

# Comal Springs Riffle Beetle Cotton Luring Analysis and Other Mesocosms



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- **Luring**
  - **Field studies**
  - **Laboratory**
- **Other mesocosms**
  - **Forward looking aquaria**
- **Future directions**

# Comal Springs riffle beetle luring efficacy – Methods

- **Field studies (leaf vs. cotton lure)**
  - Sycamore leaf lure fashioned like cotton lure
  - Both lures placed next to each other
  - Paired t-test
  - 1<sup>st</sup> run 13-Aug-2019 (48-49 days)
  - 2<sup>nd</sup> run 26-Jun-2020 (54-55 days)



# Comal Springs riffle beetle luring efficacy

## Results

- **Field studies (adults)**

- **1<sup>st</sup> run**

- 115 cotton
- 38 leaf
- $p = 0.129, n = 8$

- **2<sup>nd</sup> run**

- 30 cotton
- 48 leaf
- $p = 0.227, n = 10$

- **Combined**

- 145 cotton
- 86 leaf
- $p = 0.268, n = 18$
- **Note: *Microcyllloepus* sp. show preference to cotton**



# Comal Springs riffle beetle luring efficacy – Methods

- **Laboratory studies**

- Five 40 gal stock tanks
- Partial recirculation



- Tanks held 75 L
- Sump held 150 L
- Tank Q ranged 0.32 – 0.42 L/sec

# Comal Springs riffle beetle luring efficacy – Methods

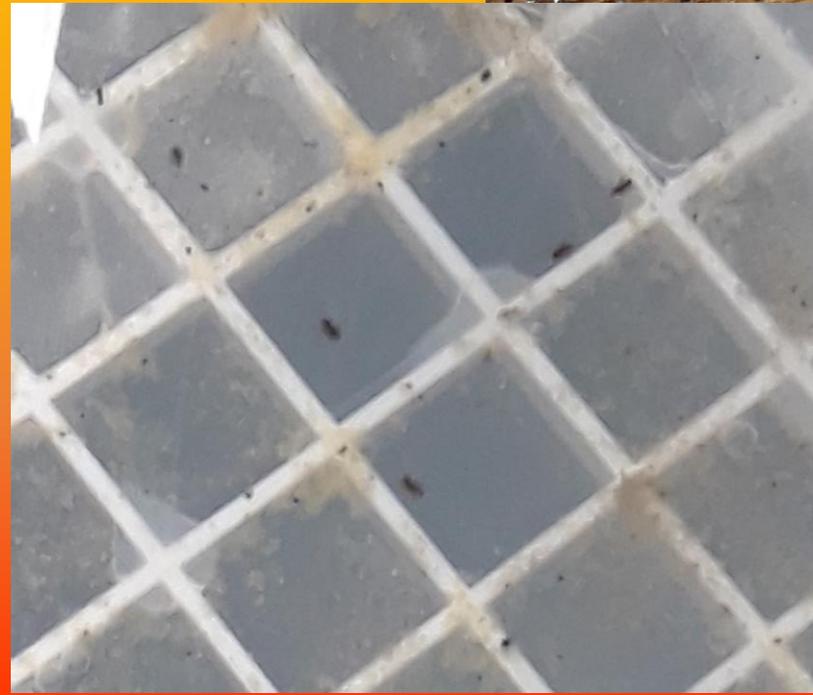
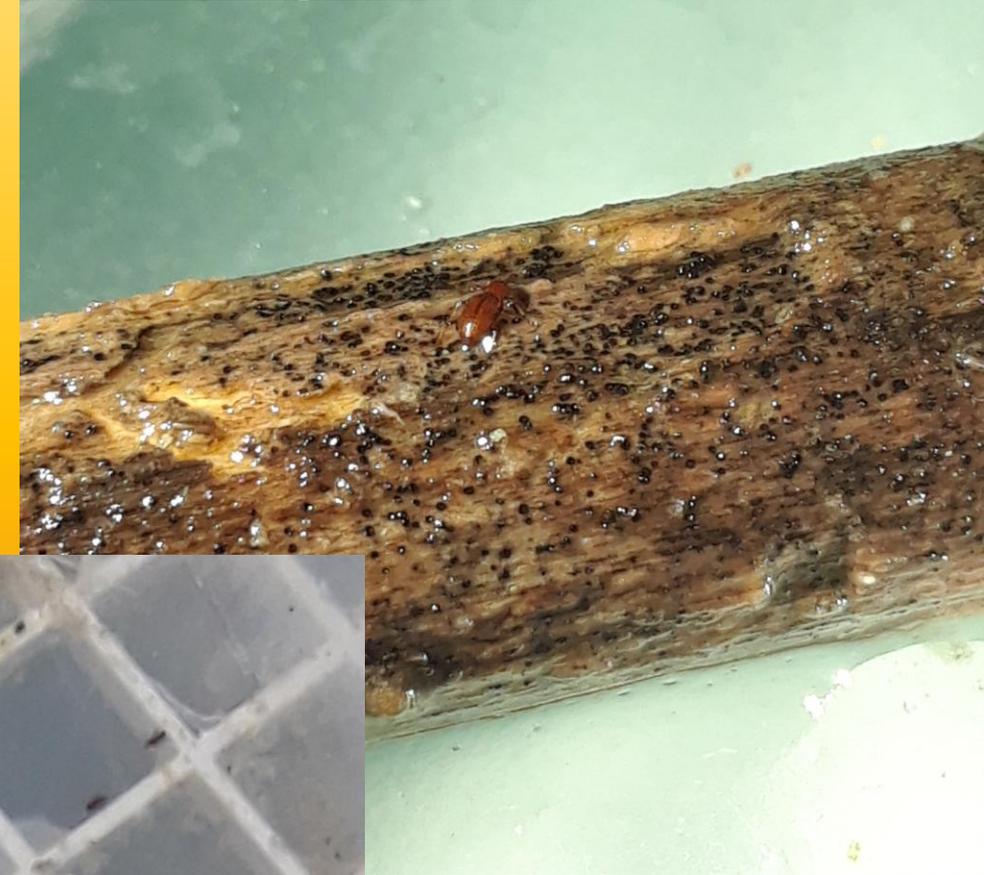
- Lures: cotton vs. leaf vs. wood
- 20 adults placed in middle
- Cotton lures inspected weekly
- 1<sup>st</sup> run 19 & 20 – Aug – 2020 (29 days)
- 2<sup>nd</sup> run 29 – Oct – 2020 (21 & 27 days)
- ANOVA – percentage of beetles found



# Comal Springs riffle beetle luring efficacy – Results

## 1<sup>st</sup> run

- 1<sup>st</sup> run 19 & 20 – Aug – 2020 (29 days)
- Many individuals “drifted” (43 out of 100)
- $0.26 \pm 0.42$  cotton
- $0.29 \pm 0.18$  leaf
- $0.27 \pm 0.18$  wood
- $0.14 \pm 0.14$  no lure
- $p = 0.759, n = 5$
  
- Outflow screens were not sealed effectively



# Comal Springs riffle beetle luring efficacy – Results

## 2<sup>nd</sup> run

- 2<sup>nd</sup> run 29 – Oct – 2020 (21 & 27 days)
- $0.25 \pm 0.16$  cotton
- $0.05 \pm 0.04$  leaf
- $0.20 \pm 0.11$  wood
- $0.45 \pm 0.08$  no lure
- $p = 0.002, n = 4$
- Excessive flocculation
  - Breaches in screen



# Comal Springs riffle beetle luring efficacy – Results

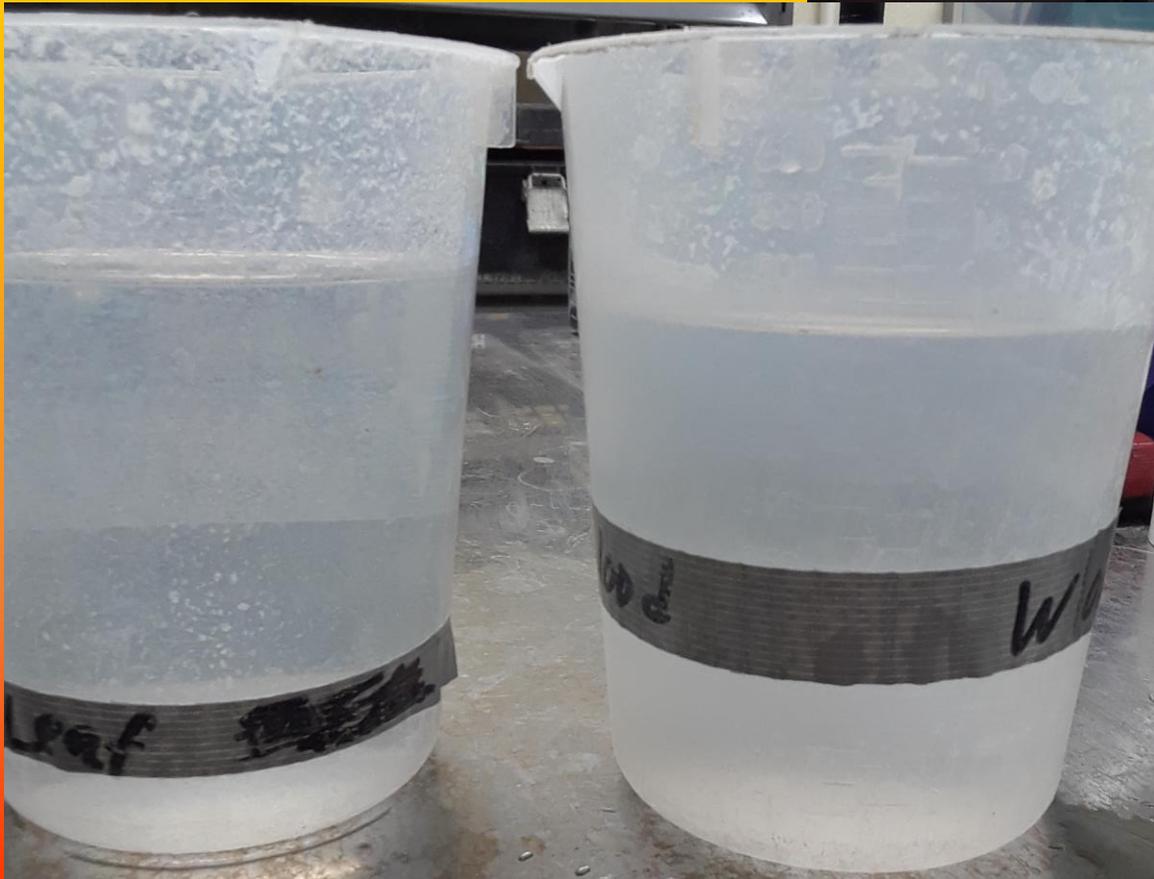
## 2<sup>nd</sup> run

- Few individuals “drifted”
- More than 20 individuals found
- Appeared unaffected



# Other mesocosms

- Good flow with more air beneficial



# Other mesocosms

- Develop more traditional aquarium design



# Other mesocosms

- Flow through tank design
  - Elicits habitat heterogeneity
- Can create additional modules
  - More like a cave system



# Future Directions

- **Re-run tank studies**
  - Same design
  - 3-D design
  - Consider utilizing flow-through rather than partial recirculation
- **Field luring**
  - Include wood lures
- **New tank designs for long term holding**
  - Simulate flow-through tubes
  - Look at completing entire life cycle within one aquarium