Hippie Fish: The Effects of 5-HT on *A. burtoni* Aggression

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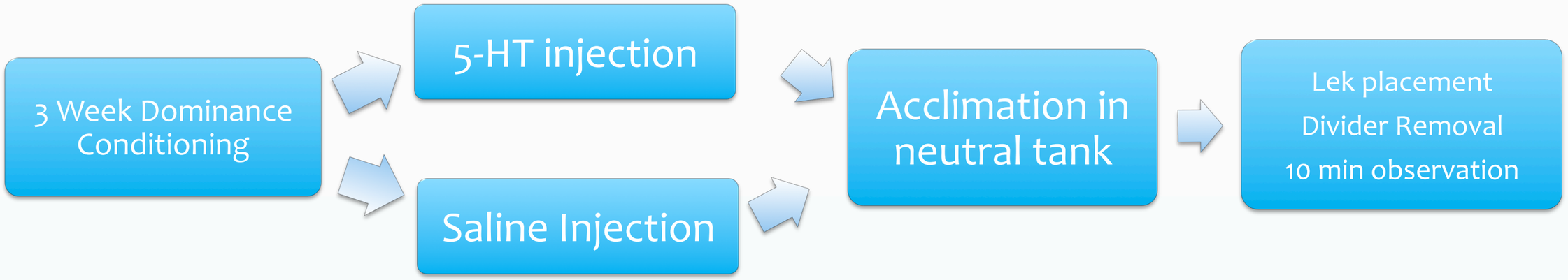
Background

- Serotonin (5-HT) has been shown to play a role in aggressive behavior in many animals, including humans[2]!
- Previous studies in fish have shown that increasing 5-HT often decreases aggression in dominant fish[3,4,5].
- Some treatments in fish have been shown to change 5-HT levels without affecting aggression levels, suggesting a more complex relationship[1].

Hypothesis

In an agonistic encounter between two dominant conditioned cichlid fish, the 5-HT treated fish will be less aggressive than the control fish.

Experimental Design



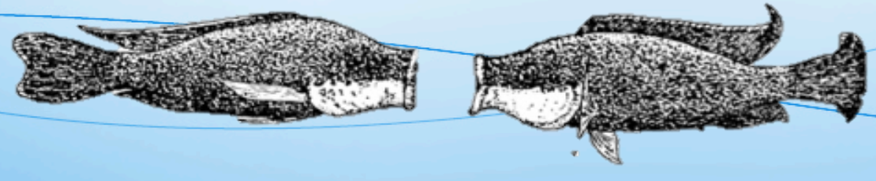
All experimental fish were males. They were maintained in tanks containing two females, a smaller male, and a lek in order to train them to be dominant. Observers were blinded to the treatment fish received.

Ethogram

Lateral Display

Butting

Frontal Display



Biting

Results

- Only one fish carried out any aggressive actions (3 lateral displays and 2 butts).
- Insufficient data for meaningful analysis.
- 5-HT treated fish qualitatively appeared to be much more lethargic than the control fish.

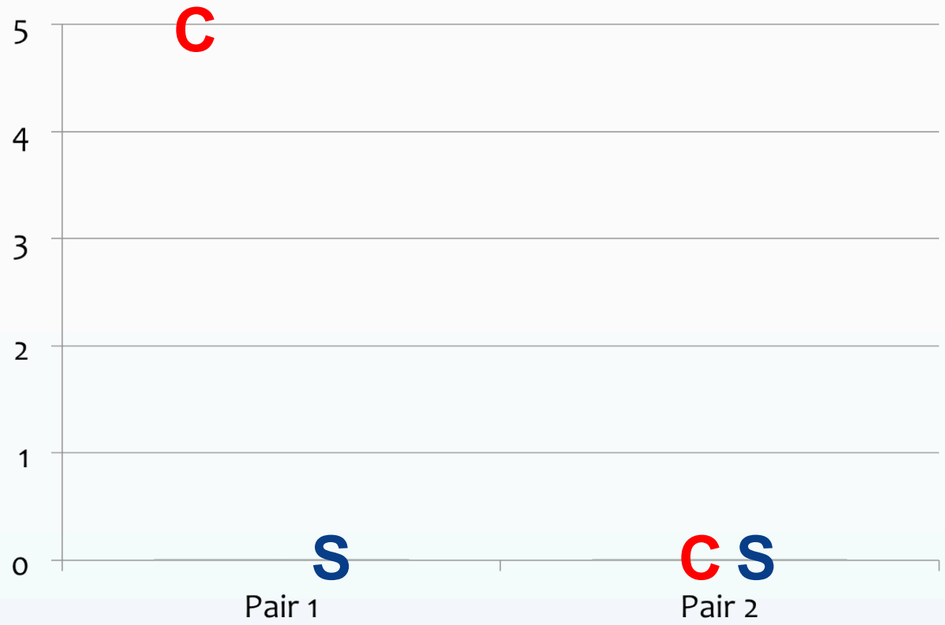


Fig. 1. Number of aggressive acts carried out in a 10 min. period. C represents the control fish, and S represents the 5-HT fish.

Conclusions

- Quantitative measures suggest we are on the right track.
- Qualitative observations accord with our hypothesis.
- Seems to support hypothesis and the previous other work with 5-HT and aggression in fish
- Larger sample size is necessary to draw meaningful conclusions.

Further Directions

- This could be investigated more thoroughly using a larger sample size.
- Additionally, lab conditions may have disrupted the circadian cycle of our fish, so repeating this experiment with a more controlled environment might be benefishal.
- Fish seemed to be alarmed by the presence of humans, so more accurate results might require the use of video recording while humans are absent from the room.
- No experiments have been done investigating whether subordinate fish react in the same or in the reverse manner to serotonin as dominant fish react.
- The fish seemed extremely disturbed by the injection process. Perhaps immersing them in a 5-HT containing solution would be less invasive and more conducive to natural behavior.

Acknowledgements

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References

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