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Predation efficiency of carnivorous aquatic plants: a novel biocontrol method for container breeding mosquito vectors in the genus *Aedes*

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There is a critical need for the development of effective and targeted biocontrol methods against mosquito arboviral vectors, particularly *Aedes aegypti* and *Aedes albopictus*. In the ideal, control of mosquito vectors reduces the population abundance of vector populations, thereby vectorial capacity, but does not impact non-target organisms such as beneficial pollinators. Several methods in biological control such as the endotoxin *Bacillus thuringiensis* have been shown effective, but few target container-breeding mosquito vectors. We explored the application and efficiency of a novel method of biocontrol using the common bladderwort (*Utricularia vulgaris*), a globally distributed carnivorous aquatic plant. This predatory plant consumes aquatic invertebrates using a bladder-like trap. We investigated the efficacy of larval control plant predation, finding near-complete elimination of *Aedes* larvae through both direct and indirect impacts plant presence. Direct predation eliminated 99% of larvae within 3 days of introduction, and indirect impacts were observed through development rate, body size, and survival with larval *Aedes aegypti* and *Aedes albopictus*. This is the first study to explore and establish the potential application of plant predation in the control of Aedine mosquito vectors. Vector-plant interactions are relatively understudied and poorly understood across all stages of the mosquito life-cycle, and may offer novel biocontrol strategies.

Biography

Jannelle Couret has completed Ph.D. (2014) in Population Biology, Ecology and Evolution from Emory University, M.E.M. (2006) in Environmental and Public Health from Duke University, Nicholas School of the Environment and A.B. (2004) in Ecology and Evolutionary Biology from Princeton University. Her lab focuses on the ecology and biology of arthropod vectors, arthropod-microbe symbioses, and the role of environmental factors such as temperature on both vector biology and vector-borne disease epidemiology.

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