

The Effects of 17 β -Estradiol on Gonadal Morphology in *Acris Blanchardi*

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Introduction

- Endocrine disrupting compounds (EDCs) can have a detrimental effect on wildlife as anthropogenic contaminants enter natural water ways, soil, and overall habitats¹.
- Amphibians are being exposed to estrogenic chemicals from animal waste, sewage, and plant decomposition².
- 17 β -Estradiol (E2) mainly comes from animal waste and causes alterations in reproductive organs, disrupts the endocrine system, and obstructs larvae development³.
- The purpose of our study is to observe gonadal changes and male to female ratios in the population of Blanchard's cricket frogs while they are exposed to 17 β -Estradiol.

Methods

- Tadpoles will be raised from eggs oviposited by captured amplexed pairs.
- Parental pairs will be sacrificed and sent for histological assay to establish background data.
- Tadpoles will be raised and housed within constructed mesocosms containing a water reservoir to serve as the medium of E2 treatment (Figure 2).
- To ensure consistent E2 exposure the static renewal method will be used every 4-5 days on the water inside the mesocosms.
- After the frogs reach sexual maturity they will be sacrificed and examined for gonadal changes via gross and histologic examination (Figure 1)⁵.

Research Question

- What effect does early life exposure to 17 β -Estradiol have on the gonadal morphology of the Blanchard's Cricket frog?

Dosages for 17 β -estradiol (μ g/L)
0.0
0.020
0.066
0.218
0.719
2.37

Table 1. Different doses of estradiol that will be used.

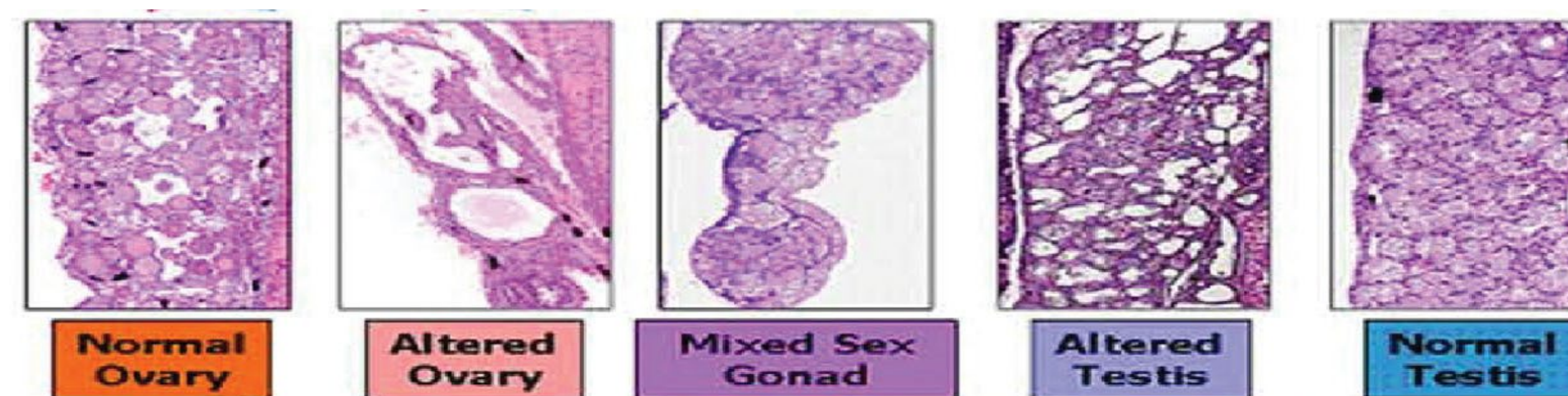


Fig 1. Histology photographs of normal gonads and altered/mixed gonads due to exposure of estradiol⁵.



Fig 2. Mesocosms with netting to prevent the frogs from escaping.

Results

- Currently we do not have any results due to the breeding season beginning in the early summer.
- We expect our results to resemble previous studies that concluded estradiol exposure causes gonadal changes such as mixed sex, ovotestis or complete sex reversal⁴.

Discussion and Future Ideas

- We chose the outdoor mesocosms to raise the frogs, instead of doing it in a lab to keep the frogs under minimal stress. The mesocosms mimic a natural environment for a frog in the wild.
- The complete sex reversal of male amphibians will result in all male offspring in future clutches which will then skew the sex ratio of the population.
- In the future, we plan to replicate this study by using levels of Atrazine that are environmentally relevant.

References

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