



The Hormone AVT Affects Competitive Behavior in *Hyla chrysoscelis*

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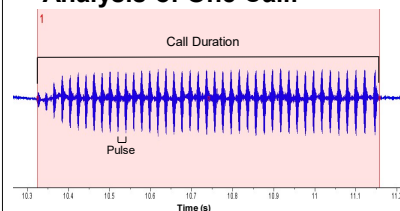
Introduction

- Male frogs produce acoustic advertisement calls to attract females, and they compete with one another by changing their call rate and call duration.
- In *H. versicolor*, the hormone Arginine Vasotocin (AVT) causes males to produce more attractive calls [1].
- **We don't know how AVT affects the response to competition.**
- **The effects of AVT have not been tested in *H. chrysoscelis***

Methods

- Inject frog with 25µL saline or 25µg AVT suspended in 25µL of saline.
- After 30 minutes, take 3 minute baseline recording of calling behavior ("Pre").
- Expose to moderately competitive playback and record calling response for 3 minutes.
- Repeat with highly competitive playback and record response for 3 minutes.
- After highly competitive playback, record 3 minute post competition response ("Post").

Analysis of One Call:



Call Rate = # calls/sec
Duty Cycle = Call Rate * Call Duration

Results

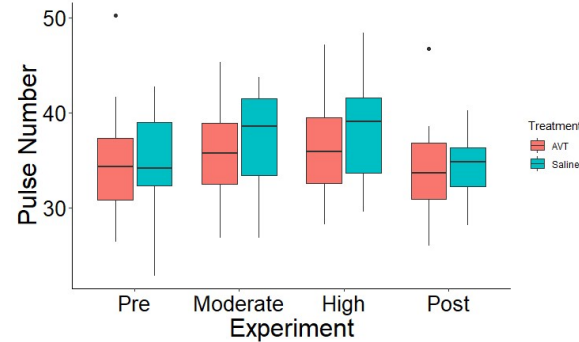


Figure 1. Effect of treatment and experiment type on pulse number. There was not a difference in pulse number ($p=0.29$) between saline ($n=14$) and AVT individuals ($n=23$).

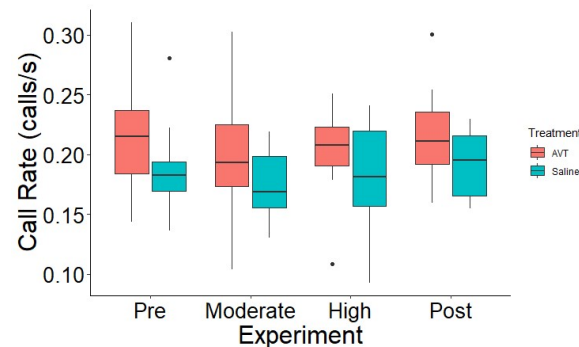


Figure 2. Effect of treatment and experiment type on call rate. AVT-treated frogs ($n=23$) had a significantly higher call rate ($p=0.02$) than saline-treated frogs ($n=14$).

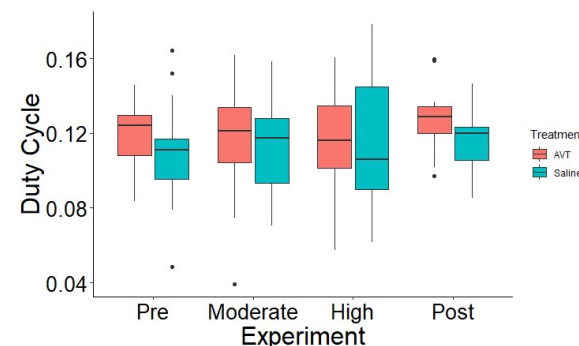


Figure 3. Effect of treatment and experiment type on duty cycle. AVT frogs had a higher duty cycle in noncompetitive environments (pre/post recordings; $p=0.04$), but exhibited no difference in duty cycle in competitive environments (moderate/high; $p=0.67$). Overall, there was not a difference in duty cycle between AVT ($n=23$) and saline ($n=14$) individuals ($p=0.15$).



Conclusion

- Saline frogs have a lower duty cycle in noncompetitive environments, which is less attractive to females.
- Treatment affected duty cycle in noncompetitive environments, suggesting that AVT frogs may perform at peak ability in both noncompetitive and competitive environments.
- Our results are similar to a finding in cricket frogs where AVT increased motivation to call [2].
- Overall *H. chrysoscelis* has comparable results to *H. versicolor* studies.

Acknowledgements and References

Acknowledgements:

We would like to express gratitude to the Wentz foundation at Oklahoma State University for their generosity and support in helping fund this project. In addition we would like to thank all of the members of the Reichert Lab for their assistance during the execution of this project. Without their feedback and help with the frogs, this would not have been possible.

References:

- [1] Kramsberg KF, Marler CA. The neuropeptide arginine vasotocin alters male call characteristics involved in social interactions in the grey treefrog, *Hyla versicolor*. *Animal Behaviour*. 2000;59(4):807-812.
[2] Marler, C. A., Chu, J., & Wilczynski, W. Arginine vasotocin injection increases probability of calling in cricket frogs, but causes call changes characteristic of less aggressive males. *Hormones and Behavior*. 1995;29(4):554-570.