Comal Springs riffle beetle

Captive population nutrition & longevity



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Needs for Refugia Success

- □ 25-50% of larvae to reach pupation
- □ 50% of pupa reach eclosion/emergence
- Increase survivability of wild stock adults
 Survivability drops off after 5-7 months
- \Box F1 adults nutritionally comparable to wild population(s)
 - Re-stock in event of catastrophic loss



2019 Objectives

- •Analyze gut content of wild & refugia adults
 - Compare with wild analysis of Nowlin *et al.* 2017
 - Determine nutritional inadequacies in captivity
 - Determine new item(s) to supplement current refugia diet
- Compare non-traditional diet items
 - Sections of balsa wood, plant roots, & control
 - 10-20 adults per treatment
 - 2-3 replicates
 - Compare survivability and larvae production



Current Contents

- Leaves
 - Anacua
 - Sycamore
 - Walnut/Pecan
- Conditioned polycotton cloth
- Poplar Dowel











Balsa Wood

• Conditioned

Roots

- Spring sourced
- Terrestrial margin sourced

Control

- Leaves
- Conditioned Cloth

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Methods

• Collect aquatic-based plant roots from Comal Springs

- Microscope inspection & toothbrush scrub
- Collect wild adults for each replicate
 - 50% \bigcirc : 50% \bigcirc per treatment
- Set lures in Spring Run 3
- Start each treatment simultaneously
- Record data weekly & monthly



Data Collected

- Non-traditional nutrition experiment
 - Survivorship (Kaplan-Meir)
 - Larvae production (ANOVA)
 - Time to observation of larvae
 - Time to 7th instar (long-term outcome)
 - Evaluate potential drawbacks of treatments
- Gut content analyses
 - $\bullet\,\delta_{13}C$ analysis of dietary amino acids
 - Lipid & carbohydrate composition

Experimental Design

- 2 treatments (diet item) + control
- 3 replicates (flow through tube)
- 20 adults / treatment; (10 \bigcirc : 10 \bigcirc)
- •Total adults used: 180



2019 Timeline

Date	Action
January	Set up experimental tubes Send old refugia beetles for analysis Set lures for all replicates Continue conditioning balsa wood (starting in Dec 2018)
February	Collect lures Start experiment
October	Anticipated completion of experiment
November	Evaluate results First draft of report
December	Present findings Final report

Expected Benefits to Refugia

- Upgraded container efficiency
- Improved husbandry
- Increased F1 production rates
- Increased adult survival







Comments & Questions