

PHYTOTELMATA

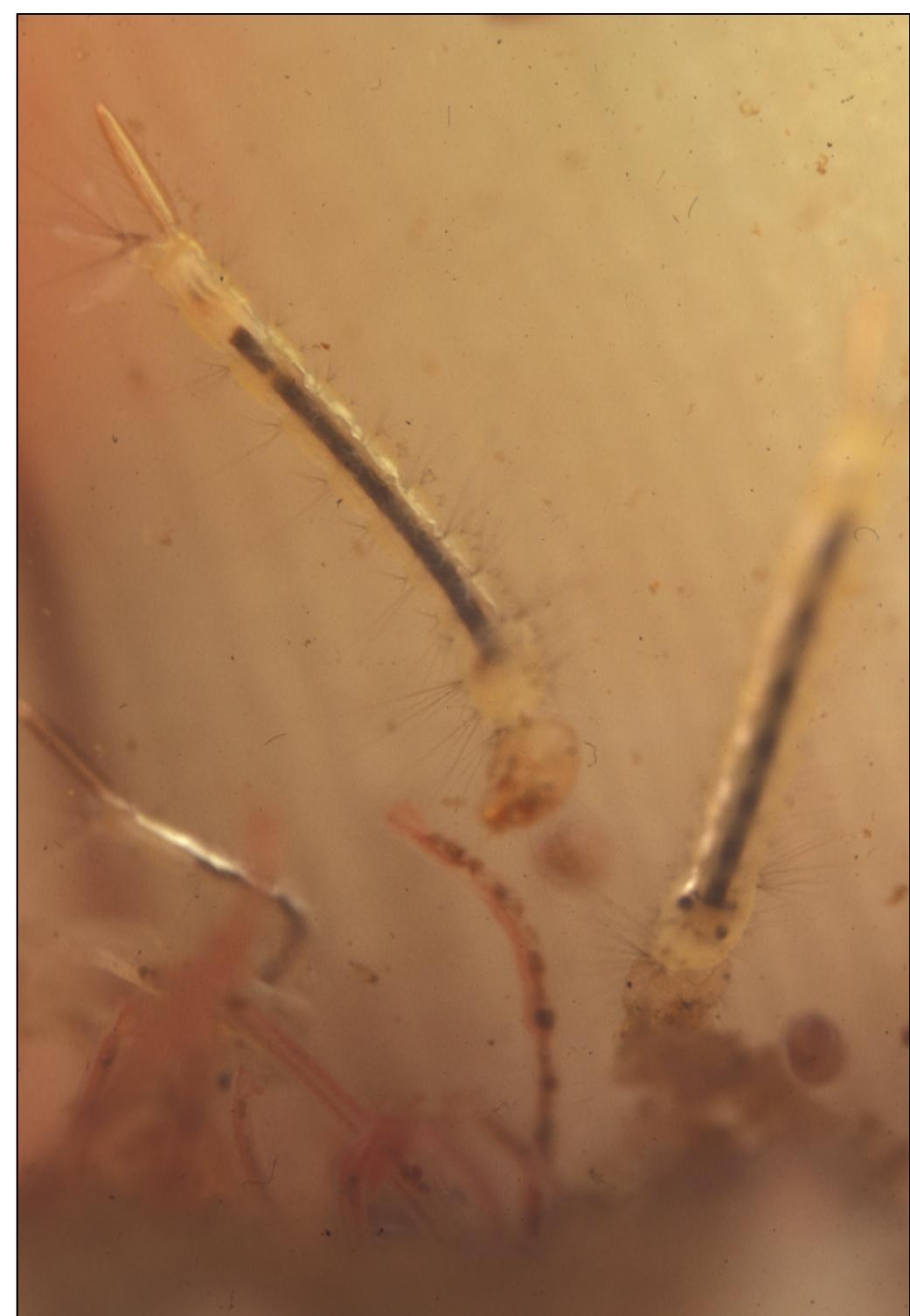


Phytotelmata are pools of water contained by plants. Epiphytic tank bromeliads include many species that are important phytotelm-supporting plants, particularly in wet, Neotropical forests. The pools of water function as aquatic microcosms for many specialist organisms and as nutrient sources for the bromeliads, and provide habitat and water sources in the canopy. In Florida, native bromeliad populations are being destroyed by an invasive bromeliad-eating weevil, the Mexican bromeliad weevil. *Tillandsia utriculata* (pictured above) is an epiphytic tank bromeliad that was once widespread from central to south Florida. It has been hit particularly hard by the weevil and is declining rapidly. With the loss of this species, phytotelmata will be lost. In a 2-year study at the Enchanted Forest Sanctuary, a *T. utriculata* population suffered an 87% loss due to the weevil in the first 6 months and, at 25 months, less than 3% of the population remained (Table 1). During the first 6 months, 13,500 liters of phytotelmata were lost, and 2,800 liters were lost over the next 19 months, for a total loss of more than 16,000 liters. The loss of the phytotelmata results in the loss of habitat, loss of biological diversity, a decrease in water and nutrient availability, and alterations in the water and nutrient cycles.

Table 1: Estimated number of *T. utriculata* and volume of phytotelmata over a 240,000 m² area in the Enchanted Forest Sanctuary, Florida.

	time = 0	time = 6 months	time = 25 months
Estimated number of <i>T. utriculata</i>	46,000	8,800	1,100
Estimated volume of phytotelmata (liters):	16,700	3,200	400

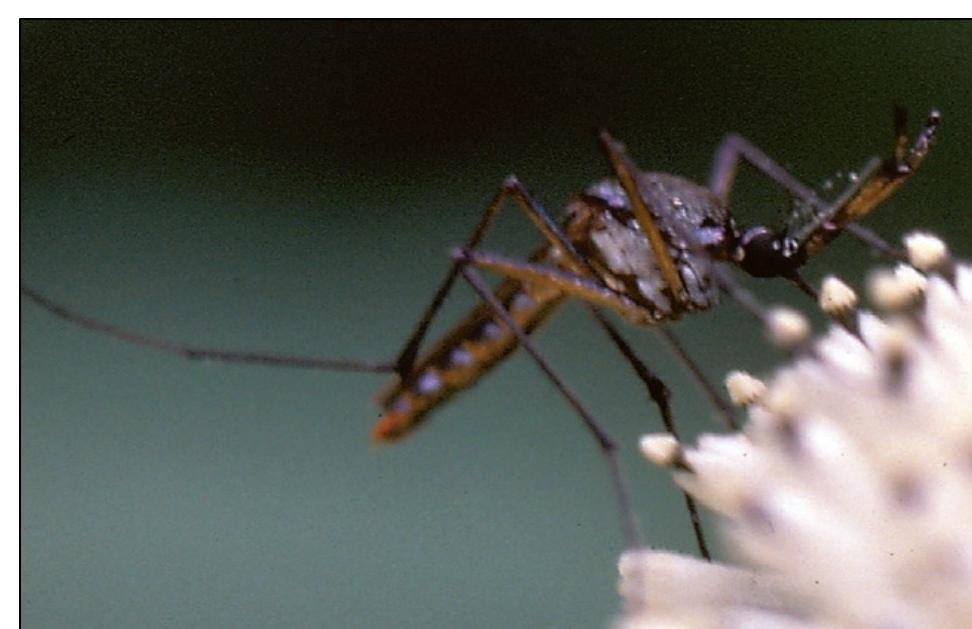
Phytotelm inhabitants include specialist and facultative organisms. The majority of the inhabitants are invertebrates, but frogs and other vertebrates also rely on the water for part of their life cycle. A recent list of specialist aquatic bromeliad-inhabiting organisms in Florida include segmented worms, seed shrimp, copepods, and arthropods including many species of flies.



Wyeomyia mitchellii and some seed shrimp.



Dr. Howard Frank sampling phytotelmata.



Adult *Toxorhynchites haemorrhoidalis*.

What could be lost?

"Twenty-one native species, consisting of 12 bromeliads and at least 9 (perhaps 19) invertebrates are at risk of extinction in Florida and in the USA. At least 6 of them (1 bromeliad and 5 invertebrates) seem to be precinctive species."

Frank and Fish 2008

Frank, J.H., Fish, D., 2008. Potential biodiversity loss in Florida bromeliad phytotelmata due to *Metamasius callizona* (Coleoptera: Dryophthoridae), an invasive species. Fla. Entomol. 91, 1-8.

THE INVASIVE SPECIES *METAMASIUS CALLIZONA* (MEXICAN BROMELIAD WEEVIL): PROBLEMS AND PROSPECTS

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