

The effect of caffeine on two insect larval species

Presented by;

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How does caffeine get into our ecosystems?

- Old sewer systems and septic tanks leak when it rains
- Sewer watersheds can lead to stream and pond ecosystems



- University of Pittsburgh. "Pittsburgh's leaky faucet: How aging sewers are impacting urban watersheds." ScienceDaily. ScienceDaily, 11 March 2013. <www.sciencedaily.com/releases/2013/03/130311124203.htm>.end citations

Why worry about Caffeine?

- Causes neural damage to animal & insect species
- Causes potential death to different species
- Can create imbalances in ecosystems
- Reduces biodiversity
- Found in the environment Consistently



- Distribution and Risk Assessment of Pharmaceutical Compounds in River Sediments from Doñana Park (Spain)
- D. Camacho-Muñoz & J. Martín & J. L. Santos & I. Aparicio & E. Alonso
- Received: 20 May 2013 / Accepted: 23 July 2013 / Published online: 20 September 2013 # Springer Science+Business Media Dordrecht 2013



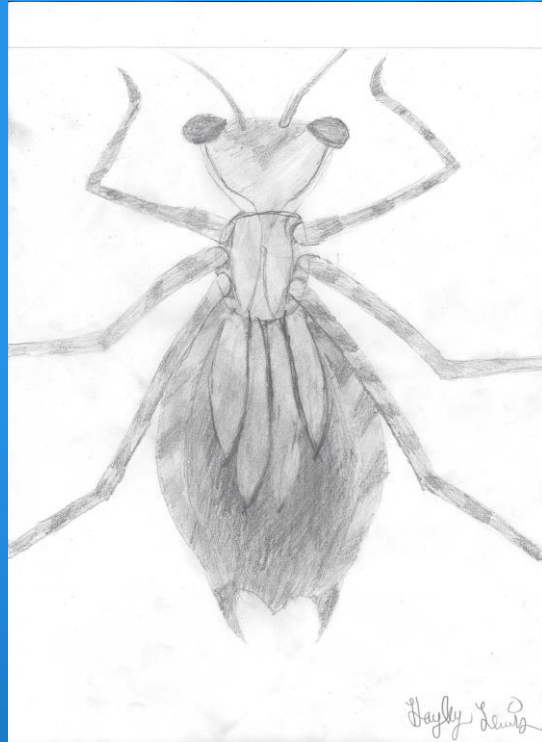
Problem

- Minimal studies have been done comparing mosquito larvae's sensitivity to caffeine
- None have compared it to its predators



Hypothesis

- Mosquito larva will be less sensitive to caffeine than its predators



<http://3.bp.blogspot.com/-n0o-MSJ0y04/TbLaxS6R7II/AAAAAAAAADI/o5P9dN6zfGY/s1600/mosquito-larvae-and-midge-eggs.jpg>

Test setup

- 6 tubs for each species
- Control and experimental with randomized placement



- Outdoor setup and pond debris added to tanks to mimic natural environment
- .1 grams per liter of caffeine used

Results

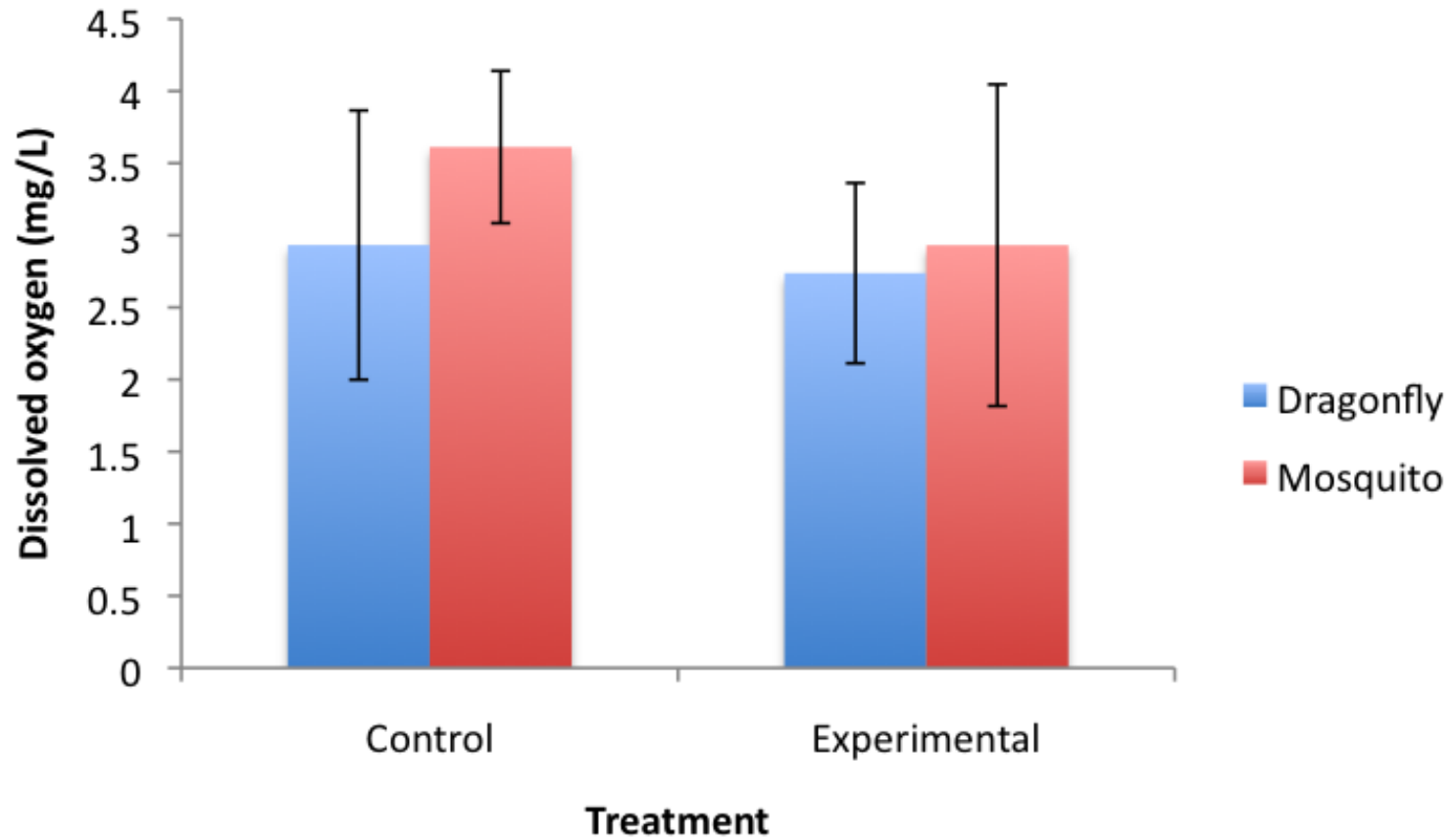
- Dragonfly larva minimally impacted



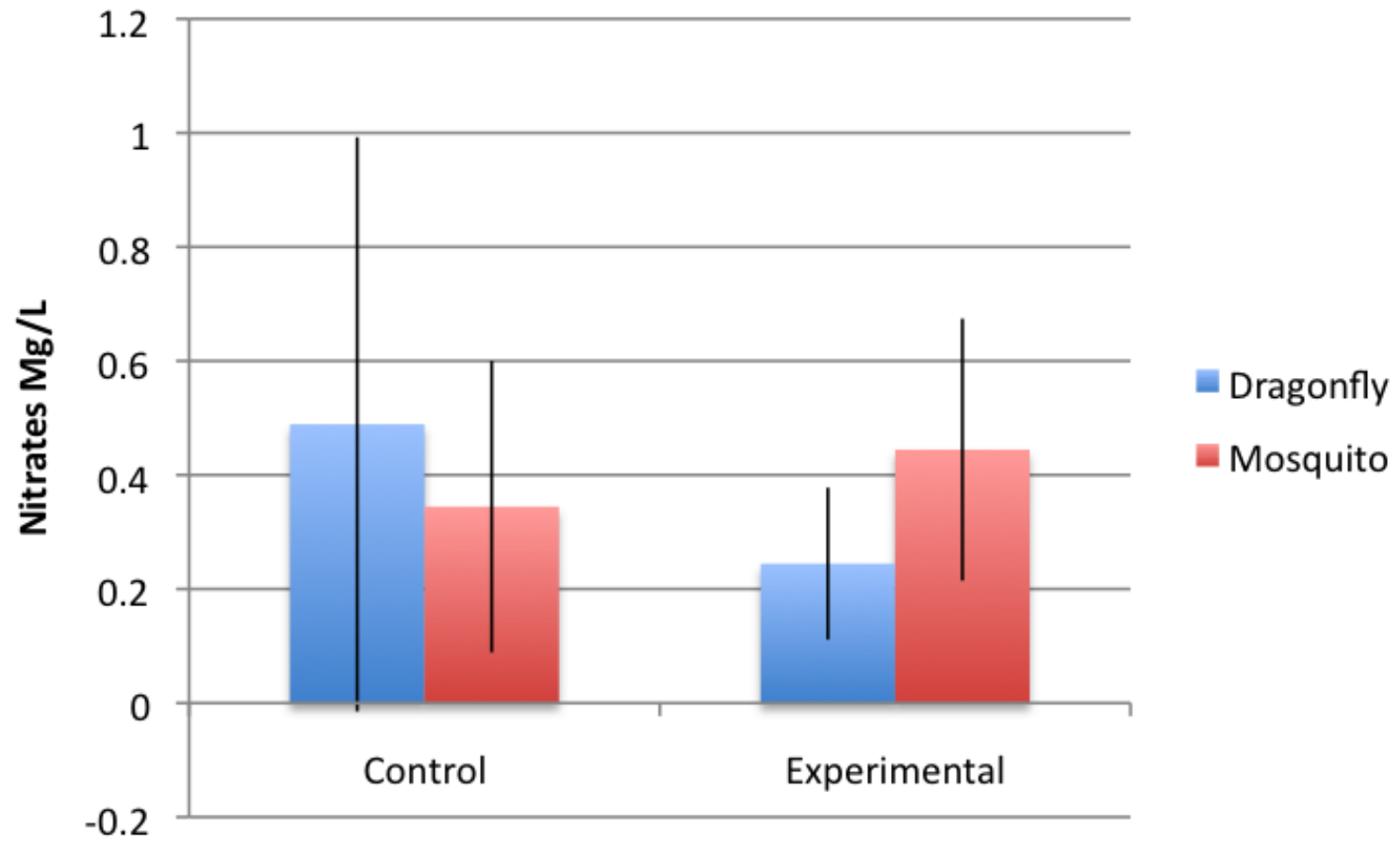
<http://fme1.ifas.ufl.edu/kits/images/emerge.jpg>

- Mosquito larva drastically impacted
- Few survived (many may have been eaten) or effected by heavy rainfall
- Several adult emergences occurred

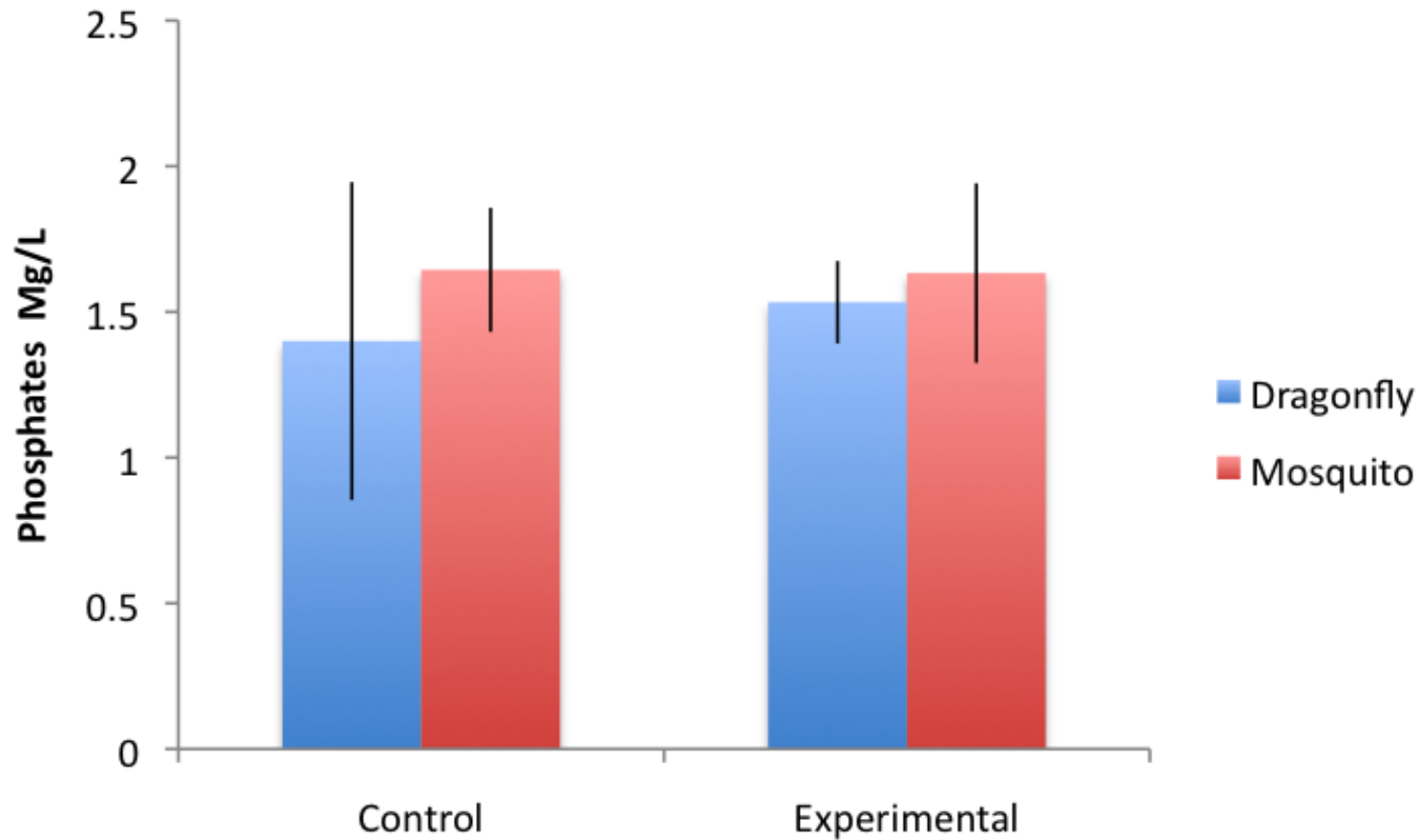
Dissolved Oxygen levels



Nitrate Levels



Phosphate Levels



Discussion

- Buckets were contaminated
- Data not very reliable

http://farm4.staticflickr.com/3018/3009963614_897659a0b8_z.jpg



Future research

- The experiment will be repeated with pond litter replaced
- The buckets will be under the new pavilion
- Tadpoles may be used in the future



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