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\textsuperscript{st} run 13-Aug-2019 (48-49 days)
  • 2\textsuperscript{nd} run 26-Jun-2020 (54-55 days)
Comal Springs riffle beetle luring efficacy

Results

• Field studies (adults)
  • 1\textsuperscript{st} run
    • 115 cotton
    • 38 leaf
    • $p = 0.129$, $n = 8$
  • 2\textsuperscript{nd} run
    • 30 cotton
    • 48 leaf
    • $p = 0.227$, $n = 10$
  • Combined
    • 145 cotton
    • 86 leaf
    • $p = 0.268$, $n = 18$
    • Note: \textit{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
- 1\textsuperscript{st} run 19 & 20 – Aug – 2020 (29 days)
- 2\textsuperscript{nd} run 29 – Oct – 2020 (21 & 27 days)
- ANOVA – percentage of beetles found
Comal Springs riffle beetle luring efficacy – Results

1\text{st} run

- 1\text{st} 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

2nd run

• 2nd 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
  • Breeches 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