
Lygaeidae (Hemiptera) of Oklahoma

KURT F. SCHAEFER, Panhandle State, Goodwell

and

WILLIAM A. DREW, Oklahoma State University, Stillwater

Among the Hemiptera of Oklahoma, the Lygaeidae rank second in numbers only to the family Miridae. They are principally phytophagous; however, some members of the subfamilies Rhyparochrominae and Georhynchinae are noted as beneficial predators. The predatory forms usually have swollen front femora which are often armed beneath with teeth and spines. Only two species of this family are of detriment in Oklahoma; they are the chinch bug (*Blissus leucopterus*) and false chinch bug (*Nysius ericae*).

Important literature dealing with lygaeid taxonomy relating to Oklahoma fauna includes: Blatchley (1926), Froeschner (1944), Slater (1964), and Torre-Bueno (1946). Slater's (1964) recent catalog of the world Lygaeidae updates the nomenclature, and his distribution lists indicate the possibility of more species being found in the state than indicated by Van Duzee's (1917) catalog, Torre-Bueno's (1946) synopsis, and Oklahoma museums' records. Ortenburger (1927) and Stoner et al. (1962) give lists of lygaeids collected during their investigations in the state.

Except for omission of subspecific designations of *Blissus leucoptera*, *Geocoris bullatus*, *G. pallens* and *G. uliginosus*, taxonomic arrangement follows Slater (1964). The taxa are arranged alphabetically within subfamilies to facilitate use. No new taxa are presented; 55 specific taxa in nine subfamilies are included, of which 17 are not presently recorded from the state.

KEY TO THE SUBFAMILIES

1. Sutures between ventral abdominal segments three and four usually curved anteriorly and not reaching lateral abdominal margins
Sutures between ventral abdominal segments three and four as others, reaching lateral margins *Rhyparochrominae*
2. Pronotal hind margin in front of scutellum turned down convexly; fore femora neither swollen nor spinose beneath
Pronotal hind margin in front of scutellum not turned down; fore femora usually swollen and sometimes spinose beneath
3. Hemelytra and often entire upper surface impunctate
Hemelytra and upper surface except hemelytral membrane punctate
4. Hemelytral corium with apical costal margin straight; colors often black and reddish
Hemelytral corium with apical costal margin distinctly sinuate; colors not black and reddish *Lygaeinae*
..... *Orsillinae*
5. Hemelytral corium hyaline, no punctures along its middle; fourth antennal segment slightly longer than third
Hemelytral corium opaque, punctate throughout; fourth antennal segment shorter than third *Ischnorhynchinae*
..... *Cyminae*
6. All abdominal ventral segments with visible spiracles; anterior femora more or less swollen and armed with one or more spines
Abdominal ventral segments one and two with visible spiracles; anterior femora moderately swollen and unarmed
7. Fore femora strongly swollen and with rows of spines beneath; hemelytra not extending over sides of abdomen
Fore femora but slightly swollen and with a single spine beneath; hemelytra extending beyond sides of abdomen *Pachygronthinae*
..... *Oxycareninae*
8. Head narrower than posterior margin of pronotum; hemelytral claval commissure at least half as long as scutellum
Head wider than posterior margin of pronotum; hemelytral claval commissure very short or absent *Blissinae*
..... *Geocorinae*

BLISSINAE

Characteristics: Head broader than long across compound eyes, narrower than hind pronotal margin; pronotum usually not distinctly constricted or impressed to form two lobes; hemelytra dimorphic in length clavus not narrowing behind, commissure at least half the scutellum length; female with abdominal ventrals five and six overlapping and converging forward.

KEY TO THE SPECIES

1. Abdomen less than twice as long as head and pronotum together..... 2
 Abdomen more than twice as long as head and pronotum together
 ----- *Ischnodemus falicus*
2. Length more than 3.5 mm ----- *Blissus leucopterus*
 Length less than 3 mm ----- *Blissus nanus*

Blissus Burmeister

Characteristics: Head sloping downward, its width across eyes about one-half that of hind pronotal margin; antennae as long as head and thorax united, first joint exceeding apex of head; hemelytra either entire or in brachypterous forms only to third abdominal tergite.

Blissus leucopterus (Say)

Characteristics: Length 3.67-4.2 mm; color black, thickly clothed with fine appressed pubescence; hemelytra milky white, veins tinged with yellow, apex of corium blackish.

Distribution: Alfalfa, Cleveland, Grant, Noble, Okmulgee, Payne, Pontotoc, Washington and Woods counties.

Blissus nanus Barber

Characteristics: Length 2.8 mm; only brachypterous form is known; color black; head, anterior three-fourths of pronotum, and basal half of scutellum grayish pruinose, sparsely covered with recumbent silvery white hairs, some long pilose hairs; posterior portion of pronotum velvety black; hemelytral corium whitish, often marked with brown; membrane white, hemelytra nearly twice as long as scutellum.

Distribution: Barber (1937) gives distribution as Kansas.

Ischnodemus Fieber

Characteristics: Body slender; antennae slightly longer than head and pronotum together, first joint longer than apex of head; pronotum with a more or less evident transverse impression; abdomen concave above, enclosing hemelytra; hemelytra entire or in brachypterous forms often scarcely longer than pronotum.

Ischnodemus falicus (Say)

Characteristics: Length 4.2-5.3 mm; head, pronotum, scutellum, and venter black, thickly clothed with fine pubescence; abdomen dark red, margins paler; hemelytral corium and membrane whitish with veins dark red; pronotum subquadrate, depressed above, sides rounded in front; hemelytra of macropterous forms reaching sixth tergite.

Distribution: Payne County.

CYMINAE

This subfamily is sufficiently characterized by the subfamily key.

Cymus Hahn

Characteristics: Head inserted in thorax almost to eyes; beak reaching mesocoxae; pronotum longer than wide, constricted near apex, coarsely, evenly punctate; hemelytral membrane relatively small, hyaline.

Cymus angustatus Stal

Characteristics: Length 3.8-4.2 mm; color pale brownish yellow;

head, pronotum, and scutellum often darker; apices of hemelytral clavus and corium dark brown; pronotal front margin as wide as interocular space.

Distribution: Delaware, LeFlore, McCurtain and Okmulgee counties.

GEOCORINAE

Characteristics: Head broader than long, compound eyes prominent projecting backward and overlapping front of pronotum; antennae shorter than head and pronotum together, first segment not exceeding apex of head; beak reaching mesocoxae; pronotum not divided into distinct lobes. hemelytra of macropterous form entire, of brachypterous form not surpassing fifth abdominal tergite.

KEY TO THE SPECIES

1. Second joint of beak subequal to first joint 1
 Second joint of beak noticeably shorter than first joint 2
2. Hemelytral corium sparsely and irregularly punctate over entire disk *Hypogeocoris piceus*
 Hemelytral corial punctures in rows near clavus *Hypogeocoris imperialis*
3. Head smooth, polished; a groove from apex of head extending back to vertex *Geocoris punctipes*
 Head granulose; groove at head apex not extended to vertex 4
4. Scutellum longer than wide, bicolored 5
 Scutellum nearly equilateral, usually concolorous *Geocoris uliginosus*
5. Upper surface depressed; pronotum little convex, sometimes sunken in middle behind calli; scutellum not evenly and strongly convex, either low convex, with median smooth raised line making it somewhat roof-shaped, sometimes elevated at or near base, or with a Y-shaped raised area; ground color more grayish; length 2.75-4.5 mm *Geocoris bullatus*
 Upper surface more convex; pronotum rounded, sometimes subdepressed; scutellum very convex, evenly rounded median line usually scarcely elevated, or elevated Y-shaped area sometimes present *Geocoris decoratus* and *pallens*

Geocoris Fallen

Characteristics: Third and fourth antennal segments subequal, second longer; compound eyes not obviously stalked, their inner margins usually contiguous with front side margins of pronotum.

Geocoris bullatus (Say)

Characteristics: Length 2.75-4.5 mm; color grayish, some yellow; head between eyes, base of scutellum, and two spots on hind margin of hemelytral corium blackish; pronotum with two prominent smooth yellow calli on apical third; head, pronotum, and scutellum sparsely evenly punctate.

Distribution: McCurtain and Payne counties.

Geocoris decoratus Uhler

Characteristics: Length 3-4 mm; head, most of pronotum except calli margins, and scutellum except two marginal pale spots dark brown to black; pronotum often much lighter; hemelytra entirely pale.

The above description is modified from McAtee (1914) to help the reader differentiate between this species and *G. pallens*. With our limited number of specimens, we have been unable to differentiate these species. They were considered synonymous until Barber (1949) stated that *G. decoratus* was not a synonym of *G. pallens*, but his description of *G. pallens* lacks any structural difference, and since the color pattern of the genus is generally highly variable, one cannot safely distinguish the two. Drs. H. Harris and R. Sailer have identified specimens for our museum, the former as both questioned species, the latter as *G. pallens*; all identified specimens appear to be conspecific. Slater's (1964) distribution list for each species places Oklahoma near their eastern boundary.

Geocoris pallens Stal

Characteristics: Length 3-4 mm; pronotum often medially dark, calli with a central pale spot.

The above description is modified from Barber (1949). The reader should note the discussion of *G. decoratus* concerning the uncertainty of these two species in Oklahoma.

Geocoris punctipes (Say)

Characteristics: Length 3.5-5 mm; color grayish yellow; head between eyes, a curved mark on each side of apical third of pronotum, and basal and medial portion of scutellum usually in great part dark brown; front of head, a spot on each side of scutellum, and remainder of pronotal disc yellowish.

Distribution: Delaware, McCurtain and Payne counties.

Geocoris uliginosus (Say)

Characteristics: Length 3-4 mm; color shining black, hemelytral membrane hyaline. Several color varieties have been named, but as yet only the typical form has been collected in the state. The other forms may have either pronotum or hemelytral margin or both with yellow. No further differentiation is made here; Blatchley (1926) gives a key to the color varieties.

Distribution: Payne County.

Hypogeocoris Montandoni

Characteristics: Head smooth, second and fourth antennal joints subequal; first joint of beak equal to or shorter than second; eyes obviously stalked, not in contact with front side of pronotum.

Hypogeocoris imperialis (Distant)

Characteristics: Length 3.5-4 mm; color yellowish orange and black; head, anterior two-thirds of pronotum, and hemelytral clavus and corium yellowish orange; basal portion of pronotum, and scutellum, black; front margin, hind lobe of pronotum, and three rows on hemelytral clavus with punctures.

Distribution: Coal County.

Hypogeocoris piceus (Say)

Characteristics: Length 4-4.2 mm; color shining black; head, base of first, apex of third and usually fourth antennal segments, beak, and legs reddish yellow or reddish brown; hemelytral corium sparsely and irregularly punctate.

Distribution: Slater (1964) lists the distribution as Colorado, Kansas, Missouri and New Mexico.

ISCHNORHYNCHINAE

This subfamily is sufficiently characterized by the subfamily key.

Kleidocerys Stephens

Characteristics: Antennae longer than head and pronotum, joints two and three slender, four stouter, fusiform; beak reaching second abdominal sternite; pronotum bell-shaped, constricted near apex; hemelytral clavi with sides parallel; hemelytra entire.

Barber (1953a) revised this genus.

Kleidocerys reesdae geminatus (Say)

Characteristics: Length 4-5 mm; color dull yellow; first and fourth antennal joints, front pronotal margin, hind pronotal margin, and a V-shaped marking of disk black; punctures on head, pronotum, scutellum, and three rows each on hemelytral corium and clavus; membrane hyaline.

Distribution: Alfalfa County.

LYGAEINAE

Characteristics: Base of pronotum in front of scutellum impressed or depressed; hemelytra impunctate, membrane with two inner veins united near base by a transverse vein.

KEY TO THE SPECIES

1. Posterior pronotal margin before scutellum sinuate; carinate anteriorly in the middle *Oncopeltus (Erythrischius) fasciatus*
- Posterior pronotal margin truncate, without median carina, or carina not reaching anterior margin 2
2. Pronotum black, with a postmedian transverse red band or three red spots, remote from posterior margin; length greater than 10 mm. 3
- Pronotum without a postmedian transverse red band; length less than 10 mm 6
3. Head with an anterior Y-shaped red mark, its arm extending between antennal bases and compound eyes *Lygaeus turcicus*
- Head with red spot of varying size but not Y-shaped 4
4. Hemelytral clavus entirely black 5
- Hemelytral clavus anteriorly red *Lygaeus reclinatus*
5. Hemelytral membrane with two white spots and a broad white margin *Lygaeus kalmii kalmii*
- Hemelytral membrane without white spots, or with very small ones, and a narrow white margin *Lygaeus kalmii angustomarginatus*
6. Length 5 mm or less 7
- Length over 5 mm 8
7. Hemelytral membrane dark brown, pale margined, with a clean-cut transverse median white spot, often prolonged and continuous to middle of base of membrane *Lygaeospilus pusio*
- Hemelytral membrane dark brown, variegated white; discal spot more or less confused with pale variegations, not pale margined; a pale triangle at outer basal angles *Lygaeospilus tripunctatus*
8. Posterior pronotal lobe, hemelytral corium, venter except genital segments, and small vittae, red *Melanocoryphus bicrucis*
- Posterior pronotal lobe, hemelytral corium, clavus, and venter entirely brown 9

9. Hemelytral costal margin red *Melanocoryphus lateralis*
 Hemelytral costal margin, commissural and inner claval margins
 red *Melanocoryphus admirabilis*

Lygaeospilus Barber

Characteristics: Upper surface with short decumbent, grayish pubescence; hemelytral membrane with a whitish discal spot or variegated with white.

Lygaeospilus pusio (Stal)

Characteristics: Length 4.5 mm; beak reaching behind mesocoxae; pronotal humeri tubercular; hemelytra red, more or less infuscated; venter dark brown sometimes margined with red.

Distribution: Payne County.

Lygaeospilus tripunctatus (Dallas)

Characteristics: Length 3.5-4.5 mm; pronotum with front margin and small spot on hind angles and middle brownish yellow; hemelytral costal margin of corium reddish brown; pronotum punctate at middle and behind front margin; scutellum with transverse ridge low.

Distribution: Slater (1946) gives Missouri, New Mexico and Texas.

Lygaeus Fabricius

Characteristics: Beak reaching to or beyond middle coxae; pronotum more or less punctate, transversely impressed near middle, hind lobe usually with an evident carina; scutellum depressed with a longitudinal median carina; hemelytra entire.

Lygaeus kalmii Stal

This common species has been taken in 30 counties in this state. Parshley (1919) established two subspecies, one found in eastern United States and the other a western form; Oklahoma is in the zone of intergradation between the two. In the past, there has been some controversy about their validity; see Blatchley (1926), Froeschner (1944), Parshley (1923), Simanton and Andre (1935), and Slater (1952). The arrangement followed here is that of Slater (1952) who accepts that of Parshley.

Distribution: The following counties are included on our museum records, but no specimens are available so their subspecific identity is unknown. The remaining counties represented by specimens are listed under their respective subspecies.

Cherokee, Craig, Creek, Delaware, Garvin, Harper, Lincoln, Love, McIntosh, Noble, Oklahoma, Okmulgee, Osage, Pittsburg, Washington, Woods and Woodward counties.

Lygaeus kalmii kalmii Stal

Characteristics: Length 10-12 mm; color pattern similar to *L. k. angustomarginatus* except for the presence of two white spots on middle area of membrane and a broad white membranal margin.

Distribution: Alfalfa, Beaver, Cimarron, Cleveland, Comanche, Ellis, Grady, Payne and Texas counties.

Lygaeus kalmii angustomarginatus Parshley

Characteristics: Length 10-12 mm; color black and dull red; red spot on head confined to vertex; hemelytral clavus black, membrane black with narrow white costal margin, corium black with inner margins banded

with red, appearing as an X-shaped red marking; pronotal hind lobe largely red, front lobe and apical margin black; head, except vertex, and thorax, except transverse red band, black; abdomen red, last two apical segments, and two rows of black spots on each side.

Distribution: Beaver, Cleveland, McCurtain, Payne, Pontotoc, Pushmataha and Texas counties.

Lygaeus reclivatus Say

Characteristics: Length 11 mm; color similar to *L. kalmii angustomarginatus*, except with anterior margin of hemelytral clavus red; discal spots as in *L. k. kalmii* or absent.

Distribution: Slater (1964) gives distribution as Colorado, Kansas, Missouri, New Mexico and Texas.

Lygaeus turcicus Fabricius

Characteristics: Length 10-11.5 mm; color similar to *L. kalmii angustomarginatus*, except Y-shaped red marking on head.

Distribution: McCurtain County.

Melanocoryphus Stal

Characteristics: Head black not marked with red; upper surfaces not pubescent; hemelytral membrane without whitish discal spots.

Melanocoryphus admirabilis Uhler

Characteristics: Length 4.5-6 mm; hemelytral costal, apical, commissural, and inner claval margins red; pronotal disc at sides of postmedian carina finely punctate; first antennal segment thick, as thick as apex of head; beak reaching metcoxae.

Distribution: Slater (1964) includes Colorado, Kansas, New Mexico and Texas.

Melanocoryphus bicructs (Say)

Characteristics: Length 7.5-9 mm; head, pronotal front lobe, scutellum, hemelytral membrane, antennae, and legs black; pronotal hind lobe, hemelytral corium and clavus, and greater part of venter dull red; front margin of front pronotal lobe, inner margins of clavus and corium margined white.

Distribution: Adair, Choctaw, Craig, LeFlore, McCurtain, Ottawa, Payne, Pittsburg, Pontotoc, Pushmataha, Rogers, Sequoyah, Texas and Woods counties.

Melanocoryphus lateralis (Dallas)

Characteristics: Length 7.3-8 mm; color dark brown to black, pronotal front margin, medial carina, posterior angles, and hemelytral corial margin reddish, hemelytral membrane grayish; hind lobe of pronotum coarsely punctate.

Distribution: Beaver, Beckham, Caddo, Cimarron, Cleveland, Ellis, Jackson, Nowata, Payne, Roger Mills and Texas counties.

Oncopeltus (Erythrischius) Stal

Characteristics: Head and pronotum without long hairs or very short pilose; posterior margin of pronotum before scutellum straight or slightly sinuate.

Torre-Bueno (1946) gives a key to the subgenera and species found in the United States.

Oncopeltus (Erythrischius) fasciatus (Dallas)

Characteristics: Length 13-18 mm; color black and red or reddish orange; head black with a V-shaped red marking extending from vertex to between antennae; pronotum black, margin red, except posterior margin in front of scutellum; hemelytra dark with apical and just behind the middle transverse red bands.

Distribution: Alfalfa, Choctaw, Cleveland, Comanche, Craig, Ellis, Harper, Jackson, LeFlore, Major, McCurtain, McIntosh, Okmulgee, Osage, Pawnee, Payne, Pontotoc, Pushmataha, Texas, Washington and Woodward counties.

ORSILLINAE

Characteristics: Apical margin of hemelytral corium sinuate near clavus; hind wing subhyaline, not infuscated; ventral abdominal segments four to six of female carinate, compressed and apparently divided at middle.

KEY TO THE SPECIES

1. Basal antennal segment not reaching apex of head
 *Belonochilus numenius*
 Basal antennal segment reaching or surpassing apex of head 2
2. Hemelytral costal margin straight throughout length
 *Ortholomus scolopax*
 Hemelytral costal margin straight only at base, if at all 3
3. Bucculae (elevated plates or ridges on underside of head on each side of beak) short, never reaching beyond middle of ventral head region; first joint of beak extending much beyond bucculae
 *Nysius californicus*
 Bucculae much longer, extending beyond middle of ventral head region, subequal in length to first beak joint 4
4. Bucculae high in front, slightly narrowing posteriorly, ending abruptly at base of head *Nysius angustatus*
 Bucculae lower in front, tapering toward and ending before base of head 5
5. Pronotum short, nearly twice as wide as long and subequal to length of head *Nysius raphanus*
 Pronotum longer, less than twice as wide as long, usually longer than head *Nysius ericae*

Belonochilus Uhler

Characteristics: Head subequal to length of pronotum, first antennal segment not surpassing apex of head; eyes not touching front margin of pronotum; fourth antennal segment fusiform; beak reaching or surpassing fifth ventral sternite.

Belonochilus numenius (Say)

Characteristics: 5.3-6 mm; color dull yellow; median line of head, smooth areas on hind lobe of pronotum, median carina of scutellum, costal margin of hemelytral corium, tibiae, and abdomen pale yellow; apex of corium and middle of each connexival margin reddish; pronotum punctate, transverse impression deep; beak often reaching last abdominal segment.

Nysius Dallas

Characteristics: Body finely pubescent; head slightly shorter than wide across eyes; beak reaching metacoxae; pronotum punctate; hemelytra entire.

Barber's (1947) revision of this genus, and Hantsbarger's (1957), review of the South Dakota species, are current papers including the Oklahoma species.

Nysius angustatus Uhler

Characteristics: Length 3.5-4.5 mm; color and structures similar to *N. californicus*, separable by key characters only.

Distribution: Slater (1964) includes Colorado, Kansas, New Mexico and Texas.

Nysius californicus Stal

Characteristics: Length 4.7-5.6 mm; color grayish yellow, clothed with minute glistening silvery-gray pubescence; head with a large dark spot surrounding each ocellus; pronotum often in great part dark or only a dark transverse bands across middle of front lobe and starting down median carina; front margin of scutellum dark; pronotal and scutellar punctures brown; legs pale yellow with brown spots.

Distribution: Adair, Alfalfa, Bryan, Caddo, Canadian, Carter, Choctaw, Cherokee, Cleveland, Comanche, Harmon, Kiowa, LeFlore, Love, Marshall, Mayes, McCurtain, Murray, Okfuskee, Pawnee, Payne, Pittsburg, Pontotoc, Pushmataha, Texas and Woodward counties.

Nysius ericae (Schilling)

Characteristics: Length 3.2-4.5 mm; color similar to *N. californicus*, scutellum often darker.

Distribution: Caddo, Canadian, Cherokee, Comanche, Delaware, Dewey, Garvin, Jackson, Jefferson, Kiowa, LeFlore, Major, Marshall, Mayes, McCurtain, Murray, Payne, Pontotoc, Pushmataha and Wagoner counties.

Nysius raphanus Howard

Characteristics: Length 2.75-3.5 mm; color and shape similar to *N. californicus*, scutellum often darker.

Distribution: Grant and Payne counties.

Ortholomus Stal

Characteristics: Body pubescent; head slightly longer than broad across eyes, first antennal joint reaching apex of head, fourth joint fusiform; pronotum coarsely punctate, hind lobe elevated convex, longer and wider than front lobe; scutellum punctate, carina distinct, hemelytra impunctate, entire.

Ortholomus scolopax (Say)

Characteristics: Length 5-6 mm; color grayish brown, thinly clothed with short gray pubescence; pronotal front margin narrow, transversely impressed; apical angles of pronotum and basal half of each connexival blackish; apex of hemelytral corium reddish; membrane whitish-hyaline; hemelytra with brown markings; scutellar carine, apical angles of each connexival dull yellow; venter dull reddish brown, thickly clothed with prostrate grayish pubescence.

Distribution: McCurtain, Payne and Pontotoc counties.

OXYCARENINAE

This subfamily is sufficiently characterized by the subfamily key.

Crophius Stal

Characteristics: Head porrect, convex, densely punctate; slightly wider across eyes than front of pronotum; antennae slender, longer than head and pronotum united; beak reaching middle of mesosternum; pronotum densely punctate, feebly constricted near middle; scutellum punctate, hemelytra, except hyaline membrane, punctate, entire.

Crophius disconotus (Say)

Characteristics: Length 3-3.75 mm; head, pronotum and scutellum dark reddish brown, hind pronotal lobe often paler; hemelytra whitish hyaline; punctures and veins reddish.

Distribution: Slater (1964) includes Colorado and Missouri.

PACHYGRONTHINAE

Characteristics: Head more or less declivent, inserted into thorax to compound eyes; pronotum not distinctly constricted or impressed to form two lobes, hind margin before scutellum straight, hemelytra punctate, in evident rows. Slater (1955) revised the entire subfamily.

KEY TO THE SPECIES

1. Head nearly horizontal; first antennal segment surpassing apex of head 2
- Head almost vertical, first antennal segment not reaching apex of head 3
2. Fore femora shining black beneath *Oedancala dorsalis*
Fore femora not black beneath *Oedancala crassimana*
3. Second antennal segment twice length of first *Phylegyas annulicrus*
Second antennal segment nearly three times length of first
..... *Philegyas abbreviatus*

Oedancala Amyot and Serville

Characteristics: Head longer than wide; first antennal joint longer than head, its apex slightly enlarged; beak reaching mesosternum; pronotal disc finely, evenly punctate, with a pale smooth medial line; hemelytra entire.

Oedancala crassimana (Fabricius)

Characteristics: Length 6.5-7 mm; color above brownish yellow; head and pronotum with a narrow median yellow stripe, scutellum with two pale yellow areas on each side; head, pronotum, and scutellum with punctures brown; punctures of hemelytral clavus and corium in rows and paler color; membrane hyaline.

Distribution: Rogers County.

Oedancala dorsalis (Say)

Characteristics: Length 6-6.3 mm; color pattern similar to *O. crassimana* but darker and more contrasting.

Distribution: Choctaw, McCurtain, Payne and Rogers counties.

Phlegyas Stal

Characteristics: Antennae but slightly longer than pronotum, second antennal joint longest, three times length of first; front of head flattened; hemelytra entire, narrower than abdomen.

Phlegyas abbreviatus (Uhler)

Characteristics: Length 3-5 mm; color dull reddish brown, head, middle of pronotum, scutellum and venter densely clothed with iridescent yellowish-gray pubescence; pronotum with a black transverse band before middle and one across base, these often interrupted to form spots or absent altogether; scutellar carina, margins of hemelytral corium, in part, and a spot on each connexival blackish; hemelytral membrane whitish hyaline.

Distribution: McCurtain, Murray, Noble, Pawnee and Payne counties.

Phlegyas annulicrus Stal

Characteristics: Length 4.5-5 mm; color generally similar to *P. abbreviatus*, separated best by key characters.

Distribution: Okmulgee and Payne counties.

RHYPAROCHROMINAE

Characteristics: First two segments of beak united, much longer than head; ocelli not widely separated; female abdominal sternites five and six narrower toward middle, not obliquely prolonged forward, nearly vertical, tips of sixth meeting on median line of apically compressed abdomen.

KEY TO THE TRIBES

1. Body length less than 2.5 mm *Antillocorini*
Body length greater than 2.5 mm 2
2. Two lateral glandular opaque spots on abdominal fourth sternite close to anterior spot and remote from posterior margin 3
Two lateral glandular opaque spots on abdominal fourth sternite widely separated, posterior spot closer to posterior margin than to anterior spot 4
3. Pronotal marginal lamellar expansion noticeably wider between two lobes *Drymini*
Pronotal marginal lamellar expansions not obviously widened between two lobes *Lethaetini*
4. Pronotum with side margin of front lobe obtusely rounded
..... *Myodochni*
Pronotum with side margins of front lobe carinate or laminate expanded 5
5. Pronotal side margins simply carinate 6
Pronotal side margins laminate expanded 7
6. Compound eyes not in contact with front margin of pronotum
..... *Ozophorini*
Compound eyes in contact with front margin of pronotum
..... *Rhyparochromini*
7. Scutellum with two subapical pale spots *Megalonotini*
Scutellum concolorous *Gonianotini*

Lethaeni Stal

Characteristics: Head small, triangulate, ocelli widely separated, distance between them three or more times than between them and compound eyes; basal antennal segment exceeding apex of head by half or more its length; second longest, three and four subequal; beak reaching metacoxae.

KEY TO THE SPECIES

1. Hemelytral clavus with three rows of punctures ...*Cryphula trimaculata*
Hemelytral clavus coarsely and irregularly punctured
..... *Cistalia explanata*

Cistalia Stal

Characteristics: Dorsum somewhat shiny; lateral edges of pronotum not widened between lobes, commonly not pale; anterior angles of pronotum with a long seta; scutellum longer than wide, hind tibiae with long bristles; basal segment of beak subequal to length of first antennal segment; fore femora with few tubercles and numerous long setae; basal segment of hind tarsi twice as long as second and third together; hind tibiae with strong bristles.

Cistalia explanata Barber

Characteristics: Length 5-6 mm; basal antennal segment gradually enlarged toward apex; all segments distinctly pilose, without longer scattered hairs; hemelytral clavus coarsely and irregularly punctate.

Distribution: Torre-Bueno (1946) includes Kansas and Texas.

Cryphula Stal

Characteristics: Head inserted in thorax to eyes; beak surpassing mesocoxae; pronotum subquadrate, two-thirds wider than long, sides subparallel, pronotal disk without transverse constriction; scutellum flattened, not carinate; hemelytra entire or abbreviated, if so, reaching sixth dorsal tergite.

Cryphula trimaculata (Distant)

Characteristics: Length 3-4 mm; head, disk of pronotum, base of scutellum, venter reddish brown; side, hind angles, spots near base of pronotum, hemelytral corium and three small spots on apical half of scutellum dull yellow; tibiae with coarse bristles; basal joint of hind tarsi subequal to joints two and three together; hemelytral clavus with three rows of punctures, corium thickly irregularly punctate.

Distribution: Slater (1964) includes Colorado, Kansas and Missouri.

Antilocorini Ashlock

This tribe is sufficiently characterized by the tribal key.

Antilocoris Kirkaldy

Characteristics: Head with eyes as wide as front margin of thorax, beak reaching mesocoxae; first antennal segment exceeding apex of head; pronotum feebly constricted to form two lobes; hemelytra in macropterous forms entire, in brachypterous forms with membrane often absent.

Antilocoris pilosulus Stal

Characteristics: Length 1.8-2 mm; dorsum clothed thickly with yellowish pilose hairs; antennae and venter reddish brown; hemelytral corium in brachypterous forms reaching middle of fourth dorsal.

Distribution: LeFlore and McCurtain counties.

Drymini Stal

Characteristics: Posterior pair of trichobothria, which appear as a dull spot on sternum five, are anterior to spiracle.

KEY TO THE SPECIES

1. Pronotum with both lobes distinctly and closely punctate 2
Pronotal front lobe impunctate *Eremocoris ferus*
2. Pronotal side margins slightly paler than disk; front lobe of pronotum darker and more finely punctate than hind lobe. *Drymus unus*
Pronotum entirely dark brown, side margins not paler; both lobes evenly, densely and coarsely punctate *Drymus crassus*

Drymus Fieber

Characteristics: Head not inserted in thorax to eyes; pronotum with side margins rounded in front of middle, edges slightly expanded, front lobe without a definite collar; scutellum flat, thickly punctate; hemelytra entire; hind tibiae without rigid bristles.

Drymus crassus Van Duzee

Characteristics: Length 6.5-7 mm; color darker than *D. unus*; head, pronotum densely punctate.

Distribution: McCurtain County.

Drymus unus (Say)

Characteristics: Length 4.2-5 mm; head, front lobe of pronotum and sternum dark brown, hind lobe of pronotum and hemelytra lighter brown, punctation dark brown.

Distribution: Slater (1964) includes Colorado, Missouri and Texas.

Eremocoris Fieber

Characteristics: Head almost prorect, not inserted in thorax to eyes; pronotum longer than wide, apical lobe strongly convex, side margins flattened; hemelytral clavus with regular rows of punctures, hemelytra entire.

Eremocoris ferus (Say)

Characteristics: Length 5.2-6 mm; head, front lobe of pronotum, four stripes on hind lobe, venter brownish black; side margins of pronotum, hind lobe of pronotum except dark stripes, basal half of hemelytra brownish yellow; hemelytral corium with fuscous blotches, membrane dark brown with pale spots on each side near apex of corium.

Distribution: Slater (1964) includes Colorado, Kansas, Missouri, New Mexico and Texas.

Ozophorini Sweet

This tribe is sufficiently characterized by the tribal key.

Ozophora Uhler

Characteristics: Head wider across eyes than front margin of pronotum, beak reaching metacoxae or first abdominal sternite, first joint as long as head; hemelytra entire.

Ozophora picturata Uhler

Characteristics: Length 6-6.5 mm; head, front lobe of pronotum, disk of scutellum dark brown; hind lobe of pronotum often with four vague dark stripes; hemelytral corium with an elongate spot opposite apex of scutellum, costal area and triangular spot near inner apical angle pale yellow.

Distribution: Latimer, McCurtain, Nowata and Pontotoc counties.

Myodochini Boitard

Characteristics: Pronotum with side margins of front lobe obtusely rounded or terete, never carinate or laminate-expanded, disk usually strongly constricted transversely to form two distinct lobes, front lobe usually with a ring-like collar behind front margin.

KEY TO THE SPECIES

1. Head greatly exserted, postocular portion of head drawn out into a long cylindrical neck; neck longer than pronotum *Myodocha serripes*
- Postocular portion of head not so drawn out; neck not as long as pronotum 2
2. Pronotal front lobe not more than twice as long as hind lobe 3
- Pronotal front lobe three or four times as long as hind lobe *Cnemodus mavortius*
3. Head not inserted into prothorax to compound eyes; anterior pronotal margin with a ring-like collar 4
- Head inserted into prothorax to compound eyes; pronotum without an anterior collar 11
4. Postocular space about four times that between compound eye and base of antenna *Heraeus plebejus*
- Postocular space subequal to that between compound eye and base of antenna 5
5. Pronotal lobes separated by a shallow, obtuse transverse constriction; first joint of beak reaching base of head 6
- Pronotal lobes separated by a deep, distinct transverse constriction; first joint of beak not reaching base of head 7
6. Length 5.4-6.5 mm *Perigenes similis*
- Length 7-9 mm *Perigenes constrictus*
7. Abdominal sternites two and three with a very fine strigose lunate area on either side 8
- Abdominal sternites two and three without lunate strigose areas on either side 10
8. Head and pronotum shining; first antennal segment subequal in length to first joint of beak *Pseudopamera nitidicollis*
- Head and pronotum not shining; first antennal segment shorter than first joint of beak 9
9. Transverse dark bar not reaching costal edge of hemelytral corium *Ligyrocoris diffusus*
- Transverse dark bar reaching costal edge of hemelytral corium *Ligyrocoris sylvestris*
10. Hemelytral costal margin, except apex, wholly pale, not interrupted behind middle by a transverse black band *Pachybrachus basalis*

- Hemelytral costal margin interrupted behind middle by a transverse black band *Pachybrachius bilobatus*
11. Scutellum much longer than wide, distinctly carinate posteriorly; meta-basal tarsal joint subequal in length to second and third together 11
 Scutellum subequilateral, not distinctly carinate posteriorly; meta-basal tarsal joint longer than second and third together
 *Valonetus puberulus*
12. Antennal segments two and three filiform, two longer than three *Exptochiomera oblonga*
 Antennal segments more or less swollen, sometimes clavate 11
13. Antennal segment three thicker than four *Ptochiomera nodosa*
 Antennal segment three thinner than four *Simamnes claviger*

Cnemodus Herrich-Schaeffer

Characteristics: Head prorect, distinctly exerted, ocelli absent; antennae slender, longer than half length of body, basal joint exceeding length of head by two-thirds its length, second longest, third and fourth subequal.

Cnemodus mavortius (Say)

Characteristics: Length 8-9 mm; color black, pronotum shining, hemelytral costal margin paler color; antennae reddish brown; brachypterous form, membrane of hemelytra not exceeding apex of corium, not beyond fifth abdominal tergite, macropterous form hemelytra entire.

Distribution: Osage, Payne and Sequoyah counties.

Exptochiomera Barber

Characteristics: Third and fourth antennal segments filiform, much more slender than either basal or terminal segments; body glabrous or sparsely pilose; anterior tibiae of male most often without a postmedial spine; hemelytra entire.

Barber (1953a) gives a key and description of the genus.

Exptochiomera oblonga (Stal)

Characteristics: Length 3.64 mm; color brown, hemelytral corium except veins and membrane whitish; compound eyes not quite touching anterior angles of pronotum; antennae longer than head and pronotum combined; anterior lobe of pronotum longer than hind lobe; hemelytral claval commissure one-third as long as scutellum.

Distribution: Payne County.

Heracus Stal

Characteristics: Head exerted, tapering into a distinct neck; antennae reaching middle of scutellum, first joint slightly exceeding tip of head, third, and fourth subequal, second longer, beak reaching middle of mesosternum, first joint shorter than base of head; front lobe of pronotum subglobose, narrow, slightly longer than hind lobe; scutellar apex acute; hemelytra of macropterous forms entire; hind femora with fine stiff bristles; basal joint of hind tarsi as long as other united.

Heracus plebejus Stal

Characteristics: Length 4.5-5.5 mm; body thinly clothed with short yellowish pubescence; head, front lobe of pronotum, scutellum, venter dull brown to black; hind lobe of pronotum, hemelytra reddish brown, margins

paler; hemelytral corium and clavus with more or less regular rows of punctures.

Distribution: Adair, Caddo, Cherokee, Choctaw, Comanche, Hughes, LeFlore, Mayes, McCurtain, Ottawa, Payne and Pottawatomie counties.

Ligyrocoris Stal

Characteristics: Head porrect, wider across eyes than front lobe of pronotum, without distinct neck, beak reaching mesocoxae, first joint not reaching base of head; front lobe of pronotum narrow, less than twice length of hind lobe; scutellum usually much longer than wide; basal segment of hind tarsi usually more than twice length of others united.

Ligyrocoris diffusus (Uhler)

Characteristics: Length 5.2-7 mm; head, front lobe of pronotum, scutellum dull black, bearing a few short erect hairs, hemelytral clavus with a transverse bar, not clearly defined across corium, and apex of clavus pale reddish brown; hind lobe of pronotum with hind angles and often three vague stripes on disk, pale; front lobe of pronotum much less than twice the length of and distinctly narrower than the hind lobe; collar width plainly less than that of the constriction between lobes.

Distribution: Slater (1964) gives the range as Colorado, Kansas, Missouri, New Mexico and Texas.

Ligyrocoris sylvestris (Linnaeus)

Characteristics: Length 4.7-5.5 mm; color pattern similar to *L. diffusus* except dark transverse bar more clearly defined.

Distribution: Slater (1964) gives the range as Colorado, Kansas, Missouri and Texas.

Myodocha Latreille

Characteristics: Head oval, pointed, longer than pronotum, drawn out behind eyes into long curved neck; eyes prominent, coarsely faceted; beak reaching mesosternum, first two joints not reaching base of head; pronotum bell-shaped; hemelytra punctate, entire; first tarsal joint of hind legs three times as long as other joints united.

Myodocha serripes Oliver

Characteristics: Length 8-9.5 mm; head, venter shining black; pronotum, scutellum brownish black; hemelytra reddish brown, costal margins, two spots near apical margin of corium yellow; membrane brown with pale spot near apex.

Distribution: Adair, Bryan, Caddo, Carter, Craig, LeFlore, Mayes, McCurtain, Ottawa, Payne, Pontotoc, Rogers and Woods counties.

Pachybrachius Hahn

Characteristics: Head porrect, broader across eyes than front margin of pronotum; antennae slender, longer than head and pronotum united; beak reaching mesocoxae, first joint not reaching base of head; pronotum strongly constricted, front lobe subcylindrical, longer than hind lobe, collar distinct; hemelytra entire; basal tarsi of hind legs twice as long as others united.

Barber (1953b) reviewed the genus and added new species to the northern fauna.

Pachybrachius basalis Dallas

Characteristics: Length 3.7-5.2 mm; head, front lobe of pronotum, scutellum, and venter of abdomen thickly clothed with minute yellowish-gray pubescence; hind lobe of pronotum paler at middle; hemelytral corium clavus off-white, rows of brownish punctures, corium with a small rounded white spot in inner apical angle; membrane pale brown, veins whitish; pronotal front lobe subglobose, hind lobe and scutellum coarsely irregularly punctate, scutellum with a low median keel toward apex.

Distribution: Payne County.

Pachybrachius bilobatus (Say)

Characteristics: Length 4.8-5.3 mm; head, pronotum, scutellum and venter dark reddish brown to black; hind lobe of pronotum usually with three vague blackish stripes; hemelytral corium and clavus dull white with brown punctures, corium usually with a stripe along claval suture, an angulate cross-bar behind middle, apex darker; membrane pale brown; pronotal front lobe subcylindrical, sides rounded, collar present.

Distribution: Love and McCurtain counties.

Perigenes Distant

Characteristics: Head wider across eyes than front margin of pronotum, convex, inserted to eyes; beak slightly surpassing mesocoxae, first joint reaching base of head, joints two to four with erect hairs; pronotum nearly bell-shaped, transverse constriction behind middle shallow; scutellum slightly keeled on apical half; hemelytra entire.

Perigenes constrictus (Say)

Characteristics: Length 7-9 mm; head, front lobe of pronotum, scutellum, and venter dull black, thickly clothed with fine appressed yellowish pubescence, and numerous erect stiff hairs; hind lobe of pronotum, hemelytral clavus, and disk of corium dark reddish brown; hemelytral costal margin of corium pale yellow, interrupted behind middle by a dark spot; membrane dark brown; anterior femora with anteriorly placed spines, one large, another smaller.

Distribution: Mayes County.

Perigenes similis Barber

Characteristics: Length 5.4-6.5 mm; similar in color to *P. constrictus*; anterior femora with one anteriorly placed large spine.

Distribution: Adair, Hughes, Kiowa, Mayes and Marshall counties.

Pseudopamera Distant

Characteristics: Head and pronotum shining; first antennal segment long, nearly as long as first joint of beak; anterior tibiae in male curved and armed with a medial tooth.

Pseudopamera nitidicollis (Stal)

Characteristics: Length 4-4.5 mm; front pronotal lobe slightly wider than long, but little longer than hind lobe; anterior tibiae of male curved basally, a stout tooth one-third the distance toward apex; head and front lobe of pronotum shining reddish; hind lobe and much of hemelytra whitish yellow; scutellum dull reddish; hemelytral corium with two transverse dull reddish bands, one medially, the other apically.

Distribution: Jackson, Payne and Pontotoc counties.

Ptochiomera Say

Characteristics: Head wider than long, inserted in thorax to eyes; first antennal joint surpassing apex of head, third and fourth thicker than others; beak reaching mesocoxae; front lobe of pronotum subcylindrical or subglobose, distinctly narrower than hind lobe, hemelytra entire in macropterous form; basal tarsi of hind legs subequal to others united.

Barber (1953c) revised this genus.

Ptochiomera nodosa Say

Characteristics: Length 3-3.5 mm; head, front lobe of pronotum, scutellum except carina, third and basal half of fourth antennal joints, dark brown; narrow front margin and hind lobe of pronotum, disk of hemelytral corium and clavus straw yellow, marked with numerous brown punctures; membrane hyaline; first and second antennal joints, and beak pale yellow; pronotum with a transverse and longitudinal carina.

Distribution: Payne and Sequoyah counties.

Sisamnes Distant

Characteristics: Third and fourth antennal segments strongly swollen, often calvate, fourth more swollen than third; antennae without erect hairs; pronotum with transverse constriction slightly impressed, front lobe two-thirds longer than hind lobe; scutellum with a low transverse and longitudinal carina; hemelytra entire in macropterous forms, reaching base of fourth tergite, membrane absent in brachypterous forms.

Barber (1953c) gave a key and synonymy to the species of this genus.

Sisamnes clavigerus (Uhler)

Characteristics: Length 2.5-2.8 mm; body uniformly reddish brown, densely and coarsely punctate with dark brown, each puncture bearing a minute yellow scale-like hair; apex of scutellum and a few small scattered spots on hemelytral corium dull yellow; hemelytra of brachypterous forms reaching base of fourth tergite, membrane wanting.

Distribution: Slater (1964) gives the range as Colorado, Kansas, Missouri, New Mexico and Texas.

Valonetus Barber

Characteristics: Body, antennae, legs strongly pilose, not shining; head slightly exserted, length and width subequal; first antennal segment extending beyond apex of head; beak with first joint reaching base of head; pronotum without collar, constricted behind middle; basal tarsi of hind legs twice length of others combined.

Valonetus puberulus (Stål)

Characteristics: Length 3 mm; head triangular, eyes strongly protruding; antennal segments one and two subequal; hind lobe of pronotum more sparsely and coarsely punctured than front lobe; scutellum and hemelytral corium sparsely punctured, clavus with three regular rows of punctures.

Distribution: Slater (1964) gives the range as Colorado, Missouri and Texas.

Rhyarochromini Slater and China

This tribe is sufficiently characterized in the tribal key.

Peritrochus Fieber

Characteristics: Head as wide or wider than front margin of pronotum; beak reaching to or behind mesocoxae; pronotal disk without transverse constriction; scutellum much longer than wide, without carina, hemelytra entire.

Peritrochus fraternus Uhler

Characteristics: Length 4.3-5 mm; head, front lobe of pronotum, basal half or more of scutellum, and venter dull black, finely pubescent, head with a brassy tinge; hind lobe of pronotum, V-shaped mark on scutellum, and hemelytra brownish yellow, marked with dark punctures; membrane whitish hyaline, often clouded with brown.

Distribution: Adair, Caddo, Jackson, Klowa, Love, Major, Marshall, Osage and Sequoyah counties.

Goniatotini Stal

Characteristics: Spiracle of fourth abdominal segment dorsal; two dorsal abdominal glands opening at the posterior margins of abdominal tergites four and five.

Torre-Bueno (1946) gave a key to the species of this tribe but listed the *Delochilocoris* taxa under the genus *Aphanus*.

KEY TO THE SPECIES

1. Dorsal color generally dull brownish yellow *Emblethis vicarius*
Dorsal color generally black 2
2. Entire body black *Delochilocoris umbrosus*
Head, pronotum, except narrow side and margins, and scutellum
venter black *Malezonotus rufipes*

Delochilocoris Bergroth

Characteristics: Head wider across eyes than long; beak reaching mesosternum; pronotum subquadrate, slightly convex, except basal margin concave; hemelytra entire.

Delochilocoris umbrosus Distant

Characteristics: Length 6-7 mm; color black, shining; hind lobe of pronotum, scutellum, and hemelytral corium finely, sparsely, and irregularly punctate; hemelytral clavus with four rows of punctures, two median rows confused.

Distribution: LeFlore, Payne and Pontotoc counties.

Emblethis Fieber

Characteristics: Head scarcely as wide across the eyes as front margin of pronotum; beak reaching mesosternum, first joint as long as head; pronotum wider than long, sides widely flattened, disk slightly convex, front margin concave; scutellar length subequal to length of pronotum, not carinate; hemelytra entire; hind tibiae with setose bristles; basal segment of hind tarsi twice as long as others united.

Emblethis vicarius Horvath

Characteristics: Length 6-6.2 mm; color above dull brownish yellow, thickly marked with dark brown punctures, often appearing as dark blotches; hemelytra paler brown, often spotted dark brown near base.

Distribution: Cimarron, Dewey and Payne counties.

Malezonotus Barber

Characteristics: First antennal segment barely exceeding apex of head; pronotum not punctate, hind margin broadly concave before scutellum; scutellum longer than wide, not or very finely punctate; hemelytral clavus with three irregular rows of punctures, corium irregularly covered with punctures; front femora swollen, armed beneath with two or three teeth; hind tibiae with short rigid bristles.

Malezonotus rufipes (Stal)

Characteristics: Length 4-5 mm; head, pronotum, scutellum, a large spot on hemelytral corium and diffused spot on membrane and venter blackish; lateral margins of pronotum pale; antennae and legs reddish yellow.

Distribution: Payne County.

Megalonotini Slater

This tribe is sufficiently characterized by the tribal key.

Slater and Sweet (1961) discussed the tribe's relationship with other closely related tribes. Torre-Bueno (1946) gave a key to the taxa of the tribe but included it in the tribe Rhyparochromini.

Sphragisticus Stal

Characteristics: Head inserted to eyes, but slightly wider across eyes than front margin of pronotum; beak reaching mesocoxae, scutellum longer than wide, hemelytra entire.

Sphragisticus nebulosus Fallen

Characteristics: Length 5-5.3 mm; head, disk of front lobe of pronotum, scutellum, and venter dull black; hind lobe of pronotum, two subapical spots on scutellum, and hemelytra grayish yellow, dark brown punctures; membrane brownish yellow.

Distribution: Caddo and Roger Mills counties.

LITERATURE CITED

- Barber, H. G. 1937. Descriptions of six new species of *Blissus* (Hemiptera-Heteroptera: Lygaeidae). Proc. Entomol. Soc. Wash. 39(4):81-86.
- 1947. Revision of the genus *Nysius* in the United States and Canada (Hemiptera-Heteroptera: Lygaeidae). J. Wash. Acad. Sci. 37:354-366.
- 1949. Some synonyms in the family Lygaeidae. Proc. Entomol. Soc. Wash. 51:273-276.
- 1953a. A revision of the genus *Kleidocerys* Stephens in the United States (Hemiptera, Lygaeidae). *Ibid.* 55:273-283.
- 1953b. The genus *Pachybrachius* in the United States and Canada with the description of two new species (Hemiptera:Lygaeidae). J. N.Y. Entomol. Soc. 60:211-220.
- 1953c. A second revision of the genus *Ptochiomera* Say and its allies (Hemiptera, Lygaeidae). Proc. Entomol. Soc. Wash. 55:19-27.
- Blatchley, W. S. 1926. *Heteroptera or True Bugs of Eastern North America, with Special Reference to the Fauna of Indiana and Florida*. Nature Publ. Co., Indianapolis. 1116 pp.

- Froeschner, R. C. 1944. Contributions to a synopsis of the Heteroptera of Missouri, part 3. Amer. Midland Natur. 31:638-683.
- Hanstbarger, W. H. 1957. *Nysius* of South Dakota (Lygaeidae-Hemiptera). J. Kans. Entomol. Soc. 39(4):156-159.
- McAtee, W. L. 1914. Key to the nearctic genera and species of Geocorinae (Hemiptera-Lygaeidae). Proc. Biol. Soc. Wash. 27:125-136.
- Ortenburger, A. I. 1927. Some Oklahoma Hemiptera. Proc. Okla. Acad. Sci. 6:184-192.
- Parshley, H. M. 1919. On some Hemiptera from western Canada. Occas. Pap. Mus. Zool. Univ. Mich. 71:1-35.
- 1923. The distribution and forms of *Lygaeus kalmii* Stal with remarks on insect zoogeography (Hemiptera, Lygaeidae). Can. Entomol. 55:81-84.
- Simanton, W. A., and F. Andre. 1935. Two Hemiptera for use as experimental insects in insecticide studies. J. Econ. Entomol. 28:695-696.
- Slater, J. A. 1952. An annotated list of the Lygaeidae of Iowa and Illinois (Hemiptera: Heteroptera). Proc. Iowa Acad. Sci. 59:521-540.
- 1955. A revision of the subfamily Pachygronthinae of the world (Hemiptera: Lygaeidae). Philippine J. Sci. 84:1-160.
- 1964. *A Catalogue of the Lygaeidae of the World*. Univ. Connecticut Press, Storrs. 1668 pp.
- and M. H. Sweet. 1961. A contribution to the higher classification of the Megalonotinae (Hemiptera: Lygaeidae). Ann. Entomol. Soc. Amer. 54:203-209.
- Stoner, Adair, D. E. Bryan and W. A. Drew. 1962. A partial inventory of insect populations in tallgrass prairie pastures in north central Oklahoma. Proc. Okla. Acad. Sci. 42:143-157.
- Torre-Bueno, J. R. 1946. A synopsis of the Hemiptera-Heteroptera of America north of Mexico, 3, Family 11, Lygaeidae. Entomol. Amer. 26:1-141.
- Van Duzee, Edward P. 1917. *Catalogue of the Hemiptera of America North of Mexico*. Univ. Calif. Pub. Entomol. 2:1-902.
-