

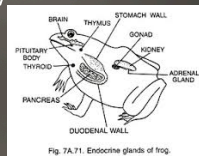


Endocrine Disruption

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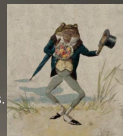
Endocrine system review

- Hormones!
 - Thyroid
 - Penal and pituitary gland
 - Adrenal
 - Testis and Ovaries
- Chemicals messages that control metabolism, reproduction, everything! (basically)



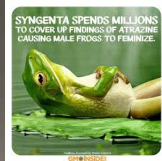
Endocrine Disruptors Review

- What are Endocrine Disruptors (EDs)?
 - Anything that disrupts the bodies endocrine system, (interfere with your bodies hormones).
 - Basically your body cant tell the deference between it and it's own hormones.
- What do they do?
 - **DOOM US ALL!!!!**
 - In all seriousness they have been linked to a lot
 - decreases in human male sperm count over the past 50 years.
 - More amphibian Hermaphrodites
 - Developmental delays
 - Etc.



Introduction

- Information on endocrine disruptors in amphibians is scarce
 - Particularly with Endocrine Disruptors at low levels.
- Is of particular concern in view of the worldwide decline of amphibians
- Notable endocrine disruptors
 - Prozac
 - Atrazine and S-metolachlor (pesticide)
 - DDT
 - Estrogen mimics (Soy)



Where do they come from

- Point sources
 - Industrial runoff
- Nonpoint sources
 - Agricultural runoff
 - Untreated water



How does endocrine disruption effect amphibians?

- Low doses in the environment
 - Atrazine – Demasculinization Hemaporditism
 - Decreases reproduction
 - Prozac (fluoxetine) – Developmental Delays
 - Decreased survivability among other things



Pesticide atrazine can turn male frogs into females
By Peter Szabo, Staff Reporter | March 3, 2010
Atrazine is a herbicide used on corn, sorghum and other crops. It has been found in the blood of male frogs, and it can cause them to develop female characteristics, according to a new study by researchers at the University of California, Berkeley.

• <https://www.youtube.com/watch?v=dzxqj7UTqBM>

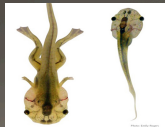
Why endocrine disrupters?

- Prevalent
 - Atrazine and S-metolachlor are heavily used
 - Fluoxetine (Prozac) is commonly proscribed in both human and veterinary medicine
- Affects on reproductive success and survivability due to developmental delays.
- Not the only source, but definitely a leading cause in the "death by a thousand cuts" declines that amphibian populations are undergoing.

UP TO 90 PERCENT OF MANY PRESCRIPTION DRUGS THAT HUMANS CONSUME ULTIMATELY FIND THEIR WAY TO SEWAGE-TREATMENT PLANTS.

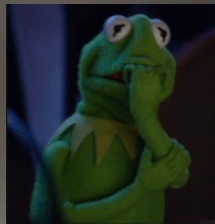
Delayed Development

- Fluoxetine
 - Shown to have effects on development at low levels (0.029 micrograms/L)
 - In some raw waste water, this drug (and similar drugs) have been shown at levels of 0.223 micrograms/L and as high as 0.099 micrograms/L in the water after treatment.



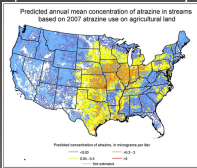
Hermaphrodites

- Pesticides (Atrazine and S-metolachlor)
 - Develop Ovarian tissues in testis
 - Severely reduces reproductive viability
 - Both can cause this affect individually but have the most detrimental effects when combined

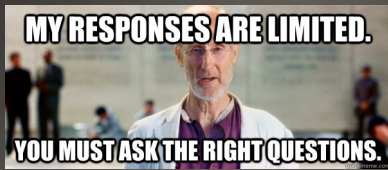


History

- DDT
 - Endocrine Disruptor that cause dramatic crashes in raptor populations.
- If an endocrine disruptor can do that to birds, why not amphibians?



Question?



References

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