB 92

Squash Bugs of South Dakota

Agricultural Experiment Station
South Dakota State University
U.S. Department of Agriculture

TB 92

Squash Bugs of South Dakota

Burruss McDaniel
Professor, Plant Science Department
South Dakota State University

COREIDAE (HEMIPTERA: HETEROPTERA)

The family Coreidae is best known because of the destructive habit of the squash bug, Anasa tristis, on squash, pumpkin, cucumber, and other members of the cucurbit family in the United States. The family, represented by various species, is found throughout the world. However, only 13 species are found in South Dakota. Lethierry and Severin (1894) supplied us with the earliest and most complete catalog of these bugs. They listed 1,320 species and divided them into 29 subfamilies. Van Duzee (1917), in his catalog of the Hemiptera of America north of Mexico, listed 125 species which he divided among 48 genera and five subfamilies. Two of these subfamilies Alydinae and Corizinae were elevated to family rank by Parshley (1923) and Blatchley (1926). Torre–Bueno (1941) listed 76 species for the family Coreidae in the United States. He recognized 29 genera, 9 tribes, and 3 subfamilies in the Coreidae and used the family rank for the Alydinae and Corizinae.

Schaefer (1965) recognized four subfamilies, Pseudophloeinae, Meropachydinae, Coreinae and Agriopocorinae (this latter extrazimital). Baranowski and Slater (1986), in their Coreidae of Florida, listed 120 species dispersed among 18 genera, 9 tribes and 3 subfamilies.

The material examined in this work is deposited in the SDSU H.C. Severin Insect Museum and represents an accumulation of years of collecting by Dr. H.C. Severin from 1919 until his death in 1954.

The family Coreidae is characterized as follows: Antennae four–segmented, inserted above the eye; rostrum four– segmented; scutellum triangular, small to medium in size, not reaching middle of body; hemelytra composed of clavus, corium, and membrane, the membrane furnished with numerous veins frequently forked or anastomosing; tarsi three–segmented; ocelli present; metathoracis scent gland auricle distinct, short, rounded; female ovipositor plates flattened, "plate like." Abdominal trichobothria present. Male parameres internal, must be dissected for study. Nymphs have doral abdominal scent gland openings between terga 4–5 and 5–6.

Key to South Dakota Subfamilies of Coreidae

(From Baranowski and Slater, 1986)

1. *Posterior tibiae with a distinct tooth or spine at distal ends . . . . . Meropachydinae*
   Posterior tibiae without a distinct tooth or spine at distal ends 2

2. *Head anterior to eyes with a median sulcus; tibiae usually sulcate on outer surface . . . . . Coreinae*
   Head anterior to eyes lacking a median sulcus; tibiae not sulcate on outer surface . . . . . Pseudophloeinae

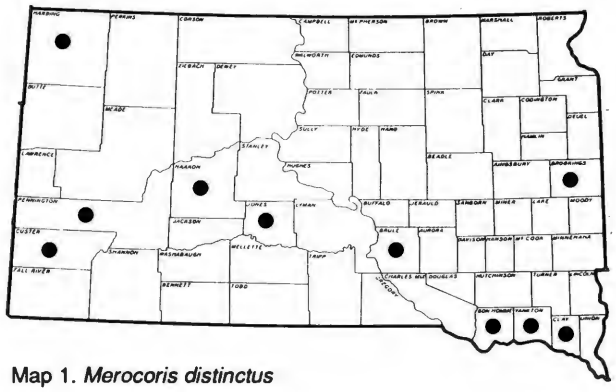
Subfamily Meropachydinae

This subfamily is represented by a single species in South Dakota. The distinct tooth or spine at the distal ends of the tibiae separates the single species from all the rest of the coreids in South Dakota.

Merocoris distinctus (Dallas).
(fig. 1, map 1)
(Determination labels – H.M. Harris, H.M. Parshley)

DISTRIBUTION – Alabama, Arkansas, Iowa, Kansas, Maine, Mississippi, Missouri, New York, Oklahoma, South Dakota; Wisconsin (Deay, 1928, Drew and Schaefer, 1962; Froeschner, 1942; Harris, 1937; Parshley, 1922; Torre–Bueno (1941); Van Duzee, 1917).

Fig 1. *Merocoris distinctus*



Map 1. *Merocoris distinctus*

DESCRIPTION – Head not prolonged in front; antennal segment I constricted basally, setae of antennae thick and bristle–like, antennal segment IV subequal to or longer than II and III combined; labium shorter than or just reaching mesocoxae; eyes prominent, subglobular; scutellum short, triangular, with apex acute; apical margin of corium long, oblique, sinuate, outer angle acute; membrane reaching tip of abdomen, its veins very numerous, simple, connexivum narrowly exposed; apices of tibiae ending beneath in a short, projecting spine; hind femora curved, strongly clavate, basal halves slender, apical halves thickened, spined beneath.

LIFE HISTORY – Recorded as associated with carrion. Fifth–instar nymph, reared on green bean in laboratory, molted into adult. Apparently one generation per year, overwintering as adult, adult collected on goldenrod in Wisconsin, from Ambrosia trifida L. and Cassia sp. in grasslands. (Engelhardt, 1912; Drew and Schaefer, 1962; Froeschner, 1942; Parshley, 1914; Yonke and Medler, 1969).

RECORDS:
Bon Homme Co., Springfield, June 14, 1928, H.C. Severin.

Brookings Co., Brookings, August 2, 1922; August 3, 1928; July 6, 1933; June 22, 1939, H.C. Severin, N.P. Lawson.
——————— Lake Hendricks, August 17, 1923, H.C. Severin.
——————— Lake Oakwood, August 24, 1923, H.C. Severin.
——————— Warrens Woods, September 25, 1925, H.C. Severin.
Brule Co., Brule Agency, August 23, 1929, H.C. Severin.
Clay Co., Centerville, August 5, 1941, J.A. Lofgren.
——————— Vermillion, June 8, 1921, H.C. Severin.
Custer Co., Custer, no date, H.C. Severin.
——————— State Game Park, September, 1923, H.C. Severin.
Haakon Co., Nowlin, June 25, 1928, H.C. Severin.
Harding Co., Buffalo, June 20, 1925, H.C. Severin.
Jones Co., Capa, August 10, 1919, same 18, 1919, H.C. Severin.
Pennington Co., Rapid City, June 24, 1923; September 9, 1923, H.C. Severin.
Yankton Co., Yankton, August 7, 1916; September 27, 1923, H.C. Severin.

Additional records:
Iowa, Ames, September 3, 1923, H.C. Severin.

South Dakota: 33
Iowa: 1
Total collection: 34

Key to South Dakota Tribes of Coreinae

(Adapted from Baranowski and Slater, 1986)

1. *Posterior tibiae dilated on one or both sides to form thin, leaf-like plates* 2
1'. *Posterior tibiae simple, subcylindrical, terete, or if somewhat flattened, not expanded as leaf-like dilations* 3

2. *Tylus compressed, projecting upward between antenniferous tubercles in the form of a triangular spine* . . . . . *Acanthocephalini*
2'. *Tylus either porrect or deflexed before distal end of juga but never projecting upward in the form of a triangular spine* . . . . . *Anisoscelini*

3. *Rostrum relatively elongate, extending posteriorly to posterior coxae; antennal segments 2 and 3 three-sided* . . . . . *Chelinidini*
3'. *Rostrum relatively short, at most extending posteriorly to middle coxae* 4

4. *Posterior femora not armed below with teeth, at most 2 or 3 small spines present, frequently mutic, not strongly incrassate in males; anterior portion of lateral margins of pronotum either armed with distinct teeth or unarmed* 5
4'. *Posterior femora armed below with numerous teeth, strongly incrassate in males; anterior portion of lateral pronotal margins toothed or crenulate* 6

5. *Neither juga nor tylus strongly deflexed, head not appearing incised anteriorly; antenniferous tubercles not prominently produced* . . . . . *Coreini*
5'. *Juga and tylus strongly, abruptly deflexed; head appearing incised anteriorly; third antennal segment flattened and rounded into a leaf-like plate distally; antenniferous tubercles bearing a distinct spine* . . . . . *Chariesterini*

6. *Antenniferous tubercles with a distinct spine present; metathoracic scent gland auricle with a single disc; ocellar tubercle large* . . . . . *Acanthocerini*
6'. *Antenniferous tubercles lacking a distinct spine; metathoracic scent gland auricle terminating in a pair of divergent discs; ocellar tubercle small* . . . . . *Nematopini*

TRIBE ACANTHOCEPHALINI Stal 1870

Hind tibiae expanded and flattened in both sexes; tylus compressed, projecting upward between antenniferous tubercles in the form of a triangular spine; posterior femora of males greatly enlarged; all femora of both sexes spinose ventrally.

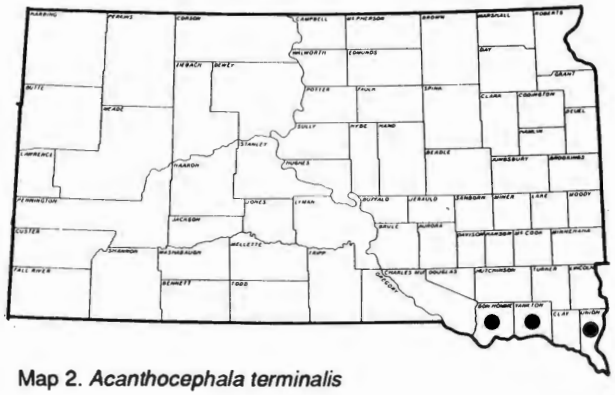
This tribe is represented by a single species in South Dakota. The triangular spine–like form of the tylus separates the single species from all the rest of the coreids in South Dakota.

Acanthocephala terminalis (Dallas).
(fig. 2, map 2)
(Determination labels – H.M. Harris)

DISTRIBUTION – Colorado, Connecticut, Florida, Illinois, Kansas, Louisiana, Massachusetts, Michigan, Missouri, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, South Dakota, Texas, Wisconsin (Baranowski and Slater, 1986; Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Hussey, 1922; Torre–Bueno, 1941; Van Duzee; 1917 Yonke and Medler, 1969).

DESCRIPTION – Color black, brown, or reddish brown, dilation of posterior tibiae in both sexes extending two thirds or more of the entire length of tibia, deeply scalloped; antennal segment IV pale, first 3 segments reddish brown; humeral angles of pronotum obtusely rounded with tubercles weakly developed, at most moderately expanded, extending laterally, at most, only slightly beyond lateral abdominal margin (Baranowski and Slater, 1986; Dallas, 1852; Torreo–Bueno, 1941).

Fig 2. *Acanthocephala terminalis*



Map 2. *Acanthocephala terminalis*

LIFE HISTORY – Found associated with trees, shrubs, along woodland margins, in weedy fields; adults overwinter; description of immature stages studied for Wisconsin; feeding observed on Rhus typhina L., Vitis riparia Michx., Physocarpus opulifolius (L.) Maxim., collected from Fraxinus spp., Rubus sp., Tilia americana L., Desmodium glutinosum (Muhl. ex Willd,) Wood., Ulmus rubra Muhl., Fraxinus americana L., Celtis laevigata Willd., Baccharis neglecta Britt., Eupatorium perfoliatum L., Eupatorium purpureum, Solidago spp., Carya spp. Reported as being parasitized by Trichopoda plumipes and Trichopoda sp. (Arnaud, 1978; Blatchley, 1926; Drew and Schaefer, 1962; Torre–Bueno,1941; Yonke and Medler, 1969).

RECORDS:
Bon Homme Co., Springfield, August 27, 1926; August 26, 1929; August 10, 1933; September 8, 1934; September 18, 1948, H.C. Severin.
Union Co., Elk Point, September 8, 1924; September 15, 1925, H.C. Severin.
Yankton Co., Yankton, September 27, 1923; August 18, 1927, H.C. Severin.

South Dakota: 15
Total collection: 15

TRIBE ANISOCELINI Amyot and Serville 1843

Tylus not compressed or curved upward as a triangular spine; posterior femora straight, only slightly thicker than other femora; posterior tibiae widely dilated, leaf–like.

This tribe is represented in South Dakota by the genus Leptoglossus and two species.

Key to the South Dakota Species of the Genus Leptoglossus Guerin

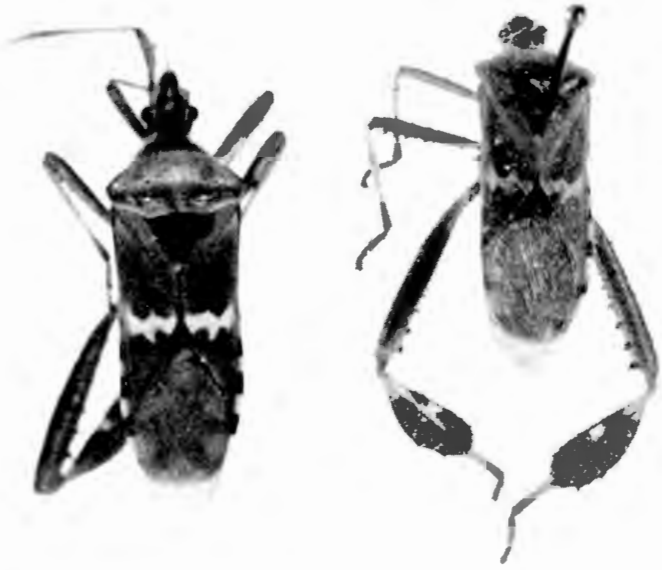
1. *Tylus extended into a long spine-like projection . . . . . L. clypealis*
1'. *Tylus not extended into a long spine-like projection, apex of head pointed or rounded; pronotum finely punctate, not rugose; antennal segment IV equal to or shorter than III; outer expansion of posterior tibiae reaching only two thirds the length of the tibia . . . . . L. occidentalis*

Leptoglossus clypealis Heidemann.
(figs. 3a, 3b, 4, map 3)
(Determination labels H.M. Harris)

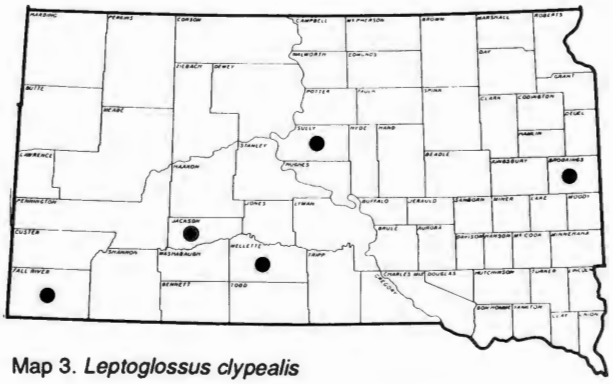
DISTRIBUTION – Arizona, California, Colorado, Kansas, New Mexico, Oklahoma, Oregon, South Dakota, Utah (Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Torre–Bueno, 1941; Van Duzee, 1917).

DESCRIPTION – Rostrum extended beyond hind coxae to abdomen; tylus extended into a long spine–like projection; antennae reddish–brown, basal segment with black line exteriorly; legs reddish–brown, hind femora sulcate beneath, armed with double row of stout black spines, upper side mostly blackish streaked; tibia expansion spatulate, extending toward apex, surface of the membranous expansion dark brown, with numerous small yellow spots (Deay, 1928; Heidemann, 1910; Torre–Bueno, 1941)

LIFE HISTORY – Collected from ornamental pomegranate, observed feeding on Rhus aromatica Ait. (Froeschner, 1942; Torre– Bueno, 1941).



Figs 3a,b. *Leptoglossus clypealis*



Map 3. *Leptoglossus clypealis*

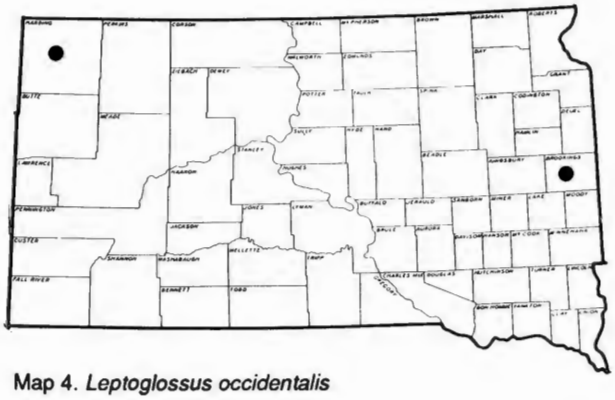
Fig 4. *Leptoglossus clypealis*

RECORDS:
Brookings Co., Brookings, September 6, 1938, H.C. Severin.
Fall River Co., Hot Springs, August 20, 1932, F.R. Bigham.
Jackson Co., Interior, August 29, 1922, H.C. Severin.
Mellette Co., Cedar Butte, April 27, 1938, L.K. Brunn.
Sully Co., Onida, June 25, 1932, G.B Spawn.

South Dakota: 12
Total collection: 12

Leptoglossus occidentalis Heidemann
(fig. 5, map 4)
(Determination labels H.M. Harris, H.M. Parshley)

DISTRIBUTION – California, Colorado, Idaho, South Dakota (Harris, 1937; Parshley, 1922; Torre–Bueno, 1941; Van Duzee, 1917).



Map 4. *Leptoglossus occidentalis*

DESCRIPTION – Rostrum extending beyond middle coxae; apex of head pointed, tylus not extended into a long spine–like projection; outer expansion of posterior tibiae reaching only two thirds the length of tibia (Torre–Bueno, 1941).

LIFE HISTORY – Unknown.

Fig 5. *Leptoglossus occidentalis*

RECORDS:
Brookings Co., Brookings, September 7, 1923, H.C. Severin.
Harding Co., Buffalo, September 10, 1948, H.C. Severin.

South Dakota: 2
Total collection: 2

TRIBE ACANTHOCERINI Bergroth 1913

Head quadrate, prominent postocular tubercles present with ocelli on distinct tubercles; antenniferous tubercles armed with prominent spines; fourth antennal segment relatively short, robust; femora at least moderately incrassate, usually armed below subdistally on ventral surface; posterior femora markedly incrassate in males (Baranowski and Slater, 1986).

Only a single genus and species of this tribe is recorded from South Dakota.

Genus Euthochtha Mayr

Head with tylus strongly declivent, not projecting forward of bases of antennae; antennal tubercles prominent, with a blunt spine projecting laterally, exceeding tylus; pronotum with lateral margins toothed, each antero–lateral angle produced into a short tooth; humeri rounded, crenulate; connexivum projecting laterad of margins of hemelytra; femora armed below, hind femora curved, tuberculate above; tibiae with small spines on inner margin; antennal vestiture of inconspicuous slender hairs (Baranowski and Slater, 1986; Torre–Bueno, 1941).

Euthochtha galeator (Fabricius)
(fig. 6, map 5)
(Determination labels H.M. Harris, H.M. Parshley)

DISTRIBUTION – California, Connecticut, Florida, Illinois, Iowa, Kansas, Massachusetts, Michigan, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Virginia, Wisconsin (Baranowski and Slater, 1986; Deay, 1928; Drew and Schaefer, 1962; Ebeling, 1959; Froeschner, 1942; Harris, 1937; Mitchell, 1980a; Parshley, 1922; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969).

DESCRIPTION – Dull yellow to reddish–brown above, marked with fuscous punctures over pronotum and hemelytra; antennae reddish–brown or yellow, terminal segment darker than rest of antenna; connexivum

Map 5. *Euthochtha galeator*

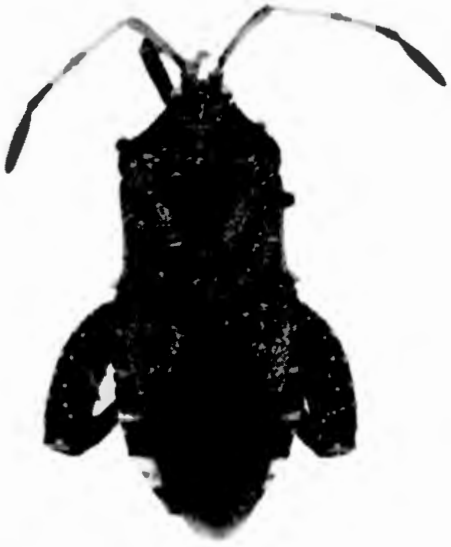


Fig 6. *Euthochtha galeator*

reddish–brown, margins of segments fuscous, marked with yellow, under surface yellow or reddish–brown with fuscous dots; scutellum finely transversely rugulose.

LIFE HISTORY – Territorial defense has been observed in males; death feigning is common; nymphal aggregating occurs; food plants include observations on Agrimonia gryposepala Wallr., Achillea millefolium L., Aster pilosus Willd., Monarda fistulosa L., Desmodium glutinosum (Muhl.ex Wild.)Wood, Quercus ellipsoidalis Hill, oranges, citrus, potted lychee plants, Rudbeckia hirta L., Solidago canadensis L., Conyza canadensis (L.) Cronq., Amphicarpaea bracteata (L.) Fern., Aureolaris glandiflora (Benth.) Pennell var. pulchra Pennell, Carya sp., Ulmus rubra Muhl., Aster ericoides L.(nymph), roses, Solanum sp., Bidens sp., Flaveria linearis Lag., Lyonia marianna Parks, Gaura parviflora Dougl., Ambrosia trifida L., Cirsium texanum Buckl., Heterotheca latifolia Buckl., Baccharis neglecta Britt., Ratibida columnifera (Nutt.), Woot. & Standl., bush beans, Prunus americana Marsh., and Urtica dioica L. (eggs); one generation a year in the north; adults overwintering; eggs parasitized by Ooencyrtus anasae (Ashmead), Ooencyrtus sclisiocampae (Ashmead), Anastatus spearsalli (Ashmead), Trichopoda pennipes (Fabricius) (Arnaud, 1978; Baranowski and Slater, 1986; Ebeling, 1959; Froeschner, 1942; Griffiths and Thompson, 1957; Hubbard, 1885; Hussey, 1922; Mead, 1981; Mitchell, 1980b; Torre–Bueno, 1908; Yonke and Medler, 1969).

RECORDS:

Bon Homme Co., Springfield, June 21, 1924, September 7, 1924, June 16, 1926, August 27, 1926, August 26, 1929, June 24, 1938, September 13, 1948, H.C. Severin.

Lincoln Co., Canton, August 27, 1923, September 4, 1946, H.C. Severin.

Yankton Co., Yankton, August 27, 1923, September 5, 1928, H.C. Severin.

South Dakota: 20
Total collection: 20

TRIBE NEMATOPINI Amyot and Serville 1843

Femora slightly incrassate, hind femora markedly so in males; anterior femora armed distally on ventral surface with two spines; abdominal venter unarmed; metathoracic scent gland auricle terminating in a pair of divergent discs; ocellar tubercle small.

Key to the Genera of Nematopini of South Dakota

(From Baranowski and Slater, 1986)

1. *Mesosternum with a distinct longitudinal groove or sulcus behind anterior coxae; margins elevated . . . . . Mozena*

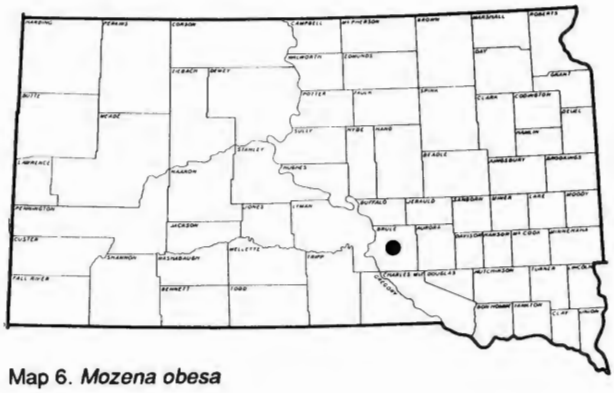
1'. *Mesosternum behind anterior coxae not or at most very shallowly and indistinctly grooved or sulcate; margins not elevated . . . . . Piezogaster*

Genus Mozena Amyot and Serville

Large species; head compressed, deflexed between cheeks; antennae stout, basal segment feebly curved, longer than head, 3 and 4 subequal, shorter than 2; mesosternum with distinct longitudinal groove or sulcus behind anterior coxae; pronotum strongly declivent, lateral margins nodulose, humeri produced laterally; femora armed at least distally with spines on ventral surface; posterior femora swollen (Baranowski and Slater, 1986; Blatchley, 1926; Drew and Schaefer, 1962).

Mozena obesa Montandon
(fig. 7, map 6)
(Determination label H.M. Harris)

Fig 7. *Mozena obesa*



Map 6. *Mozena obesa*

DISTRIBUTION – Florida, Kansas, Mississippi, Missouri, Nebraska, Oklahoma, South Carolina, South Dakota (Baranowski and Slater, 1986; Deay, 1928; Drew and Schaefer, 1962; Froeschner, 1942; Torre–Bueno, 1941; Van Duzee, 1917).

DESCRIPTION – Adult brown to dark reddish–brown; scutellum transversely rugose, punctate, yellowish; connexivum broadly exposed, reflexed, marked with brown and yellow; antennae reddish brown; truncate hind margin of pronotum wider than base of scutellum; abdomen with small prominent spine or tooth at posterior angle of each segment (Baranowski and Slater, 1986; Drew and Schaefer, 1962; Torre–Bueno, 1941).

LIFE HISTORY – Adults and nymphs collected from Schrankia uncinata Willd., Prosopis glandulosa Torr., The single specimen recorded from South Dakota was collected in an area where the species Schrankia nuttalli (DC. ex Britt. & Rose) Standl. (sensitive briar) grows (Froeschner, 1942; Mitchell (unpub.) in Baranowski and Slater, 1986).

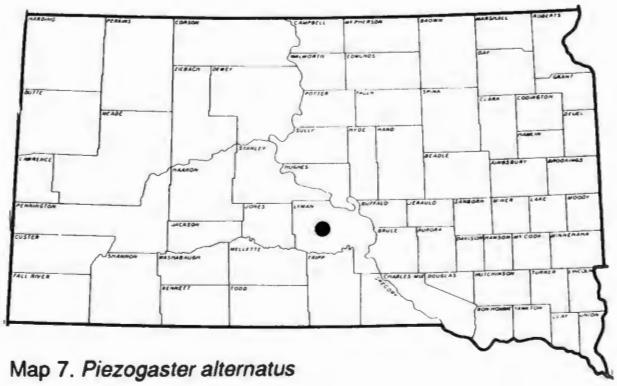
RECORDS:
Brule Co., Chamberlain, August 31, 1923, H.C. Severin.

South Dakota: 1
Total collection: 1

Genus Piezogaster Amyot and Serville

Head triangular; postocular tubercles distinct, forming a smooth curve with eye; antenniferous tubercles lacking outward directed spines; pronotum variable, humeral angles obtuse; mesosternum behind anterior coxae not or at most very shallowly and indistinctly grooved or sulcate, margins not elevated; all femora armed below, at least distally, with conspicuous spines; posterior femora markedly incrassate in males, less so in females; posterior tibiae rounded or slightly flattened in females; curved and flattened, but not dilated in males (Baranowski and Slater, 1986).

Piezogaster alternatus (Say)
(fig. 8, map 7)
(Determination labels H.M. Harris)



Map 7. *Piezogaster alternatus*

Fig 8. *Piesogaster alternatus*

DISTRIBUTION – Colorado, Florida, Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, New Jersey, North Carolina, Oklahoma, South Dakota, Tennessee, Virginia, Wisconsin (Baranowski and Slater, 1986; Blatchley, 1926; Deay, 1928; Drew and Schaefer, 1962; Hoffman,1975; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969).

DESCRIPTION – Truncate hind margin of pronotum wider than base of scutellum; antennal tubercles not spinose; connexivum marked with alternating yellow and brown; femora with numerous erect dark bristle–like hairs; hind femora of males strongly incrassate, those of females less incrassate; labium reaching middle of mesosternum; antennae with basal segment stoutest, equal in length to segments 2,3 (Baranowski and Slater, 1986; Blatchley, 1926; Drew and Schaefer, 1962).

LIFE HISTORY – There is one generation per year; overwintering stage is adult; eggs found in Wisconsin June–July; first instar nymphs active June–July, second: June– August, third: June–August; fourth: July–Sepember, fifth: July–Sepember; adults copulating on ragweed, (Ambrosia trifida L.), goldenrod, (Solidago gigantea, S. canadensis L.), feeding on S. canadensis, Aster sagittifolius Wedemeyer ex Willd., Galium concinnum Torr. & Gray, Desmodium glutinosum (Muhl. ex Willd) Wood; eggs found on D. glutinosum upper surface of leaves; adults found predominantly on D. glutinosum throughout season; adults feed on horse–mint, (Monarda fistulosa), sunflower, (Helianthus decapetalus), collected on Aster sp., Rhobinia pseudoacacia; eggs observed on may apple (Podophyllum peltatum); nymphs found on hog–peanut, Amphicarpaca bracteata; first through fourth instar nymphs obligophagous; fifth instar polyphagous found resting and feeding on ragweeds, (A. artemisiifolia and A. trifida), hornewort, (Cryptotaenia canadensis) and D. glutinosum; adults feed on daisy fleabane, Erigeron annuus, skunk cabbage, Symplocarpus foetidus, collected on Aster sp. A. trifida, Solidago spp.; adults feign death; parasites found, eggs A. natus, Ooencyrtus clisiocampae, Anastatus spearsalli; adult Trichopoda pennipes, T. lanipes; incubation period eggs 10 days, enclosion by means of pseudopercular cap (Arnuad, 1978, Baranowski and Slater, 1986, Yonke and Medler, 1969).

RECORDS:
Lyman Co., Iona, June 25, 1931, H.C. Severin.

Additional records:
Iowa, Ledges Park, September 17, 1927, Harris & Johnston.

South Dakota: 1
Iowa: 2
Total collection: 3

TRIBE CHARIESTERINI Stal 1867

Antenniferous tubercles spined above; segment 3 of antennae dilated and flattened, leaf–like; pronotal humeri spinose; femora 1,2,3 with short spine near distal end; tibiae terete.

This tribe contains only a single genus found in the United States.

Genus Chariesterus Laporte

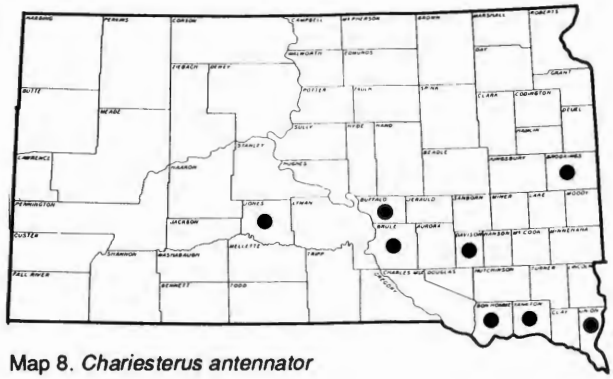
Small species; head subquadrate, deeply cleft, visible pit in front of each ocellus; antenniferous tubercles prominent with acute forward projecting spine; first antennal segment three–sided; second rounded or slightly three–sided; third segment strongly dilated and flattened; pronotum with prominent spinose humeri, lacking anterior collar; hemelytral membrane fuscous, veins parallel, anastomosing (Baranowski and Slater, 1986; Torre–Bueno, 1941).

Chariesterus antennator (Fabricius)
(fig. 9, map 8)
(Determination labels M.M. Harris, H.M. Parshley)

DISTRIBUTION – Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Mississippi, New Jersey, New York, Nebraska, North Carolina, Oklahoma, Pennsylvania, South Dakota, Texas, Virginia, Wisconsin (Ashmead, 1895; Baranowski and Slater, 1986; Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Hart, 1907; Hoffman, 1975; Hussey, 1922; Parshley, 1922; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969).

DESCRIPTION – Elongate, slender, gray or reddish–brown; third antennal segment flattened and dilated, black, other antennal segments are reddish–brown; front and hind margins of humeral angles toothed; head with black spines anterior to ocelli and behind compound eyes;

Fig 9. *Chariesterus antennator*



Map 8. *Chariesterus antennator*

femora armed below distally with a prominent small black spine (Baranowski and Slater, 1986; Blatchley, 1926; Deay, 1928; Torre–Bueno, 1941).

LIFE HISTORY – Found associated with goldenrod, in pollen, and flowers where it buries itself; egg described as triquetrous, of a golden–bronze color with fine hexagonal reticulations; frequently found in open fields, reported from Michigan dunes where it fed on Euphorbia corollata L.; collected by sweeping shortgrass highplains rangeland and sand– sage rangeland, tallgrass praire rangeland; occurs on Jersey tea, (Ceanothus americanus Torr. & Gray), Euphorbia spp., Asclepias spp., dwarfwillows, bushes, flowering spurge, Euphorbia corollata L., Ceanothus spp., Apocynum spp., Plantago spp., Rhus spp., Castanea pumila (L.), Solidago spp., cotton, Asclepias spp., coconut grove, pine woods; oviposited on Euphorbia corollata L.; last instar nymph with head, pronotum and margins of entire body armed with long forked or serrate spines; reported feeding on the cells of a sphecid wasp, Solierella inermis (Cresson) (Baranowski and Slater, 1986; Blatchley, 1926; Drew and Schaefer, 1962; Hart, 1907; Hoffman, 1975; Hussey, 1922; Kurzewski, 1967; Torre–Bueno, 1941).

RECORDS:
Bon Homme Co., Springfield, June 21, 1924, September 14, 1925, September 8, 1934, H.C. Severin.
Brookings Co., Brookings, May 27, 1921, H.C. Severin.
Brule Co., Chamberlain, June 22, 1941, H.C. Severin.
Buffalo Co., Ft. Thompson, June 28, 1946, H.C. Severin.
Davison Co., Mitchell, July 7, 1955, W.M. Hantsbarger.
Jones Co., Capa, August 30, 1919, H.C. Severin.
Union Co., Elk Point, June 24, 1926, June 25, 1926, June 27, 1946, J.A. Lofgren.
Yankton Co., Yankton, September 27, 1923, H.C. Severin.
Additional records:
Nebraska, Niobrara, August 10, 1923, H.C. Severin.
Oklahoma, Texhoma, September 1, 1950, H.C. Severin.

South Dakota: 20
Nebraska: 1
Oklahoma: 1
Total collection: 22

TRIBE CHELINIDINI Uhler 1863

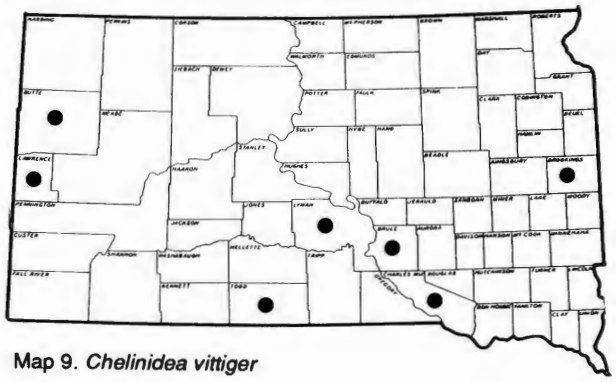
Head porrect, juga with subconical rather subacute apices with tylus deflexed between them; pronotal humeri rounded, not prominent, lateral margins of pronotum explanate; femora swollen; second and third antennal segments and tibiae three–sided (Baranowski and Slater, 1986)

Chelinidea vittiger Uhler
(figs. 10, 11, 11a, map 9)

DISTRIBUTION – Alabama, Arizona, California, Colorado, Georgia, Idaho, Kansas, Louisiana, Montana, New Mexico, Nebraska, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Virginia, Wyoming (Baranowski and Slater, 1986; Blatchley, 1926; Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Hoffman, 1975; Torre–Bueno, 1941; Van Duzee, 1917).

DESCRIPTION – Antennae with first three segments three–sided; head porrect, juga produced as conical subacute processes; pronotum broadly rounded, margins entire, explanate, posterior margin not emarginate; scutellum calloused, smooth, punctured; hemielytra in South Dakota material with white veins that are diagnostic; femora spinose distally below; tibiae three–sided; dorsal abdomen when exposed red. (Baranowski and Slater, 1986; Deay, 1928; Torre–Bueno, 1941).

Figs 10,11. *Chelinidea vittiger*



Map 9. *Chelinidea vittiger*

Fig 11A. *Chelinidea vittiger*

LIFE HISTORY – Hosts, Opuntia humifusa Raf., O. stricta Haw., O. lindhemeri Engelm. O. inermis DC, O. ficus indica (Australia), Cereus giganteus, Echinocereus spp., O. compressa; reared successfully on O. austrina and O. pusilla Haw.; adults hibernate on underside of cactus joints in Florida from December through February, appearing on surface of plants to feed during warm periods; adults emerge from hibernation in north Florida during February; oviposition begins in March, four generations develop annually in Florida; nymphs described by Hunter et al. (1912) and Hamlin (1924). In South Dakota adults hibernate in lower mulch layer of Opuntia, emerge in late May; oviposition observed in June; nymphs observed middle June; adults flash red abdomen when touched with a needle, wings remain in an upright position until danger has passed, seek hiding area in Opuntia; nymphs found at the base of plant, difficult to capture due to cactus needles, move to lower area if plant is cut in order to reach them; adults seldom fly but move to lower portion of plant; surrounding plants not infected; Herring (1980) reports that C. vittiger would starve rather than migrate to uninfested plants even if food supply was destroyed. Only a single population was observed, this area was burned by a prairie fire July 5, 1984, which ended the observation. C. vittiger was again found in this area on July 16, 1987, two nymphs were collected on this date (fig. 11a), along with two adults. The colony is still being studied to trace its spread to other cactus plants. (Baranowski and Slater, 1986; Hamlin, 1924; Herring, 1980; Hunter et al., 1912; McDaniel, 1983, (unpubl.observations); Mead and Herring, 1974; Mitchell (unpubl.) in Baranowski and Slater, 1986; Torre–Bueno, 1941).

RECORDS:
Brookings Co., Bijon Hills, October 20, 1943, H.C. Severin.
Brule Co., Chamberlain, August, 15, 1936, H.C. Severin.
Butte Co., Bell Fourche, July 1, 1936, N.P. Larson.
Charles Mix Co., Platte, May 25, 1942, H.C. Severin.
Lawrence Co., Spearfish, June 18, 1942, N.P. Larson.
Lyman Co., Oacoma, June 17, 1984, July 16, 23, 1987, July 20,26, August 12, 20, 1988, B. McDaniel.
Todd Co., Rosebud, June 17, 1936, G.I. Gilbertson.

Additional records:
Colorado, State Bridge, August 22, 1941, H.C. Severin.

South Dakota: 33
Colorado: 1
Total collection: 34

TRIBE COREINI Stal 1867

Head porrect, subquadrate, or subtriangular, produced slightly forward in front of bases of antennae; tylus elevated between antenniferous tubercles; pronotum hexagonal, margins simple, not spinose; hamus of hindwing hooked; femora normally unarmed or with one or two small spines; tibiae simple, cylindrical (Baranowski and Slater, 1986; Schaefer, 1965).

Key to the Genera and Species of Coreini of South Dakota

(Adapted from Baranowski and Slater, 1986)

1. *Posterior femora armed below with one or more spines . . . . . Anasa [A. armigera (Say)]*
1'. *Posterior femora not armed below with spines 2*

2. *Shelf-like plate present beneath antenniferous tubercle extending over lower rim of antennal articulation orifice; first antennal segment subequal in length to head; smaller than Anasa species found in South Dakota . . . . . Catorhintha [C. mendica Stal]*
2'. *Shelf-like raised plate absent below antenniferous tubercle; head dark colored; fourth antennal segment black; spine on head posterior to antenniferous tubercle absent; scutellum without pale midline . . . . . Anasa [A. tristis (DeGeer)]*

Genus Anasa Amyot and Serville

The genus Anasa is large and, as currently defined, is strikingly heterogenous. Baranowski has just completed a revision of the genus Anasa (personal comm. from Slater).

Anasa armigera (Say)
(fig. 12, map 10)
(Determination labels H.M. Harris, H.M. Parshley)

Map 10. *Anasa armigera*

Fig 12. *Anasa armigera*

DISTRIBUTION —Connecticut, Florida, Georgia, Indiana, Iowa, Kansas, Massachusetts, Maryland, New Jersey, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Texas, Virginia, Wisconsin (Baranowski and Slater, 1986; Blatchley, 1926; Britton,

1923; Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Torre–Bueno, 1941; Yonke and Medler, 1969).

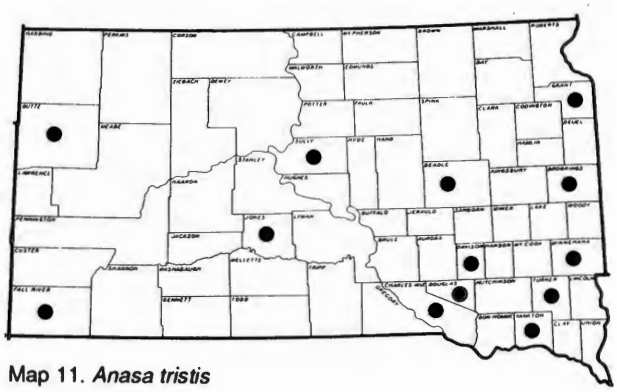
DESCRIPTION – First antennal segment with large black or dark brown spots; head spines arising behind base of antenniferous tubercles, extending dorso–laterally reaching beyond bases of antennae; humeral angles of pronotum produced, reflexed upward; connexivum dark brown to black, basal fourth of each segment pale yellow, exposed in female; pronotum concave or sinuate; legs yellow, marked with black dots (Baranowski and Slater, 1986; Blatchley, 1926; Drew and Schaefer, 1962).

LIFE HISTORY – Reported on Sicyos angulatus L. (one–seeded bur–cucumber), other cucurbits; 5 nymphal instars; 1 generation a year in the North; parasitized by Trichopota pennipes; collected beneath bark and by sweeping dense wet hammocks; eggs collected as late as September; more active than A. tristis, flying freely, seen on upper surface of leaves during the day; remains active after A. tristis has gone into hibernation (Arnaud, 1978; Baranowski and Slater, 1986; Blatchley, 1926; Chittenden, 1898; Hoffman, 1975; Torre–Bueno, 1941).

RECORDS:
Brookings Co., Brookings, July 10, 1931, G.B. Spawn.

Additional records:
Massachusetts, Northhampton, August 26, 1919, October 9, 1919, H.M. Parshley.

South Dakota: 1
Massachusetts: 2
Total collection: 3



Map 11. *Anasa tristis*

Fig 13. *Anasa tristis*

Anasa tristis (DeGeer)
(fig. 13, map 11)
(Determination labels H.M. Harris, H.M. Parshley)

COMMON NAME – Squash Bug.

DISTRIBUTION – Alabama, Arizona, California, Colorado, Connecticut, Florida, Illinois, Indiana, Iowa, Kansas, Maryland, Massachusetts, Michigan, New Jersey, New York, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Virginia, Wisconsin (Baranowski and Slater, 1986; Blatchley, 1926; Britton, 1923; Deay, 1928; Drew and Schaefer, 1962; Harris, 1937; Hoffman, 1975; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969).

DESCRIPTION – Fourth antennal segment black; no spine on head posterior to antenniferous tubercle; scutellum without pale midline; lateral margins of pronotum and tip of scutellum yellow; head brownish with narrow, pale yellow median line and with shorter yellow stripe on each side; covered over dorsal surface with dark punctures; connexivum with front half of each segment yellow, irregularly marked with fuscous punctures and blotches; membrane brown–black, reaching tip of abdomen; under surface and legs dull yellow; humeri not prominent, tips obtusely rounded; apex of corium sinuate near tip (Baranowski and Slater, 1986; Blatchley, 1926; Torre–Bueno, 1941).

LIFE HISTORY – Adults copulate and begin deposition of eggs in May or June, depending on the temperature and locality, attaching them to leaves in masses of three or four to 40 or more; eggs are metallic brown or

bronze, flattened on three sides, are laid on under side of leaf as a rule, in regular rows, whitish when first laid, hatch in 8 to 13 days; first instar nymphs green and black, live in colonies, tend to feed at dusk; second instar appears after 3 days, this stage lives 8–9 days before next molt; third molt requires 7–8 days, fourth stage 4–6 days, the fifth is final stage. If food is cleared away, this stage will seek shelter in rubbish, under boards or stones, old vines, or similar vegetation; it has been observed under loose bark of dead trees, cracks of barns where it passes the winter; in the east, hibernation begins in September; plants are first attacked in early summer by the hibernated stage; Trichopoda pennipes reported as an adult parasite; Ooencyrtus anasae, Hadronotus anasa, and Eupelmus reduvii are egg parasites (Arnaud, 1978, Baranowski and Slater, 1986; Chittenden, 1902)

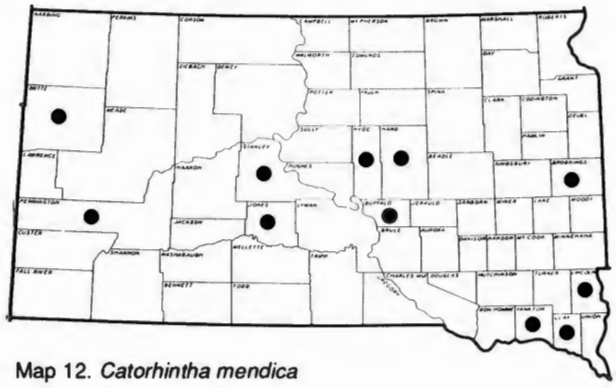
RECORDS:
Beadle Co., Huron, August 12, 1930, H.C. Severin.
Brookings Co., Brookings, June 23, 1937, L. Brunn, September 6, 1938, H.C. Severin, September 9, 1938, L. Brunn, September 18, 1936, R.D. Jones, July 16, 1979, B. McDaniel (cucumbers), September 1984, B. McDaniel, (cucumbers), October 1985, B. McDaniel (cucumbers).
Butte Co., Newell, July 29, 1923, H.C. Severin.
Charles Mix Co., Platte, August 7, 1921, August 23, 1921, H.C. Severin.
Davison Co., Mt. Vernon, August 21, H.C. Severin.
Douglas Co., Corsica, March 14, 1933, G.L. Gilbertson.
Fall River Co., Cascade Creek, July 6, 1938, V.E. Weyi.
Grant Co., Revillo, October 15, 1941, H.C. Severin.
Jones Co., Capa, August 15, 1922, H.C. Severin.
Minnehaha Co., Sioux Falls, July 2, 1932, G.L. Gilbertson.
Sully Co., Onida, July 15, 1933, G.L. Gilbertson.
Turner Co., Marion, September 2, 1924, H.C. Severin.
Yankton Co., Volin, August 29, 1923, H.C. Severin.

Additional records:
Iowa, Lincoln Co., Lake Shaokatan, (no date), H.C. Severin.
Michigan, Lansing, June 18, 1906, H.M. Parshley.
New York, Ithaca, June 20, 1906; June 28, 1906, H.M. Parshley.
Wisconsin, Madison, May 23, 1889, H.M. Parshley.

South Dakota: 117
Iowa: 1
Michigan: 1
New York: 6
Wisconsin: 1
Total collection: 126

Catorhintha mendica Stal.
(fig. 14, map 12)
(Determination labels H.M. Harris)

DISTRIBUTION – Arizona, Colorado, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, Virginia, Wisconsin (Balduf, 1957; Blatchley, 1926; Deay, 1928; Drew and Schaefer, 1962; Froeschner, 1942; Harris, 1937; Hoffman, 1975; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969). Baranowski and Slater (1986) state that C. mendica is not a member of the Florida fauna and the records by Barber and Fracker are mistaken identifications of C. guttula.



Map 12. *Catorhintha mendica*

Fig 14. *Catorhintha mendica*

DESCRIPTION – First antennal segment subequal in length to head; pronotum with disk in front of humeri quadrate, convex, evenly punctate; scutellum with numerous transverse wrinkles between rows of punctures; hind tibiae without leaf–like dilations; hind femora not swollen; osteolar auricle without anterior tubercle; antennal tubercles spined or tuberculate;

connexivum black–spotted; tylus convex, longer than juga, declivent between antennal bases; labium reaching middle coxae (Blatchley, 1926; Drew and Schaefer, 1962; Hoffman, 1975; Torre–Bueno, 1941; Yonke and Medler, 1969).

LIFE HISTORY – Host plant is Mirabilis nyctaginea (Michx) (wild four–o'clock); females lay 2–7 eggs per batch, hatched from 5–8 days; observed on Rhus aromatica Ait. (this plant is not regarded as a host plant); eggs and nymphs collected from wild four–o'clock, early instar nymphs collected from under involucral bracts which enclose flowers and seeds, later instar nymphs fed on petioles (Balduf, 1942,1957; Blatchley, 1926; Hoffman, 1975; Torre–Bueno, 1941; Yonke and Medler, 1969).

RECORDS:
Brookings Co., Brookings, September 16, 1913, May 28, 1921, August 19, 1931, October 1, 1931, H.C. Severin; July 12, 1983, September 23, 1984, August 18, 1985, B. McDaniel.
–––––––– Warren Woods, September 25, 1925, H.C. Severin.
–––––––– White, July 26, 1922, H.C. Severin.
Buffalo Co., Ft. Thomson, September 18, 1923, August 25, 1942, H.C. Severin.
Butte Co., Nisland, August 16 1950, H.C. Severin.
Clay Co., Vermillion, July 10, 1939, H.C. Severin.
––––––––, Volin, August 29, 1923, H.C. Severin.
Hand Co., Vayland, June 7, 1949, H.C. Severin.
Hyde Co., Highmore, July 15, 1945, H.C. Severin.
Jones Co., Capa, August 1, 1919, H.C. Severin.
Lincoln Co., Canton, August 27, 1923, August 16, 1927, H.C. Severin.
––––––––, Newton Hills, June 24, 1935, H.C. Severin.
Pennington Co., Rapid City, (no date), H.C. Severin.
Stanley Co., Fort Pierre, August 6, 1948, H.C. Severin.
Yankton Co., Yankton, August 30, 1923, H.C. Severin.

Additional records:
Minnesota, Browns Vallley, June 23, 1931, H.C Severin.

South Dakota: 29
Minnesota: 1
Total collection: 30

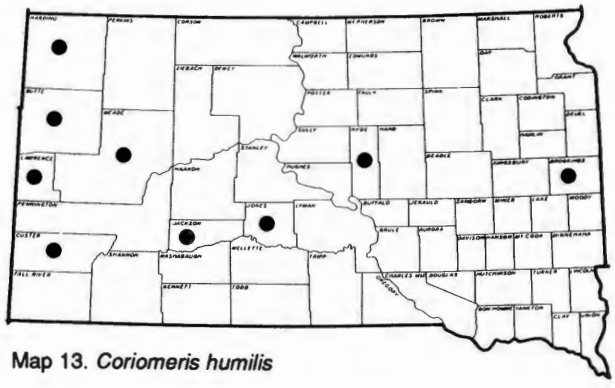
TRIBE PSEUDOPHLOEINAE Stal

Head produced anteriorly in front of bases of antennae; pronotum declivent, roughly granulate with each granule bearing a small adpressed setum; scent gland auricle with margins reduced; forewing membrane with curved vein remote from margin with small veins arising from it, anastomosing anteriorly, forked at apex; tibiae terete, not sulcate or dilated. (Baranowski and Slater, 1986; Blatchley, 1926).

This tribe is represented by a single species in South Dakota. Members of this tribe are distinguished by the absence of a tooth on the hind tibiae and the absence of a median sulcus anterior to the eyes.

Coriomeris humilis (Uhler)
(fig. 15, map 13)
(Determination labels H.M. Harris)

DISTRIBUTION – Arizona, California, Colorado, Connecticut, Idaho, Illinois, Kansas, Michigan, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, Wisconsin, Wyoming (Blatchley, 1926; Deay, 1928; Dolling and Yonke, 1976; Torre–Bueno, 1941; Van Duzee, 1917; Yonke and Medler, 1969). Baranowski and Slater (1986) regarded the C. humilis record from Florida by Torre–Bueno as improbable. Dolling and Yonke (1976) did not find it in Florida. Also on their Figure 6, they do not show it as occurring in North Dakota. However, in the text, Dolling and Yonke cite Hussy's (1922) records from Amidon and Fargo, North Dakota. Dolling and Yonke also do not record it from Texas; however, Van Duzee (1917 records it from Texas, and, if this is Uhler's record, it is questioned by Dolling and Yonke).



Map 13. *Coriomeris humilis*

Fig 15. *Coriomeris humilis*

DESCRIPTION – Pronotum with lateral margin almost straight, humeral angles scarcely produced; longest setae of pronotal lateral margin together with tubercular base shorter than dorsal transverse width of eye; antennal segment 1 with setae short and apically truncate; length of longest setae inclusive of tubercular base less than half diameter of segment (Dolling and Yonke, 1976).

LIFE HISTORY – Host plants recorded are Hedysarum boreale Nutt., Medicago sativa L., Oxytropis lambertii Pursh., Astragalus beckwithii T.&G., Salix spp. casual resting plants; feeding records have been recorded from Trifolium, Medicago, and Melilotus; overwinters as an adult; one generation per year; possible hybrids with C. insularis Dolling and Yonke; lives at altitudes of up to 11,200 ft; distribution pattern indicates that humid, cold winters are normal for this species (Dolling and Yonke, 1976).

RECORDS:

Brookings Co., Brookings, July 11, 1931, G.B. Spawn; June 11, 1941, N.P. Larson.
Butte Co., Newell, June 28, 1923, H.C. Severin.
Custer Co., Pringle, September 14, 1930, H.C. Severin.
Harding Co., Buffalo, June 19, 1925, H.C. Severin.
Hyde Co., Highmore, June 14, 1948, H.C. Severin.
Jackson Co., Interior (Bad Lands), June 15, 1948, H.C. Severin.
--------, Wall (Bad Lands), July 26, 1948, H.C. Severin.
Jones Co., Capa, August 12, 1921, H.C. Severin.
Lawrence Co., Spearfish, June 18, 1942, N.P. Larson (from sugar beet).
Meade Co., Fox Ridge, June 28, 1947, H.C. Severin.

Additional records:

Iowa, Ledges Park, September 17, 1927, Harris & Johnston.

South Dakota: 18
Iowa: 1
Total collection: 19

LITERATURE CITED

Arnaud, P.H. 1978. A host–parasite catalog of North American Tachinidae (Diptera). USDA Agr Misc Publ 1319, 860 p.

Ashmead, W.H. 1895. Notes on cotton insects found in Mississippi. Insect Life 7:320–326.

Balduf, W.V. 1942. Bionomics of Catorhintha mendica Stal (Coreidae: Hemiptera). Bull Brooklyn Ent Soc 37:158–66.

--------. 1957. Spread of Catorhintha mendica Stal. (Coreidae; Hemiptera). Proc, Ent Soc Washington 59:176–85.

Baranowski, R.M., and J.A. Slater. 1986. Coreidae of Florida (Hemiptera: Heteroptera). Arthropods of Florida and Neighboring Land Areas, Fl Dept Agr 12(630): 1–82.

Blatchley, W.S. 1926. Heteroptera of Eastern North America. Nature Publ Co, Indianapolis. 1116 pp.

Britton, W.E. 1923. Hemiptera of Connecticut. State Geological and Nat Hist Survey, 34:1–805.

Chittenden, F.H. 1898. New squash bug. Canadian Ent 30:239–40.

--------. 1902. Common squash bug (Anasa tristis DeG.). USDA Circ, Div Ent 39:1–5.

Dallas, W.S. 1852. List of the specimens of hemipterous insects in the collection of the British Museum 2:369–592.

Deay, H.O. 1928. Coreidae of Kansas. Uni Kans Sci Bull 18:371–415.

Drew, W.A., and K. Schaefer. 1962. Coreidae of Oklahoma (Hemiptera). Proc, Oklahoma Acad Sci 43:112–22.

Dolling, W.R. and T.R. Yonke. 1976. Genus Coriomeris in North America. Ann Ent Soc America 69:1147–52.

Ebeling, W. 1959. Subtropical fruit pests. Uni California Div Agr Sci. 436 p.

Engelhardt, G.P. 1912. Hemipteron on carrion. J New York Ent Soc 20:294.

Froeschner, R.C. 1942. Contributions to a synopsis of the Hemiptera of Missouri. II Coreidae, Aradidae, Neididae, American Midl Nat 27:591–609.

Griffiths, J.T. and W.L. Thompson. 1957. Insects and mites found on Florida citrus. Uni Florida AES Bull 591:86.

Hamlin, J.D. 1924. Review of the genus Chelinidea (Hemiptera–Heteroptera) with biological data. Ann Ent Soc America 17:193–208.

Harris, M.H. 1937. Contributions to the South Dakota list of Hemiptera. Iowa State College Jour of Sci 11:169–76.

Hart, C.A. 1907. On the biology of the sand areas of Illinois. Part III. Zoological studies in the sand regions of the Illinois and Mississippi River Valleys. Bull Illinois St Lab Nat Hist 7:195–267.

Heidemann, O. 1910. New species of Leptoglossus from North America (Hemiptera–Coreidae). Proc, Ent Soc Wash 12:191–97.

Herring, J.L. 1980. Review of the cactus bugs of the genus Chelinidea with the description of a new species (Hemiptera:Coreidae). Proc, Ent Soc Washington 82:237–51.

Hoffman, R.L. 1975. Insects of Virginia. no 9. Squash, broad–headed and scentless plant bugs of Virginia (Hemiptera:Coreoidea:Coreidae, Alydidae, Rhopalidae). Virgina Polytech. Ist Res Div Bull 105:1–52.

Hubbard, H.G. 1885. Insects affecting the orange. USDA Div Ent 48th Congress, 2nd Session, House of Representatives, Misc Doc No. 40, U.S. GPO, Washington, D.C. 227 p.

Hunter, W.D., E.C. Pratt, and J.D. Mitchell. 1912 (1913). Principal cactus insects of the United States. Bull, USDA Div Ent (N,S.) 113:1–71.

Hussey, R.F. 1922. Hemiptera from Berrien County, Michigan. Occas Papers Mus Zool Un Michigan 118:1–39p.

Kurzewski, F.E. 1967. Note on the nesting behavior of Solierella sp? inermis (Hymenoptera:Sphecidae, Larrinae). J Kansas Ent Soc 40:203–8.

Lethierry, L., and G. Severin. 1894. Catalogue generale des Hemipteres. Tome II. Mus Hist Nat Belge, Brussels. 277p.

McDaniel, B. 1983. Observations on a colony of Chelinidea vittiger on a cactus plant in the Missouri River breaks near Oacoma, South Dakota. Unpublished Ann Rep, South Dakota AES, Brookings. 8 p.

Mead, F.M., 1981. Coreid bug Euthochtha galeator (Fabricius) in Florida (Hemiptera:Coreidae). Florida Dept and Consumer Serv, Div Pl Ind Circ 222:1–4.

-------- and J.L. Herring. 1974. Cactus bug Chelinidea vittiger aequoris McAtee in Florida (Hemiptera: Coreidae). Fla Dept and Consumer Serv, Div Pl Ind Entomol Circ 194:1–2.

Mitchell, P.L. 1980a. Host plant utilization by leaf footed bugs: an investigation of generalist feeding strategy. Ph.D. dissertation. Uni Texas, Austin. 226 p.

--------. 1980b. Combat and territorial defense of Acanthocephala femorata (Hemiptera: Coreidae). Ann Entomol Soc America 73:404–408.

Parshley, H.M. 1914. List of the Hemiptera–Heteroptera of Maine. Psyche 21:139–149.

--------. 1922. Report on a collection of Hemiptera–Heteroptera from South Dakota. TB 2, SD St Coll. 22p.

--------. 1923. Families Coreidae, Alydidae and Corizidae. Bull Conn Geol Nat Hist Survey 34:746–53.

Schaefer, C.W. 1965. Morphology and higher classification of the Coreoidea (Hemiptera–Heteroptera). Part III. Families Rhophaidae, Alydidae, and Coreidae. Misc Publ Entomol Soc Amer 5:1–76.

Torre–Bueno, J.R. de la. 1908. Notes on Heteroptera. Canadian Entomol Soc 16:61.

--------. 1941. Synopsis of the Hemiptera – Heteroptera of America north of Mexico; Part II. Families Coreidae, Alydidae, Corizidae, Neididae, Pyrrhocoridae, and Thaumastotheriidae. Entomol Amer 21 (n.s.): 99–108.

Van Duzee, E.P. 1917. Cataloque of the Hemiptera of America north of Mexico. Uni Calif Pub Entomol 2:1–902.

Yonke, T.R. and J.R. Medler. 1969. Biology of the Coreidae of Wisconsin. Wisconsin Acad Arts & Letters 57:163–188.

ACKNOWLEDGMENTS

Thanks are extended to Dr. J.A. Slater, Department of Ecology and Evolutionary Biology, University of Connecticut, for reviewing the manuscript and the many helpful suggestions offered. To Drs G.E. Larson, Department of Biology, SDSU, for his help regarding host plants; and R.J. Walstrom and M.L. Horton, Plant Science Department, SDSU, for reading the manuscript.

This research was supported by the South Dakota Agricultural Experiment Station, SDSU, Brookings, project numbers H–138, H–714, and H–273; by USDA, ARS cooperative agreement numbers 137–20260– 010–A, 32u4–1–280, 1040–20261–01–A, and 58–3615–6–001, 0–20261–01–A, and 58–3615–6–001.

April 1989

Published in accordance with an act passed in 1881 by the 14th Legislative Assembly, Dakota Territory, establishing the Dakota Agricultural College and with the act of re-organization passed in 1887 by the 17th Legislative Assembly, which established the Agricultural Experiment Station at South Dakota State University.