Red Swamp Crayfish (*Procambarus clarkii*) Stress Levels in Polluted Water

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<u>Red swamp crayfish stress levels are not significantly affected by polluted water.</u>

Image 1: Respirometry system with red swamp crayfish in their chambers

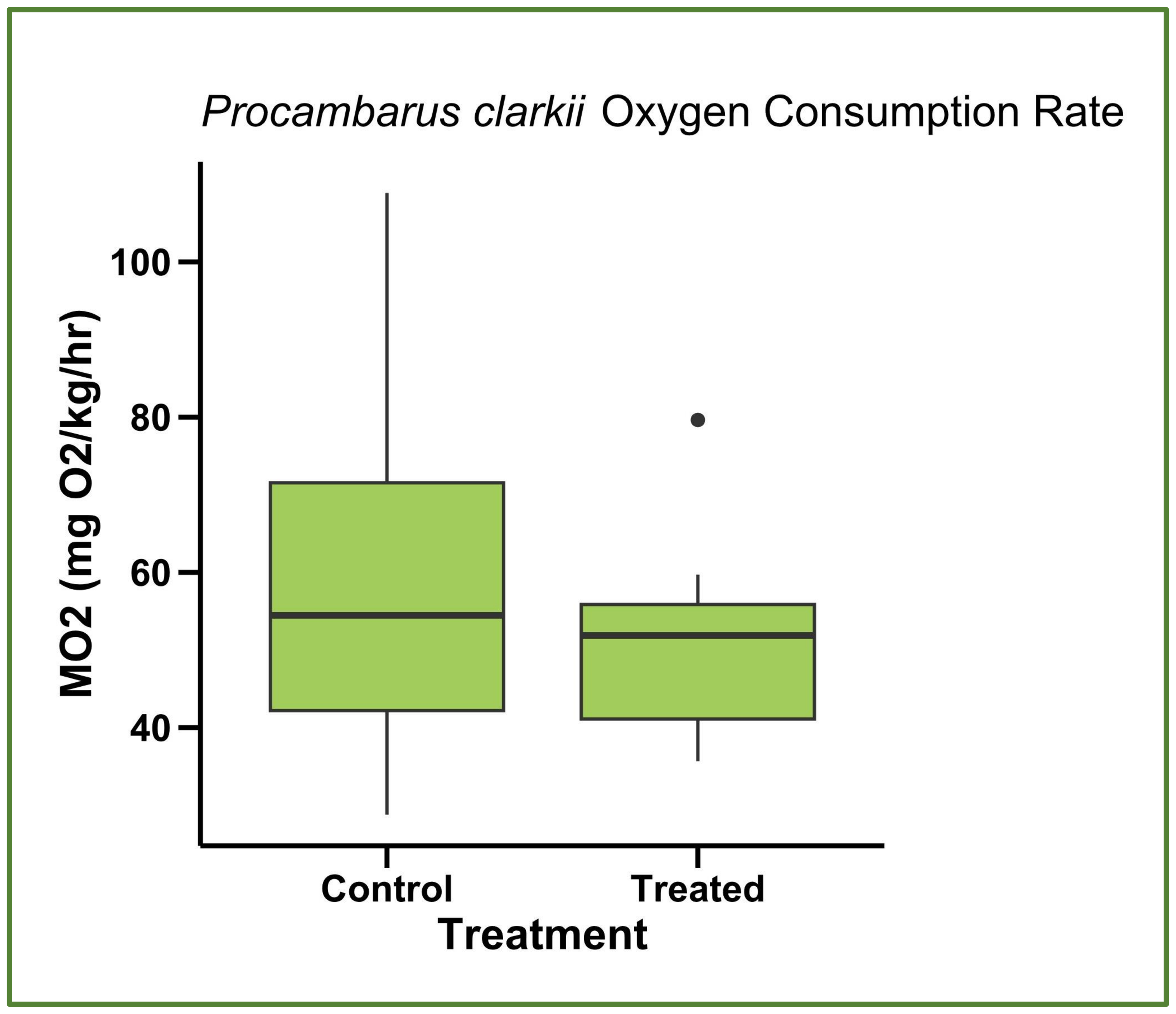

Figure 1: Boxplot of mean oxygen consumption per kilogram of weight per hour between control (n=10) and treatment (n=7) crayfish.

Results

- The study found no significant difference in red swamp crayfish oxygen consumption between River Park water (control) and Road Lock and Dam water (treated).
- This reflects no significant difference in metabolic rate, thus no change in the organisms' stress levels.
- Control water showed higher variability as compared to treated water.

Discussion and Conclusion

This finding is consistent with red swamp crayfish being a highly tolerant species. This tolerance has aided successful invasion fronts in polluted waters. As a potential limitation, crayfish were sampled from the River Park location, which is historically a polluted channel itself due to sewage flushing. Future research could proactively analyze potential future invasive species to determine their resistance to anthropogenic impacts.

Abstract

Red swamp crayfish (*Procambarus clarkii*) is an invasive species established in the Chicago River. I exposed red swamp crayfish to polluted water from the Brandon Road Lock and Dam and measured oxygen consumption using respirometry.

Higher metabolic stress generates increased oxygen consumption. My results show that red swamp crayfish are not significantly affected by the polluted water, failing to reject the null hypothesis.

Methodology

1. Control water was sampled from River Park where the Red Swamp Crayfish were collected. Treated water was collected from the Brandon Road Lock and Dam.
2. Crayfish were starved (24hr) and then exposed to either treated or control water for an additional 24 hours.
3. Respirometry trials were run overnight to attain accurate basal metabolic rates.
4. The system was thoroughly cleaned between trials with a bleach solution.
5. Background respiration was measured to ensure bacterial respiration was not calculated into final data.

Image 2: A red swamp crayfish in a respirometry chamber

References

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