Hemiptera, Suborder Sternorrhyncha (Aphids, Psyllids, Scales, Whiteflies)

Soft Scales

Family: Coccidae

Lifecycle - Paurometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host -Ornamental Trees

Female soft scales are elongate and usually convex. They have a smooth, hard exoskeleton or are covered in wax. Females usually have reduced or absent legs and antennae. Males may be winged or wingless. The brown soft scale, wax scales and tortoise scales are included in this family.

Level: Intermediate, Senior

Whiteflies

Family: Aleyroididae

Lifecycle - Paurometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host -Vegetables, cotton

Whiteflies are generally small, under 2mm even as adults. The adults are usually white, as the name implies, and fly slowly around plants. Their lifecycle is complex with the nymphs laying closely on the plant surface. The last nymphal stage is more like a pupal stage than a nymph. Eggs and nymphs look very different from adults. Whiteflies can be severe plant pests and some strains are resistant to insecticides. They are pests often pests in greenhouses, but can be pests in field crops and vegetables too. The silverleaf whitefly, *Bemisia argentifolii* (Bellows & Perring), is one of the worst pests in this family.

Level: Senior

Megaloptera (Dobsonflies)

Dobsonfly

Corydalus spp.
Family: Corydalidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -Streams

Dobsonflies are large (some are over 3 inches long) insects with long **membranous** wings. The wings are typically held flat over their back when they are at rest. Adults are often attracted to lights but usually only near flowing rivers. The male (pictured above) has extremely long mandibles, which are not particularly good for biting. However, these mandibles are used to grasp the female during mating. The adult female (no pictured) can be an effective biter if given the opportunity. Dobsonflies are the adult form of a common aquatic immature called a hellgrammite. Hellgrammites are aggressive predators found in flowing streams. They are good fish bait and are very often used as such.

Level: Junior, Intermediate, Senior

Neuroptera (Antlions, Lacewings, Mantipids, & Owlflies)

Antlion

Family: Myrmeleontidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -Plants

Antlions have long clear wings with many veins and long delicate bodies. Some of them have dark markings or spots of color in the wings. They are usually over an inch long. Antlions may look similar to damselflies at first, but antlions have short but conspicuous antennae that are enlarged at the end. Antlions are likely to be found at lights at night but can be found in the daytime usually at rest on foliage. Immature antlions are often called doodlebugs. They make pits in sandy areas and wait for ants and other insects to fall into the pits. Look for their pits under eaves of houses, under bridges, or in other sheltered areas. Adults are sometimes attracted to lights.

Level: Junior, Intermediate, Senior

Brown Lacewing

Family: Hemerobiidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -Insects

While they are in different Families, brown lacewings and green lacewings have similar habits. Adults feed on pollen, nectar and honeydew and can also feed on aphids, spider mites or other prey. The larvae are voracious predators and can feed on any insect that is small enough. Brown lacewings are especially good at eating aphids.

Level: Senior

Photo Credit: Salvador Vitanza

Green Lacewing

Family: Chrysopidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -Insects

Adult green lacewings feed on pollen, nectar and honeydew and can also feed on aphids, spider mites or other prey. The larvae are voracious predators and can feed on any insect that is small enough. Larval lacewings are key predators and often provide good biological control of many pests. The next time you see a pecan tree or rose bush covered with honeydew (indicating an aphid infestation), look around for lacewing larvae on the leaves. the potato or tomato psyllid depending on which host it is infesting.

Level: Intermediate, Senior

Photo Credit: Winfield Sterling

Mantispid (Mantisfly)

Family: Mantispidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -Woodlots

Mantispids, or mantisflies, superficially resemble preying mantids because they have raptorial front legs. They can also resemble wasps and the wings are sometimes marked like a wasp. Some immature mantispids feed on spider egg masses.

Level: Senior

Neuroptera (Antlions, Lacewings, Mantipids, & Owlflies)

Owflies

Family: Mymeloentidae
Subfamily: Ascalaphidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host -At Lights

Owlflies are rather large insects and resemble dragonflies or damselflies. The long-clubbed antennae are key characters that separate this group from Odonata. The wing **venation** is also more like lacewings than dragonflies. The larvae do not dig pits like antlions but lie on the surface of the ground and wait for prey to move past.

Level: Senior

Coleoptera (Beetles)

Alfalfa Weevil

Hypera postica (Gyllenhal)
Family: Curculionidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host -Alfalfa

The alfalfa weevil is an important pest of alfalfa in most of the U. S. The larvae and adults feed directly on foliage and can reduce the yields.

Level: Senior

Blister Beetle

Family: Meloidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host -Plants, Alfalfa, Weeds

Blister beetles can cause blisters on skin if they walk on it because of a substance that they produce called **cantharidin**. This substance is very toxic, and a horse can be killed if it ingests two or more blister beetles. The toxin is still active even after the beetles die. There is more than one species of blister beetles that is striped in Texas. Blister beetles come in many colors including black, gray, yellow, and metallic blue. They can also have a variety of markings especially spots and stripes. They feed on a variety of plants, including alfalfa, weeds, and vegetables such as tomatoes.

Level: Junior, Intermediate, Senior

Coleoptera (Beetles)

Boll Weevil

Anthonomus grandis grandis (Boheman)

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Cotton

The boll weevil is a hard-shelled, grayish to brown, long- legged beetle. It is about 1/4 inch long with a slender snout, and two spurs on the inside of each front leg. Larvae are white crescent- shaped grubs found exclusively inside cotton fruit (squares and young bolls). Adults feed and lay eggs in cotton fruit, causing the plant to shed any damaged young fruit and damaging the fiber lint of older bolls. Boll weevils are not native to Texas and are arguably the most historically impactful pest on record. They feed naturally on wild cotton trees in Central America, but found cultivated cotton fields as an excellent host. Boll weevils were first discovered in south Texas in 1892 and quickly spread through the cotton growing regions. Through the late 20th century multiple local, regional, and national eradication programs targeting the weevil were enacted with good impacts. The current Texas “Boll Weevil Eradication Program” was started in the 1990’s and successfully eradicated boll weevils from all but the southern tip of Texas. The Boll Weevil Eradication Program remains active in control efforts, preventing the re-infestation of areas of cotton production and maintaining an observation system to detect any weevils moving into Texas.

Level: Intermediate, Senior

Carpet Beetles

Family: Dermestidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host -Wool carpets

Carpet beetle adults are small, mottled brown to solid black, oval-shaped beetles about 1/8 inch long. Larvae are carrot-shaped, hairy or bristly, brownish, and about 1/4 inch long. Larvae can damage textiles, even synthetic materials, but are particularly attracted to items high in protein such as wool, fur, felt, silk, feathers, and leather. Adults feed on pollen and are often found on window ledges indoors or outdoors on flowers in the early spring.

Level: Senior

Carrion Beetle

Family: Staphylinidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Dead animals

Carrion beetles are typically found in decaying animal carcasses. Some carrion beetles are very attractively colored and are beneficial by helping to break down animal carcasses.

Level: Senior

Coleoptera (Beetles)

Caterpillar Hunter
Family: Carabidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host -Woodland

The caterpillar hunter is one of the largest beetles of the ground beetle family in the US. They are active predators. They make attractive specimens because they are large and some species have green metallic coloration across their backs.

Level: Junior, Intermediate, Senior

Click Beetle
Family: Elateridae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host -Corn, field crops

Click beetles are generally brown or black in color. They are elongated and flattened and quite similar in shape. Many are rather small and under 1/2 inch in length while a few are over two inches long. The eyed click beetle, *Alaus oculatus*, and others of this genus have conspicuous eye spots on the pronotum. Click beetles get their name from the behavior they exhibit when placed on their back. They tense the body and thrust the pronotum downward with a sharp clicking sound. This action flips the beetle into the air for several inches and they usually land right side up after this maneuver. The click beetle genus *Pyrophorus* has eye spots that bioluminesce. The eye spots stay glowing for long periods and can be seen for over a hundred feet away on a dark night. The ability to bioluminesce is well known in the firefly family, Lampyridae, but is uncommon in other insect groups.

Level: Senior

Colorado Potato Beetle
Leptinotarsa decemlineata (Say)
Family: Chrysolmelidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Potatoes

The Colorado potato beetle has a convex body shape, is about 3/8 inch long and yellow and has five black stripes on each forewing. Larvae are red to yellow, humpbacked, and as long as 3/5 inch. Both adults and larvae feed on potato foliage

Level: Intermediate, Senior

Cottonwood Borer
Plectrodera scalator (Fabricius)
Family: Cerambycidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Cottonwood trees

Cottonwood borers are robust, large beetles about 1 1/4 inch long. The long antennae make them appear even larger. They are black and white in color but there is a lot of variation in the pattern with some specimens being almost entirely black. The larvae are wood borers that feed in cottonwood and willow. They generally infest trees that are weak or dying but sometimes attack trees that are quite healthy. Adults also feed on the same trees and can sometimes be found in large numbers near the base of a tree.

Level: Junior, Intermediate, Senior

Coleoptera (Beetles)

Elm Leaf Beetle

Xanthogaleruca luteola (Mueller)
Family: Chrysomelidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Elm trees

Elm leaf beetle adults are about 1/4 inch long, and yellow to brownish-green in body color, and marked with black spots on the head and thorax. They have broad black stripes following the outer **elytra** margins. Larvae grow to about ½ inch and are yellowish with black spots and broad stripes along the sides. Pupae are 1/4 inch long and are bright orange-yellow with scattered black bristles. This insect is a foliage-feeding pest on elms especially in the High Plains.

Level: Senior

Firefly (Lighteningbug)

Family: Lampyridae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing
Host - Weeds

Fireflies are well known for their nighttime light displays. The light-producing organs of these soft-bodied beetles are located in the yellowish-green areas on the undersurface of the abdomen. The production of light (bioluminescence) is found in relatively few other insect families.

Level: Junior, Intermediate, Senior

Flatheaded Borer (Metallic Wood Borer)

Family: Buprestidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Trees

Flatheaded borers are larvae of metallic wood borers. They range in length from 1/10 to over 1 1/4 inches. Larvae are called flat-headed borers because the thorax is flattened and the head retracted. They tunnel just below the bark of dead or dying wood, but some species are attracted to healthy trees and are considered pests. Many adults, especially the larger species, can be found on freshly cut wood. The smaller species can be collected on leaves in the sunlight or on flowers, they are especially active in the spring and are more common in small twigs with some being root borers. The smallest species are leaf miners in oaks, certain legumes and other plants. s larvae.

Level: Senior

Flea Beetle

Family: Chrysomelidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Weeds

Flea beetles range in size from minute to more than 1/4 inch long. Most are dark with a smooth, shiny surface. However, some are striped. Their hind legs are enlarged, enabling the beetles to jump vigorously when disturbed. They damage a wide range of vegetables, riddling the leaves with small holes.

Level: Senior

Coleoptera (Beetles)

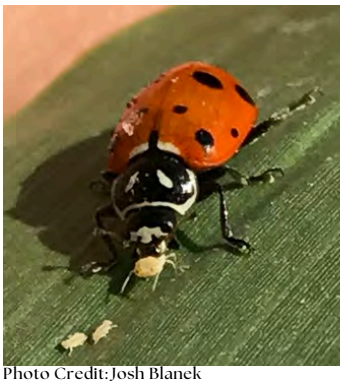


Photo Credit: Josh Blanek

Lady Beetle

Family: Coccinellidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host - Aphids

There are many species of lady beetles in Texas. The convergent lady beetle, *Hippodamia convergens* (Guérin-Méneville), is one of the most common and easily recognized species. It is called convergent because the white bars on the pronotum converge. Lady beetles are recognized as beneficial insects because both the adults and larvae feed on aphids and other small insects.

Level: Junior, Intermediate, Senior

Lesser Grain Borer

Rhyzopertha dominica (Fabricius)
Family: Bostrichidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host - Stored grain

The lesser grain borer both in the larval and adult stages is a serious pest of stored grain. The adult feeds on whole or cracked grain, and larvae develop inside kernels, destroying the internal contents. The adult is about 1/8 inch long and has powerful chewing mouthparts. Note how the head is turned down under the thorax, a distinguishing characteristic of many species in the family to which this insect belongs.

Level: Intermediate, Senior

Locust Borer

Megacyllene robiniae (Forster)
Family: Cerambycidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host - Black Locust Trees

Locust borer larvae feed in living black locust trees. Locust borers are a species of longhorn beetle. There are other similar beetles in the same genus with a wide range of variation in color and size. Long antennae and bright color patterns make these favorites for collectors.

Level: Senior

Maize Weevil (Rice Weevil)

Family: Curculionidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host - Stored grain

Th maize weevil (rice weevil) is a small weevil only a few millimeters long. It is a serious pests in stored grain especially corn and rice. Adults are dark brown to black in color with four lighter spots on the corners of the **elytra** (forewings). This weevil also has an elongated “snout”. The larva like most weevil grubs are more or less "C- shaped".

Level: Intermediate, Senior

Coleoptera (Beetles)

May Beetle
Family: Scarabaeidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Shrubs

May beetles in the genus *Phyllophaga* and *Cyclocephala* include over 200 species in the US. Identification to species is difficult and they can be very similar in appearance. Larvae feed on roots of grasses and other plants and some (but not all) species can cause damage in lawns and crops. Even though the genus name *Phyllophaga* means "leaf feeding" the adults do not cause damage very often. These common insects are easily collected under lights in the spring and early summer.

Level: Junior, Intermediate, Senior

Mealworm
Tenebrio molitor (Linnaeus)
Family: Tenebrionidae

Lifecycle - Holometabolous
Status - Variable
Mouthparts - Chewing
Host - Stored grain

Mealworms are pests of stored grain. However, this species is best known as a pet food for lizards, frogs, and snakes. The larvae are also used as fish bait. Because this insect is relatively easy to grow, it has been used in many experiments and scientific studies.

Level: Senior

Plum Curculio
Conotrachelus nenuphar (Herbst)
Family: Curculionidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Peaches

Plum curculio adults are weevils about 1/4 inch long with projections on the wing covers. Larvae are white C-shaped grubs which feed in fruit. They are a serious pest of peaches, but also feed on plums, apricots, and apples.

Level: Intermediate, Senior

Red Flour Beetle
Tribolium castaneum (Herbst)
Family: Tenebrionidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Stored grain

The red flour beetle is a shiny, reddish brown beetle about 1/7 inch long with antennae that have a 3-segmented club. It is a common pest of stored products. Both larvae and adults feed on starchy materials such as flour or cracked kernels of grain. Adults can fly, allowing them to spread from stored grain to homes and other structures, causing major nuisances.

Level: Senior

Coleoptera (Beetles)

Rove Beetle
Family: Staphylinidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing
Host - At lights, Pond

Rove beetles are a large family in terms of species. Most of them lead rather secret lives and are easily overlooked. They are most commonly found under bark, logs or rocks and at lights at night. Some superficially resemble earwigs because of the short elytra. The larvae and adults are generally considered to be predators or decaying organic matter feeders.

Level: Senior

Sawtoothed Grain Beetle
Oryzaephilus surinamensis (Linnaeus)
Family: Sylvanidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Stored grain

These small beetles are pests in food like cereal, corn meal, flour and other processed grains. They can enter your house in infested products from the grocery store or they could move in from the surrounding habitat. They get their name from the jagged saw-like edges on the pronotum of the adults.

Level: Senior

Soldier Beetle
Family: Cantharidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing
Host - Flowers

Some soldier beetles are common on flowers, where they feed on nectar and pollen. Most are **carnivorous**. They come in a variety of shapes and sizes. Some species can be confused with fireflies.

Level: Senior

Spotted Cucumber Beetle
Diabrotica undecimpunctata howardi (Barber)
Family: Chrysomelidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Cucurbits

Spotted cucumber beetle larvae are also known as the southern corn rootworm. Adults are yellowish or yellowish-green with 12 black spots on the back and are about 1/4 inch long. Adults are active and commonly found. A wide variety of plants are attacked by the larvae.

Level: Junior, Intermediate, Senior

Coleoptera (Beetles)

Sweetpotato Weevil

Cylas formicarius (Fabricius)

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing
Host - Sweet potatoes

Sweet potato weevil grubs are legless and white, with pale brown heads, and are as long as 1/3 inch. Adults are red and blue-black beetles, about 1/4 inch long, and have their snout projected forward. Eggs are laid on stem or sweet potato and larvae mine into tubers (potato) or vines, causing damage to the plant and making the sweet potato inedible.

Level: Intermediate, Senior

Tiger Beetle

Family: Carabidae*
Subfamily: Cicindelinae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host - Shady trails

Tiger beetles are fast, agile predators and are a challenge to collect. They are found often in sandy areas and along trails in wooded areas. They are one of the favorite groups for beetle collectors and some collectors specialize only in this group.
* Some authorities place the tiger beetles in a separate Family: called Cicindelidae.

Level: Junior, Intermediate, Senior

Tumbling Flower Beetle

Family: Mordellidae

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Chewing
Host - Flowers

Tumbling flower beetles can be very abundant on flowers especially those in the carrot family (Apiaceae) and aster family (Asteraceae). The larvae feed in stems and dead wood. Adults feed on pollen and can be pollinators. The pointed tip of the abdomen gives the family a second common name, the spine-tailed beetles. Their name comes from bouncing way they move to avoid predators.

Level: Senior

Water Scavenger Beetle

Family: Hydrophilidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Chewing
Host - Stream

Water scavenger beetles are found in a wide range of sizes and are generally brown or black in color. Adults usually feed on decaying organic matter. Llarvae are usually **predaceous**. To breathe, water scavenger beetles hold an air bubble on the undersurfaces of their bodies. These beetles come to the water surface head first.

Level: Senior

Coleoptera (Beetles)

Whirlygig Beetle

Family: Gyrinidae

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Chewing
Host - Stream , Pond

Whirligig beetles are found on ponds and streams. an congregate in large numbers and scurry about the water surface in a random pattern. When handled, these beetles give off an apple-like odor. Whirligig beetles are unique in that their **compound eyes** are divided, giving them a four-eyed appearance. This eye division allows them to see above and below the water surface at the same time.

Level: Senior

Mecoptera (Scorpionflies)

Scorpionfly

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Chewing
Host - Plants

Scorpionflies are attractive insects with patterned wings. They get the name scorpionfly since the male genitalia is held over the back of the abdomen in the typical defensive posture of scorpions. However, they are harmless and cannot sting. Females lack the conspicuous genitalia. They are predators and capture other insects as food using their legs.

Level: Intermediate, Senior

Siphonaptera (Fleas)

Fleas

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host - Cat, dog

Adult fleas are legendary for their jumping ability. The cat flea, *Ctenocephalides felis* (Bouché), is the most common flea pest of dogs and cats in Texas. Adults can be found on the pet and sometimes move to humans for a blood meal. Flea larvae are small, elongate, and thin. The larvae are found in the yard or around the pet bedding area and they feed on skin flakes, hair and other organic matter.

Level: Intermediate, Senior

Diptera (Flies)

Bee Fly
Family: Bombyliidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Flowers

Bee flies are commonly found on flowers. They are fuzzy bodied flies that feed on nectar. You can differentiate them from bees by counting wings (flies have 2, bees have 4).

Level: Senior

Black Flies (Buffalo Gnats)
Family: Simuliidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Biting & Lapping
Host - Stream

Buffalo gnats are small humpbacked biting flies. They are persistent biters and even crawl into the hair to bite the scalp. They use scissor like mouthparts to bite the skin and lap the blood. Bites are generally worse than mosquito bites and the bite can bleed long after the flyhas left. They are a nuisance and sometimes a serious pest of humans, pets, and livestock. The larvae are found in flowing water where they attach to rocks, sticks, and other structures and sift food from the water as it floats by. Adults are strong fliers so they can be found long distances from water.

Level: Senior

Blow Flies
Family: Calliphoridae

Lifecycle - Holometabolous
Status - Variable
Mouthparts - Sponging (Adults)
Host - Carrion

These flies are about the size of a house fly or a little larger, but many of them are brightly colored in green, blue or bronze. Adults arrive at a dead carcass where they lay eggs. **Maggots** feed on the dead flesh of the carcass with hook-like mouthparts that tease apart tissues. Most blow flies are **scavengers** and some of the larvae can also feed on excrement. A few species in this family have been reared under septic conditions and the larvae are used for treating certain diseases.

Level: Senior

Common Cattle Grub
Hypoderma lineatum (Villers)
Family: Oestridae

Lifecycle - Holometabolous
Status - Pest
Host - Cattle
Mouthparts - Chewing/Hook-like (larvae)

The common cattle grub or heel fly is a hairy fly that is 1/2 inch long, or about the size of a honey bee. The front, sides, and back of the head are covered with yellowish white hairs. Adult mouthparts are small (reduced) and nonfunctional. Larvae have hooks as mouthparts for tearing flesh. Larvae tunnel through the bodies of cattle and form lumps in the backs of the cattle before adult flies emerge.

Level: Intermediate, Senior

Diptera (Flies)

Photo Credit: Dhanushka Devarajan

Crane Flies
Family Tipulidae

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Reduced
Host - Meadow

There are literally thousands of species of crane flies in North America. They are conspicuously long legged and commonly attracted to lights. Larvae of crane flies generally grow in damp or wet habitats. Many people think that these are large mosquitoes, however, this is incorrect and they cannot bite.

Level: Junior, Intermediate, Senior

Deer Flies
Chrysops sp.
Family: Tabanidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Biting & Lapping
Host - Woodlands

Deer flies are biting flies of yellow black coloring. They have stripes on the abdomen and patterned wings. They are larger than a house fly but smaller than most horse flies. They can bite human, pets, and livestock. Larvae are large **maggots** usually in slow moving water where they feed on organic matter. Adult flies can be found around lakes and ponds. However, they are also a pest of livestock in rangeland where the adults like to roost in cedar trees. In Texas, they are sometimes called "cedar flies."

Level: Senior

Flesh Flies
Family: Sarcophagidae

Lifecycle - Holometabolous
Status - Variable

Mouthparts - Sponge-like (Adults)
Host - Carrion

These flies look much like a house fly and most are greyish with black stripes, but some have a red tip on the abdomen. Larvae usually feed on some sort of animal material with hook-like mouthparts they use to tear tissue. There are **scavengers** on dead animals, **parasites** of other insects, and a few are parasites of vertebrates.

Level: Senior

Horn Fly
Haematobia irritans (Linnaeus)
Family: Muscidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host - Cattle

The horn fly looks like the house fly but is only about half as large. Adults have piercing-sucking mouthparts and suck blood. Adults rest with their heads pointed downward on the backs of livestock. Larvae have hooks in their mouthparts and feed on cattle manure.

Level: Intermediate, Senior

Diptera (Flies)

Horse Fly

Tabanus sp.
Family: Tabanidae

Lifeycle - Holometabolous
Status - Pest

Mouthparts - Biting & Lapping
Host - Woodlands

Horse flies lap blood from livestock, using scissor-like mouthparts to cut skin. Some species are only 3/4 inch long. The common black horse fly attains a length of 1 1/4 to 1 1/2 inches. Horse flies are black to dark brown and have green or black large, **compound eyes**.

Level: Junior, Intermediate, Senior

House Fly

Musca domestics (Linnaeus)
Family: Muscidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Sponging
Host - Barn

House fly adults are 1/4 to 5/16 inch long. The top part of the thorax is dusty gray and contains four equally broad stripes running from front to back. The fourth wing vein makes a sharp bend to the outside and almost meets the third at the wing tip. Adults have sponging and sucking mouthparts, while larvae have hooks in their mouthparts for tearing.

Level: Junior, Intermediate, Senior

Mosquito

Family: Culicidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host - Yard, meadow

Mosquitoes are slender-bodied, long-legged insects, less than 1/2 inch long, with delicate wings fringed with scales. Males have bushy antennae. Mosquitoes have long, slender sucking mouthparts. Only adult females suck blood. Males feed on nectar.

Level: Junior, Intermediate, Senior

Robber Fly

Family: Asilidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Piercing & Sucking
Host - Woodlands

Robber flies are very common insects especially in the summer. They are active predators that catch insects on the wing. They often sit on a conspicuous perch and fly out to catch insects passing by. A few of the robber flies mimic bumble bees and wasps are very difficult to distinguish without a close inspection. Of course, they have only two wings like all flies while bees and wasps have four wings.
Robber flies also have a concave area on the top of the head between the eyes.

Level: Senior

Diptera (Flies)

Sheep Keds

Family: Hippoboscidae

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Piercing & Sucking
Host - Sheep

Sheep keds are wingless, even as adults, and have legs that are widely spread to the sides of the thorax. They feed on sheep, taking blood meals with piercing-sucking mouthparts. They can be found deep in the wool right next to the skin.

Level: Senior

Sorghum Midge

Contarinia sorghicola (Coquillet)
Family: Cecidomyiidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host - Sorghum

Sorghum midge adults are reddish and smaller than a sorghum seed. Their eggs are deposited in sorghum seed at the time that heads bloom. The larvae develop inside of and feed on sorghum seeds.

Level: Intermediate, Senior

Stable Fly

Stomoxys calcitrans (Linnaeus)
Family: Muscidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Piercing & Sucking
Host - Cattle

Stable fly adults are about 1/4 inch long and have grayish- colored bodies and piercing-sucking mouthparts. Except for a pointed, stiff, slender beak sticking out from under the head, a stable fly adult resembles a house fly. Seven dark, rounded spots are on the upper side of the abdomen. Larvae have hooks in their mouthparts and feed in manure.

Level: Senior

Syrphid Fly (Flower Fly, Hover Fly)

Family: Syrphidae

Lifecycle - Holometabolous
Status - Beneficial

Mouthparts - Sponging
Host - Flowers

Syrphid flies are sometimes called flower or hover flies. They are normally brightly colored in yellows and blacks. Many people mistake these for bees. Larvae of syrphid flies have hook-like mouthparts and occur in a variety of habitats. Many of them feed on aphids, some occur in sewage, and others occur in decaying wood.

Level: Junior, Intermediate, Senior

Trichoptera (Caddisflies)

Caddisflies

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Chewing (larvae)
Host - Near streams

Caddisflies are an important component of the aquatic insect community. Larvae live in water, especially flowing streams. Larvae look much like a caterpillar with few hairs. Some larvae make small cases to hide in made out of sticks, leaves, sand, or pebbles. However, some larvae do not make any case at all. They feed on organic matter on the bottom of the stream. Adults are alive for only a day or two, do not feed and are attracted to lights at night. The adults look like small moths with long antennae and most of them are drab brown or gray.

Level: Intermediate, Senior

Lepidoptera (Butterflies, Moths, Skippers)

Be able to identify with wings closed and spread

Alfalfa Caterpillar (Orange Sulfur, Alfalfa Butterfly)

Colias eurytheme (Boisduval)
Family: Pieridae

Lifecycle - Holometabolous
Status - Pest
Host - Alfalfa

Mouthparts - Siphoning (adult)
Chewing (larvae)

The larvae of this species is referred to as the alfalfa caterpillar and adult as the orange sulfur or alfalfa butterfly. The alfalfa caterpillar is a representative in a group of butterflies known as yellows or sulphurs. The alfalfa caterpillar has at least two-color forms as an adult, one yellow and one nearly white. Intermediates between these colors also occur. Alfalfa caterpillars can become exceedingly numerous in alfalfa and are sometimes pests of that crop.

Level: Intermediate, Senior

Armyworm

Mythimna unipuncta (Haworth)
Family: Noctuidae

Lifecycle - Holometabolous
Status - Pest
Host - Grasses

Mouthparts - Siphoning (adult)
Chewing (larvae)

Armyworm moths are a medium gray in color. They are distinguished by a single small white spot which always occurs in the front wing. Armyworm larvae are dark green to greenish-brown with three stripes on each side: first a pale orange white-bordered stripe, next a dark brown almost blackish stripe, and below another pale orange stripe edged with white on the upper side. They are about 1 1/2 inches long when full grown. Armyworm larvae prefer grasses, corn and small grains.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Bagworm
Family: Psychidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Trees

Bagworms are brownish, rather fat-bodied worms which live within tough silken bags. The bags, when full grown, are up to 2 inches long and hang from leaves and twigs of the trees they attack. There are multiple species of bagworms, this particular species attacks trees which they attack. Species in this family feed on oaks, junipers, elms and various other trees. The species *Thyridopteryz ephemeraiformis* is well known in Texas, attacking junipers.

Level: Intermediate, Senior

Female

Black Swallowtail
Papilio polyxenes asterius (Stoll)
Family: Papilionidae

Lifecycle - Holometabolous
Status - Beneficial (adult)
Host - Carrot family
Mouthparts - Siphoning (adult)
Chewing (larvae)

Larvae of the black swallowtail feed on celery, carrots, parsley and dill. These caterpillars are yellow with black stripes across the back. Adults are pollinators of nectar producing, flowering plants. Males are black with a yellow band across the fore and hind wing. Females are black with a blue band across the hind wing and yellow spotting on the forewing.

Level: Junior, Intermediate, Senior

Bollworm (Corn Earworm)
Helicoverpa zea (Boddie)
Family: Noctuidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Cotton, corn, others

Bollworm larvae can feed on over 250 plant species. It is a pest on cotton, corn, tomatoes, sorghum, soybeans, and other crops.. Adult moths are attracted to lights at night. This is one of the worst pests in cotton. There are artificial pheromone traps that are used to trap male moths to monitor their populations.

Level: Junior, Intermediate, Senior

Buckeye
Junonia coenia (Hubner)
Family: Nymphalidae

Lifecycle - Holometabolous
Status - Inconsequential
Host - Plantain Family, snapdragons
Mouthparts - Siphoning (adult)
Chewing (larvae)

The buckeye is a widely distributed butterfly and the larvae feed on plants in the plantain family, Plantaginaceae such as snapdragons and foxglove. The eye spots on the upper surface of the wings are one of the conspicuous characteristics of the buckeye.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Cabbage Butterflies
Pieris rapae (Linnaeus)
Family: Pieridae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Cole crops

The cabbage butterfly, is the common white butterfly found throughout most of the eastern US. The larvae of this species is a pest when it feeds on cabbage, broccoli, and related crops but it also feeds on many wild host plants. There are several other white butterflies that also share the name as cabbage butterflies.

Level: Senior

Cabbage Looper
Trichoplusia ni (Hubner)
Family: Noctuidae

Lifecycle - Holometabolous
Status - Pest
Host - Generalist feeder
Mouthparts - Siphoning (adults)
Chewing (larvae)

The cabbage looper is a green caterpillar with white stripes down the back. They have only three pairs of fleshy prolegs (legs on the abdomen) and loop when crawling. They grow to 1 1/4 inches long. Caterpillars have a wide range of hosts that include broccoli, cabbage and cauliflower. Adults are brown moths with siphoning mouthparts.

Level: Intermediate, Senior

Photo Credit: Hayat Qurunful

Cecropia
Hyalophora cecropia (Linnaeus)
Family: Saturniidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing (larvae)
Host - Oak

The cecropia moth is one of our largest moths. This reddish charcoal moth can typically be found in wooded areas in the spring and summer. Male moths have feathery antennae and are strongly attracted to unmated females. The huge larvae feed on leaves of various broad- leafed trees. Adults do not have functioning mouthparts.

Level: Senior

Cutworms
Family: Noctuidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Grass, plants

The cutworms are a group of Noctuidae that share the habit of hiding in the soil and usually feed on plants near the soil. A few of the species also climb plants to feed. The adults are typically drab moths usually colored from nearly black to gray or brown. The larvae are typically grey, brown, or green with short hairs and few markings. Often the damage is seen much easier than the caterpillars.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Fall Armyworm
Spodoptera frugiperda (Smith)
Family: Noctuidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Grasses

Fall armyworm larvae are tan or green to nearly black caterpillars with three very thin yellow lines down the back and a wider one on each side. Prominent white markings form an upside-down Y on the front of the head readily distinguishing it from other armyworms. Full-grown larvae may attain a length of 1 to 1 1/2 inches.

Level: Junior, Intermediate, Senior

Fall Webworm
Hyphantria cunea (Drury)
Family: Erebidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Trees

The fall webworm makes webs in pecan and other trees. Larvae reside inside in a mass within the web. These larvae are very hairy, pale-yellow caterpillars with black spots about 1 inch long when full grown. Adult moths are medium sized and generally white with black markings. The markings are quite variable and some moths will be heavily marked. Several generations occur each year.

Level: Senior

Forest Tent Caterpillar
Melacosoma disstria (Hubér)
Family: Lasciocampidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Broad-leafed trees

Despite the name, the forest tent caterpillar does not make a tent. This species is common and widespread for a few weeks in the spring when it feeds on many species of broad-leaved trees, especially elms and oaks. Caterpillars can be identified by a series of white key-hole shaped markings with one per segment down the back. The adults are rather drab, fuzzy moths that are only out for a few weeks in late spring or early summer. The eastern tent caterpillar, *Malacosoma americanum*, makes a tent where branches meet and feeds mostly on peaches, plums, cherries, and hawthorns. The caterpillars have a single white dash on each segment of the back.

Level: Senior

Giant Swallowtail
Papilio cresphontes (Cramer)
Family: Pompilidae

Lifecycle - Holometabolous
Status - Beneficial
Host - Citrus
Mouthparts - Siphoning (adult)
Chewing (larvae)

The giant swallowtail is the largest butterfly in North America. It is easily recognized by the conspicuous yellow pattern on a black background. Adults are pollinators of nectar producing, flowering plants. Larvae feed on citrus and are called orange dogs. Caterpillars in the north feed on other plants such as prickly ash.

Level: Intermediate, Senior

Lepidoptera (Butterflies, Moths, Skippers)

Gray Hairstreak (Cotton Square Borer)
Strymon melinus (Hubner)
Family: Lycinidae

Lifecycle - Holometabolous
Status - Pest
Host - Cotton

Mouthparts - Siphoning (adult
Chewing (larvae)

The gray hair streak is an attractive little butterfly with minute tails on its hind wings, although these tails are often broken off. Larvae of the gray hair streak are known as cotton square borers and attack cotton squares and hibiscus buds.

Level: Junior, Intermediate, Senior

Photo Credit: Ian Scarr

Great Leopard Moth
Hypercompe scribonia (Stoll)
Family: Arctiidae

Lifecycle - Holometabolous
Status - Inconsequential

Mouthparts - Chewing (larvae)
Host - Variety of plants

This moth can be quite common under lights in some years. Adults do not have fully formed mouthparts. Larvae feed on a wide variety of plants such as deciduous trees, shurbs, wildflowers and garden plants. The fuzzy caterpillars are often seen migrating across roads. They have black hairs with a pink body underside. There is confusion with the common name "leopard moth" which is also used for a moth in the carpenter moth family, Cossidae.

Level: Senior

Greater Wax Moth
Galleria mellonella (Linnaeus)
Family: Pyralidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing (larvae)
Host - Honey bee hives

The greater wax moth is a pest in beehives. Caterpillars of this species tunnel through the comb, feeding on wax, honey and pollen. They are not usually a problem in healthy hives. However, if not controlled, they can be extremely damaging to weakened hives or to combs placed in storage.

Level: Intermediate, Senior

Indian Meal Moth
Plodia interpunctella (Hubner)
Family: Pyralidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing (larvae)
Host - Stored Grain

The Indianmeal moth is a common stored product pest. Adults often appear to have the front wing very dark. In some specimens most of the dark wing scales are lost and they appear very light in color. There are actually several species of caterpillars that feed on grain products, nuts, dried fruit and other foods. Caterpillars in this group have few hairs and usually spin webbing in the food where they feed.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Io Moth

Automeris io (Fabricius)
Family: Saturniidae

Lifecycle - Holometabolous
Status- Inconsequential
Mouthparts - Chewing (larvae)
Host - Trees, Corn

Io moths are smaller than most silk moths with a wingspan of only 2 to 3 inches. They also have large eye spots on the hind wings. Io moths are yellow in color with females being darker colored than males. The larvae have clusters of hairs on conspicuous raised areas on each segment. These hairs can be very irritating to humans. Larvae occasionally attack corn and roses in large numbers.

Level: Senior

Luna Moth

Actias luna (Linnaeus)
Family: Saturniidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing (larvae)
Host - Oak

The luna moth is a very elegant looking silk moth. Adults are often green in color with long “tails” extending from the hindwing. Larvae feed on trees such as oak, sweet gum, hickory, walnut and persimmon. Some individuals will show darker colorations tending toward purple.

Level: Junior, Intermediate, Senior

Monarch

Danaeus plēxíppus (Linnaeus)
Family: Nymphalidae

Lifecycle - Holometabolous
Status - Beneficial
Host - Milkweed
Mouthparts - Siphoning (adult)
Chewing (larvae)

The monarch is a very attractive orangish-brown and black butterfly. Larvae of this butterfly incorporate a toxin into their body from feeding on milkweed which makes them taste bad to birds and other predators. The orange and black color pattern is a warning to predators indicating that the butterfly tastes bad. Monarchs migrate north in the spring and the following generation(s) migrate south in the fall. They **overwinter** in Mexico. Monarchs are the Texas State Butterfly.

Level: Junior, Intermediate, Senior

Lepidoptera (Butterflies, Moths, Skippers)

Mourningcloak Butterfly

Nymphalis antiopa (Linnaeus)
Family: Arctiidae

Lifecycle - Holometabolous
Status - Inconsequential
Host - Willow

Mouthparts - Siphoning (adult)
Chewing (larvae)

Mourningcloak butterflies are one of the few butterflies that **overwinter** as adults. Consequently, they can be found early in the season before most butterflies are on the wing. They get their name because the drab black color of the wings appears like a cloak that was used to cover a casket or was worn by the mourners, in past times.

Level: Senior

Photo Credit: Joseph Berger, Bugwood.org

Peachtree Borer

Synanthedon exitiosa (Say)
Family: Sesiidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing (larvae)
Host - Peach Trees

Peachtree borer adults are moths. Females are blue-black with clear hind wings and an orange crossband on the abdomen.
Adult male moths have wings nearly clear and several narrow yellow bands across the abdomen. Larvae are about 1 inch in length, are whitish in color with a dark brown head and have a plate behind the head. Larvae tunnel in trunks of peach trees and produce a mass of **frass** in the process.

Level: Senior

Photo Credit: Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org

Pecan Nut Casebearer

Acrobasis nuxvorella (Neunzig)
Family: Pyralidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing (larvae)
Host - Pecans

The pecan nut casebearer is an important pest of pecans. The adult moth has a siphoning mouth tube. Larvae have chewing mouthparts. Several generations occur each year. The first generation is usually the most damaging in pecans since it damages terminal growth as nuts are first formed.

Level: Intermediate, Senior

Pink Bollworm

Pectonophora gossypiella (Saunders)
Family: Gelechiidae

Lifecycle - Holometabolous
Status - Pest

Mouthparts - Chewing (larvae)
Host - Cotton

Pink bollworm are pinkish-white, brown-headed caterpillars up to 1/2 inch long and are found in cotton bolls. They are easily distinguished from boll weevil grubs by having 8 pairs of legs and prolegs.

Level: Intermediate, Senior

Lepidoptera (Butterflies, Moths, Skippers)

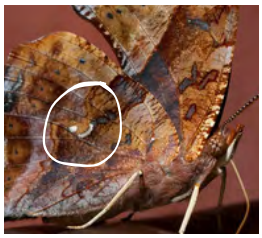
Polyphemus

Antheraea polyphemus (Cramer)
Family: Saturniidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing (larvae)
Host - Oaks

The polyphemus is another one of the giant silk moths. It is generally a medium brown color with conspicuous eye spots in the wings. The larvae feed on various broad-leafed trees. They usually form pupae on the ground where they roll leaves into a cocoon. Adults do not have fully functioning mouthparts.

Level: Junior, Intermediate, Senior



Question Mark

Polygonia interrogationis (Fabricius)
Family: Nymphalidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Siphoning (adult) Chewing (larvae)
Host - Nettles, Elms

The question mark has a pair of silver spots on the lower surface of the hind wing. This is quite conspicuous against the leaf brown pattern of the hind wing. Its name is derived from the similarity of these silver spots to the form of a question mark. There are several closely related species to the question mark and care must be taken in their identification.

Level: Senior

Red Admiral

Vanessa atalanta rubria (Fruhstorfer)
Family: Nymphalidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Siphoning (adult) Chewing (larvae)
Host - Nettle

The red admiral occurs across the northern hemisphere. The larvae feed on nettles and male adults are known to be territorial, defending a particular nettle patch against other males. Adults are pollinators of nectar producing, flowering plants.

Level: Junior, Intermediate, Senior

Saltmarsh Caterpillar

Plodia interpunctella (Hubner)
Family: Pyralidae

Lifecycle - Holometabolous
Status - Variable
Mouthparts - Chewing (larvae)
Host - Grasses, weeds

Saltmarsh caterpillar adult males and females differ. Females have white hind wings and males (pictured here) have yellow hind wings. The caterpillars have a very fuzzy appearance and attack a wide variety of plants including cotton. It is a sporadic pests that rarely requires management.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Silverspotted Skipper

Epargyreus clārus (Cramer)
Family: Hesperiidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Siphoning (adult) Chewing (larvae)
Host - Black locust tree

The silverspotted skipper is one of our larger skippers. Its name comes from the large silver spots that are visible on the underside of its hindwings. Skippers form an intermediate group between butterflies and moths. They are more thick-bodied than typical butterflies, yet resemble butterflies in other ways such as in being active during the day. The antennae of most skippers are hooked. The name skipper comes from the characteristic fast and bouncy flight of these butterflies.

Level: Intermediate, Senior

Sorghum Webworm

Nolā cereellā (Riley)
Family: Nolidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Sorghum

Sorghum webworm larvae attack grain sorghum heads. The larvae are greenish-yellow to tan with four darker stripes down the back and are covered with closely spaced hairs and spines. The older larvae are about 1/2 inch long and have chewing mouthparts with which they consume the developing grain.

Level: Senior

Southwestern Corn Borer

Diatraea grandiosellā (Dyar)
Family: Cramidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (larvae)
Host - Grain Crops

The southwestern corn borer is an important pest of corn especially in the High Plains. This pest often borers into corn stalks causing yield loss or lodging (falling over) of the corn plants. The adult is a whitish moth. 4-Hers should know larval and adult forms.

Level: Senior

Eastern Tiger Swallowtail

Papilio glaucus (Linnaeus)
Family: Papilionidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing (larvae)
Host - Cherry, trees

The eastern tiger swallowtail is nearly as large as the giant swallowtail. The yellow background with black stripes are the obvious reason for their name. Some females are black and can be mistaken for black swallowtails. Adults are pollinators of nectar producing, flowering plants.

Level: Senior

Lepidoptera (Butterflies, Moths, Skippers)

Tomato Hornworm

Manduca quinquemaculāta (Haworth)
Family: Sphingidae

Lifecycle - Holometabolous
Mouthparts - Siphoning (adult) Chewing (larvae)
Status - Pest
Host - Tomatoes

Tomato hornworms are large (some as long as 4 inches), green caterpillars with diagonal white bars on the sides and a slender horn at the end of the body. Adults have long, sucking tubes for mouthparts, while larvae have chewing mouthparts. Larvae and adults often are confused with the tobacco hornworm which it closely resembles. The tobacco hornworm feeds on the same plants and sometimes is more common than the tomato hornworm. Adult tomato hornworms have a spindle shaped body with five yellow-orange markings along each side of the abdomen.

Level: Intermediate, Senior

Underwing Moth

Family: Erebidae

Lifecycle - Holometabolous
Mouthparts - Siphoning (adult) Chewing (larvae)
Status - Inconsequential
Host - Trees

Underwing moths include a wide variety and large number of species. The forewings of underwing moths are generally dull colored and form effective camouflage while they are at rest. The hind wings are conspicuously marked, normally with a yellow or red and black pattern. Some species have black, or black and white hindwings. Larvae normally feed on trees and are common on walnut and hickory. Species identification of underwing moths should not be attempted by anyone except experts in this group.

Level: Junior, Intermediate, Senior

Viceroy

Limenitis archippus (Cramer)
Family: Nymphalidae

Lifecycle - Holometabolous
Mouthparts - Siphoning (adult)
Status - Inconsequential
Host - Poplar

The viceroy closely resembles the monarch butterfly. This relationship of resemblance is known as Mullerian mimicry. When different species of butterflies that look similar and taste bad, they all benefit by having predators avoid eating them. Viceroys are distinguished from monarchs by their smaller size and an additional black line across the hind wing. Viceroys usually have a single row of white dots on the outer margin of the wing and monarchs typically have a double row.

Level: Senior

Wood Nymph

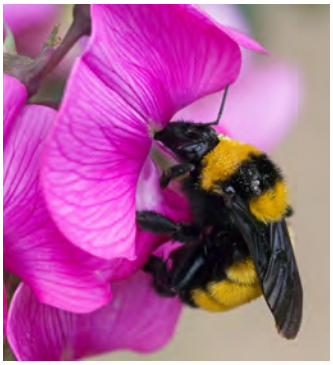
Family: Nymphalidae

Lifecycle - Holometabolous
Mouthparts - Siphoning (adult)
Status - Inconsequential
Host - Thick Woods

There are many species of wood nymphs in the United States. They are all basically brown and have some form of eye spot on their wings.

Level: Junior, Intermediate, Senior

Hymenoptera (Ants, Bees, Wasps, Sawflies & Horntails)



Bumble Bee
Bombus spp.
Family: Apidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Lapping (adult)
Host - Meadow

Bumble bees have a hairy or fuzzy thorax and abdomen black and yellow. They nest in the ground or hollow trees and stumps, making colonies of up to a few hundred individuals. Bumble bees are important pollinators of many native plants and vegetables.

Level: Junior, Intermediate, Senior

Carpenter Bee
Xylocopa spp.
Family: Apidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing (adult)
Host - Fence posts

Carpenter bees resemble bumble bees but can be distinguished by the shiny surface on the top of the abdomen. They nests in hollows of wood and sometimes excavate into cedar and other wood used in buildings.

Level: Senior

Cicada Killer
Sphecius spp.
Family: Crabronidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Soil

Cicada killers are a soil-nesting wasp. It is very large with a reddish-brown thorax and a yellow and black abdomen. This beneficial insect captures cicadas and carries them to a nest where they are fed upon by the wasp larvae.

Level: Junior, Intermediate, Senior

Honey Bee
Apis mellifera (Linnaeus)
Family: Apidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Lapping
Host - Flowers

Honey bees are about ½ inch long, yellow and black in color with fuzzy bodies. They are social insects that live in colonies called hives, with a single queen and tens of thousands of female workers. The honey bee is extremely valuable for its pollination of crops, but also produces wax and honey.

Level: Junior, Intermediate, Senior

Hymenoptera (Ants, Bees, Wasps, Sawflies & Horntails)

Horntails
Family: Siricidae

Lifecycle - Holometabolous
Status - Variable
Mouthparts - Chewing
Host - Logs

Horntails are an unusual because their biology is not typical of most Hymenoptera. Larvae feed in dead logs much like wood- boring beetle larvae. Adults resemble wasps but they have a broadly joined waist and therefore a cylindrical body, placing them in the suborder Symphyta. Most other Hymenopterans have a thin waist, placing them in the suborder Apocrita. Adults are often found **ovipositing** (laying eggs) on logs. Some species are known to be pests in pines.

Level: Senior

Ichneumon Wasp
Family: Ichneumonidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Flowers (adults)

Ichneumon wasps are very common but easily overlooked. They range in size from about 1/4 inch to over an inch. They come in many colors but often are black with yellow markings or brown. They can often be found around light at night or near wood piles where they are searching for borers that they use as food for their larvae. Adults feed on sap or nectar. They are **parasitic** wasps that sting prey and leave eggs in the prey. Larvae develop inside the host and emerge later. Ichneumon wasps have a cell in their front wing that looks like a witch's hat (or the sorting hat from Harry Potter).

Level: Senior

Leaf-cutting Bees
Family: Megachilidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Flowers

Leaf-cutting bees are generally beneficial because they aid in pollination. However, they can cause minor damage to plants (particularly roses) by cutting oval or circular holes in the leaves. They use the leaf cuttings to line their nests, which are constructed in soil, rotten wood, hollow stems, or other cavities. They are solitary bees and do not live in colonies.

Level: Senior

Mud Daubers
Family: Sphecidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Buildings

Mud daubers build their nests with mud, which they may carry for a considerable distance. Mud nests are formed on various surfaces, such as buildings, and can become a nuisance or distraction in some areas. Adult mud daubers are about ¾ of an inch long, various colors, and have a thin, threadlike waist.

Level: Junior, Intermediate, Senior

Photo Credit: Joe White

Paper Wasps

Polistes spp.
Family: Vespidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Houses

Paper wasps are 3/4 to 1 inch long, slender, narrow-waisted wasps. Body coloration varies with species from brown and yellow or reddish brown. Paper wasps are semi-social insects, building nests of hexagonal cells with wood fiber. Nests are facing down and suspended by a single filament. While generally considered pests, they are beneficial predators of many insects, such as caterpillars.

Level: Junior, Intermediate, Senior

Red Harvester Ant

Pogonomyrmex barbatus (Smith)
Family: Formicidae

Lifecycle - Holometabolous
Status - Inconsequential
Mouthparts - Chewing
Host - Pastures

Red harvester ants are reddish-brown and 1/4 to 1/2 inch long. They have two nodes on their **petiole** and a row of hairs under their mandibles. They build nests which are clear of vegetation and typically covered with small gravel near the entrance hole at the center. These ants may sting if disturbed. They forage around the mound for seeds. They are considered a major food source for the Texas Horned Lizard.

Level: Junior, Intermediate, Senior

Red Imported Fire Ant

Solenopsis invicta (Buren)
Family: Formicidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Pastures, lawns

The red imported fire ant is well known to most Texas at least in the eastern and southern parts of the state. These ants have two nodes, a reddish-brown head and thorax, and a black abdomen with a stinger. The antennae end in a 2 segmented club.

Level: Junior, Intermediate, Senior

Sawflies

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Plants

One can tell the difference between adult sawflies and most other Hymenopterans by the fact that sawflies have a very broad connection between the abdomen and thorax (placing them in the suborder Symphta). Larvae look very much like caterpillars, and this is uncommon in the Hymenoptera. Sawflies occasionally become quite numerous and can cause significant damage to forests and horticultural plants.

Level: Senior

Tarantula Hawk
Family: Pompilidae

Lifecycle - Holometabolous
Status - Beneficial
Mouthparts - Chewing
Host - Woodlands

Tarantula hawks some of the largest species of wasps in Texas. They sting tarantulas, bury them in holes in the ground and lay eggs on them. The larvae of the wasp then feeds on the provided tarantula. These large wasps are bright metallic blue-black in color with reddish-brown wings. They are generally harmless to humans because they seldom sting. However, they can be provoked to sting.

Level: Senior

Texas Leafcutting Ant
Atta texana (Buckley)
Family: Formicidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Woodlands

Texas leafcutting ant is also known as the town ant or cut ant. They are reddish-brown in color with spines on their head and thorax. The workers come in different sizes. They form large colonies with numerous entry holes preferring sandy soils in East and South Texas. They carry foliage from trees back to the colony to grow fungus on which they feed their young.

Level: Senior

Velvet Ant
Family: Mutilidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Soil

Velvet ants are actually wasps. Females are wingless and shaped like ants but are hairy or fuzzy. They are usually red, orange, yellow or white with black. One of the larger species is called the "cow killer" because of the severe sting they give, but they do not kill cows. Males of this group are winged and fly slowly over grass or weeds in search of a female to mate with. Females crawl rapidly on the ground and attack nests of other ground dwelling insects.

Level: Junior, Intermediate, Senior

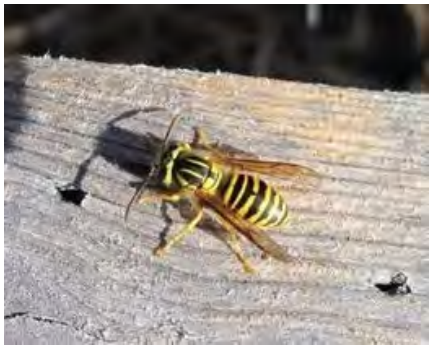


Photo Credit: Gary Johnson

Yellow Jackets
Family: Vespidae

Lifecycle - Holometabolous
Status - Pest
Mouthparts - Chewing
Host - Ground nests

The name yellowjacket causes confusion because it is sometimes applied to any yellow and black wasp. Yellowjackets typically nest in the ground but they may nest in trees or structures. They collect caterpillars and other insects as a protein source for their larvae. They also forage for sweet substances like fruit and nectar. Their sting is painful. Adults are yellow and black in color and create enclosed paper nests out of chewed wood fiber.

Level: Junior, Intermediate, Senior

Class Arachnida, Subclass Acari (Ticks, Mites, Chiggers)

Brown Dog Tick

Rhipicephalus sanguineus (Latreille)
Family: Ixodidae

Mouthparts - Piercing & Sucking Status - Pest
Host - Dog

The brown dog tick is a pest primarily on pets. They can build up in big numbers especially in kennels and other areas where pets are confined. These ticks are light to dark brown in color with no noticeable markings. They have a hard shield on their back called a **scutum**, which classifies them as hard ticks.

Level: Senior

Lone Star Tick

Amblyomma americanum (Linnaeus)
Family: Ixodidae

Mouthparts - Piercing & Sucking Status - Pest
Host - Cattle

Female lone star ticks are reddish-brown with a white spot on the back. This tick species is a member of the hard tick family because it has a shield- shaped plate (**scutum**) on its back. Piercing-sucking mouthparts help this pest take blood from the host. Ticks that take in a lot of blood enlarge and are called engorged.

Level: Junior, Intermediate, Senior

Spider Mites

Family: Tetranychidae

Mouthparts - Piercing & Sucking Status - Pest
Host - Plants

Spider mites are sometimes called red spiders. They are pale-greenish to reddish in color, are soft-bodied and get up to about 1/60 inch long. They are six-legged in the immature stages and eight-legged as adults. Piercing-sucking mouthparts are often used to feed on plant tissues. Some species of spiders mites are predatory. Mites cannot be identified to species without very high power microscopes and special preparation of specimens (slide-mounted)

Level: Intermediate, Senior

Class Arachnida, Order Araneae (Spiders)

Crab Spiders

Family: Thomisidae

Mouthparts - Chelicerae
Host - Flowers

Status - Beneficial

Crab spiders have the first two pairs of legs projecting forward. This gives them a crab-like appearance and thus the name. Some crab spiders are yellow or white and sit up on flowers where they wait for prey. Other species are dull colored and are commonly found under bark.

Level: Intermediate, Senior

Jumping Spiders

Family: Salticidae

Mouthparts - Chelicerae
Host - Garden

Status - Beneficial

Jumping spiders have large eyes and usually a chunky, fuzzy body. They come in many colors from black and grey to bright red with many having a distinct color pattern. Some species mimic ants and are difficult to tell from them at a glance. Jumping spiders are very active hunters during the day. Their excellent eyesight is used for stalking prey. Before pouncing on a victim, jumping spiders attach a line of silk from which they can dangle if they fall.

Level: Senior

Recluse Spider

Loxosceles spp.
Family: Sicariidae

Mouthparts - Chelicerae
Host - Board Piles

Status - Pest

Recluse spiders live in undisturbed areas. The body of an adult is 3/10 to 1/2 inch long, but much larger if legs are included. Adults have a violin-shaped spot on the **cephalothorax** (head and thorax combined) and six pairs of eyes on the front of the cephalothorax. The bite can result in a severe wound that may require two months to heal. Usually, the internal reaction to a bite is less severe than is the reaction to the bite of a black widow spider. The brown recluse spider, *Loxosceles reclusa,* is the species that is often mentioned. However, there are about six species in Texas and they are difficult to distinguish.

Level: Intermediate, Senior

Tarantulas

Aphonopelma spp.
Family: Theraphosidae

Mouthparts - Piercing
Host - Soil

Status - Beneficial

Tarantulas are widespread throughout Texas and are our largest spiders. Most of our species are in the genus *Aphonopelma*. They inhabit burrows, usually excavating it themselves. They spend most of the day in the burrow and move out at night to hunt. They line the burrow with webbing and extend the webbing out on the soil surface. The extended web is used to sense prey that is walking by.

Level: Senior

Photo Credit: Leigh Redwine

Widow Spider

Latrodectus spp.
Family: Theriidae

Mouthparts - Chelicerae
Host - Woodlots
Status - Pest

Widow spiders are shy, secretive and found in seldom- disturbed areas. Mature females have a characteristic hourglass- shaped, reddish-orange marking on the underside of the abdomen. However, there are four species of this genus in Texas and the markings on the abdomen can be highly variable. It is often difficult to distinguish between the species. Not all species are all black and males and juveniles can have red, green, white or other colored markings. Widow spiders are **predaceous**, devouring small arthropods trapped in their irregular cobwebs. Their bite is relatively painless, but may be followed in about an hour by intense pain and swelling. The venom causes nausea, cramps, lack of coordination, and difficulty breathing by interference in nervous functions. Death is rare but has occurred in individuals hypersensitive to the venom.

Level: Junior, Intermediate, Senior

Wolf Spiders

Family: Lycosidae

Mouthparts - Chelicerae
Host - Under rocks
Status - Beneficial

Wolf spiders are brown to grey in color, often with various markings on the body. They are usually active at night. They capture prey by actively hunting rather than by waiting in a web. One common species is *Rabidosa rabida* (Walckenaer) which is marked with chevrons (sergeant stripes) down the back.

Level: Junior, Intermediate, Senior

Yellow Garden Spider

Argiope aurantia (Lucas)
Family: Araneidae

Mouthparts - Chelicerae
Host - Garden
Status - Beneficial

The yellow garden spider or black-and-yellow argiope is a particularly attractive and large species of orb-weaving spider. It is also known as the yellow garden orb-weaver and the "writing spider". This spider has a white **cephalothorax** yellow abdomen with black markings, and black and yellow legs. Orb weaver spiders are some of our more conspicuous spiders. Many people think of a typical orb weaver web when they think of a spider.

Level: Junior, Intermediate, Senior

Class Arachnida, Order Opiliones (Harvestmen)

Harvestmen

Mouthparts - Chelicerae
Host - Caves

Status - Inconsequential

Harvestmen are also often called Daddy-Longlegs. Some species are found in caves. They have a rounded body with long, slender legs. Most species in this group are predacious or plant feeders. There is an urban legend that daddy long legs are venomous but their mouthparts are too small to inject venom, however, this is untrue.

Level: Intermediate, Senior

Class Arachnida, Order Scorpiones (Scorpions)

Scorpions

Mouthparts - Chelicerae
Host - Log piles

Status - Pest

Scorpions are arachnids, however, they are usually included in entomology. They are important because of their painful sting. Texas species rarely cause problems when they sting except in young children or those hypersensitive to their venom. The striped bark scorpion, *Centruroides vittatus* (Say), occurs throughout the state and is the only scorpion in the eastern half of Texas. Scorpions have 8 legs, “claws” or “pinchers” on the front of the body, and a long tail with a stinger at the tip.

Level: Junior, Intermediate, Senior

Class Arachnida, Order Thelyphonida (Vinegaroons)

Photo Credit: Salvador Vitanza

Vinegaroons

Mastigoproctus giganteus (Lucas)

Mouthparts - Chelicerae
Host - Arid regions

Status - Inconsequential

Vinegaroons are large arachnids of 40 to 80 mm in length. They have forward projecting mouthparts enlarged and formed into pinchers. They are predators with forward projecting claws. They are called vinegaroons because they can emit acetic acid (a main component of vinegar) from the base of the tail, as defense against predators. They are also called whip-scorpions because of the thin tail. They do not sting. Vinegaroons are found only in the western parts of Texas.

Level: Senior

Class Arachnida, Order Solifugae (Sunspiders)

Photo Credit: Bill Hauser

Sunspider (Windscorpion, Camelspider)

Mouthparts - Chelicerae
Host - Arid regions

Status - Inconsequential

Sunspiders are also known as camelspiders and windscorpions. They can run very fast - "like the wind" - which is the source for the common name. Sun spiders are found primarily in drier parts of the state. They have strong jaws that protrude forward that are used to capture and tear apart their prey.

Level: Intermediate, Senior

Class Chilopoda (Centipedes)

Photo Credit: Salvador Vitanza

Centipedes

Mouthparts: Chewing and Sucking Status - Inconsequential
Host - Ground

Centipedes have elongated, worm-like bodies and a pair of antennae. They have one pair of legs per body segment and a pair of appendages on the end of the abdomen that mimic stingers and lure prey to the head. They are fast moving predators and usually active at night. They are typically flattened from top-to-bottom (dorso-ventrally). Some centipedes are hazardous because they can bite and pinch with the legs and cerci and produce venomous compounds which are injected by fangs or dropped into a wound from between the leg segments. When feeding they masticate (chew) and then suck the juices of their prey. The largest centipedes in Texas are in the genus *Scolopendra*. They can be over 6 inches long.

Level: Senior

Class Diplopoda (Millipedes)

Millipedes

Mouthparts - Chewing Status - Variable
Host - Leaf litter

Millipedes have elongated wom-like bodies and a pair of antennae. They have two or more pairs of legs per body segment. Most millipedes have round cylindrical bodies. However, some of them have flattened extensions on the side of each segment. They are generally slow moving and active mostly at night. They tend to hide under rocks or stones and in organic debris.

Level: Senior

Order Isopoda (Sowbugs, Pillbugs)

Sowbugs & Pillbugs

Mouthparts - Chewing Status - Variable
Host - Compost

Sowbugs and pilllbugs are crustaceans which is a group that includes shrimp, crawfish and lobsters. Isopods are some of the few crustacea that are terrestrial. Sowbugs and pillbugs have 7 pairs of legs and 2 pair of antennae. Pillbugs can roll their bodies into a tight ball when disturbed and this behavior gives them the name. Other names are "roly-pollies" and "ball bugs". Sowbugs have two tail extensions and do not roll into a ball. Both are found together especially in moist habitats with lots of organic matter.

Level: Senior

Class Collembola (Springtails)

Springtails

Mouthparts - Chewing Status - Variable
Host - Surface of puddles

This class contains small (usually under 2 mm), soft-bodied insects that leap using an appendage on the end of the abdomen called a **furcula**. They prefer moist habitats. and can build in large numbers. Springtails used to be classified as insects, but because they have internal mouthparts (not external like insects), they are included in the subphylum Hexapoda, but not in Class Insecta.

Level: intermediate, Senior

GLOSSARY

alate - winged form of insect

aphid - an insect in the family Aphididae, order Hemiptera, sometimes called a plant louse

beneficial insect - any insect that has a life style that is advantageous to man. Insects that preserve the balance of nature by feeding on others, pollinators, and recyclers are examples of beneficial insects.

cantharidin - a toxic, blistering compound produced by certain beetles, most notably blister beetles

carnivore - an insect that feeds on a living animal

caterpillar - the immature stage of any Lepidoptera (butterflies and moths)

cephalothorax - e.g. spiders, a single body segment with the head (ceph) and chest (thorax) areas fused together

cerci - paired appendages on the end of the abdomen of many insects which are used for sensing, defense, or mating

chelicerae - front pair of appendages of an arachnid often specialized with fangs

chewing (mouthparts) - any mouthpart that is used to break up food into smaller pieces to aid in digestion; other mouthpart types are piercing-sucking and sponging

clavate - Clublike antennae enlarged at the tip.

collophore - a tube-like structure on the underside of the first abdominal segment of Collembola

compound eyes - the large multi-faceted eyes of insects

coreids - a member of the family Coreidae, order Hemiptera

corium - the elongate, thickened basal portion of the forewing of Hemiptera

cornicles - tubular structure on each side of the abdominal region of aphids from which pheromones are expelled.

coxa (pl. = coxae) - basal portion of the leg

crepuscular - having activity periods during low light levels at dawn and evening

cursorial - adapted for running

dactyl - literally a finger or finger-like projection on an insect body part

dealate - winged form that has shed its wings, like a reproductive termite or ant

defoliate, **defoliation** - removal of foliage from plants, often by chewing insects

detritivore - any organism that eats decaying organic matter

diapause - an insect resting stage, usually induced by environmental signals or extreme conditions like winter or summer

dimorphic - having two distinct forms

dorsal - relating to or situated near the back

elytra - hardened forewings of beetles and some other insects that serve as protective covers for the more delicate hindwings and the dorsal side of the abdomen.

estivation (**aestivation**) - a resting stage (quiescence) resulting from continued high temperature or xeric conditions; diapause; hibernation

exoskeleton - the outer portion of an insect body which may be relatively soft like a caterpillar or hardened like many beetles

femur (plural: femora) - a segment of an insect leg; the third and usually the largest segment

filiform - linear shaped as the antennae of ground beetles

frass - solid larval insect excrement; plant fragments made by wood-boring insects, usually mixed with excrement

furculum (plural: **furcula**) - the elongate fork-like appendage on the end of the abdomen (folds under the body) of Collembola which is used as a spring action for leaping

gall - an abnormal growth or swelling of plant tissue caused by various organisms such as insects

genera - plural of **genus**; a genus is a group of plants or animals with similar characteristics

girdle, **girdling** - damage of a plant that encircles the stem or branch and cuts off the transportation system of the plant

gradual metamorphosis - see metamorphosis

halteres - small, knob-like structures found in flies and some other two-winged insects that are modified hind wings

harmful insect - an insect pest that destroys homes, buildings, crops, or hurts animals

haustellate - a type of mouthpart in insects that is adapted for sucking or piercing and sucking liquids.

hemelytron (pl. = hemelytra) - the front wing of a Hemipteran which has the base more thickened than the membranous outer portion

herbivore - an insect that feeds on living plants

honeydew - a sugary liquid excreted by certain plant-sucking insects, such as aphids, whiteflies, and scale insects

imago - the adult stage of an insect

instar - an insect stage between molts. The term applies to juvenile stages only.

larval stage (larva, plural: larvae) - an immature insect, sometimes used to include all immature stages, even eggs. Usually this term refers more specifically to the feeding stages of insects with complete metamorphosis like grubs, caterpillars, and maggots.

lateral - relating to or situated near the side of the body rather than the upper or lower surfaces

maggot - in most Diptera, legless larva lacking a distinct head, with cephalic (head) end pointed and caudal (rear) end blunt

mandibulate - insects that have chewing mouthparts, specifically mandibles, which are jaw-like structures used to bite, cut, and grind solid food.

membranous - thin and semi-transparent; like a membrane

mesothorax - the second section of the insect thorax which includes the attachment points for the second pair of legs and the first pair of wings

metamorphosis - change in form during an insect's growth and development

complete metamorphosis (holometabolous) - This type of metamorphosis includes a pupal stage. Immature insects are called larvae and usually look very different from adults. The stages are egg, larva, pupa, and adult. Complete metamorphosis is the most advanced type of metamorphosis and is found in Superorder Endopterygota. This group includes lacewings, beetles, butterflies and moths, fleas, bees and wasps, and several other orders.

gradual metamorphosis (paurometabolous) - This type of metamorphosis does not include a pupal stage and has three stages: egg, immature and adult. Immature insects are called nymphs and are terrestrial. Nymphs are look similar to adults, but do not have fully developed wings or reproductive organs. Gradual metamorphosis is less advanced than complete metamorphosis. This group includes cockroaches, grasshoppers, true bugs, and several other orders.

incomplete metamorphosis (hemimetabolous) – This type of metamorphosis does not include a pupal stage and has three stages: egg, immature and adult. Immature insects are called naiads and are aquatic. This group includes dragonflies, damselflies, mayflies and stoneflies.

no metamorphosis (ametabolous)- There is no metamorphosis except for the gradual development of adult reproductive structures. Insect groups with no metamorphosis include the Archaeognatha and Zygentoma. The ametabolous insects are considered to be the most primitive insects.

metathorax - the third section of the insect thorax which includes the attachment points for the third pair of legs and the second pair of wings

mite - a member of the order Acarina (ticks and mites)

molt, molting process - in insects, the process of shedding the exoskeleton

naiad - a term for immature insects that are aquatic from the orders Plecoptera, Odonata, and Ephemeroptera. This term is now being replaced by the more general term "immature" insect.

nasute (plural: nasuti) - a (type of) soldier in certain termites in which the head narrows into an anteriorly pointing “nozzle” through which sticky defensive liquids are squirted.

necrosis - death of tissue in plants or animals

nymph - an immature stage of hemimetabolous insects (those with incomplete metamorphosis)

ootheca (plural: oothecae) - a bean-like hardened egg capsule produced by female cockroaches

omnivorous - an organism that eats both plant and animal matter

osmeterium (pl. = osmeteria) - scent- producing area behind the tibia

overwinter - time spent during the winter months. Insects are often in hibernation or at least rather immobile in colder temperatures.

ovipositor - the egg-laying apparatus of an insect. The stinger of a bee is actually a modified ovipositor.

parasitic insect (parasite) - an insect that feeds on a host but does not kill it. Some insect parasites live on large hosts like dogs, cows or man, and usually do not kill them; however, most parasites, like fleas and lice, keep an animal from being in "top condition." Some parasitic insects are good, since they destroy harmful insects; others are harmful. In entomology we often misuse the term "parasite" when we are talking about an insect that lays its eggs in or on another insect and the developing larva usually kills it. This common usage of the word is actually incorrect because, by definition, parasites do not directly kill their hosts. In this case the insect would correctly be called a parasitoid (see below).

parasitoid - an insect that spends a significant portion of its life history within a host and causes the death of the host, usually before it can reproduce.

parthenogenesis - egg development without fertilization

pedipalps - second pair of appendages of the cephalothorax corresponding to the mandibles of insects

petiole - the stalk that attaches the leaf blade to a stem