

Common Wasps, Bees, and Ants (Order Hymenoptera) in the Wichita Mountains and Surrounding Areas

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Introduction

The order Hymenoptera is divided into the suborders Symphyta (sawflies) and Apocrita (ants, bees, and wasps). In sawflies the abdomen is broadly joined to the thorax. Most sawfly larvae feed externally on plant foliage and look and behave like small caterpillars, but have two conspicuous simple eyes (ocelli), whereas caterpillars have several minute ocelli on each side of the head. Sawfly larvae have six to eight pairs of prolegs (false legs), whereas true caterpillars have no more than five pairs of prolegs. Some sawfly larvae are wood or stem borers. In these larvae the thoracic legs are atrophied and the prolegs absent.

In the suborder Apocrita (ants, bees, and wasps) the first abdominal segment is fused to the thorax and is called the propodeum. The second (or second and third in some ants) abdominal segment is constricted and forms petiole or "waist" associated with wasps. The larvae are legless, lack a well-developed head (see Fig. 26), and depend on the adults for nourishment and survival. The females in some families have a stinger and venom glands. This guide covers only hymenopterans in the suborder Apocrita.

Hymenopterans have two pairs of membranous wings. The posterior wings are smaller than the anterior wings and have a row of minute hooks along their anterior border that attach to the posterior border of the anterior wings. The legs consist of six articulated segments: the coxa, trochanter, femur, tibia, tarsus, and pretarsus or

claws. Most species are predaceous or parasitic on other arthropods. Hymenopterans undergo a complete metamorphosis that consists of the egg, larval, pupal, and adult stages. Three of the four groups of social insects, the ants (Family Formicidae), the social wasps (Family Vespidae), and the social bees (Family Apidae) belong in this order. The termites (Order Isoptera) make up the fourth group of social insects. Note that a family name always ends in "ae."

The scientific name of a plant or animal consists of the genus and species, written in *italics*. The genus is written in full the first time that it is mentioned in a paper (e.g. *Apis mellifera*). Thereafter, the genus name is abbreviated to its initial (e.g. *A. mellifera*). If another genus with the same initial is discussed in the same section, both genera are spelled out to avoid confusion.

Less than 2% of known insect species in the U.S. have approved common names. Relying on only common names for a given species may lead to confusion, since more than one common name may exist for the same species, or the same 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. There are some 18,000 species of hymenopterans recorded in the U.S. and Canada. This guide mentions only a few of the more common and noticeable hymenopterans found in our area.

All photos in this guide were taken by the author using a Canon PowerShot SX110 IS camera.

Family Ichneumonidae (ichneumonid wasps)

The ichneumonids are part of a vast guild of parasitic wasp families that attack every developmental stage of most insects, including other parasitic species. Hosts of ichneumonids include caterpillars, beetle larvae, spider eggs, and sawfly larvae, especially those that develop in wood. Most species are thin, with a small head and a filiform antennae that is at least half as long as the body. Many females have a long, flexible, and permanently exposed ovipositor, which is often longer than the body. As other parasitic wasps, ichneumonids lack a stinger.

Ophion sp. (Fig. 1) is slender, $\frac{3}{4}$ - 1 inch long, with a long, laterally compressed abdomen, short ovipositor, and long, thin antennae and legs. These wasps are often attracted to outdoor lights. *Ophion* wasps are internal parasitoids of scarab larvae that live buried in the soil, including those species commonly known as white grubs. An egg is inserted in a host and, after hatching, the larva feeds internally on the host's tissues. Parasitized hosts do not die and may continue feeding. Once it is fully developed the larva emerges from the dying host and pupates in the soil.



Figure 1. Ichneumonid wasp, *Ophion* sp.

Family Chalcididae

Chalcid wasps are small, rather stocky parasitic wasps, mostly $\frac{1}{4}$ inch or less in length. The hind femora are enlarged and the hind tibia are distinctly arched (Fig. 2). Their hosts are mainly larvae and pupae of Lepidoptera, Diptera, and Coleoptera. *Brachymeria* females parasitize only blowfly and flesh fly larvae (maggots), which are the first insects to colonize fresh carrion. The chalcid larva develops inside the maggot, which continues to feed and develop, and eventually pupates. The chalcid larva pupates inside the maggot, but emerges from the fly pupa.



Figure 2. Chalcid wasp, *Brachymeria* sp., exploring deer mouse carcass

The wasp in Fig. 2 seems to be searching for fly maggots on a dead deer mouse, *Peromyscus* sp. The fresh mouse carcass had also attracted blowflies, but at this early stage there were no maggots present yet.

Family Chrysididae (cuckoo wasps)

These small ($\frac{1}{4}$ - $\frac{1}{2}$ inch) wasps are never abundant, but when present their brilliant metallic green or blue coloration attract attention (Fig. 3). The body surface is hard and covered with minute pits that are best seen with a 10X magnifier. A third unique feature in these wasps

is their concave abdomen. When in danger, a cuckoo wasp can curve its body and fit its head and thorax tightly in the abdomen underside for protection. Some sweat bees (Halictidae) are also small and metallic green, but lack the pitted surface and concave abdomen. Cuckoo wasps parasitize the larvae of solitary bees and wasps.



Figure 3. A cuckoo wasp

Family Mutillidae (velvet ants)

Female velvet ants are wingless and resemble large true ants (Figs. 4 - 5). The males are winged and look more like wasps (Fig. 6).



Figure 4. Red velvet ant, *Dasymutilla occidentalis*, female

Velvet ants are often covered with short red, orange, and black hairs, usually in contrasting patterns. In some species the hairs are white and

short or almost absent. Females have a long stinger and will sting if handled. Length for most species ranges from ¼ to 1 inch. Velvet ants parasitize larvae and pupae of various bees and wasps. The colorful red velvet ant, also known as cow killer, *Dasymutilla occidentalis* (Fig. 4) is ¾ inch long and one of the largest and most conspicuous mutillid in the area.



Figure 5. *Dasymutilla* sp. (possibly *D. nigripes*), female



Figure 6. *Dasymutilla* sp., male

Family Formicidae (ants)

There are almost 700 species of ants in North America north of Mexico. Ants are social insects. Their colonies consists of winged queens, winged males, and wingless workers. Ants are found just about anywhere, and in large numbers. Their food habits are diverse, but most species are generalists and feed on dead

and live insects and carbohydrates, including nectar and honeydew. A few species grow fungi for food. Harvester ants feed primarily on small seeds. Some species prey on agricultural pests, thus contributing to their control.

The first step in identifying an ant at subfamily level is determining whether the abdominal pedicel consists of one (petiole) or two (petiole + postpetiole) segments. Due to their small size, identifying most ants generally requires at least a 40X magnification and suitable taxonomic keys. However, the larger ants, such as the carpenter, harvester, and acrobat ants, may be identified to genus by sight or with the help of a 4X or 10X hand lens.

Subfamily Formicinae

The ants in this subfamily have a one-segmented petiole and lack a stinger

Carpenter ants, *Camponotus* spp.

Camponotus americanus is one of several species of carpenter ants found in this region. These ants are reddish, with a dark brown to almost black head (Fig. 7). Carpenter ants are polymorphic, mature colonies consisting of workers of various sizes. The smaller workers are the minors and the largest ones the majors or soldiers. In some species, majors can be up to ½ inch in length, while minors are about half as long. Majors also have a disproportionately large head, powerful mandibles, and play a main role in colony defense. The pedicel consists of a single, upright scale-like node. Carpenter ants lack a stinger, but can squirt formic acid through the acidopore, a circular orifice bordered by a fringe of hairs and located at the tip of the abdomen. These ants generally make their nests in living and dead trees, usually in decaying wood in which galleries can be enlarged as the colony grows. Mature colonies may contain

from hundreds to thousands of individuals. Their food consists of live and dead insects and carbohydrates, such as homopteran honeydew, fruit, and nectar. A few species, such as the black carpenter ant, *C. pennsylvanicus*, may infest houses and other wooden structures and is considered a structural pest.



Figure 7. *Camponotus americanus* major workers

Wood, forest, or field ants, *Formica* spp.

Wood ants also have a single petiolar node, lack a stinger, and can squirt formic acid from the acidopore for defense. If disturbed these active ants will quickly retreat into their underground nest. Unlike carpenter ants, the workers are all of similar length and proportion (monomorphic).

Formica pallidefulva (Fig. 8) is locally common.



Figure 8. Wood ant worker, *Formica pallidefulva*

The workers are tan or dark yellow, relatively large (about ¼ inch in length), with long thin legs. Their food include small insects, as well as honeydew, nectar, and other sources of carbohydrates.

Subfamily Myrmicinae

The ants in this subfamily have a two-segmented pedicel, and some of them have a stinger.

Southern fire ant, *Solenopsis xyloni*

Of six fire ant species found in the U.S. four are native and the other two (red imported fire ant and black imported fire ant) are introduced or invasive. Two species are only found in the southwester deserts and two others in the south-eastern states. The geographic ranges of the other two species, the southern fire ant and the red imported fire ant, overlap to some extent.

The southern fire ant, *Solenopsis xyloni* (Figs. 9 - 10), is a native species and the only fire ant found in the Wichita Mountains. Fire ants have two petiolar nodes, a ten-segmented antennae, with the last three segments forming a club, and a stinger. These traits distinguish fire ants from most other ants. Mature colonies consist of smaller workers or minors and larger ants or majors. The minor is about 1/8 inch long and the major about twice as long, with the head and thorax reddish-brown and the abdomen dark brown to black (Fig. 9). These ants nest under rocks or build an underground nest with a small mound around the entrance. Fire ants respond immediately to any disturbance by emerging in large numbers and attacking the source. The ants in Fig 10 were nesting under a flat rock, by the southern edge of the Quanah Parker Lake.



Figure 9. Southern fire ant minor and major workers, *Solenopsis xyloni*



Figure 10. Southern fire ant minor workers

The red imported fire ant, *S. invicta*, was introduced in the U.S. in 1933 and has been found in some Oklahoma localities, but does not appear to occur in our area. This invasive species is a pest of agricultural and medical importance. In infested areas its mounds may number several hundreds per acre. It is highly aggressive ant responds to any threat to the nest by emerging in large numbers and biting and stinging the source of the disturbance. This mass attack can be lethal to small animals, and in humans the stings leave the affected area covered with sore and itchy pustules. The venom may also cause a serious allergic reaction in sensitive individuals

Red harvester ant, *Pogonomyrmex barbatus*

The red harvester ant or red ant, *Pogonomyrmex barbatus*, is about ¼" in length, reddish, with two petiolar nodes and a stinger (Figure 11).



Figure 11. Red harvester ants, *Pogonomyrmex barbatus* at nest entrance

The back of the head has fringes of long hairs that help transport soil and seeds. These ants clear all vegetation around the nest entrance leaving a round barren patch 2-3 ft in diameter that is often covered with fine gravel and discarded seed husks (Fig. 12).



Figure 12. Area around red harvester ant nest entrance

Harvester ants gather and feed primarily on small seeds. These ants travel to and from foraging areas along well-defined trails that radiate from the nest in various directions and

extend for 50 or more yards. Harvester ants are monomorphic. That is, all workers are of similar size. Harvester ants constitute 90% of the diet of the Texas horned lizard, *Phrynosoma cornutum*, and are key to the survival of this lizard. Although these ants are not especially aggressive, they will sting if disturbed, and their sting can be very painful.

Acrobat ants, *Crematogaster* spp.

Acrobat ants are shiny black or dark brown, 1/8 - ¼ inch in length, and lack a stinger, although they can bite if disturbed. These ants can be recognized by the heart-shaped abdomen, which is flat above, convex below, and tapers to a point posteriorly (Fig. 13).



Figure 13. Acrobat ant, *Crematogaster* sp.

In addition, the two-segmented pedicel slopes upward and is connected to the upper edge of the abdomen, whereas in other ants the pedicel is horizontal and is attached to the lower edge of the abdomen. When agitated, these ants run with the abdomen curved up, which explains the "acrobat" name. All these traits distinguish *Crematogaster* from all other ant genera. These ants prey on insects, but are also attracted to carbohydrates, especially honeydew, and can often be found tending aphids on infested plants. Acrobat ants nest in the ground.

The little black ant, *Monomorium minimum*

These minute, shiny black, monomorphic ants have two petiolar nodes and a stinger that is too small and weak to pierce human skin. The workers are 1/16 long and are among the smallest ants in the area (Fig. 14). These ants forage in trails and feed on plant material, dead insects, and sugary secretions such as honeydew.



Figure 14. Little black ant, *Monomorium minimum*

Family Vespidae (Wasps)

This family consists of over 400 species of social and solitary wasps. Social wasps include the yellowjackets (*Vespula* and *Dolichovespula*) and paper wasps (*Polistes*), all of which are native insects. Yellowjackets in the genus *Vespula* make mostly underground papery nests, whereas those in the genus *Dolichovespula* make closed, football-like aerial nests on trees. Although the term hornet is often applied to the larger *Dolichovespula* wasps, the true hornets belong in the European genus *Vespa*. One species, *V. crabro*, was introduced to the eastern U.S. in the 1800s.

Unlike wasps in other families, vespids fold their wings longitudinally when at rest. Workers feed mostly on nectar and honeydew, but capture and chew various insects and spiders to feed their brood. Each larva develops inside one

of the hexagonal cells that make up the nest. Workers and males die at the end of fall, but mated females (queens) survive the winter and start a new colony in spring.

Yellowjackets, *Vespula squamosa*

There are 17 species of yellowjackets in the U.S., 12 species in the genus *Vespula* and 5 in *Dolichovespula*. The abdomen in most species has alternate bands of black and yellow. The southern yellowjacket, *V. squamosa*, can be identified by the two parallel yellow lines on the black pronotum (Figs. 15 - 17).



Figure 15. Southern yellowjacket, *Vespula squamosa*, worker

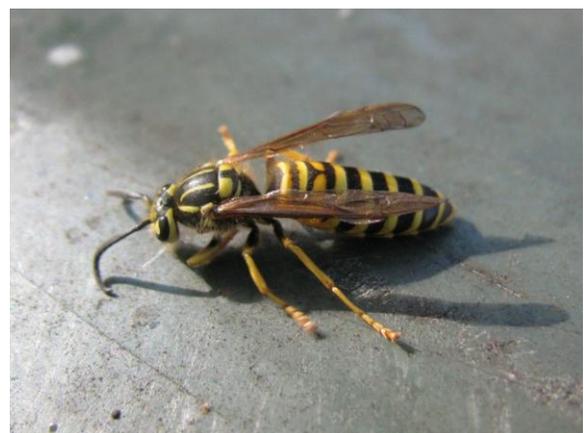


Figure 16. Southern yellowjacket, *Vespula squamosa*, male

Males lack a stinger and have seven abdominal segments, while workers have six. Males appear in the fall and can be recognized by their elongated abdomen (Fig. 17). Mated females (queens) are larger than the workers and males and can be seen flying in early spring searching for nesting sites. Yellowjackets workers aggressively defend their underground nests and quickly emerge to attack any intruder that may be perceived as a threat. Away from the nest these wasps are rather docile and will not sting unprovoked.



Figure 17. Southern yellowjacket, *Vespula squamosa*, queen

Paper wasps, *Polistes* spp.

Paper wasps make open, upside-down nests that are attached by a thin stalk to an overhanging surface. Two common species in our area are *Polistes exclamans* and *P. carolina*.



Figure 18. Paper wasp, *Polistes exclamans*
P. exclamans is $\frac{3}{4}$ inch long, mostly yellow, with large reddish-brown marks on head, thorax, and abdomen (Figs. 18 - 19).



Figure 19. Paper wasps and nest, *Polistes exclamans*

P. carolina is rusty-red, without noticeable darker markings, dark-blue wings, and dark flagellum (third and longest antennal segment). These wasps are about 1 inch long (Fig. 20).



Figure 20. Paper wasp, *Polistes carolina*

In spring overwintering female paper wasps builds a nest with a few hexagonal cells for her first brood. These wasps capture caterpillars, chew them, and feed them to the larvae. As the nest grows, some first generation females begin to lay eggs, while others assist the queen to feed the brood and add cells. In late summer reproductive males and females (queens) emerge from a second brood and mate. Workers and males begin to die in late fall, but fertilized females survive until the following year. Unlike yellowjackets, paper wasps are not aggressive, but will defend their nest if threatened.

Mason or potter wasp, *Monobia quadridens*

Monobia quadridens is one of several potter or mason wasp species. This wasp resembles a large paper wasp (*Polistes*), but the combination of dark blue wings, black body, and whitish or ivory marks on the thorax and near the base of the abdomen (Fig. 21) are unique to this species. This solitary wasp nests in existing cavities, including the abandoned nests of other wasp species. The adults feed on nectar, and the female feeds small caterpillars to her brood. Each nest consists of several sealed cells.



Figure 21. Mason wasp, *Monobia quadridens*

Family Pompilidae (spider wasps)

This family of solitary wasps consists of about 290 species in the U.S. and Canada. Most spider wasps are black or bluish black and ¼ inch to almost 2 inches in length. These wasps capture spiders as food for their young. The smaller wasps prey on small ground spiders, while the larger species hunt large wolf spiders, tarantulas, and trapdoor spiders. Spider wasps search for spiders by actively crawling on the ground. Occasionally a wasp may be seen dragging a paralyzed spider into a previously excavated burrow. After depositing a single egg on the spider, it covers the burrow, and goes in search of another spider. The larva feeds externally on the paralyzed spider, and by the time it is ready to pupate the spider is dead or close to death.

Tarantula hawk, *Pepsis* sp.

The spider wasps in the genus *Pepsis* are known as tarantula hawks. The body is dark blue or blue-black, with orange or rust-colored wings (Fig. 22) and bright orange antennae in some species. Females can be two inches long and among the largest wasps in the U.S. The female attacks, stings, and drags a paralyzed tarantula to an underground nest. In spite of their large size and fangs, tarantulas are unable to deter the attack. The wasp lays an egg on the spider

before sealing the burrow. The larva feeds on the paralyzed tarantula until it reaches maturity and pupates. This process is repeated several times as long as the wasp has eggs in her ovarioles. If handled these wasps are known to deliver a highly painful sting.



Figure 22. Tarantula hawk, *Pepsis* sp.

Spider wasp *Tachypompilus* sp.

This medium-sized spider wasp is about $\frac{3}{4}$ inch in long, reddish, with narrow dark bands on the abdomen and bluish wings. Unlike *Pepsis*, this spider preys on large wolf spiders. The female in Fig. 23 has captured a male rabid wolf spider, *Hogna rabidosa*, and is dragging it to a burrow as food for its larva. This behavior is similar to that described for *Pepsis* wasps.



Figure 23. Spider wasp *Tachypompilus* sp. with rabid wolf spider prey

Family Sphecidae (digger wasps)

This large family of solitary wasps consists of over 1,100 species in the U.S. and Canada. Most species prey on related species, such as cicadas, spiders, or caterpillars. The female captures, stings, and stores the paralyzed prey as food for its progeny, as do spider wasps in the family Pompilidae. The family Sphecidae was recently reorganized, and a large number of sphecid genera were reassigned to the family Crabronidae, including *Sphecius* and *Tachites*.

Thread-waisted wasp, *Ammophila procera*

This wasp is about $1\frac{1}{2}$ inches in length, with a long and narrow petiole, and one of several species known as thread-waisted wasps. This common wasp is black, with an orange band half-way between the base of the petiole and tip of the abdomen (Fig. 24). It stings and drags a paralyzed caterpillar to a burrow. Each female digs multiple burrows, each containing a single egg and a paralyzed caterpillar.



Figure 24. A large thread-waisted wasp *Ammophila procera*

Black and yellow mud dauber, *Sceliphron caementarium*

The black and yellow mud dauber is a familiar thread-waisted wasps in the area. It is about one

inch in length, black, with prominent yellow marks on legs, thorax, and abdomen, and a thin petiole that is as long as the abdomen (Fig. 25).



Figure 25. Black and yellow mud dauber, *Sceliphron caementarium*

The female constructs hardened mud nests (Fig. 26) in which she rears her brood. These familiar nests are often seen attached to walls, ceilings, window sills, and other parts of buildings. The nest consists of several sealed cells, each containing a larva and several small to medium-sized paralyzed spiders.



Figure 26. Black and yellow mud dauber mud nests

The legless and blind grub-like larva (Fig. 27) is typical for all wasps, bees, and ants. The head is reduced to a pair of mandibles, and it is entirely dependent on the adults for survival. The mud

cell provides protection from predation, but can be breached by various parasitic wasps and flies that use the mud dauber larva and paralyzed spiders to feed their own progeny.



Figure 27. Black and yellow mud dauber larva

Cicada killer, *Sphecius speciosus*

This is a large wasp that may reach two inches in length. It is mostly black, with three pairs of transverse yellow bars on the abdomen, and dark yellow wings (Fig. 28). The female captures, stings, and carries cicadas to an underground nest chamber that it has dug previously.



Figure 28. Cicada killer, *Sphecius speciosus*, with prey

This wasp often flies with its prey, but will also drag it on the ground when the nest is close by. Its larvae develops feeding on the paralyzed cicadas. The nest chamber consists of several

cells, each containing one larva. These wasps can be seen in mid-summer, flying in search of prey or digging burrows. Their large size and loud buzzing flight are distinctive.

Great golden digger wasp, *Sphex ichneumoneus*

This colorful wasp is about one inch long. The head and thorax are covered with short golden hairs, and the eyes and antennae are black. The legs are red, and the abdomen is red and black. This is a ground-nesting solitary wasp that captures grasshoppers for its brood. The wasp in Fig. 29 was digging a burrow in moist soil.



Figure 29. Golden digger wasp, *Sphex ichneumoneus*

Sand-loving wasp, *Tachytes* sp.

These small solitary wasps can be readily identified by their unusually large green eyes (Fig. 30). The females nest in the ground and provide the larvae with small, immature grasshoppers and other small Orthoptera.

Steel-blue cricket hunter, *Chlorion aerarium*

This wasp is about one inch long, metallic blue, with a medium-sized petiole (Fig. 31). The female digs a burrow that houses several sealed cells, each containing a larva and several paralyzed field crickets.



Figure 30. A green-eyed wasp, *Tachytes* sp.



Figure 31. Steel-blue cricket hunter, *Chlorion aerarium*

Family Halictidae (sweat bees)



Figure 32. A sweat bee, family Halictidae

Halictids are solitary bees often seen on flowers collecting pollen. These native pollinators may be entirely or partially metallic green (Fig. 32),

and resemble cuckoo wasps, but lack the pitted surface and concave abdomen. These bees nest in burrows that consist of several cells, one for each larva. Larvae develop feeding on pollen and honey stored by the female before she seals each cell.

Family Anthophoridae (digger and carpenter bees)

Digger bee, *Melissodes* sp.

Digger bees are about ½ inch long, rather robust, with a dense cover of short, brownish hairs that give them a fuzzy appearance. The eyes are large, and the front of the head is densely covered with short white or yellowish hairs. The antennae in males are as long as half the head and body length (Fig. 33). The antennae in females are much shorter. The female collects pollen from a wide range of wild plants using stiff hairs that cover the hind legs. Some species frequent only flowers in the sunflower family (Asteraceae). These solitary bees nest in the ground. The nest consists of several individual wax cells, each containing a pellet of pollen and one egg. The developing larvae feed exclusively on the stored pollen.



Figure 33. A digger bee, *Melissodes* sp., male

Family Apidae (honey and bumble bees)

Bumblebee, *Bombus* sp.

Bumblebees are ¾ - 1 inch in length, robust, hairy, and black and yellow (Fig. 34). These large social bees nest in the ground, and their colonies are small and annual. In spring the queen builds a nest, often in a depression or an abandoned rodent burrow. The nest consists of a disorganized cluster of wax. A larva develops in each cell and is fed pollen and honey by the queen. The first adults to emerge are female workers, which take over the food gathering and brood care duties, while the queen continues to lay eggs. In summer drones and future queens develop and mate. At the end of fall the workers die, but fertilized queens overwinter and start new colonies the following spring. Bumble bees are among the most important native pollinators.



Figure 34. Bumble bee, *Bombus* sp.

Honey bee, *Apis mellifera*

The European honey bee is an introduced species. The worker is about ½ inch long and slightly robust. The abdomen is golden brown, with four transverse dark bands (Fig. 35). The workers are infertile females that live five to six weeks. Workers collect pollen and nectar from wild and cultivated plants flowers to feed the developing brood. Pollen is carried in a pollen

basket, a structure that consists of a concave, hairless area on the hind tibia surrounded by a fringe of hairs. Workers use wax secreted by abdominal glands to construct hexagonal cells organized in vertical combs. The cells are used to rear larvae and store honey for winter consumption.



Figure 35. Honey bee, *Apis mellifera*

References

- Arnett, R. H. and R. L. Jacques, Jr. 1981. Simon & Schuster's guide to insects. Simon & Schuster, New York. 511 pp.
- Arnett, R. H. Jr. 1993. American insects, A handbook of the insects of America North of Mexico. The Sandhill Crane Press, Gainesville. 850 pp.
- Borror, D. J., D. M. DeLong, and C.A. Triplehorn. 1981. An introduction to the study of insects. Fifth Edition. Saunders College Publishing, Philadelphia. 827 pp.
- Borror, D. J. and R. E. White. 1970. A field guide to the insects of America north of Mexico. Houghton Mifflin Company, Boston. 404 pp.
- Clausen, C. P. 1972. Entomophagous insects. Hafner Publishing Company, New York. 688 pp.
- Drees, B. M. and J. A. Jackman. 1998. A field guide to common Texas insects. Gulf Publishing, New York. 359 pp.
- Eaton, E. R. and K. Kaufman. 2007. Kaufman field guide to insects of North America. Houghton Mifflin Company, New York. 391 pp.
- Entomological Society of America. Common names of insects database. <http://www.entsoc.org/common-names?page=3>
- Hansen, L. D. and J. H. Klotz. 2005. Carpenter ants of The United States and Canada. Cornell University Press, Ithaca. 204 pp.
- Hölldobler, B. and E. O. Wilson. 1990. The ants. The Belknap Press. Harvard University Press. 732 pp.
- Oklahoma State University. undated. Checklists of Spiders, Mites, and Insects of Oklahoma. Entomology and Plant Pathology. K. C. Emerson Entomology Museum. <http://entoweb.okstate.edu/museum/museum.htm>
- Powell, E. and L. Taylor. 2016. Black & yellow mud dauber, *Sceliphron caementarium* (Drury, 1773) (Insecta: Hymenoptera: Sphecidae). University of Florida. EENY-653 http://entnemdept.ufl.edu/creatures/MISC/WASPS/Sceliphron_caementarium.htm
- Reed, H. C., R. Grantham, and R. Wright. undated. Paper wasps, yellowjackets, and other stinging wasps. Oklahoma State University. Oklahoma Cooperative Extension Service. EPP-7305. <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-2284/EPP-7305webcolor.pdf>
- Salsbury, G. and S. White. 2000. Insects in Kansas. Third edition. Kansas Department of Agriculture. 523 pp.
- Taber, S. W. 1998. The world of the harvester ants. Texas A & M University Press, College Station. 213 pp.
- United States Department of Agriculture - National Invasive Species Information Center. 2017. <https://www.invasivespeciesinfo.gov/animals/rifa.shtml>
- Wheeler, G. C. and J. Wheeler. 1973. Ants of Deep Canyon. University of California, Riverside. 162 pp.