

Husbandry and Growth of Cave Crayfish *Cambarus tartarus* in the First Year

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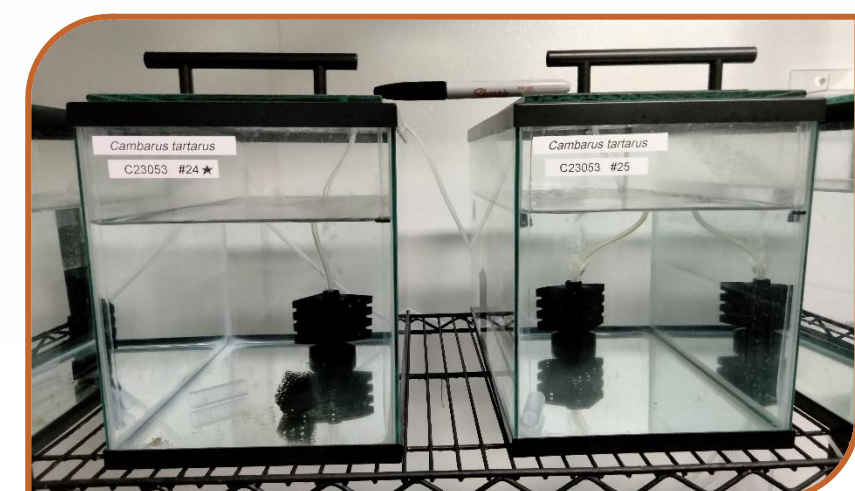


Introduction

Cambarus tartarus is a stygobitic crayfish, endemic to cave systems in the Ozark Highlands. On 28 February 2023, a mature female was collected by researchers in Delaware County, OK and was transported to the Center for Conservation & Research at San Antonio Zoo. On 7 June 2023 she was observed with a clutch of eggs under her telson. The eggs hatched on August 15th and 16th, 2023, the first time this species has hatched in human care. One year later, 24 juveniles comprise a unique study population. The following data represents what we have learned about this population during their first year of life.

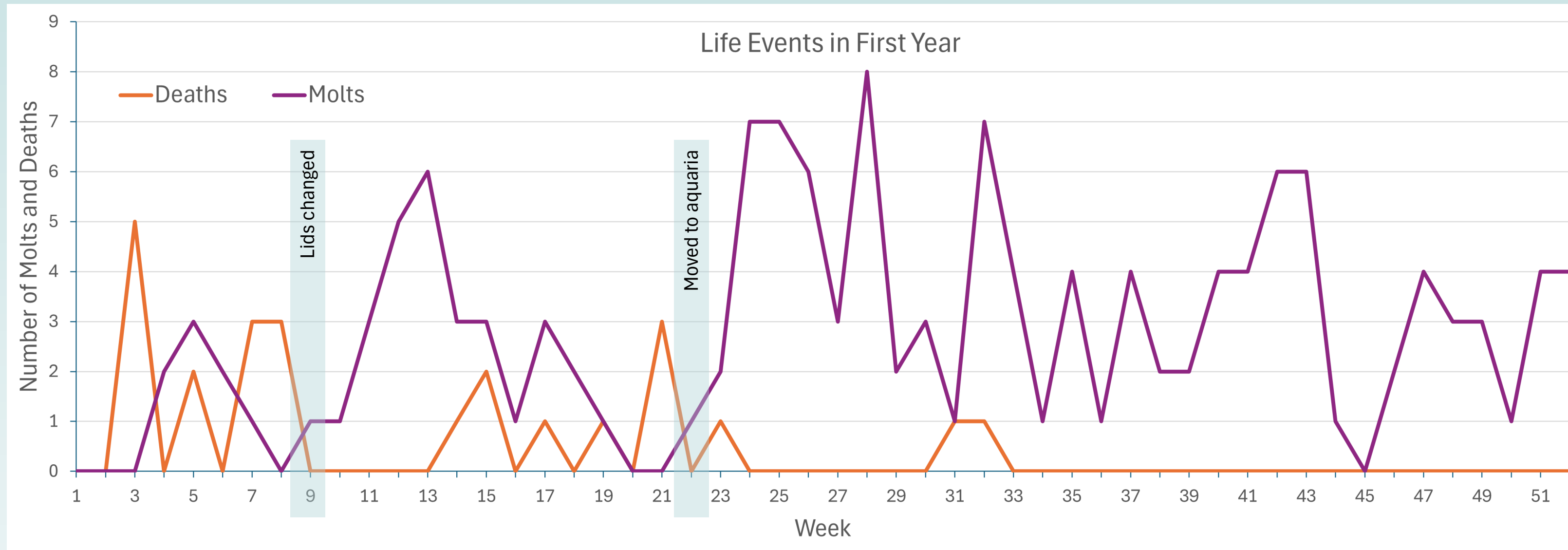


Enclosures



Husbandry

- All hatchlings were separated from the mother and housed individually to avoid cannibalism.
- Water quality parameters varied throughout the year and dictated the frequency of water changes, which ranged from twice per week to once every two weeks.
- Molted exoskeletons were left in enclosures and consumed by crayfish within a few days. Many aquatic arthropods consume molted exoskeletons to reabsorb the nutrients and strengthen the new exoskeleton.
- Some molting occurrences may have been missed; numbers of molts represent the minimum number of molts.



Graph 1: Weekly counts of molts and deaths from 15 August 2023 (n=50) to 12 August 2024 (n=24). On week 9 the lids on each enclosure were changed to a less permeable type which resulted in improved water quality. On week 22 all crayfish were moved from 32-oz plastic cups to 5-gallon glass aquaria with sponge filters.

Diet

Diet Study (7 months)	Control (n=13)	Bloodworms (n=9)	Siblings (n=4)	Single Factor ANOVA
Deaths	1	1	0	
Average Molts per Crayfish	4.33	4.37	4.00	P=0.8588
Average Size (cm)	1.93	2.05	1.90	P=0.0638

Table 1: The study population (n=26) was split into three groups and given different diets. All crayfish were fed powdered algae wafer once per week, and spirulina powder once every other week. The control group (n=13) received no additional food. The bloodworms group (n=9) were additionally fed bloodworms once every other month. The siblings group (n=4) were additionally fed the remains of deceased sibling crayfish as they became available. Differences in size and number of molts between groups were not statistically significant.

Growth

Averages one year after hatching

Number of molts: 5

Time between molts: 54 days

Total length: 1.96 cm

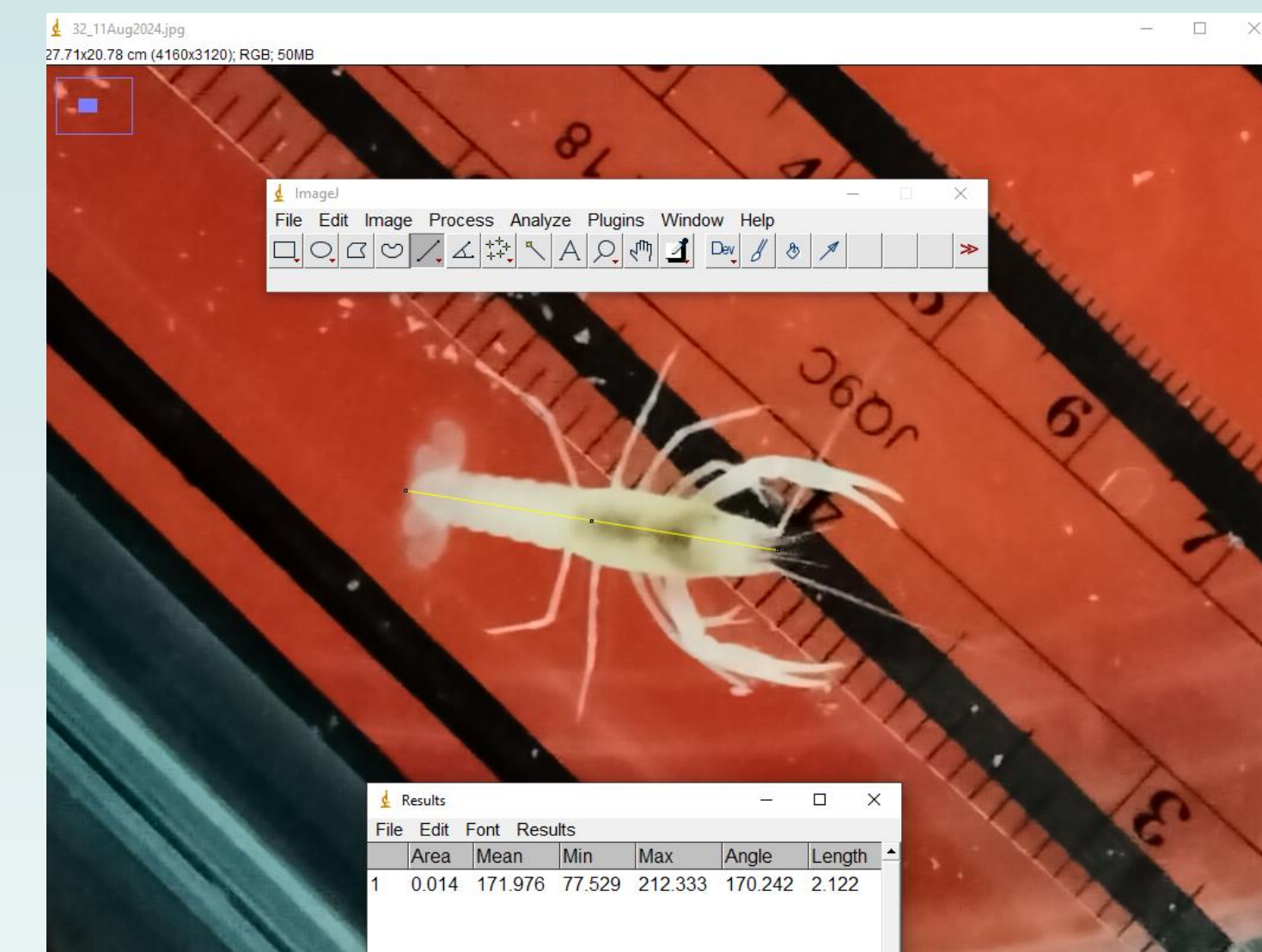


Figure 1: Crayfish were measured by placing a ruler in their enclosure and photographing them from above. ImageJ was used to measure the total length from the base of the antennae to the end of the telson.

Takeaways

- This species requires careful attention to water quality and husbandry conditions.
- Molting seems to increase in correlation with improved conditions.
- Variance in diet did not affect growth within our study. We will continue to monitor growth to see if patterns emerge given more time.
- This study population can be used for future research.