MICROHABITAT PREFERENCES OF LARVAL MOSQUITOES

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STUDY SITE

- Ichauway Ecological Reserve
- 29,000 acres longleaf pine forest
- Minimally disturbed wetlands
ISOLATED WETLANDS

- Not connected to surface waters
- Variable periods of flooding and drying
- Small
- Role in landscape is poorly known
- Lack legal protection
- Frequently disturbed by agricultural land use and urbanization
Isolated wetlands
Significant due to their contribution to regional biodiversity

Plants

Amphibians

Invertebrates
Reference Wetlands

Grass-Sedge Marsh
- Open and treeless
- Groundcover dominated by panic grasses & cutgrass
- Sandy or sandy soil clays

Cypress-Gum Swamp
- Dense canopy of cypress and gums
- Inundated for longer periods
- Organic soils over clay
History

- Part of a long term study examining mosquito species within isolated wetlands
Objectives

- Improve sampling techniques for larval surveillance
  - Compare suitability of microhabitat characteristics as breeding habitat for larval mosquitoes
  - Examine microhabitat characteristics as predictors of species diversity and abundance
Microhabitats

1. Edge
2. Vegetation gaps
3. Continuous vegetation coverage
   - *Panicum sp.*
   - *Carex sp.*
4. Cypress
5. Depth (recorded for every individual square within every microhabitat)
Methods

- 1m² grid
- 36 individual “capture chambers”
- 3 dips per square using standard dipper
- Each microhabitat sampled three times: 108 squares
- January, May and September
Methods

-Captured larvae were raised in rearing chambers
-Preserved once they reached the fourth instar
-Identified to the lowest possible taxonomic level
Capture Results

- Eight species were captured representing four genera.
- Species capture and abundance differed depending on the time of year.

Species Captures/Month

- February
- May
- September
Results: Edge

We analyzed data based off of proximity to “edge”

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<th>Group:</th>
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Closest → Farthest
Results: Edge

We analyzed data based off of proximity to “edge”

ANOVA on Ranks (P=.008)
Results: Vegetation

Vegetation vs. Open Water Patches

There are statistically more larvae found within vegetation patches than are found within open water patches

\[ P = < 0.001 \]
Mann-Whitney Rank Sum Test

Vegetation vs. Edge

There are statistically more larvae found within vegetation patches than are found along the edges of the wetlands

\[ P = < 0.001 \]
Mann-Whitney Rank Sum Test
Results: Cypress

*C. erraticus* capture success in relation to Cypress tree

*C. territans* capture success in relation to Cypress tree

*U. sapphirina* capture success in relation to Cypress
Results: Depth

[Graph depicting a scatter plot with axes labeled Axis 1 and Axis 2, showing species distribution based on depth categories: Species, Shallow Depth, Deep Depth, Intermediate Depth.]
Conclusions: How can sampling techniques improve for larval surveillance?

-Sampling within an array of microhabitats will improve capture diversity and abundance

-With more research, it may be possible to pinpoint specific microhabitats where target species (i.e. vector species) typically reside.
Conclusions: How do microhabitat characteristics differ as breeding habitat for larval mosquitoes?

-Microhabitat’s have characteristics that differ as potential breeding habitat

-We have shown that within a specific habitat (i.e. forested swamp) there are microhabitat characteristics that species “select” (i.e. vegetation, distance from edge)

-An interesting question is whether the larvae remain within close proximity to the specific microhabitat where oviposition occurs (ex: A. quadrimaculatus)
Conclusions: Can certain microhabitats be used as predictors of species diversity and abundance?

Within our isolated wetlands:
• Depth: <8cm is an ideal place to find *A. quadrimaculatus*. Depths over 8 cm result in greater species diversity.

• Vegetation: Stands of emergent vegetation are the greatest predictor of diversity and abundance.
Conclusions

Conducting more microhabitat sampling events would:
- allow for a more complete investigation of the 24 other species we have collected in SW Georgia
- allow us to identify microhabitat characteristics of a more diverse set of mosquitoes
- Perhaps make sampling for particular species more efficient by targeting microhabitats.

Many of the mosquitoes we observed can serve as vectors for arboviruses.
- transmission of arboviruses is an emerging public health issue in the southeastern U.S.
- little surveillance has occurred in rural areas of SE U.S.