



Mosquito Biology and Behavior



A Teacher's Resource Guide

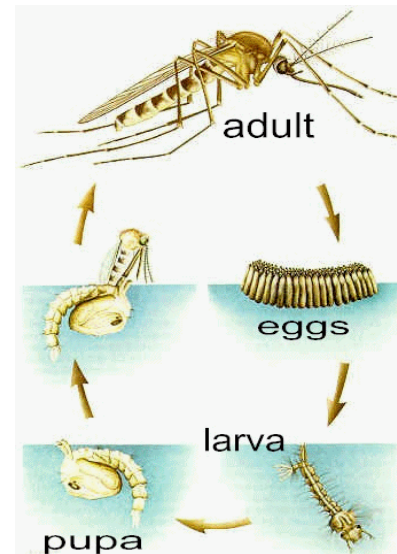
Compiled by Marc Seligson, Fall 2010

What is a mosquito?

Mosquitoes are very common insects of the family Culicidae. There are about 3,500 different species of mosquitoes throughout the world, of which approximately 230 species can be found in the United States. The three most common mosquitoes found in the United States are *Aedes albopictus*, *Culex pipens*, and *Anopheles quadrimaculatus*.

What is the life cycle of the mosquito?

Like many insects, mosquitoes go through four life stages that include egg, larva, pupa, and the adult. The female mosquitoes lay their eggs on the water, where they can sit anywhere from 24-36 hours. Once they hatch, the mosquitos are in their larval phase for 7-14 days. During this time they feed on organic debris and microorganisms in the water while molting their exoskeleton several times until they become pupae. The mosquitoes will stay in the pupae phase for about two days until they exit their pupal skin and fly off to find their first blood or nectar meal. At normal water temperatures and nutrient conditions, this entire process takes about 10 to 14 days.



<http://www.mosquito-misting.com/life%20cycle.htm>

How long do mosquitoes live?

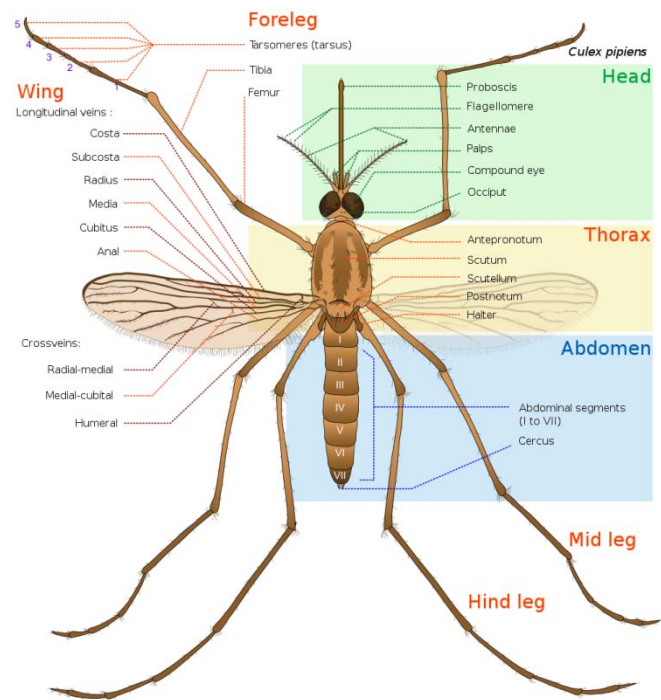
Mosquitoes are relatively fragile insects with an adult life span that lasts about two weeks. A majority of mosquitoes end their life cycle as food for birds, dragonflies, and spiders or are killed by the effects of nature such as wind, rain, or drought.



Some mosquito species that have just a single generation each year are longer lived and may live for as long as 2-3 months given the proper environmental conditions. There are some species of mosquito that can hibernate for 6-8 months. Some of the mosquito species found in arctic regions enter hibernation twice and take more than a year to complete their life cycle.

Why do mosquitoes suck blood?

Contrary to popular belief, mosquitoes do not feed on blood; they get the nutrients in their diets from the nectar of flowers and plants. Blood is only crucial for the development of mosquito eggs which require certain proteins found in the blood. Because males do not lay eggs it is only the female mosquitoes that suck blood.



How do mosquitoes suck blood?

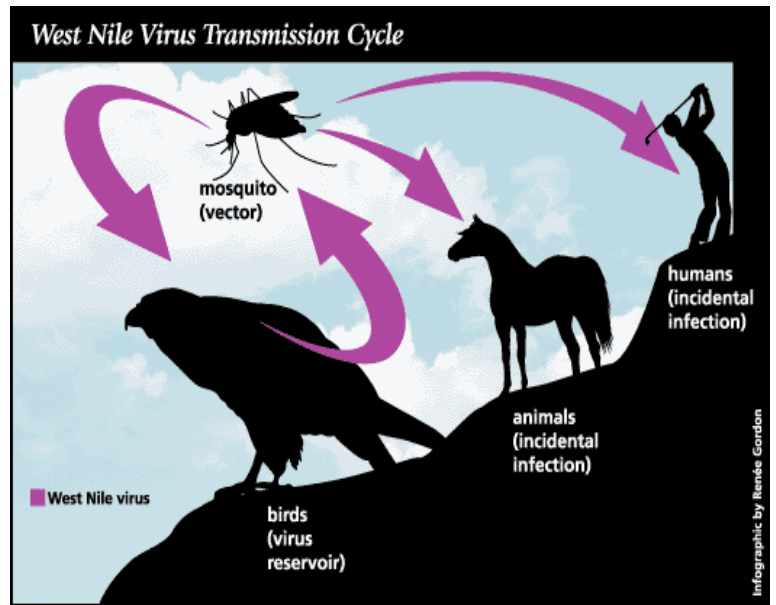
The female mosquito can locate her victim by detecting the carbon dioxide levels in the air. Once carbon dioxide is exhaled from the lungs, the mosquito may follow the CO₂ trail in a zigzag pattern until she has located the source. Once located, the female mosquito can puncture the skin with her mouth part called the proboscis. Once a blood vessel is found, the mosquito will suck the blood out through one mouthpiece. Many species of mosquito can take in up to four times their weight in blood. They are able to do this due to special chemicals in their saliva which keeps our blood from clotting. Once she has fed, the female mosquito will finish developing her eggs and lay them in a still water source. This cycle is repeated many times during the mosquitoes short 2 week life span.

What else are mosquitoes attracted too?

Using highly sensitive sensory hairs along the length of their antennae, mosquitoes are able to detect many changes in their environment which allow them to easily find their blood meals. Depending on the species, female mosquitoes can detect a host to feed on from up to 40 yards away. These structures can sense changes in moisture, heat, movement and vibrations, as well as the levels of chemicals in the air like carbon dioxide and lactic acid. There are an estimated 400 chemicals emitted from human skin and about 100 volatile compounds in each human breath that mosquitoes can detect. Therefore, the more you sweat the easier it is for a mosquito to find you because they are drawn to the smell of lactic acid as you perspire. In addition, it is dark colors which capture heat that make people more attractive to mosquitoes. Wearing lighter colors will reflect heat and are less attractive to mosquitoes. Finally, floral detergents, fabric softeners, and many other scented hygiene products can heighten mosquito attraction.

What is a disease vector?

A vector is a type of organism that is capable of transmitting disease from one host to another host. Mosquitoes play a unique function as vectors for many diseases; these diseases often have a wide distribution and a high number of cases. Because of its role as a vector, mosquito-borne diseases kill more people worldwide each year than any other single factor. Many mosquito species are known as bridge vectors because they suck blood from both birds and other mammals, including humans.

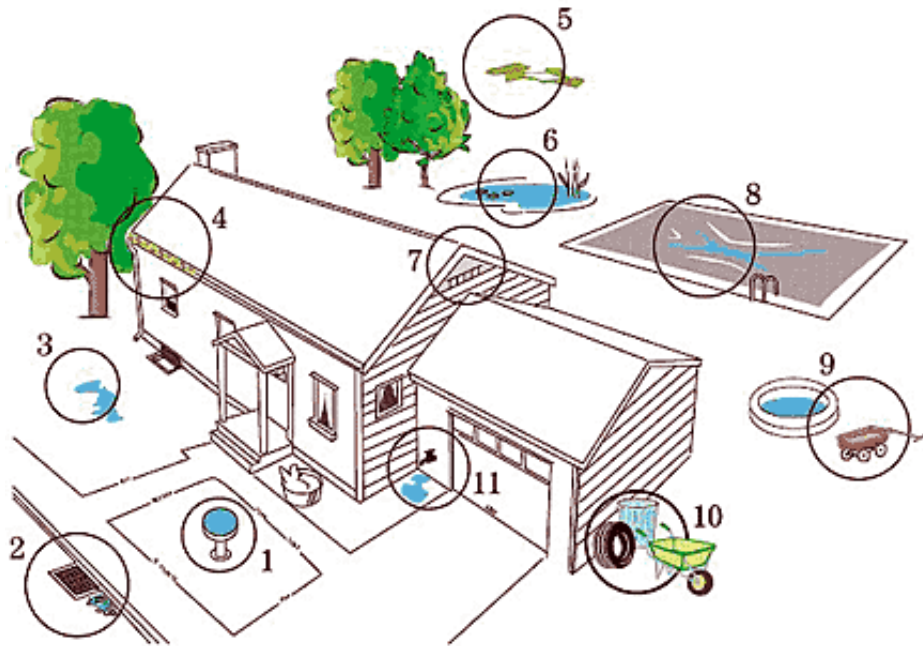


What diseases can mosquitoes carry?

Mosquitoes can carry Malaria, Yellow Fever, West Nile Virus, La Crosse Encephalitis, Dengue Fever, Heartworm, and more. Luckily, many of these diseases have been eradicated from the United States.

How can I protect myself from mosquitoes?

The best way to control the mosquito population is to focus efforts at removing their breeding grounds. This is the most effective way because without a stable breeding ground, the mosquitoes will not have a chance to develop into adults. Mosquitoes like shallow water and can breed in a variety of permanent or temporary bodies of water. Eliminating these bodies of water from around the house is easy, as long as you know what to look for.



<http://www.publichealthgreybruce.on.ca>

Other steps you can take to prevent mosquito bites are: The proper use of insect repellents like DEET, wearing long sleeves and pants when heading into high mosquito areas, replace outdoor lights with "bug lights", and by also securing door and window screens.

Additional Resources for Mosquito Biology and Behavior:

<http://www.control-mosquitoes.com/>

This is a great website with a ton of fun facts and information about mosquitos as well as information on mosquito control.

http://www.cdc.gov/ncidod/diseases/list_mosquitoborne.htm

This is the Center for Disease Control's web page with more information on the various diseases which mosquitos can carry.

<http://www.clarku.edu/~tlivdahl/mc.html>

Website designed by Clark University, contains many valuable resources including additional teaching resources, class project ideas, and puzzles about mosquitoes.

The Mosquito Word Search

A M R M G T O S B S D C E S S H
N S L E P T R A P I J T E A I T
T A F T N U E E S N I L J D C L
E L U A C I P E E B E Z O C S A
N I W M A Y A A D H T N A G O E
N V L O K S T T P T O R M G B H
A A I R E X O O N H B L K E O T
E T N P M P N K P O Z W E K R J
B L Z H H A L I N D C H B B P Q
T O Y O T J S D Z A I R A L A M
I M K S E D I C I T C E S N I H
R E L I N O N L I A T I W J A L
E B T S X I T C H C V E L D C S
C M A I V E C T O R S R U B C P
B G D M O S Q U I T O L A S U G
X E D O O L B N T S T G X L S P

Words:

- ADULT
- ANOPHELES
- ANTENNAE
- BITE
- BLOOD
- CARBONDIOXIDE
- CONTAINER
- DEET
- DISEASE
- EGG
- HEALTH
- INSECTICIDE
- ITCH
- LARVA
- MALARIA
- METAMORPHOSIS
- MOLT
- MOSQUITO
- PROBOSCIS
- PUBLIC
- PUPA
- SALIVA
- SIPHON
- TIRE
- TREEHOLE
- VECTOR