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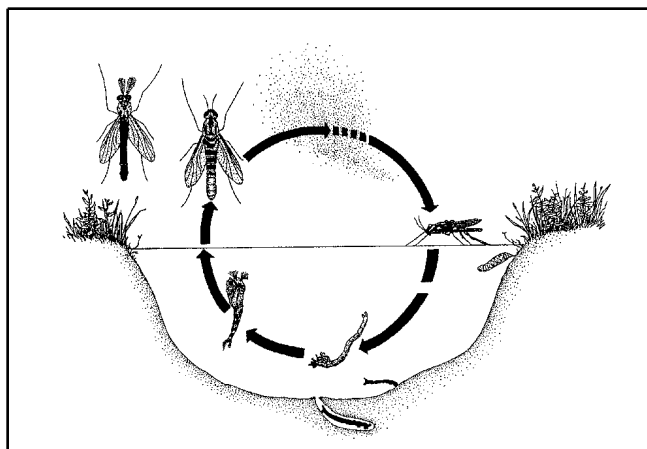
## Blind Mosquitoes (Aquatic Midges)<sup>1</sup>

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Blind mosquitoes are mosquito-like insects in the family Chironomidae. They are often referred to as aquatic midges since their immatures (larvae and pupae) live in water. Blind mosquito is a layman's term which may refer to several species of these midges. Blind mosquitoes do not bite, suck blood, or carry disease. Their occurrence and survival in certain polluted waters often indicates pollution of aquatic habitats. They are important to man only when they emerge in such large numbers that they are a nuisance.

### Life Cycle

Figure 1 depicts the life cycle of the blind mosquito. There are 4 stages in the life cycle - egg, larva, pupa and adult. The eggs are laid in a mass on the surface of the water containing 10 to 3,000 eggs depending on the species. Each mass of eggs is enclosed in a gelatinous substance which is usually attached to the edge of the lake, stream or river, and twigs in contact with the water. Egg masses not attached to objects will sink to the bottom where the eggs hatch. Eggs of aquatic midges usually hatch in 2 to 7 days. The newly hatched larvae feed on the gelatinous material for about 2 days.



**Figure 1.** Blind Mosquito Life Cycle (Clockwise from mid right: egg mass, larva, pupa, adults-male, left, female, right).

On the second or third day after hatching, the larvae leave the mass, burrow into the mud or available organic matter or bind with their salivary secretions small inorganic or organic substrate particles to build small tubes and tunnels in which they live. The tubes may also be composed of silk-like threads. Most larval tubes have an opening at each end to allow the larva to feed from either end. Larvae of the burrowing type may live in tubes or tunnels having only one open end. The larva spends

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most of its time undulating rapidly within the tube to circulate water. From the water the larvae extract oxygen and food. The larvae feed on suspended matter in the water and organic matter in the mud.

After the first molt the larvae of most aquatic midges take on a pink color which gradually darkens into a deep red (some are consequently called blood-worms). As the larvae grow, they enlarge the tube periodically to accommodate their increasing size. The larval stage can last from less than 2 to 7 weeks depending on the water temperature.

The larvae transform into pupae while still in the tubes. The pupal stage normally lasts 3 days. The pupae leave the tube and actively swim to the surface a few hours before the adult emerges.

The adults which emerge mate during swarming at night. The adults do not feed during their adult existence and consequently only live for 3 to 5 days. The entire life cycle can be completed in 2 weeks, although it is common for the life cycle to take longer to complete.

### Breeding Sites

Blind mosquitoes are one of the most common and abundant organisms in natural and man-made water systems. In Florida, the larvae are abundant in small and large natural lakes, waste water channels, sewage oxidation and settling ponds, and residential-recreational lakes.

Surveys of larval infestations in central Florida has revealed larval populations of 4500/ft<sup>2</sup> on the bottom of certain lakes. It is the midges emerging from these breeding areas that cause a variety of nuisance and economic problems.

The problem blind mosquitoes in Florida are, *Chironomus crassicaudatus*, and *Chironomus decorus*, *Goeldichironomus holoprasinus* as well as certain species of *Tanytarsus*. These species usually breed in polluted water 3-12 feet deep.

### Importance

The importance of blind mosquitoes as pests has increased during the past 20-30 years due to:

- Creation of new midge producing habitats close to residences.
- Deteriorating water quality which is more suitable for breeding midges.
- Increasing desire of humans to live close to lakes and rivers.

Residents close to blind mosquito breeding areas experience severe nuisance and economic problems. Blind mosquitoes can emerge in phenomenal numbers between April and November. Often humans have to cease outdoor activity since the adult midges can be inhaled or fly into the mouth, eyes, or ears.

During hot, summer days, midges fly to cool shady places. At night they are attracted to lights around houses and businesses. When large numbers are present, they stain paint, stucco and other wall finishes. Automobiles become soiled, and headlights and windshields get covered with dead midges. The bodies which are mashed to painted surfaces cause permanent staining. Also, blind mosquitoes will fly indoors as doors are opened and closed. Problems indoors such as ruining laundry and staining indoor walls, ceilings, draperies and other furnishings cause severe annoyance for residents.

Where midges are prevalent, spider webs and spiders abound. Accumulations of dead midges and webs require residents to frequently wash and maintain homes and businesses. The dead midges have a smell similar to rotting fish as they decay. The smell persists in damp weather, even after the insects have been removed.

A recent economic impact study undertaken by the Greater Sanford Chamber of Commerce, Seminole County, revealed that blind mosquitoes emerging from Lake Monroe and other nearby bodies of water cause of 3-4 million dollars business loss annually. One lakefront establishment, the Holiday Inn, spends \$50,000 each year on property maintenance and blind mosquito control. The same study indicated that at least 10 counties in Florida are affected by similar problems.

Blind mosquitoes are an important component of the food chain in a lake. Fish utilize the larvae as

food. Lakes where aquatic midges breed are often our best fishing lakes.

### Control

Extensive research has been carried out on the use of insecticides against the larvae and adults of blind mosquitoes. Since the larvae live on the lake or river bottom, they are more difficult to kill than the biting mosquito larvae that live on the water surface. The entire water volume must be treated with insecticide to provide effective control. In the past; this total treatment in many instances has been done in small lakes; however, today with emphasis on environmental quality and the development of resistance in midges to pesticides, larval control is not feasible.

Control measures against adult blind mosquitoes are effective for short periods of time. Mists or fogs from boat-mounted or truck-mounted sprayers traveling close to the shoreline kill midges resting in grass or other vegetation near the water's edge before they fly to the buildings. Individuals can kill blind mosquito adults by using fogging or aerosol units (several attach to lawn mowers or tractors). Follow directions on the label and fogging attachment for application and formulation instructions. Products labeled as outdoor space sprays are listed in Table 1.

Blind mosquitoes rest on vegetation and walls after they emerge as adults. These surfaces where they rest can be treated with residual insecticides. Residual surface sprays are listed in Table 2. Be sure to apply these materials so water sources are not contaminated.

These control methods are strictly temporary and do not get to the root of the problem. Blind mosquitoes breed in lakes and rivers in large numbers mainly due to the pollution of the water. Indications are that effluents from food-processing plants, septic tanks, sewage treatment plants, and leaching of fertilizers from lawns and agriculture around lakes, apply nutrients which contribute to the production of food for blind mosquitoes. As pollution increases, the available food increases and blind mosquito populations explode. Blind mosquitoes have been known for years to be indicators of pollution in waterways. But certain lakes in Florida have become

so severely polluted that even blind mosquitoes cannot survive in them.

Blind mosquitoes have predators, diseases and parasites which are being investigated as biological control agents. It is hoped that the propagation and establishment of these disease causing organisms parasites, and predators will be a future solution to the blind mosquito problem.

Consequently three long term solutions to the control of blind mosquitoes may be possible: (1) reduce effluents which provide food for the pest or (2) increase the effluents until the pest cannot survive or (3) biological control.

**Table 1.** Midge management products labeled for crack and crevice or indoor surface treatment.\*

Common Name	Homeowner Products*	Commercial Products*
Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	
Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	PT Cy-Kick CS Controlled Release Cyfluthrin Tempo 20 WP Tempo SC Ultra
Deltamethrin		Suspend SC Insecticide
Permethrin		Dragnet SFR Termiticide/Insecticide
Pyrethrins		PT ULD BP-300
Pyrethrins, MGK-264, Permethrin	Ortho Ant-B-Gon	
Pyrethrins, PBO		Pyrenone 100 Synerol Insecticide
<b>* Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive.</b>		

**Table 2.** Midge management products labeled for indoor space treatment.\*

Common Name	Homeowner Products*	Commercial Products*
Prallethrin		PT ULD SPY-300
Pyrethrins		PT ULD BP-300
Pyrethrins and Others		PT 565 Plus XLO PT Clear Zone Metered Pyrethrum Spray PT Microcare CS Controlled Release Pyrethrum PT Pro-Control PT ULD BP-100
Pyrethrins, PBO		PT P.I. Contact Insecticide PT ULD BP-50 Pyrenone 100 Synerol Insecticide TurboCide Shroom Insecticide
Pyrethrins, PCO		Pyrenone 50
Pyrethrins (0.05%), Permethrin (0.4%)	Ortho Indoor Insect Fogger	
Tetramethrin (0.2%), Phenothrin (0.2%)	Ortho Flying Insect Killer 1	
<b>* Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive.</b>		

**Table 3.** Midge management products labeled for outdoor barrier treatment.\*

Common Name	Homeowner Products*	Commercial Products*
Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	
Bifenthrin		Tastar Termiticide/Insecticide
Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer Bayer Power Force Multi-Insect Killer Ready-to-Spray Bayer Power Force Multi-Insect Killer Ready-to-Use	PT Cy-Kick CS Controlled Release Cyfluthrin Tempo 20 WP Tempo SC Ultra
Cypermethrin		Cynoff EC Cynoff Power Spray Insecticide Cynoff WP Cynoff WSB Prevail FT Termiticide
Deltamethrin		Suspend SC Insecticide
Permethrin		Astro Insecticide Dragnet SFR Termiticide/Insecticide
Pralletrin, Esfenvalerate, MGK-264 synergist	Ortho Roach, Ant & Spider Killer	
Pyrethrins and Others		PT Microcare CS Controlled Release Pyrethrum PT Microcare Pressurized Pyrethrum Capsule Suspension
Pyrethrins, MGK-264, Permethrin	Ortho Ant-B-Gon	
<b>* Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive.</b>		

**Table 4.** Midge management products labeled for outdoor broadcast treatment.\*

Common Name	Homeowner Products*	Commercial Products*
Beta-Cyfluthrin	Bayer Power Force Carpenter Ant & Termite Killer Plus	
Bifenthrin		Talstar Termiticide/Insecticide
Cyfluthrin	Bayer Advanced Home, Home Pest Control Indoor & Outdoor Insect Killer	Tempo 20 WP Tempo SC Ultra
Malathion	Ortho Malathion 50 Plus Insect Spray	
<b>* Read label carefully to insure pest, site and commodity are listed prior to applying product. Some product labels are very restrictive.</b>		