SAMPLE 1

Response of *Electrophorus electricus* Electric Organ Discharge (EOD) to Captivity in the Pacific Northwest

Robin J. Cogitare

Introduction

The population of *Electrophorus electricus*, commonly known as electric eels, in captivity has been increasing in the past twenty years due to widespread public interest in these enigmatic sea creatures and refinements in artificial environmental technologies. This has provided opportunities for systematic observation and data collection across multiple generations that have revealed unusual responses to captivity. Of particular interest are variable effects on eels' Electric Organ Discharge (EOD), their eponymous ability to generate electric charges, central to both navigation and hunting, which is sustained by electrocytic organs. Anecdotal accounts have long held that captive eels experience some decline in EOD capabilities, and recent research has indicated that eels born in captivity experience increasing EOD deficiencies with each succeeding generation. Moreover, the magnitude of decline appears linked to unknown geographic factors, with eels in the Pacific Northwest especially susceptible to rapid loss in this vital ability.

Thesis Statement

We hypothesize that potassium and sodium content in the air and water in Pacific Northwest eel environments is linked to EOD development during eel gestation and that increasing content levels will reduce generational declines. Eels' native environment is high in both of these elements, and evidence indicates that they play a central role in electrocytic action.

Approach or Methodology

Working in the lab of Dr. Sten Bolt at the Hatfield Marine Science Center, I will establish a control and three closed experimental breeding populations of eels. The control group will be kept in conditions that mirror historical practices. Experimental group A will be placed in water with artificially augmented sodium and potassium levels; group B will experience atmospheric injections of sodium and potassium gas compounds; and in group C eels will be given potassium and sodium supplements orally. We will take regular measurements in all groups of sodium and potassium levels in the water, atmosphere, and eels' blood. We will also regularly measure EOD abilities in eel populations in each group using the well-established Hendricks Measurement scale.

Expected Results and Significance

We expect to find that sodium and potassium levels similar to eels' natural habitat will reduce, but not eliminate, the reduction in EOD potential across generations. Our data will have important consequences for both the understanding of eels' electrocytic organ development and for captivity and rehabilitation practices of eel management.

Does this project involve human subject research requiring IRB approval? No

Mentor: _____

Sten Bolt, Zoology Date

By signing, the Mentor gives his/her assurances that he/she has read the proposal, sees it as a legitimate HC project, and is willing to serve as the student's thesis advisor for the proposed project.

Honors College Thesis Expectations Agreement

Student Responsibilities

- Work **3** hours each week per research credit in Z 403 course.
- Maintain a notebook/journal/lab record to verify accomplishments, protocols, problems, questions, dates and number of hours worked and results
- Mid-way through the research, student will select committee members (the committee will include the mentor, and two others) to review the thesis. Selection of committee members is in consultation with and approved by the thesis mentor.
- Submit a final draft copy of the thesis to their thesis committee no later than ten business days prior to their scheduled thesis defense date
- Present their thesis in front of their thesis committee, discuss and defend their thesis by answering questions about their research and related topics such as theoretical background, rationale, results, experimental design and overall significance
- Revise, edit, print, and bind the thesis, and gather signatures for submission to the Honors College and the OSU Scholar Archive no later than Friday of week 10 of their graduation term

Student: _____

Robin J. Cogitare, Date

By signing, the student gives his/her assurance that he/she agrees to the 'Student Responsibilities' outlined for the proposed project.

Mentor Responsibilities

- Provide guidance on the development of, and direction of the research project. The project, including background reading and real-time research, should take about 18-30 total hours (6 credits at 3-5 hours per credit).
- Explain and demonstrate how records should to be kept, including notebooks or data organization and storage.
- Identify the publishing or style guide to be used for the thesis: **the ESA Style Guide**
- Recommend a secondary person for the student to utilize in case of questions. **Kelli K.**
- Assist in preparing and reviewing:
    - project timeline
    - project reference materials
    - drafts of the written thesis
- Assist in selecting and approving fellow committee members
- Provide grades for research credits in terms student enrolls in
- Provide guidance as the student designs the poster and prepares for the thesis defense
- Facilitate the student's thesis defense

Mentor: _____

Sten Bolt, Zoology Date

By signing, the mentor gives his/her assurance that he/she agrees to the 'Mentor Responsibilities' outlined for the proposed project.

Suggested Date	Tasks	Submit to:
General Guidelines	***In the GRADUATE stage**, 1st term - Read & Research / 2nd term -Analyze Results & Write / 3rd term – Edit, Defend & Print*	
By Oct. 31	Read and summarize past literature on topic	Dr. Bolt
By Jan. 1	Gather questions / research / data / themes	Kelli K.
By Feb. 15	Analyze thesis questions / data / research / themes	Kelli K.
By Feb. 15	Select committee members	Dr. Bolt
By Apr. 15	Write and format thesis	Dr. Bolt
By May 1	Revise thesis draft #1, #2, #3	Kelli K.
By May 5	Finalized draft to the thesis committee	Dr. Bolt
By May 15	Schedule the thesis defense	Robin
By May 10	Design and print the thesis poster	Robin
By May 15	Create a presentation on your project	Robin
By May 25	Defend the thesis project	Robin
By June 1	Make revisions to the thesis and format it for binding	Robin
By June 3	Upload thesis to the OSU Scholars Archive	Robin
By June 4	Gather approval signatures	Robin
By June 5	Submit the thesis	HC Office