

No-see-ums

Culicoides spp.

There are over 4,000 species of biting midges in the Ceratopogonidae family, and over 1,000 in just one genus, *Culicoides*; 47 species are known to occur in Florida. These are more commonly called No-see-ums.

Biting midges can be a nuisance to any one who spends time outdoors during early morning and evenings, and even during the daytime on cloudy days when winds are calm. They will readily bite humans; the bites are irritating, painful, and can cause long-lasting painful lesions for some people.

A common observation upon experiencing a bite is that something is biting, but the person suffering can not see what it is. Biting midges are sometimes incorrectly referred to as sand flies. Sand flies are insects that belong to a different biological group and should not be confused with the biting midges.

The natural habitats of biting midges vary by species. Areas with substantial salt marsh habitat are major producers of many species.

Biting midges progress from egg to larva to pupa, and finally to the adult stage. The complete cycle can occur in two to six weeks, but is dependent on the species and environmental conditions. The adults are most abundant near productive breeding sites, but will disperse to mate and to feed.

Male *Culicoides* typically emerge before the females and are ready to mate when the female emerges from the pupal stage. Mating typically occurs in flight when females fly into swarms of males. Some species mate without swarming; instead, the males go to hosts where the female is likely to feed on blood; mating occurs when she finishes feeding.

Males and females feed on nectar, but like mosquitoes, the females require blood for their eggs to mature. They blood-feed primarily around dawn and

dusk, but there are some species that prefer to feed during the day. Some species are autogenous and therefore may produce the first batch of viable eggs without a blood meal using reserves stored from the larval period; blood meals are required for subsequent batches of eggs.

The number of eggs produced varies among species and size of bloodmeal.

The eggs are laid on moist soil and cannot stand drying out. Some species can lay up to 450 eggs per batch and as many as seven batches in a life-span. Eggs typically hatch within two to 10 days of being laid depending on the species and temperatures.

Larvae require water, air, and food and are not strictly aquatic or terrestrial, but they cannot develop without moisture. They will be in and around salt-marsh and mangrove swamps, on shores of streams and ponds, and in muddy substrates.

The larval habitat of many tropical species is in rotting fruit, bromeliads, and other water-holding plants. Other larval habitats include mud, sand, and debris at edges of pond and lakes, tree holes, and slime-covered bark.

The pupal stage typically lasts two to three days.

The adult no-see-ums are gray and less than 1/8 inch long. The wings possess dense hairs and give rise to pigmentation patterns which are used to identify species. The large compound eyes are more or less contiguous above the bases of the antennae. Mouthparts are well-developed with cutting teeth on elongated mandibles in the proboscis, adapted for bloodsucking in females, but not in males.

The adults only live a few weeks under natural conditions.

In the U.S., the biting midges are primarily a nuisance. The major medi-



cal issue associated with *Culicoides* is allergic reactions to the bites. However, like other blood feeding Diptera, *Culicoides* species are vectors of pathogens that can cause disease in humans and animals.

General applications of insecticides targeting the adult stage are not efficient. They may kill biting midges active on a given night, but they are continually dispersing from the larval habitat and entering areas of human activity. It would require insecticide applications on a daily basis, which is not efficient or environmentally sound.

Home owners can install proper screening for windows and patios to prevent No-see-ums from entering residences. Most biting midges can pass through 16-mesh insect wire screen and netting, so a smaller mesh size is required. The small mesh size does limit air flow through the screens. Additionally, because no-see-ums are so small and are weak fliers, ceiling and window fans can be used at high speeds to keep no-see-ums out of small areas.

Individually, insect sprays containing at least 25% DEET can somewhat deter No-see-ums, but they will not dissuade all of them from biting.