

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
 - 1st run 13-Aug-2019 (48-49 days)
 - 2nd run 26-Jun-2020 (54-55 days)



Comal Springs riffle beetle luring efficacy

Results

- **Field studies (adults)**
 - **1st run**
 - 115 cotton
 - 38 leaf
 - $p = 0.129, n = 8$
 - **2nd run**
 - 30 cotton
 - 48 leaf
 - $p = 0.227, n = 10$
 - **Combined**
 - 145 cotton
 - 86 leaf
 - $p = 0.268, n = 18$
 - Note: *Microcylloepus* 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

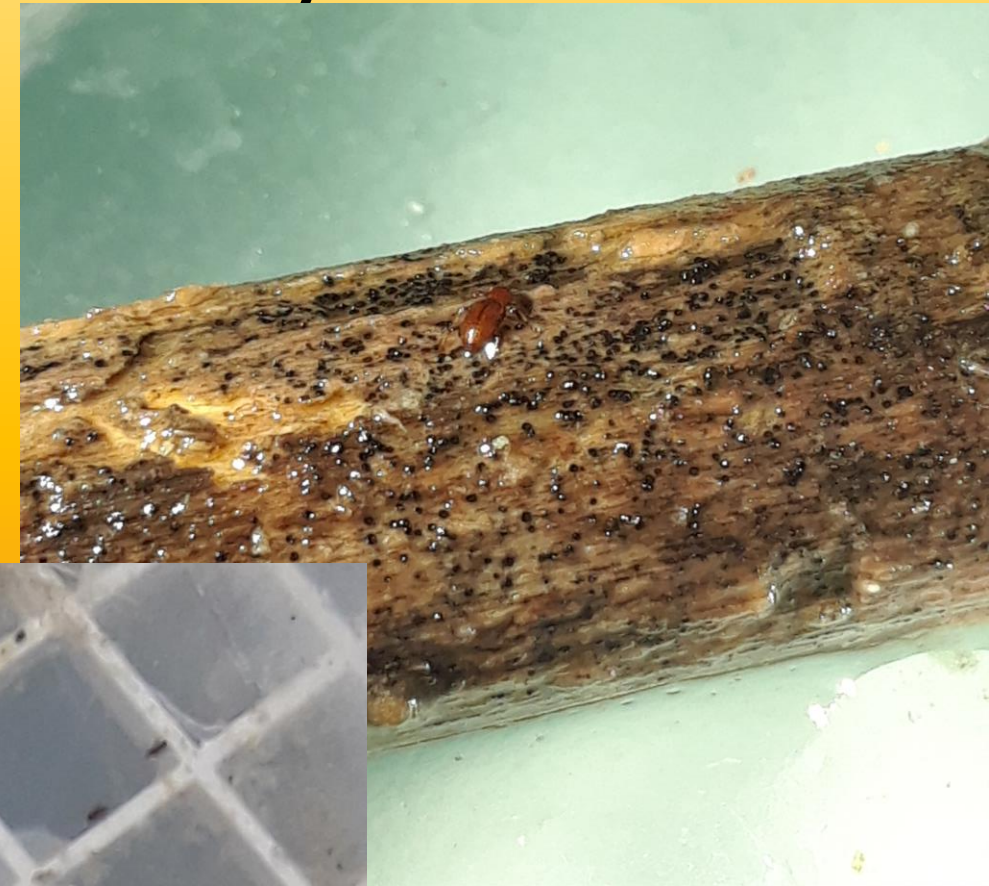
- Lures: cotton vs. leaf vs. wood
- 20 adults placed in middle
- Cotton lures inspected weekly
- 1st run 19 & 20 – Aug – 2020 (29 days)
- 2nd run 29 – Oct – 2020 (21 & 27 days)
- ANOVA – percentage of beetles found



Comal Springs riffle beetle luring efficacy – Results

1st run

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



Comal Springs riffle beetle luring efficacy – Results

2nd run

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



Comal Springs riffle beetle luring efficacy – Results

2nd 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