



Entomological Notes

Department of Entomology

MOSQUITOES

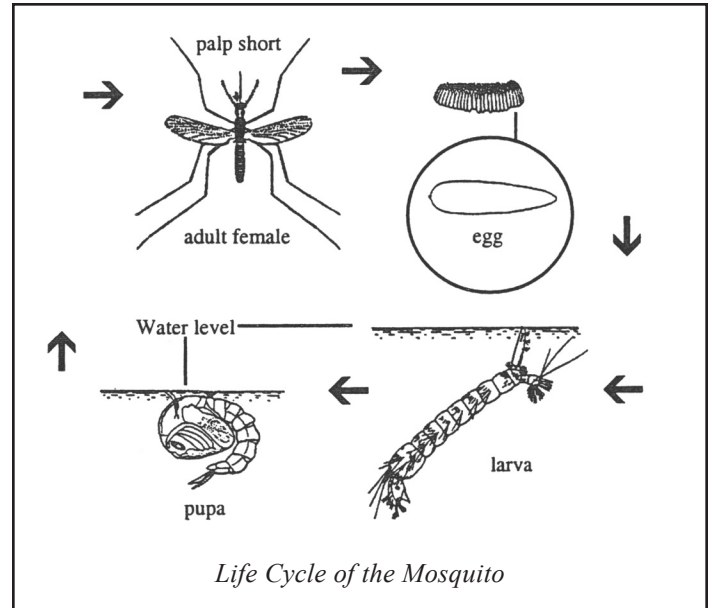
Worldwide, there are over 3,000 species of mosquitoes. The United States has approximately 200 documented species and Pennsylvania has about 60 species. Each year diseases transmitted by mosquitoes (such as malaria, yellow fever, dengue and filarial worms) kill or debilitate millions of people, mostly in developing countries located in tropical areas. In Pennsylvania, the risk of contracting a mosquito-borne disease has recently increased with the introduction of West Nile virus¹ (WNV). Fortunately, West Nile virus poses little risk to most Pennsylvanians unless they have compromised immune systems. Other diseases of concern are eastern equine encephalitis and canine heartworm disease (dogs only). Canine heartworm disease is easily prevented, and eastern equine encephalitis rarely occurs² far from the Atlantic coastal regions.

The mosquito most often discovered in urban areas of Pennsylvania is the **northern house mosquito**, *Culex pipiens*. This is also the mosquito that is thought to transmit the most cases of WNV (human cases) in Pennsylvania and consequently poses the greatest annoyance and risk to our citizens.

Although the risk of contracting serious illness from mosquitoes is low, much can be done to increase protection from mosquito-borne disease. This includes the reduction of breeding sites, use of repellents, repair of home screens and the limitation of outdoor activities to periods of time when mosquitoes are less active.

DESCRIPTION

Adult mosquitoes are slender, small long-legged flies with narrow, hairy wings and extended mouthparts. The eggs, depending on species, are deposited on water or vegetation in water, in tree holes, and at sites that hold a high potential for flooding. The northern house mosquito deposits its eggs on end and side by side (called rafts) on the water surface. Some mosquito species can complete their life cycles in as little as 7 days but the northern house mosquito requires a minimum of 10-14 days – more often



closer to a month. The mosquito larvae are known as wrigglers because they wriggle around in water as a method of locomotion. When undisturbed, the wrigglers lie just below the water surface and breathe through a tube located on their abdominal end.

IMPACT

Adult female mosquitoes require a blood meal in order to produce viable eggs. While feeding, the females inject saliva-containing anticoagulants that prevent the blood from clotting. Because mosquitoes take numerous blood meals, they can acquire disease organisms from an infected host and later transmit those organisms to previously uninfected hosts. Environmental conditions such as high rainfall and warm temperatures favor mosquito development, increase the level of infection in the reservoir host population, and thereby increase the chance of humans acquiring the disease.

MANAGEMENT

Outdoor activities:

The northern house mosquito is most active at dusk to dawn. Pennsylvanians with immune system deficiencies should try to limit outside activities to daylight hours. Likewise, parents of young children and infants should keep children inside during these same hours. Although some species of mosquitoes bite

¹ During the 5 year period from 2001 through 2005, the number of west Nile virus human cases reported were: 2001 - 3; 2002 - 62; 2003 - 237; 2004 - 15; 2005 - 25.

² Only 2 cases of eastern equine encephalitis occurred in Pennsylvania during the 37-year period from 1964 through 2000.

during daylight, they are not as prevalent in urban areas as the northern house mosquito.

Stagnant Water:

Eliminate standing water around the property to reduce the numbers of potential mosquito breeding sites. Ideally, this should be a community goal because most mosquitoes can fly long distances.

The types of modifications include:

- Removing old tires, cans, buckets, pots, and similar items that can trap rainwater.
- Position tarps and boat covers to allow rain runoff and limit 'ponding.'
- Potted plants with water-capture bases should be drained or screening applied to the overflow vents.
- Turn plastic wading pools and wheelbarrows upside-down when not in use.
- Change birdbath water at least once a week.
- Keep swimming pools chlorinated and stock ornamental ponds with surface-feeding minnows.
- Rain gutters should be installed with sufficient slope to prevent the pooling of water; remove leaves and other obstructions from downspouts.

Exclusion:

All doors and windows should fit tightly and remain closed during the peak mosquito activity periods between dusk and dawn. Screening should be no larger than 18 x 18 mesh. Replace screening that has holes or tears.

Insecticides:

Only licensed pest control companies operating under the direction of an appropriate government authority should perform area-wide treatment of adult mosquitoes using fogging equipment. This type of control is only temporarily effective when applied to relatively large areas. This method of mosquito management is not effective when applied by homeowners to small areas because mosquitoes can fly in from untreated locations.

Homeowners can treat standing water (retention ponds, ornamental pools, etc.) by using a safe material called Bti (a bacterium named *Bacillus thuringiensis* var. *israelensis*). This material affects larval, aquatic fly species. It is available in pellet and doughnut-shaped briquettes, typically kills the wrigglers in less than 12 hours and has no measured effect on fish, birds or mammals.

Repellents:

Materials containing DEET (N,N-diethyl-meta-toluamide) are effective in repelling mosquitoes. See the following website for information on the safe use of repellents: http://www.pested.psu.edu/issues/wnv/pres_facts.shtml

WARNING

Pesticides are poisonous. Read and follow the label directions and safety precautions. Handle them carefully and store in original, labeled containers—out of the reach of children, pets, and livestock. Dispose of empty containers quickly, in a safe manner and place. Do not contaminate forage, streams, or ponds.

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