



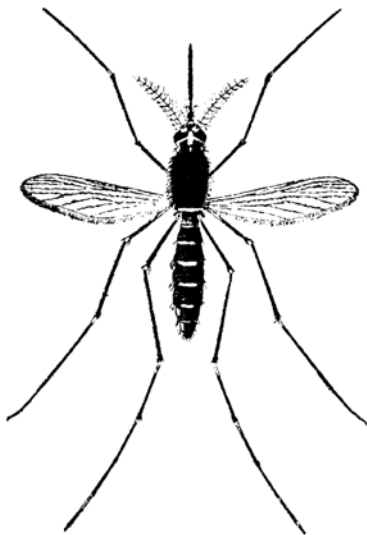
Household & Public Health

Department of Entomology

MOSQUITOES IN AND AROUND THE HOME

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Usually, the major reason for mosquito control is relief from the annoyance of mosquito bites and the irritating reaction that often follows. Many of the approximately 50+ species of mosquitoes that occur in Indiana do significantly annoy by their biting activity. However, a potentially more important reason for control is the prevention of disease transmission.



MOSQUITOES AS DISEASE CARRIERS

The diseases associated with mosquitoes have spread terror throughout many parts of the world. Fortunately, names such as malaria, yellow fever, and dengue fever are spoken of with concern only in the tropics. Those of us living in Indiana, however, do need to be concerned with encephalitis, although malaria was once a serious problem in the area.

Encephalitis is an inflammation of the brain which can be caused by a mosquito-borne virus. There are several kinds of mosquito-borne encephalitis of potential concern to Indiana residents (e.g., St. Louis Encephalitis, Eastern Equine Encephalitis, Western Equine Encephalitis, LaCrosse Virus). Each of these infections is primarily a disease of birds or small mammals and is referred to as a zoonosis. Several species of birds in North America are capable of harboring these viruses. The origin of these viruses is unknown. We only know that a few infected migratory birds appear in the springtime at various, unpredictable places. As the birds move north, they reproduce, and nestlings appear just as mosquito populations begin to grow. As the virus is picked up and spread from one bird to another by mosquitoes, the size of the virus reservoir increases. By the end of July, if the size of the virus reservoir is large enough and if mosquito populations are high, some of the mosquitoes which have fed on infected birds may bite people and transmit the disease. Thus there is an overflow of the virus into the human population, and this causes an outbreak of encephalitis. The size of the outbreak will be determined by the extent of contact between people and infected mosquitoes.

Culex sp. mosquitoes are the most likely culprits for the spread of St. Louis Encephalitis. They breed in pools of water which are very rich in organic nutrients that come from bird droppings, sewage, decaying plant material, etc. Clogged rain gutters, barrels, bird baths and tires also make excellent breeding sites. Virtually any container in which water accumulates for a period is a potential breeding site.

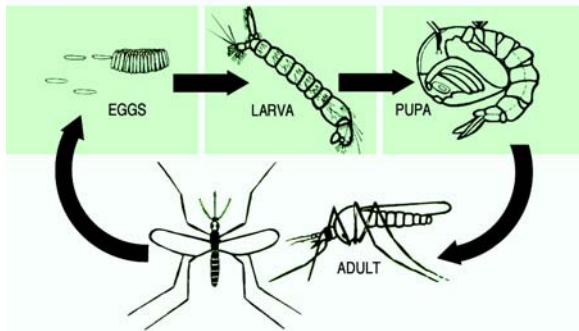
Although infection does occur among all ages, elderly and chronically ill individuals are affected to a greater degree by St. Louis Encephalitis. The mortality rate is

about 10 percent. Outbreaks are extremely sporadic and unpredictable because of the bird reservoir. In 1975, an outbreak occurred in several Indiana counties resulting in illnesses and several deaths.

Eastern and Western Equine Encephalitis can be very virulent. These diseases appear mainly in children, can be fatal in a great percentage of cases, and have been known to cause mental retardation, convulsions and paralysis in survivors. The mortality rate in horses is extremely high.

The reservoirs of LaCrosse Virus are chipmunks and squirrels. The primary mosquito responsible for transmission of the virus is *Aedes triseriatus*. This mosquito is associated with woodland areas and breeds in water-containing holes in trees. It can also be found breeding in water inside discarded tires. LaCrosse Virus is an endemic disease that remains with us constantly in localized areas. The disease especially affects children. Though one of the less virulent of the encephalitides, the aftereffects of infection have not been sufficiently studied to determine the effect on human populations in areas where there is a high incidence of the virus.

Other potential disease transmitting mosquitoes are of concern to Indiana and the Midwest. One species, *Aedes albopictus*, the Asian tiger mosquito, has gotten established in certain areas of Indiana, and is of potential concern in disease transmission. It, like the *Aedes triseriatus*, is a tree hole breeder and readily breeds in discarded tires.



WHERE AND HOW MOSQUITOES DEVELOP

Mosquitoes always develop in water, but the type of breeding place varies with the species of mosquito. Common breeding places are flood waters, woodland pools, slow-moving streams, ditches, marshes, and around the edges of lakes. Mosquitoes may also develop in tree cavities, rain barrels, fish ponds, bird baths, old tires, tin cans, guttering, and catch basins - in other words, in anything that holds water. The extensive breeding of mosquitoes in such containers has often contributed to disease outbreaks. Mosquitoes lay eggs on the surface of water or in low places where water is likely to

accumulate. In these low places, the eggs may hatch in less than 3 days after flooding occurs. The larvae, commonly called "wobble-tails," mature in 7-10 days and change into a pupal or "tumbler" stage. Two or three days later, adult mosquitoes emerge. After taking a blood meal, each female lays 100-400 eggs or more. The entire life cycle may be completed in 5-10 days.

ELIMINATING BREEDING PLACES

The most effective control of mosquitoes around the home is to prevent them from breeding. This can be done by eliminating or altering existing breeding sites as follows:

1. Destroy or dispose of tin cans, old tires, or any other artificial water containers.
2. Make weekly inspections of the water in flower pots and plant containers. If mosquito larvae are seen, change the water. Also, be sure to loosen soil in flower pots regularly to ensure that water penetrates through the soil instead of forming a stagnant pool on the surface for mosquitoes to breed in.
3. Change the water in bird baths and wading pools once or twice a week. Drain wading pools when not in use.
4. Stock garden and lily ponds with top-feeding minnows.
5. Keep rain gutters unclogged and flat roofs dry.
6. Drain and fill stagnant pools, puddles, ditches, or swampy places around the home and property.
7. Keep margins of small ponds clear of vegetation.
8. Place tight covers over cisterns, cesspools, septic tanks, fire barrels, rain barrels, and tubs where water is stored.
9. Fill all tree holes with sand or mortar, or drain them.
10. Remove all tree stumps that may hold water.

CONTROLLING MOSQUITOES OUTDOORS

In addition to the elimination of breeding sites, it may be necessary to control adult mosquitoes that migrate in from surrounding areas. The adults like to rest in vegetation. Therefore, do not allow weeds to grow uncontrolled near the home, and keep weeds in nearby lots well trimmed. Leave insecticide treatments to trained mosquito control personnel. Contact your local health department regarding any concerns or interest for chemical treatment.

CONTROLLING MOSQUITOES INDOORS

Mosquitoes can be prevented in the home by keeping windows and porches tightly screened. Inspect screens in windows, doors, and porches for holes or tears. Likewise, fill gaps around windows and doors with weather-stripping. Space sprays or aerosols containing synergized pyrethrins are effective against mosquitoes found in the home. Use these materials as directed on the label.

PERSONAL PROTECTION

When possible, wear long-sleeved shirts and long pants with enough thickness to prevent mosquitoes from reaching the skin. Dark colors attract mosquitoes, so wear light tones if you're going to be outside. Mosquitoes are often most active at dawn and dusk. If possible stay indoors or in a tightly screened area to avoid bites at these times. When the female mosquito bites, our body reacts by releasing histamine at the bite site. This causes itching and swelling. Overzealous scratching can break the skin and lead to secondary infection. Apply a topical antihistamine treatment to relieve the itching and swelling. Check label directions for proper use. If an infection develops, seek proper medical attention.

Repellents are very useful in protecting against mosquito bites. Available under various trade names, those repellents that contain the active ingredient diethyl toluamide (DEET) are the most effective. Use only those repellents that are registered by the Environmental Protection Agency (EPA). These are proven to be effective when used according to label directions. Citronella candles are available, but may be of limited effectiveness because of variable outdoor wind movement. A granular repellent containing naphthalene compounds, Mosquito Beater, can be applied on lawns and other mosquito-infested areas. It effectively keeps mosquitoes repelled for several hours.

DOG HEARTWORM TRANSMISSION

Mosquitoes not only feast on human blood but other target animals as well as birds and amphibians. Generally, animals are not harmed by mosquitoes. However, some species of mosquitoes may play a role in transmitting heartworm in dogs. During times of high infestation, keep pets inside the house, a screened-in kennel or porch area. Avoid walking your pet during prime mosquito "feeding time." Check with a veterinarian for preventative measures for dog heartworm.

READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDE.

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