

Bromeliads and Mosquitoes¹

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INTRODUCTION: Bromeliads are popular ornamental plants in central and southern Florida. Many imported species and hybrids are easy to care for. They provide colorful flowers, attractive foliage, or both. Most of them grow best in partial or full shade. Dead leaves and twigs of shade trees fall, and some are caught and decompose in the leaf axils of some bromeliads which hold little pools of water (tanks). These tank bromeliads obtain nutrients from the decomposing materials in their water-filled tanks.

Larvae of some mosquito species also will live in these water-filled, nutrient-containing tanks. The mosquito larvae do not harm the bromeliads, but the adult female mosquitoes bite warm-blooded animals in daylight hours. Although many of the tank bromeliads that support development of mosquito larvae in cities in central and south Florida are imported from the tropics, some tank bromeliads are native to Florida and are protected by law. In addition to mosquito larvae, they may contain numerous, harmless, minute, native, aquatic organisms which occur nowhere but in bromeliad tanks (Frank 1983).

BROMELIADS: Over 2,500 species of plants are included in the family Bromeliaceae (commonly called "air plants"). Almost all are native to South or Central America, Mexico or the West Indies, with only a few native to the USA. About 16 are native to Florida, and all of these grow naturally as epiphytes of trees. The Florida natives belong to the genera *Catopsis*, *Guzmania*, and *Tillandsia*, and most of these are protected by Florida law. The two which are not protected, because they are so abundant in Florida, are *Tillandsia usneoides* L. ("Spanish moss") and *Tillandsia recurvata* L. ("ball moss"), but these are not tank bromeliads. The two fairly abundant tank bromeliads in central and southern Florida are *Tillandsia fasciculata* Sw. and *T. utriculata* L., commonly called "wild pines". Many imported bromeliads species and hybrids, grown in central and southern Florida cities for their attractive foliage or flowers, are tank bromeliads and their tanks provide a habitat for larvae of *Wyeomyia* mosquitoes.

MOSQUITOES AND THEIR CONTROL: The aquatic immature stages (eggs, larvae, and pupae) of two mosquito species, *Wyeomyia mitchellii* (Theobald) and *Wyeomyia vanduzeei* Dyar & Knab, depend upon bromeliad tanks for their development. Both are native to Florida. They inhabit tanks of native "wild pines" and have adapted readily to the micro-habitat provided by tanks of imported bromeliads. The most abundant imported bromeliad in central and southern Florida cities probably is *Billbergia pyramidalis* (Sims) Lindley; each plant of this species is estimated to produce about 100 adult *Wyeomyia* mosquitoes each year (Frank et al. 1988), so beds of these plants in Florida cities can lead to substantial production of adult *Wyeomyia* mosquitoes. Mosquito control agencies in central and southern Florida receive numerous complaints from people who have been bitten by *Wyeomyia* mosquitoes. These complaints come mainly from people who grow imported bromeliads in their yards, but sometimes from their neighbors. An obvious way to avoid being bitten by such mosquitoes in your yard is not to grow tank bromeliads.

The most reliable control strategy for the *Wyeomyia* mosquitoes is to reduce the number of imported tank bromeliads grown. Chemical pesticides do not control them reliably. Alternative strategies are available to people who want to grow imported tank bromeliads, though these strategies take some effort (Frank, in press).

LITERATURE CITED:

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FIGURE 1-4: 1 (upper left) *Tillandsia fasciculata* Sw. is one of the two "wild pines" native to Florida - both of the "wild pines" impound water in their leaf axils, and the impounded water provides a habitat for eggs, larvae, and pupae of *Wyeomyia* mosquitoes - other bromeliad species native to Florida are rare and/or, unlike the "wild pines", do not impound water so do not provide a substantial habitat for immature mosquitoes; 2 (upper right) *Billbergia pyramidalis* (Sims) Lindley, is one of several imported bromeliad species popular as ornamentals in southern Florida - it, too, provides habitat for the aquatic stages of *Wyeomyia* and occasionally for other sorts of mosquitoes, in water in a central tank formed by the leaves; 3 (lower left) section of the water-filled tank formed by leaves of *Billbergia pyramidalis* and containing *Wyeomyia* mosquito larvae; 4 (lower right) adult female *Wyeomyia* mosquito engorged with blood from a human hand - these are small mosquitoes whose females bite during daylight hours and which hold the 3rd pair of legs forward over the back and head - they are not known to transmit human diseases in Florida although the bite itches. Other species of pest mosquitoes are attracted to lay their eggs in bromeliad tanks mainly when the water is fouled with excessive organic materials such as grass clippings; these other species are capable of transmitting human diseases when the diseases are prevalent.

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