

The Heteroptera (Hemiptera) of North Dakota I: Pentatomomorpha: Pentatomoidea

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Abstract

The Pentatomoidea fauna for North Dakota is documented. There are 62 species of Pentatomoidea known from North Dakota: Acanthosomatidae (2), Cydnidae (4), Pentatomidae: Asopinae (9), Pentatomidae: Pentatominae (34), Pentatomidae: Podopinae (2), Scutelleridae (6), and Thyreocoridae (5). Of this total, 36 represent new state records for North Dakota. Additionally, 16 new state records are reported for Minnesota, and one new state record each for South Dakota, Texas, and Utah. The new state records for North Dakota are: Acanthosomatidae: *Elasmotherus cruciatus* (Say), *Elasmucha lateralis* (Say); Cydnidae: *Amnestus pusillus* Uhler, *Amnestus spinifrons* (Say), *Microporus obliquus* Uhler; Pentatomidae (Asopinae): *Perillus exaptus* (Say), *Podisus brevispinus* Phillips, *Podisus maculiventris* (Say), *Podisus placidus* Uhler, *Podisus serieiventris* Uhler; Pentatomidae (Pentatominae): *Aelia americana* Dallas, *Neottiglossa sulcifrons* Stål, *Euschistus ictericus* (Linnaeus), *Euschistus latimarginatus* Zimmer, *Euschistus variolarius* (Palisot de Beauvois), *Holcostethus macdonaldi* Rider and Rolston, *Meneclis insertus* (Say), *Mormidea lugens* (Fabricius), *Trichopepla atricornis* Stål, *Parabrochymena arborea* (Say), *Mecidea minor* Ruckes, *Chinavia hilaris* (Say), *Chlorochroa belfragii* (Stål), *Chlorochroa ligata* (Say), *Chlorochroa viridicata* (Walker), *Tepa brevis* (Van Duzee), *Banasa euchlora* Stål, *Murgantia histrionica* (Hahn); Pentatomidae (Podopinae): *Amaurochrous brevitylus* Barber and Sailer, *Amaurochrous cinctipes* (Say); Scutelleridae: *Phimodera binotata* (Say), *Vanduzeeina borealis* Van Duzee, *Acantholomidea denticulata* (Stål), *Homaemus bijugis* Uhler; and Thyreocoridae: *Corimelaena lateralis* (Fabricius), *Galgupha ovalis* Hussey. New state records for Minnesota are: Acanthosomatidae: *E. cruciatus*; Cydnidae: *Amnestus pallidus* Zimmer, *A. pusillus*, *M. obliquus*; Pentatomidae (Asopinae): *P. placidus*; Pentatomidae (Pentatominae): *A. americana*, *N. sulcifrons*, *E. ictericus*, *E. latimarginatus*, *Holcostethus abbreviatus* Uhler, *Holcostethus limbolarius* (Stål), *M. insertus*, *M. lugens*, *T. atricornis*, *C. belfragii*; and Scutelleridae: *V. borealis*. *B. euchlora* is recorded from South Dakota for the first time, and *E. latimarginatus* is reported from Texas and Utah for the first time. Keys are provided for the identification of all included taxa.

Introduction

The taxonomic literature is wrought with an abundance of faunal studies of various groups from various states, regions, and/or countries. The introductory notes of nearly every one of these elaborates on the great diversity of habitats contained in the study area to give cause for the study. At first glance, North Dakota may appear to be an exception; the perception being that North Dakota is composed wholly of grassland prairie. Although it is true that the majority of

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the state is covered with grassland prairie, upon closer inspection we begin to see that even North Dakota has a variety of habitats to survey. The grassland prairie itself includes areas of rolling sand dunes, especially in the southeastern counties, and ranges from mixed grass prairies with pockets of tallgrass in the east to widespread shortgrass prairie in the west. Many insect species usually considered to be of eastern origin enter North Dakota in the southeastern part of the state, often in the riparian habitats up and down the Red River Valley, but also along some of the more western rivers (Wild Rice, Sheyenne, etc.). Of course, there is a boreal component in the northern part of the state, especially in the Turtle Mountains region. The rolling sand dunes occur mainly in the Sheyenne National Grasslands (SNG), but there are a few isolated areas with dunes in central North Dakota; these possess faunas similar to dune areas in South Dakota and Nebraska. Finally, the southwestern areas of the state are much drier, the insect fauna containing species more indicative of the desert southwest.

Nevertheless, the view that North Dakota was nearly void of interesting habitats to survey has led to a paucity of collecting in the state. I am aware of only two major collecting expeditions within the state. The U.S. Geological and Geographical surveys of the 1860's and 1870's included North Dakota. The results of these expeditions were reported on by the eminent hemipterist P. R. Uhler, but in his early work, he often gave the locality data as simply "Dakota" (e.g., Uhler 1872). Later, Uhler (1878) reported on the Hemiptera collected by Dr. Elliott Coues from a collecting expedition through North Dakota and into Montana; in this work he gave more specific locality details. The second important collecting expedition was made in 1920 by T. H. Hubbell as part of a joint venture of the newly formed (1919) North Dakota Biological Station and the Museum of Zoology of the University of Michigan. The results of this expedition were reported upon by another well-known hemipterist, R. F. Hussey (1922). Specimens from the Uhler studies may be conserved in the U.S. National Museum of Natural History in Washington, D.C.; specimens from the latter expedition are housed at the University of Michigan (Dan Swanson, personal communication). The only other North Dakota records of Heteroptera come from specific revisions of certain genera, and as such are scattered throughout the literature. There are several papers documenting the Heteroptera fauna of neighboring South Dakota (Parshley 1922; Harris 1937, 1943). There really is no good comprehensive list of terrestrial Heteroptera for Minnesota; the only records come from scattered revisions and lists from neighboring states, and a few minor records from an outdated, extension-style publication (Lugger 1900).

The present contribution is the first part of a planned series of papers which will document the entire Heteroptera fauna of North Dakota. It is intended that all parts will include keys for the identification of species which are known from North Dakota (frequently the keys will also include non-Dakotan species that may eventually be found in the state). This part covers the Pentatomoidea. In recent years, the taxonomic staff at North Dakota State University has also conducted intensive collecting in western areas of Minnesota, which has provided several new heteropteran records for that state; when convenient those records are also reported upon within this series of papers.

Other than scattered regional treatments or revisions of specific genera, the best sources for studying the eastern North American pentatomoid fauna remain Blatchley (1926) and McPherson (1982). The former treats all Heteroptera and covers the eastern U.S., but specializes mainly on the faunas of Indiana and Florida; the latter treats only the Pentatomoidea, and covers the northeastern United States with an emphasis on Illinois. McPherson (1982) provided many references to distribution, life history, food plants, natural enemies, most of which are not repeated here. I also find the "How to Know the True Bugs" by Slater and Baranowski (1978) immensely helpful in keying specimens to at least the generic level, and occasionally on to species. A more recent world

synthesis of the family classification has been presented by Schuh and Slater (1995). Specific references for various generic revisions will be given under the treatment of those genera.

It is with great pleasure that this manuscript is dedicated to Dr. Jay McPherson upon the occasion of his retirement. Jay has trained a plethora of students in hemipteran taxonomy, biology, life history; but more importantly he has instilled an intense interest (or excitement) in these students for this wonderful group. Although I was not one of Jay's students, he provided sage advice while I worked on my dissertation research, and has continued to give encouragement through the years. I have become good friends with a number of his students, all of whom received wonderful training from Jay. His legacy will continue through these students, and others (such as myself) that he has influenced through the years. Thanks Jay!

Materials and Methods

The basis for this study (and for the future parts of this series) comes from both the literature and from collected specimens. The main literature sources were mentioned in the introduction, but it would be prudent to mention the main collecting sites listed in those papers. In some of Uhler's earlier papers (e.g., 1872), he simply listed "Dakota" as the locality for certain species. These records probably originated from North Dakota as I have not seen any specific South Dakota records in any of Uhler's papers. In his 1878 paper, Uhler included only four collection sites, one of which is in Montana. His sites included Pembina (Pembina Co.), Turtle Mountains (probably in Rollette Co.), Mouse River (probably in Bottineau Co.), and Milk River (Montana). The details of the Hubbell expedition are outlined nicely by Hussey (1922) (see that paper for details). In general, Hubbell collected in the following localities: 1) Devils Lake region (Ramsey Co.) with several short expeditions to Stump Lake and Spring Lake (Nelson Co.), and to a spot near the Sheyenne River (Eddy Co.); 2) Turtle Mountains (probably in Rollette Co.) with a few days in Bottineau (Bottineau Co.); 3) southwestern areas near Amidon (Slope Co.); and 4) Fargo (Cass Co.).

Specimens from the following four collections were examined for this study (acronyms in parentheses). The bulk of the study material comes from the North Dakota State Insect Reference Collection (NDSU). This collection contains specimens from throughout the state, with some emphases on the southeastern and southwestern regions (also western areas of Minnesota). Other collections examined include those belonging to the University of North Dakota (UNDG) and Minot State University (MISU), which have emphasis on the faunas from Grand Forks Co. and Ward Co., respectively. The fourth collection studied is my own (DARC) composed of specimens from my years of collecting, trading, etc.

To aid in future sampling, additional information about a few of the collecting sites is given here. Within the data listed in this paper, the reader will notice quite a few references to Mirror Pool and Mirror Pool WMA. There are two (maybe more) old oxbows of the Sheyenne River (in the Sheyenne National Grasslands in southeastern North Dakota, and abbreviated SNG throughout this work) that are known as Mirror Pool. The first, sometimes referred to as Iron Pond by locals, lies south of the river in Richland County. This is a beautiful U-shaped pond with the arms of the 'U' northward near the river, and a greatly elevated ridge following around the southern shore of the pond. This pond is officially a State Natural Area (SNA). Access to this pond was by a lightly maintained dirt road that was slowly eroded away in several places by the main river. This road was eventually closed, gated, and locked several miles away from the pond in each direction. The second Mirror Pool is actually a series of

small to medium-sized ponds located north of the Sheyenne River in Ransom County, but still only a couple miles west of the Mirror Pool described above; this area is officially referred to as the Mirror Pool Wildlife Management Area (or WMA). Early access to this area was by a two-wheel track across several miles of pasture. Eventually, a new gravel road was constructed that has greatly helped access to this area. For our recent work, collecting switched from one site to the other roughly around the year 2000; references to Mirror Pool prior to 2000 generally refer to the site in Richland County; those after 2000 probably refer to the site in Ransom County.

There are also many references to the Horsetrail Head site. This site is on County Road 23 in the eastern part of the SNG. County Road 23 is a gravel road that crosses the Sheyenne River and winds southward through rolling sand dunes populated with many trees, especially bur oak. This is why this area is affectionately called the Oak Savannah (at least by our personnel). Approximately two miles south of where the road crosses the Sheyenne River is a small grass parking lot on the east side of the road. This parking area is equipped with special log posts for tying up horses, and a horse trail winds off through the dunes both to the east and to the west. We have sampled on both sides of the road, hence the differences in longitude and latitude listings for this site. Another site commonly surveyed is the Ekre Grassland Preserve. This is a parcel of land that was donated to NDSU, and is presently under the supervision of the Range Program. It is located on the east side of State Highway 18, approximately 5 miles south of State Highway 46. This site has a house and a few barns with pastures; there are some forested areas, and a fairly large tallgrass prairie habitat on the side of a large hill.

The devastating floods we have experienced during the past 10-15 years have created several interesting new places to collect in our area. Because of repeated flooding, the Fargo city government has purchased (bought out) all the homes in several neighborhoods along the Red River. These homes have been torn down and the lots cleaned of debris. The entrance to these neighborhoods have usually been gated and locked, and the land has been allowed to return to its native habitat (most are in transition with a lot of weeds, etc.). This has resulted in areas with fairly native habitat right along the river with transitional habitats where the homes used to be, and there are still paved roads that allow for easy walking access. Examples of this type of habitat cited in this paper are the Chrisan Edition, Wild Rice River at University Drive, and Wild Rice River at Red River.

The arrangement of taxa in this paper is purely alphabetical by family, subfamily, tribe, genus, and species. The tribal classification used in this paper is tentative at best. It is based primarily on the taxonomic literature available, and perhaps some on my own work. It should be noted, however, that a thorough phylogenetic study on the tribal classification of the Pentatomidae was not conducted, and the tribal arrangement used herein will invariably change once such a study is completed.

It should also be noted that the keys contained within this paper should work for those species occurring in North Dakota, and perhaps adjoining areas. They will not work for other regions of the United States. The keys were developed with ease of use as the primary focus. No attempt was made to make the keys reflect phylogeny. The exception to this, out of some necessity, may be the key to Pentatominae tribes. For this reason, I have also developed a key to the genera of all Pentatominae known to occur in North Dakota, irrespective of what tribe they belong. In some ways, this key may be easier to use than first keying the specimen to tribe, and then keying to genera within each tribe. At any rate, this will give the user two routes for identifying their specimens.

KEY TO NORTH DAKOTA FAMILIES OF PENTATOMOIDEA

- 1 Tarsi two-segmentedAcanthosomatidae
- Tarsi three-segmented2
- 2(1) Hind tibiae provided with one to several rows of stout spines3
- Hind tibiae lacking stout spines (hairs may be present, but they are never spine-like)4
- 3(2) Scutellum subtriangular in shapeCydnidae
- Scutellum large, rounded, covering most of abdomen..... Thyreocoridae
- 4(2) Scutellum greatly expanded and rounded, covering nearly all of hemelytra, sometimes (*Eurygaster*) more spatulate in shape, but in this case, the exposed portion of the corium narrows apically, apex angulate to acuteScutelleridae
- Scutellum usually subtriangular, sometimes (*Coenus*) more spatulate in shape, but in this case, exposed portion of corium widens apically, apex rounded to truncatePentatomidae

ACANTHOSOMATIDAE Signoret, 1863

This family is easily separated from all other North American pentatomoid families by having only two tarsal segments. All other North American pentatomoid families have three tarsal segments (note that there are several exceptions in other geographical regions). The scutellum is subtriangular, and the tibiae lack stout spines or bristles. The coloration is often brown to mottled gray, but may be paler, and may even have reddish markings. Thomas (1991) provided a review of the genera and species for North America. At present, only two genera are known to occur in North America, both of which are now known from North Dakota. Many species are known to provide parental care to eggs and early instars, and they often are found breeding on members of the Betulaceae. The Acanthosomatidae is divided into three subfamilies (Acanthosomatinae, Blaudusinae, Ditomotarsinae). Both our North American genera belong in the nominate subfamily.

Key to the genera of Acanthosomatidae in North Dakota

- 1 Ostiolar canal relatively short, extending laterally only to middle of metapleuron; posterolateral angles of pronotum prominent, distinctly produced posteriorly*Elasmucha*
- Ostiolar canal relatively long, extending laterally beyond middle of metapleuron; posterolateral angles of pronotum angulate, but not prominent, not produced posteriorly*Elasmostethus*

Elasmostethus Fieber, 1860

The genus *Elasmostethus* is represented in North America by three species, one of which is now known from North Dakota. *Elasmostethus interstinctus* (Linnaeus) is a Palearctic species known in the New World only from Alaska; *E. atricornis* (Van Duzee) appears to be an eastern species, not definitely occurring further west than Illinois and Michigan. Torre-Bueno (1939) (repeated by McPherson 1982) listed Montana, but the source of this record is unknown, and is in need of verification. *Elasmostethus cruciatus* (Say) is herein reported from North Dakota for the first time. North American species of *Elasmostethus* tend to be somewhat larger in size than North American species of *Elasmucha*, and can be recognized by the longer ostiolar rugae.

***Elasmotethus cruciatus* (Say, 1831)** - For comparative purposes *E. cruciatus* has the antennae pale with segments four, five, and occasionally three darker, the humeral angles are pale, often tinged with red, and the pronotal punctures are dark. In *E. atricornis*, the antennae are entirely black, the humeral angles are black, and the pronotal punctures are concolorous with the pronotal surface. McPherson (1982) gave the distribution as Labrador and Québec west to the Pacific Coast, and south to South Carolina, northern Georgia, Texas, New Mexico, and California. Froeschner (1988a) did not list this species from North Dakota, or from any of the surrounding states or provinces, but Maw *et al.* (2000) recorded it from both Manitoba and Saskatchewan. Lugger (1900) listed this species from northern Minnesota, but his figure is clearly not *E. cruciatus*; the pronounced posterolateral pronotal angles, the darkened humeral angles, and the black marks along the connexival incisures indicate that he actually had *Elasmucha lateralis*. Jones and McPherson (1980) studied the biology of this species, and reported that in South Carolina, it feeds and reproduces on common alder, *Alnus serrulata* (Aiton) [Betulaceae].

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Cass Co.:** Gull Lake, 30-VIII-1996, Plant (1♀ DARC). **St. Louis Co.:** Giants Ridge, T059N R16W NE13, 16 May 1992, D. Cuthrell, light trap (1♂ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** north Fargo, 17 Aug. 1999, P. Mason, on *Betula* (1♀ NDSU).

Elasmucha Stål, 1864

Elasmucha contains two U.S. species, one of which (*cordillera* Thomas) is known only from New Mexico southward; the other species, *E. lateralis* (Say), occurs across the northern U.S. and southern Canada, and is herein reported from North Dakota for the first time. North American species of *Elasmucha* tend to be smaller than North American species of *Elasmotethus*, and can be recognized by the shorter ostiolar rugae.

***Elasmucha lateralis* (Say, 1831)** - This species is smaller in size than *Elasmotethus cruciatus*, and the ostiolar ruga is shorter, not reaching the middle of the metapleuron. McPherson (1982) gave its distribution as Québec and New England west to the Pacific Coast, and south to South Carolina. Froeschner (1988a) listed this species from Minnesota, and Maw *et al.* (2000) recorded it from both Manitoba and Saskatchewan. Several specimens have been examined from northern Minnesota as well as the North Dakota specimens listed below. There are numerous papers citing birch [Betulaceae] as the host plant of this species (most recently, see Jones and McPherson 1980, who also studied its biology, and confirmed the presence of maternal care of the young).

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Grand Forks Co.:** Forest R. Biol. Area, 1.8 mi. W, 1 mi. N Inkster, T154N R55W, Sec. 11 & 14, 16 July 1977 (2♀♀ UNDG).

CYDNIIDAE Billberg, 1820

Members of the family Cydnidae are relatively easy to recognize. They generally are small to medium in size, uniformly black, brown, or reddish-brown in color, have a triangular scutellum, and have one to several rows of stout spines on the hind tibiae. Their common name is burrowing bugs, and most occur in or on the ground; occasionally members of the *Sehirinae* are found on foliage. Many are collected at lights. The best reference for North American cydnids remains the monographic work of Froeschner (1960). Prior to this study, only one species had been reported from North Dakota; three more species in two genera are herein added.

Key to the Subfamilies and Genera of North Dakota Cydnidae

- 1 Hemelytra with clavi meeting along midline posterior to apex of scutellum forming a straight line, the length of which is about one-fourth to one-third the length of the scutellum (*Amnestinae*).....*Amnestus*
- Hemelytral clavi not meeting along midline posterior to scutellum.....2
- 2(1) Anterolateral margin of pronotum provided with a row of submarginal setigerous punctures; diameter of tarsal segment II subequal to diameter of tarsal segments I and III (*Cydninae*).....*Microporus*
- Anterolateral margin of pronotum lacking submarginal row of setigerous punctures; diameter of tarsal segment II distinctly less than diameter of tarsal segments I and III (*Sehirinae*)*Sehirus*

Amnestus Dallas, 1851

Amnestus together with *Lattinestus* Eger and a handful of fossil genera form the subfamily *Amnestinae*. This subfamily is easily recognized by the clavi meeting in a straight line posterior to the scutellar apex. Members of *Amnestus* tend to be quite small (less than 5mm in length), and are often uniformly reddish-brown in color (a few, including *spinifrons*, may be somewhat darker). Until recently, it was believed that *Amnestus* was entirely a New World genus, but a single species, *A. pusillus* Uhler has been discovered in Iran (Lis 1998, Martinez et al. 2012). There are six species known to occur in the United States, but two of these, *pusio* (Stål) and *trimaculatus* Froeschner, only occur in the U.S. from south Texas and Florida, respectively. *Amnestus basidentatus* Froeschner is more widespread in the southeastern U.S.; the closest record to North Dakota coming from Missouri. The remaining three species are all now known to occur in North Dakota, or nearby in western Minnesota; they can be identified by the following key.

Key to the Species of *Amnestus* in North Dakota

- 1 Jugal each with four marginal pegs*Amnestus pusillus* Uhler
- Jugal each with five marginal pegs2
- 2(1) Smaller, usually less than 2mm in length, coloration reddish brown; length of rostrum tends to be shorter, not reaching base of abdomen [not yet found in North Dakota]*Amnestus pallidus* Zimmer
- Larger, usually more than 2mm in length; coloration dark brown to fuscus; length of rostrum tends to be longer, reaching nearly to or beyond base of abdomen..... *Amnestus spinifrons* (Say)

Amnestus pallidus Zimmer, 1910 - Traditionally, the length of the rostrum has been used to separate this species from *A. spinifrons*, it being cited as longer in *spinifrons*. The length of the rostrum seems fairly stable in specimens of *A. pallidus*, but it seems to vary in *A. spinifrons* (see discussion below). My concept of this species is that it tends to be smaller, and more reddish-brown than *A. spinifrons*. McPherson (1982) gave the distribution for this species as Québec, Ontario, and Massachusetts south to Georgia, and west to Washington and California. Froeschner (1988b) did not list this species from North Dakota, or from any of the surrounding states or provinces. Specimens have been examined from western Minnesota, so it is likely that it will eventually be found in North Dakota. Not much is known about the biology of this species, but it has been collected on the aster, *Antennaria planaginifolia* (Linnaeus) (Stoner 1920).

Specimens examined: MINNESOTA [NEW STATE RECORD]: *Clay Co.*: Felton Prairie, 47° 03' Lat. 96° 26' Long., 6-X-1999, C. Davis & C. Jordan, pitfall trap

(1♂, NDSU); CCL Trust Lands, 47° 03'Lat. 96° 26'Long., 20-V-1999, P. Tinerella & G. Fauske, pitfall trap (2♀♀, NDSU), 26-VI-1998, P. P. Tinerella, pitfall trap (1♀, NDSU).

***Amnestus pusillus* Uhler, 1876** - This is the only species of *Amnestus* in our area that has only four marginal pegs on each jugum; both *A. pallidus* and *A. spinifrons* have five. This species has not previously been reported from North Dakota, or from any of the surrounding states or provinces. McPherson (1982) gave the distribution as Québec, Ontario, and Maine west to Oregon, and south to Virginia, Louisiana, Texas, California, and Mexico.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Clay Co.:** Bluestem Prairie, 46° 51'Lat. 96° 29' Long., 10-VI-1999, P. Tinerella & G. Fauske (1♂ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Fargo, NDSU, 14-VI-2011, D. Rider & G. Fauske, Lindgren trap baited with manuka oil (1♀ NDSU), 8-IX-2010, D. Rider & G. Fauske, Lindgren trap baited with linolein lure (1♂ NDSU). **Sioux Co.:** Fort Yates, 24 Aug. 1988, J. T. Schultz (1♂ NDSU).

***Amnestus spinifrons* (Say, 1825)** - This species, along with *A. pallidus*, has five marginal pegs on each jugum. Specimens of this species tend to be larger and much darker brown to fuscus in color than *A. pallidus*. Traditionally, this species has been described as having a much longer rostrum than *A. pallidus*. My concept of the species indicates that this might be true in more southern parts of its range, but specimens from northern areas tend to have the rostrum similar in size with those of *A. pallidus*. McPherson (1982) provided the following distribution for this species: Québec, Ontario, and Massachusetts south to Florida, and west to Iowa, Kansas, Texas, and Utah. This species has not previously been recorded from North Dakota, or any surrounding state or province.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Fargo, NDSU, 14-VI-2011, D. Rider & G. Fauske, Lindgren trap (2♂♂ NDSU), 27-VI-2011, D. Rider, G. Fauske, Lindgren trap (1♂ 1♀ NDSU).

***Microporus* Uhler, 1872**

Microporus is a member of the nominate subfamily, and can be separated from all other cydnine genera by the metapleural evaporative area that just outlines the peritreme. It is the only cydnine genus known to occur in North Dakota.

***Microporus obliquus* Uhler, 1872** - This species is relatively easy to separate from other North Dakota cydnids; it is relatively small, it lacks the claval commissure of the Amnestinae, and it has many long hairs dorsally. Froeschner (1988b) listed this species from South Dakota, and Maw et al. (2000) recorded this species from Saskatchewan. McPherson (1982) gave the distribution for this species as Virginia, South Carolina, and Louisiana west to Washington, Oregon, California, and Mexico. It is interesting to note that this species has in the past been associated with sandy areas (Vestal 1915, Hart 1919, Stoner 1920); two of the collection sites listed below (Agassiz Dunes in western Minnesota, and Ransom County) are largely composed of sandy areas.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Polk Co.:** Agassiz Dunes, 47 30'Lat. 96 17'Long., 11-VI-1999, P. Tinerella & G. Fauske, pitfall trap (1♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **McHenry Co.:** Sec. 36 Twp. 156 R. 78, 27-VII-1967, J. Knudson (1♂ NDSU). **Ransom Co.:** 29-IX-1960, J. Onsager (1♀ NDSU).

***Sehirus* Amyot and Serville, 1843**

Sehirus is a member of the subfamily Sehirinae, which contains several genera and many Palearctic species. In the New World, the Sehirinae is rep-

resented by a single species, *S. cinctus* (Palisot de Beauvois) which has been divided into three subspecies: the southern *texensis* Froeschner, the widespread nominate form, and the northern *albonotatus* Dallas. This species is separable from all other North American cydnids by the white margins of the pronotum, corium, and hemelytra.

***Sehirus cinctus albonotatus* Dallas, 1851** - This species also lacks the claval commissure found in the amnestines; it is somewhat larger than *Microporus* and it lacks the long dorsal hairs which characterize that species. This subspecies has a small white spot near the apex of R+M vein on each corium (these white spots are lacking in the nominate subspecies). McPherson (1982) gave the distribution of this species as Newfoundland and Maine south to Pennsylvania, and west to Alberta and northern California. Uhler (1878) reported this species from two North Dakota localities: **Bottineau Co.:** near Mouse River, August 29, 1973, and **Pembina Co.:** near Pembina. All known records of this species come from the eastern half of North Dakota. Luger (1900, as *Canthophorus cinctus*) recorded this species from Minnesota. Although other cydnids seem to remain close to or in the soil, this species can often be caught by sweeping various herbs, especially certain mint species (Lamiaceae). McDonald (1968a) reared this species in the laboratory on *Stachys palustris* Linnaeus [Lamiaceae], and described the eggs and various nymphal instars. Five specimens in the NDSU collection were collected from *Physostegia parviflora* Nutt. ex A. Gray [Lamiaceae], and several more were collected at lights; the Fort Ransom specimens I collected (see below) were also on an unidentified mint.

Specimens Examined: NORTH DAKOTA: **Cass Co.:** Fargo, 11-VI-1924, R. L. Webster (1♀ NDSU), 5-IX-1919, O. A. Stevens, *Physostegia parviflora* (1♂ 2♀♀ 1? NDSU); NDSU Campus, 4-IX-2001, D. A. Rider (1♂ DARC); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (1♂ DARC), 13-VIII-2012, D. A. Rider (13♂♂ 3♀♀ DARC); 18-VII-1960, D. Noetzel (1♀ NDSU), 21-VII-1971, D. Gardner (1♀ NDSU), 9-VIII-1968, J. Johnson (1♀ NDSU). **Grand Forks Co.:** Northwood, 15-VI-1964, R. L. Post (2♂♂ NDSU), 11-VII-1963, R. L. Post (6♂♂ NDSU). **Griggs Co.:** Cooperstown, 30-VII-1964, R. J. Saver (2♂♂ NDSU). **LaMoure Co.:** 22-VI-1959, R. L. Post (1♂ NDSU). **Ransom Co.:** Fort Ransom St. Pk., 13-VII-2002, D. A. Rider (10♂♂ 1♀ DARC); 2.5km. SW McLeod, 12-VII-1995, D. Rider, black light & mercury vapor light (4♀♀ DARC); 2mi. SW McLeod, T134N R53W SW35, 14-VII-1992, D. A. Rider (2♀♀ DARC); SNG Orchid Site D, T134N R53W SE 5, 27-VII-1992, D. Cuthrell (1♀ DARC).

PENTATOMIDAE Leach, 1815

The family Pentatomidae is largest of the pentatomoid families containing nearly 5,000 species. It has been divided into several subfamilies, five of which have members occurring in the United States. Of these five, two (Discocephalinae, Edessinae) only have a few species each occurring in the very southern areas of the U.S. The remaining three (Asopinae, Podopinae, and the nominate subfamily), however, have species that occur in North Dakota.

Members of the Pentatomidae can be recognized by the small to large size, the lack of spines on the tibiae, three tarsal segments, and the usually subtriangular scutellum (if scutellum is more spatulate, it still does not cover the entire abdominal dorsum).

Key to the Subfamilies of North Dakota Pentatomidae

- 1 Rostrum large, incrassate, first segment not fitting tidily between bucculae Asopinae
- Rostrum smaller, slender, fitting neatly between bucculae.....2

- 2(1) Scutellum distinctly spatulate in shape; pronotum with distinct antero-laterally projecting tooth on each side just posterior to each compound eye; antehumeral tooth present; usually relatively flat, dark brown to gray in color Podopinae
- Scutellum usually triangular in shape; if spatulate, then color usually paler, brown; pronotum lacking anterolaterad projecting tooth on each side near compound eyes, or each tooth very small; antehumeral tooth usually lacking..... Pentatominae

PENTATOMIDAE: ASOPINAE Spinola, 1850

The Asopinae include the predatory stink bugs; that is members of this subfamily have an enlarged rostrum, very little of which fits between the pair of bucculae on the ventral side of the head. Members of this subfamily feed on other insects, and several are considered to be important in biological control programs. There are at least nine species known (either from the literature or herein reported) from North Dakota, with another two possible.

Key to the Genera of North Dakota Asopinae

- 1 Apical part of scutellum (tongue) enlarged, as long as or longer than frenal margin of scutellum, and about as wide as corium*Perillus*
- Apical part of scutellum small, shorter than frenal margin and much narrower than corium2
- 2(1) Ostiole of scent gland without elevated ruga; peritreme terminating in short or long sulcus that is not surrounded by shagreened area of cuticle (evaporatorium)3
- Ostiole of scent gland attended by elevated ruga surrounded by shagreened area of cuticle.....4
- 3(2) Juga much longer than tylus, convergent, contiguous anteriorly [not yet found in North Dakota]*Rhacognathus*
- Juga and tylus subequal in length [not yet found in North Dakota]*Zicrona*
- 4(2) Males lacking glandular patches of silky hairs on abdominal venter; female basal plates contiguous*Podisus*
- Males with glandular patches of silky hairs on abdominal venter; female basal plates separated by intervening plate*Apoecilus*

Apoecilus Stål, 1870

Apoecilus was originally described as a subgenus of *Podisus* and is obviously related to that genus. In fact, the species included here used to be in the genus *Podisus*, and then they were also included in another closely related genus *Apateticus*. The present arrangement was set forth by Thomas (1992). There are currently three species in *Apoecilus*, but *A. invarius* (Walker) occurs in the southwestern U.S. and Mexico. The remaining two species both occur in North Dakota, and can be separated by the following key.

Key to species of *Apoecilus* in North Dakota

- 1 Basal plates of female convergent apically, medial plate between them triangular; upper arm of male paramere curvilinear, not bent, and about equal in diameter to lower arm.....*Apoecilus bracteatatus* (Fitch)

- Basal plates of female not convergent apically, medial plate between them quadrangular; upper arm of male paramere either bent or more slender in diameter than lower arm.....*Apoecilus cynicus* (Say)

***Apoecilus bracteatus* (Fitch, 1856)** - Interestingly, the two North Dakotan species of *Apoecilus* are easier to tell apart in the female sex than in males. The medial plate between the basal plates is triangular in this species, and squarish in *A. cynicus*. Males can be separated, however, by the male parameres. Each paramere is divided into a dorsal and a ventral arm. In this species, the two arms are nearly the same size and shape. In *A. cynicus*, the dorsal arm is often more curved and is more slender than the ventral arm. McPherson (1982) gave the distribution of this species (as *Apateticus bracteatus*) as Québec and New England west to Vancouver, Idaho, Colorado, New Mexico, Utah, and California. Although several published works have recorded this species from nearly all the states or provinces surrounding North Dakota (Van Duzee 1904, Froeschner 1988c, Maw et al. 2000), there is only a single published record from North Dakota. Hussey (1922) gave the following record: **Bottineau Co.:** Bottineau, T. H. Hubbell. The life history of this species was studied by Downes (1920, as *Apateticus crocatus*) and Evans and Root (1980, as *Apateticus bracteatus*).

Specimens Examined: NORTH DAKOTA: **Cass Co.:** Fargo, 12-VII-1967, J. W. Goertel (1♂ NDSU). **Cavalier Co.:** summer, 1958 (1♀ NDSU). **Divide Co.:** 26-VII-1958, S. Wilson (1♂ NDSU). **Grand Forks Co.:** Grand Forks, 4-VII-1970, G. Ruonala (1♀ UNDG), 28-VII-1966 (1♂ UNDG); Oakville Prairie, T151N R52W Sec. 16, 16-VII-1976 (2♀♀ UNDG); T151N, R50W, Sec. 16, 27-VI-1966 (1♀ UNDG). **Hettinger Co.:** 26-VIII-1976, Lago & Kurtz (1♂ NDSU). **Stutsman Co.:** VIII-1957 (1♀, NDSU).

***Apoecilus cynicus* (Say, 1831)** - This species is relatively easy to distinguish from *A. bracteatus* (see key and discussion above). McPherson (1982) gave the distribution for this species as Québec and New England south to Florida, and west to Montana, Colorado, Texas, and Arizona. Uhler (1878) listed two North Dakota records for this species: **Bottineau Co.:** near Mouse River, August 29, 1873, and **Pembina Co.:** plains near Pembina. The biology of this species (as *Apateticus cynicus*) was studied by Jones and Coppel (1963); they also described the immature stages.

Specimens Examined: NORTH DAKOTA: **Grand Forks Co.:** Turtle R., 4.8 mi. W, 2 mi. N Emerado, T152N R53W Sec. 20 & 29, 19-IX-1984 (1♂ UNDG). **Hettinger Co.:** 12-VII-1976, Lago & Kurtz (1♂ NDSU). **Richland Co.:** Ekre Research Ranch, 48 32 15N, 27 12 00W, 9-VII-2002, A. Joshi (1♂ NDSU). **Sargent Co.:** 9mi. E, 1mi. S of Oakes, 23-IX-2007, K. Delahoyde (1♀ DARC).

Perillus Stål, 1862

This genus can be recognized by the somewhat enlarged scutellar tongue. The only other American genus with the scutellum enlarged is *Stiretrus* Laporte, but this genus does not occur in North Dakota. In *Stiretrus*, the scutellum is greatly enlarged, covering the majority of the abdomen. Besides the three species treated below, there are another four *Perillus* species not known from North Dakota. *Perillus confluens* Herrich-Schäffer is a southwestern U.S. species; *P. lunatus* Knight and *P. splendidus* (Uhler) occur in the western U.S.; and *P. strigipes* (Herrich-Schäffer) is a southeastern U.S. species. This genus was revised by Knight (1952) and Thomas (1992).

Key to Species of *Perillus* in North Dakota

- 1 Profemur with anteapical spine or stout tubercle; transverse pronotal dark band interrupted medially, forming two large spots2

- Profemur with tubercle obsolescent; transverse pronotal dark band entire, not interrupted medially*Perillus exaptus* (Say)
- 2(1) Abdominal spiracles enclosed within yellow area
.....*Perillus circumcinctus* Stål
- Abdominal spiracles enclosed within brown or black area
..... *Perillus bioculatus* (Fabricius)

***Perillus bioculatus* (Fabricius, 1775)** - This species, commonly known as the twospotted stink bug, preys on a variety of species, but seems to have a preference for the larvae of Chrysomelidae, especially the Colorado potato beetle. It has been studied extensively as a biological control agent against that species. This species is known from two distinct color forms. The typical form is red and black; the less common form (given the name *clanda* Say) is white or yellowish with brown markings. McPherson (1982) gave the range of this species as Québec, Ontario, and New York west to the Pacific coast, and south to Florida, New Mexico, Arizona, and California. Uhler (1878), under the name *Perillus claudus*, recorded this species from near Turtle Mount [probably in **Rollette Co.**], July 24, 1873; later Hussey (1922) recorded *P. bioculatus claudus* from Devils Lake [**Ramsey Co.**], May, 1921, N. A. Wood. Knight (1923) studied the biology and life history of this species.

Specimens Examined. NORTH DAKOTA: **Burleigh Co.:** Bismarck, IX-1921 (1♂ NDSU); VIII-1960 (1♀ NDSU). **Cass Co.:** Fargo, NDSU Campus, 46°54'42"N 96°48'14"W, 9-VII-2002, L. M. Tobias (1♀ NDSU); 28-VIII-1960 (1♂ NDSU). **Divide Co.:** Crosby, 5-IX-1969, T. D. Lindsey (1♀ UNDG). **Grand Forks Co.:** Grand Forks, 22-IX-1933 (1♀ UNDG), 22-IX-1941 (1♀ UNDG), IX-1929 (1♂ UNDG), 1-X-1934, E. & G. Wheeler (1♀ UNDG), 3-X-1941 (1♂ UNDG), 4-X-1937 (1♂ UNDG), 28-X-1963 (1♂ DARC). **McKenzie Co.:** Watford City, 21-III-1985 (1♀ NDSU); 30-VIII-1978 (1♀ NDSU). **McLean Co.:** Garrison, Elevator, 10-VII-2007, K. Conklin (1♂ DARC); Washburn, 27-VII-1984, feeding on sunflower beetle larvae (1♂ NDSU); IX-1958 (1♂ 1♀ NDSU). **Morton Co.:** Mandan, 22-IX-1922, R. L. Webster (1♂ NDSU). **Mountrail Co.:** 13-VII-1957, P. Bergen (1♀ NDSU), 10-IX-1960 (1♂ NDSU); Stanley, 15-IX-1998, A. Nelson (1♀ MISU). **Ward Co.:** Minot, 10-IV-1936, H. Rosg (1♀ MISU), 5-V-1936, S. Anhalt (1♂ MISU), 9-V-1936 (1♀ MISU), 10-V-1936 (1♀ MISU), 13-VII-1937, T. Tate (1♀ MISU). **Wells Co.:** 6-IX-1959 (1♀, NDSU).

***Perillus circumcinctus* Stål, 1862** - This species is very similar in appearance to the *clanda* form of *P. bioculatus*, but can be recognized by the lack of large dark spots surrounding the spiracles. McPherson (1982) gave the distribution of this species as Québec west to Saskatchewan, and south to New Jersey, Illinois, Missouri, and Nebraska. Uhler (1878) simply listed this species from "Dakota," but Hussey (1922) provided two specific North Dakota collection records: **Bottineau Co.:** Bottineau, August 1, 1920, T. H. Hubbell, and **Ramsey Co.:** Devils Lake, July 28, 1920, T. H. Hubbell, on a raspberry bush feeding on a chrysomelid larva.

Specimens Examined. NORTH DAKOTA: **Burleigh Co.:** 10-VII-61, A. C. Olson (1♀ NDSU). **Cavalier Co.:** Clyde, IX-1922, W. Baker (1? NDSU). **Divide Co.:** Crosby, 5-IX-1969, T. D. Lindsey (1♀ UNDG). **Ransom Co.:** 1-VIII-1961 (1♂ NDSU).

***Perillus exaptus* (Say, 1825)** - This species is distinctly smaller than the previous two, and can be recognized by the continuous transverse pronotal dark band. Although Froeschner (1988c) listed this species from "Dakota," I have not seen any specific literature records for North Dakota. McPherson (1982) gave the distribution as Québec and New England west to the Pacific coast, and south to New Jersey, Missouri, New Mexico, Utah, and California. Uhler (1878) provided a record from Montana, and Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan.

Specimens Examined. NORTH DAKOTA [New State Record]: *McKenzie Co.*: Ted. Roos. Park, 24-VI-1964, R. J. Sauer (1♂ NDSU). *Richland Co.*: 2mi. NE Mirror Pool, 28-VI-1993, G. Fauske (1♂ NDSU); SNG, Horsetrail Head 46°31.409N, 97°12.194W, 25-VIII-2009, D. A. Rider (1♂ DARC). *Slope Co.*: Burning Coal Vein St. Pk., 10-VIII-1993, D. A. Rider (1♀ DARC).

Podisus Herrich-Schäffer, 1853

This is a large and diverse genus, especially in the Neotropics. Thomas (1992) has provided a review of the genus. There are six species known to occur in the United States, but one, *P. sagitta* (Fabricius), only enters the U.S. in southern Florida and Texas. *Podisus neglectus* seems to be an eastern U.S. species, although there are records as far west as Indiana and Michigan. The remaining four have been or are now recorded from North Dakota.

Key to Species of *Podisus* of North Dakota

- 1 Anterolateral pronotal margins straight; wing membrane clear (sometimes with a faint vitta) *Podisus placidus* Uhler
- Anterolateral pronotal margins concave; wing membrane with a dark blotch or stripe 2
- 2(1) Humeri acute to spinose; femora with pair of anteapical spots; abdominal sternite VII with midventral spot *Podisus maculiventris* (Say)
- Humeri rounded or obtusely angular; femora variably maculate or immaculate; abdominal sternites immaculate or with row of spots 3
- 3(2) Metafemora immaculate, except sometimes faint spot or two subapically; may or may not have a row of dark spots along midline of abdominal venter *Podisus brevispinus* Phillips
- Metafemora densely spotted; usually with row of spots on midline of abdomen *Podisus serieiventris* Uhler

***Podisus brevispinus* Phillips, 1992** - This species has had a somewhat confused taxonomic history. Early workers treated this species under the name *P. modestus* (Dallas). Phillips (1983) in an unpublished dissertation determined that *P. modestus* was actually a synonym of *P. maculiventris*, thus leaving *P. modestus* of authors (not Dallas) without a name. She described it in her dissertation under the name *P. brevispinus*. Although Phillips never published her work in a reviewed journal, Thomas (1992) gave Phillips credit for her discoveries, and for the naming of this species. This species is most likely to be confused with *P. maculiventris*, but it can be recognized by the more rounded humeral angles, and the shorter medial abdominal spine. McPherson (1982, as *P. modestus*) gave the distribution of this species as Québec and New England west to British Columbia, Montana, and Idaho, and south to North Carolina, Georgia, and New Mexico. Although Froeschner (1988c, as *P. modestus*) listed this species from "Dakota," Manitoba, and Montana, no specific localities from North Dakota have been published; Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan. Phillips (1983) listed this species from *Bot-tineau Co.* and *Towner Co.* in her unpublished dissertation. The life history of this species (as *Podisus modestus*) was studied in Québec (Tostowaryk 1971), Wisconsin (Coppel and Jones 1963), and New York (Wheeler 1977). McPherson (1982, as *P. modestus*) provided a list of the nearly 50 prey species published for *P. brevispinus*.

Specimens Examined. NORTH DAKOTA [NEW STATE RECORD]: *Bottineau Co.*: Turtle Mountains, 6-IV-1968, W. Kotchman (1♂ NDSU). *Cavalier Co.*: Langdon, 18-VIII-1929 (1♂ UNDG). *Grand Forks Co.*: Forest R. Biol. Area, 1.8mi. W, 1mi. N Inkster, T154N R55W Sec. 11 & 14, 18-IX-1976 (1♂ UNDG);

Turtle River State Park, 3-VII-1965, S. Kraft (2♀♀ UNDG); University Biology Forest R. Valley Inkster, 18-VI-1958 (1♀ UNDG). **Mercer Co.:** T144N, R84W, Sec. 22, 4-6-VIII-1972, A. C. F. Hung (1♂ UNDG). **Pembina Co.:** Cavalier, 4-IX-1976 (1♀ UNDG). **Richland Co.:** Ekre Grassland Preserve, 46.552N, 97.130W, 28-V-2010, D. Rider (1♀ DARC), 3-IX-2009, D. A. Rider (4♂♂ 5♀♀ DARC); Mirror Pool, T135N, R52W, Sec 8, 29-VIII-1996, D. Rider (1♂ 3♀♀ NDSU); SNG, Horse trail head, 46°31.409N, 97°12.194W, 25-VIII-2009, D. A. Rider (1♀ DARC). **Walsh Co.:** S. Branch, Park River NE of Adams, 21-VIII-1970, J. Singleton (1♀ UNDG).

***Podisus maculiventris* (Say, 1831)** - This species, commonly called the spined soldier bug, is relatively common throughout the U.S. It feeds on a variety of insect species. As mentioned above, it may be confused with *P. brevispinus*, but the humeral angles are always sharply spinose, and the ventral basal abdominal spine is longer, reaching between the hind coxae. It does not seem to be as common in North Dakota as *P. brevispinus*. Neither Uhler (1878) or Hussey (1922) (or anyone else) has previously recorded this species from North Dakota. McPherson (1982) gave the distribution as Québec and New England west to the Pacific coast, and south to Florida, Arizona, and California. Froeschner (1988c) listed this species from Manitoba and Montana, and Maw et al. (2000) recorded this species from Manitoba. Lugger (1900, as *P. spinosus*) recorded this species from Minnesota. Phillips (1983) listed this species from **Grand Forks Co.** in her unpublished dissertation. This species is generally considered to be a beneficial species in agricultural situations, even though it is an indiscriminate predator (see list of prey species given by McPherson 1980, 1982). This has resulted in a multitude of published works on its biology and life history, including prey species, natural enemies, and biology in general (again, see McPherson 1982 for citations).

Specimens Examined. NORTH DAKOTA [New State Record]: **Billings Co.:** Medora 47 02 00N, 103 36 00W, 24-VI-2002, A. Joshi (1♂ NDSU). **Cass Co.:** Fargo, NDSU campus, 5-VIII-2002, D. Doyle (1♂ NDSU), 5-IX-2000, R. Aylesworth (1♂ NDSU); SW Fargo, 1-X-2002, S. Koudela (1♂ NDSU); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (1♂ DARC), 13-VIII-2012, D. A. Rider (1♀ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (2♀♀ DARC), 1-VIII-2012, D. A. Rider (4♀♀ DARC), 13-VIII-2012, D. A. Rider (1♂ DARC). **Grand Forks Co.:** Northwood, 11-VII-1953, R. L. Post (1♀ NDSU); Oakville Prairie, T151N R53W Sec. 16, 14-IX-1977 (1♂ UNDG). **Ransom Co.:** SNG, Mirror Pool, T135N R53W SW Sec. 1, 22-VII-2002, L. Tobias (2♂♂ NDSU). **Richland Co.:** Mirror Pool, 26-VIII-1994, T. Nowatzki (1♂ NDSU); SNG, Oak Savannah Area, 18-VI-2000, D. A. Rider (1♀ DARC). **Ward Co.:** Minot, 10-VII-2002, G. Hanley (1♀ MISU).

***Podisus placidus* Uhler, 1870** - This is the easiest species of *Podisus* to identify in North Dakota. The straight anterolateral pronotal margins, and the usually clear membrane, will separate this species from the other *Podisus* species. McPherson (1982) gave the distribution as Québec west to British Columbia, and south to New Jersey, Arkansas, Colorado, Utah, and Idaho. Froeschner (1988c) did not list this species from North Dakota, or from any of the surrounding states or provinces (Alberta, Ontario, Iowa are some of the closest records), and I have not seen any other published records from either North Dakota or Minnesota. Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan. Phillips (1983) listed this species from both Minnesota and North Dakota in her unpublished dissertation: MINNESOTA: **Carlton Co., Cass Co., Clearwater Co., Hennepin Co., Mille Lacs Co., Olmstead Co., Ottertail Co., Pine Co., Ramsey Co., St. Louis Co., Wabash Co.** and the three NORTH DAKOTA records are included in the data below (she examined the NDSU specimens from **Billings Co., Cass Co.:** Fargo, **Golden Valley Co.**). The life history and immature stages have been described (Coppel and Jones 1963, Oetting and Yonke 1971a). McPherson (1982) provided a list of known prey species.

Specimens Examined. MINNESOTA [New State Record]: *Cleawater Co.*: Itasca Pk., 17-VI-1937, H. R. Dodge (1♂ DARC), 8-VIII-1937, H. R. Dodge (1♀ DARC). *St. Louis Co.*: Dark Lake Barrens, T60N R20W 25, 31-V-1992, T. Warner (1♀ NDSU). NORTH DAKOTA [New State Record]: *Billings Co.*: Theo. Roos. Mem. Pk., 30-VIII-1961, R. L. Post (1♀ NDSU). *Cass Co.*: Fargo, 14-VI-1923, R. L. Webster (1♀ NDSU); Leonard, 22-VII-1989, D. Hyder, on sunflower (1♀ NDSU). *Golden Valley Co.*: Beach, 19-IX-1922, R. L. Webster (1♂ NDSU). *Richland Co.*: 1mi. E Mirror Pool, 22-VII-1993, D. A. Rider, reared from nymph (2♂♂ DARC).

Podisus serieiventris Uhler, 1871 - It may be difficult to separate this species from *P. brevispinus*. In well marked specimens, it should be no trouble. The hind femora in *P. serieiventris* should have numerous dark spots, and there should be a row of dark spots along the midline of the abdomen. I have seen specimens of *P. brevispinus*, however, that also have the black spots on the abdominal venter, but they do not have the hind femora maculate as in this species. McPherson (1982) gave the range for this species as Nova Scotia and Québec west to British Columbia, and south to North Carolina, Florida, New Mexico, Utah, and Idaho. Froeschner (1988c) listed this species from Minnesota and Montana, and Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan. Phillips (1983), in her unpublished dissertation, reported examining the specimen from *Cass Co.* that is listed below. The biology of this species has been studied (Prebble 1933), and some limited information about this species life history was given by Coppel and Jones (1963).

Specimen Examined. NORTH DAKOTA [New State Record]: *Cass Co.*: Fargo, VI-1950, G. J. & R. L. Post (1♀ NDSU).

Rhacognathus Fieber, 1860

Rhacognathus is generally considered to be an Old World genus with a single species known from North America. *Rhacognathus americanus* Stål occurs in southeastern Canada and northeastern United States. Van Duzee (1904) recorded this species from Winnipeg, Manitoba; Froeschner (1988c) listed this species from Manitoba and Minnesota; and Maw et al. (2000) recorded this species from Manitoba. It is likely that this species will eventually be collected in North Dakota, probably in eastern or northern areas of the state.

Zicrona Amyot and Serville, 1843

This genus contains two North American species, the cosmopolitan *Z. caerulea* (L.) and the recently described *Z. americana* Thomas. The latter species occurs in the southwestern and western states. Froeschner (1988c) did not list *Z. caerulea* from North Dakota, or from any of the surrounding states or provinces; but Maw (2000) recorded this species from Manitoba and Saskatchewan. It may eventually be collected in North Dakota.

PENTATOMIDAE: PENTATOMINAE Leach, 1815

The Pentatominae is the largest subfamily of stink bugs, and all known species are phytophagous. This subfamily contains many of the economically important pests.

I have provided two keys for the reader to use to identify their specimens to the generic level. First, I have provided a key to the tribes known to occur in North Dakota. Once you have finished with this key, you will then find a key to the genera of each tribe located under each tribal heading. Second, following the key to tribes, I have also provided a key to all pentatomine genera known to

occur in North Dakota, regardless of what tribe they occur in. The two keys are similar in some ways, but different in others; the hope being, one or the other will get the reader to the correct identity.

Key to the Tribes of North Dakota Pentatominae

- 1 Lateral margin of each jugum with a relatively conspicuous tooth or denticle between the compound eye and the apex, usually near apex; anterolateral pronotal margins coarsely denticulate; veins in wing membrane dark brown with brown and white pattern between veinsHalyini
- Apex of each jugum may be acute or toothlike, but lateral margin lacking conspicuous tooth between compound eye and apex; anterolateral pronotal margins variable, but never coarsely denticulate; veins in wing membrane variable, but never with bicolored pattern between veins2
- 2(1) Coloration pale yellow; elongate, slender, length about four times width; abdominal venter with stridulatory area on first three sternites on each side of midline..... Mecideini
- Coloration variable, but if pale yellow, then more broadly rounded (some fall forms of *Thyanta custator accerra*) or humeral angles spinose (*Oebalus pugnax*, which is not known to occur in North Dakota); not especially elongate or slender, no more than twice as long as width; stridulatory areas on abdominal venter lacking.....3
- 3(2) Ostiole very small, difficult to see, located mesially between middle and hind coxae, and lacking attending ruga, canal, or evaporative area.... Strachiini
- Ostiole larger, more conspicuous, located laterad of coxal bases, and always attended by at least a small evaporative area, and usually a canal or ruga of various sizes and/or shapes.....4
- 4(3) Relatively small, flattened, with lateral margins of head, pronotum, and coria explanate Sciocorini
- Usually larger, if small, then lateral margins of head, pronotum, and coria not explanate5
- 5(4) Anterior margin of propleura explanate, convex, expanded anteroventrad up to the base of the antennifer, sometimes covering the antennifer and the base of the first antennal segment.....Aeliini
- Anterior margin of propleura not explanate, usually more or less straight, remote from the antennifer6
- 6(5) Primarily green in color, at most with a few small black or yellow spots or stripes, and remaining green after death Nezarini
- Color variable, but usually not mostly green.....7
- 7(6) Base of abdominal venter produced anterad as a small spine or tuberclePentatomini
- Base of abdominal venter not produced anterad, smoothly rounded ... Carpororini

Key to the Genera of North Dakota Pentatominae

- 1 Body strongly pubescent, dorsal surface with many long, bristle-like hairs [Carpororini (part)] *Trichopepla*
- Body not strongly pubescent, perhaps a few longer hairs on legs, but dorsal surface nearly glabrous (*Brochymena* and *Parabrochymena* may have small, white, scale-like hairs, but never long bristle-like hairs).....2

- 2(1) Elongate, slender, length about four times width, coloration pale yellow; abdominal venter with stridulatory area on first three sternites on each side of middle [Mecideini] *Mecidea*
- Not particularly elongate or slender, no more than twice as long as width, coloration variable, but if yellowish, then usually more broadly rounded (some specimens of the fall form of *Thyanta*) or humeral angles are spinose (*Oebalus pugnax* which is not yet known from North Dakota); stridulatory areas on abdominal venter lacking 3
- 3(2) Predominant color black with red or orange markings, or orange with black markings (rarely orange coloration faded in preserved specimens and appear pale yellow to white) 4
- Predominant color brown, gray, or green; if nearly black, then lacking red or orange markings 5
- 4(3) Relatively small, length less than 8mm, outline nearly circular; dorsal coloration black with red cross-shaped marking on pronotum and a pair of red spots near apex of scutellum; ostiole and accompanying ruga or canal conspicuous [Carpocorini (part)] *Cosmoepepla*
- Medium in size, length 8 to 12mm, shape somewhat more elongate-oval, dorsal color usually orange with black markings, occasionally more black than orange; ostiole and accompanying ruga or canal obsolete [Strachiini] *Murgantia*
- 5(3) Lateral margin of each juga with a conspicuous tooth or denticle between apex and compound eye, usually near apex; anterolateral pronotal margins coarsely denticulate; veins in hemelytral membrane dark brown with a brown and white pattern in the membrane between veins [Halyini] 6
- Each juga may be acute apically, but lateral margin never with a tooth or denticle between apex and compound eye; anterolateral pronotal margin variable, but never coarsely toothed; veins in hemelytral membrane variable, but never with brown and white pattern in membrane between veins 7
- 6(5) Humeral angles subquadrate; basal disk of scutellum distinctly elevated *Parabrochymena*
- Humeral angles subtriangular, rounded to angulate, but not quadrate; basal disk of scutellum at most slightly elevated *Brochymena*
- 7(5) Dorsal coloration predominantly green, sometimes with yellowish stripes or spots, and/or small black spots 8
- Dorsal coloration predominantly brown or black, often with pale markings 12
- 8(7) Base of abdominal venter produced forward into a small obtuse spine or tubercle 9
- Base of abdominal venter smoothly rounded, not produced forward [Nezarini (part)] 10
- 9(8) Smaller, less than 15mm in length [Pentatomini (part)] *Banasa* (part)
- Larger, more than 25mm in length [Nezarini (part)] *Chinavia*
- 10(8) Smaller, usually less than 8mm in length *Tepa*
- Larger, usually more than 10mm in length 11
- 11(10) Ostiolar ruga elongate, reaching at least two-thirds to edge of supporting plate, and acuminate apically *Thyanta*

- Ostiolar ruga much shorter, reaching no more than half way to edge of supporting plate, not acuminate apically..... *Chlorochroa*
- 12(7) Relatively small, body broadly oval , somewhat flattened, lateral margins of pronotum and corium explanate; width of body greatest across abdomen; head nearly as broad as basal width of scutellum [Sciocorini] *Sciocoris*
- Larger, if small, then body not unusually broad, usually more robust, lateral margins rounded, carinate, or reflexed, but not explanate; width of body usually greatest across pronotum, sometimes across abdomen; head usually not as wide as basal width of scutellum..... 13
- 13(12) Base of abdominal venter with small basal spine or tubercle basally [Pentatomini (part)]..... *Banasa* (part)
- Base of abdominal venter smoothly rounded basally 14
- 14(13) Ostiolar ruga relatively short, more or less auriculate (maybe lacking or very small in *Neottiglossa*)..... 15
- Ostiolar ruga relatively long, not auriculate, tapering laterally, forming acute to acuminate apex..... 21
- 15(14) Scutellum subtriangular, shorter than corium, with apical third narrower than apex of corium, apex narrowly rounded [Carpocorini (part)] 16
- Scutellum more spatulate, longer than corium, with apical third wider than apex of corium, apex broadly rounded 19
- 16(15) Relatively small, less than 7.5mm in length; dark chocolate brown with some ivory markings on scutellum and a transverse ivory callus on anterior pronotal disk..... *Mormidea*
- Larger, usually more than 8mm in length; color variable, but never chocolate brown, and never with transverse ivory callus on anterior pronotal disk 17
- 17(16) Anterolateral pronotal margins crenulate or dentate; humeral angles often prominent, angulate to spinose (rounded in *Euschistus tristigmus*) *Euschistus*
- Anterolateral pronotal margins entire, not crenulate or dentate; humeral angles broadly rounded 18
- 18(17) Anterolateral pronotal margins somewhat explanate, distinctly convex; overall color grayish *Meneclis*
- Anterolateral pronotal margins not explanate, straight to slightly convex; overall color yellowish-brown, sometimes with reddish hues.. *Anthemina*
- 19(15) Head horizontal, or slightly declivent, tylus distinctly elevated above juga, juga not meeting anterior to tylus; propleura not produced anteroventrad, remote from adjacent antennifer [Carpocorini (part)] *Coenus*
- Head strongly declivent, tylus at most slightly elevated above juga, juga longer than and contiguous anterior to tylus; propleura explanate, convex, produced anteroventrad, contiguous with or covering antennifer, and sometimes first antennal segment [Aeliini] 20
- 20(19) Relatively small, less than 7mm in length; prostethium with anterior margin not extending beyond anterior margin of eye, contiguous with or covering base of antennifer *Neottiglossa*
- Larger, usually greater than 8mm in length; prostethium with anterior margin extending beyond anterior margin of eye, covering antennifer and at least part of first antennal segment..... *Aelia*

- 21(14) Juga distinctly longer than tylus and often contiguous anterior to tylus.....*Holcostethus*
 – Juga and tylus subequal in length or juga slightly longer, never contiguous anterior to tylus.....*Halyomorpha*

Tribe Aeliini Douglas and Scott, 1865

Members of this tribe are characterized by the produced prostethium which covers or nearly covers the base of the antennifers; they also tend to be somewhat cylindrical in shape. This is a relatively small tribe, at present containing only three genera. *Aelia* and *Neottiglossa* occur in both the New World and Old World, but both are limited to the Nearctic and Palearctic regions. The third genus, *Aeliopsis* occurs in northern Africa. Members of both *Aelia* and *Neottiglossa* are primarily grass feeders.

Key to the genera of Aeliini of North Dakota

- 1 Relatively small, less than 7mm in length; prostethium with anterior margin not extending beyond anterior margin of eye, contiguous with or covering base of antennifer..... *Neottiglossa*
 – Larger, usually greater than 8mm in length; prostethium with anterior margin extending beyond anterior margin of eye, covering antennifer and at least part of first antennal segment..... *Aelia*

Aelia Fabricius, 1803

Aelia is primarily an Old World genus with a single species occurring in North America. Several species are known to cause serious damage to wheat in Europe and the Middle East, but our species seems to prefer non-agricultural prairie grasses. It has been reported occasionally from wheat, but damage has been minimal.

Aelia americana Dallas, 1851 - This species is fairly distinctive. It is cylindrical in shape, a little larger than the species of *Neottiglossa*, and the prostethium is greatly expanded to cover the adjacent antennifer. The range of this species is given by McPherson (1982) as British Columbia south to Arizona, and east to Manitoba, Michigan, and Illinois. Rider (1986a) extended the known range southeastward to Arkansas and Alabama. Although Froeschner (1988c) and Maw et al. (2000) recorded this species from all states or provinces north, west, and south of North Dakota, it appears that no one has recorded it from North Dakota or Minnesota. Froeschner (1942) studied the immature states of this species, and compared them with those of *Neottiglossa* species.

Specimens Examined. MINNESOTA [NEW STATE RECORD]: **Clay Co.:** Blazing Star Prairie, 47° 03'Lat 96° 25'Long., P. Tinerella & G. Fauske, pitfall (1♀ NDSU); Bluestem Prairie, 46° 50'Lat. 96° 26' Long., 5-VIII-1996, C. Locken & G. Fauske, pitfall (1♂ 2♀♀ NDSU), 3-IX-1996, C. Locken & T. Kochis, pitfall (1♀ NDSU); 46° 51'Lat. 96° 28'Long., 27-VII-1995, D. Rider & G. Fauske, pitfall (1♀ NDSU), 31-VII-1997, P. Tinerella & A. Abbott, pitfall (1♀ NDSU), 26-VIII-1995, G. Fauske & D. Rider, pitfall (1♀ NDSU), 16-IX-1996, C. Locken & T. Kochis, pitfall (1♀ NDSU); Bluestem SNA, T139N R46W Sec. 23, 27-VI-1996, C. Locken & G. Fauske, pitfall (1♀ NDSU); CCL Trust Lands, 47° 03'Lat. 96° 26'Long., 24-VI-1997, P. Tinerella & G. Fauske, pitfall (2♀♀ NDSU), 3-VII-1996, J. Albertson & L. DeCock, pitfall (1♀ NDSU), 9-VII-1997, P. Tinerella, pitfall (1♂ NDSU), 13-VII-1999, P. Tinerella & G. Fauske, pitfall (1♀ NDSU), 1-VIII-1996, C. Locken & K. Urlacher, pitfall (1♀ NDSU), 28-VIII-1997, P. Tinerella & A. Abbott, pitfall (1♀ NDSU). **Polk Co.:** Agassiz Dunes SNA, 47° 30'Lat. 96° 18'Long., 21-VIII-1997, G. Fauske & P. Tinerella, pitfall (1♀ NDSU). NORTH

DAKOTA [NEW STATE RECORD]: **Barnes Co.**: Natl. Fish Hatchery, 7-VI-1978, I. Nashnosh (1♂ NDSU); Valley City S.U., 17-X-1976 (1♀ UNDG). **Billings Co.**: Medora, T141N R102W, 24-VI-2002, L. M. Tobias (1♀ NDSU). **Cass Co.**: 4-X-1954, B. Bernardy (1♀ NDSU). **Emmons Co.**: Linton, 22-VII-1964, R. J. Sauer (1♂ NDSU). **Grand Forks Co.**: Arvilla, J. M. Davis (1♂ UNDG); Oakville Prairie, Sec. 9 Oakville Township, 5-VII-1961 (1♂ UNDG), 3-X-1959 (1♂ UNDG). **McKenzie Co.**: T.R. Nat. Pk., NU, 23-VI-1977, E. U. Balsbaugh & A. Jamieson (1♀ NDSU). **Mercer Co.**: Sec. 22, T144N, R84W, 4-6-VIII-1972, A. C. F. Hung (1♀ UNDG). **Richland Co.**: SNG, 2.5mi. SE McLeod, 26-V-1992, D. Rider (1♂ DARC). **Ward Co.**: NW Minot, 6-VI-1994, G. Hanley (1♀ MISU); SE Minot, 17-V-1994, G. Hanley (1♀ MISU), 22-V-1994, G. Hanley (1♀ MISU). **Williams Co.**: Williston, 23-VIII-1987, M. J. Weiss (2♀♀ NDSU).

Neottiglossa Kirby, 1837

This genus has species occurring in both North America and Europe and Asia. The North American species were recently revised (Rider 1990). They are relatively small, somewhat cylindrical species, usually brown to fuscus with some pale markings; they can be separated from *Aelia* by their smaller size, and that the expanded prostethium at most covers only the base of the antennifer. Only two species are known from North Dakota, but a third, *N. trilineata* (Kirby), may eventually be found in the state. It has been recorded from Manitoba, Saskatchewan, and "Dakota" (Froeschner 1988c, Maw et al. 2000). The three species can be separated by the following key.

Key to species of *Neottiglossa* that may occur in North Dakota

- 1 Coxae pale yellow; evaporative surfaces pale yellow to brown-gray with contrasting black punctures.....2
- Coxae fuscous to black; evaporative surfaces black with concolorous punctures *Neottiglossa sulcifrons* Stål
- 2(1) Dorsal surface of head and propleura mostly black with concolorous punctures [not yet recorded from North Dakota]
..... *Neottiglossa trilineata* (Kirby)
- Dorsal surface of head and propleura with large areas of pale yellow to brown with black punctures *Neottiglossa undata* (Say)

***Neottiglossa (Texas) sulcifrons* Stål, 1872** - This species can be separated from the other two species that may occur in North Dakota by the dark coxae and evaporative surfaces. Blatchley (1926) gave the range of this species as New Jersey south to Georgia, and west to Nebraska, Kansas, and New Mexico; McPherson (1982) indicated that the known range should be extended to South Dakota and British Columbia. This species has not been reported from North Dakota; in fact, neither Froeschner (1988c) nor Maw et al. (2000) listed this species from any of the surrounding states or provinces. The immature stages have been described (Esselbaugh 1946, DeCoursey and Esselbaugh 1962).

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Clay Co.**: 3mi. E, 2mi. S Felton, 47°03.71'N, 96°25.99'W, 26-VI-2002, P. B. Beauzay (1♂ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Billings Co.**: Freeman's Frontier near Medora, 9-VIII-1993, D. A. Rider (1♀ DARC); Medora, 47°02'00"N, 103°36'00"W, 24-VI-2002, A. Joshi (2♂♂ NDSU). **Oliver Co.**: T43N, R83W, Sec. 6, 15-VIII-1972, P. B. Kannowski (1♂ 2♀♀ UNDG). **Richland Co.**: Mirror Pool, T135N, R52W, Sec. 8, 27-VI-1992, D. A. Rider (1♂ DARC).

***Neottiglossa (Neottiglossa) undata* (Say, 1832)** - This species tends to be slightly larger than *N. sulcifrons*, and it has the coxae pale, as well as the

evaporative area (with contrasting dark punctures). McPherson (1982) gave the known distribution as Québec and New England west across southern Canada and the northern United States to the Pacific coast. There is a single published record of this species from North Dakota. Hussey (1922) recorded this from near the Bois de Sioux River at Fargo (*Cass Co.*). Froeschner (1988c) listed this species from Minnesota, and Maw et al. (2000) recorded it from both Manitoba and Saskatchewan.

Specimens Examined: NORTH DAKOTA: *Bottineau Co.*: 4-VI-1968, R. W. Katayama (1♂ NDSU). *Cass Co.*: Fargo, 31-VIII-2004, S. Kuchera (1♀ NDSU); S Fargo, 76 Ave. S, Chrisan Edition, 46.766N, 96.780W, 5-VI-2012, D. A. Rider (1♂ DARC); Wildlife Man. Area N of Brewers Lake, 26-V-2010, D. A. Rider (1♀ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♂ 1♀ DARC), 1-VIII-2012, D. A. Rider (2♀♀ DARC). *Dickey Co.*: 22-VI-1959, R. L. Post (1♀ NDSU). *Grand Forks Co.*: Air Force Base Property, McKinock Twp, T152N, R53W, Sec. 27, 16-IX-1970 (1♂ UNDG); Arvilla, 30-IX-1929 (1♂ UNDG); Grand Forks, 21-VII-1958 (1♀ UNDG); Northwood, 15-VI-1964, R. L. Post (1♀ NDSU); Oakville Prairie, Oakville Twp, Sec. 9, 28-VI-1961 (1♂ UNDG); Turtle River, 5mi. W, 2mi. N Emerado, 8-IX-1975 (1♀ UNDG); Turtle River State Park, 30-VI-1953 (1♂ UNDG); UNDG Biology Area, Forest R. Valley, near Inkster, 12-VII-1963 (1♀ UNDG), 27-IX-1968, R. S. Trobec (1♀ UNDG). *McKenzie Co.*: Th. Roos. M. Prk, 22-VI-1965, W. Kotchman (1♂ NDSU). *Mercer Co.*: T144N, R84W, Sec. 22, 4-6-VIII-1972, A. C. F. Hung (1♀ UNDG). *Oliver Co.*: T143N, R83W, Sec. 6, 15-VIII-1972, P. B. Kannowski (2♀♀ UNDG). *Ransom Co.*: Mirror Pool WMA, 46°32.348N, 97°17.475W, 27-VI-2012, D. A. Rider (2♀♀ DARC); SNG, A-Annex, T136N, R52W, Sec. 8, 4-IX-1992, D. A. Rider (1♀ DARC); SNG, 1.5mi. W McLeod, T134N, R53W, Sec. 22, 4-VI-1992, D. A. Rider (1♂ DARC). *Richland Co.*: Ekre Grassland Preserve, 22-VII-1993, D. L. Cuthrell (1♀ NDSU), 25-VII-1995, G. Fauske (1♂ NDSU), 28-VIII-2008, D. A. Rider (1♀ DARC), 3-IX-2009, D. A. Rider (1♂ DARC), 25-IX-1994, T. Nowatzki (1♂ 1♀ NDSU); Mirror Pool, T135N, R52W, Sec. 8, 27-VI-1992, D. A. Rider (1♂ 1♀ DARC); 6-VI-1962, R. D. Frye, alfalfa (1♂ NDSU); SNG, Oak Savannah, 17-VII-1993, D. Cuthrell (2♀♀ NDSU); SNG, Horse trail head, 46.52N, 96.21W, 20-VII-2012, D. A. Rider (2♀♀ DARC); SNG, Horsetrail Head, 46°31.409N, 97°12.194W, 25-VIII-2009, D. A. Rider (1♂ 2♀♀ DARC). *Ward Co.*: Minot, Roosevelt Pk., 15-V-1994, G. Hanley (1♀ MISU); SE Minot, 23-V-1994, G. Hanley (1♀ MISU), 28-V-1994, G. Hanley (1♀ MISU). *Williams Co.*: D. A. Mundal, *Euphorbia esula* (1♂ NDSU).

Tribe Cappaeini Atkinson, 1888

At present, this tribe contains 23 genera, none of which is native to the New World. The majority of included genera occurs in Africa, but several genera can also be found in the Indian and Oriental regions, and even out into the Australian region. This tribe is included here simply because of a recent introduction of one of its members into the New World. *Halyomorpha halys* (Stål) was first discovered around 1998 in eastern Pennsylvania (Hoebeke and Carter 2003). Its range has spread extensively in the eastern U.S. and a number of disjunct populations have now been discovered. No known populations exist in North Dakota, but individual specimens have been found (in shipping containers) in Grand Forks (*Grand Forks Co.*) and from western Minnesota (*Clay Co.*). It may be only a matter of time before this nuisance species arrives and becomes established here.

Tribe Carpocorini Mulsant and Rey, 1866

In general, this tribe contains those pentatomine genera which lack a tubercle or spine on the abdominal venter, and have auriculate ostiolar rugae.

Occasionally, the ostiolar rugae may be elongate, but rarely are they acuminate as seen in the Antestiini or some of the Nezarini or Pentatomini. Many of our genera have traditionally been placed in the Pentatomini. This is the largest pentatomine tribe, containing many genera; it is also the most cosmopolitan, occurring in all geographical regions.

Key to Genera of Carpacorini known to occur in North Dakota

- 1 Dorsal surface of body covered with elongate, erect hairs *Trichopepla*
- Dorsal surface of body nearly glabrous2
- 2(1) Overall coloration black with reddish markings forming a cross on the pronotum and two small spots near apex of scutellum*Cosmopepla*
- Not colored as above, usually pale yellow to brown, and usually lacking reddish markings.....3
- 3(2) Small, dark brown with an transverse ivory line (callus) on pronotum*Mormidea*
- Usually larger, not colored as above.....4
- 4(3) Scutellum somewhat spatulate in shape, apex broadly rounded.....*Coenus*
- Scutellum subtriangular in shape, apex narrowly rounded5
- 5(4) Ostiolar rugae elongate, tapering to a subacute apex; juga longer than and usually meeting in front of tylus*Holcostethus*
- Ostiolar rugae auriculate, not subacute apically; juga and tylus usually subequal in length, but if juga longer (*Euschistus servus*), usually separated apically.....6
- 6(5) Anterolateral pronotal margins crenulate or dentate; humeral angles usually prominent, angulate to spinose (rounded in *Euschistus tristigmus*).....*Euschistus*
- Anterolateral pronotal margins entire, not crenulate or dentate; humeral angles usually broadly rounded7
- 7(6) Anterolateral pronotal margins somewhat explanate, distinctly convex; overall color grayish*Meneclis*
- Anterolateral pronotal margins not explanate, straight to slightly convex; overall color yellowish-brown, sometimes with reddish hues.. *Antheminia*

Antheminia Mulsant and Rey, 1866

Antheminia is mainly an Old World genus with two species known from North America. Our two species were treated by Thomas (1974) under the generic name *Codophila*. There has been some discussion, however, that the Pacific coast species, *A. sulcata* (Van Duzee), may only be a subspecies of *A. eurynota*. The single species in our area is also a western species, just reaching into the western half of North Dakota. The nominate subspecies occurs in the Old World in eastern Russia.

***Antheminia eurynota remota* (Horváth, 1908)** - The taxon *remota* was considered to be a valid species until Kerzhner (1993) determined that it was conspecific with the Old World *A. eurynota*. He continued to recognize the North American form as a subspecies of *A. eurynota*. This is a western U.S. species, occurring only in the western half of North Dakota. This species was not treated by McPherson (1982). Hussey (1922, as *Carpocoris remota*) provided the first two records of this species from North Dakota: **Slope Co.:** prairie near Amidon,

23-VIII-1920, T. H. Hubbell, and **Williams Co.:** Buford, A. L. Olson. Van Duzee (1904, as *Carpocoris lynx*) recorded this species from **Williams Co.:** Williston.

Specimens Examined. NORTH DAKOTA: **Billings Co.:** Easy Hill, T138N, R100W, D. Aarhus (1♂ NDSU); Freeman's Frontier near Medora, 9-VIII-1993, D. A. Rider, on Chenopodiaceae (1♀ DARC); Historical Marker, S. Unit, T. 140, R. 02, S. 10, Port. 400, 22-VI-1977 (1♀ NDSU). **Eddy Co.:** 22-VIII-1958, S. Wilson (2♀♀ NDSU). **Golden Valley Co.:** 25-VI-1957, P. Bergen (1♀ NDSU). **McLean Co.:** Ruso, 3-VII-1938, E. Boe (1♂ MISU). **Mercer Co.:** Sec. 9, T144N, R85W, 18-20-VII-1972, A. C. F. Hung (1♂ UNDG). **Mountrail Co.:** 12-VII-1957, P. Bergen (1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 12-VIII-1993, D. A. Rider (1♂ DARC). **Ward Co.:** Minot, 10-V-1936, Hovdestad (1♀ MISU). **Williams Co.:** Williston, 28-VI-1987, M. J. Weiss (2♀♀ NDSU); Williston Exp. Stat., 1mi. W of Williston, IV-IX-1986, M. J. Weiss, pitfall (1♂ 1♀ NDSU); 11-VII-1961, V. Goodfellow, wheat (1♀ NDSU).

Coenus Dallas, 1851

Members of the genus *Coenus* tend to be more ovate, or even somewhat tear-drop in shape; the scutellum is enlarged, more spatulate than in most pentatomids, but not as enlarged as in the scutellerids or thyreocorids. There are currently three species in the genus. *Coenus inermis* Harris and Johnston occurs in the south central states with the closest records to North Dakota being from Missouri; *C. explanatus* Rider was recently described from southern Alabama and Georgia. The genus was recently reviewed (Rider 1996).

***Coenus delius* (Say, 1832)** - This species is relatively easy to recognize by the robust teardrop shape and the broadly rounded scutellum. McPherson (1982) gave the known distribution as Québec and New England south to North Carolina, and west to British Columbia, Montana, Idaho, Utah, Oklahoma, and Texas. This species probably occurs statewide in North Dakota. Uhler (1878) reported collecting it in two localities: **Bottineau Co.:** Mouse River region, August 29, and **Pembina Co.:** vicinity of Pembina. Hussey (1922) added several more records: **Bottineau Co.:** Turtle Mountains, T. H. Hubbell, **Eddy Co.:** Sheyenne River, about 3 miles S of Warwick, August 8, 1920, A. L. Olson, **Nelson Co.:** Stump Lake, T. H. Hubbell, **Ramsey Co.:** Devils Lake, T. H. Hubbell, and **Slope Co.:** Amidon, T. H. Hubbell. Rider (1996) presented a number of additional records from North Dakota, including abbreviated information (counties and a few specific localities); the full data is presented below. The life history of this species has been studied (Oetting and Yonke 1971b), and the immature stages have been described (Esselbaugh 1946, DeCoursey and Esselbaugh 1962).

Specimens Examined: **Benson Co.:** 9-VIII-1958, S. Wilson (1♀ NDSU). **Billings Co.:** Easy Hill, T138N, R100W, D. Aarhus (1♂ 1♀ NDSU); Fremman's Frontier near Medora, 9-VIII-1993, D. A. Rider (1♀ DARC); Medora, T141N, R102W, 24-VI-2002, L. M. Tobias (1♀ DARC); Th. Roos. M. Prk, 29-VI-1965, L. Grochowski (2♀♀ NDSU), 15-VII-1965, W. Kotchman (1♀ NDSU), 11-VIII-1965, W. Kotchman (1♂ NDSU); 3-VII-1966 (2♀♀ NDSU). **Bottineau Co.:** Omeme, 29-VII-2008, D. Larson (1♀ NDSU). **Cass Co.:** Fargo, 1-V-1939, E. Sulerud (1♀ NDSU), 30-V-1940 (1♀ NDSU), VII-1966, J. W. Goertel (1♂ NDSU); Fargo, NDSU campus, 14-IX-2002, N. Boll (1♂ NDSU); 20-IX-1958, Roeshans (1♂ NDSU), S. Wilson (2♀♀ NDSU). **Dunn Co.:** 146-97-25-400, 13-VII-1976, Lago & Kurtz (1♀ NDSU), 20-VII-1977, L. A. Schutz & J. W. Smith (1♂ NDSU). **Grand Forks Co.:** Air force Base Property, McKinock Twp, Sec. 27, T152N, R53W, 18-IX-1974 (1♂ UNDG); Forest River Biology area, T154N, R55W, S11&14, 2-VII-1953 (1♀ UNDG); Grand Forks, 9-VII-1953 (1♀ UNDG), 21-IX-1931 (1♀ UNDG), 13-X-1947 (1♀ UNDG); Kelly's Slough NWR, 18-VI-1993, D. L. Cuthrell (1♀ DARC); Oakville Prairie, Sec. 9, T151N, R52W, Oakville Township, 22-VI-2012, D. A. Rider (3♂♂ 3♀♀ DARC), 23-VI-1961 (1♀ UNDG), 26-VI-1961

(1♀ UNDG), 28-VI-1961 (2♀♀ UNDG), 5-VII-1961 (1♀ UNDG), 5-VII-1962, C. Sweikert (1♀ UNDG), 31-VII-1961 (1♂ 1♀ UNDG), 15-IX-1975 (2♀♀ UNDG), 5-X-1965 (1♀ UNDG); Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (1♂ 8♀♀ DARC), 21-VIII-2009, D. A. Rider (2♀♀ DARC), 24-VIII-2009, D. A. Rider (1♀ DARC), 26-IX-1983, K. Howe (2♂♂ UNDG), 4-X-1965 (1♀ UNDG); Turtle R, 4.8mi. W, 2mi. N Emerado, T152N, R53W, Sec. 20&29, 8-IX-1982, K. Kreil (1♀ UNDG), 18-IX-1976 (1♂ UNDG); T151N, R50W, 1-X-1965 (1♀ UNDG). **McHenry Co.:** 5-VIII-1956 (1♂ NDSU). **McKenzie Co.:** 146-98-16-110, 6-VII-1977, L. A. Schutz & J. W. Smith (1♀ NDSU), 21-VII-1976, Lago & Kurtz (1♂ NDSU), 25-VIII-1976 (1♂ NDSU). **Mercer Co.:** Stanton Area, 1-VII-1972, A. C. F. Hung (1♀ UNDG), 4-6-VIII-1972, A. C. F. Hung (1♀ UNDG); Sec. 22, T144N, R84W, 15-VIII-1972, P. B. Kannowski (1♂ UNDG). **Morton Co.:** 19-VIII-1958, R. L. Post (1♀ NDSU). **Nelson Co.:** 2-VII-1958 (1♀ NDSU). **Oliver Co.:** Sec. 6, T143N, R83W, 16-VIII-1972, P. B. Kannowski (1♀ DARC). **Ransom Co.:** Lisbon, 1-VII-1983, J. Julian (1♀ NDSU), 28-VII-1982, J. Julian, on leafy spurge (1♂ NDSU); McLeod, 19-V-1973, D. Scott (1♀ NDSU); 4mi. NW of McLeod, T134N, R53W, Sec. 6, 18-VI-1992, D. A. Rider (1♀ DARC); 7mi. SE Sheldon, 12-VII-1990, J. R. Powers (1♀ DARC). **Richland Co.:** Ekre Grassld Pres., 3-IX-2009, D. A. Rider (1♂ 2♀♀ DARC), Mirror Pool, 2-VII-1979, J. W. Hoganson (1♀ NDSU); Oak Savannah, T135N, R52WW Sec. 10, 11-VI-1996, L. DeCock (1♀ NDSU); Hwy 27, 5mi. W of Hwy 18, 5-IX-1979, E. U. Balsbaugh (1♀ NDSU); SNG, Horse trail head, 46.52N, 96.21W, 20-VII-2012, D. A. Rider (1♀ DARC); T136N, 61W Sec. 32, 23-VII-1993, G. Fauske (1♀ NDSU); 26-VII-1965, R. L. Post (1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 23-VI-1965, L. Grochowski (1♀ NDSU), 1-VII-1965, L. Grochowski (1♀ NDSU), 10-VIII-1993, D. A. Rider (1♀ DARC); Chalky Buttes, 5-VI-1971, T. L. McCabe (1♂ NDSU); 136-102-14-200, 3-VII-1977, L. A. Schutz & J. W. Smith (1♂ NDSU), 29-VII-1976, Lago & Kurtz (1♂ 4♀♀ NDSU), 8-VIII-1976 (2♂♂ 2♀♀ NDSU), 8-IX-1976, Lago & Kurtz (1♀ NDSU); 11-VII-1986, K. Larsen (1♀ MISU). **Stutsman Co.:** Jamestown, 7-VIII-1962, J. G. & B. L. Rozen (1♂ DARC). **Ward Co.:** Minot, 22-IV, Kløver (1♂ MISU), 13-V-1936, C. Bonness (1♂ MISU); SE Minot, 22-V-1994, G. Hanley (1♀ MISU), 23-V-1994, G. Hanley (1♀ MISU); 6-V-1967, G. Eltz (1♀ MISU). **Williams Co.:** Williston, 23-VIII-1987, M. J. Weiss (1♀ NDSU).

Cosmopepla Stål, 1867

Members of this New World genus are relatively easy to identify by their small size, orbicular shape, and characteristic coloration. Most species are black with distinct dorsal markings in yellows, oranges, and/or reds (there are a few species in the western U.S. that are somewhat more drab, and as such appear quite similar to the Old World genus *Eysarcoris*). The genus has been revised fairly recently (McDonald 1986). There are presently eight species in the genus, all except one occurs in the western or southwestern U.S. extending into Mexico and Central America. Only one species occurs in North Dakota.

***Cosmopepla lintneriana* Kirkaldy, 1909** - The name of this species has had a confusing taxonomic history which was discussed in length by Rider and Rolston (1995). In short, the original name *carnifex* Fabricius, 1798, is preoccupied; the next available synonym was thought to be *bimaculata* Thomas, 1865, but it is also preoccupied. Kirkaldy (1909) proposed *lintneriana* as a replacement name; this was not accepted by many workers. As such, much of the early literature pertaining to this species is under the name *C. carnifex* and most of the more recent literature is under *C. bimaculata*. *Cosmopepla lintneriana* is the correct name, however. This species is relatively easy to identify by the small orbicular shape, the black coloration, and the reddish dorsal markings including the pair of red spots near the scutellar apex, and a reddish cross on the pronotum. McPherson (1982, as *C. bimaculata*) gave the known range as Nova Scotia and New England west to British Columbia and Washington, and

south to Georgia, Texas, and Mexico. Uhler (1878, as *C. carnifex*) recorded this species from two North Dakota counties: **Pembina Co.:** near Pembina, June, and **Rollette Co.:** Turtle Mountains, July 24; Hussey (1922, as *C. bimaculata*) also recorded it from **Rollette Co.:** Turtle Mountains, T. H. Hubbell, taken on willow in a moist meadow. Lugger (1900) recorded this species (as *C. carnifex*) from Minnesota. The behavior, biology, and life history of this species has been studied (McDonald 1968b, Fish and Alcock 1973, McPherson 1976b, McPherson and Tecic 1997).

Specimens examined: **Barnes Co.:** Bald Hill Dam, 7-VI-1978, E. U. Balsbaugh (2♂♂ NDSU); Valley City, 10-VI-1993, K. Mundal (2♂♂ DARC, 2♂♂ NDSU). **Cass Co.:** Fargo, 10-VI-1923, W. Baker (1♀ NDSU), 12-VII-1922, R. L. Webster (1♀ NDSU); N Fargo, Riverwood Pk, 46.945N, 96.802W, 19-VII-2012, D. A. Rider (1♂ DARC); NE Fargo, 19-VI-2012, D. A. Rider (1♀ DARC); s. Fargo, 76 Ave S, Chrisan Edition, 46.766N, 96.780W, 5-VI-2012, D. A. Rider (1♀ DARC); Fargo, NDSU campus, 25-VI-2012, D. A. Rider (1♀ DARC); Tower City, 27-VI-1906, MWR (1♂ DARC, 1♂ 1♀ NDSU), 12-VII-1906 (1♀ DARC); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (5♂♂ 2♀♀ DARC), 13-VIII-2012 (2♂♂ 1♀ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (3♂♂ 5♀♀ DARC); 17-III-1963, R. Poole (1♀ NDSU), 16-VI-1966 (1♀ NDSU), 24-VII-1968, J. Johnson (1♂ 3♀♀ NDSU), 9-VIII-1968, J. Johnson (1♂ NDSU). **Cavalier Co.:** Clyde, 20-IX-1923, W. Baker (1♂ NDSU); Langdon Farm, 7-IX-2002, D. Nowatzki (1♂ NDSU). **Divide Co.:** vicinity of Crosby, 13-IX-1987, M. Buck (1♂ MISU). **Grand Forks Co.:** Air Force Base Property, McKinock Twp., T152N, R53W, Sec. 27, 16-IX-1970 (2♀♀ UNDG); Forest R. Valley, UNDG Biol. Stn., 1mi. N Inkster, 9-VII-1976 (1♂ UNDG), 16-VII-1977 (1♂ UNDG), 30-IX-1970, D. Shouse (1♀ UNDG); Grand Forks, 24-VI-1953 (1♂ UNDG), 25-VI-1917, P. W. Fattig (1♂ 1♀ 1? NDSU), 26-VII-1953 (1♀ UNDG), 26-VII-1966 (1♀ UNDG), 29-IX-1945 (1♂ 1♀ UNDG), 2-X-1939 (1♀ UNDG), 4-X-1945 (1♀ UNDG), 13-X-1947 (1♀ UNDG); Grand Forks, 706 Reeves Dr., 20-IX-1982 (1♀ UNDG); Kelly, 1-X-1927, E. & G. Wheeler (1♂ UNDG); Northwood, 15-VI-1964, R. L. Post (8♂♂ 13♀♀ NDSU); Oakville Prairie, T151N, R52W, Sec. 16, 10-IX-1980 (1♂ 3♀♀ UNDG), 24-IX-1976 (1♀ UNDG), 10-X-1976 (1♂ UNDG); State Park near Arvilla, 30-VII-1966 (1♀ UNDG), 4-X-1947 (2♂♂ UNDG); Turtle R., 4.8mi. W, 2mi. N Emerado, T152N, R53W, Sec. 20&29, 25-VI-1979 (1♀ UNDG), 9-VIII-1977 (1♂ UNDG), 8-IX-1975, A. Glass (1♀ UNDG), 8-IX-1980 (1♀ UNDG), 11-IX-1976 (1♀ UNDG), 12-VI-1977 (1♂ 1♀ UNDG), 16-IX-1984 (1♀ UNDG), 17-IX-1984 (1♀ UNDG), 18-IX-1976 (2♂♂ 3♀♀ UNDG), 20-IX-1978 (1♂ 1♀ UNDG); Turtle River State Park, 28-VI-1965, S. Kraft (1♀ UNDG), 4-IX-1976 (1♂ UNDG), 23-IX-1978 (2♂♂ UNDG); T151N, R50W, Sec. 6, 28-VII-1966 (1♀ UNDG); 9-IX-2008, T. Fattig (1♀ UNDG), 27-IX-2008, C. Black (1♀ UNDG). **Griggs Co.:** Cooperstown, 30-VII-1964, R. J. Sauer (2♂♂ NDSU). **McKenzie Co.:** 1-VIII-2008, J. Beard (1♀ UNDG). **Ransom Co.:** Fort Ransom St. Pk., 13-VII-2002, D. A. Rider (4♂♂ 1♀ DARC); 2mi. SW McCleod, T134N, R53W, SW35, 9-VI-1992, D. A. Rider (1♂ 1♀ DARC), 8-VII-1992, D. Cuthrell, T. Madson, at light (2♂♂ 1♀ NDSU); 4mi. NW of McCleod, T134N R53W Sec 6, 18-VI-1992, D. A. Rider (1♂ 6♀♀ DARC); Mirror Pool, 10mi. SE Sheldon, 12-VI-1981, J. Smith (1♀ NDSU); Mirror Pool WMA, 46°32.348N, 97°17.475W, 27-VI-2012, D. A. Rider (2♂♂ 6♀♀ DARC), 30-VIII-2006, W. Clark (1♀ NDSU); 7 mi. SE Sheldon, 23-V-1985, J. R. Powers (6♂♂ 3♀♀ DARC, 2♂♂ 2♀♀ NDSU); Sheyenne National Grassland, T134N, R53W, Sec. 12, 11-VI-1992, D. Cuthrell (1♀ NDSU); SNG, Orchid Site A, T134N, R54W, SESE12, 29-VI-1992, D. Cuthrell (2♂♂ 4♀♀ NDSU); SNG, Orchid Site D, T134N, R53W, SE05, 23-VI-1992, D. Cuthrell (1♀ NDSU); SNG, Viking Prairie, 15-IX-2006, K. A. Fox (1♀ NDSU); 6-VI-1963, R. L. Post (1♀ NDSU), 11-VII-1961, J. C. Larsen (1♂ 1♀ NDSU). **Richland Co.:** Ekre Grassland Pres., 3-IX-2009, D. A. Rider (3♀♀ DARC); Mirror Pool, 3-VI-1994, D. A. Rider (1♀ DARC), 2-VII-1979, J. W. Hoganson (1♀ NDSU), 5-VII-1979, D. Fischer (1♂ NDSU); SNG, Oak Savannah,

T135N, R52W, Sec. 10NE, 14-IX-1996, L. Pederson (1♂ NDSU); SNG, Horse trail head, 46.523N, 97.201W, 28-V-2010, D. A. Rider (7♂♂ 5♀♀ DARC; 7♂♂ 4♀♀ NDSU), 27-VI-2012, D. A. Rider (3♂♂ DARC), 25-VIII-2009, D. A. Rider (1♂ 1♀ DARC); Verbena Site, T135N, R51W, 31, 5-VIII-1992, D. Cuthrell (2♂♂ 2♀♀ NDSU). **Traill Co.:** 27-VI-1967, R. L. Post (2♂♂ 1♀ NDSU). **Ward Co.:** Minot, 29-VI-2008, D. Markle (1♂ NDSU), 22-VII-1948, Knapp & Dahl (1♂ 1♀ NDSU); Nedrose Twp, 5-VI-1957, R. Nelson (1♂ MISU). **Williams Co.:** T-154-96-31, D. A. Mundal, *Euphorbia esula* (1♂ NDSU).

Euschistus Dallas, 1851

This is a large, diverse genus with many species occurring in North America and the Neotropics. There are no recent keys that cover all the North American species, the most recent being that of Torre-Bueno (1939). In general, however, North American species of *Euschistus* can be separated from other genera by the crenulate to dentate anterolateral pronotal margins. McPherson and Ahmad (2012) compared the male genitalia among those species of *Euschistus* that occur in the midwestern United States. Five species occur in North Dakota, and can be identified by the following key.

Key to the species of *Euschistus* in North Dakota

- 1 Pronotum with distinct transhumeral pale band or callous; spiracular peritremes dark brown to black.....*Euschistus ictericus* (Linnaeus)
- Transhumeral pale band usually lacking, not distinct, if faintly present, then spiracular peritremes pale, colorous with abdominal venter.....2
- 2(1) Juga distinctly longer than tylus.....3
- Juga and tylus subequal in length, juga rarely slightly longer than tylus in which case humeral angles are distinctly angulate or spinose4
- 3(2) Connexivum immaculate *Euschistus latimarginatus* Zimmer
- Connexivum pale with dark brown spots or bands
.....*Euschistus servus euschistoides* (Vollenhoven)
- 4(2) Pale brown, somewhat more elongate; humeral angles angulate to spinose; abdominal venter lacking medial black spots.....
..... *Euschistus variolarius* (Palisot de Beauvois)
- Dark brown to gray, somewhat broader; humeral angles rounded; abdominal venter usually with one to four medial black spots
.....*Euschistus tristigmus luridus* Dallas

***Euschistus ictericus* (Linnaeus, 1763)** - This species is relatively easy to recognize by the pale transhumeral callus and the dark spiracular peritremes. McPherson (1982) summarized the known distribution of this species as occurring in the northern states and Canada as far west as Utah, and as far south as Florida, Oklahoma, and Texas. Neither Uhler (1878) or Hussey (1922) reported this species from North Dakota. Froeschner (1988c) did not list this species from North Dakota, or from any of the surrounding states or provinces (the closest records are from Colorado, Iowa, Illinois, and Wisconsin). McPherson and Paskewitz (1984a) described the immature stages and observed the adults ovipositing on sedges.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Clay Co.:** MSUM Buffalo River Science Center, 46°51'45"N, 96°28'41"W, 24-VIII-2006, W. Clark (1♂ DARC), 26-VIII-2004, S. Ganehiarachchi (1♀ NDSU), C. P. Johnson (1♀ DARC). **Dakota Co.:** Hastings, 20-VIII-1928, H. A. Scullen (1♂ DARC). **Stearns Co.:** St. Cloud, 1-VIII-1972 (1♀ DARC); St. Stephen, 18-IX-1968, R. J. Trobec (1♂ UNDG). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Fargo,

10-VI-1923, W. Baker (1♀ NDSU); Fargo, NDSU campus, Ladd Hall, 1-X-2002, R. Bohl (1♀ NDSU); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (1♀ DARC); IX-1958 (1♂ NDSU). **Grand Forks Co.:** 28-VIII-2008, T. Campbell (1♂ UNDG); State Park near Arvilla, 4-X-1947 (1♂ UNDG). **Ransom Co.:** SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. Rider (1♂ DARC).

***Euschistus latimarginatus* Zimmer, 1910** - This species can be recognized by the elongate juga and the immaculate connexiva. *Euschistus latimarginatus* was originally described from Nebraska, and was later recorded from South Dakota (Harris, 1937). Van Duzee (1917) listed it also from Colorado (repeated by Torre-Bueno, 1939 and Froeschner 1988c), but the source of this record has not been located. From specimens at hand, this species appears to be much more widespread than previously thought, but it may be very local, occurring only on sand dune sites. Zimmer (1912) indicated that he collected this species on seed pods of yucca and opuntia; I have collected a single specimen (as a late instar which I reared to adult on green beans) on the seed pod of penstemon. Because of the apparent lack of published records, I have listed several new state records outside the scope of this work.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Polk Co.:** 2mi. S Fertile, 47°30.14N, 96°18.00W, 12-VII-2000, P. B. Beauzay (1♀ NDSU). NEBRASKA: **Cherry Co.:** Valentine, 10-VI-1982, Wolfe (1♂ DARC). **Thomas Co.:** Halsey, 12-VI-1971, K. Pruess, on yucca (5♂♂ 3♀♀ DARC). NORTH DAKOTA [NEW STATE RECORD]: **Ransom Co.:** Sheyenne Natl. Grasslands, T135N, R53W, Sec. 27, 28-VII-2000, J. Maxwell, in sand hills nr *Hudsonia* spp. (1♂ NDSU). **Richland Co.:** Mirror Pool, 6-IX-1980, J. Thomas (1♂ NDSU); 1mi. E Mirror Pool, 24-VII-1993, coll. as nymph on penstemon (1♂ DARC). SOUTH DAKOTA: **Bennett Co.:** Martin, 3-IX-1924, H. C. Severin (1♂ DARC). TEXAS [NEW STATE RECORD]: **El Paso Co.:** Fabens, IX-1940, S. E. Jones (1♂ DARC). **Ward Co.:** Monahans Sand Hills, 28-VII-1973, W. E. & C. A. Triplehorn (1♂ DARC); 3mi. E. Monahans, 19-VIII-1983, E. G. & M. A. Riley (1♂ DARC). UTAH [NEW STATE RECORD]: Zion Natl Park (1♂ DARC).

***Euschistus servus euschistoides* (Vollenhoven, 1868)** - In North Dakota, this species is easy to recognize by the elongate juga and the maculate connexiva. The nominate subspecies is more difficult to separate from other *Euschistus* species as the juga and tylus are subequal in length; this subspecies occurs in the southern half of the U.S. There is some question whether *euschistoides* is a valid subspecies as the boundary between the two subspecies is rather broad, and the main character separating the two subspecies is more or less clinal through this boundary area. McPherson (1982) stated that the boundary between the two subspecies was not clear except for his work in Illinois and some work in Virginia; he gave the range for this subspecies as simply across the northern part of the continent. Froeschner (1988c) did not list this species from North Dakota or Minnesota even though Hussey (1922) provided two North Dakota records: **Ramsey Co.:** Devils Lake, T. H. Hubbell, and **Slope Co.:** Amidon, T. H. Hubbell. I originally had thought that this species had not actually been recorded from Minnesota, but upon closer inspection, I discovered that the record of *E. variolarius* (Lugger 1900) is actually a misidentification of this species. In northern regions, *E. variolarius* has the humeral angles spinose; the specimen in Lugger's illustration distinctly has rounded humeral angles. This species appears to be quite common, and probably occurs statewide in both North Dakota and Minnesota. Youther and McPherson (1975) studied the mating behavior of this species in the laboratory. This common species has been the subject of numerous citations concerning its biology and life history (see McPherson 1982 for citations).

Specimens Examined: NORTH DAKOTA: **Barnes Co.:** Valley City, 10-VI-1993, K. Mundal (1♀ DARC); T139, R58, Sec. 14, 18-IX-2004, P. S. Burange (1♂ 1♀ NDSU). **Benson Co.:** 8-IX-1958, S. Wilson (1♂ NDSU). **Billings Co.:**

Roosevelt Natl. Park, Medora, 24-VI-2002, F. Antwi (1♂ NDSU). **Burleigh Co.:** 12-VI-2008, B. Axtman (1♂ UNDG), 17-VII-2008, H. Dassinger (1♀ UNDG). **Cass Co.:** Absaraka, 19-IX-2008, L. Grindberg (1♂ 1♀ NDSU); Fargo, 24-VIII-1923, W. Baker (1♂ NDSU), 29-VIII-1917, P. W. Fattig (1♀ NDSU), 7-IX-2004, L. Kuster (1♂ NDSU); Fargo, NDSU campus, 9-IV-2008, R. DeGreeff (1♂ NDSU), 11-IX-2008 (1♂ NDSU); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♂ DARC), 1-VIII-2012, D. A. Rider (1♀ DARC); 5-VIII-1960 (1♂ NDSU), 9-IX-2003, R. Wagner (1♂ NDSU). **Cavalier Co.:** Langdon Farm, 7-IX-2002, D. Nowatski (1♂ NDSU); 5mi. E Langdon, 25-VIII-2007, J. Balsdon (1♂ NDSU). **Dunn Co.:** 5mi. W Killdeer, 26-V-1977, E. U. Balsbaugh (1♀ NDSU); 21-VI-1977, L. A. Schutz & J. W. Smith (1♂ NDSU), 13-VII-1976, Lago & Kurtz (1♀ NDSU), 20-VII-1977, L. A. Schutz & J. W. Smith (1♀ NDSU), 2-VIII-1977, L. A. Schutz & J. W. Smith (1♂ 1♀ NDSU), 25-VIII-1976 (2♂♂ 2♀♀ NDSU). **Golden Valley Co.:** D. A. Mundal, *Eurphorbia esula* (1♂ 2♀♀ NDSU). **Grand Forks Co.:** 5mi. N of Arvilla, 7-IX-2002, K. Benson (1♂ NDSU); State Park near Arvilla, 4-X-1947 (1♀ UNDG); Forest R. Biol. Stn., 1mi. N Inkster, 9-VII-1976 (2♀♀ UNDG); Grand Forks, 11-IX-1992 (1♀ UNDG), 4-X-1983 (1♂ UNDG); Grand Forks Industrial Park, 1-IX-2011, G. Machart, Lindgren trap baited with *Ips* lure (1♂ NDSU); Grand Forks KOA, 1-IX-2011, G. Machart, Lindgren trap baited with Manuka oil (1♀ NDSU); Northwood, 1-VI-1956, R. C. & R. L. Post (1♀ NDSU); Oakville Prairie, T151N, R52W, Sec. 16, 22-VI-2012, D. A. Rider (1♂ 1♀ DARC), 14-VIII-2009, D. A. Rider (1♂ DARC), 28-VIII-2008, B. Stargardt (1♀ UNDG), 10-IX-1980 (1♂ UNDG), 15-IX-1975 (1♀ UNDG), 15-IX-1979 (1♀ UNDG), 26-IX-1983 (1♂ UNDG); Turtle River State Park, 4-IX-1976 (1♂ 1♀ UNDG), 2-X-1992 (1♀ UNDG); Turtle R., 4.8mi. W, 2mi. N Emerado, T152N, R53W, Secs. 20 & 29, 12-VI-1977 (1♀ UNDG), 9-VIII-1979 (1♂ UNDG), 1-IX-1982 (1♀ UNDG), 2-IX-1992 (1♂ 1♀ UNDG), 6-IX-1980 (5♂♂ 2♀♀ UNDG), 6-IX-1992 (1♂ UNDG), 8-IX-1975, A. Glass (1♂ 1♀ UNDG), 8-IX-1982, R. Kreil (2♂♂ 2♀♀ UNDG), 9-IX-1975 (1♀ UNDG), 9-IX-1982 (1♂ UNDG), 10-IX-1980 (2♀♀ UNDG), 17-IX-1984 (1♀ UNDG), 18-IX-1974 (1♀ UNDG), 19-IX-1984 (1♀ UNDG); UND campus, 19-X-1975 (1♂ UNDG); T151N, R50W, Sec. 26, 9-X-1969 (1♂ UNDG); 7-VIII-2008, J. Hughes (1♂ UNDG), 9-IX-2008, H. Dassinger (1♂ UNDG), 9-IX-2008, T. Fettig (1♂ UNDG), 12-IX-2008, P. Dorgan (1♂ UNDG), 12-IX-2008, C. Black (1♀ UNDG), 18-IX-2008, M. Michelson (1♀ UNDG), 30-IX-2008, N. Hoagland (2♀♀ UNDG), 4-XI-2008, N. Hoagland (1♂ UNDG), 13-XI-2008, B. Stargardt (1♀ UNDG). **Marshall Co.:** 4mi. W Argyle, 27-IX-2008, K. Rivard (1♀ NDSU). **McHenry Co.:** T156N, R78W, Sec. 36, 22-VI-1967, J. Knudson (1♀ NDSU). **McKenzie Co.:** Th. Roos. M. Prk., 3-VIII-1965, W. Kotchman (1♂ NDSU). **Mercer Co.:** Stanton Area, 1-VII-1972, A. C. F. Hung (1♀ UNDG); T144N, R84W, Sec. 22, 6-VII-1972, A. C. F. Hung (1♂ 4♀♀ UNDG), T144N, R84W, Sec. 28, 18-20-VII-1972, A. C. F. Hung (1♂ UNDG); T144N, R85W, Sec. 9, 18-20-VII-1972, A. C. F. Hung (1♂ UNDG), 15-VIII-1972, P. B. Kannowski (1♂ UNDG). **Mountrail Co.:** Van Hook, 5-VII-1982 (1♀ NDSU). **Oliver Co.:** 2mi. E. of Hensler, 20-VII-1978, L. A. Schutz & J. W. Smith (1♀ NDSU); T143N, R83W, Sec. 6, 16-VIII-1972, P. B. Kannowski (1♀ UNDG). **Pembina Co.:** Crystal, 22-IX-2004, P. S. Burange (1♂ NDSU); 2mi. NE Crystal, 13-IX-2003, A. Moquist (1♀ NDSU); Icelandic State Park, 27-VIII-1981, E. U. Balsbaugh (1♀ NDSU). **Ramsey Co.:** Lawton, 22-IX-2004, R. Miller (1♀ NDSU). **Ransom Co.:** Fort Ransom St. Pk, 13-VII-2002, D. A. Rider (1♀ DARC); Lisbon, 1983, J. Julian, on leafy spurge (2♂♂ 1♀ NDSU); 2mi. SE McLeod, T134N, R53W, Sec. 35, 8-VII-1992, D. Cuthrell, T. Madson, at light (1♂ NDSU); Mirror Pool WMA, 27-VI-2012, D. A. Rider (1♀ DARC), 30-VIII-2007, D. A. Rider (3♂♂ 1♀ DARC), 4-IX-2009, D. A. Rider (1♂ DARC); 7mi. SE Sheldon, 19-V-1992, J. R. Powers (1♀ DARC), 23-V-1985, J. R. Powers (3♂♂ 1♀ DARC), 5-IX-1979, J. W. Smith (1♂ NDSU); SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. Rider (1♀ DARC). **Richland Co.:** 4mi. W Barney, 14-VI-1984, M. McLeod (1♂ NDSU); Colfax, 17-IX-2000, A. Hackey (1♂ NDSU); Ekre Grassland Preserve, T136N, R51W, Sec. 32, 28-V-2010, D. A. Rider (2♀♀ DARC), 28-VII-1993, D. L. Cuthrell (1♀ DARC),

19-VIII-2011, D. Rider, G. Fauske, Lindgren trap (♀ NDSU), 28-VIII-2008, D. A. Rider (2♂♂ DARC), 31-VIII-2011, D. Rider, G. Fauske, Lindgren trap (1♂ NDSU), 3-IX-2009, D. A. Rider (1♂ 4♀♀ DARC), 6-IX-1994, M. Ellefson (2♀♀ NDSU), 6-IX-1994, D. A. Rider (1♀ DARC), 25-IX-1994, T. Nowatzki (1♂ 1♀ NDSU); SW of Kindred, 11-IX-1993, J. Franger (1♀ NDSU); McLeod, T133N, 52W, Sec. 6, 18-IX-1979, E. U. Balsbaugh (1♂ NDSU); 1mi. SE McLeod, 3-VI-1985, J. R. Powers (1♀ DARC); Mirror Pool, T135N, R52W, Sec. 8, 3-VIII-2004, S. Ganehiarachchi (1♂ 2♀♀ NDSU), 26-VIII-1994, T. Nowatzki (3♂♂ NDSU), 29-VIII-1996, D. A. Rider (2♂♂ 1♀ DARC), 3-IX-1992, J. A. Nelson (1♀ NDSU), 4-IX-1998, D. A. Rider (1♂ DARC), 11-IX-1993, B. Clapper (1♂ NDSU), 18-IX-1994, D. A. Rider (1♀ DARC), 20-IX-1994, W. G. Schroeder (1♂ NDSU); 1mi. E Mirror Pool, 25-VI-1993, D. L. Cuthrell (1♀ DARC), 28-VII-1993, D. Cuthrell (1♂ NDSU); 2mi. NE Mirror Pool, 28-VI-1993, G. Fauske (1♀ NDSU); SNG, Oak Savannah Area, 11-VI-1996, L. DeCock (1♀ NDSU), 18-VI-2000, D. A. Rider (1♂ DARC), 26-VI-1996, L. DeCock (1♀ NDSU), 7-VIII-1993, D. Cuthrell (1♂ 1♀ NDSU), 17-IX-1996, P. Anderson (2♂♂ NDSU); SNG, Horse trail head, 46°31.409N, 97°12.194W, 25-VIII-2009, D. A. Rider (3♂♂ 1♀ DARC), 4-IX-2009, D. A. Rider (2♂♂ 3♀♀ DARC), 9-IX-2008, D. A. Rider (1♂ DARC); SNG Horse trail head, 46.52N, 96.21W, 20-VII-2012, D. A. Rider, col. on Penstemon as last instar nymph (1♂ DARC); Walcott, 10-IX-2004, C. Juricek (1♂ NDSU); Walcott Dunes, 26-VI-1975, P. K. Lago (1♀ NDSU); 11mi. W Walcott, 23-V-1988, J. R. Powers (1♂ 2♀♀ DARC); 4-H Camp, 2-VII-1964 (1♂ NDSU); T135N, R52W, S4-SW1/4, 26-IX-1984, R. Kruger (1♂ NDSU); 6-VIII-1958, S. Wilson (1♀ NDSU). **Rollette Co.:** 4-VI-1958, Kotchman (1♂ NDSU). **Sargent Co.:** 3.5mi. N Crete, 5-IX-1982 (1♀ UNDG). **Slope Co.:** Chalky Buttes, 5-VI-1973, T. L. McCabe (1♀ NDSU). **Stearns Co.:** St. Stephen, 28-IX-1968 (1♂ UNDG). **Stutsman Co.:** Chase Lake, 13-VI-1975, P. K. & B. A. Lago (1♀ NDSU). **Walsh Co.:** 10mi. W of Park River, 11-VI-1981, E. U. Balsbaugh, on *Carduus nutans* (3♂♂ 3♀♀ NDSU); South Branch of Park River, NE of Adams, 20-VIII-1970, J. Singleton (1♂ UNDG); 20-VII-2008, E. Oldenburg (1♂ UNDG), 23-VII-2008, M. Flom (1♀ UNDG), 16-VIII-1958 (1♀ NDSU). **Ward Co.:** Minot 15-VI-1936, R. Neubauer (1♂ MISU), 10-VII-2002, G. Hanley (2♂♂ 1♀ MISU); NW Minot, 6-VI-1994, G. Hanley (1♀ MISU), SE Minot, 22-VI-2005, G. Hanley (1♀ MISU); Nedrose Twp, 12-VI-1957, R. Nelson (1♀ MISU).

***Euschistus tristigmus luridus* Dallas, 1851** - This species is usually easy to identify, because the abdominal venter has from one to four black spots along its midline. In a few specimens, these spots are obsolete, but they can still be identified by their smaller size, the rounded humeral angles, and the dorsum being somewhat darker brown to gray, contrasting more sharply with the pale venter. Although this species can be caught in old field situations, it tends to occur more in forested areas than the other North Dakotan *Euschistus* species. Similar to *E. servus euschistoides*, this species has been divided into two subspecies. The northern subspecies, *E. t. luridus*, has the humeral angles rounded, whereas the nominate subspecies (southeastern U.S.) has the humeral angles acute to spinose. Apparently the boundary between these two forms is much more narrow than in *E. t. euschistoides*; McPherson (1976a) gave the dividing line as around latitude 41° N and gave (1982) the distribution north of that latitude from Nova Scotia, Québec, and New England west to Washington. Only the *luridus* subspecies occurs in North Dakota. Hussey (1922) provided two North Dakota records of this species: **Eddy Co.:** Sheyenne River, about 3 miles S of Warwick, 8 August 1920, T. H. Hubbell, and **Ramsey Co.:** Devils Lake, 28 July, T. H. Hubbell, undergrowth in an oak woods. It appears that this species is common throughout the eastern half of the state, but seems to be absent in the far western counties. The life history of this species has been studied (McPherson 1975), and this species has been reared in the laboratory (McPherson 1971b).

Specimens Examined: NORTH DAKOTA: **Barnes Co.:** Valley City 10-VI-1993, K. Mundal (1♂ DARC); 13-IX-1946, R. L. Post (1♂ NDSU). **Cass Co.:** Fargo, VII-1957, R. C. & G. J. Post (1♀ NDSU), 31-VIII-2004, N. Hillen (1♀ NDSU); Fargo, NDSU campus, 3-IX-2002, R. Holthusen (1♂ NDSU); S Fargo, 76 Ave. S., Chrisan Edition, 46.766N, 96.780W, 8-VI-2012, D. A. Rider (1♂ 1♀ DARC); 17-VI-1958, S. Wilson (1♂ NDSU). **Cavalier Co.:** Langdon Farm, 7-IX-2002, D. Nowatzki (1♂ NDSU). **Grand Forks Co.:** Air Force Base Property, McKinock Twp, T152N R53W, Sec. 27, 21-IX-1974 (1♀ UNDG); Grand Forks, 20-VIII-1928 (1♀ UNDG), 26-IX-1952 (1♂ UNDG), 3-X-1941 (1♂ UNDG); Northwood, 15-VI-1964, R. L. Post (1♀ NDSU); Oakville Prairie, Oakville Twp, Sec. 9, 2-X-1958 (1♂ UNDG); Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (1♂ 5♀♀ DARC), 21-VIII-2009, D. A. Rider (1♂ DARC), 10-IX-1980 (1♀ UNDG); Turtle River, 4.8mi. W, 2mi. N. Emeraldo, T152N, R53W, Sec. 20 & 29, 8-IX-1975, A. Glass (1♀ UNDG), 10-IX-1980 (1♂ UNDG), 17-IX-1984 (2♂♂ 1♀ UNDG), 18-IX-1974 (1♂ UNDG), 19-IX-1984 (1♂ 1♀ UNDG), 25-IX-1965 (1♀ UNDG); Turtle River State Park, 8-VII-1940 (1♂ UNDG), 14-IX-1975 (2♂♂ UNDG), 18-IX-1965 (1♀ UNDG), 19-IX-1966 (1♂ UNDG), 25-IX-1937 (1♀ UNDG), 27-IX-1969, R. Becker (1♀ UNDG), 4-X-1947 (1♂ UNDG); UNDG Biology Area, Forest R. Valley, Inkster, 18-VI-1958 (1♀ UNDG), 18-VI-1970, R. Lamp (1♀ UNDG), 25-VI-1970, G. Ruonala (1♂ UNDG), 9-VII-1976 (1♀ UNDG), 31-VIII-1966 (2♀♀ UNDG), 29-IX-1980 (1♂ UNDG), 5-X-1969 (1♂ UNDG), 9-X-1965 (1♀ UNDG); 25-VIII-2008, B. Roth (1♀ UNDG), 10-IX-2008, J. Morseth (1♀ UNDG). **Mercer Co.:** T144N, R84W, Sec. 22, 6-VII-1972, A. C. F. Hung (2♂♂ 3♀♀ UNDG), 4-6-VIII-1972, A. C. F. Hung (1♀ UNDG), 15-VIII-1972, P. B. Kannowski (2♀♀ UNDG); Stanton area, 1-VII-1972, A. C. F. Hung (1♀ UNDG). **Morton Co.:** Mandan, VII-1965, J. W. Goertel (1♂ NDSU); 12-VIII-2008, N. Bundermann (1♂ UNDG). **Pembina Co.:** 4mi. W of St. Thomas, 14-VI-1979, J. Pontius, window pane trap (1♂ NDSU). **Ramsey Co.:** Lawton, 17-IX-2004, M. Duppong (1♀ NDSU). **Ransom Co.:** Lisbon, 1983, J. Julian (1♀ NDSU); Mirror Pool WMA, 46°32.348N, 97°17.475W, 27-VI-2012, D. A. Rider (3♀♀ DARC), 18-VII-2002, L. Tobias (1♀ DARC), 24-VII-1979, A. C. Ashworth (1♂ NDSU), 30-VIII-2007, D. A. Rider (3♂♂ DARC); SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. Rider (1♂ DARC). **Richland Co.:** Ekre Grassland Preserve, T136N, R51W, Sec. 32, D. Pitzen (1♂ 2♀♀ NDSU), 1-V-2011, D. Rider, G. Fauske, Lindgren trap (8♂♂ 4♀♀ NDSU), 28-V-2010, D. A. Rider (2♂♂ 2♀♀ DARC), 8-VII-2011, D. Rider, G. Fauske, Lindgren trap (1♂ 5♀♀ NDSU), 21-VII-2011, D. Rider, G. Fauske, Lindgren trap (1♂ 5♀♀ NDSU), 28-VII-1993, D. L. Cuthrell (2♀♀ DARC), 3-IX-2009, D. A. Rider (3♂♂ 8♀♀ DARC), 11-IX-1993, M. J. Dietrich (1♀ NDSU); Mirror Pool, T135N, R52W, Sec. 8, 27-VI-1992, D. Rider (1♀ DARC), 2-VII-1979, J. W. Hoganson (1♀ NDSU), 18-VII-1992, D. A. Rider (1♀ NDSU), 10-VIII-1994, J. L. Jyoti (1♂ 2♀♀ NDSU), 29-VIII-1996, D. Rider (4♂♂ 2♀♀ DARC), 4-IX-1998, D. A. Rider (3♂♂ 1♀ DARC), 5-IX-1994, T. Nowatzki (1♂ NDSU), 11-IX-1974, P. K. Lago (1♀ NDSU); 1mi. E Mirror Pool, 25-VI-1993, D. L. Cuthrell (1♂ DARC); 1.5mi. NE Mirror Pool, 16-VI-1994, D. A. Rider (1♀ DARC), 27-VII-1993, D. L. Cuthrell (1♀ DARC); SNG, Horse Trail head, 46°31.409N, 97°12.194W, 27-VI-2012, D. A. Rider (1♂ 1♀ DARC), 4-IX-2009, D. A. Rider (1♀ DARC); SNG, Oak Savannah, 18-VI-2000, D. A. Rider (1♀ DARC). **Rollette Co.:** Sec. 20, Twp. 163, R. 72, 9-VI-1967, J. Knudson (1♀ UNDG); 4-VI-1968, Kotchman (1♀ NDSU). **Sargent Co.:** Shuman Twp, NW Sec. 3, 12-IX-1976 (1♂ UNDG). **Stutsman Co.:** 27-IX-1958, R. L. Post (1♀ NDSU). **Trail Co.:** 27-VI-1967, R. L. Post (1♀ NDSU). **Walsh Co.:** S. Branch, Park River, NE of Adams, 19-VIII-1970, D. Shouse (1♂ UNDG), 21-VIII-1970, J. Singleton (1♂ UNDG).

***Euschistus variolarius* (Palisot de Beauvois, 1817)** - This species is commonly referred to as the onespotted stink bug, the one spot being a black medial spot at the base of the pygophore in males. *Euschistus variolarius* is a common, widespread species, often confused with *E. servus*. Male specimens

are easy to separate because the black spot on the pygophore (referred to above) is lacking in *E. servus*. In North Dakota, the two are readily separated by the jugs (elongate in *E. servus*, not so in *E. variolarius*) and the humeral angles (rounded in *E. servus*, angulate to spinose in *E. variolarius*). One should note that these characters work only in northern latitudes; *E. servus* is quite variable in more southern areas. McPherson (1982) gave the distribution of this species as Québec, Ontario, and New England south to Florida, and west to British Columbia, Idaho, and Utah. Neither Uhler (1878) nor Hussey (1922) recorded collecting specimens of this species from North Dakota; also Froeschner (1988c) did not list this species from North Dakota or surrounding states. Luger (1900) recorded this species from Minnesota, but this record is a misidentification of *E. servus*. The North Dakota distribution of this species is very interesting. There are only two North Dakota records of *E. variolarius* prior to 1993, one in Richland County in 1958 and the other from Grand Forks County in 1976. Since 2000, however, this species has been collected fairly frequently, especially in the southeastern part of the state, but there is a record as far north and west as Minot in Ward County (2002). The biology of this species has been studied (Parish 1934), and Munyaneza and McPherson (1994) described the life cycle of this species in the midwest.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Fargo, 46°54'55"N, 96°47'55"W, 21-VII-2002, L. M. Tobias, UV light trap (1♂ DARC); Fargo, 19th Ave. SW, 24-IX-2002, E. Delahoyde (1♀ NDSU); s. Fargo, 76 Ave S., Chrisan Edition, 46.766N, 96.780W, 5-VI-2012, D. A. Rider (1♂ DARC); Fargo, NDSU campus, 21-V-2012, D. A. Rider (2♂♂ DARC), 25-VI-2012, D. A. Rider (1♂ 2♀♀ DARC), 6-IX-2000, G. Goenner (1♀ NDSU), 6-IX-2001, D. A. Rider (1♂ 1♀ DARC), 7-IX-2002, F. Antwi (1♀ NDSU), 9-XI-2008, J. Ell (1♀ NDSU); s. Fargo, 10-IX-2002, S. Koudela (1♀ NDSU); Fargo, Edgewood Golf Course, 2-X-2002, J. Prust (1♂ NDSU); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (4♂♂ 1♀ DARC), 13-VIII-2001, D. A. Rider (1♂ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 13-VIII-2012, D. A. Rider (1♂ DARC). **Grand Forks Co.:** Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (1♂ 2♀♀ DARC); Turtle River, 4.8mi. W, 2mi. N Emerado, T152N, R53W, Sec. 20 & 29, 15-IX-1976 (1♂ UNDG); 28-VIII-2008, D. Johns (1♂ UNDG). **Griggs Co.:** 1mi. E Hannaford, 8-XI-2007, K. D. Haugen (1♂ NDSU). **LaMoure Co.:** 3mi. W LaMoure, 28-IX-2002, C. Dathe (1♂ NDSU). **Ransom Co.:** Mirror Pool WMA, 27-VI-2012, D. A. Rider (2♂♂ 5♀♀ DARC), 30-VIII-2006, C. P. Johnson (1♀ NDSU), 30-VIII-2007, D. A. Rider (1♀ DARC), 7-IX-2000, C. L. Jorgensen (1♂ NDSU); SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. Rider (2♂♂ 1♀ DARC). **Richland Co.:** Ekre Grassland Preserve, 15-VII-2002, A. Joshi (1♂ 1♀ NDSU), 28-VII-1993, D. Cuthrell (1♂ DARC); Mirror Pool, 3-VIII-2004, S. Ganehiarachchi (1♂ NDSU); SNG, Horsetrail Head nr. Oak Savannah, 25-X-2007, D. A. Rider (1♂ DARC); SNG, Horsetrail head, 46°31.409N, 97°12.194W, 27-VI-2012, D. A. Rider (2♂♂ DARC), 8-IX-2008, D. A. Rider (1♀ DARC); SNG, Horsetrail head, 46.52N, 96.21W, 20-VII-2012, D. A. Rider, col. on Penstamon as last instar nymph (1♀ DARC); 6-VIII-1958, S. Wilson (1♀ NDSU); SNG, Oak Savannah, West I Allotment, 3-IX-2002, F. Antwi (1♂ 1♀ NDSU), A. Joshi (1♀ NDSU). **Ward Co.:** Minot, 10-VII-2002, G. Hanley (2♀♀ MISU).

Holcostethus Fieber, 1860

This genus has had a confused taxonomic history, and there are still some existing problems. The taxonomic history has been given in detail in Belousova (2007) and Ribes *et al.* (2008). In recent times, nearly all species were placed in *Holcostethus*. Ribes and Schmitz (1992) proposed that those species in which the tylus is enclosed by the jugs should be placed in *Peribalus* (Ribes and Schmitz erroneously used *Dryocoris* for this genus - see Dolling 1995, and Rider and

Rolston 1995 for an explanation), whereas those with the tylus not enclosed by the juga belonged in *Holcostethus*. Rider and Rolston (1995) argued that in North American species (not studied by Ribes and Schmitz), this character was variable even within a species, and as such only one genus, *Holcostethus*, should be recognized. Both Belousova (2007) and Ribes *et al.* (2008) have again argued that both genera should be recognized, and now have added several characters from both the male and female genitalia to support their position. These authors still did not study New World species.

I have examined specimens of most of the North American species and have conducted a quick survey of the New World literature (McDonald 1974, 1982), and conclude once again that in New World species, the jugal characters are variable, and simply do not work. The other characters, although not completely surveyed, seem to place most, if not all of our North American species in *Peribalus*. It seems best, however, to keep our species in *Holcostethus* until a thorough study of North American taxa can be made. The North American species were revised by McDonald (1974); he later provided an updated key (McDonald 1982). There are presently three species of *Holcostethus* known to occur in North Dakota. One other species, *H. fulvipes*, has been recorded from Manitoba (Maw *et al.* 2000).

Key to species of *Holcostethus* that may occur in North Dakota

- 1 Abdominal venter dark brown with at most the margins outlined in yellow..... *macdonaldi* Rider and Rolston
- Abdominal venter pale yellow to reddish brown, with or without dark markings2
- 2(1) Reddish brown; abdominal venter with distinct black markings in zig-zag pattern; juga not meeting in front of tylus [not yet known from North Dakota]..... *fulvipes* (Ruckes)
- Brown; abdominal venter without distinct pattern of dark markings3
- 3(2) Connexiva pale with a dark transverse band along both anterior and posterior connexival margins, resulting in an alternating pale and dark pattern..... *abbreviatus* Uhler
- Connexiva with narrow mesial margins dark, lateral margins pale, not interrupted by dark bands, no alternating pale and dark pattern *limbolarius* (Stål)

Holcostethus abbreviatus* Uhler, 1872** - In this species, the tylus is distinctly enclosed by the juga, and the connexiva is distinctly banded, alternating dark and pale. McPherson (1982) gave the range of this species as Iowa northwest to British Columbia and Washington, west to Oregon and California, and southwest to New Mexico. Hussey (1922) provided two specific localities for North Dakota; they were ***Bottineau Co.: Bottineau, from herbage in a depression in a pasture, T. H. Hubbell, and ***Rollette Co.***: Turtle Mountains, shrub-filled clearing, T. H. Hubbell. This species has also been recorded from Manitoba (Maw *et al.* 2000). Interestingly, it appears that this species has not been recorded from Minnesota yet.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: ***Clay Co.***: CCL Trust Lands, 47°03'Lat. 96°26'Long., 1-IX-1997, P. Tinerella, pitfall trap (1♀ NDSU); Felton Prairie Complex, 3mi. E, 2mi. S Felton, 47°03.87'N, 96°25.64'W, 30-VII-1999, David, Jordan (1♀ NDSU). NORTH DAKOTA: ***Billings Co.***: Sully Crk. St. Park, 10-VIII-1993, D. A. Rider (1♀ DARC). ***Cass Co.***: Fargo, 10-VI-1923, W. Baker (1♀ NDSU); Fargo, NDSU campus, 27-IX-2008, A. Clyde (1♀ NDSU). ***Dunn Co.***: Killdeer Mts., 28-VI-1965, L. Grochowski (1♀ NDSU); 3-VII-1966 (1♀ NDSU). ***Grand Forks Co.***: Forest River Biol. Area, 1.8mi. W, 1mi. N Inkster, T154N, R55W, Sec. 11 & 14, 18-IX-1976 (1♀ UNDG); Oakville Prairie, Oakville Twp., Sec. 9, 23-VI-1961 (1♀ UNDG). ***Mercer Co.***: Stanton

area, 1-VII-1972, A. C. F. Hung (♀ UNDG); T144N, R84W, Sec. 22, 4-6-VIII-1972, A. C. F. Hung (1♀ UNDG). **Morton Co.:** 6mi. E Glen Ullin, 1-VIII-1975, P. K. & B. A. Lago (1♀ NDSU). **Ransom Co.:** SNG, 1.5mi. W McLeod, T134N, R53W, Sec. 22, 4-VI-1992, D. A. Rider (1♀ DARC). **Richland Co.:** 1.5mi. NE Mirror Pool, 18-VII-1993, D. L. Cuthrell (1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 1-VI-1965, W. Kotchman (1♀ NDSU), 6-VI-1973, T. L. McCabe (1♀ NDSU), 13-VII-1965, W. Kotchman (1♀ NDSU), 10-VIII-1993, D. A. Rider (1♀ DARC); Chalky Buttes, 7-VI-1965, L. Grochowski (1♀ NDSU). **Stutsman Co.:** Montpelier, 31-V-1972, M. Knutson (1♀ NDSU). **Ward Co.:** Minot, 9-V-1936, O. Hill (1♂ MISU), 19-V-1936, C. Johnson (1♂ MISU); SE Minot, 23-VI-2005, G. Hanley (1♀ MISU).

***Holcostethus limbolarius* (Stål, 1872)** - This is the most common and widespread species in North America. This species is most likely to be confused with *P. abbreviatus*, but the two are easily separated by the pattern of dark markings on the connexival segments. In *P. abbreviatus*, the connexiva has a distinct alternating pale and dark pattern, whereas in *P. limbolarius*, the lateral half of the connexiva is entirely pale, not interrupted with dark. McPherson (1982) gave the range of this species as Québec, Ontario, and New England west across the continent, and south and southwest to Georgia, Texas, New Mexico, and California. This species appears to be fairly common in North Dakota, but to date only a single literature record is known. Hussey (1922) recorded it from **Slope Co.:** Amidon, T. H. Hubbell. Interestingly, it appears that this species has not yet been documented for Minnesota; Froeschner (1988c) listed this species only from Manitoba and Montana from our region, and Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan. This species has been recorded from a variety of different plant species; my survey works agrees with this as most specimens were collected in Old Field situations with quite a diversity of weed species. The life history of this species has been studied (Oetting and Yonke 1971b), and the immature stages have been described (Esselbaugh 1946, DeCoursey and Esselbaugh 1962).

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Clay Co.:** Bluestem Prairie, 46°50'Lat., 96°26'Long., 10-IX-1999, C. Davis, C. Jordan (1♀ NDSU); Bluestem Prairie, 4mi. E, 1 mi. S Glyndon, 46°50.08'N, 96°25.08'W, 24-IX-1999, P. B. Beauzay (1♂ NDSU); Regional Science Center Buffalo River Site, 29-VIII-2002, F. Antwi (1♀ NDSU). **Marshall Co.:** 4mi. W Argyle, 27-IX-2008, K. Rivard (1♂ NDSU). NORTH DAKOTA: **Barnes Co.:** S of Valley City, 47°04.00'N, 98°04.00'W, 18-IX-2002, A. Joshi (1♀ NDSU). **Burke Co.:** 17-VIII-1958, S. Wilson (1♀ NDSU). **Burleigh Co.:** Double Ditch, 27-IX-1975 (1♀ UNDG). **Cass Co.:** Fargo, 17-IX-2008, D. Hanson (1♀ NDSU), 18-IX-1921, R. L. Webster (1♀ NDSU), 21-IX-1958, G. J. & R. L. Post (12♂♂ 19♀♀ NDSU), Fargo, NDSU campus, 21-V-2012, D. A. Rider (3♀♀ DARC), 25-VI-2012 (1♂ DARC), 24-VIII-2002, F. Antwi (1♀ NDSU), 3-IX-2008, D. A. Rider (1♂ 1♀ DARC), 6-IX-2001, D. A. Rider (1♂ 2♀♀ DARC), 11-IX-2008 (1♀ NDSU), 17-IX-2003, C. J. Kjergaard (1♀ NDSU), 25-IX-2000, B. Gebhard (1♂ NDSU), 9-X-2003, B. Foster (1♂ NDSU); Wild Rice R. at Red Riv., 46.758N, 96.787W, 1-VIII-2012, D. Rider (1♀ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♀ DARC), 1-VIII-2012, D. A. Rider (3♂♂ 3♀♀ DARC), 13-VIII-2012, D. A. Rider (3♂♂ 2♀♀ DARC); 27-V-2002, J. Knott (1♀ DARC); 1958 (1♂ NDSU). **Cavalier Co.:** 3-VIII-1961, R. L. Post (1♀ NDSU). **Dunn Co.:** 13-VII-1976, L. A. Schutz & J. W. Smith (1♀ NDSU), 28-VII-1976, Lago & Kurtz (1♀ NDSU). **Grand Forks Co.:** Air Force Base Property, McKinock Twp, T152N, R53W, Sec. 27, 16-IX-1970, D. Nelson (3♂♂ 1♀ UNDG); Arvilla, 28-IX-1931 (1♂ 2♀♀ UNDG), X-1929 (1♂ UNDG); Forest River Biol. Area, 1.8mi. W, 1mi. N Inkster, T154N, R55W, Sec. 11 & 14, 18-IX-1976 (1♂ UNDG), 5-X-1969 (1♀ UNDG); Grand Forks, 30-IX-1963 (1♀ UNDG), 16-X-1931 (1♀ UNDG), 16-X-1950 (1♀ UNDG); Northwood, 17-VI-1959, R. L. Post (1♂ NDSU); Oakville Prairie, Oakville Twp, Sec. 9, 2-X-1959 (1♀ UNDG); Oakville Prairie, T151N, R52W, Sec. 16, 26-IX-1983

(1♂ UNDG); Thompson, 1.5mi. W of I-29 interchange, 20-IX-1992, J. Froelich (2♀♀ UNDG); Turtle River State Park, 30-VI-1953 (1♂ UNDG), 2-X-1992 (1♀ UNDG). **Hettinger Co.:** 19-VIII-1977, L. A. Schutz & J. W. Smith (1♂ NDSU). **McKenzie Co.:** Th. Roos. M. Prk, 5-VI-1965, L. Grochowski (1♂ NDSU), 23-VI-1965, L. Grochowski (1♀ NDSU). **Mercer Co.:** Beulah, 3-IX-1977 (1♀ UNDG); 18mi. S, 4mi. W Beulah, 3-IX-1977 (1♀ UNDG); Stanton area, 1-VII-1972, A. C. F. Hung (2♂♂ 1♀ UNDG), 4-6-VIII-1972, A. C. F. Hung (2♂♂ 3♀♀ UNDG); T144N, R84W, Sec. 22, 1-VII-1972, A. C. F. Hung (1♂ UNDG), 15-VIII-1972, P. B. Kannowski (1♂ UNDG); T144N, R85W, Sec. 9, 18-20-VII-1972, A. C. F. Hung (1♀ UNDG). **Mountrail Co.:** Clearwater Lake, 17-IX-1998, A. Nelson (1♀ MISU); 19-VIII-1958, S. Wilson (3♀♀ NDSU). **Morton Co.:** Mandan, VII-1965, J. W. Goertel (1♀ NDSU). **Oliver Co.:** T143N, R83W, Sec. 6, 16-VIII-1972, P. B. Kannowski (1♂ UNDG). **Pembina Co.:** 8-VIII-1961, R. L. Post (1♀ NDSU), 11-VIII-1958, S. Wilson (1♀ NDSU), 11-IX-1958, S. Wilson (1♀ NDSU). **Ransom Co.:** Mirror Pool WMA, 25-IX-1993, M. J. Dietrich (1♀ NDSU). **Renville Co.:** 15-VIII-1958, S. Wilson (1♀ NDSU). **Richland Co.:** 1mi. SE McLeod, 26-V-1992, J. R. Powers (1♀ DARC); Mirror Pool, 23-VIII-1974, P. K. Lago (1♀ NDSU); 16-V-1962, R. Frye, alfalfa (1♀ NDSU), 21-IX-1957, R. L. Post & M. Olson (1♂ 4♀♀ NDSU); SNG, Oak Savannah, T135N, R52W, Sec. 10, 7-VIII-1993, D. Cuthrell (1♀ NDSU). **Sargent Co.:** Cayuga, 19-VI-1962, R. D. Frye (1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 19-VII-1978, E. U. Balsbaugh (1♀ NDSU). **Stark Co.:** Patterson Lake Dickinson, 14-VI-2011, D. Nelson, Lindgren trap (1♀ NDSU). **Trail Co.:** 10-VI-1958 (1♀ NDSU). **Ward Co.:** Minot, 26-VI-1936, M. Rita (1♀ MISU); SE Minot, behind Menards, 17-IX-1999, G. Hanley (1♀ MISU). **Wells Co.:** Harvey, 3-VII-1961, B. Liebe (1♂ MISU).

***Holcostethus macdonaldi* Rider and Rolston, 1995** - This is the only species in North Dakota with the abdominal venter dark brown with a few pale markings; all other species have the abdominal venter pale, sometimes with a few dark markings. Until recently, this species went under the name *H. piceus*, but this name is preoccupied; Rider and Rolston (1995) provided the replacement name *macdonaldi*. McPherson (1982, as *H. piceus*) gave the distribution as Québec west to Alberta, and south to Illinois and Colorado. This species has not yet been recorded from North Dakota, although Froeschner (1988c) and Maw et al. (2000) reported it from all surrounding states or provinces except Minnesota. This species appears to be much scarcer than the other two species reported from North Dakota.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Barnes Co.:** Valley City St. Univ., 17-X-1976 (1♂ UNDG). **Benson Co.:** T156N, R71W, Sec. 10, 2-V-1962, P. E. Slabaugh (1♂ NDSU). **Burleigh Co.:** Bismarck landfill site, 29-VII-2008, D. Nelson (3♀♀ NDSU). **Cass Co.:** VII-1957 (1♂ NDSU). **Mercer Co.:** T144N, R84W, Sec. 28, 18-20-VII-1972, A. C. F. Hung (1♀ UNDG); T144N, R84W, Sec. 22, P. B. Kannowski, 8-VIII-1973 (1♂ UNDG). **Morton Co.:** Ft. Abraham Lincoln St. Pk., 28-VII-2007, D. Nelson, Lindgren trap (1♀ NDSU). **Richland Co.:** SNG, Horsetrail Head nr. Oak Savannah, 25-X-2007, D. A. Rider (1♀ DARC).

Menecles Stål, 1867

This genus contains only two species, both North American. *Menecles portacrus* Rolston is only known from the Big Bend area of Texas; *M. insertus* (Say) is more widespread and now known to occur in North Dakota. Rolston (1972b) reviewed the genus.

***Menecles insertus* (Say, 1832)** - This species is fairly easy to recognize simply by the body shape; it is more ovoid than most pentatomids, somewhat flattened, and the anterolateral pronotal margins are distinctly convex. The distribution of this species was given by McPherson (1982) as Québec, Ontario,

and New England west to Nebraska and Kansas, southwest to Arizona and California, and south to Arkansas and Florida. This species has not been recorded from North Dakota or Minnesota. The closest records given by Froeschner (1988c) are from Illinois and Nebraska. The life history has been studied by Balduf (1945), and the immature stages have been described (Esselbaugh 1946, DeCoursey and Esselbaugh 1962).

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Becker Co.:** 6mi. SW Detroit Lakes, 24-29-VII-1983, M. Moher (1♂ DARC). **Clay Co.:** Moorhead, 27-IX-1989, J. R. Powers (2♂♂ DARC). NORTH DAKOTA [NEW STATE RECORD]: **Grand Forks Co.:** Turtle River, 4.8mi. W, 2mi. N Emerado, T152N, R53W, Sec. 20 & 29, 24-IX-1976 (1♂ UNDG). **McKenzie Co.:** 25-V-1961, R. L. Post (1♀ NDSU). **Stark Co.:** Dickinson, Patterson Lake, 13-VII-2011, K. Marmon, Lindgren trap (1♀ NDSU).

Mormidea Amyot and Serville, 1843

This is another large, diverse New World genus with many species distributed primarily throughout the neotropics. Other than a few species that enter into the United States in extreme southern Florida or the desert southwest, *M. lugens* (Fabricius) is the only widespread species in North America. Rolston (1978) revised the genus *Mormidea*.

Mormidea lugens* (Fabricius, 1775) - *Mormidea lugens is easy to separate from other North Dakota pentatomoids by virtue of being the only smallish, dark brown species with a distinct ivory callus transversing the anterior disk of the pronotum. McPherson (1982) gave the distribution of this species as Ontario, Québec, and Maine south to Florida and west to North and South Dakota, Wyoming, Colorado, Oklahoma, and Texas. The only literature record from the Upper Midwest I have found is that of Uhler (1876), who recorded this species from "Dakota" and "Indian Terr." Froeschner (1988c) listed this species from North Dakota, perhaps based upon the above "Dakota" record. Maw et al. (2000) also recorded this species from Manitoba. The records presented herein appear to be the first specific literature records for either North Dakota or Minnesota. The records presented would seem to indicate that this species occurs across most of Minnesota at least as far north as the Itasca area (Clearwater Co.); in North Dakota, the known records are confined to the southeastern corner of the state. The immature stages have been described (Esselbaugh 1946, DeCoursey and Esselbaugh 1962). McPherson (1974) studied the biology of this species.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: **Clearwater Co.:** Itasca State Park, 24-VI-1958, R. Gundersen (1♀ DARC). **Fillmore Co.:** 24-VI-1984, M. Tenney (1♀ DARC). **Hubbard Co.:** Camp Wilderness, 23-VII-1995, G. Fauske (1♂ NDSU). **Morrison Co.:** 10mi. N Little Falls, 17-VI-1981 (1♀ DARC). **Norman Co.:** Agassiz Dunes SNA, 47°29'Lat. 96°18'Long., 27-V-1999, P. Tinerella, G. Fauske, pitfall (1♀ NDSU), 11-VI-1999, P. Tinerella, G. Fauske, pitfall (2♀♀ NDSU), 8-VII-1998, P. Tinerella, pitfall (1♀ NDSU), 17-VII-1996, K. Urlacher, C. Locken, pitfall (2♀♀ NDSU); Agassiz Dunes SNA, 0.5mi. W, 2mi. S Fertile, 47°30.02'N, 96°18.36'W, 27-V-1999, Davis, Jordan (1♂ NDSU); 2mi. S Fertile, 47°29.92'N, 96°18.57'W, 28-VI-2001, P. Beauzay (1♂ NDSU). **Polk Co.:** Agassiz Dunes SNA, 47°30'Lat. 96°18'Long., 1-VII-1997, P. Tinerella, A. Abbott, pitfall (3♀♀ NDSU), 8-VII-1998, P. Tinerella, pitfall (1♀ NDSU), 9-VII-1999, P. Tinerella, G. Fauske, pitfall (2♀♀ NDSU), 21-VII-1997, A. Abbott, P. Tinerella, pitfall (6♀♀ NDSU); 31-VII-1998, P. Tinerella, pitfall (2♀♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Prosper NDSU Res. Plots, T141N, R51W, Sec. 27, 3-VII-2002, L. M. Tobias (1♂ NDSU); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♀ DARC). **Ransom Co.:** Mirror Pool WMA, 46°32.348N, 97°17.475W, 27-VI-2012, D. A. Rider (1♂ DARC). **Richland Co.:** Ekre's Grassland Preserve, 46.552N, 97.130W, 28-V-2010, D.

A. Rider (1♀ DARC); 28-VII-1993, D. L. Cuthrell (1♀ NDSU); 0.5mi. SE Mirror Pool, 6-VI-1995, D. A. Rider (3♀♀ DARC); 1mi. E Mirror Pool, 28-VII-1993, D. A. Rider (1♀ DARC); 1mi. NE Mirror Pool, 17-VII-1993, D. L. Cuthrell (2♂♂ NDSU); 1.5mi. NE Mirror Pool, 15-VI-1994, D. A. Rider (2♂♂ 3♀♀ DARC); 2mi. NE Mirror Pool, 28-VI-1993, G. Fauske (1♂ 2♀♀ NDSU); SNG, Oak Savannah area, T135N, R52W, Sec. 10, 6-VI-1995, C. Locken, D. Pitzen, G. Fauske (1♂ NDS), 11-VI-1996, L. DeCock (3♂♂ 6♀♀ NDSU), 13-VI-1995, G. Fauske, C. Locken, D. Pitzen (1♂ 2♀♀ NDSU), 18-VI-2000, D. A. Rider (1♂ 1♀ DARC), 17-VII-1993, D. Cuthrell (2♀♀ NDSU); SNG, Horsetrail Head, 46°31.409N, 97°12.194W, 27-VI-2012, D. A. Rider (1♂ 2♀♀ DARC), 25-VIII-2009, D. A. Rider (3♂♂ DARC), 4-IX-2009, D. A. Rider (4♂♂ 3♀♀ DARC); SNG, Horsetrail Head, 46.523N, 97.201W, 28-V-2010, D. A. Rider (2♂♂ 7♀♀ DARC); SNG, Horse trail head, 46.52N, 96.21W, 20-VII-2012, D. A. Rider (1♂ 2♀♀); T136N, 61W, Sec. 32, 23-VII-1993, G. Fauske (2♂♂ 1♀ NDSU).

Trichopepla Stål, 1867

Members of this genus are easily recognized by the pubescent dorsum. There are other genera with species that are pubescent, but none of these occur in North Dakota. McDonald (1976) recognized seven species (all of which occur in North America) in his revision of *Trichopepla*. Only one species, *T. atricornis* Stål, is known to reach the Upper Great Plains. The widespread *T. semivittata* (Say) does not occur as far north as North Dakota, the closest known records coming from Iowa and Nebraska. The unlocalized record of *Trichopepla grossa* Van Duzee from South Dakota (McDonald 1976) needs confirmation; I have not been able to locate the source of this record. The remaining species are all distributed in the western and/or southern United States. In the event that *T. semivittata* and/or *T. grossa* might actually occur in the southern parts of North Dakota, a key is provided for the separation of these three species.

Key to species of *Trichopepla* that may be found in North Dakota

- 1 Connexiva pale with dark mesial margins, the dark markings also along both anterior and posterior connexival incisures, producing a distinct alternating pale and dark pattern; if connexival pattern is weak, then second antennal segment is pale, and head is somewhat elongate, tapering to a narrowly rounded apex [not yet found in North Dakota]..... *semivittata* (Say)
- Connexiva pale with dark mesial margins, the dark markings sometimes slightly intruding along connexival incisures, at most creating an undulating pattern; second antennal segment black, sometimes pale at joints; head shorter, not tapering apically, broadly rounded apically2
- 2(1) Anterolateral pronotal margins reflexed to narrowly explanate, distinctly incised submarginally.....*atricornis* Stål
- Anterolateral pronotal margins edged, but not reflexed or explanate, not incised submarginally [not yet found in North Dakota]
.....*grossa* Van Duzee

Trichopepla atricornis* Stål, 1872 - *Trichopepla atricornis is easy to separate from all other North Dakotan pentatomids by the densely pubescent dorsal surface of the body. McPherson (1982) gave the distribution as Ohio, Illinois, and Wisconsin west to Alaska, British Columbia, and California. This species has not officially been recorded from either Minnesota or North Dakota, even though Froeschner (1988c) listed it from Montana and several states both to the east and west of North Dakota; also Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan. Members of *Trichopepla* seem to show a preference for plants in the Apiaceae.

Specimens Examined: MINNESOTA [NEW STATE RECORD]: *Clay Co.:* Bicentennial Prairie, 47°03'Lat., 96°25'Long., 9-VII-1997, P. Tinerella, A. Abbott, pitfall (1♀ NDSU), 28-VII-1997, P. Tinerella, pitfall (1♂ NDSU); Blazing Star Prairie, 47°03'Lat., 96°25'Long., 1-V-1999, P. Tinerella, G. Fauske, pitfall (1♂ NDSU), 27-VII-1998, P. Tinerella (1♀ NDSU); Bluestem Prairie, T139N, R45W, Sec. 19, 3-IX-1996, J. Albertson, L. DeCock (1♂ 2♀ NDSU); Bluestem Prairie, T139N, R46W, Sec. 10, 3-IX-1996, J. Albertson, L. DeCock (1♀ NDSU), Sec. 15, 13-VII-1995, D. Rider, C. Locken, G. Fauske (4♂♂ 6♀♀ NDSU), Sec. 21-15, 17-VII-1995, D. Rider, C. Locken, G. Fauske (1♂ NDSU); Bluestem Prairie, 46°50'Lat., 96°25'Long., 1-X-1998, P. Tinerella, pitfall (1♀ NDSU); Bluestem Prairie, 46°51'Lat., 96°25'Long., 31-VII-1997, P. Tinerella, A. Abbott, pitfall (1♀ NDSU); western edge Bluestem Prairie, 10-IX-2009, D. A. Rider (9♂♂ 11♀♀ DARC); B-B ranch, 47°02'Lat., 96°26'Long., 9-VII-1997, P. Tinerella, A. Abbott, pitfall (1♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: *Grand Forks Co.:* Oakville Prairie, Oakville Twp, Sec. 9, 29-VI-1966 (1♂ UNDG). *Mercer Co.:* T144N, R85W, Sec. 9, 5-VI-1973, P. B. Kannowski (1♂ UNDG). *Oliver Co.:* T143N, R83W, Sec. 6, 15-VIII-1972, P. B. Kannowski (3♂♂ UNDG). *Williams Co.:* 1mi. N Williston, 1-X-1977 (1♀ UNDG).

Tribe Halyini Amyot and Serville, 1843

The tribe Halyini is mostly an Old World tribe with only two genera known from the New World; it is especially diverse in Africa, the Orient, and Australia. Defining characters, other than those associated with the male genitalia, are few and difficult to discern. Gross (1976) gives a fairly detailed discussion of the genital characters. It should also be noted that at one time many New World genera from Central and South America were included in the Halyini, but all of them except the two treated in this paper have now been transferred to the tribe Ochlerini in the subfamily Discocephalinae. The two remaining genera, *Brochymena* and *Parabrochymena*, are both mainly Nearctic genera with a handful of species in Mexico, and a couple more reaching Costa Rica and Panama. They generally are very cryptic, colored so as to blend in with the bark of various tree species.

Key to the genera of Halyini occurring in North Dakota

- 1 Humeral angles subquadrate; basal disk of scutellum distinctly elevated *Parabrochymena*
- Humeral angles subtriangular, rounded to angulate, but not quadrate; basal disk of scutellum at most slightly elevated *Brochymena*

Brochymena Amyot and Serville, 1843

This genus, and the recently split-off genus *Parabrochymena*, are the only New World representatives of the tribe Halyini. Their species have a somewhat flattened appearance, especially ventrally, and are usually mottled black, gray, and white. It is easy to visualize these species blending onto the bark on various tree species, where they are most commonly collected. *Brochymena* was recently divided into two genera; the species having quadrate humeral angles were transferred to *Parabrochymena* (Larivière 1992). Acceptance of this division has not been universal, but it seems best to follow this classification until a more thorough study has been completed (see McPherson and Ahmad 2005, 2007, for further discussion). *Brochymena* contains a number of North American species, several of which also occur in Mexico and into Central America. Only one species reaches into North Dakota however. Herbert Ruckes published a series of papers (1938, 1939a, b, c, 1941, 1946) describing several new species, and the biology or feeding habits, finally culminating in a revision (1947) of the

genus. Even though Ruckes' paper was extremely detailed, he designed identification keys that also reflected phylogeny, making them incredibly difficult to use. More recently, Larivière (1992) published an excellent review of the genus.

***Brochymena quadripustulata* (Fabricius, 1775)** - This is the only species of *Brochymena* in North Dakota, so it is fairly easy to recognize by the generic characters. It and *Parabrochymena arborea* both have the tooth near the apex of each jugum, but this species has the subtriangular humeral angles (subquadrate in *P. arborea*). It also has the jugs much longer than the tylus, and usually meeting anterior to the tylus. There are other species of *Brochymena* that are difficult to separate from *B. quadripustulata* in other areas of the U.S.; in fact, examination of the male genitalia is necessary for some species. The distribution given by McPherson (1982) is across southern Canada and the continental United States, from the Atlantic to Pacific coasts, and ranges south into northern Mexico. Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan; Froeschner (1988c) did not list this species from North Dakota, or from any of the surrounding states or provinces, even though Lugger (1900, as *B. annulata*) recorded this species as a pest of apple trees in Minnesota. Larivière (1992) listed *B. quadripustulata* from both Minnesota and North Dakota, but did not give any specific localities. Cuda and McPherson (1976) studied the life history of this species, including rearing it in the laboratory, and they provided a description of the immature stages. Gamboa and Alcock (1973) studied the mating behavior.

Specimens Examined: MINNESOTA: **Clay Co.:** Bluestem Prairie, western edge, 10-IX-2009, D. A. Rider (1♀ DARC); Moorhead, 27-IX-1989, J. R. Powers (1♂ DARC); Moorhead Science Center, 26-VIII-2004, S. Ganehiarachchi (1♀ NDSU); 4-IX-2008, D. A. Rider (3♂♂ 1♀), 6-IX-2007, D. A. Rider (2♂♂ 1♀). **Stearns Co.:** St. Cloud, 18-IX-1983, Garder (1♂ DARC), 18-IX-1984, M. Nelson (1♀ DARD), 29-IX-1982, Y. Ito (1♀ NDSU); St. Cloud, State College, 15-VII-1967 (1♀ NDSU), 2-X-1968 (1♂ DARC). NORTH DAKOTA: **Billings Co.:** vicinity Medora, 21-VI-2000, G. Hanley (1♀ MISU). **Burleigh Co.:** Bismarck, 1-V-1987, R. Wilmont (1♀ NDSU); 19-IX-1985, D. Cashman (1♂ NDSU). **Cass Co.:** Fargo, 8-VI-1923, W. Baker (1♂ NDSU). **Divide Co.:** 11-IX-1962, R. L. Post & R. D. Gordon, beating dead box elder (1♂ NDSU). **Dunn Co.:** 25-VIII-1976 (1♀ NDSU). **Grand Forks Co.:** Grand Forks, 2-X-1975 (1♂ UNDG); State Park near Arvilla, 1-X-1969 (1♂ UNDG); Turtle R., 4.8mi. W, 2mi. N Emerado, T152N, R53W, Sec. 20 & 29, 7-IX-1977 (1♂ UNDG), 8-IX-1982, K. Kreil (1♂ 1♀ UNDG); UNDG Biology area Forest R. Valley, Inkster, 3-X-1965 (1♀ UNDG). **Kidder Co.:** Lake Isabel, 20-VIII-1980 (1♂ UNDG). **McHenry Co.:** Sec. 36, T156, R78, 26-V-1967, P. E. Slabaugh (1♂ NDSU). **McIntosh Co.:** 22-IX-1962, R. L. Post & G. Thomasson (1♀ NDSU). **McLean Co.:** Ruso, 3-VII-1938, E. Boe (1♂ MISU). **Morton Co.:** Mandan, 9-IX-1985, T. Schmidt (1♀ NDSU), 22-IX-1922, R. L. Webster (1♂ NDSU). **Mountrail Co.:** Sanish, 16-V-1973 (1♂ NDSU). **Oliver Co.:** Sec. 6, T143N, R83W, 16-VIII-1972, P. B. Kanno (1♀ UNDG). **Pembina Co.:** 6-VII-1961, E. Saugstad (1♀ NDSU). **Ransom Co.:** Lisbon, summer 1983, J. Julian, on leafy spurge (1♀ NDSU); SNG, A Annex site, T136N, R52W, NW8, 17-VII-1992, D. A. Rider (1♀ DARC). **Renville Co.:** 11-IX-1962, R. L. Post & G. L. Thomasson, beating dead thornapple (1♂ NDSU). **Richland Co.:** Ekre Grassland Pres., 28-VIII-2008, D. A. Rider (1♀ DARC); Hankinson, 22-IX-1923, R. L. Webster (1♂ NDSU); Mirror Pool, 4-IX-1998, D. A. Rider (1♀ DARC). **Slope Co.:** Burning Coal Vein, 7-VI-1973, T. L. McCabe (1♂ NDSU). **Stark Co.:** Dickinson, Patterson Lake, 14-VI-2011, D. Nelson, Lindgren trap (1♂ NDSU), 28-VI-2011, K. Marmon, Lindgren trap (1♂ NDSU), 13-VII-2011, K. Marmon, Lindgren trap (2♂♂ 1♀ NDSU), 26-VII-2011, K. Marmon, Lindgren trap (1♂ NDSU), 23-VIII-2011, K. Marmon, Lindgren trap (2♀♀ NDSU). **Ward Co.:** Minot, 25-IV-1936, E. Schrel (1♀ MISU), 17-V-1939, L. Hanson (1♀ MISU), 10-VII-1936, S. Clotidis (1♀ MISU), 13-VII-1993, R. Harry (1♀ MISU); NW Minot, 13-VI-2003, G. Hanley, sweeping alfalfa (1♂ MISU); 17-XI-1962, R.

L. Post & R. Gordon (1♂ NDSU). **Williams Co.:** Williston, 1mi. N, 2-VI-1978 (1♂ UNDG), 3-IX-1977 (1♂ 1♀ UNDG).

Parabrochymena Larivière, 1992

This genus is very closely related, and may actually be congeneric with *Brochymena*. Both are somewhat flattened gray to fuscous species mottled with pale markings so as to easily blend in with tree bark. There are apparently genitalic differences, but the easiest way to separate the two genera is by the form of the humeral angles. *Parabrochymena* species tend to have subquadrate humeral angles whereas they are more angular to rounded in *Brochymena*. This genus was revised by Larivière (1994). There are several southern and western species of *Parabrochymena*, but only a single species extends as far north as North Dakota.

***Parabrochymena arborea* (Say, 1825)** - Similar to *B. quadripustulata*, this is the only species of *Parabrochymena* to occur in North Dakota, so identification is fairly easy by using generic characters. The juga with a tooth near the apex, coupled with subquadrate humeral angles should separate this species from all others in North Dakota. McPherson (1982, as *Brochymena arborea*) provided the following range: Québec, Ontario, and New England south to Florida, and west to Kansas, New Mexico, Mexico, South Dakota, and Iowa. Neither Uhler nor Hussey recorded this species from North Dakota; Froeschner (1988c) listed it from South Dakota. Larivière (1994) provided a list of states (without specific localities) in which this species had been collected; her list included Minnesota and South Dakota, but not North Dakota. The distribution map she provided, however, had the southern half of North Dakota shaded. I consider the following record to be the first official record for North Dakota. To date, only a single specimen is known from North Dakota. I have also provided a couple records from Minnesota because its northern distribution may not be well defined.

Specimens Examined: MINNESOTA: **Becker Co.:** Detroit Lakes, 2-IX-1984, V. Beregovoy (1♀ NDSU). **Morrison Co.:** 10mi. N Little Falls, 21-VII-1981 (1♀ NDSU), 1-VIII-1981 (1♀ DARC). **Ottertail Co.:** Maplewood State Park, 29-IX-2001, L. M. Tobias (1♂ NDSU). **Stearns Co.:** St. Cloud, 1-X-1984, M. Nelson (1♂ DARC); St. Cloud, State College, 15-X-1965 (1♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Absaraka Arboretum, 14-IX-2000, A. Hackey (1♀ NDSU).

Tribe Mecideini Distant, 1902

The Mecideini includes a single genus, *Mecidea*, but has species occurring throughout the Old and New Worlds. It is characterized primarily by the stridulatory areas on the abdominal venter, although such areas are also present in members of the Diemeniini, a primarily Australian tribe. The mecideines are elongate, slender species, feeding primarily on grasses in somewhat arid areas; the diemenines are more typically stink-bug shaped, and not definitely associated with grasses.

Mecidea Dallas, 1851

This genus has species in both the New World and Old World; they tend to occur on grasses in xerophytic regions. In the New World, there are four known species: *M. longula* occurs in the West Indies, *M. pampeana* occurs in southern South America, and *M. major* and *A. minor* both occur in southwestern and central states of the U.S., with *M. minor* occurring as far south as northern South America. The American species were once confused with *M. longula*

and much of the earlier literature for both species is under that name. Sailer (1952) revised the genus. Species of this genus are easily recognized by the pale yellowish color, and by the presence of stridulatory ridges on the abdominal venter; the only other North American genus that is elongate, slender, and pale yellow is *Oebalus*, but the widespread *O. pugnax* (which lacks the stridulatory areas, and has spinose humeral angles) does not occur in our area. No other North American pentatomid genera have stridulatory ridges on the abdominal venter. *Mecidea major* and *M. minor* can be difficult to separate, but *M. major* does not occur in our area (nearest records are from Illinois and Missouri). Just in case, however, I have provided some distinguishing characters. In *M. minor*, the spiracles are usually pale, there may be a row of dark markings along the midline of the abdominal venter, the males have a tubercle near the posterior margin of the pygophore, and the females have a relatively small black spot on the abdominal venter just below each abdominal setigerous puncture. In *M. major*, the spiracles are often brown to black, the row of black spots along the midline of the abdominal venter are usually lacking, the males lack the tubercle near posterior margin of pygophore, and the females have a relatively large black spot on the abdominal venter just below each setigerous puncture.

***Mecidea minor* Ruckes, 1946** - This species is very easy to recognize; it is the only elongate, slender, pale yellowish pentatomid known to occur in North Dakota. McPherson (1982) gave the range of this species as northern Mexico north to central California, northern Utah, and central South Dakota, with the eastern boundary near the eastern borders of Texas, Oklahoma, and Kansas. This species has not previously been recorded from North Dakota. Harris (1943) recorded this species (as *M. longula*) from central South Dakota. At present, only a single specimen is known from North Dakota.

Specimen Examined: NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Wild River at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♀ DARC).

Tribe Nezarini Atkinson, 1888

It is very risky to make determinations based on color characters; it is even more risky to base classifications on color characters. That is why I am hesitant to say that the easiest way to recognize the tribe Nezarini is that its members are green in color, and usually remain green after death. There are other tribes whose members are green while alive (some Procliticini, Rhynchocorini, and a undescribed tribe related to *Chlorocoris*), but they invariably turn pale yellow after death. As presently understood, this tribe contains a number of genera, both in the Old World and New World. Several of these occur in the United States; I have treated four North Dakota genera in this tribe, but I have some concerns about including *Tepa* and *Thyanta*.

Key to the Genera of Nezarini occurring in North Dakota

- 1 Base of abdominal venter produced forward into a small obtuse spine or tubercle *Chinavia*
- Base of abdominal venter smoothly rounded, not produced forward .2
- 2(1) Smaller, usually less than 8mm in length *Tepa*
- Larger, usually more than 10mm in length 3
- 3(2) Ostiolar ruga elongate, reaching at least two-thirds to edge of supporting plate, and acuminate apically *Thyanta*
- Ostiolar ruga much shorter, reaching no more than half way to edge of supporting plate, not acuminate apically *Chlorochroa*

Chinavia Orian, 1965

This genus has had a somewhat checkered taxonomic history, and has only recently become accepted. Most of the species included in this genus were considered to be members of the genus *Acrosternum*. It now appears that the true *Acrosternum* should be confined to those Old World species that are somewhat smaller in size, paler in color, and occur in more arid regions. In contrast, species of *Chinavia* are larger in size, much brighter green in color, and they occur in temperate to tropical areas in both the New World and Africa. This is a very diverse genus with many North American and Neotropical species. The genus was recently revised (Rolston 1983), and there have been a number of recent additions, none of which affects North American species. There are two species which are relatively widespread in eastern North America, but one, *C. pennsylvanica* (DeGeer), does not occur in North Dakota (it is much more broadly rounded, with distinctly convex anterolateral pronotal margins); the closest records are from Iowa and Missouri (there is actually a record of this species from Minnesota, but this is based upon a misidentification - see below).

***Chinavia hilaris* (Say, 1832)** - This species, commonly referred to as the green stink bug, is easily recognized by its somewhat larger size, the long, acuminate ostiolar ruga, and the basal, anteriorly directed spine or tubercle on the abdominal venter. The distribution given by McPherson (1982) was from Québec and New England west through southern Canada and the northern states to the Pacific coast, and south and southwest to Florida, Texas, Arizona, Utah, and California. Froeschner (1988c) listed this species from Montana and South Dakota. Luggler (1900), in Minnesota, briefly described the biology of what he called *Acrosternum pennsylvanicum*. It is, however, evident from his brief description and the accompanying figure that he actually had specimens of this species. It appears that this common species has not been recorded from North Dakota. All North Dakota records are from the southeastern part of the state except for the Nelson Co. record which is a little farther north. Because the northern limits of this species are poorly known, I have also provided several collection records from Minnesota. McPherson and Tecic (1997) studied the life history of this species.

Specimens Examined: MINNESOTA: **Becker Co.:** Detroit Lakes, 26-VIII-1984, V. Beregovoy (1♂ NDSU); 6mi SW Detroit Lakes, 23-V-1990, P. Kamrud (1♂ DARC), 5-VI-1990, J. R. Powers (1♀ DARC). **Big Stone Co.:** Clinton, 10-IX-2002, N. Brandt (1♂ NDSU). **Clay Co.:** Moorhead Science Center, 6-IX-2007, D. A. Rider (2♂♂ 1♀ DARC). **Ottertail Co.:** 12-VI-2008, K. Johnson (1♂ UNDG). **Scott Co.:** UM Landscape Arboretum, 27-IX-2008, J. Ell (1♂ NDSU). **Stearns Co.:** Cold Spring, 1-X-1972, W. Karulak (1♀ DARC); State College, St. Cloud, 25-VII-1965 (1♀ DARC). NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** Absaraka Arboretum, 14-IX-2000, A. Hackey (1♀ NDSU); Fargo, NDSU campus, 2-IX-2008, D. A. Rider (1♂ DARC). **Grand Forks Co.:** 12-IX-2008, C. Black (1♂ UNDG), 18-IX-2008, C. Hanson (1♂ UNDG). **Nelson Co.:** 2-VII-1958 (1♀ NDSU). **Pembina Co.:** Crystal, 12-VIII-1989, M. Dietrich (1♀ NDSU). **Ransom Co.:** SNG, A-Annex, 19-V-2005, G. M. Fauske, Merc. vapor/blklight (1♀ DARC); Mirror Pool WMA, 30-VIII-2006, C. P. Johnson (1♂ NDSU), 30-VIII-2007, D. A. Rider (1♂ 2♀♀ DARC); SNG, Sagvold, 23-VII-1993, D. Cuthrell, Hg vapor light (1♂ DARC). **Richland Co.:** Jerome Link Farm, 21-X-2002, T. Link (1♀ NDSU); Mirror Pool, 6-VI-1993, J. Nelson, blk light (1♂ NDSU), 4-IX-1998, D. A. Rider (1♀ DARC), 11-IX-1974, R. K. Lago (2♂♂ NDSU).

Chlorochroa Stål, 1872

Chlorochroa species tend to be medium in size (smaller than *Chinavia*, but larger than *Tepa* or *Thyanta*), the ostiolar ruga is short and auriculate, and the abdominal venter lacks the basal spine or tubercle. Several species within

this genus are very difficult to separate. Fortunately, there have been three relatively recent publications, each with many illustrations and identification keys (Buxton et al., 1983; Thomas, 1983; Scudder and Thomas, 1987).

Key to North Dakota species of *Chlorochroa*

- 1 Scutellum with more or less distinct medial yellow longitudinal stripe; scutellar tongue marked with brown or black on each side 2
- Scutellum without medial yellow longitudinal stripe; scutellar tongue not marked with brown or black 3
- 2(1) Relatively small, less than 12mm in length; outer margin of each embolium lacking dark brown or black markings *Chlorochroa faceta* (Say)
- Relatively large, more than 12mm in length; outer margin of each embolium narrowly margined with brown or black *Chlorochroa belfragii* (Stål)
- 3(1) Relatively small, length less than 10mm *Chlorochroa viridicata* (Walker)
- Relatively large, length greater than 11mm 4
- 4(3) Base of scutellum with three more or less distinct pale spots, one in each basal angle and one medial; embolium only slightly wider apically than basally; angle between posterior and medial processes of each paramere much greater than 90 degrees *Chlorochroa uhleri* (Stål)
- Basal spots of scutellum lacking or very small; embolium much wider apically than basally; angle between posterior and medial processes of each paramere about 90 degrees 5
- 5(4) Male pygophore in posteroventral view with small central tumescence *Chlorochroa ligata* (Say)
- Male pygophore in posteroventral view with well-developed subapical transversely arcuate ridge, lacking central tumescence *Chlorochroa persimilis* Horváth

***Chlorochroa belfragii* (Stål, 1872)** - This species is fairly easy to recognize. There are only two pentatomid species in North Dakota that are green to gray-green with a yellowish, longitudinal stripe down the dorsal midline. The other species is *C. faceta*, which tends to be smaller than *C. belfragii*. Also, *C. faceta* lacks the dark markings on the lateral margins of the embolium that are characteristic of *C. belfragii*. This species is relatively widespread, but is rarely collected; in fact, at one time it was a candidate species for the U.S. threatened or endangered lists. It may not be as rare as previously thought; it may just be under collected because of its biology. This species belongs in the subgenus *Rhytidolomia*, and is related to *C. dismalia* Thomas, *C. saucia* (Say), and *C. senilis* (Say). Both *C. saucia* and *C. senilis* occur on salt marsh grasses along the Atlantic and Gulf coasts, and Parshley (1923) reported finding *C. saucia* down in the matted grasses near the base of the plants. The specimens I collected on Oakville Prairie were on grasses located in low, wet swales. They required great effort to collect; that is, one had to sweep these grasses for hours to capture only a specimen or two. I suspect the reason for this is that this species may also be living near the soil in the grass mats. Froeschner (1988c) did not list this species from North Dakota, or from any of the surrounding states or provinces. Maw et al. (2000) recorded this species from Manitoba. There is a photograph of a specimen of this species posted on the internet on BugGuide (<http://bugguide.net/node/view/430768/bgimage> ; accessed 31 August 2012) that was collected in **Ward Co.:** near Lake Darling, 11-VII-2010.

Specimens Examined. MINNESOTA [NEW STATE RECORD]: **Clay Co.:** Bluestem Prairie, 9-VIII-1995, D. Rider, G. Fauske, & C. Locken (1♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Foster Co.:** Carrington Expt. Station, 28-IV-1988, D. D. Kopp & H. J. Meyer (1♂ NDSU). **Grand Forks Co.:** Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 21-VIII-2009, D. A. Rider (1♀ DARC), 24-VIII-2009, D. A. Rider (1♂ 1♀ DARC); Oakville Prairie, T151N, R52W, Sec. 16, 8-IX-1961 (1♂ UNDG), 26-IX-1983 (1♂ UNDG).

***Chlorochroa faceta* (Say, 1825)** - As mentioned above, there are only two species in North Dakota which have a pale, longitudinal stripe down the dorsal midline; this species can be separated from *C. belfragii* by the lack of black markings on the distal end of the embolium. This species is a member of the subgenus *Rhytidolomia*, and is nearly identical in appearance to *C. lineata* Thomas, a member of the nominate subgenus. Separation of these two species can be accomplished only by examining the male genitalia. Fortunately, *C. lineata* does not occur in North Dakota (it has been recorded only from California, Nevada, and Utah). Uhler (1872) recorded this species simply from "Dakota" without more precise information. Hussey (1922) presented the following North Dakota collection data: **Ramsey Co.:** shore of Devils Lake at the Narrows, July 21, 1920, T. H. Hubbell.

Specimens Examined: NORTH DAKOTA: **Foster Co.:** McHenry, 15-IV-1967, J. Slough (1♀ MISU). **Grand Forks Co.:** Oakville Prairie, Sec. 9, 22-VI-2012, D. A. Rider (2♂♂ 1♀ DARC), 14-VIII-2009, D. A. Rider (2♂♂ DARC); Oakville Prairie, Sec. 9, Oakville Township, 28-VI-1961 (1♀ UNDG), 17-VII-1961 (2♂♂ UNDG), 31-VII-1961 (2♂♂ 4♀♀ UNDG), 26-IX-1983, K. Stowe (1♀ UNDG). **Slope Co.:** Burning Coal Vein St. Pk., 10-VIII-1993, D. A. Rider (1♀ DARC); 11-VII-1986, K. Larsen (1♀ MISU). **Ward Co.:** Kenmare, 7-V-1936 (1♀ MISU); Minot, 10-V-1936, Hovdestad (1♂ MISU).

***Chlorochroa ligata* (Say, 1831)** - In most of its range, this species is relatively easy to identify; it is often a much darker, green, sometimes approaching black. But in northern regions, including North Dakota, they are usually the same bright green as other *Chlorochroa* species. Male specimens are easily identified by the male genitalia (they have a small tumescence on the posteroventral surface of the pygophore; this tumescence is lacking in other species; it is replaced in other species by a more or less obtuse, transverse, U-shaped ridge); female specimens are nearly impossible to separate from some other species, including *C. persimilis*, which is common in North Dakota. Lugger (1900) recorded this species from Minnesota, but at that time, workers had not realized that eastern U.S. populations were a separate species from the western species. His brief description and figure match *C. persimilis*, and undoubtedly are of that species. There are no published records of this species from North Dakota. In going through material for this project, I located 4 specimens with 1981 Don Thomas determination labels for this species, but he (Buxton et al. 1983) did not include any North Dakota localities on his distribution map. He did include a locality in western South Dakota (Harris 1937, also gave a record from South Dakota). Three of the four specimens are females. One specimen, however, was a male specimen, thus verifying that *C. ligata* probably does occur in this state. More recently Scudder and Thomas (1987) extended the distribution of *ligata* into Saskatchewan and Manitoba, further lending credence to the North Dakota records. This is a western U.S. species coming into the western half of our state. Fish and Alcock (1973) studied the behavior of this species.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Oliver Co.:** Sec. 6, T143N, R83W, 16-VIII-1972, P. B. Kannowski (1♂ UNDG). Female specimens identified by Don Thomas in 1981: **Mercer Co.:** Sec. 9, T144N, R85W, July 18-20, 1972, A. C. F. Hung (1♀ UNDG). **Walsh Co.:** S. Branch, Park River, NE of Adams, 19-VIII-1970, J. Singleton (1♀ UNDG - this is probably *C. persimilis*).

***Chlorochroa persimilis* Horváth, 1908** - Basically, there are three species of *Chlorochroa* in North Dakota that are bright green in color, and lack the pale stripe down the dorsal midline. *Chlorochroa uhleri* (see below) can be separated from the other two by having three relatively large white spots along the basal margin of the scutellum; also, the embolium is nearly as narrow apically as it is basally. Both *C. ligata* and this species lack the pale spots along the basal margin of the scutellum (or they are very small), and the embolium is distinctly wider apically than it is basally. To separate this species from *C. ligata*, please see comments under *C. ligata*; in short, it is nearly impossible to separate female specimens, and to separate male specimens, one must examine the pygophore. McPherson (1982) gave the distribution for this species as Québec and New England south to Florida, and west to at least the Mississippi River, and probably to Iowa and Kansas. Froeschner (1988c) listed this species from North Dakota and more eastern and southern states. Maw et al. (2000) recorded this species from Manitoba. Lugger's (1900) record of *C. ligata* from Minnesota is actually a misidentification of this species.

Specimens Examined: NORTH DAKOTA: **Benson Co.:** IX-1958 (1♂ NDSU). **Billings Co.:** Medora, 47°02.00N, 103°36.00W, 24-VI-2002, A. Joshi (1♀ NDSU); Roosevelt Natl. Park, Medora, 24-VI-2002, F. Antwi (1♂ NDSU); 14-VII-1965 (1♀ NDSU). **Cass Co.:** Fargo, 19-VI-1971, R. L. Post (1♀ NDSU). **Dunn Co.:** Killdeer Mts., 11-VI-1965, L. Grochowski (1♀ NDSU). **Eddy Co.:** 22-VIII-1958, S. Wilson (1♀ NDSU). **Golden Valley Co.:** T-140-104-4, D. A. Mundal, 1984, on *Euphorbia esula* (1♀ NDSU). **Grand Forks Co.:** Arvilla, 28-IX-1931 (1♀ UNDG); Emerado, 1-VIII-1949 (1♂ UNDG); Grand Forks, 10-VII-1957 (1♀ NDSU), 12-X-1964 (1♀ UNDG); Oakville Prairie, Sec. 9, T151N R52W, 15-IX-1975 (1♀ UNDG), Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (2♀♀ DARC), 21-VIII-2009, D. A. Rider (1♂ 2♀♀ DARC), 10-IX-1958 (1♂ 1♀ UNDG); UNDG, 15-VIII-2008, B. Stargardt (1♀ UNDG); 2-IX-2008, A. Morrone (1♀ UNDG), 18-IX-2008, S. Teske (1♂ UNDG). **McHenry Co.:** Towners-Round Lk., VIII-1930, N. A. Weber (1♀ UNDG). **McKenzie Co.:** Arnegard, 5-IX-2004, E. Bruins (1♂ NDSU); 148-99-34-120, 24-VIII-1976 (1♀ NDSU). **McLean Co.:** Riverdale, 26-V-1977, E. U. Balsbaugh (1♀ NDSU). **Mercer Co.:** 10-VIII-1958, Boeshans (1♀ NDSU). **Mountrail Co.:** Stanley, 14-IX-1998, A. Nelson (1♀ MISU). **Richland Co.:** 6-VIII-1958, S. Wilson (1♂ 1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 7-VI-1973, T. L. McCabe (1♀ NDSU), 10-VIII-1993, D. A. Rider (1♀ DARC). **Walsh Co.:** S. Branch, Park River, NE of Adams, 19-VIII-1970, J. Singleton (1♀ UNDG). **Ward Co.:** Kenmare, 21-IX-1965, M. Rutter (2♀♀ UNDG); Minot, 9-V-1986, K. Larson (1♀ MISU). **Wells Co.:** 11-VIII-1960, G. Mulkern (2♂♂ 1♀ NDSU).

***Chlorochroa uhleri* Stål, 1872** - In general, this species can be recognized by the somewhat larger white spots along the base of the scutellum, and the embolium is at most slightly wider apically than it is at the base. Hussey (1922) reported this species from two North Dakota localities: **Bottineau Co.:** Bottineau, T. H. Hubbell, and **Nelson Co.:** shore vegetation behind the mud flats at Spring Lake, July 25, 1920, T. H. Hubbell. This is a western U.S. species, coming into our state from the west.

Specimens Examined: NORTH DAKOTA: **Billings Co.:** Freeman's Frontier near Medora, 9-VIII-1993, D. A. Rider, collected on *Chenopodiaceae* (1♀ DARC); Theo. Roos. Mem. Pk., 30-VIII-1961, R. L. Post (1♀ NDSU), 7-IX-1939, R. L. Post & N. M. Post (1♂ NDSU). **Emmons Co.:** 14-VIII-1941, J. A. Munro (6♂♂ 64♀♀ NDSU). **Golden Valley Co.:** Beach, IX-1921, R. L. Webster (1♀ NDSU); Sentinel Butte, 31-VIII-1961, J. Onsager & G. B. Mulkern (1♀ NDSU); VII-1958 (1♀ NDSU). **Grand Forks Co.:** Grand Forks, 2-X-1939 (1♀ UNDG), 3-X-1928 (1♂ UNDG); VII-1957 (1♀ NDSU). **Hettinger Co.:** New England, 27-XI-1940, H. S. Telford & F. P. Gutscher (2♂♂ 2♀♀ NDSU). **McKenzie Co.:** 14-VIII-1958, S. Wilson (1♀ NDSU). **Slope Co.:** Burning Coal Vein, 6-VI-1973, T. L. McCabe (1♀ NDSU), 29-VI-1972, T. L. McCabe (1♀ NDSU). **Williams**

Co.: 21-IV-1961, J. R. Dogger (2♀♀ NDSU), 11-VII-1961, V. Goodfellow, swept from wheat (5♂♂ 11♀♀ NDSU); Williston, 12-VIII-1961, K. Brevik (1♀ NDSU).

***Chlorochroa viridicata* (Walker, 1867)** - This is a much smaller species than the other dakotan *Chlorochroa* species, and it is more tear-dropped shaped than other species. Neither Uhler (1878) nor Hussey (1922) reported this species from North Dakota. Froeschner (1988c) did not list this species from North Dakota either; the closest records they listed came from Montana and Nebraska.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Cass Co.:** 1958 (1♂ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 10-VIII-1993, D. A. Rider (1♂ DARC), 12-VIII-1993, D. Cuthrell (1♂ NDSU).

Tepa Rolston and McDonald, 1984

Species of *Tepa* at one time were included in the genus *Thyanta*; in fact, Rolston (1972a), along with species now placed in *Cyptocephala*, called them the small *Thyanta* species. He provided a key for their identification; then later (Rolston and McDonald 1984) described a new genus, *Tepa*, to hold these species. Rider (1986b) made a couple corrections, and provided a new key for their identification. There are currently six *Tepa* species known, two of which are known to occur in North Dakota, and a third species has been recorded from South Dakota. The following key will separate our two species, as well as *T. vanduzeei* Rider in case it might eventually be found in North Dakota.

Key to species of *Tepa* that may be found in North Dakota

- 1 Ostiolar ruga elongate, distance from mesial margin of ostiole to apex of ruga much greater than distance from apex of ruga to lateral margin of supporting sclerite [not yet found in North Dakota] *vanduzeei* Rider
- Ostiolar ruga shorter, distance from mesial margin of ostiole to apex of ruga equal or less than distance from apex of ruga to lateral margin of supporting sclerite 2
- 2(1) Anterolateral pronotal margins straight to slightly convex; ostiolar ruga nearly evanescent apically in profile *brevis* (Van Duzee)
- Anterolateral pronotal margins distinctly concave; ostiolar ruga truncate apically in profile *rugulosa* (Say)

***Tepa brevis* (Van Duzee, 1904)** - The two species of *Tepa* known from North Dakota are relatively easy to separate. This species has the anterolateral pronotal margins substraight; in *T. rugulosa*, they are distinctly concave. This is primarily a western or southwestern species, coming in the western third of North Dakota. There are no published records of this species from North Dakota. Neither Froeschner (1988c) nor Maw et al. (2000) listed this species from North Dakota or any surrounding states or provinces. The closest known record is from Colorado (Rider 1986b). Some of the specimens collected listed below were collected on a low bushy plant in the Chenopodiaceae.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Billings Co.:** Freeman's Frontier near Medora, 9-VIII-1993, D. A. Rider, on Chenopodiaceae (3♂♂ 2♀♀ DARC); Freeman's Frontier, T140N, R101W, Sec. 25, 9-VIII-1993, G. Fauske (1♀ NDSU).

***Tepa rugulosa* (Say, 1831)** - In this species, the anterolateral pronotal margins are distinctly concave, whereas members of *T. brevis* have the margins substraight. The lectotype and at least one paralectotype (see Rider 1986b) of *Thyanta punctiventris* Van Duzee were collected by Prof. Wickham from 8-9 June, and are from Williston (**Williams Co.**), North Dakota. *Thyanta punctiventris* is a synonym of this species. This is a western or southwestern U.S. species, coming

only into the western third of North Dakota. Some specimens listed below were collected with the previous species on a small bush in the family Chenopodiaceae.

Specimens examined: NORTH DAKOTA: **Billings Co.:** Freeman's Frontier near Medora, 9-VIII-1993, D. A. Rider, on Chenopodiaceae (1♂ 5♀♀ DARC). **Slope Co.:** Burning Coal Vein St. Pk., 10-VIII-1993, D. A. Rider, at light (1♀ DARC). **Williams Co.:** Williston, 23-VIII-1987, M. J. Weiss (1♂ NDSU).

Thyanta Stål, 1862

Thyanta is a relatively large genus, and most species occur in the Neotropical regions; there are seven species that occur in North America, but three of these are tropical just reaching into the southern areas of the U.S.; a fourth species is endemic to southern Florida, and a fifth species is western reaching only as far east as Utah. The other two species are widely distributed in the eastern U.S., but one of these, *T. calceata* (Say), does not reach North Dakota. Only one species occurs in North Dakota. The genus was recently revised in two parts; the first part covered the South American species (Rider and Chapin 1991), while the second part covered those species occurring north of South America (Rider and Chapin 1992). Members of this genus tend to be small to medium in size, usually pale to bright green (there is some yellow to brown autumnal forms), sometimes with reddish or blackish markings; the ostiolar rugae are elongate, tapering to an acuminate apex.

***Thyanta custator accerra* McAtee, 1919** - The nominate subspecies occurs along the Gulf and Atlantic coasts, and is distinguished by black markings along the anterolateral pronotal margins, and a small black spot located in the inner angle of each pronotal cicatrice (both are lacking in this subspecies). The distribution given by McPherson (1982) was New York south to Georgia, and west to Idaho, northeastern Utah, northeastern New Mexico, and Texas. Uhler (1876) listed this species simply from 'Dakota'; this may serve as the basis for Froeschner (1988c) listing it from North Dakota. Hussey (1922) did not record it from North Dakota. The only published records are those of Rider and Chapin (1992), who listed it from three North Dakota counties (**Cass Co.**, **Hettinger Co.**, and **Stark Co.**) without any specific collecting data.

Specimens Examined: NORTH DAKOTA: **Cass Co.:** Fargo, 915 11th Ave. N., 10-X-2008, J. Sanden (1♀ NDSU); Fargo, NDSU campus, 6-IX-2001, D. A. Rider (1♂ DARC), 9-IX-2003, B. Dokter (1♂ NDSU); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 1-VIII-2012, D. A. Rider (1♀ DARC); 7-VI-1940 (1♀ NDSU). **Hettinger Co.:** 9-VIII-1955, V. Goodfellow (1♀ NDSU). **McIntosh Co.:** Wishek, 12-IX-2005, B. Aipperspach (1♂ NDSU). **Ransom Co.:** SNG, A Annex, 19-V-2005, G. M. Fauske, at light (1♂ NDSU). **Richland Co.:** Ekre Grassland Preserve, 48°32'15"N, 97°12'00"W, 8-VII-2002, A. Joshi (1♀ NDSU). **Slope Co.:** Amidon, 23-VI-2002, J. Knott (1♂ NDSU). **Ward Co.:** Minot, 20-VII-2002, G. Hanley (1♀ MISU); NCREC, Minot, 13-VII-1999, A. Culbertson, blacklight trap (1♀ NDSU).

Tribe Pentatomini Leach, 1815

This is a difficult tribe to define. Basically, after most other genera have been placed in other tribes, those remaining genera which have a spine or tubercle at the base of the abdomen have been placed in the Pentatomini. The basal abdominal spine or tubercle is not confined to the Pentatomini however. This character also occurs in the Menidini, some Nezarini, some Procleticini, and others. The type of the tribe, *Pentatoma*, is an Old World genus that is much larger, and very differently colored than *Banasa*. So, its placement in the Pentatomini is tentative at best; it may be better suited in the Menidini, near the genus *Rio*.

Banasa Stål, 1860

Banasa is a very diverse New World genus with most of its species occurring in the Neotropics. Twelve species are recorded from North America, but only two occur in our area. *Banasa* was revised in three parts: the first part covered North America (Thomas and Yonke 1981), the species in Mexico, Central America, and the Antilles were treated in the second part (Thomas and Yonke 1988), and the South American species were covered in the third part (Thomas and Yonke 1990).

Key to species of *Banasa* in North Dakota

- 1 Dorsal surface bright green with distinct white mottled spots; pronotal disk monochlorous.....*euchlora* Stål
 — Dorsal surface colored differently; pronotal disk usually bicolored, posterior half much darker than anterior half*dimidiata* (Say)

***Banasa dimidiata* (Say, 1832)** - This species can be recognized by the distinctly bicolored pronotum (see key above). Say originally spelled the species name *dimiata*, but LeConte emended the name to *dimidiata* in his reproduction of Say's works. Froeschner (1988c) considered this an unjustified emendation, but Hoffman (2005) argued for the continued use of the emended form *dimidiata*. McPherson (1982) gave the distribution as Québec and New England west to the Pacific coast, and south to Florida, Oklahoma, Texas, and California. Although he gave no specific localities, Van Duzee (1904) reported that he had examined specimens of this species from North Dakota. This may serve as the basis for Froeschner (1988c) also listing it from North Dakota. Decoursey (1963) described the life history of *B. dimidiata*. This species has been collected on several bushes or trees including juniper and ash.

Specimens Examined. NORTH DAKOTA: **Billings Co.:** Th. Roos. M. Prk., 14-VII-1965, W. Kotchman (1♂ NDSU). **Cass Co.:** Absaraka Arboretum, 20-IX-2002, S. Koudela (1♂ NDSU); NDSU Campus, 25-VI-2012, D. A. Rider (3♀♀ DARC), 4-IX-2004, C. Bye (1♂ NDSU), 4-IX-2008, D. A. Rider (2♂♂ 2♀♀), 6-IX-2000, S. Kveno (1♂ NDSU), 6-IX-2001, D. A. Rider (1♂ 3♀♀ DARC); W NDSU Campus, 21-V-2012, D. A. Rider (1♂ DARC); n. Fargo, 1-VIII-2012, C. Erhard (1♀ NDSU); ne Fargo, 46.759N, 96.765W, 31-VII-2012, D. Rider (1♂ 1♀ DARC); Wild Rice R. at Univ. Dr., 46.759N, 96.797W, 27-VII-2012, D. A. Rider (1♂ DARC), 13-VIII-2012, D. A. Rider (1♂ 1♀ DARC); V-1963, G. Nitz (1♀ UNDG); IX-1957 (1♂ NDSU). **Grand Forks Co.:** State Park near Arvilla, 1-X-1969 (1♂ UNDG); Grand Forks, 4-X-1961 (1♀ UNDG), 27-X-1993 (1♂ UNDG); 20mi. S. Grand Forks, 19-IX-1970 (1♀ UNDG); Oakville Prairie, Secs. 9&26, T151N, R52W, 23-IX-1968, D. Klein (1♂ UNDG); Turtle R., 4.8mi. W., 2mi. N. Emerado, T152N, R53W, Sec. 20 & 29, 22-IX-1979 (1♂ UNDG), 24-IX-1976 (1♂ UNDG), 28-X-1980 (1♀ UNDG). **Morton Co.:** Mandan, 22-VII-1974, P. K. & B. A. Lago (1♂ NDSU), 22-IX-1922, R. L. Webster (1♂ NDSU). **Nelson Co.:** McVile, 1-IX-2004, J. Stein (1♀ NDSU). **Ramsey Co.:** Grahms Island State Park, 28-V-2007, T. Retterath, Lindgren trap (1♂ NDSU). **Ransom Co.:** Lisbon, 14-VII-1983, D. Siebert (2♂♂ 2♀♀ NDSU); 3mi N of Mirror Pool, T135N R53W, Sec 2, 13-VI-1992, D. Cuthrell (2♀♀ NDSU); 4mi. NE Sheldon, 19-VI-1984, M. McLeod (1♂ 1♀ NDSU); Walcott Dunes, 13-IX-1994, M. Ellefson (1♀ NDSU). **Richland Co.:** Ekre Grassland Presv., 25-IX-1994, T. Nowatzki (1♂ NDSU); Ekre Grassland Preserve, T136N, R51W Sec. 32, 6-IX-1994, K. Urlacher (1♂ NDSU); Mirror Pool, T135N R52W Sec 8, 3-VI-1994, D. A. Rider (4♀♀ DARC), 10-VIII-1994, J. L. Jyoti (1♂ NDSU), 28-VIII-1994, J. L. Jyoti (1♀ NDSU), 29-VIII-1996, D. Rider (2♀♀ DARC), 6-IX-1994, T. Nowatzki (1♂ NDSU); 1.5mi NE Mirror Pool, 15-VI-1994, D. A. Rider (3♀♀ DARC); SNG, Oak Savannah, T135N R52W Sec. 10, 26-VI-1996, L. DeCock, Hg vapor light

(1♀ NDSU), 26-VI-1996, L. Pederson (1♂ NDSU). **Walsh Co.:** 1mi. E of Pisek, 24-VII-1976 (1♂ UNDG); S. Branch, Park River, NE of Adams, 19-VIII-1970, J. Singleton (1♀ UNDG).

Banasa euchlora Stål, 1872 - This is one of the easiest *Banasa* species to identify; the bright green coloration with relatively large pale spots on the dorsum is diagnostic. Froeschner (1988c) did not list this species from North Dakota, or from any of the surrounding states or provinces (closest records included Iowa and Illinois). This species is very common in the southern and southwestern United States, and becomes rather sparse and sporadic farther north. All known North Dakota records are from the southern half of the state. There is also a ♀ specimen in the NDSU Collection from South Dakota, **Fall River Co.:** Bttl. Mt. Game Prod. Area, 7-VIII-1984, G. Fauske, which appears to represent a new state record.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Burleigh Co.:** Bismarck, 6-XII-2010, T. Quanrud, inside home (1♀ NDSU). **Cass Co.:** Fargo, NDSU, 2-X-1992, S. Cong, at light (1♀ NDSU), 9-X-2002, J. Dykshoorn (1♂ DARC). **Richland Co.:** VII-1957 (1♂ NDSU).

Tribe Sciocorini Amyot and Serville, 1843

This is primarily an Old World tribe with only a few genera, but many species. There are only two sciocorine genera in the New World. *Antillosciocoris* Thomas contains a single species known only from the Dominican Republic in the West Indies. The South American genus *Trincauellius* Distant has been placed in the Sciocorini, but it probably belongs in another tribe. *Sciocoris* is the only sciocorine genus known from the North America. Members are fairly small, and usually have the lateral margins of the head, pronotum, and/or corium expanded, somewhat explanate. A single genus with a single species occurs in our region.

Sciocoris Fallén, 1829

This is primarily an Old World genus with only three New World species known; in fact, the species in our area is Holarctic, occurring also in northern parts of the Old World. The other two New World *Sciocoris* species are *S. crassus* Ruckes (occurs in Mexico) and *S. longifrons* Ruckes (occurs in Texas). Members of the Sciocorini tend to be smallish, orbicular, and usually have the lateral margins of the head, pronotum, and coria somewhat explanate.

***Sciocoris microphthalmus* Flor, 1860** - This is the only species of this genus that occurs in North Dakota. The small, ovate shape coupled with the explanate pronotal margins will separate this species from all other North Dakota's pentatomids. McPherson (1982) gave the distribution as Québec west to Alberta, and south to Massachusetts, Iowa, North Dakota, and possibly Oklahoma. Hussey (1921, 1922) recorded this species from **Slope Co.:** rocky side of Black Butte, near Amidon, August 21, 1920, T. H. Hubbell.

Specimen examined: NORTH DAKOTA: **Grand Forks Co.:** Oakville Prairie, T151N, R52W, Sec. 16, 10-IX-1980, TLS (1♀ UNDG).

Tribe Strachiini Mulsant and Rey, 1866

This tribe contains more genera and species in the Old World than in the New World, but there are several western hemisphere genera. Its included genera are characterized by the ostiole being very small, obsolete, and located more mesially between the mid and hind coxae; the ostiolar rugae and associated evaporative areas are also obsolete. Many of these species are brightly

colored with reds, oranges, and/or blues. Until recently, only one genus occurred in North America, *Murgantia*. In the past five years, specimens of *Bagrada hilaris* have been discovered in California and Arizona (Palumbo and Natwick, 2010). These are much smaller, and much less brightly colored than *Murgantia*. In general, species of this tribe seem to feed on members of the Brassicaceae.

Murgantia Stål, 1862

This New World genus, at present contains a number of species mostly of neotropical distribution. A single species, *M. histrionica* (Hahn), is common throughout much of the United States. There is, however, some evidence that *M. histrionica* may not be congeneric with the other species placed in this genus. Again, this will require further study.

***Murgantia histrionica* (Hahn, 1834)** - This is a very easily recognized species with its bright orange coloration on a shiny, black background. Parschley (1922) listed this species from South Dakota, and Froeschner (1988c) listed it from Minnesota; I have not located the source of that record. There is a single specimen in the UNDG collection from North Dakota; it is from Grand Forks Co., or about two-thirds up the Red River Valley. Its presence in North Dakota needs verification (the specimen listed below appears to have been collected by a student as the label was untrimmed, there is no specific data, and there was also a "Pentatomidae" label). Additionally, Lugger (1900) reported that *M. histrionica* had not been found in Minnesota. The biology of this species has been studied (Canerday 1965), and more recently, McPherson and Ahmad (2008) described the genitalia.

Specimen Examined: NORTH DAKOTA [NEW STATE RECORD]: *Grand Forks Co.*: 8-IX-2008, S. Teske (1♂ UNDG).

PENTATOMIDAE: PODOPINAE Amyot and Serville, 1843

Not only is this a relatively small subfamily in numbers (not many genera or species), but also in size as most of its members are relatively small. This subfamily is much more diverse in the Old World. Most species are rather drab gray or brown to black in color, but a few species in the Old World are conspicuous red with black markings (*Graphosoma*). They are commonly called turtle bugs, perhaps because of their turtle-like shape, or because of the fact that some species are commonly found on grasses near wet marshy areas. In fact, several species are known to be considerable pests of rice in both the Old World (*Scotinophara*) and New World (*Amaurochrous*). Several genera occur throughout North America, but only one, *Amaurochrous*, has species known from North Dakota.

Amaurochrous Stål, 1872

This genus contains six North American species, but two of these occur only in the very eastern parts of the U.S.; one is only known from California; and one is widespread in the eastern states, but does not reach North Dakota. This leaves two species which are known to occur here. A review of this genus was provided within the review of the entire subfamily for North America (Barber and Sailer 1953).

Key to species of *Amaurochrous* in North Dakota

- 1 Anterolateral pronotal margins distinctly sinuous, distinctly concave along posterior two-thirds; head relatively narrowly rounded, width at apex at most slightly wider than width just in front of eyes; juga slightly longer than tylus, but usually not contiguous..... *cinctipes* (Say)

- Anterolateral pronotal margins slightly sinuous, nearly straight, no where distinctly concave; head broadly rounded apically, distinctly wider near apex than width just in front of eyes; juga distinctly longer than tylus and usually contiguous anteriorly.....
.....*brevitylus* Barber and Sailer

***Amaurochrous brevitylus* Barber and Sailer, 1953** - This species can be separated from *A. cinctipes* by its nearly straight anterolateral pronotal margins. There has been no report of this species from North Dakota although Froeschner (1988c) listed it from Minnesota. We have collected many specimens of this species from Bluestem Prairie in western Minnesota (*Clay Co.*).

Specimen Examined: NORTH DAKOTA [NEW STATE RECORD]: *Cass Co.*: X-1957 (1♂ NDSU).

***Amaurochrous cinctipes* (Say, 1828)** - This species can be separated from *A. brevitylus* by the distinctly sinuous anterolateral pronotal margins. There has been no report of this species from North Dakota; Froeschner (1988c) listed it from Minnesota. The ecology and biology of this species has been studied (Parshley 1923, Davis 1925). McPherson and Paskewitz (1984b) reared this species in the laboratory, and described the immature stages.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: *Richland Co.*: Ekre Grassland Preserve, 3-IX-2009, D. A. Rider (1♂ DARC); 19-VI-1966 (1♀ NDSU).

SCUTELLERIDAE Leach, 1815

Members of the Scutelleridae lack the spines on the tibiae characteristic of the Cydnidae and Thyreocoridae; they have three tarsal segments, similar to the Pentatomidae, but the scutellum is usually greatly enlarged, covering nearly the entire abdominal dorsum (if the scutellum is somewhat spatulate, then the exposed portion of the corium narrows apically). The family can be divided into several subfamilies, three of which have species occurring in North Dakota. The North American scutellerid species have been treated in an unpublished dissertation (Lattin, 1964).

Key to the Subfamilies of Scutelleridae in North Dakota

- 1 Scutellum spatulate, corium exposed for nearly its entire length, becoming somewhat acuminate apically Eurygastrinae
- Scutellum more broadly rounded, covering most of abdomen, corium only exposed basally, apex angulate.....2
- 2(1) Abdominal sternites IV and V with a series of very small ridges forming stridulatory areas, these ridges can be difficult to see without a proper microscope and light system Pachycorinae
- Abdominal sternites IV and V lacking stridulatory areas
..... Odontotarsinae

SCUTELLERIDAE: EURYGASTRINAE Amyot and Serville, 1843

Members of this tribe can be recognized by the more spatulate scutellum that does not cover the entire abdomen; that is, the corium is exposed along the lateral margins for its entire length. The Eurygastrinae contains only a few genera, most of which are restricted to the Old World in distribution. The only genus known from the New World, *Eurygaster*, has most of its species distributed in the Eastern Hemisphere.

Eurygaster Laporte, 1833

There are several species of *Eurygaster* described from North America, but only two, *E. alternata* (Say) and *E. amerinda* Bliven, may occur in our area; only *E. alternata* has been recorded from North Dakota. *Eurygaster amerinda* has been recorded from California and Illinois (Lattin, 1964) and Manitoba and Saskatchewan (Maw et al., 2000). *Eurygaster amerinda* has the anterolateral pronotal margins distinctly convex, and the apex of the head broadly rounded. In *E. alternata*, the anterolateral pronotal margins are nearly straight, and the apex of the head is more narrowly rounded. In the material listed below, there is an occasional specimen that has the anterolateral pronotal margins slightly convex and perhaps the head is slightly broader, but I do not see any other significant differences, especially in the male or female genitalia. I have chosen to consider all specimens I have examined from North Dakota to be *E. alternata* until a more thorough study can be done. The North American species of *Eurygaster* were reviewed by Vodjani (1961).

Eurygaster alternata (Say, 1828) - McPherson (1982) gave the range for this species as across the entire northern part of the continental United States and southern Canada, but also ranges southward to Virginia and New Mexico. Uhler (1878) recorded this species from three different North Dakota localities: **Bottineau Co.:** prairies near Mouse River, August 29, **Pembina Co.:** near Pembina, and **Rollette Co.:** Turtle Mountains. Hussey (1922) added three more records from two additional counties: **Ramsey Co.:** Devils Lake, July 25-28, 1920, T. H. Hubbell, **Slope Co.:** Chalky Buttes south of Amidon, August 22, 1920, T. H. Hubbell and Amidon, edge of wheat field, August 24, 1920, T. H. Hubbell.

Specimens Examined: NORTH DAKOTA: **Billings Co.:** Easy Hill, T138N, R100W, D. Aarhus (1♂ 1♀ NDSU); Freeman's Frontier nr. Medora, 9-VIII-1993, D. A. Rider (1♂ DARC); Medora, 47 02 00N, 103 36 00W, 24-VI-2002, A. Joshi (1♂ 2♀♀ NDSU); TR Elkhorn Rch, 25-VI-1965, W. Kotchman (1♀ NDSU). **Cass Co.:** 10-X-2003, R. Wagner (1♀ NDSU). **Dunn Co.:** Killdeer Mts., 11-VI-1965, L. Grochowski (1♀ NDSU), W. Kotchman (1♂ 1♀ NDSU), 28-VI-1965, L. Grochowski (1♂ NDSU), 3-VIII-1965, W. Kotchman (1♀ NDSU); 21-VI-1977, L. A. Schutz, J. W. Smith (♀ NDSU), 3-VII-1966 (1♀ NDSU), 13-VII-1976 (1♂ NDSU). **Grand Forks Co.:** Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (1♂ 2♀♀ DARC), 24-VIII-2009, D. A. Rider (1♂ 1♀ DARC). **McKenzie Co.:** Th. Roos. M. Park, 22-VI-1965, W. Kotchman (1♂ NDSU), 24-VI-1964, R. L. Post (1♀ NDSU), 20-VII-1965, W. Kotchman (1♂ NDSU), L. Grochowski (♀ NDSU); 13-VII-1976, Lago & Kurtz (1♀ NDSU). **McLean Co.:** 18-VII-1958, S. Wilson (1♀ NDSU). **Ransom Co.:** 2mi. SW McLeod, T134N, R53W, sec. 35, 9-VI-1992, D. A. Rider (1♀ DARC); 4mi. NW of McLeod, T134N, R53W, Sec. 6, 18-VI-1992, D. A. Rider (1♀ DARC). **Richland Co.:** 0.5mi. SE Mirror Pool, 6-VI-1995, D. A. Rider (1♀ DARC); SNG, Oak Savannah Area, 18-VI-2000, D. A. Rider (1♂ 1♀ DARC), 17-VII-1993, D. Cuthrell (1♀ NDSU); SNG, Horsetrail Head, 46°31.409N, 97°12.194W, 28-V-2010, D. A. Rider (3♂♂ 6♀♀ DARC), 27-VI-2012, D. A. Rider (1♂ 1♀ DARC), 20-VII-2012, D. A. Rider (1♂ DARC), 25-VIII-2009, D. A. Rider (4♂♂ 2♀♀ DARC), 4-IX-2009, D. A. Rider (1♀ DARC). **Slope Co.:** Burning Coal Vein St. Pk., 26-VI-1973, T. L. McCabe (1♀ NDSU), 10-VIII-1993, D. A. Rider (2♀♀ DARC); 9-VI-1977 (1♂ 1♀ NDSU). **Stutsman Co.:** Chase Lake, 4-VI-1973, T. L. McCabe (1♂ 1♀ NDSU). **Ward Co.:** Minot, 6-VII-1986, K. Larsen (1♀ MISU).

SCUTELLERIDAE: ODONTOTARSINAE Mulsant and Rey, 1865

Scutellerids with a more spatulate scutellum are placed in the Eurygastrinae (see above); the remaining genera with a more extensive scutellum (corium only exposed basally) can be split into two subfamilies. Those which have a series of stridulatory ridges on the abdominal venter belong in the Pachycorinae (see below),

and those genera which lack the stridulatory ridges belong in this subfamily. These genera were treated in the Eurygastrinae by McPherson (1982). Again, many of the included genera occur mainly in the Old World, but several are known from North America. Members in this subfamily tend to not be collected as commonly as members of the other two subfamilies. There are three Odontotarsine genera which occur, or may occur, in North Dakota; they can be separated by the following key.

Key to the Odontotarsinae Genera that may occur in North Dakota

(modified from Lattin 1964)

- 1 Anterolateral pronotal margins strongly sinuate.....2
- Anterolateral pronotal margins substraight, at most only slightly sinuous *Vanduzeeina*
- 2(1): Anterior margin of pronotum produced over base of head; tylus and juga strongly developed, protuberant [not yet recorded from North Dakota].....*Euptychodera*
- Anterior margin of pronotum not produced over base of head; tylus slightly elevated above juga, but not strongly developed or protuberant..... *Phimodera*

Euptychodera Bergroth, 1908

This New World genus contains a single species, *E. corrugata* (Van Duzee). Its distribution is south and west of North Dakota, but Harris (1943) recorded it from South Dakota. Because this species is not common, I am providing the locality data from the single specimen housed in NDSU from South Dakota: **Yankton Co.:** Yankton, 17-V-1967, V. M. Kirk, beach (1♂ NDSU). It is possible that this species may eventually be found in North Dakota.

Phimodera Germar, 1839

This genus can be recognized by the lack of stridulatory ridges on the abdominal venter, the distinctly sinuous anterolateral pronotal margins, and the anterior pronotal margin not produced over the base of the head. This genus presents an interesting taxonomic problem; three species (with several subspecies) have been described from North America, but Lattin (1964) in his unpublished thesis placed *P. torpida* Walker and *P. torrida* Reuter as synonyms of *P. binotata* (Say). It does not appear that this synonymy has been published, and so all three names are still in use (all three were cataloged as valid species in Froeschner 1988d). This does not affect this manuscript greatly as only the oldest named species has been recorded from North Dakota. But *P. torpida* was listed from Saskatchewan and Michigan by Froeschner (1988d); if it is a valid species, then it could possibly be found in North Dakota, if it is a synonym, then it fits with the known distribution of *P. binotata*.

***Phimodera binotata* (Say, 1824)** - The distribution of this species was given by McPherson (1982) as Manitoba and Michigan west and southwest to British Columbia, Washington, Oregon, California, Arizona, and New Mexico. There are no published records of this species from North Dakota, although Froeschner (1988d) listed it from Manitoba and South Dakota, and Maw et al. (2000) recorded it from Manitoba and Saskatchewan.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Ransom Co.:** SNG, T135N, R53W, Sec. 29, 13-VIII-2000, J. Maxwell, collected on sand hills nr. *Hudsonia* (1♀ NDSU). **Richland Co.:** Walcott Dune, 20-VIII-1979, J. W. Smith (2♀♀ NDSU). **Ward Co.:** Minot, 7-V-1936, C. Bigler (1♀ MISU), 10-VIII-1987, M. J. Weiss (3♂♂ 2♀♀ NDSU). **Williams Co.:** Williston, 19-V-1987,

M. J. Weiss (2♂♂ NDSU), 14-VI-1987, M. J. Weiss (1♂ 3♀♀ NDSU), 12-VII-1987, M. J. Weiss (1♀ NDSU), 26-VII-1987, M. J. Weiss (2♀♀ NDSU).

Vanduzeeina Schouteden, 1904

This genus contains five species, only one of which occurs in our region. Three are known only from California, and the fourth is western in distribution, reaching only as far east as Colorado. Usinger (1930) provided a key to the species of *Vanduzeeina*.

***Vanduzeeina borealis* Van Duzee, 1925** - It is possible to confuse this species with *Homaemus aeneifrons* if you do not closely examine the specimens. In general, they both have a similar color pattern, and they are about the same size. This species, however, tends to have a much more robust abdomen, it lacks the stridulatory ridges on the abdomen, and it tends to be darker brown all over. McPherson (1982) gave the distribution for this species as Illinois, South Dakota, Manitoba, Alberta, British Columbia, and the Yukon Territory. Froeschner (1988d) listed this species from Manitoba and South Dakota, and Maw et al. (2000) also recorded this species from Manitoba. Apparently, this species has not previously been reported from either Minnesota or North Dakota. It is interesting to note that all the specimens from Minnesota were collected in pitfall traps; there is one more specimen in the NDSU collection from Manitoba that was also collected in a pitfall trap.

Specimens examined: MINNESOTA [NEW STATE RECORD]: **Norman Co.:** Agassiz Dunes SNA, 47°29'N 96°18'W, 18-VI-1996, C. Locken, D. Rider, pitfall (2♀♀ NDSU), 1-VII-1997, A. Abbott, P. Tinerella, pitfall (1♀ NDSU), 9-VII-1999, P. Tinerella, G. Fauske, pitfall (2♀♀ NDSU), 17-VII-1996, K. Urlacher, C. Locken, pitfall (1♀ NDSU), 30-VII-1996, D. Rider, C. Locken, pitfall (1♀ NDSU). **Polk Co.:** Agassiz Dunes SNA, 47°31'N, 96°18'W, 11-VI-1998, P. Tinerella, pitfall (1♀ NDSU), 29-VI-1999, P. Tinerella, G. Fauske, pitfall (1♀ NDSU), 1-VII-1997, P. Tinerella, A. Abbott, pitfall (1♂ NDSU), 9-VII-1999, P. Tinerella, G. Fauske, pitfall (1♀ NDSU), 17-VII-1996, D. Rider, C. Locken, pitfall (1♀ NDSU), 21-VII-1997, P. Tinerella, A. Abbott, G. Fauske, pitfall (2♀♀ NDSU), 27-VII-1999, C. Davis, C. Jordan, pitfall (2♀♀ NDSU), 12-VIII-1996, K. Urlacher, D. Rider, pitfall (1♀ NDSU), 21-VIII-1997, P. Tinerella, A. Abbott, pitfall (1♀ NDSU). NORTH DAKOTA [NEW STATE RECORD]: **Slope Co.:** Burning Coal Vein St. Pk., 23-VI-1965, L. Grochowski (1♀ NDSU).

SCUTELLERIDAE: PACHYCORINAE Amyot and Serville, 1843

In our region, this subfamily contains those scutellerid genera which have a relatively extensive scutellum, covering most of the abdomen, and also has a series of stridulatory ridges on the abdominal venter. This is a fairly large subfamily with quite a few included genera. Only two genera, however, have members recorded from North Dakota; there is a chance that a species from a third genus (*Tetyra*) may eventually be found in North Dakota.

Key to Pachycorinae Genera that May Occur in North Dakota

(modified from McPherson 1982)

- 1 Pronotum with distinct, transverse, submedian impression; head strongly declivent; color black.....*Acantholomidea*
- Pronotum without distinct, transverse impression; head gradually declivent; color usually not black.....2
- 2(1) Ostiole extended as distinct canal toward lateral margin of supporting plate.....*Homaemus*

- Ostiole not extended as canal toward lateral margin of supporting plate..... *Tetyra*

Acantholomidea Sailer, 1945

Members of this genus are relatively distinctive with the stridulatory ridges on the abdominal venter, and the transverse pronotal impression. There are two North American species in this genus, one of which has been found in North Dakota, and is treated below. The known distribution of the other, *A. porosa* (Germar), seems to be more western or southern. In *A. porosa*, the anterolateral pronotal margins lack the teeth or denticles which are present in *A. denticulata*.

Acantholomidea denticulata (Stål, 1870) - This species is easy to recognize by the transverse pronotal impression coupled with the denticles along the anterolateral pronotal margins. McPherson (1982) gave the distribution as Ontario, New York south to Virginia, and west to Minnesota and Kansas. There are no published records of this species from North Dakota; Froeschner (1988d) listed it from Minnesota. The biology of this species has been studied (Harris and Andre 1934).

Specimen Examined: NORTH DAKOTA [NEW STATE RECORD]: *Richland Co.*: Mirror Pool, T135N, R52W, Sec. 8, NE 1/4, 23-VI-1966, Gordon & Aarhus (1♀ NDSU).

Homaemus Dallas, 1851

In our region, members of this genus can be recognized by the presence of the stridulatory ridges on the abdominal venter, and an ostiolar canal extending laterally and then curving rather abruptly anteriorad at its apex. There are five species (and several subspecies) that occur in North America. Again, some confusion exists stemming from the unpublished Lattin (1964) thesis. Lattin (1964) recognized five species, but he considered subspecies of *H. aeneifrons* and *H. extensus* Walley as a synonym of *consors*. Froeschner (1988d) treated *consors* as a synonym of *bijugis* and *extensus* as a subspecies of *aeneifrons*. This is not a major problem for this paper, however, as only two species are known from North Dakota: the nominate subspecies of *H. aeneifrons* and *H. bijugis*. The majority of specimens in our region can be readily separated by the presence (*bijugis*) or absence (*aeneifrons*) of pale submarginal stripes on the head. There is, however, a small percentage of *H. bijugis* with the pale stripes nearly lacking, and conversely some specimens of *H. aeneifrons* that have a trace or more of the stripes present. Additionally, I have found that the female abdominal sternite character (see key below) is not always reliable. There is a color character for female specimens that seems to work well. Male specimens tend to have the scutellum solid brown in color, with a few dark punctures and a few pale punctures in no apparent pattern. Female specimens tend to have a thin, pale, medial longitudinal line that tends to widen distally, forming a pale band. In *H. bijugis*, the thin line widens very gradually to form a relatively narrow pale band; in *H. aeneifrons*, the thin line widens rather abruptly, and forms a slightly wider pale band. In general, I have also found that specimens of *H. aeneifrons* tend to be slightly larger and a little broader, but this is not always evident unless one has a series of both species.

Key to the species of North Dakota *Homaemus*

- 1 Dorsum of head nearly uniformly black, usually lacking yellow submarginal stripe on each jugum, occasionally yellow stripe partially present; overall size and shape slightly larger, broader, more rounded; female

with last abdominal sternite flattened or concavely impressed postero-medially, the posterior margin of which forms a transverse carina just anterior to genital plates; female with thin, pale, mediolongitudinal line on scutellum abruptly widening forming a relatively broad pale band near apex *aeneifrons* (Say)

- Dorsum of head black with distinct yellow submarginal stripe on each jugum, occasionally yellow stripe invaded with small amount of black; overall size and shape somewhat smaller, narrower, more elongate; female with last abdominal sternite not concavely impressed posteromedially; female with thin, pale, mediolongitudinal stripe gradually widening to form a relatively narrow pale band apically *bijugis* Uhler

Homaemus aeneifrons* (Say, 1824)** - At one time or another, this species has been split into three subspecies. Lattin (1964) considered *H. a. extensis* Walley to be a synonym of *H. a. consors*, so at present only two subspecies are recognized. The nominate subspecies occurs in our area; *H. a. consors* Uhler is more western in distribution. In the past, some workers have considered *consors* to be a valid species. McPherson (1982) gave the distribution as north-eastern Nova Scotia south to Tennessee and western North Carolina, and west to Manitoba and Kansas. Uhler (1878) provided two records of this species from North Dakota: ***Bottineau Co.: vicinity of Mouse River, August 29, 1873, T. H. Hubbell, and ***Pembina Co.***: near Pembina. Hussey (1922) added an additional three North Dakota records: ***Cass Co.***: Fargo, T. H. Hubbell; ***Ramsey Co.***: Devils Lake, July 25, 1920, T. H. Hubbell; and ***Rollette Co.***: Turtle Mountains, T. H. Hubbell. This species is quite common in North Dakota.

Specimens Examined: NORTH DAKOTA: ***Barnes Co.***: Valley City, 26-VIII-1917, P. W. Fattig (1♂ NDSU); T139N, R58W, Sec. 14, 18-IX-2004, P. S. Burange (1♀ NDSU). ***Billings Co.***: TR Elkhorn Rch, 25-VI-1965, L. Grochowski (2♂♂ NDSU), 14-VII-1965, W. Kotchman (1♂ NDSU). ***Bottineau Co.***: 28-VIII-1961, R. L. Post (1♂ NDSU). ***Cass Co.***: Fargo, VIII-1971, M. Knutson (1♀ NDSU); Magnolia WMA, T140N, R54W, Sec. 25, 10-IX-1994, K. Urlacher (1♀ NDSU); Wild Rice R. at Red R., 46.758N, 96.787W, 13-VIII-2012, D. A. Rider (1♂ DARC); 18-VII-1960, D. Noetzel (1♀ NDSU), 18-VIII-1958, S. Wilson (1♀ NDSU), 27-IX-1958 (1♀ NDSU). ***Dunn Co.***: 13-VII-1976, Lago & Kurtz (1♂ NDSU), 28-VII-1976, Lago & Kurtz (1♂ 1♀ NDSU). ***Grand Forks Co.***: Inkster Spring, 13-VII-1964, R. J. Sauer (1♀ NDSU); Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 22-VI-2012, D. A. Rider (1♂ DARC), 21-VIII-2009, D. A. Rider (2♂♂ 1♀). ***Hettinger Co.***: Indian Creek Dam, T133N, R95W, Sec. 17, 8-X-1994, K. Urlacher (1♀ NDSU). ***McKenzie Co.***: Th. Roos. M. Prk., 21-VII-1965, L. Grochowski (1♂ NDSU); 27-VII-1976, Lago & Kurtz (1♂ NDSU); 10-VIII-1976 (1♀ NDSU), 24-VIII-1976 (1♀ NDSU). ***McLean Co.***: 10-VI-1957, P. Bergen (1♂ 1♀ NDSU). ***Ransom Co.***: McLeod, Sandhills, 26-VIII-1972, D. Scott (1♂ lacking pygophore 1♀ with ♂ pygophore attached NDSU); 1mi. SE McLeod, 7-IX-1979, P. R. Larson (1♂ NDSU); 2mi. SW McLeod, T134N, R53W, Sec. 35, 14-VII-1992, D. A. Rider (1♂ DARC); 4mi. NW McLeod, T134N, R53W, Sec. 6, 18-VI-1992, D. A. Rider (1♂ DARC); Mirror Pool WMA, 46°32.348N, 97°17.475W, 27-VI-2012, D. A. Rider (1♂ DARC), 30-VIII-2007, D. A. Rider (2♂♂ DARC), 4-IX-2009, D. A. Rider (2♂♂ 4♀♀ DARC); 2mi. W Mirror Pool, 29-VII-1993, D. L. Cuthrell, at light (1♀ NDSU); 7mi. SE Sheldon, 5-IX-1979, E. U. Balsbaugh (2♂♂ 1♀ NDSU); SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. A. Rider (1♂ 1♀ DARC); 13-VII-1986, K. Larsen (1♂ MISU). ***Richland Co.***: Ekre Grassland Preserve, T136N, R51W, Sec. 32, 28-VII-1993, D. L. Cuthrell (1♂ NDSU), 3-IX-2009, D. A. Rider (10 ♂♂ 16 ♀♀ DARC), 6-IX-1994, D. A. Rider (1♀ DARC), 24-IX-1994, K. Urlacher (2♀♀ NDSU), 25-IX-1994, T. Nowatzki (1♂ 2♀♀ NDSU); Mirror Pool, T135N, R52W, Sec. 8, 18-VII-1992, D. A. Rider (1♂ DARC), 28-VIII-1996, P. Anderson (1♂ NDSU), 24-IX-1994, K. Urlacher, at light (1♀ NDSU); 1.5mi. NE Mirror Pool, 18-VII-1993, D. L. Cuthrell (1♂ NDSU); SNG, Horsetrail Head, 46°31.409N, 97°12.194W, 27-VI-2012, D. A. Rider (1♀

DARC), 25-VIII-2009, D. A. Rider (9♂♂ 4♀♀ DARC), 4-IX-2009, D. A. Rider (5♂♂ 2♀♀ DARC), 9-IX-2008, D. A. Rider (6♂♂ 9♀♀ DARC); SNG, Oak Savannah, 17-IX-1995, P. Anderson (1♀ NDSU); SNG Orchid Site B, T134N, R53W, Sec. 35, 8-IX-1992, D. Cuthrell (1♂ NDSU); SNG, West I allotment, T135N, R52W, Sec. 10, 3-IX-2002, A. Joshi (2♂♂ NDSU); T136N, 61W, Sec. 32, 23-VII-1993, G. Fauske (1♂ NDSU); 6-VIII-1958, S. Wilson (2♂♂ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 1-VII-1965, L. Grochowski (1♀ NDSU), 10-VIII-1993, D. A. Rider (1♂ DARC), 12-VIII-1993, D. A. Rider (1♂ DARC).

Homaemus bijugis Uhler, 1872 - Although this appears to be the most common scutellerid species occurring throughout the state, it appears that it has not actually been officially recorded from the state. The range given by McPherson (1982) for this species is Wisconsin and Illinois west and southwest to Saskatchewan and Alberta, Montana, Idaho, Wyoming, Colorado, and Arizona. Froeschner (1988d) listed it from Minnesota, Montana, South Dakota, and Saskatchewan, and Maw et al. (2000) recorded it from both Manitoba and Saskatchewan.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Barnes Co.:** Katie Olson WMA, N of Valley City, 47°04'N, 98°04'W, 2-VII-2002, A. Joshi (1♀ NDSU); Rogers, Wesley's Acres, 47°04'N, 98°10'W, 5-IX-2002, A. Joshi (1♀ NDSU); south of Valley City, 47°04'N, 98°04'W, 18-IX-2002, A. Joshi (1♀ NDSU). **Billings Co.:** Freeman's Frontier nr. Medora, T140N, R102W, Sec. 26, 9-VIII-1993, D. A. Rider (1♂ 3♀♀ DARC), 17-IX-1994, K. Urlacher (1♂ 2♀♀ NDSU); Theo. Roos. Mem. Prk, 25-VI-1964, R. L. Post, sweeping grass (1♂ NDSU), 29-VI-1965, L. Grochowski (1♀ NDSU). **Cass Co.:** Fargo (1♀ NDSU), VIII-1971, M. Knutson (1♀ NDSU), 17-IX-1948, R. L. Post (1♀ NDSU); Fargo, NDSU campus, 5-IX-2000, J. Kramer (1♂ NDSU), 6-IX-2001, D. A. Rider (1♂ DARC), 9-IX-2008, N. Noah (1♂ NDSU); 20-IX-1958, S. Wilson (1♂ NDSU), IX-1968 (1♀ NDSU), 15-X-1958 (1♂ NDSU), fall 1958 (1♀ NDSU). **Dunn Co.:** Killdeer Mts., 11-VI-1965, L. Grochowski, (2♂♂ NDSU), W. Kotchman (1♂ 1♀ NDSU); 2-VII-1976, Lago & Kurtz (1♀ NDSU). **Golden Valley Co.:** Beach, 10-VIII-1924, R. L. Webster (1♀ NDSU), 5-IX-1921, R. L. Webster (1♀ NDSU), 19-IX-1922 (1♀ NDSU). **Hettinger Co.:** 14mi. NE New England, T136N, R96W, Sec. 3, 17-IX-1994, K. Urlacher (3♂♂ 1♀ NDSU); Indian Creek Dam, T133N, R95W, Sec. 17, 8-X-1994, K. Urlacher (1♀ NDSU). **McKenzie Co.:** Th. Roos. M. Prk, 23-VI-1977, E. U. Balsbaugh (1♂ NDSU), 20-VII-1965, L. Grochowski (1♀ NDSU), 4-VIII-1965, L. Grochowski (1♀ NDSU); 2-VIII-1977, L. A. Schutz & J. W. Smith (1♀ NDSU). **McLean Co.:** 24-III-1957, P. Bergen (1♀ NDSU), 10-VII-1957, P. Bergen (1♀ NDSU). **Morton Co.:** Mandan, 11-VIII-1922, R. L. Webster (1♂ NDSU), 12-VIII-1922, R. L. Webster (1♀ NDSU), 18-VIII-1922, R. L. Webster (1♀ NDSU); 19-VIII-1958, R. L. Post (3♂♂ 1♀ NDSU). **Oliver Co.:** 2mi. E Hensler, 20-VII-1978, L. A. Schutz & J. W. Smith (1♂ NDSU). **Ransom Co.:** 1.5mi. W McLeod, T134N, R53W, Sec. 22, 4-VI-1992, D. A. Rider (1♂ DARC); 1.5mi. SE McLeod, T134N, R52W, SW 31, 11-VIII-1992, D. Cuthrell (1♀ NDSU); 2mi. SW McLeod, T134N, R53W, Sec. 35, 14-VII-1992, D. A. Rider (1♂ DARC), 17-VII-1992, D. A. Rider (4♀♀ DARC); 4mi. NW McLeod, T134N, R53W, Sec. 6, 18-VI-1992, D. A. Rider (3♂♂ 2♀♀ DARC); SNG, A-Annex, 46.441N, 97.384W, 6-IX-2001, D. A. Rider (4♂♂ 3♀♀ DARC); SNG, Orchid site B, T134N, R53W 35, 5-VIII-1992, D. Cuthrell (1♀ NDSU); SNG, Orchid site D, T134N, R54W, SE 12, 3-IX-1992, D. Cuthrell (1♂ 1♀ NDSU); SNG, 9-IX-2008, K. Ghising (1♂ NDSU); 1-VII-1964, R. L. Post (1♂ 4♀♀ NDSU), 6-VIII-1958, S. Wilson (1♂ 1♀ NDSU). **Richland Co.:** Ekre Grassland Preserve, T136N, R51W, Sec. 32, 6-IX-1994, M. Ellefson (1♂ NDSU), T. Nowatzki (1♂ NDSU), D. A. Rider (2♀♀ DARC), W. G. Schroeder (2♂♂ 1♀ NDSU); McLeod, T133N, R52W, Sec. 6, 23-VIII-2000, J. Maxwell (1♂ NDSU), 18-IX-1979, E. U. Balsbaugh (3♀♀ NDSU); 1.5mi. SE McLeod, T134N, R52W, Sec. 31, 8-IX-1992, D. Cuthrell (1♀ NDSU); Mirror Pool, T135N, R52W, Sec. 8, 27-VI-1992, D. A. Rider (4♂♂ 1♀ DARC), 2-VII-1979, J. W. Hoganson (1♂ 1♀ NDSU), 4-IX-1998, D. A. Rider (1♂ 3♀♀ DARC), 5-IX-1994, T. Nowatzki (1♀ NDSU), 15-IX-1994,

K. Urlacher (2♀♀ NDSU), 18-IX-1994, D. A. Rider (2♀♀ DARC), 25-IX-1994, K. Urlacher, UV light (2♂♂ 1♀ NDSU); 1.5mi. NE Mirror Pool, 15-VI-1994, D. A. Rider (3♀♀ DARC); 1mi. NE Mirror Pool, 25-VI-1993, D. L. Cuthrell (1♂ 1♀ NDSU), 17-VII-1993, D. L. Cuthrell (1♀ NDSU), 28-VII-1993, D. L. Cuthrell (1♀ NDSU); 2mi. NE Mirror Pool, 28-VI-1993, G. Fauske (1♀ NDSU); SNG, Horsetrail Head, 46°31.409N, 97°12.194W, 27-VI-2012, D. A. Rider (8♂♂ 5♀ DARC), 20-VII-2012, D. A. Rider (5♂♂ 3♀♀ DARC), 25-VIII-2009, D. A. Rider (1♂ DARC), 9-IX-2008, D. A. Rider (1♂ 2♀♀ DARC), 25-X-2007, D. A. Rider (2♀♀ DARC); SNG, Oak Savannah area, T135N, R52W, Sec. 10, 18-VI-2000, D. A. Rider (3♂♂ 2♀♀ DARC), 28-VI-1995, G. Fauske (2♂♂ 5♀♀ NDSU), 17-VII-1993, D. Cuthrell (1♂ NDSU), 26-IX-1995, G. Fauske (3♂♂ 4♀♀ NDSU); SNG, I allotment, T235N, R52W, Sec. 10, 3-IX-2002, A. Joshi (1♂ 2♀♀ NDSU); Walcott Dunes 28-VIII-1971, T. L. McCabe (1♀ NDSU); T135N, 52W, Sec. 8, 12-IX-1992, J. A. Nelson (2♂♂ NDSU); T136N 61W Sec. 32, 23-VII-1993, G. Fauske (1♂ NDSU); 1-VII-1964, R. J. Sauer (1♂ NDSU), 19-VII-1965, R. L. Post (1♀ NDSU), 4-VIII-1958, S. Wilson (1♀ NDSU), 6-VIII-1958, S. Wilson (1♂ 1♀ NDSU), 13-IX-1968, R. Johnson (1♀ NDSU). **Slope Co.:** Burning Coal Vein St. Pk., 28-VI-1982, R. J. Dregseth & T. McCabe (1♂ NDSU), 1-VII-1965, L. Grochowski (2♂♂ 1♀ NDSU), 1-VIII-1972, T. L. McCabe & R. J. Dregseth (1♀ NDSU), 10-VIII-1993, D. A. Rider (1♂ DARC); Chalky Buttes, 7-VI-1965, L. Grochowski (1♂ NDSU); T135N, R102W, Sec. 27, west edge, 19-VII-1978, L. A. Schutz & J. W. Smith (1♀ NDSU); 11-VII-1986, K. Larsen (1♀ MISU), 8-VIII-1976 (1♀ NDSU), 20-VIII-1955, V. Goodfellow (1♀ NDSU), 20-VIII-1958, R. L. Post (1♀ NDSU). **Ward Co.:** SE Minot, behind Menards, 17-IX-1999, G. Hanley (5♂♂ MISU).

Tetyra Fabricius, 1803

The genus *Tetyra* contains six species, most of which are neotropical in distribution. Two of the neotropical species occur in the United States only in the southern states. For example, *T. antillarum* Kirkaldy occurs in Florida southward; *T. robusta* Uhler occurs in Arizona, Nevada, and Utah, southward into Mexico. There is only one species that is more widely distributed in the eastern United States. *Tetyra bipunctata* (Herrich-Schäffer) has not yet been recorded from North Dakota, but Froeschner (1988d) listed it from Minnesota, and the NDSU collection contains a specimen from northwestern Minnesota: **Norman Co.:** Gary Pines, 17-X-2000, R. Halland (1♀ NDSU). Norman County is on the border with North Dakota, so it is likely this species will eventually be collected in North Dakota. It feeds on and has been recorded as a pest of various species of pine (Gilbert et al. 1967).

THYREOCORIDAE Amyot and Serville, 1843

Members of this family have in the past been called negro bugs (because of their general black color). It has at times been considered to be a subfamily of a very inclusive Cydnidae (Dolling 1981), but most present-day workers treat it as a full family. Although it is becoming dated, the single best publication to help identify thyreocorids is that of McAtee and Malloch (1933). Some caution is needed as some names have changed, and there have been a number of new species described since 1933, but it is impressive how useful this paper remains. Identification of thyreocorids can be tedious, partially because of the small size of many of its species; but also some of the important characters involve examining the location of the spiracles and associated trichobothria. Fortunately, our species are relatively easy to identify. Only three genera are known to occur in our area. Thyreocorids tend to live at or near the ground, but they are often encountered higher up on host plants, especially members of the Apiaceae.

Key to genera of North Dakota Thyreocoridae

- 1 Anterolateral pronotal margins and costal margins of coria with long slender bristles *Cydnoides*
- Anterolateral pronotal margins and costal margins of coria lacking long slender bristles 2
- 2(1) Coloration completely black, no pale markings 3
- Coloration black with at least some pale markings along basal costal margins of coria *Corimelaena* (part)
- 3(2) Spiracles nearer to trichobothria than to lateral margins of abdominal sternites; costal margin bordered within by definite groove..... *Galgupha*
- Spiracles nearer to lateral margins of abdominal sternites than to trichobothria; costal margin not bordered within by definite groove ...
..... *Corimelaena* (part)

Corimelaena White

Although there is some overlap, North American species of *Corimelaena* tend to be smaller (less than 4.8mm in length) than species of *Galgupha* (most are greater than 4.5mm in length). Nearly all North American species of *Corimelaena* have pale markings on the basal costal margin of each corium, the exception being *C. nigra*. In contrast, nearly all North American species of *Galgupha* lack pale markings on the corium (it should be noted that many neotropical species of *Galgupha* have pale markings on the coria, several of which may enter the southern parts of North America). Although only two *Corimelaena* species are positively known from North Dakota, there are three more species that may eventually be collected here. Froeschner (1988e) listed *C. alpina* McAtee from Minnesota, even though McPherson (1982) indicated that the Minnesota record came from an unpublished manuscript by R. Sailer. *Corimelaena nigra* Dallas has been recorded from both north and south of North Dakota (Froeschner 1988e, Maw et al. 2000), but I have not examined any specimens from our region. *Corimelaena extensa* Uhler appears to be a western species, but was listed by Froeschner (1988e) from Montana and South Dakota, so it may eventually be found in North Dakota. The following key includes all five species in anticipation of eventually finding any of the above mentioned species.

Key to species of *Corimelaena* that may occur in North Dakota

- 1 Coloration completely black, lacking pale markings on coria [not yet recorded from North Dakota] *nigra* Dallas
- Coloration black with pale markings along basal costal margin of each corium 2
- 2(1) Pale markings along basal lateral margin of each corium confined to exocorium, not extending onto mesocorium *lateralis* (Fabricius)
- Pale markings along basal lateral margin of each corium extending onto mesocorium 3
- 3(2) Spiracles of segments three to six below the lateral carina; apex of corium obtusely rounded 4
- Spiracles of segments three to six in the lateral carina; apex of corium pointed, not rounded [not yet recorded from North Dakota]
..... *extensa* Uhler
- 4(3) Hind tibia without posterodorsal bristles; sides of head in front of eyes slightly emarginate; head from lateral view only slightly arched [not yet recorded from North Dakota] *alpina* (McAtee and Malloch)

- Hind tibia with one to three short posterodorsal bristles; sides of head in front of eyes distinctly emarginate, especially in males; head from lateral view strongly arched *pulicaria* (Germar)

***Corimelaena (Corimelaena) lateralis* (Fabricius, 1803)** - This species is relatively easy to identify; it is the only thyreocorid species in our area having the pale lateral margin of the coria confined to the exocorium, not spilling onto the mesocorium basally. It also tends to be slightly larger than our other common species, *C. pulicaria*. Apparently, there have been no specific localities published for North Dakota. Neither Uhler (1876) nor Hussey (1922) cited this species from North Dakota. McAtee and Malloch (1933) provided the following range: "New York to North Dakota and south to Florida and Texas." Possibly based on the range given by McAtee and Malloch, Froeschner (1988d) listed this species from North Dakota. This species has been reared in the laboratory (McPherson 1971a); he (1972) also studied its life history and described the immature stages.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Richland Co.:** Mirror Pool, T135N, R52W, NE 8, 3-VI-1994, D. A. Rider (3♂♂ 1♀ DARC), 27-VI-1992, D. A. Rider (1♀ DARC, 1♂ NDSU).

***Corimelaena (Corimelaena) pulicaria* (Germar, 1839)** - In this species, the pale lateral margin of the corium spills onto the mesocorium basally. There are two other species that may have this color pattern that could occur in North Dakota. *Corimelaena extensa* has a different arrangement of the spiracles (see the key above) and the apex of the corium is more sharply pointed than in this species; *C. alpina* lacks several bristles on the hind tibia that are present in this species (also see key above). This species tends to be slightly smaller than our other common species, *C. lateralis*. McPherson (1982) gave the range for this species as Québec, Ontario, and Massachusetts west to British Columbia and Oregon, and south to Florida, Arkansas, Texas and Guatemala. Uhler (1878) cited this species simply from 'Dakota.' Hussey (1922), however, provided three specific localities for North Dakota: **Cass Co.:** Fargo, T. H. Hubbell; **Eddy Co.:** near Sheyenne River, about 3 miles south of Warwick, on vegetation in an open woods, August 8, 1920, T. H. Hubbell; and **Ramsey Co.:** Devils Lake, August 14, 1920, on *Ambrosia*, T. H. Hubbell. Lugger (1900), in Minnesota, provided a colorful description of the unfortunate finding of these bugs in a plate of berries.

Specimens Examined: NORTH DAKOTA: **Barnes Co.:** 1984, D. A. Mundal, *Euphorbia esula* (1♂ 2♀♀ NDSU). **Billings Co.:** Medora, 47°02'N, 103°36'W, 24-VI-2002, A. Joshi (2♀♀ NDSU); Th. Roos. M. Pk., 10-VI-1965, W. Kotchman (1♀ NDSU). **Burleigh Co.:** Bismarck, 24-VII-2007, D. Nelson, Lindgren trap (1♀ NDSU). **Cass Co.:** Fargo (1♂ 4♀♀ NDSU), 11-V-1940 (1♂ NDSU), 13-V-1939, W. Southam (1♀ NDSU), 20-V-1923, W. Baker (1♂ NDSU), 26-VII-1922, O. A. Stevens, *Sonchus arvensis* (3♀♀ NDSU), 17-IX-1948, R. L. Post (1♀ NDSU); NE Fargo, 46.759N, 96.765W, 31-VII-2012, D. A. Rider (2♂♂ 1♀); N Fargo, Riverwood Pk., 46.945N, 96.802W, 16-VII-2012, D. A. Rider (1♀ DARC); Fargo, NDSU Campus, 21-V-2012, D. A. Rider (6♀♀ DARC), 1-VI-2011, D. A. Rider & G. Fauske, lindgren trap with *Ips* lure (1♀ NDSU), 14-VI-2011, D. A. Rider & G. Fauske, lindgren trap with *Sirex* lure (1♂ NDSU), 23-VIII-2002, F. Antwi (1♀ NDSU); S Fargo, 76 Ave. S, Chrisan Edition, 46.766N, 96.780W, 5-VI-2012, D. A. Rider (1♂ 2♀♀ DARC); Wild Rice R. at Red R., 46.758N, 96.787W, 1-VIII-2012, D. A. Rider (3♂♂ 2♀♀ DARC), 13-VIII-2012, D. A. Rider (2♂♂ 1♀ DARC); Wild Rice R. at University Dr., 46.759N, 96.797W, 27-VII-2012 (15♂♂ 9♀♀ DARC), 1-VIII-2012, D. A. Rider (2♂♂ DARC); 3-VIII-1968, J. Johnson (1♂ NDSU). **Dunn Co.:** Killdeer Mtns., 3-VIII-1965, W. Kotchman (1♂ 1♀ NDSU); 9-VIII-1976, Lago & Kurtz (1♀ NDSU). **Golden Valley Co.:** 1984, D. A. Mundal, *Euphorbia esula* (1♂

3♀♀ NDSU). **Grand Forks Co.:** Goose R., 1-VIII-1962, D. G. Aarhus (2♂♂ 1♀ NDSU); Inkster Spring, 20-X-1962, R. Poole (1♀ NDSU); Northwood, 25-V-1956, R. L. Post (3♂♂ NDSU), 27-V-1956, R. L. Post (1♂ 1♀ NDSU); Oakville Prairie, Sec. 16, 47°53.403N, 97°18.855W, 14-VIII-2009, D. A. Rider (1♂ DARC); 28-VIII-1958, R. C. & R. L. Post (1♀ NDSU). **Hettinger Co.:** 4mi. N Regent, T135N, R94W, Sec. 19, 18-VIII-1996, K. Urlacher, *Fagopyrum esculintum* (3♂♂ 3♀♀ NDSU); 5mi. N Regent, T135N, R94W, Sec. 18, 24-VII-1995, K. Urlacher, pitfall trap in *Brassica juncea* (3♀♀ NDSU). **McKenzie Co.:** Th. Roos. M. Park, 22-VI-1965, L. Grochowski (1♀ NDSU), 24-VI-1964, R. L. Post (2♀♀ NDSU). **Pembina Co.:** 2-VII-1961, R. L. Post (1♂ NDSU). **Ransom Co.:** Lisbon, 1-VI-1983, J. Julian, on leafy spurge (1♀ NDSU), 11-VI-1982, J. Julian, on leafy spurge (1♂ NDSU); 7mi. SE Sheldon, 3-IX-1979, E. U. Balsbaugh (2♂♂ NDSU), 5-IX-1979, E. U. Balsbaugh (1♂ NDSU); SNG, A-Annex, T134N, R53W, Sec. 8, 26-V-1992, D. A. Rider (1♂ DARC). **Richland Co.:** SNG, Horse Trail Head, 46.523N, 97.201W, 28-V-2010, D. A. Rider (1♂ 9♀♀ DARC, 1♂ 3♀♀ NDSU), 20-VII-2012, D. A. Rider (1♀ DARC); SNG, Oak Savannah, T135N, R52W, Sec. 10NE, 23-VII-1996, L. Pederson (1♀ NDSU); 6-V-1962, R. D. Frye, grass (1♀ NDSU). **Rolette Co.:** 4-VI-1968, Kotchman (3♂♂ 1♀ NDSU), 4-VI-1968, Kotchman, *P. tremuloides* (1♀ NDSU), 5-VI-1968, R. Katayama (1♂ NDSU). **Slope Co.:** 22-VI-1976, Lago & Kurtz (1♀ NDSU). **Stark Co.:** Dickinson, Patterson Lake, 9-VIII-2011, K. Marmon, lindgren trap with AP + GE lure (1♀ NDSU), 23-VIII-2011, K. Marmon, lindgren trap with *Ips* lure (4♀♀ NDSU), 23-VIII-2011, K. Marmon, lindgren trap with AP + GE lure (2♀♀ NDSU), 23-VIII-2011, K. Marmon, lindgren trap with Chalcogram (1♀ NDSU). **Towner Co.:** 6-VI-1968, R. W. Katayama (1♀ NDSU), 6-VI-1968, Kotchman (1♂ 1♀ NDSU). **Ward Co.:** Minot, 14-V-1941, L. E. Storhaug (1♂ MISU). **Williams Co.:** 1984, D. A. Mundal, *Euphorbia esula* (2♀♀ NDSU).

Cydnoidea Malloch, 1919

To date, no species of *Cydnoidea* has been recorded from North Dakota; I have not examined any specimens from this area either. There are, however, three species that may eventually be collected in North Dakota. One paratype of the subspecies *C. ciliatus orientis* McAtee and Malloch (1933) is from Scott Co., Minnesota, which is just south of Minneapolis. *Cydnoidea renormatus* (Uhler) appears to be primarily a desert southwestern species, but Hart (1919) recorded one specimen from northern Illinois, and according to McPherson (1982), Sailer in an unpublished manuscript mentioned an additional specimen from Minnesota. Harris (1943) recorded *C. albipennis* (Say) from South Dakota. I have provided a key to the identification of *Cydnoidea* species that might occur in North Dakota.

Key to species of *Cydnoidea* that may occur in North Dakota

(extracted from McAtee and Malloch, 1933)

- 1 Hind tibia without a carinate line on posterior surface; exposed corium about as wide at apex as at base (subgenus *Sayocoris*)...*albipennis* (Say)
- Hind tibia with a definite carinate line on posterior surface; exposed corium not nearly as wide as apex as at base (subgenus *Cydnoidea*)2
- 2(1) Corium entirely fuscous to black, no part whitish; hind tibia with at least five posterodorsal bristles*ciliatus* Uhler
- Corium partly white or cream-colored; hind tibia with not more than four posterodorsal bristles.....*renormatus* Uhler

***Galgupha* Amyot and Serville, 1843**

Galgupha is an extremely diverse genus, with many species, especially in the neotropics. As mentioned previously, all our species are essentially solid black in color. Some of the southern U.S. species and many of the neotropical species, however, have pale markings not only on the corium, but sometimes also on the scutellum. Our species tend to be slightly larger than species of *Corimelaena*. Although the pale markings on the corium will usually separate our common species of *Corimelaena* from this genus, one may need to examine the position of the spiracles in relation to the trichobothria, or become familiar with the grooves and/or ridges along the margin of the corium to separate some species (see key to genera above). Three species of *Galgupha* are known to occur in North Dakota; a fourth species (*G. loboprostethia* Sailer) may eventually be found here (in fact, see discussion under *G. ovalis*; possibly it has been found here). Froeschner (1988e) listed *G. loboprostethia* from South Dakota; it can be recognized by the expanded prostethium.

Key to species of *Galgupha* that may occur in North Dakota

- 1 Lateral area of metapleuron distinctly punctate laterad of evaporative areas (subgenus *Nothocoris* McAtee and Malloch)*nitiduloides* (Wolff)
- Lateral area of metapleuron impunctate laterad of evaporative areas (subgenus *Galgupha* Amyot and Serville).....2
- 2(1) Anterior margin of prostethium produced to form explanate lobe, granulated portion as wide as base of second rostral segment [not yet recorded from North Dakota]..... *loboprostethia* Sailer
- Anterior margin of prostethium not lobed, granulated portion relatively narrow3
- 3(2) Anterodorsal series of spines on each fore tibia with distal two spines distinctly weaker than preceding spines, or lacking; corium without distinct ridge inside costal groove, ridge represented only by series of punctures distally; punctation on discal portions of pronotum and scutellum mostly obsolete*atra* Amyot and Serville
- Distal two spines of anterodorsal series on fore tibiae subequal in size with preceding spines; corium with distinct ridge inside costal groove; punctation on discal portions of pronotum and scutellum more evident *ovalis* Hussey

***Galgupha (Galgupha) atra* Amyot and Serville, 1843** - This species lacks the punctures laterad of each evaporative area; separation of this species from *G. ovalis* requires a fairly detailed examination of the spines on the fore tibiae, and/or the ridges on the coria (see key above). McPherson (1982) gave the distribution of this species as Québec, Maine, and Washington south to Florida, Texas, Arizona, and Mexico. Froeschner (1988e) listed this species from Manitoba, Montana, North Dakota, and South Dakota. Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan.

Specimen examined: NORTH DAKOTA: ***Billings Co.***: Roosevelt Natl. Pk., Medora, 24-VI-2002, F. Antwi (2♀ NDSU). ***Cass Co.***: Fargo, 22-V-1923, W. Baker (1♀ NDSU). ***Ransom Co.***: 2mi. SE McLeod, T134N, R53W, Sec. 35 SW 1/4, 8-VII-1992, D. Cuthrell & T. Madson, Hg light (1♀ NDSU); 7mi. SE Sheldon, 5-IX-1974, J. W. Smith (1♀ NDSU). ***Richland Co.***: Walcott Dunes, T. L. McCabe (1♀ NDSU). ***Rolette Co.***: Turtle Mtns., 8-VII-1964, R. J. Sauer (1♀ NDSU). ***Starck Co.***: Dickinson, 8-VII-1941, H. S. Telford (1♀ NDSU).

***Galgupha (Galgupha) ovalis* Hussey, 1925** - This species lacks the punctures laterad of each evaporative area; to separate it from *G. atra*, please

see the characters in the key (above). McPherson (1982) gave the distribution of this species as Massachusetts west to Montana, and south to Florida, Arizona, Texas, and Guatemala. Neither Uhler (1876) nor Hussey (1922) recorded this species from North Dakota. Apparently, it has not previously been recorded from North Dakota. Froeschner (1988e) listed this species from Montana, South Dakota, and many states to the east and south of North Dakota. Interestingly, one of the female specimens in the series collected in Grant Co. on May 18, 1964, has the prostethium expanded similarly as seen in specimens of *G. loboprostethia*, but it is identical in all other respects with the remaining specimens in the series. At this time, it seems prudent to consider this specimen as an aberrant individual of *G. ovalis*. It is also interesting to note that all specimens of this species collected so far from North Dakota come from either Grant County or Logan County, both of which are in the south central area of North Dakota.

Specimens Examined: NORTH DAKOTA [NEW STATE RECORD]: **Grant Co.:** *Grant Co.:* Heart Butte Dam, 18-V-1964, R. L. Post (2♂♂ 3♀♀ NDSU); 18-V-1964 (6♂♂ 3♀♀ NDSU). **Logan Co.:** 16-VI-1967, W. Kotchman (1♂ 1♀ NDSU).

Galgupha (Nothocoris) nitiduloides (Wolff, 1802) - This is the easiest species to recognize in our area. The punctures laterad of each evaporatorium are diagnostic, although be aware that in greasy specimens, it is almost impossible to see these punctures. Also, the number of punctures is not great, and the area of punctures is not extensive, but rather it is more in the form of a narrow band paralleling the margin of the evaporative area. Hussey (1922) stated that "Van Duzee (1917, p. 14, No. 28) lists this species as occurring in North Dakota. It does not occur in Mr. Hubbel's collection." Froeschner (1988e) listed this species from Minnesota, Montana, and North Dakota, and Maw et al. (2000) recorded this species from both Manitoba and Saskatchewan.

Specimens Examined: NORTH DAKOTA: **Barnes Co.:** 27-VI-1958 (1♀ NDSU). **Burleigh Co.:** Bismarck, landfill #2, 6-VII-2011, C. Larson, Lindgren trap (1♀ NDSU). **Cass Co.:** Fargo, 10-VII-1924, A. Oderkirk, swept from flax (1♂ NDSU). **Grand Forks Co.:** Inkster Spring, 13-VII-1964, R. J. Sauer (1♂ NDSU), 17-VIII-1961 (1♂ NDSU). **Oliver Co.:** 10mi. SE Kensler, T142N, R81W, Sec. 7, 20-VII-1995, K. Urlacher, pitfall trap in *Fagopyrum esculintum* (1♀ NDSU). **Ransom Co.:** SNG, A Annex, T134N, R53W, Sec. 8, 14-VII-1992, D. A. Rider (1♀ DARC), 17-VII-1992, D. L. Cuthrell (1♀ NDSU); SNG, 1.5mi. SE McLeod, T134N, R52W, SW31, 7-9-VIII-1992, D. L. Cuthrell (1♂ NDSU); SNG, 2mi. SE McLeod, 14-VII-1992, D. A. Rider (1♂ DARC); SNG, 4mi. NW McLeod, 25-VI-1992, D. A. Rider (1♂ DARC); 1mi. NE Mirror Pool, 17-VII-1993, D. A. Rider (4♂♂ 2♀♀ DARC). **Richland Co.:** Mirror Pool, T135N, R52W, Sec. 8, 18-VII-1992, D. A. Rider (1♀ DARC), 14-21-IX-1994, W. G. Schroeder (1♂ NDSU); 1mi. E Mirror Pool, 28-VII-1993, D. A. Rider (1♀ DARC); 1mi. NE Mirror Pool, 17-VII-1993, D. A. Rider (2♂♂ 1♀ DARC), 27-VII-1993, D. L. Cuthrell (1♂ NDSU); SNG, Horse Trail Head nr. Oak Savannah 46.52N, 96.21W, 20-VII-2012, D. A. Rider (4♂♂ DARC), 25-X-2007, D. A. Rider (1♂ DARC); Wahpeton, 8-XI-1964, L. Fomes & R. L. Post, in sod by wheat (1♀ NDSU); 10mi. W Walcott, 3-V-1978, E. U. Balsbaugh (1♂ 2♀♀ NDSU); SNG, T135N, R52W, Sec. 30, 5-VII-2000, J. Maxwell (1♂ NDSU).

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Literature Cited

- Balduf, W. V. 1945.** Bionomic notes on *Meneclis insertus* (Say) (Hemiptera, Pentatomidae). Bulletin of the Brooklyn Entomological Society 40(3): 61–65.
- Barber, H. G., and R. I. Sailer. 1953.** A revision of the turtle bugs of North America (Hemiptera: Pentatomidae). Journal of the Washington Academy of Sciences 43(5): 150–162.
- Belousova, E. N. 2007.** Revision of the shield-bug genera *Holcostethus* Fieber and *Peribalus* Mulsant & Rey (Heteroptera, Pentatomidae) of the Palearctic region. Entomologicheskoe Obozrenie 86(3): 610–654. [English translation in 2007, Entomological Review 87(6): 701–739]
- Blatchley, W. S. 1926.** Heteroptera or True Bugs of Eastern North America with Special Reference to the Faunas of Indiana and Florida. Indianapolis, The Nature Publ. Co. 1116 pp.
- Buxton, G. M., D. B. Thomas, and R. C. Froeschner. 1983.** Revision of the species of the *sayi*-group of *Chlorochroa* Stal (Hemiptera: Pentatomidae). Occasional Papers in Entomology (Sacramento, Calif.) 29: 23 pp.
- Canerday, T. D. 1965.** On the biology of the harlequin bug, *Murgantia histrionica* (Hemiptera: Pentatomidae). Annals of the Entomological Society of America 58: 931–932.
- Coppel, H. C., and P. A. Jones. 1963.** Bionomics of *Podisus* spp. associated with the introduced sawfly *Diprion similis* (Htg.) in Wisconsin. Transactions of the Wisconsin Academy of Sciences, Arts and Letters 51: 31–56.
- Cuda, J. P., and J. E. McPherson. 1976.** Life history and laboratory rearing of *Brochymena quadripustulata* with descriptions of immature stages and additional notes on *Brochymena arborea* (Hemiptera: Pentatomidae). Annals of the Entomological Society of America 69(5): 977–983.
- Davis, W. T. 1925.** Note on *Podops cinctipes* and *Solubea pugnax*. Bulletin of the Brooklyn Entomological Society 20: 147.
- DeCoursey, R. M. 1963.** The life histories of *Banasa dimidiata* and *Banasa calva* (Hemiptera: Pentatomidae). Annals of the Entomological Society of America 56: 687–693.
- DeCoursey, R. M., and C. O. Esselbaugh. 1962.** Descriptions of the nymphal stages of some North American Pentatomidae (Hemiptera-Heteroptera). Annals of the Entomological Society of America 55: 323–342.
- Dolling, W. R. 1981.** A rationalized classification of the burrower bugs (Cydnidae). Systematic Entomology 6: 61–76.
- Dolling, W. R. 1995.** [Editorial note on *Holcostethus*]. Entomologist's Monthly Magazine 131: 161.
- Downes, W. 1920.** The life history of *Apateticus crocatus* Uhl. (Hemiptera). Proceedings of the Entomological Society of British Columbia. 16: 21–27.
- Esselbaugh, C. O. 1946.** A study of the eggs of the Pentatomidae (Hemiptera). Annals of the Entomological Society of America 39: 667–691.
- Evans, E. W., and R. B. Root. 1980.** Group moulting and other lifeways of a solitary hunter, *Apateticus bracteatus* (Hemiptera: Pentatomidae). Annals of the Entomological Society of America 73(3): 270–274.
- Fish, J., and J. Alcock. 1973.** The behavior of *Chlorochroa ligata* (Say) and *Cosmopepla bimaculata* (Thomas), (Hemiptera: Pentatomidae). Entomological News 84(8): 260–268.
- Froeschner, R. C. 1942.** The nymphs of *Aelia* and *Neottiglossa* (Hemiptera: Pentatomidae). Entomological News 53(10): 291–292.
- Froeschner, R. C. 1960.** Cydnidae of the Western Hemisphere. Proceedings of the United States National Museum 111(3430): 337–680.

- Froeschner, R. C. 1988a.** Family Acanthosomatidae Signoret, 1863. The acanthosomatids, pp. 1–3. *In* T. J. Henry, and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden, New York, xix + 958 pp.
- Froeschner, R. C. 1988b.** Family Cydnidae Billberg, 1820. Burrowing bugs, pp. 119–129. *In* T. J. Henry, and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden, New York, xix + 958 pp.
- Froeschner, R. C. 1988c.** Family Pentatomidae Leach, 1815. The stink bugs, pp. 544–607. *In* T. J. Henry, and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden, New York, xix + 958 pp.
- Froeschner, R. C. 1988d.** Family Scutelleridae Leach, 1815. The shield bugs, pp. 684–693. *In* T. J. Henry, and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden, New York, xix + 958 pp.
- Froeschner, R. C. 1988e.** Family Thyreocoridae Amyot and Serville, 1843. The negro bugs, pp. 698–707. *In* T. J. Henry, and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, Leiden, New York, xix + 958 pp.
- Gamboa, G., and J. Alcock. 1973.** The mating behavior of *Brochymena quadrapustulata* [sic] (Fabricius). *Psyche* 80(4): 265–270.
- Gilbert, B. L., S. J. Barras, and D. M. Norris. 1967.** Bionomics of *Tetyra bipunctata* (Hemiptera: Pentatomidae: Scutellerinae) as associated with *Pinus banksiana* in Wisconsin. *Annals of the Entomological Society of America* 60(3): 698–701.
- Gross, G. F. 1976.** Handbook of the flora and fauna of South Australia. Plant-feeding and other bugs (Hemiptera) of South Australia. Heteroptera - Part 2. Handbooks Committee, South Australian Government, Adelaide, pp. 251–501.
- Harris, H. M. 1937.** Contributions to the South Dakota list of Hemiptera. *Iowa State College Journal of Science* 11(2): 169–176.
- Harris, H. M. 1943.** Additions to the South Dakota list of Hemiptera. *Journal of the Kansas Entomological Society* 16(4): 150–153.
- Harris, H. M., and F. Andre. 1934.** Notes on the biology of *Acantholomidea denticulata* Stal (Hemiptera, Scutelleridae). *Annals of the Entomological Society of America* 27(1): 5–15.
- Hart, C. A. 1919.** The Pentatomoidea of Illinois with keys to the nearctic genera. [Ed. by J. R. Malloch] *Illinois Natural History Survey, Bulletin* 13(7): 157–223, pl. 16–21.
- Hoebeke, E. R., and M. E. Carter. 2003.** *Halyomorpha halys* (Stål) (Heteroptera: Pentatomidae): A polyphagous plant pest from Asia newly detected in North America. *Proceedings of the Entomological Society of Washington* 105(1):225–237.
- Hoffman, R. L. 2005.** The Virginia species of *Banasa*, three decades later (Heteroptera: Pentatomidae). *Banisteria* 25: 41–44.
- Hussey, R. F. 1921.** Distributional notes on Hemiptera, with the description of a new *Gerris*. *Psyche* 28: 8–15.
- Hussey, R. F. 1922.** On some Hemiptera from North Dakota. *Occasional Papers of the Museum of Zoology, University of Michigan* 115: 23 pp.
- Jones, P. A., and H. C. Coppel. 1963.** Immature stages and biology of *Apateticus cynicus* (Say) (Hemiptera: Pentatomidae). *The Canadian Entomologist* 95(7): 770–779.
- Jones, W. A., Jr., and J. E. McPherson. 1980.** The first report of the occurrence of acanthosomatids in South Carolina. *Journal of the Georgia Entomological Society* 15(3): 286–289.

- Kerzhner, I. M. 1993.** Notes on synonymy and nomenclature of Palaearctic Heteroptera. *Zoosystematica Rossica* 2(1): 97–105.
- Kirkaldy, G. W. 1909.** Catalogue of the Hemiptera (Heteroptera) with biological and anatomical references, lists of foodplants and parasites, etc. Vol. I. Cimicidae. Berlin, xl + 392 pp.
- Knight, H. H. 1923.** Studies on the life history and biology of *Perillus bioculatus* Fabricius, including observations on the nature of the color pattern (Heteroptera, Pentatomidae). Report of the State Entomologist of Minnesota 19[1922]: 50–99, pls. 1–3.
- Knight, H. H. 1952.** Review of the genus *Perillus* with description of a new species (Hemiptera, Pentatomidae). *Annals of the Entomological Society of America* 45: 229–232.
- Larivière, M.-C. 1992.** Description of *Parabrochymena*, new genus, and redefinition and review of *Brochymena* Amyot and Audinet-Serville (Hemiptera: Pentatomidae), with considerations on natural history, chorological affinities, and evolutionary relationships. *Memoirs of the Entomological Society of Canada*, no. 163: 75 pp.
- Larivière, M.-C. 1994.** *Parabrochymena* Larivière (Hemiptera: Pentatomidae): Systematics, natural history, chorological affinities, and evolutionary relationships, with a biogeographic analysis of *Parabrochymena* and *Brochymena* Amyot and Audinet-Serville. *Canadian Entomologist* 126(5): 1193–1250.
- Lattin, J. D. 1964.** The Scutellerinae of America north of Mexico (Hemiptera: Heteroptera: Pentatomidae). Ph.D. dissertation, University of California, Berkeley, 350 pp.
- Lis, J. A. 1998.** *Amnestus raunoi* n. sp. from Iran, the first Old World representative of the New World subfamily Amnestinae (Hemiptera: Heteroptera: Cydnidae). *Entomologica Fennica* 9(1): 5–7.
- Lugger, O. 1900.** Bugs (Hemiptera) injurious to our cultivated plants. Minnesota Agricultural Experiment Station Bulletin 69: 1–259.
- Martinez, C. M., L. Cervantes Peredo, and J. A. Lis. 2012.** *Amnestus raunoi* J. A. Lis, the only representative of the Amnestinae in the Old World: A synonym of *Amnestus pusillus* Uhler (Hemiptera: Heteroptera: Cydnidae). *Zootaxa* 3445: 67–68.
- Maw, H. E. L., R. G. Footitt, K. G. A. Hamilton, and G. G. E. Scudder. 2000.** Checklist of the Hemiptera of Canada and Alaska. National Research Council of Canada, NRC Research Press, Ottawa, Canada, 220 pp.
- McAtee, W. L., and J. R. Malloch. 1933.** Revision of the subfamily Thyreocorinae of the Pentatomidae (Hemiptera-Heteroptera). *Annals of Carnegie Museum* 21: 191–411, pls. 4–17.
- McDonald, F. J. D. 1968a.** Some observations on *Sehirus cinctus* (Palisot de Beauvois) (Heteroptera: Cydnidae). *Canadian Journal of Zoology* 46(5): 855–858.
- McDonald, F. J. D. 1968b.** The life history of *Cosmoepepla bimaculata* (Thomas) (Heteroptera: Pentatomidae) in Alberta. *Quaestiones Entomologicae* 4: 35–38.
- McDonald, F. J. D. 1974.** Revision of the genus *Holcostethus* in North America (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 82(4): 245–258.
- McDonald, F. J. D. 1976.** Revision of the genus *Trichoepepla* (Hemiptera: Pentatomidae) in N. America. *Journal of the New York Entomological Society* 84(1): 9–22.
- McDonald, F. J. D. 1982.** Description of the male genitalia of *Holcostethus hirtus* (Van Duzee) with a revised key to North American species (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 90(1): 5–7.
- McDonald, F. J. D. 1986.** Revision of *Cosmoepepla* Stål (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 94(1): 1–15.
- McPherson, J. E. 1971a.** Notes on the laboratory rearing of *Corimelaena lateralis lateralis* (Hemiptera: Corimelaenidae) on wild carrot. *Annals of the Entomological Society of America* 64(1): 313–314.

- McPherson, J. E. 1971b.** Laboratory rearing of *Euschistus tristigmus tristigmus*. *Journal of Economic Entomology* 64(5): 1339–1340.
- McPherson, J. E. 1972.** Life history of *Corimelaena lateralis lateralis* (Hemiptera: Thyreocoridae) with descriptions of immature stages and list of other species of Scutelleroidea found with it on wild carrot. *Annals of the Entomological Society of America* 65(4): 906–911.
- McPherson, J. E. 1974.** Notes on the biology of *Mormidea lugens* and *Euschistus politus* (Hemiptera: Pentatomidae) in Southern Illinois. *Annals of the Entomological Society of America* 67(6): 940–942.
- McPherson, J. E. 1975.** Life history of *Euschistus tristigmus tristigmus* (Hemiptera: Pentatomidae) with information on adult seasonal dimorphism. *Annals of the Entomological Society of America* 68(2): 333–334.
- McPherson, J. E. 1976a.** Effects of photoperiod on a population of *Euschistus tristigmus* (Hemiptera: Pentatomidae) from Storrs, CT. *Annals of the Entomological Society of America* 69(4): 691–694.
- McPherson, J. E. 1976b.** Notes on the biology of *Cosmopepla bimaculata* (Hemiptera: Pentatomidae) in southern Illinois. *Transactions of the Illinois State Academy of Science* 69(3): 362–366.
- McPherson, J. E. 1980.** A list of the prey species of *Podisus maculiventris* (Hemiptera: Pentatomidae). *The Great Lakes Entomologist* 13(1): 17–24.
- McPherson, J. E. 1982.** The Pentatomoidea (Hemiptera) of northeastern North America with emphasis on the fauna of Illinois. Southern Illinois University Press, Carbondale & Edwardsville, 240 pp.
- McPherson, J. E., and I. Ahmad. 2005.** Further information on male genitalia of *Parabrochymena* Amyot & Serville (Hemiptera: Pentatomidae). *Annals of the Entomological Society of America* 98: 282–290.
- McPherson, J. E., and I. Ahmad. 2007.** Redescriptions of *Brochymena* and *Parabrochymena* (Hemiptera: Heteroptera: Pentatomidae), based primarily on male genitalia, with reclassification of three species and description of New World tribe (Halyini). *Annals of the Entomological Society of America* 100(5): 673–682.
- McPherson, J. E., and I. Ahmad. 2008.** Comparison of male genitalia of *Murgantia histrionica*, *M. varicolor*, and *M. violascens* (Hemiptera: Heteroptera: Pentatomidae). *Proceedings of the Entomological Society of Washington* 110(4): 1028–1033.
- McPherson, J. E. and I. Ahmad. 2012.** Comparison of male genitalia of *Euschistus* spp. in the midwestern United States (Hemiptera: Heteroptera: Pentatomidae). *Annals of the Entomological Society of America* 105(3): 395–402.
- McPherson, J. E., and S. M. Paskewitz. 1984a.** Life history and laboratory rearing of *Euschistus ictericus* (Hemiptera: Pentatomidae), with descriptions of immature stages. *Journal of the New York Entomological Society* 92(1): 53–60.
- McPherson, J. E., and S. M. Paskewitz. 1984b.** Laboratory rearing of *Amaurochrous cinctipes* (Hemiptera: Pentatomidae: Podopinae) with descriptions of immature stages. *Journal of the New York Entomological Society* 92(1): 61–68.
- McPherson, J. E., and D. L. Tecic. 1997.** Notes on the life histories of *Acrosternum hilare* and *Cosmopepla bimaculata* (Heteroptera: Pentatomidae) in southern Illinois. *The Great Lakes Entomologist* 30(3): 79–84.
- Munyaneza, J. and J. E. McPherson. 1994.** Comparative study of life histories, laboratory rearing, and immature stages of *Euschistus servus* and *Euschistus variolarius* (Hemiptera: Pentatomidae). *The Great Lakes Entomologist* 26(4): 263–274.
- Oetting, R. D., and T. R. Yonke. 1971a.** Immature stages and biology of *Podisus placidus* and *Stiretrus fimbriatus* (Hemiptera: Pentatomidae). *The Canadian Entomologist* 103(11): 1505–1516.

- Oetting, R. D., and T. R. Yonke. 1971b. Biology of some Missouri stinkbugs. *Journal of the Kansas Entomological Society* 44(4): 446–459.
- Palumbo, J. C., and E. T. Natwick. 2010. The bagrada bug (Hemiptera: Pentatomidae): A new invasive pest of cole crops in Arizona and California. *Plant Health Progress*. (<http://www.plantmanagementnetwork.org/sub/php/brief/2010/bagrada/>). Accessed 13 September 2012.
- Parish, H. E. 1934. Biology of *Euschistus variolarius* P. de B. (Pentatomidae). *Annals of the Entomological Society of America* 27(1): 50–54.
- Parshley, H. M. 1922. Report on a collection of Hemiptera-Heteroptera from South Dakota. South Dakota State College, Technical Bulletin, no. 2: 22 pp.
- Parshley, H. M. 1923. On the ecology of *Podops cinctipes* Say and *Rhytidolomia saucia* Say, (Hemiptera, Pentatomidae). *The Canadian Entomologist* 55(3): 69–71.
- Phillips, K. A. 1983. A taxonomic revision of the nearctic species of *Apateticus* Dallas and *Podisus* Herrich-Schaeffer (Heteroptera: Pentatomidae: Asopinae). Ph.D. Dissertation, Oregon State University, 275 pp.
- Prebble, M. L. 1933. The biology of *Podisus serievventris* Uhler in Cape Breton, Nova Scotia. *Canadian Journal of Research* 9: 1–30.
- Ribes, J., S. Pagola-Carte, and I. Zabalegui. 2008. On some Palearctic Carpocorini (Hemiptera: Pentatomidae: Pentatominae). *Heteropterus Revista de Entomología* 8(2): 155–169.
- Ribes, J., and G. Schmitz. 1992. Révision du genre *Brachynema* Mulsant & Rey, 1852 (Heteroptera, Pentatomidae, Pentatominae). *Bulletin et Annales de la Société Belge Entomologie* 128: 105–166.
- Rider, D. A. 1986a. New state records from the southeastern United States for *Aelia americana* (Hemiptera: Pentatomidae). *Florida Entomologist* 69(1): 251–252.
- Rider, D. A. 1986b. A new species and new synonymy in the genus *Tepa* Rolston and McDonald (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 94(4): 552–558.
- Rider, D. A. 1990. Review of the New World species of the genus *Neottiglossa* Kirby (Heteroptera: Pentatomidae). *Journal of the New York Entomological Society* 97(4) [1989]: 394–408.
- Rider, D. A. 1996. Review of the genus *Coenus* Dallas, with the description of *C. explanatus*, new species (Heteroptera: Pentatomidae). *Journal of the New York Entomological Society* 103(1)[1995]: 39–47.
- Rider, D. A., and L. H. Rolston. 1995. Nomenclatural changes in the Pentatomidae (Hemiptera-Heteroptera). *Proceedings of the Entomological Society of Washington* 97(4): 845–855.
- Rider, D. A., and J. B. Chapin. 1991. Revision of the genus *Thyanta* Stål, 1862 (Heteroptera: Pentatomidae) I. South America. *Journal of the New York Entomological Society* 99(1): 1–77.
- Rider, D. A., and J. B. Chapin. 1992. Revision of the genus *Thyanta* Stål, 1862 (Heteroptera: Pentatomidae) II. North America, Central America, and the West Indies. *Journal of the New York Entomological Society* 100(1): 42–98.
- Rolston, L. H. 1972a. The small *Thyanta* species of North America (Hemiptera: Pentatomidae). *Journal of the Georgia Entomological Society* 7(4): 278–285.
- Rolston, L. H. 1972b. The genus *Meneclis* Stål (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 80(4): 234–237.
- Rolston, L. H. 1978. A revision of the genus *Mormidea* (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 86(3): 161–219.

- Rolston, L. H. 1983.** A revision of the genus *Acrosternum* Fieber, subgenus *Chinavia* Orian, in the Western Hemisphere (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 91(2): 97–176.
- Rolston, L. H., and F. J. D. McDonald. 1984.** A conspectus of Pentatomini of the Western Hemisphere. Part 3 (Hemiptera: Pentatomidae). *Journal of the New York Entomological Society* 92(1): 69–86.
- Ruckes, H. 1938.** Courtship and copulation in *Brochymena sulcata* Van D. *Bulletin of the Brooklyn Entomological Society* 33(2): 89–90.
- Ruckes, H. 1939a.** Two new species of *Brochymena* (Pentatomidae, Heteroptera) from Arizona. *Bulletin of the Brooklyn Entomological Society* 33(5)[1938]: 236–242.
- Ruckes, H. 1939b.** Three new species of *Brochymena* from the United States and Mexico. *Bulletin of the Brooklyn Entomological Society* 34(2): 111–118, 1 pl.
- Ruckes, H. 1939c.** *Brochymena florida*, a new species of pentatomid from Florida. *Bulletin of the Brooklyn Entomological Society* 34(5): 236–239.
- Ruckes, H. 1941.** Note on the feeding habits of *Brochymena carolinensis* (West.) in Florida. *Bulletin of the Brooklyn Entomological Society* 36(1): 27–28.
- Ruckes, H. 1946.** *Brochymena obscura* (H.-S.), *Brochymena tenebrosa* Walker, and *Brochymena parva*, a new name. *Bulletin of the Brooklyn Entomological Society* 41(2): 41–44.
- Ruckes, H. 1947.** Notes and keys on the genus *Brochymena* (Pentatomidae, Heteroptera). *Entomologica Americana* 26(4)[1946]: 143–238.
- Sailer, R. I. 1952.** A review of the stink bugs of the genus *Mecidea*. *Proceedings of the United States National Museum* 102(3309): 471–505.
- Schuh, R. T., and J. A. Slater. 1995.** *True Bugs of the World (Hemiptera: Heteroptera): Classification and Natural History*. Cornell University Press, Ithaca, New York, 336 pp.
- Scudder, G. G. E., and D. B. Thomas, Jr. 1987.** The green stink bug genus *Chlorochroa* Stål (Hemiptera: Pentatomidae) in Canada. *The Canadian Entomologist* 119(1): 83–93.
- Slater, J. A., and R. M. Baranowski. 1978.** *How to know the true bugs (Hemiptera-Heteroptera)*. Wm. C. Brown Co., Dubuque. 256 pp.
- Stoner, D. 1920.** The Scutelleroidea of Iowa. *University of Iowa Studies, Studies in Natural History* 8(4): 1–140, pls. 1–7.
- Thomas, D. B., Jr. 1974.** The genus *Codophila* Mulsant in North America (Hemiptera: Pentatomidae). *The Pan-Pacific Entomologist* 50(4): 441–442.
- Thomas, D. B., Jr. 1983.** Taxonomic status of the genera *Chlorochroa* Stål, *Rhytidilomia* Stål, *Liodermin* Kirkaldy, and *Pitedia* Reuter, and their included species (Hemiptera: Pentatomidae). *Annals of the Entomological Society of America* 76(2): 215–224.
- Thomas, D. B. 1991.** The Acanthosomatidae (Heteroptera) of North America. *The Pan-Pacific Entomologist* 67(3): 159–170.
- Thomas, D. B., Jr. 1992.** Taxonomic synopsis of the asopine Pentatomidae (Heteroptera) of the Western Hemisphere. *Thomas Say Foundation Monograph, ESA, Vol. 16: iv + 156 pp.*
- Thomas, D. B., Jr. and T. R. Yonke. 1981.** A review of the Nearctic species of the genus *Banasa* Stål (Hemiptera: Pentatomidae). *Journal of the Kansas Entomological Society* 54(2): 233–248.
- Thomas, D. B., Jr., and T. R. Yonke. 1988.** Review of the genus *Banasa* 1860 (Hemiptera: Pentatomidae) for Mexico, Central America, and the Antilles. *Annals of the Entomological Society of America* 81(1): 28–49.

- Thomas, D. B., Jr., and T. R. Yonke. 1990.** Review of the genus *Banasa* (Hemiptera: Pentatomidae) in South America. *Annals of the Entomological Society of America* 83(4): 657–688.
- Torre-Bueno, J. R. de la. 1939.** A synopsis of the Hemiptera-Heteroptera of America North of Mexico. Part I, Families Scutelleridae, Cydnidae, Pentatomidae, Aradidae, Dysodiidae and Termitaphididae. *Entomologica Americana* (ns) 19(3): 141–206.
- Tostowaryk, W. 1971.** Life history and behavior of *Podisus modestus* (Hemiptera: Pentatomidae) in boreal forest in Quebec. *The Canadian Entomologist* 103(5): 662–673.
- Uhler, P. R. 1872.** Notices of the Hemiptera of the Western Territories of the United States, chiefly from the surveys of Dr. F. V. Hayden, pp. 392–423. *In* F. V. Hayden, Preliminary report of the United States Geological survey of Montana and portions of adjacent territories, being a fifth annual report of progress. Government Printing Office, Washington, D. C.
- Uhler, P. R. 1876.** List of the Hemiptera of the region west of the Mississippi River, including those collected during the Hayden explorations of 1873. *Bulletin of the United States Geological and Geographical Survey of the Territories* 1: 267–361.
- Uhler, P. R. 1878.** On the Hemiptera collected by Dr. Elliott Coues, U. S. A., in Dakota and Montana, during 1873–74. *Bulletin of the U. S. Geological and Geographical Survey of the Territories* 4: 503–512.
- Usinger, R. L. 1930.** Two new species of *Vanduzeeina* from California (Scutelleridae, Hemipt.). *The Pan-Pacific Entomologist* 6: 131–133.
- Van Duzee, E. P. 1904.** Annotated list of the Pentatomidae recorded from America, North of Mexico, with descriptions of some new species. *Transactions of the American Entomological Society* 30(1): 1–80.
- Van Duzee, E. P. 1917.** Catalogue of the Hemiptera of America North of Mexico, Excepting the Aphididae, Coccidae and Aleurodidae. University of California Publications, Entomology 2:xiv + 902 pp.
- Vestal, A. G. 1915.** An associational study of Illinois sand prairie. *Bulletin of the Illinois State Laboratory of Natural History* 10: 96 pp., 5 pls.
- Vodjani, S. 1961.** The Nearctic species of the genus *Eurygaster* (Hemiptera: Pentatomidae: Scutellerinae). *The Pan-Pacific Entomologist* 37(2): 97–107.
- Wheeler, A. G., Jr. 1977.** Studies on the arthropod fauna of alfalfa. VII. Predaceous insects. *The Canadian Entomologist* 109(3): 423–427.
- Youthner, M. L., and J. E. McPherson. 1975.** A study of fecundity, fertility, and hatch in *Euschistus servus* (Hemiptera: Pentatomidae) with notes on precopulatory and copulatory behavior. *Transactions of the Illinois State Academy of Science* 68(4): 321–338.
- Zimmer, J. T. 1912.** The Pentatomidae of Nebraska. *Nebraska University Studies* 11(3)[1911]: 219–251.