



Biting Flies¹

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Biting flies attack humans to obtain a blood meal and can be very annoying. Some biting flies are also capable of transmitting disease. Biting flies of importance are sand flies, black flies, stable flies, mosquitoes (see ENY-2004), horse flies and deer flies.

Sand Flies

Often called "punkies," "no-see'ums," or biting midges (Figure 1), the sand flies are vicious where they occur. They are often more troublesome than mosquitoes because they can easily enter dwellings through ordinary 16-mesh window screen. The presence of these insects can decrease property values and severely hamper use of recreational areas. Vacationers and campers literally have been driven away from areas by these tiny biters. Sand flies can also cause loss to cattlemen in terms of annoyance to cattle and transmission of various nematode diseases.

Sand flies are members of the insect order Diptera and undergo a complete development with egg, larva, pupa, and adult forms. The adults are less than 1/16 inch long, dark gray to black in color and have one pair of wings which are spotted. The sand flies breed predominantly in salt marshes; however,



Figure 1. Sand fly (*Culicoides*). Credits: J. F. Butler, University of Florida

some species that are found inland breed in fresh water areas and tree holes.

Larvae of sand flies are found in mud, sand, and debris around the edges of ponds, springs, lakes, creeks, and in tree holes or on slime-covered bark. In the water they are free swimmers and are commonly found on floating twigs or leaf trash. The larvae pupate on floating debris or at the water's edge. The adult females, like mosquitoes, require blood to mature the eggs. Males do not bite. Sand fly larvae

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can be found in marshes the year-round; however, the period of greatest adult activity is June to August.

Sand fly activity is associated with air movement. Adults of most species seldom bite when there is air movement. Sand flies are also sensitive to temperature. Animals having a high body temperature are attractive to great numbers of female sand flies. Persons performing hard labor out-of-doors frequently are severely annoyed by these insects.

Black Flies

Black flies (Simuliidae) (Figure 2) are small, dark, stout-bodied flies with a humpbacked appearance. The adult females suck blood mainly during daylight hours and are not host specific. The black fly is a potential disease vector in Florida. It hovers about the eyes, ears, and nostrils of man and animals, often alighting and puncturing the skin with an irritating bite. Black flies are not considered to be major pests of homeowners in Florida.



Figure 2. Black fly on man. Credits: J. F. Butler, University of Florida

The black fly life cycle begins with eggs being deposited on logs, rocks, or solid surfaces in swiftly flowing streams. Larvae attach themselves to rocks or vegetation with a posterior sucker. The length of the larval period is quite variable depending on the species and the larval environment. The adults which emerge after pupation are strong fliers and may fly 7 to 10 miles from their breeding sites.

Stable Fly

The stable fly (Figure 3), also known as the dog fly or biting house fly, is a blood-sucking fly which closely resembles the house fly. It is similar to the house fly in size and color, but may be recognized by

its sharp, piercing mouthparts which project forward from the head. Unlike many flies, both sexes of the stable fly are vicious biters.



Figure 3. Stable fly. Credits: J. Castner, University of Florida

The fly is a common pest of man and animals throughout the world. In Florida -- especially western Florida -- stable flies are a serious pest of man and have been a severe threat to the tourist industry.

Stable flies are very persistent when searching for a blood meal and may be easily interrupted in feeding. They may be mechanical vectors of animal diseases but are not considered effective in spreading human disease.

Stable flies breed in soggy hay, grain or feed, piles of moist fermenting weed or grass clippings, seaweed deposits along beaches, and manure. When depositing eggs, the female will often crawl into loose material, placing the eggs in little inner pockets. Each female may lay a total of 500 to 600 eggs in four separate layings. The eggs will hatch in 2 or 5 days, and the newly hatched larvae bury themselves, begin to feed, and mature in 14 to 26 days. While the average life cycle is 28 days, this period will vary from 22 to 58 days, depending on weather conditions. The adults are strong fliers and range many miles from the breeding sites.

Horse Flies and Deer Flies

Horse flies (Figure 4) and deer flies (Figure 5) are closely related insects with similar life cycles. Both horse and deer flies are strong fliers and only

the female bites. They are daytime feeders and can easily cut the skin open for a blood meal. While feeding an anticoagulant is injected into the wound and causes the blood to flow freely. Many people are allergic to horse fly and deer fly bites. Also, wounds are excellent sites for secondary infection. Since they are intermittent feeders, horse and deer flies are important transmitters of animal diseases.



Figure 4. Horse fly. Credits: J. Castner, University of Florida



Figure 5. Deer fly. Credits: J. Castner, University of Florida

Most species of horse and deer flies are aquatic or semi-aquatic in the immature stages. Some will also develop in moist earth, leaf mold, or rotting logs. Generally the eggs are deposited in layers on vegetation, objects over water, or moist areas favorable for larval development. The eggs hatch in five to seven days and the larvae fall to the water surface or moist areas where they begin to feed on organic matter.

Many species feed on insect larva, crustacea, snails, and earthworms. When the larvae are ready to pupate, they move into drier earth usually an inch or two below the soil surface. The pupal stage lasts two to three weeks, after which the adults emerge. The life cycle varies considerably within the species, requiring anywhere from 70 days to two years.

Control of Biting Flies

Many of the biting flies, like sand flies, black flies, horse flies, and deer flies breed in water or in mucky areas near ponds and swamps. Consequently, it is very difficult for individuals to attempt control of these biting flies by reducing breeding sites. Contact your local mosquito control district to see if there are any management programs in your area to reduce sources of these biting flies. Stable flies breed in decaying grass or crop clippings, hay residues, and silage. Because they are extremely strong fliers, the source of the infestation may be located up to several hundred miles away. Therefore, stable flies usually cannot be controlled by individuals.

Many biting flies are active at certain times. Avoid outdoor activity during these peak biting times. Horse flies, deer flies, black flies, and stable flies are usually most active during the day. Sand flies usually are most active around sunrise and sunset. Most of the biting flies are also most active at certain times of the year. Deer flies and black flies are most prevalent in early to late spring. Stable flies are most abundant in late August through October or November. Sand flies are most abundant during summer months, but may bite at any time during the year.

If it is necessary to go outdoors into areas where biting flies are prevalent, wear protective clothing. Long sleeved shirts, long pants will protect arms, legs, and head from bites. If necessary, apply a repellent labeled for biting fly protection. Table 1 lists products approved for application to humans or clothing to repel biting flies and protect from bites. Apply products according to label directions. Reapply as needed and as recommended on the label. Most repellents do not work as well for biting flies as they do for mosquitoes; therefore they have to be reapplied more often.

Most biting flies bite in still air. Increasing air movement in porches, patios, and picnic areas will keep biting flies away but will not usually provide complete protection. Burning candles, coils, and torches containing citronella or other biting fly repellent will sometimes help reduce bites. Burning these items produces a smoke which repels biting insects. Most biting flies will usually rest on low vegetation until they detect a host. Pruning shrubs, mowing weedy areas, and opening up the environment for air flow will reduce numbers of biting flies in an area.

Despite all efforts, biting flies may still be a problem. If biting flies get inside the house, space sprays can be applied to kill them. Products listed as space sprays are listed in Table 2. Remove all people and pets from rooms, turn off air handling systems, apply the product according to label directions, and wait about 10-15 minutes before aerating the room. Keep room vacant as long as the label recommends.

Crack and crevice treatments can be used to treat areas where biting flies enter the house. Areas to be treated would include cracks around doors and windows. Products labeled for crack and crevice treatment are listed in Table 3.

Biting flies that usually rest on vegetation or the sides of houses before entering or before biting people. Numbers of biting flies around houses can be reduced by applying outdoor barrier treatments to places flies would contact before biting or entering the house. Table 4 lists products registered for outdoor barrier treatment. Be sure to apply all products according to label directions and to locations listed on the label.

Table 1. Repellents labeled for biting fly management.*

Common Name	Homeowner Product*
Deet	Cutter (9.5%) Cutter (Family) (6.65%) Muskol (25%) Off (14.25%) Off (Deep Woods) (28.5%) Repel (23%) Repel Lotion (9.0%) Sportsman (29%) Ultrathon (23.75%) Ultrathon (Lotion) (31.0%)
*Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive.	

Table 2. Products labeled for indoor space treatment of biting flies.^{1, 2}

Common Name	Homeowner Trade Name ¹	Commercial Trade Name ¹
Pyrethrins and Others		PT ULD BP-100 (ST) ²
Pyrethrins (0.5%), PBO (4.0%)		PT P.I. Contact Insecticide (ST) ²
Pyrethrins (0.5%), Permethrin (0.4%)	Ortho Indoor Insect Fogger (S, ST) ²	
Tetramethrin (0.2%), Phenothrin (0.2%)	Ortho Flying Insect Killer 1 (S, ST) ²	
¹ Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive. ² S = sand flies, ST = stable flies.		

Table 3. Products labeled for crack and crevice treatment of biting flies.^{1, 2}

Common Name	Homeowner Trade Name ¹	Commercial Trade Name ¹
Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus (S, ST) ²	
Pyrethrins and Others		PT ULD BP-100 (ST) ²
¹ Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive. ² S = sand flies, ST = stable flies.		

Table 4. Products labeled for outdoor barrier treatment of biting flies.^{1,2}

Common Name	Homeowner Trade Name ¹	Commercial Trade Name ¹
Beta Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus (S, ST) ²	
Bifenthrin		Talstar Termiticide/Insecticide (S, ST) ²
Carbaryl	Ortho Bug-B-Gon Multipurpose Insect Killer Ready-to-Use Granules (ST) ²	
Cyfluthrin	Bayer Power Force Multi-Insect Killer Ready-to-Spray (S, ST) ²	PT Cy-Kick Crack & Crevice Pressurized Residual (ST) ²
Cypermethrin		Cynoff ED (S, ST) ² Cynoff Power Spray Insecticide (S, ST) ² Cynoff WSB (S, ST) ² Prevail FT Termiticide (S, ST) ²
Deltamethrin		Suspend SC Insecticide (S, ST) ²
¹ Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive. ² S = sand flies, ST = stable flies.		