W 1293

MANAGING CONTAINER MOSQUITOES

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There are several mosquito species that use natural or artificial water-holding containers to lay their eggs. These species can be commonly found in and around homes and businesses. Many container mosquitoes are vectors of pathogens that cause diseases in animals and/or humans. These disease pathogens can result in asymptomatic or symptomatic infections that can be severe, potentially leading to death. Additionally, many of these mosquitoes are aggressive biters. It is important to know how to prevent mosquito bites and how to control mosquitoes around your home and/or business, which can reduce the risk of disease and minimize their nuisance.

MOSQUITO LIFE CYCLE

All mosquito species require water to complete their life cycle. Adult female container mosquitoes lay their eggs in natural containers such as tree holes, bamboo shoots and rock pools. They also will lay eggs in artificial containers such as tires, planter bottoms, toys, bottle caps, gutters, septic tanks and other containers that are accessible and hold water.

Adult females lay eggs on the inner wall of a container just above the waterline. In the egg stage, many species are desiccant tolerant (can dry out) and can survive for years in dry conditions until they are submerged in water. Eggs can survive the winter. Once the eggs hatch, the larvae will feed on organic matter (e.g., bacteria, algae and small organic debris) to help them grow and develop into pupae. Once the pupation cycle is complete, the adults will emerge from the water. In warmer climates, particularly in the Southern states, where temperatures are higher throughout the year, it is common to see adults most months of the year.

Adult mosquitoes can be seen flying and active during the day. They also may be seen resting on or under shrubs, tree leaves, flowers, structure walls (inside or outside) and/or on other plants or objects in the environment. Both sexes will feed on sugar sources to gain the carbohydrates for flight. Only females require a blood meal to gain the protein for successful egg production. Most mosquito species feed on birds and mammals, including humans.

CONTAINER MOSQUITO SPECIES & DISEASE PATHOGENS

Depending on where you are living or traveling, your risk for acquiring disease pathogens varies. See Table 1.

Table 1. Container mosquitoes can transmit many pathogens leading to disease, but each mosquito species has a unique ability to transmit each pathogen. Information on disease pathogens, vector mosquito species found in the US and the location where the disease pathogens may be present are included. Information from the Centers for Disease Control and Prevention (CDC) and the European Centre for Disease Prevention and Control (ECDC).

Disease Pathogen	Location	Mosquito Common Name (Scientific Name)			
		Asian Tiger Mosquito (*Aedes albopictus*)	Yellow Fever Mosquito (*Aedes aegypti*)	Eastern Treehole Mosquito (*Aedes triseriatus*)	Rock Pool Mosquito (*Aedes japonicus*)
Chikungunya virus	Tropical & subtropical areas	Can Transmit	Can Transmit	Cannot Transmit	Cannot Transmit
Dengue virus	US & territories, Southeast Asia, Central & South America	Can Transmit	Can Transmit	Cannot Transmit	Cannot Transmit
Dirofilariasis (Heartworm)	North & South America, Japan, Australia, Europe	Can Transmit	Cannot Transmit	Cannot Transmit	Cannot Transmit
La Crosse virus	US	Can Transmit	Cannot Transmit	Can Transmit	Can Transmit
Yellow Fever virus	Africa, South America	Cannot Transmit	Can Transmit	Cannot Transmit	Cannot Transmit
Zika virus	US territories, South & Central America	Can Transmit	Can Transmit	Cannot Transmit	Cannot Transmit

STEPS TO PREVENT MOSQUITO BITES

Most disease pathogens that can be transmitted by container mosquitoes have no available preventative treatments, such as vaccines. Therefore, it is critical to prevent mosquito bites from occurring by protecting yourself when outside and preventing them from entering your home or business.

- Wear protective clothing such as long-sleeve shirts and long pants when outdoors
- Use an EPA-approved repellent and reapply if necessary
- Avoid known activity areas when mosquitoes are active
- Maintain intact screens on windows and doors

CONTROL MEASURES FOR MOSQUITOES

The first and most important step for reducing exposure to mosquitoes is to remove habitats where they lay eggs and develop as larvae. This is achieved by removing standing water around the home, including the removal or weekly dumping of containers (e.g., buckets, bird baths or discarded tires), because eggs can result in adult mosquitoes in a little over a week. There are many unexpected sources of standing water around homes, such as clogged rain gutters and septic tanks, that can support larger mosquito populations. Water sources that cannot be removed can be covered with a secure lid to prevent the female mosquitoes from laying eggs in the container. In instances where removal or use of a lid is impractical, the water in the container also can be treated with an EPA-approved and registered product that targets and controls immature mosquitoes.

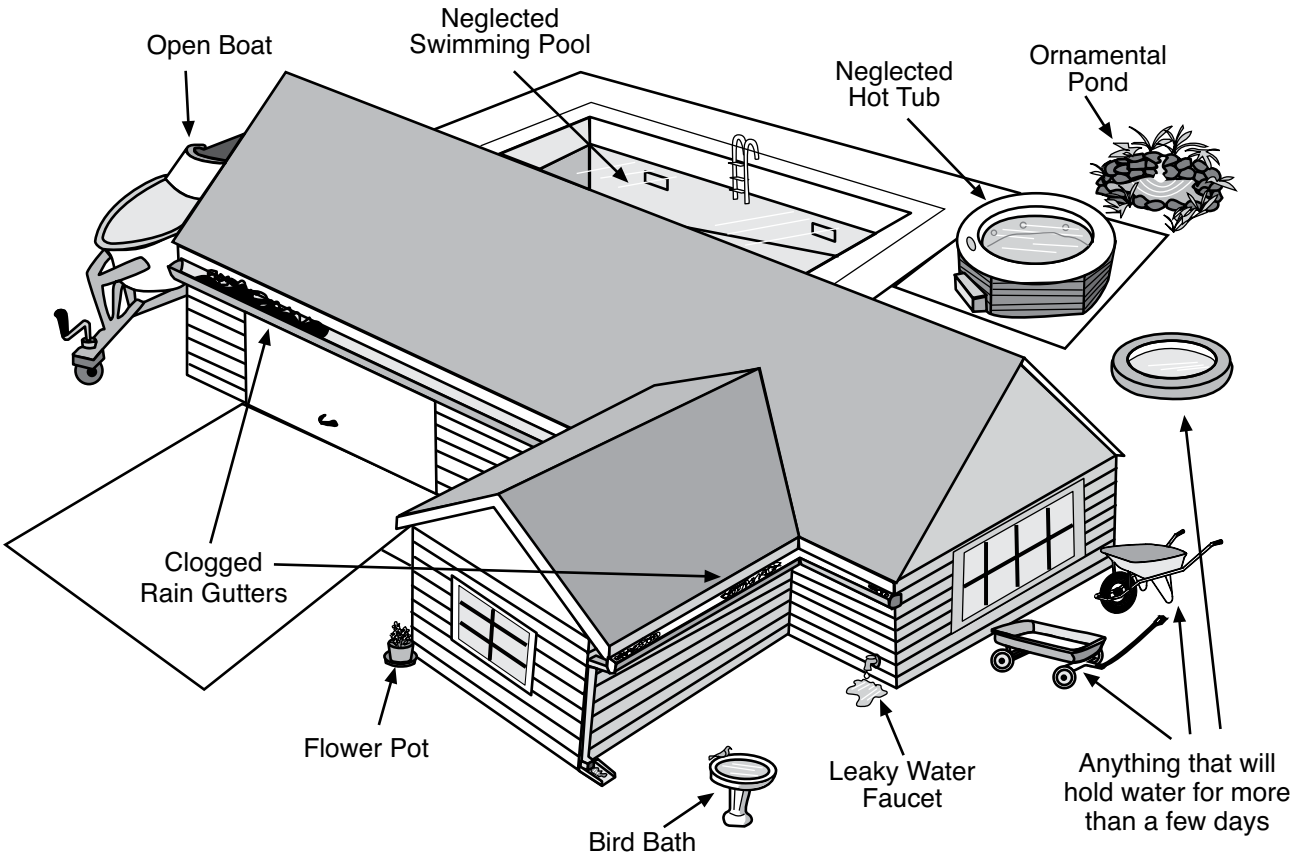

Figure 1. *Examples of potential habitats for mosquito egg laying and immature development around the home. Graphic from Vail et al. 2006.*

Local, city and state laws will determine the control methods which can be used and the frequency. Additional mosquito management strategies such as targeted pesticide applications to non-flowering plants and other resting areas can be employed by pest management professionals (PMPs) to reduce the number of mosquitoes around the home. These applications have a residual efficacy for a period after application. Focusing on resting areas will result in fewer adults. However, these strategies are not sustainable if standing water sources are not addressed. Mosquito traps may be used to trap adult females, however, not all devices are effective against all species. Multiple traps may be needed to address all mosquito species in an area. Some traps may reduce the number of adults present in an area and other devices are used to determine the relative abundance of mosquitoes in an area. These data can help a PMP, state public health or county public health employee determine additional management strategies that need to occur.

Local, county and state agencies may employ regular pesticide applications to knock down the number of adult mosquitoes in commonly used spaces. The decision to use these area-wide methods is often driven by surveillance techniques.

All these measures are meant to reduce the adult population to prevent and further reduce the current and the next generation of mosquitoes, which leads to the reduced number of pathogen-carrying mosquitoes.

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