

Yellowjackets and Hornets, *Vespula* and *Dolichovespula* spp. (Insecta: Hymenoptera: Vespidae)¹

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The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

Only two of the 18 Nearctic species of *Vespula* are known from Florida (Miller 1961). These are the two yellowjackets: eastern yellowjacket, *Vespula maculifrons* (Buysson) and the southern yellowjacket, *Vespula squamosa* (Drury). One species of *Dolichovespula* is also present: the baldfaced hornet, *Dolichovespula maculata* (Linnaeus). The baldfaced hornet is actually a yellowjacket. It receives its common name of baldfaced from its largely black color but mostly white face, and that of hornet because of its large size and aerial nest. In general, the term “hornet” is used for species which nest above ground and the term “yellowjacket” for those which make subterranean nests. All species are social, living in colonies of hundreds to thousands of individuals.

Distribution

Vespula maculifrons is found in eastern North America, while *Vespula squamosa* is found in the eastern United States and parts of Mexico and Central America. The baldfaced hornet, *Dolichovespula maculata*, is found throughout most of the Nearctic region.



Figure 1. Adult baldfaced hornet, *Dolichovespula maculata* (Linnaeus), lateral view.

Credits: James Castner, UF/IFAS

Identification

The three species of Florida yellowjackets are readily separated by differences in body color and pattern. Identification is possible without a hand lens or microscope, and, for this reason, a simple pictorial key is all that is necessary. Color patterns are relatively stable, and their use is further strengthened by morphological characters (Miller 1961). Queens and workers may be separated by abdominal patterns; males have seven abdominal segments while females have only six.

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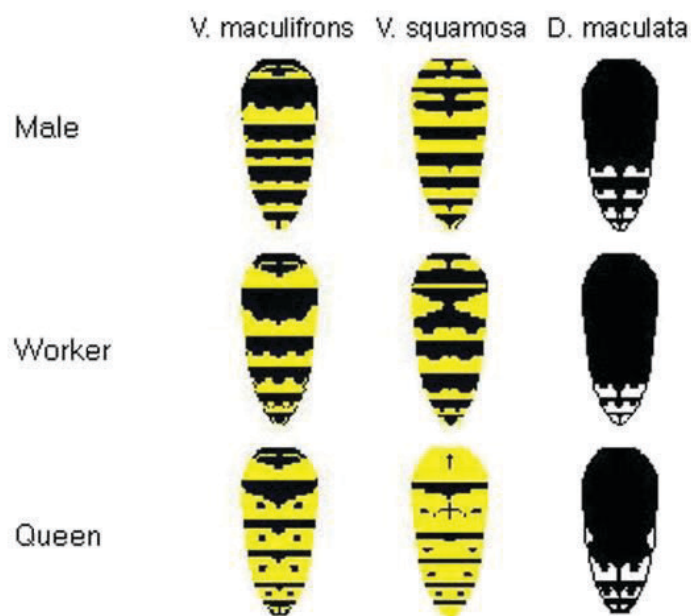


Figure 2. Color patterns of Florida yellowjackets.

Biology

Colonies are founded in the spring by a single queen that mated the previous fall and overwintered as an adult, usually under the bark of a log. Nests may be aerial or terrestrial, depending in part upon the species of the wasp. Some species may construct both types of nests. Regardless of location, each nest is a series of horizontal combs completely surrounded by a paper envelope. Initially, the solitary queen must not only construct the paper brood cells, but also forage for food, lay eggs, feed her progeny, and defend the nest from intruders. When the first offspring emerge as adults, they assume all tasks except egg laying. The queen devotes the remainder of her life to this task and does not leave the nest again. For most of the season the colony consists of sterile worker females, which are noticeably smaller than the queen. Each worker tends to persist at a given task, such as nest building or feeding larvae, for a given day, but may change tasks if the need arises. Working habits apparently are not associated with age as they are in the honeybee. Workers progressively feed larvae a diet of masticated flesh of adult and immature insects, other arthropods, and fresh carrion. Caterpillars appear to be a favorite food. In autumn, larger cells are constructed for the crop of new queens. Larvae in these cells receive more food than do those in normal cells. At the same time, the queen begins to lay unfertilized or male eggs in either large or small cells. After emergence, the new queens mate and seek shelter for the winter. These will be the founders of next spring's colonies. The old founder queen dies, and the workers begin to behave erratically until social order breaks down. With winter's arrival, the remaining colony dies.

Baldfaced Hornet, *Dolichovespula maculata* (Linnaeus)

The baldfaced hornet constructs aerial nests often a foot or more in diameter. The wasp is easily recognized by its overall black and white color, and by at least half of the anterior segments of the abdomen (terga I–III) being black. Relatively little is known about this species despite its abundance and wide distribution.



Figure 3. Adult baldfaced hornet, *Dolichovespula maculata* (Linnaeus), dorsal view.

Credits: James Castner, UF/IFAS



Figure 4. Larva of the baldfaced hornet, *Dolichovespula maculata* (Linnaeus).

Credits: Whitney Cranshaw, Colorado State University; <https://www.insectimages.org/>



Figure 5. Aerial nest of the baldfaced hornet, *Dolichovespula maculata* (Linnaeus).

Credits: Jerry A. Payne, USDA-ARS; <https://www.insectimages.org/>

Eastern Yellowjacket, *Vespula maculifrons* (Buysson)

Most reports of the eastern yellowjacket indicate subterranean nests, but aerial nests do occur. Haviland described 10 nests, each of which had a nearly spherical ground opening about 1.5 cm ($\sim\frac{1}{2}$ in) in diameter. The nest looks much like that of *Dolichovespula maculata* except the outside envelope has the consistency of charred paper. As the nest becomes larger, workers remove soil from the burrow. The soil is always deposited about 1 cm ($\frac{3}{8}$ in) distance from the nest. According to Haviland, nests ranged from 9.5 to 30 cm ($3\frac{3}{4}$ in–1 ft) in diameter. The largest nest contained eight levels of comb with over 2800 wasps present. Green et al. (1970) reviewed some unusual above-ground nest locations of *Vespula maculifrons* including decayed stumps, tree cavities, and between sidings of a home. They also found an exposed nest on the side of a building. *Vespula maculifrons* is most readily separated from *Vespula squamosa* by the color patterns.

Southern Yellowjacket, *Vespula squamosa* (Drury)

As with *Vespula maculifrons*, both terrestrial and aerial nests are known for the southern yellowjacket. Gaul (1947) described one ground nest which was 20 cm ($7\frac{7}{8}$ in) wide by 20 cm ($7\frac{7}{8}$ in) deep. The nest was 22.5 cm ($8\frac{7}{8}$ in) below the soil surface. Tissot and Robinson (1954) described



Figure 6. Adult female eastern yellowjacket, *Vespula maculifrons* (Buysson).

Credits: Bruce Marlin



Figure 7. Eastern yellowjacket, *Vespula maculifrons* (Buysson), nest in hay.

Credits: Georgia Forestry Commission; <https://www.insectimages.org/>



Figure 8. Adult female southern yellowjacket, *Vespula squamosa* (Drury).
Credits: Lyle J. Buss, UF/IFAS



Figure 9. Adult female southern yellowjacket, *Vespula squamosa* (Drury).
Credits: Lyle J. Buss, UF/IFAS



Figure 10. Southern yellowjacket, *Vespula squamosa* (Drury), nest dug from ground.
Credits: Gerald J. Lenhard; <https://www.insectimages.org/>



Figure 11. Adult female southern yellowjacket, *Vespula squamosa* (Drury), feeding on southern blueberry.
Credits: Jerry A. Payne, USDA-ARS; <https://www.insectimages.org/>



Figure 12. Large local reaction to a sting by an eastern yellowjacket.
Credits: Terry Price, Georgia Forestry Commission; <https://www.insectimages.org/>

Economic Importance and Management

These wasps perform a valuable service in destroying many insects that attack cultivated and ornamental plants. However, nests near homes may prove a source of irritation. If the nests are large or difficult to approach, for example within the walls of a house, the safest procedure would be to hire a pest control operator to eliminate the colony. Any attempt to remove or destroy nests by the layman should be done at night when nest activity is at a minimum. It is important to note that even though nests are relatively inactive at night, any disturbance will result in instant activity by the colony. It is necessary to work cautiously but quickly. Protective clothing is advisable. These wasps are adept at stinging and are especially aroused if danger threatens the nest. Unlike the honeybee, which dies upon inflicting a single sting, vespid wasps may sting as often as they find a target. In fact, when a yellowjacket or hornet is injured, it

often releases an “alarm pheromone” which quickly results in an aggressive, defensive behavior from other members of the colony.

Yellowjackets and hornets are also attracted to sugar sources, such as berries and flower nectars. However, this becomes a problem when the sugar source is a food or drink being consumed by a human. Sweet items like soft drinks, ripened fruits and watermelons attract bees and wasps. Keep these items covered outdoors. Pick fruit as it ripens and dispose of rotten fruits (Koehler and Oi 2003). In school yards, parks, and other community areas ensure that lids on trash containers are either secure or able to prevent access by wasps as this potential food source (discarded drink containers, fruit remains, etc.) can attract wasps on a continual basis, leading to stinging incidents.

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