

Yellowjackets

Scientific Name: Several *Vespula* species (Table 1). Most common is the **western yellowjacket**, *V. pensylvanica* (Sausurre), and the **prairie yellowjacket**, *V. atropilosa* (Sladen)

Order: Hymenoptera (Bees, Wasps, Ants, Sawflies and Relatives)

Family: Vespidae (Paper Wasps, Hornets, Yellowjackets, etc.)

Identification and Descriptive Features: The common species of yellowjackets are strikingly marked with black and yellow or black and white, with the patterns on the abdomen being useful to distinguish species (Figures 4-6). They are not highly hairy, as are bees, but are roughly similar in size to honey bees with workers of the western yellowjacket ranging between 10-14 mm. Queens, the fertile females seen in spring and fall, are considerably larger but similarly patterned.

Distribution in Colorado: Various yellowjackets can be found in most of the state, although they are largely absent in rangeland on the eastern plains and at highest elevations. Yellowjackets are most abundant in wooded areas and some thrive around residential developments.

Life History and Habits: Yellowjackets produce an annual nest, established in the spring by an overwintered queen and abandoned at the end of the season. The life cycle of the western yellowjacket, the primary pest species in Colorado, is used for example (Figure).

The western yellowjacket produces a paper nest that is hidden. Often they will nest belowground in abandoned rodent burrows or in cavities behind stone walls and brickwork. Rarely they will nest in cavities on the sides of buildings. Typically a nest is located about 10-15 cm belowground and may have an entrance tunnel about 10-30 cm, leading to the opening. Late in the season, as the colony increases in size, mud pellets by be piled around the entrance, making a small turret.

Nest construction is generally similar to that of the *Dolichovespula* species (baldfaced hornet, aerial yellowjacket) that produce large carton nests that are readily visible in trees or shrubs or



Figures 1, 2. Western yellowjacket (above). Western yellowjackets scavenging (below).

attached to the eaves of buildings. The interior is made of paper comb with hexagonal cells and by the end of the season includes multiple layers of comb in horizontal arrangement. Layers of paper enclose the comb, providing insulation and protection. The nest is formed from masticated plant fibers, such as weathered wood.

Nests are initiated by a fertile female mated the previous fall - a queen. The queens survive winter in scattered locations where they may find protection. Flaps of loose bark, cavities behind walls, or various holes in the ground are typical overwintering sites. The queens resume activity in late April or early May, when they seek a site to establish a new nest. If successful in locating a suitable cavity she will create a small nest of about 20-45 cells in which she will rear young.

For much of the season infertile female “workers” are reared, that are considerably smaller than the queen. The first begin to emerge in midJune and they then begin to take over most all hive maintenance activity except egg production. With the addition of workers to forage and collect food the colony expands very rapidly and by the end of the season will contain many hundreds of workers.

The western yellowjacket young are fed animal matter but almost all is scavenged. Fresh carrion from recently killed animals, dead earthworms and dead insects are common foods. This scavenging habit extends to human foods and the western yellowjacket is a notorious scavenger of outdoor dining, readily feeding on meat, chicken, and fish. The western yellowjacket with occasionally capture live insects are also sometimes taken, such as aphids, small flies and leafhoppers. (Other yellowjackets, notably the prairie yellowjacket, are strictly predators and consume large numbers of live insects. The aerial nesting wasps in the genus *Dolichovespula* - baldfaced hornet, aerial yellowjacket - are also

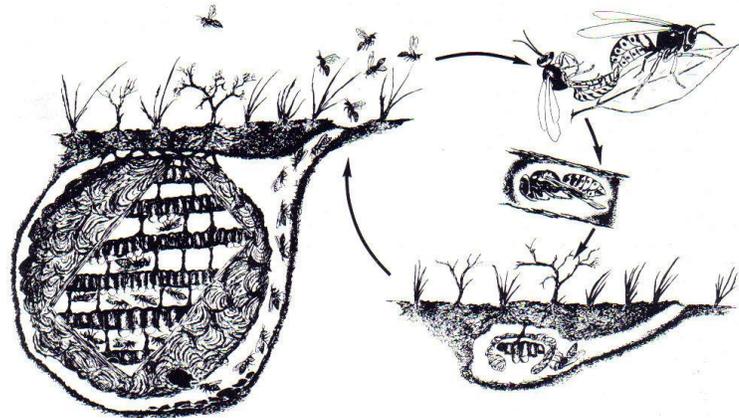


Figure 3. Life history of the western yellowjacket. Overwintered queens (center right) initiate colonies in spring (lower right). Colonies expand rapidly during the summer months (left) and may involve hundreds of workers during the peak in late summer. Males and reproductive form females (queens) are produced late in the season and the mated queens are the overwintering stage. Figure from *The Yellowjackets of America North of Mexico*.



Figure 4. Traps baited with heptyl butyrate capture western yellowjackets and prairie yellowjackets.

predators of insects and do not scavenge.) All food is chewed into a pulp and fed to the young that are reared in nest cells.

Sweet materials will also be collected, primarily to provide energy for the adults. Honeydew from insects is the primary natural source of sugars and they may commonly visit plants with heavy infestations of aphids or soft scales. Ripe sugary fruits are also visited and they may cause difficulties in harvesting berries, grapes and some other fruit crops. Soft drinks, cotton candy and other human-produced sweets are also scavenged. Occasionally, yellowjackets will visit flowers and collect nectar or pollen, but they are insignificant pollinators.

In late summer, some reproductive forms are produced in special, larger cells. These are the males and fertile females that are potential queens. The males leave the colony and may aggregate at prominent points during the day where they more likely encounter newly emerged queens for mating. After mating, the new queens scatter in search for winter shelter for hibernation. (During this period of searching queens are sometimes noticed around and in homes.) At the end of the season, usually by early October, the old colony is abandoned and all the remaining workers with the old queen perish. Only the newly mated female, the next year's queen, survives between seasons.

Yellowjackets have a stinger and they readily defend the hive. The stinger is not barbed so repeated stings can be made and no stinger is left behind. (Only honey bees leave the stinger embedded in the skin.) By far, the western yellowjacket is the most important stinging insect in Colorado.

Trapping yellowjackets. Traps have been developed that are attractive to some species of yellowjacket, including the two most common species in Colorado (western yellowjacket, prairie yellowjacket). Several commercial designs are available and most are baited with heptyl butyrate. Heptyl butyrate is highly attractive to the western yellowjacket but fresh fruit juices may also be used as baits.



Figure 5. Patterning on the abdomen (gaster patterns) of the western yellowjacket, *Vespula pensylvanica*.



Figure 6. Gaster patterns of the prairie yellowjacket, *Vespula atropilosa*.



Figure 7. Gaster patterns of the forest yellowjacket, *Vespula acadica*.

Although such traps can capture large numbers of yellowjackets, their effectiveness in reducing pest problems with yellowjackets is less clear; it may cause only marginal reductions in yellowjacket populations. To be most effective, trapping should begin early so that overwintered queens are captured before colonies are initiated. Early trapping will also capture workers produced early in the season which have an important role in survival of the young colony. Yellowjacket traps should not be located near outdoor dining areas as the traps may draw foragers to the general area.

Water traps can be designed that are baited with fresh meat. These involve suspending some food (e.g., fresh fish, bacon) above a pan of water. A bit of detergent applied to the water breaks the surface tension. Yellowjackets visiting the bait will often drop into the water after carving a piece of food, where they will drown.

Related Species: In addition to the seven species of *Vespula* known or suspected to occur in Colorado (Table 1), there are 3-4 *Dolichovespula* species that occur in the state. Most commonly observed are the **baldfaced hornet**, *Dolichovespula maculata* (L.) , and the **aerial yellowjacket**, *D. arenaria* (Fab.). Both make large, aboveground carton nests that are attached to trees, shrubs and the eaves or sides of buildings.



Figure 8. Aerial yellowjacket, *Dolichovespula arenaria*. This species makes large paper nests that often are attached to buildings.

Table 1. Yellowjackets (*Vespula* species) reported to occur in Colorado (from Akre et al. 1980). Those in the *Vulgaris* group are primarily scavengers; the *Rufa* group are predators of insects.

Scientific Name	Common Name	
	<i>Vulgaris</i> group	
<i>Vespula pensylvanica</i> (Saussure)	Western yellowjacket	Very common in most residential and forested areas of the state, excepting the eastern plains. A serious nuisance/stinging pest.
<i>V. vulgaris</i> (L.)	Common yellowjacket	Reported from state, but apparently very rare. A scavenger and potential nuisance species.

<i>V. maculifrons</i> (Buysson)	Eastern yellowjacket	Not collected from Colorado but may be present in eastern plains.
	<i>Rufa</i> group	
<i>V. atropilosa</i> (Sladen)	Prairie yellowjacket	A common species in yards and gardens. Predatory on live insects; does not scavenge.
<i>V. consoborina</i> (Saussure)	Blackjacket	Black and white species. Associated with forested areas.
<i>V. acadica</i> (Sladen)	Forest yellowjacket	Uncommon. Forest species that often nests in hollow logs.
<i>V. austriaca</i> (Panzer)		Rare. A parasite of other <i>Vespula</i> species.

Primary Reference: Akre, R.D., A. Greene, J.F. MacDonald, P.J. Landolt, and H.G. Davis. 1980. *Yellowjackets of America North of Mexico*. USDA Agriculture Handbook No. 552. 102 pp.