Common True Bugs and Related Insects (Orders Hemiptera and Homoptera) in the Wichita Mountains and Surrounding Areas

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Introduction

A word about common names - The scientific name of an organism, whether plant or animal, consists of the genus and species, written in *italics*. The genus is writen in full the first time that it is mentioned in a paper (e.g. *Arilus cristatus*). Thereafter, the genus name is abbreviated to its initial (e.g. *A. cristatus*). Less than 2% of known insect species in the U.S. have approved common names. Relying on only common names for individual species may lead to confusion, since more than one common name may be used for the same species, or the same common name may be used for more than one species. Using the scientific name, which is the same in any language or region, eliminates this problem. Furthermore, only scientific names are used in the scientific literature. Common names are not capitalized.

Order Hemiptera (true bugs)

In entomology "bug" is a common named reserved for insects in the order Hemiptera. In the true bugs the mandibles and maxillae function as a piercing-sucking organ. Some species have a scent gland on each side of the thorax that give off an unpleasant odor when disturbed. The basal half of the forewings is thickened and leathery, and is known as the corium, while the posterior half is membranous. Such wings are known as hemelytra and are unique to the Hemiptera. The number and position of the veins on the membranous part of the hemelytra are generally distinctive at the family level. The hindwings are membranous.

Although most hemipterans are terrestrial, several families are aquatic. True bugs can be plant feeders or predaceous, including those in the aquatic families. Some species are major agricultural pests, and a few, such as bed bugs and assassin bugs in the genus *Triatoma*, feed on blood. Bugs undergo a simple metamorphosis and pass through five nymphal instars before reaching the adult stage. Young nymphs resemble small wingless adults, and wing stubs do not appear until the fourth instar.

There are approximately 3,600 recorded species of Hemiptera in the U.S. and Canada. A few of the more common species in our area are discussed below. All photos in this guide were taken by the author using a Canon PowerShot SX110 IS camera.

Family Pentatomidae (stink bugs)

This is a large family with some 200 species in the U.S. Stink bugs can be recognized by their shield-shaped body. Most common species are about half inch long. The tip of the triangular scutellum extends over the back between the wings and reaches the corium. Coloration varies with the species, but is mostly green, grey, or brownish. While most stink bugs are plant feeders, a few species are predaceous. Stink bugs emit an unpleasant scent from abdominal glands that discourages small vertebrate predators. Some common species are the green stink bug, *Acrosternum hilare* (= *Chinavia halaris*), red-shouldered stink bugs, *Thyanta* spp., brown stink bugs, *Euschistus* spp., and rough stink bugs, *Brochymena* spp. (Figs. 1 - 4).

Green stink bugs and red-shouldered stink bugs may feed on peaches and nectarines, causing fruit deformation. Brown and green stink bugs are just two of several species that feed on tomato, causing spotting or discoloration at feeding sites and loss of fruit quality. The rough or arboreal stink bug is a forest dweller that feeds on the leaves of various forest trees, but may also prey on insects. Its cryptic coloration matches the color and texture of tree bark, where it is often found.

Figure 1. Green stink bug, *Acrosternum hilare*

Figure 2. Red-shouldered stink bug, *Thyanta* sp.

Figure 3. A common brown stink bug, *Euschistus* sp.

Figure 4. *Brochymena* sp.

Some species, including those in the genus *Podisus*, are predaceous. *P. maculiventris* is rather common and is known as the spined soldier bug (Figs. 5 - 7). These slow moving bugs ambush their prey and use their sharp beak to stab an insect, inject toxic saliva, and suck its body fluids. These bugs are greyish brown and can be recognized by the sharp spine on each side of the pronotum.

Figure 5. Spined soldier bug, *Podisus maculiventris* preying on small June beetle

Figure 6. Spined soldier bug preying on a moth

Figure 7. Spined soldier bug preying on *Ophion* sp., a parasitic wasp

Family Coreidae (leaf-footed and squash bugs)

These common bugs have a rather elongate body, with a scent gland on each side of the thorax. All 90 species in the family are plant feeders. Leaf-footed bugs are ¾ - 1 inch long and can be identified by the flattened, leaf-like hind tibia, a unique trait that explains their common name. *Acanthocephala terminalis* is about 1 inch long, stocky, with the tip of the antennae and scent gland openings bright orange (Fig. 8). *Leptoglossus clypealis* is a slender species, about ¾ inch long, with a diagnostic white zigzag bar across the wings (Fig. 9). The euphorbia bug, *Chareisterus antennator*, (Fig. 10), is attracted to plants in the spurge family. This bug is light gray, about ½ inch long, with antennae that arise close together from the front of the head and point straight forward. The next to the last antennal segments are flattened and black. This combination of traits are diagnostic for this species.

Figure 8. Leaf-footed bug, *Acanthocepha terminalis*

Figure 9. Leaf-footed bug, *Leptoglossus clypealis*

Figure 10. Euphorbia bug, *Chareisterus antennator*

The squash bug, *Anasa tristis*, is greyish or greyish-brown and ¾ inch long (Fig. 11). It feeds on wild and cultivated cucurbits, but is especially attracted to pumpkin and squash. Both nymphs and adults may be found in large numbers on infested plants.

Figure 11. Squash bug, *Anasa tristis*

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Family Rhopalidae (scentless plant bugs)

These plant-feeding bugs are related to the Coreidae, but lack scent glands. A common species in our area is the red-shouldered bug, *Jadera haematoloma*. This bug is about ½ inch long, dark grey, with red eyes and two lateral red bands along the sides of the thorax (Fig. 12).

Figure 12. Red-shouldered bug, *Jadera haematoloma*

Family Rhyparochromidae (seed bugs)

Until recently seed bugs were classified under the family Lygaeidae. These bugs often have enlarged femora resembling raptorial legs, but feed on seeds. *Myodocha serripes* is easily recognized by its conspicuous long "neck," a trait that is unique to this species (Fig. 13). This small, slow moving bug is about 3/8 inch long.

Figure 13. Long-necked seed bug, *Myodocha serripes*

Family Reduviidae (assassin bugs)

Assassin bugs have a small, elongate head, protruding compound eyes, and beak-like piercing-sucking mouthparts. The head is narrower behind the eyes, forming a short "neck." Some species are robust, others are slender, and a few are unusually thin and resemble a small walking stick. Most assassin bugs feed on insects. These bugs are stalkers and move slowly until the prey is within reach. The assassin bug uses its beak to stab its prey and inject a toxic saliva and enzymes that begin to digest it internally. The liquified contents are then absorbed by the bug. These insects can inflict a painful bite if handled. Bugs in the genus *Triatoma* are known as kissing or conenose bugs and feed on blood.

The wheel bug, *Arilus cristatus*, is the largest species in our area. These bugs are greyish, robust, with long legs and antennae, and a cogwheel-like semicircular protuberance on the middle of the thorax. Females are 1 - 1½ inches in length (Fig. 14). The males are smaller (Fig. 15). In young nymphs the abdomen is red and the head, thorax, and legs are black. The antennae are black with orange tips (Fig. 16).

Figure 14. Wheel bug, *Arilus cristatus*, female

Figure 15. Wheel bugs mating

Figure 16. Wheel bug nymph

Apiomerus sp. is ½ - ¾ inch long, robust, with short legs and antennae (Fig. 17). At least one species in this genus is known as the bee assassin, presumably because it is often found on wildflowers, where it captures flying insects, including bees. In our area, *Apiomerus* sp. has been observed feeding on red harvester ants .

Figure 17. An assassin bug, *Apiomerus* sp.

Zelus luridus is a common delicate-looking, greenish bug that feeds on small insects and spiders. It is about ½ inch long, with long legs and antennae, and a short sharp spine on each side of the pronotum (Fig. 17).

Figure 17. *Zelus luridus*

The thread-legged bug, *Emesaya brevipennis*, is about 1¼ inches long, thin and elongate, with thin long legs and antennae. At first glance it may be confused with a walking stick nymph, but the front legs are raptorial, designed for grasping prey, and the small head and curved beak identify this insect as an assassin bug. Thread-legged bugs move slowly and prey on small insects, such as moths and flies.

Figure 19. Thread-legged bug, *Emesaya brevipennis*

Family Miridae (plant bugs)

This is the largest family in the Hemiptera, with almost 1,800 spp. in the U.S. and Canada. Plant bugs are common on wild and cultivated plants, and some species are agricultural pests. Most are only about ¼ inch long, with few distinctive characteristics, and difficult to identify even to genus. The family, however, can be recognized by examining the forewings with a 4x magnifier. In these bugs at the end of the corium (leathery half of the hemelytra) there is a small triangular area, the cuneus, separated bordered by a suture. The cuneus shows as a pink area in Fig. 20. In addition, the back end of the wings is slightly bent downward, and the veins form two closed cells, the larger, round outer cell enclosing a smaller triangular cell (Figs. 20 - 21).

Figure 20. A plant bug (Miridae)

Figure 21. A plant bug (Miridae)

Family Gerridae (water striders)

Water striders have the ability to walk and skate on water pools. The legs are densely covered with microscopic hairs that create a hydrophobic surface. These hairs, combined with the high surface water tension and the distribution of body weight over thin, long, widely spread legs make this feat possible. The body es elongate and the mouthparts are of the piercing-sucking kind. Water striders disperse by flight and prey on small insects that fall on the water.

Figure 22. Water strider, *Gerris* sp.

Family Belostomatidae (giant water bugs)

Giant water bugs are large, flat, oval-shaped insects that use their raptorial legs and beak-like mouthparts to capture and subdue large prey, including tadpoles and small fish. These bugs live in shallow lakes and ponds that support emergent aquatic vegetation, such as cattails.

Belostoma flumineum (Fig. 23) is slightly less than one inch long. The adults are good flies, and in summer may be found at some distance from their aquatic habitat, usually near outdoor lights. Giant water bugs are also known as toe-biters.

Figure 23. Giant water bug, *Belostoma flumineum*

Order Homoptera

The order Homoptera is closely related to the order Hemiptera. Homopterans have piercing, sucking mouthparts that are similar in structure and function to the mouthparts of the Hemiptera. However, in the Homoptera the beak is shorter than in the Hemiptera and arises from the posterior part of the head. In some species it seems to arise from between the bases of the front legs. Homopterans are plant feeders that use their thin beak to pierce plant tissue and absorb the sap. Unlike the Hemiptera, the wings of the homopterans are entirely membranous. Homopterans undergo a simple metamorphosis, and most nymphs resemble wingless adults.

There are over 6,000 species of homopterans in the U.S., but the majority are very small and usually go unnoticed by the general observer. Common insects in this order include cicadas, aphids, whiteflies, leafhoppers, planthoppers, treehoppers, scale insects, and mealybugs.

Family Cicadidae (cicadas)

Cicadas are the largest homopterans, ranging from about ½ inch to slightly over 2 inches in length. The adults are robust, with bulging eyes and very short antennae. Those in the genus *Tibicen* (= *Neotibicen*) are the dog-day cicadas found in this area and throughout most of the U.S. (Fig. 24). These are annual cicadas. The nymphs spend three to five years underground, but a portion of the nymph population matures and emerges each year. On the other hand, the nymphs in the genus *Magicicada* spend 13 and 17 years underground, although each year a portion of the population emerges somewhere within its geographic range. There are about 170 species of cicadas in the U.S. and Canada.

Figure 24. Cicada, *Tibicen* sp.

Male cicadas have unique sound-producing organs and a hollow abdomen that amplifies the sound. Cicadas are fast fliers, and rely on flight as a defense mechanism against predators. The cicada life span is about one week, just long enough to mate and reproduce. Females insert their eggs into slits previously cut on branches with their ovipositor. After hatching the young nymphs drop to the ground and burrow in the soil using their strong anterior legs, which are adapted for digging. Nymphs feed on the roots of a wide diversity of perennial plants. After several years the mature nymphs (Fig. 25) emerge and crawl up a tree trunk or another vertical surface. Shortly after the nymph's skin splits along the center of the back and the adult emerges leaving behind the empty exoskeleton.

Figure 25. *Tibicen* sp. nymph

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Family Cicadellidae (leafhoppers)

Leafhoppers are ¼ - ½ inch in length. The body is streamlined and tapers toward the back (Figs. 26 - 27). There is at least one row of small spines along the hind tibia. Leafhoppers respond to perceived danger by hiding behind stems or by jumping and flying away. These insects are common in grasses and herbaceous vegetation and feed on plant sap. Some species may cause injury to food crops and ornamental plants by transmitting viral diseases or removing large amounts of sap.

Figure 26. Unidentified leafhopper

Figure 27. Unidentified leafhopper

Family Cercopidae (spittlebugs, froghoppers)

These small insects resemble leafhoppers, but have one or two short and stout spines on the hind tibia instead of the fine spines found in leafhoppers. The nymphs develop hidden under a cover of viscous froth secretion that resembles saliva (Fig. 28). The two-lined spittlebug, *Prosapia bicincta*, is a common and colorful spittlebugs in our area. It is mostly shiny black with two yellow, orange, or reddish transverse bands across the wings and a thinner line of the same color across the pronotum (Fig. 29). Froghoppers jump and fly away when disturbed.

Figure 28. Spittlebug nymph under saliva-like secretion

Figure 29. Two-lined spittlebug, *Prosapia bicincta*

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Family Aphididae (aphids, plant lice)

Aphids are only 1/16 to 1/8 inch in length. The body is rather globular or pear-shaped, with a pair of tubular structures, or cornicles, on the posterior end of the abdomen (Fig. 30). When present, the wings are transparent, with well-defined venation. Non-reproductive adults and nymphs are wingless, but reproductive aphids have well-developed wings. Winged aphids are weak fliers, but can disperse over great distances aided by wind currents. Aphids feed on plant sap and excrete a sugary solution, known as honeydew, to eliminate the carbohydrates ingested in excess. Plants infested with aphids become sticky as honeydew accumulates. This sugary solution is a major carbohydrates source for some ants, which are attracted to the infested plant ant protect the aphids by discouraging the presence of their predators. Various other insects, including house flies and yellowjackets, are attracted to honeydew.

Aphids have multiple generations per year, and their life history can be complex. Aphids overwinter in the egg stage. The individuals that emerge from those eggs are all wingless females that reproduce parthenogenetically (without mating) and produce several generations of females that continue to reproduce in the same manner. In early fall a winged generation of males and females appears. After mating, the females lay eggs that remain dormant until the following spring. During summer aphid colonies may also produce winged males and females that leave their host plant and fly in search of new plants to colonize.

Aphids can reproduce rapidly and injure plants by extracting large amounts of sap and transmitting viruses that cause various plant diseases. Several species can become major agricultural and garden pests. Several natural enemies prey on aphids, including parasitic wasps, green lacewing larvae, lady beetle adults and larvae, syrphid fly larvae, and damsel bugs.

Figure 30. Unidentified aphids

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