



BUG BIZ

Pest Management and Insect Identification Series



Sphecius speciosus, Eastern Cicada Killer (Hymenoptera: Crabronidae)

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Description

Adults of *Sphecius speciosus*, known as the cicada killer, cicada hawk or sand hornet, have been confused with the European hornet (*Vespa crabro*) and most recently with the giant Asian hornet, more commonly known as the murder hornet (*Vespa mandarinia*). These confusions made by people unfamiliar with insects can be quickly corrected by looking at basic appearance and morphology. Cicada killers are large solitary wasps 1/2 of an inch to 2 inches (13 to 50 mm) in length. Females are closer to 2 inches and males are smaller. These wasps are relatively wide bodied, with prominent constrictions separating the head, thorax and abdomen (gaster). The abdomen is long and teardrop shaped whereas hornets possess cylindrical abdomens. The cicada killer head is small in width and mandible size compared to its body. This is very different from the European hornet and the murder hornet. In those species the mandibles are relatively larger, and the head width appears broader than the thorax and abdomen. The abdomens of cicada killers are mainly black in color with three thin, yellow or white, irregular, circular bands. The bands are narrowly separated at the upper middle part of the abdomen. Differences between males and females, in addition to size, are the appearance of the hind legs and abdomen. The males have small spurs protruding from their hind leg's tibia. However, female spurs are more prominent at about one-third the length of the hind tibia. Additionally, females have a thick black line going down the abdomen dorsally connecting the other black banded portions. But the black bands of male abdomens barely connect dorsally. The thorax, antennae and head are predominantly black with yellow hairs, and the "face" below the compound eyes is yellow. The thorax also possesses a reddish-orange rectangle on the top between the wings. The two pairs of wings are translucent, bright reddish-brown in color, and extend to the tip of the abdomen. The legs are thick and bright reddish-brown in color.

Only a single species in the genus *Sphecius* occurs in Louisiana. A second species occurs in Florida and two more species are found in western U.S. The eastern cicada killer is the most common species that is confused with the two



A female eastern cicada killer, *Sphecius speciosus*, emerging from an underground nest (Jessica Louque, Smithers Viscient, Bugwood.org, Creative Commons 3.0).



A European hornet, *Vespa crabro*, and a murder hornet, *Vespa mandarinia*. Cicada killers are often mistaken for one of these species, neither of which occur in Louisiana (Hanna Royals, Bugwood.org, Creative Commons 3.0).

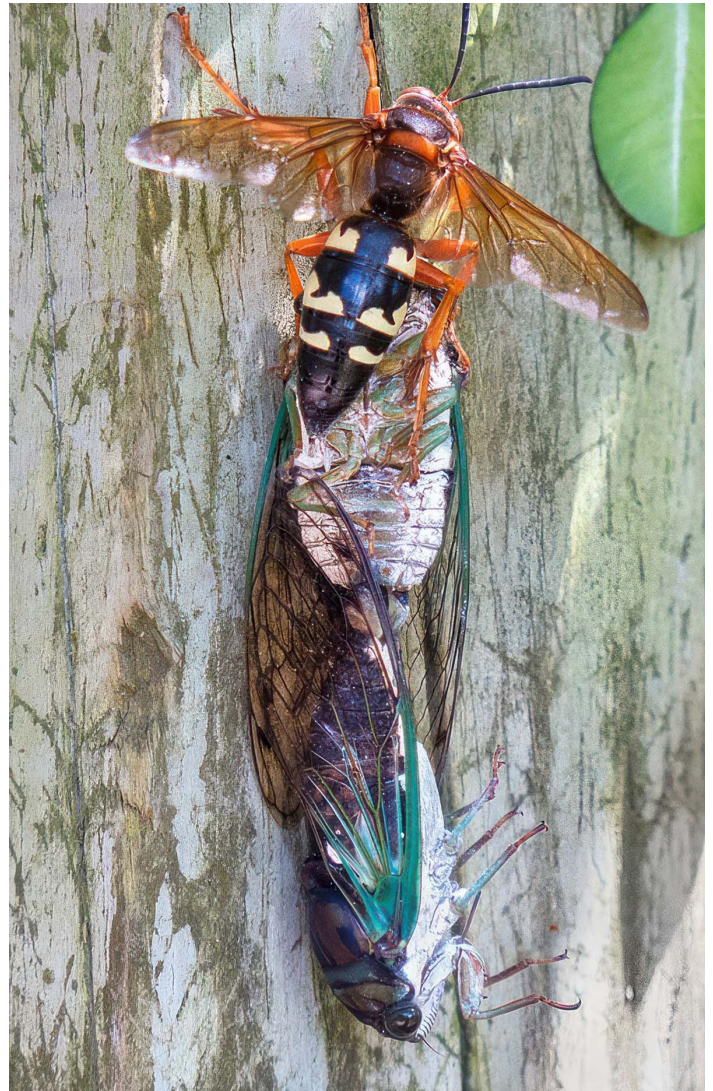
hornets mentioned above. Neither of the hornet species are reported from Louisiana, although the European hornet is reported from northern Arkansas. The so-called murder hornet is only known from a few isolated specimens and extirpated colonies in Washington state and adjacent British Columbia, but alarmist social media posts have suggested a much broader distribution.

Life Cycle

The cicada killer is considered a solitary wasp species. However, females may create underground nesting burrows in close proximity, giving the appearance of a single hive. Cicada killers emerge shortly after cicadas start mass emergence during June or July. Males emerge first and compete against each other for mates. Competition success between males is determined by the size-to-muscle-mass ratio of the males. If a male is larger and faster than the other males, they can aggress other males mid-flight by pushing each other away from the female, and maintain territory better while virgin females are emerging from underground. Males with a higher flight-muscle-to-total-mass ratio are the most successful at mating. This behavior can be confused with aggression to people as the males patrol, quickly banking and turning toward anything that enters their territory. As with all members of the order Hymenoptera, males can only bite and are incapable of stinging because the modified egg laying organ (ovipositor) used for stinging is only found in females. Males do have a powerful bite used for attacking other males. Males die soon after mating.

Cicada killer females find and hunt down cicadas by sight. Research has demonstrated that cicada killers prefer female cicadas over males. This may be because the female cicada is more active and gets spotted more often by cicada killers. Whether cicada killers use auditory cues produced by cicadas is unknown. If cicadas are absent, the cicada killer will also target other insect species, including katydids, grasshoppers and other large insects. Females have a long, prominent stinger that injects a nonlethal paralyzing agent to immobilize its prey and keep it alive and fresh. Females dig holes in soil or sand where up to 20 eggs are laid. This tunnel can have multiple cells that support one egg per cell. Each cell is filled with two to three paralyzed cicadas. If other females accidentally enter a neighbor's burrow, resident females act with variable aggression from no reaction to fighting, depending on the distance the burrows are separated from each other.

Once the burrows are provisioned with cicadas and eggs are deposited, the entrances are sealed, and the larvae begin to hatch and feed on the paralyzed cicadas for the duration of their underground development. Females live only a single season. Mature larvae spend the winter in their burrows, then pupate and complete development to



A female eastern cicada killer, Sphecius speciosus, carrying two paralyzed cicadas on fence post (Larcolt, wikipedia.org, Wikimedia Commons).

adulthood the following spring to begin the cycle anew.

Ecological Significance and Pest Status

The eastern cicada killer is a native species and considered a beneficial component of the native insect fauna. But homeowners may consider their presence undesirable due to the incorrect assumption that they pose a threat or because they object in principle to the presence of numerous large wasps in close proximity. With the new confusion of cicada killers and the murder hornet, people are even more on edge when seeing these huge wasps. Because males are territorial, people often confuse a male investigating something passing through their territory as a wasp intending to sting them. Females will sting when provoked, but that requires a substantial amount of provocation. Most stings are due to children or pets

physically restraining the females. The venom's effects on humans are minimal. Allergic reactions are extremely rare, but possible, as with all venomous animals.

Control

Cicada killers can be eliminated using traditional wasp sprays available at grocery and home improvement stores. Some wasp sprays on the market have quicker knockdown speeds but these are more expensive. For the underground chambers, synthetic pyrethroids are available for burrow treatment, but if the larvae have already pupated or have been sealed off, insecticide treatment may be ineffective. Treating for cicada killers in the early spring and summer months produces better results.

References

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PUB3875 (online) 1/24

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