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## The Corixidae (Hemiptera) of Oklahoma

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The Corixidae or water boatman family is a commonly collected family taken in a variety of aquatic habitats and frequently at lights at night or on shiny surfaces during the day.

Hungerford's 1948 monograph on the world corixids is an important contribution, essential to a serious collector. My paper is an attempt to make the identification of state forms easier and to supply descriptions and distribution data for the corixids of the state. Schaefer and Drew (1964) reported 18 species and Ewing (1964) added one for the state. Five additional species are included because information of their known ranges indicates that they will probably be found in Oklahoma when more collecting is done.

Each pair of legs is modified for a different function. The anterior pair is short with the terminal segment (pala) often more or less spoon-shaped and fringed with bristles for food gathering. Both adults and nymphs feed mainly on algae and protozoa, obtained from bottom ooze (Usinger, 1956). The middle pair of legs, used for anchorage and support, is long and slender, terminating with two long claws. The hind pair, for swimming, is stouter, laterally flattened and fringed with hairs.

The principal dimorphic structures used as key characters are as follows: males, usually smaller, with vertex of the head often more produced and frons concavely depressed. Form and chaetotaxy of the male palae, front tarsi, are much used characters. The female abdomen is bilaterally symmetrical, while the asymmetry of male may be either to the right (dextral) or left (sinistral). Hungerford (1948) and Sailer (1948) report that dextrally or sinistrally asymmetrical species deviate infrequently. The sixth abdominal male tergite often bears a dark structure (strigil) or "comb-like teeth"; its location corresponds directly with abdominal asymmetry. The venter and appendages of the male are usually a darker color than those of the female.

## KEY TO SPECIES OF CORIXIDAE

1. Apical claw of fore tarsi spinelike, resembling other spines along lower margin of palm; palae not narrowly digitiform ..... 2  
 Apical claw of fore tarsi thick, well-developed; palae narrowly digitiform (Fig. 5) ..... *Graptocorixa abdominalis*
2. Small, less than 5.6 mm long; male sinistrally asymmetrical as seen from below; fore tibia of male produced apically over short, triangular palae; female with apex of clavus not reaching beyond a horizontal line extended through costal margin of hemelytron at nodal furrow (Fig. 6) ..... 3  
 Large, often greater than 5.6 mm long (except *Corisella*, *Ramphocorixa*, *Sigara* and *Palmacorixa*); male dextrally asymmetrical as seen from below; fore tibia of male not produced over palae; female with apex of clavus reaching to or beyond a horizontal line extended through costal margin of hemelytron at furrow ..... 10
3. Pronotal disc, at middle, one-fourth its width. *Trichocorixa macroceps* ..... 4  
 Pronotal disc, at middle, about three-fourths its width ..... 4
4. Interocular width distinctly exceeding width of an eye, as seen from above, along its posterior margin ..... *Trichocorixa reticulata* ..... 5  
 Interocular width usually less than width of eye, as seen from above, along its posterior margin ..... 5
5. Males ..... 6  
 Females ..... 8
6. Left, dorsal posterior lobe of abdomen with lateral anterior angle produced to form a lobe, causing lateral margin to appear concave at some region along the distance to the apex ..... *Trichocorixa verticalis interiores* ..... 7  
 Left, dorsal posterior lobe of abdomen with lateral margin appearing evenly convex ..... 7
7. Strigil seemingly little more than a heavy dark line, sharply curved upward mesially ..... *Trichocorixa calva* ..... 11  
 Strigil normally shaped, with distinct comblike rows of "teeth" ..... *Trichocorixa kanza* ..... 11
8. Polished area along costal margin of hemelytron anterior to nodal furrow equal to or less than length of middle tibia ..... *Trichocorixa verticalis interiores* ..... 9  
 Polished area along costal margin of hemelytron anterior to nodal furrow greater than length of middle tibia ..... 9
9. Polished prenodal costal margin parallel to apex, or nearly so; costal margins with a sudden emargination (Fig. 3) ..... *Trichocorixa kanza* ..... 11  
 Polished prenodal costal margin not parallel to apex; costal margins with a gradual emargination (Fig. 4) ..... *Trichocorixa calva* ..... 11
10. Interocular width much narrower than width of eye; head sharply curved along short pronotum; body surface rugulose; dorsal medial lobe of male seventh abdominal segment bearing a hook-like projection ..... 11  
 Interocular width subequal or greater than width of eye; head variable, not as above; body surface not or faintly rugulose; dorsal medial lobe of male seventh abdominal segment without a hook-like projection ..... 12
11. Middle femur of male with a ventral longitudinal row of spines, more than 40 ..... *Palmacorixa nana walley* ..... 12

	Middle femur of male without a ventral longitudinal row of spines ..... <i>Palmacorixa buenoi</i>	
12.	Smooth, shining, never more than faintly rugulose; lateral lobes of prothorax typically with sides tapering to a narrowly rounded apex; palae of male triangular, about equal to tibial length, with a row of pegs on dorsal margin and another in or near the upper palmar row of bristles .....	13
	Usually rostrate, rugulose or effaced; lateral lobes of prothorax not tapering to a rounded apex; palae of male rectangular, peg row centrally located .....	14
13.	Large, usually over 6.5 mm long, some males smaller; male foreleg without an apical, outwardly pointed peg on tibia and on upper swollen portion of pala .....	
	..... <i>Corisella edulis</i>	
	Small, under 6.5 mm long; male foreleg with an apical outwardly pointed peg on tibia and on upper swollen portion of pala (Fig. 9) .....	
	..... <i>Corisella tarsalis</i>	
14.	Body short, broad, more than one-third as broad as long; distal portion of corium semihyaline with color pattern effaced .....	
	..... <i>Morphocorixa compacta</i>	
	Body long, narrow, less than one-third as broad as long .....	15
15.	Pala of male with upper surface deeply incised; vertex of male acuminate; both sexes with palar claws serrate at base; length less than 5.5 mm .....	
	..... <i>Ramphocorixa acuminata</i>	
	Pala of male not incised; vertex of male not acuminate; palar claws of both sexes not serrate at base; length greater than 5.5 mm .....	16
16.	Prothoracic lobe quadrate or trapezoidal; pruinose area along claval suture shorter than postnodal pruinose area; front tibia of male with spiniform tuft of hairs near apex; female never with anal lobes notched; length greater than 8 mm (Fig. 2) .....	17
	Combination of characters not as above (Fig. 1) .....	22
17.	Color orange to red with two transverse black bands .....	
	..... <i>Hesperocorixa brimleyi</i>	
	Color not orange or red .....	18
18.	Color pattern of hemelytra in part effaced, at least on corium .....	
	..... <i>Hesperocorixa lucida</i>	
	Color pattern of hemelytra not effaced .....	19
19.	Hemelytral pattern reticulate; pronotal surface not rostrate .....	
	..... <i>Hesperocorixa laevigata</i>	
	Hemelytral pattern not reticulate; pronotal surface faintly to strongly rostrate .....	20
20.	Corium with pale bands beyond hemelytral suture forming slender transverse series; corium and membrane not plainly separated .....	
	..... <i>Hesperocorixa vulgaris</i>	
	Corium with pale bands beyond hemelytral suture not forming slender transverse series or, if so, then corium and membrane plainly separated .....	21
21.	Hind femora ventrally and basally with a row of about 10 spines .....	
	..... <i>Hesperocorixa nitida</i>	
	Hind femora ventrally and basally with a row of 6 spines .....	
	..... <i>Hesperocorixa obliqua</i>	
22.	Hemelytral pattern reticulate; hemelytra and face hairy; length 6.9-7.8 mm .....	
	..... <i>Cenocorixa utahensis</i>	

- Hemelytral pattern not reticulate, hemelytra and face not hairy;  
length 4.4 - 6.9 mm ..... 23
23. Hemelytra solid black, border and sutures white .....  
..... *Sigara (Pediosigara) hydatotrepes* ..... 24  
Hemelytra not solid black, bordered in white .....
24. Length more than 6.3 mm ..... 25  
..... *Sigara (Vermicorixa) alternata* (part)  
Length less than 6.3 mm ..... 25
25. Scent gland osteole nearer lateral bend of mesoepimeron than to  
its tip ..... 26  
Scent gland osteole nearer tip than to lateral bend of the  
mesoepimeron ..... 27
26. Osteole almost in lateral bend of mesoepimeron, and connected to  
metasternum by a broad, often dark coxal piece (Fig. 1) .....  
..... *Sigara (Vermicorixa) grossolineata*  
Osteole not in lateral bend of mesoepimeron .....  
..... *Sigara (Vermicorixa) hubbelli*
27. Corial pattern in more or less definite longitudinal series .....  
..... *Sigara (Vermicorixa) hubbelli*  
Corial pattern not in longitudinal series ..... 28
28. Pala of male with row of pegs nearer dorsal margin than palm,  
peg row in gentle curve (Fig. 8) ..... *Sigara (Vermicorixa) alternata*  
Pala of male with row of pegs nearer to palm than to dorsal mar-  
gin, peg row undulate (Fig. 7) ..... *Sigara (Vermicorixa) pectenata*

*Cenocorixa utahensis* (Hungerford)

Characteristics: Length 6.9-7.8 mm, width of head across eyes 2.1-2.4 mm; color light; pronotum crossed by nine or ten regular, sometimes broken, very narrow dark lines; claval and corial pattern of narrow, broken dark lines arranged in irregularly transverse series; membranous pattern usually continuous with corium, embolium pale; strigil subquadrate, 10 combs.

Distribution: Hungerford (1948) gives as part of the species distribution Colorado, Kansas and Texas.

*Corisella edulis* (Champion)

Characteristics: Length 6.3-7.98 mm, width of head across eyes 1.9-2.48 mm; color light; pronotum crossed by 10 or 12 very slender transverse hard bands, may be effaced laterally; clavus, corium and membrane marked with short, transverse, undulate, irregular dark lines, arranged to form longitudinal series; pattern effaced at base of clavi; membrane separated from corium by pale line; embolium smoky to white; strigil large oval, four combs.

Distribution: Beaver, Cimarron, Marshall, Mayes and Tulsa counties.

*Corisella tarsalis* (Fieber)

Characteristics: Length 5.3-6.6 mm, width of head across eyes 1.47-1.93 mm; color light; pronotum crossed by nine to ten narrow dark bands; clavus, corium and membrane reticulate in pattern, inner basal angles nearly immaculate; embolium pale with dark spot at apex; vertex of male almost acuminate, rounded apex with definite narrow coria, vertex of female broadly rounded; strigil very small, three combs.

Distribution: Beaver and Cimarron counties.

*Graptocorixa abdominalis* (Say)

**Characteristic:** Length 8.5-10.8 mm, width of head across eyes 2.8-3.5 mm; color dark, abdomen largely reddish-orange; pronotum crossed by 12-16 dark bands, anterior one broader, posterior ones often broken; claval and corial patterns of long, undulate, transverse bands; black bands often the larger; membrane pattern broken and irregular; embolium yellowish basally to dark apically.

**Distribution:** Beaver, Cimarron and Woods counties.

*Hesperocorixa brimleyi* (Kirkaldy)

**Characteristics:** Length 8.2-8.8 mm, width of head across eyes 2.4-2.9 mm; color reddish-orange; two dark transverse bands, one across base of hemelytra, second across area distal to clavus; pronotum without cross-banding; embolium smoky; lateral lobe of prothorax obliquely truncate, anterior apical angle produced, mesoepimeron broad with osteole remote from tip; strigil suboval, five regular combs.

**Distribution:** McCurtain County.

*Hesperocorixa laevigata* (Uhler)

**Characteristics:** Length 9.9-11 mm, width of head across eyes 3.2-3.6 mm; color generally dark; pronotum crossed by twelve irregular black bands; claval pattern wavy, zigzag lines, pale lines slender; corial pattern not as broken, pale lines not as slender as above; pattern of membrane much interrupted, continuous with corium; embolium silvery white; lateral lobe of prothorax quadrate, rounded at apex; mesoepimeron narrow, osteole near tip; strigil elongate, side parallel, ends rounded, six to eight combs.

**Distribution:** Tulsa County.

*Hesperocorixa lucida* (Abbott)

**Characteristics:** Length 8.5-9.4 mm; width of head across eyes 2.8-3 mm; color generally dark; pronotum reddish-tan, crossed by seven to eight faint, dark bands; clavus often solid brownish-black, obscure transverse pale line anteriorly, claval suture yellowish; corium with irregular dark pattern narrowly enlarging along claval suture into an irregular globular form distal to apex of clavus, enlarging toward lateral apex of postnodal pruinose area of hemelytra; remainder of corium translucent, yellowish-brown, apex of corium often reddish; embolium smoky; membrane dark with faint pale transverse pattern to lighter with more of pale pattern showing; lateral lobe of prothorax quadrate; apex truncate; mesoepimeron narrow, osteole near tip; strigil ovate, eight regular combs.

**Distribution:** McCurtain County.

*Hesperocorixa nitida* (Fieber)

**Characteristics:** Length 8-9 mm, width of head across eyes 2.7-3.1 mm; color generally dark; pronotum with nine or ten broad, regular transverse black bands; claval pattern more or less regular transverse series, darker bands broader than pale ones, more irregular distally; corial pattern irregular, broken but still in nearly transverse series, dark areas appear to merge just beyond apex of clavus and again at corial apex and membrane on costal margin, these dark areas appear as two pairs of dark spots; membrane pattern continuous with corium but more broken and irregular, embolium smoky to black; lateral lobe of prothorax quadrate, apex slightly rounded; mesoepimeron narrow, osteole near tip; strigil small, sides parallel, ends rounded, eight regular combs.

**Distribution:** McCurtain County.

*Hesperocorixa obliqua* (Hungerford)

**Characteristics:** Length 10.1-11 mm, width of head across eyes 3.4-3.6 mm; color generally dark; pronotum crossed by about 12 narrow black bands, somewhat broken posteriorly; dark bands of clavus narrower at base than pale areas; distally dark bands broaden into transverse series although irregular and broken; corial pattern wavy and broken throughout, lines transverse but very irregular; membrane color pattern continuous with corium; embolium smoky to black; lateral lobe of prothorax quadrate, apex nearly truncate, anterior apical angle slightly produced; mesoepimeron narrow, osteole near tip; strigil elongate, eight regular combs.

**Distribution:** Beaver and Payne counties.

*Hesperocorixa vulgaris* (Hungerford)

**Characteristics:** Length 9.2-10.1 mm, width of head across eyes 3-3.3 mm; color generally dark; pronotum crossed by ten broad black bands; dark bands of clavus broad, somewhat zigzag transverse series; corial pattern transversely marked by pale bands forming slender transverse series; embolium yellowish white; membrane continuous with corial pattern more broken; lateral lobe of prothorax quadrate, apex slightly rounded; mesoepimeron narrow, osteole near tip; strigil slenderly elongate, five regular combs.

**Distribution:** Hungerford (1948) gives Kansas and Texas as part of species distribution.

*Morphocorixa compacta* (Hungerford)

**Characteristics:** Length 5.9-7 mm, width of head across eyes 1.96-2.38 mm; color generally pale; pronotum crossed by seven or eight dark bands, pale bands slightly wider; claval and corial patterns: dark bands transverse but very narrow, irregular and broken; membrane pattern similar to above but more obliterated; embolium basally dark to distally silvery white; pruinose area of claval sutures dark.

**Distribution:** Beaver County.

*Palmarcorixa buenoi* Abbott

**Characteristics:** Length 4.3-6 mm, width of head across eyes 1.2-1.6 mm; color light to dark; pronotum crossed by four to nine brown lines, varying in width and regularity; hemelytral pattern reticulate; embolium pale; strigil very small, four combs.

**Distribution:** Hungerford (1948) gives Kansas and Texas as part of the species distribution.

*Palmarcorixa nana walleyi* Hungerford

**Characteristics:** Length 4.8-5 mm, width of head across eyes 1.4-1.5 mm; color pale; pronotal disk and hemelytral pattern similar to *P. buenoi*, brown markings on base of clavus often partially effaced; strigil very small, oval, four combs.

**Distribution:** Hungerford (1948) includes Kansas, New Mexico and Texas in the range of the species.

*Ramphocorixa acuminata* (Uhler)

**Characteristics:** Length 5-5.5 mm, width of head across eyes 1.47-1.85 mm; color pale, pattern partially or completely effaced; pronotum crossed by four nearly straight bands; clavus nearly transparent margined brown, near scutellum, immaculate; corial pattern interrupted or obsolete, fusing to form three faint irregular longitudinal stripes on each

hemelytron, continuing onto membranes, vertex of male strongly produced and carinate, female broadly rounded; palae of male dorsally deeply incised; strigil small, one comb.

Distribution: Beaver, Carter, McCurtain, Marshall and Tulsa counties.

*Sigara (Pediosigara) hydatotrephe* (Kirkaldy)

Characteristics: Length 5.3-6 mm, width of head across eyes 1.57-1.7 mm; color black; pronotum crossed by three or four narrow pale lines, remainder black, clavus, corium and membrane black, sutures and margins pale.

Distribution: McCurtain County.

*Sigara (Vermicorixa) alternata* (Say)

Characteristics: Length 5.5-6.9 mm, width of head across eyes 1.7-2 mm; color brown; pronotum crossed by eight or nine narrow dark bands; clavus transversely banded by light and dark stripes of equal width; corial and membranal pattern similar, scattered, wavy, broken; corium and membrane separated by a pale line; embolium and claval suture smoky; strigil small, nearly round, seven combs.

Distribution: Beaver, Carter, Cimarron and Kay counties.

*Sigara (Vermicorixa) modesta* (Abbott)

Characteristics: Length 4.6-5.7 mm, width of head across eyes 1.5-1.9 mm; color brown; pronotum crossed by six to eight regular bands, equal in width to pale bands; clavus dark cross bands, thicker in central portions giving the appearance of a dark spot, dark band effaced at inner basal angles; corial pattern irregular, tending to coalesce near inner distal angle to form a longitudinal stripe, outer distal angle hyaline; membrane separated from corium by pale line, pattern irregular and broken; embolium pale; strigil small, three combs.

Distribution: Comanche County.

*Sigara (Vermicorixa) grossolineata* Hungerford

Characteristics: Length 4.7-5.6 mm, width of head across eyes 1.6-1.9 mm; color brown; pronotum crossed by eight regular brown bands, pale and dark bands of equal thickness; hemelytral color pattern variable; clavus almost solid or crossbanded, but dark bands coalesce along median suture; corial pattern varies from solid brown to definite mottled pattern, outer distal angle pale; membrane separated by a pale line from corium, pattern reticulated, distal margin solid brown; embolium pale; strigil small, three combs.

Distribution: Craig, Oklahoma and Tulsa counties.

*Sigara (Vermicorixa) hubbelli* (Hungerford)

Characteristics: Length 4.5-5.6 mm, width of head across eyes 1.7-1.9 mm; color light; pronotum crossed by six to eight narrow brown bands, one-half as wide as pale bands; clavus often effaced on inner basal angle, elsewhere crossbanded; corial pattern irregular, dark lines arranged in nearly longitudinal series; membrane pattern obscure, effaced, separated from corium by broad pale line; embolium pale; strigil small, five rows of combs.

Distribution: Arkansas, Kansas and Missouri are included in the range (Hungerford, 1948).

*Stgara (Vermicorixa) pectenata* (Abbott)

**Characteristics:** Length 4.4-5 mm, width of head across eyes 1.5-1.7 mm; color dark; pronotum crossed by seven or eight narrow brown bands, effaced on inner basal angle; corial pattern, short, irregular brown markings arranged in more or less transverse series; membrane separated from coria by pale line; embolium smoky to black; strigil suboval, five combs.

**Distribution:** Tulsa County.

*Trichocorixa calva* (Say)

**Characteristics:** Length 3.8-4.6 mm; color pale; pronotum crossed by eight to nine dark lines, often broken; hemelytra coarsely reticulate, base of clavi with pronounced oblique lines; membranes and coria not separated, long.

**Distribution:** Beaver, Craig, Delaware and Tulsa counties.

*Trichocorixa kanza* Sailer

**Characteristics:** Length 4.2-4.5 mm; color and hemelytra similar to *T. calva*, separated by key couplet.

**Distribution:** Beaver, Carter, Lincoln and McCurtain counties.

*Trichocorixa macroceps* (Kirkaldy)

**Characteristics:** Length 2.8-3.2 mm; color brownish; pronotum crossed by three transverse dark lines, often broken or obscure; hemelytral pattern tending to coalesce into two longitudinal vittae with inner connecting bars, right membrane infuscated, left membrane nearly transparent.

**Distribution:** McCurtain County.

*Trichocorixa reticulata* (Guerin-Meneville)

**Characteristics:** Length 2.8-5.2 mm; color brownish; pronotum crossed by ten to eleven transverse, complete lines, narrower than pale areas, hemelytral pattern reticulate, membranes not separated from corium; strigil small, elongate.

**Distribution:** Kansas and Texas are included in the range by Sailer (1948).

*Trichocorixa verticalis interiores* Sailer

**Characteristics:** Length 2.8-4.3 mm; color pale; pronotum crossed by six to eight irregular, faint transverse dark lines which may be obscure at the margins, to as many as 12 heavy dark lines; hemelytral pattern coarsely reticulate, membranes not separate from corium; strigil small, elongate.

**Distribution:** Kay County.

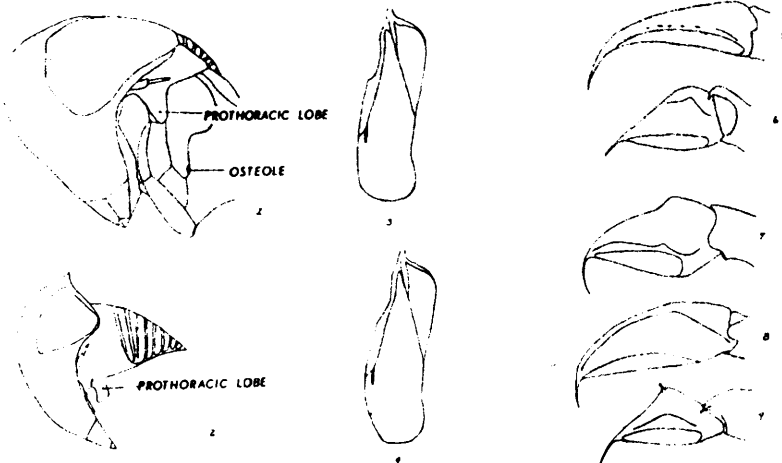
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CAPTIONS

- Fig. 1. View of head and prothorax of *Sigara* sp. showing rounded margin of the prothoracic lobe and the scent gland osteole.
- Fig. 2. View of head and pronotum showing truncate prothoracic lobe.
- Fig. 3. Wing of *Trichocorixa kanea* Sailer.
- Fig. 4. Wing of *T. calva* (Say).
- Fig. 5. Pala of male *Graptocorixa abdominalis* (Say).
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- Fig. 9. Pala of male *Cortisella tarsalis* (Fieber).