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General predation trial protocol

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This is a protocol to quantify number of *Daphnia* that a *Chaoborus* will predate upon within a given time frame.

Laura Lopez, Meghan Duffy 2022. General predation trial protocol. **protocols.io**
<https://protocols.io/view/general-predation-trial-protocol-b5m9q496>



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General Predation Trial Protocol- Duffy Lab

LK Lopez 11/11/2020

Materials:

1. 3rd or 4th instar *Chaoborus* larvae
2. *Daphnia* (at whatever age is appropriate for the experiment)
3. Pipettes
4. Filtered lake water
5. 150 mL beakers
6. Incubator
7. Beakers to rear *Daphnia* (size chosen based on experiment).

Methods for Maintaining *Chaoborus*

- *Chaoborus* can be kept in the lab refrigerators for approximately 1-2 months. The low temperature prevents them from metamorphosing and reduces their energy requirements (less feeding is needed). However, the temperature change from the fridge to the incubator or lab can be stressful and result in high mortality. If keeping *Chaoborus* in the fridge, allow time to adjust to incubator conditions. *Chaoborus* do best if kept in beakers (in a covered tote in case they metamorphosise) in incubators at ~ 20 °C (same conditions as most *Daphnia* in the lab).
- *Chaoborus* larvae need to be fed every 2-3 days, approximately 5 juvenile *Daphnia* per individual *Chaoborus*. Adult *Daphnia* can also be used for feeding, but depending on gape size, smaller 3rd instar *Chaoborus* may be unable to catch and eat them.
- Water change 50-100% required weekly.

Predation Trial Methods

1. Starve *Chaoborus* 48 hours prior to trial
2. Place required density of *Daphnia* into beaker (e.g. 10 *Daphnia* aged 20 days into 150 mL beaker filled to 120 mL) filled with clean filtered lake water.
3. Add 1 *Chaoborus*
4. Leave beakers in incubator at 20 °C in the dark for 16 hours (can be longer than this but 16 is sufficient).
5. Remove beakers and count the remaining *Daphnia* alive.

Note: Gape size is an important predictor of predation success in ambush predators. Photograph and measure a subsample of *Daphnia* and the *Chaoborus* (their heads) to control for differences in size.

Note: The same *Chaoborus* can be reused if randomly allocated to across treatments.