Mother Knows Best: INVESTIGATING MOSQUITO OVIPOSITION IN NATIVE AND INVASIVE PLANT LITTER

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SCAN ME

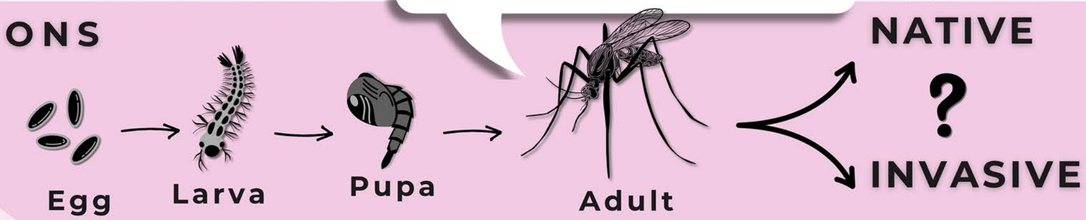
BACKGROUND

According to the CDC, mosquitoes KILL more people than any other creature because they spread diseases like malaria, dengue, West Nile virus, and yellow fever. The CDC calls mosquitoes the **"world's deadliest animal."**

Female mosquitoes bite humans to obtain a **blood** meal needed to produce and lay eggs, continuing the cycle of disease spread. Mosquitoes lay eggs on the surface of still water or on hard surfaces likely to get wet. After hatching, larvae filter feed food from vegetative detritus present in water.

But, very little is known about **vegetative detritus cues** for female oviposition decisions, specifically when considering native versus invasive plant species that prior studies suggest decompose faster.

QUESTIONS



Research Question #1: Is invasive plant detritus more attractive for oviposition than native plant detritus?

Research Question #2: Do certain mosquito species have a preference for invasive or native plant detritus when searching for oviposition sites?

Community Question: How can homeowners and land managers manage green spaces to prevent or inhibit mosquito populations?

METHODS

2 types of oviposit traps: large bins and small cups with oviposit paper & water solution

4 types of solutions: invasive & native tea, invasive & native teabag

2 replicate trials at 2 different forest-edge sites on Cary campus

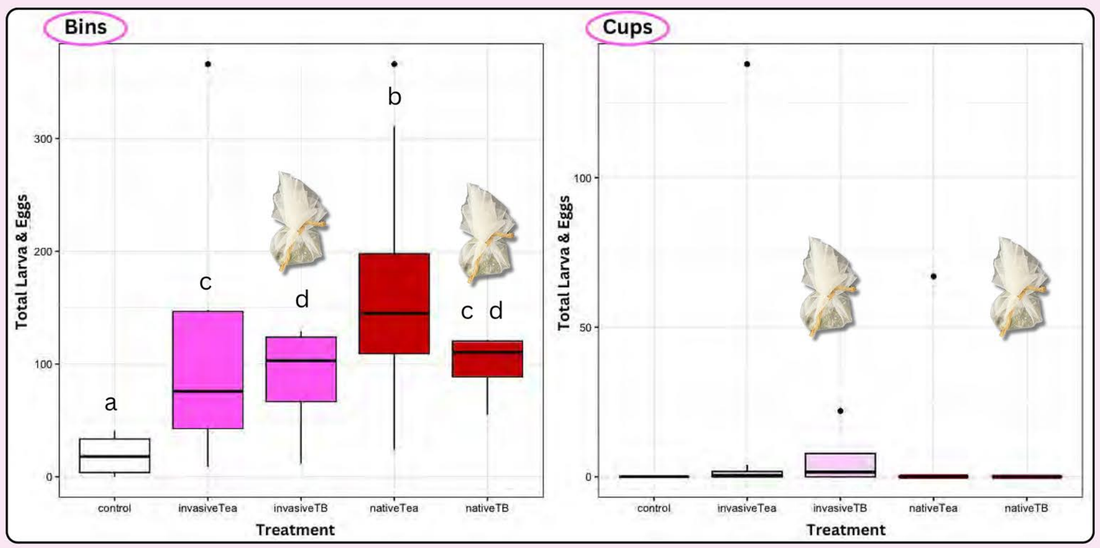
microbial functional richness of solutions assessed with SpectraMax Biolog EcoPlates

NATIVE PLANTS
- Pin Oak
- Wrinkleleaf Goldenrod
- Virginia Creeper

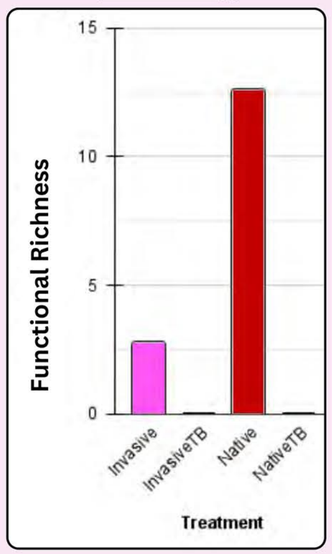
INVASIVE PLANTS
- Tree of Heaven
- Mugwort
- Morrow's Honeysuckle

RESULTS

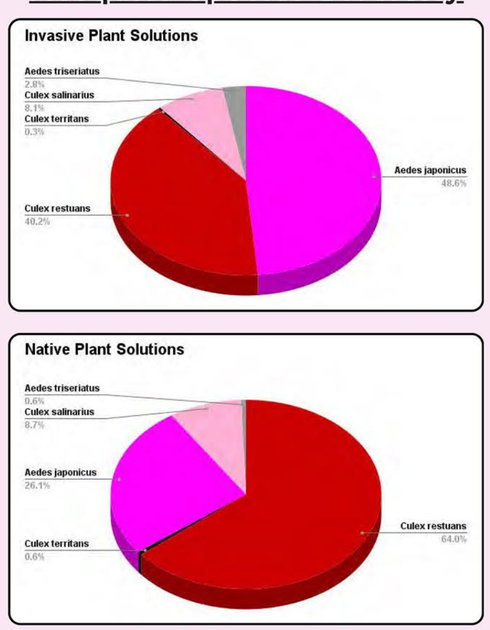
Egg & Larva Count



Microbial Functional Diversity



Mosquito Species Diversity



CONCLUSIONS

In bins, our findings showed that **native tea solution had greater oviposition** counts than all other treatments. However, in cups, **invasive teabag solution had greater oviposition** counts than all other treatments. Overall in bins, oviposition counts were **greater for each of the detrital treatments than the control** treatment. In cups, there were no statistically significant differences between detrital and control treatments.

Our estimate of initial microbial carbon activity showed **higher functional richness in the native tea solution**, followed by invasive tea, although all treatments were similar by one week.

We also observed a **difference in mosquito species diversity by treatment** with invasive *Aedes japonicus* making up 48.6% of larva counted in the invasive treatment and native *Culex restuans* making up 64% of the native treatment (n=356). *Culex restuans* are primary zoonotic vectors of West Nile virus in birds, while *Aedes japonicus* are vectors of West Nile and Zika virus, particularly in their non-native range.

TAKE-HOME MESSAGES

Overall, **keep sources of standing water to a minimum** to help prevent the spread of mosquito borne disease. Regularly replace standing water like bird baths and water for pets.

The **expansion of mosquito species' range due to climate change** is creating a greater need for long term research to understand oviposition cues and behaviors on both a local and global level.

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