

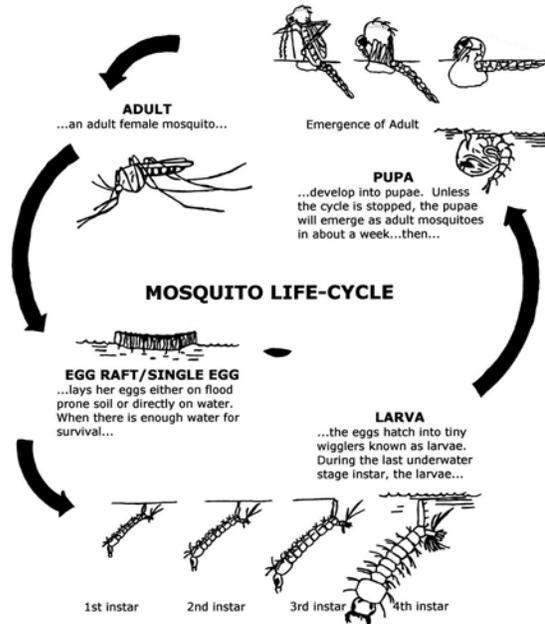


# Green Gazette

## Bromeliads and Mosquitoes

By Ron Leavitt, Master Gardener

ZIKA!! There hadn't been much recent discussion or interest in the interrelationship of bromeliads and mosquitoes until this past year when local transmission of the Zika virus by *Aedes sp.* on Florida's east coast became a topic of national news. Bromeliads were implicated in the breeding of mosquitoes and a serious campaign was waged in the Miami area to eradicate them.



So what's the big deal? It's all connected to the life cycle of the mosquito and the way bromeliads handle water. Mosquitoes are in the Diptera order of insects and they undergo a complete metamorphosis. After ingesting a blood meal, the female deposits her eggs and they will only hatch in water. The larvae go through 4 instar stages in the water and then pupate, still in water. The pupa develops into the adult mosquito at the surface, which then flies off to resume its life cycle after its wings dry. Depending on temperature and species, this life cycle takes roughly 1 to 4 weeks. Mosquitoes in Florida have been implicated in the transmission of Zika, Eastern equine encephalitis, and canine heartworm. Elsewhere in the world, they are vectors for dengue fever, chikungunya, malaria, and yellow fever.



Many species of bromeliads have a central reservoir commonly called a "tank", a central area that collects and holds water from rain, irrigation, or dew. The plants absorb most of their water as well as nutrients from dissolved organic matter from specialized cells which line their tank rather than

from roots. This tank is an ideal location for the deposition of mosquito eggs. While the *Aedes sp.* don't inhabit this preferentially over other water sources, they as well as *Culex sp* and *Wyeomia* mosquito species have been identified breeding in bromeliad tanks. Except for *Wyeomia sp*, bromeliads are just one more source of standing water in which mosquitoes can breed but not necessarily a preferred site.

During the Zika scare last summer, counties and municipalities on Florida's east coast where local transmission occurred chose to deal with bromeliads by eradicating them from public property. In the Miami Beach Botanical Garden, 3 dump truck loads were used to remove over 2000 plants. Property owners were strongly encouraged but not required to remove their bromeliads. Other less radical options exist for controlling mosquito breeding in bromeliads.

The first option is simple weekly mechanical flushing. This doesn't mean walking around with a watering can or turning on your sprinklers. Each individual Bromeliad tank must be forcibly flushed out with a hose to completely wash out the developing larvae. And given the relatively short life cycle in warm summer temperatures for *Aedes sp.*, flushing must be done weekly. The second option is *Bacillus thuringiensis israelensis*. This subspecies is targeted specifically to kill the larvae of Diptera, essentially only flies and mosquitoes. It is available as granules (bits) or liquid concentrate from most garden centers and is applied very sparingly to each Bromeliad tank on a weekly basis due to its short half-life to disrupt the life cycle. A longer acting and more expensive preparation commonly called "dunks" is a sustained release form that can be applied on 2 to 3 week intervals. Dunks come in a donut shaped preparation which the manufacture states can be broken into not smaller than quarters and applied to small bodies of water, in this case a bromeliad tank. A third option is the use of methoprene, a juvenile hormone analog. Methoprene interferes with the maturation of the larvae and with pupation but does not affect the mature mosquito. It is considered extremely safe by the EPA, is an integral part of many pet flea prevention products, and is present in trace amounts in many food products. A commonly available brand known as Altosid comes as granules to be sprinkled into the desired wet areas. Because of the half-life of methoprene, it needs to be applied every 3 to 4 weeks.

Enjoy this varied and colorful addition to the home garden, with varieties that can thrive in sun or shade. But if you want to do your part to control the mosquito population, be prepared to exercise proper control methods.

IFAS ENY 753: Florida Resident's Guide to Mosquito Control  
<http://edis.ifas.ufl.edu/pdf/IN/IN104500.pdf>

IFAS ENH 1071: Bromeliads at a Glance <http://edis.ifas.ufl.edu/ep337>

Entomology Dept. UFL: Bromeliad Inhabiting Mosquitoes in Florida  
<http://entnemdept.ufl.edu/frank/bromeliadbiota/mosbrom.htm>



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