

Thesis meeting

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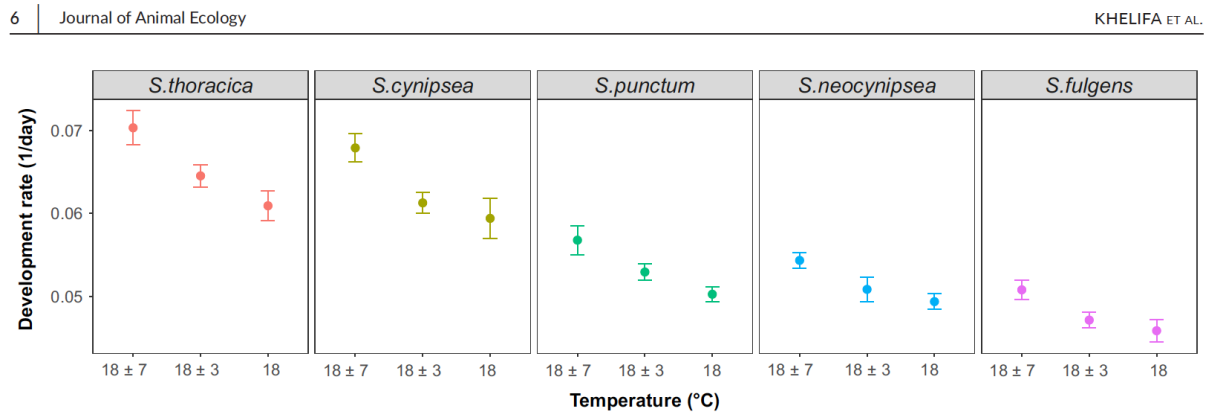
Goals for today's meeting

1. Discuss figure(s) from preliminary extraction
2. Outline extract methods and binning
3. Next steps for conducting holistic search terms

Study selection

Khelifa et al 2019

I really enjoy this paper and feel that its figures and methods are very straightforward. I'd like my final figure to ultimately look like this (Figure 2). I extracted all the data from this figure in my composite figure beyond.



I wanted to include a study that feature community level responses to colored environmental variation and I settled on this one. Admittedly the papers I looked at this summer had fewer color manipulations of temperature than I anticipated. They often manipulated other independent variables (resource concentration, dispersal etc).

Figure 1(a) is a scatter plot showing the total biomass over time (1 to 7) for three different scenarios: Constant (circles), Fast (squares), and Slow (triangles). The y-axis represents Total biomass on a logarithmic scale from 10^{-2} to 10^0 . The x-axis represents time from 1 to 7. The plot shows that the Fast scenario generally results in the highest biomass, followed by the Slow scenario, and the Constant scenario results in the lowest biomass. The biomass values for all scenarios increase over time, with the Fast scenario reaching a plateau around 10^0 by time 7.

| Time | Constant (Circles) | Fast (Squares) | Slow (Triangles) |
|------|--------------------|----------------|------------------|
| 1 | ~0.03 | - | ~0.025 |
| 2 | ~0.01 | ~0.08 | ~0.015 |
| 3 | - | ~0.015 | ~0.1 |
| 4 | ~0.08 | ~0.06 | ~0.04 |
| 5 | ~0.15 | ~0.5 | ~0.3 |
| 6 | ~0.3 | ~0.5 | ~0.3 |
| 7 | - | ~1.0 | ~0.3 |

I also seemed to struggle to find individual level studies that seemed easily wrangle-able. I landed on Joshi et al 1996 from my pre-existing library. I wasn't quite sure how to bin the sex differentiation between flux treatments and response variables, so I just ended up including them. I wasn't sure if I should just average the response and SE for both?

Table 1. Duration of development from hatching to eclosion (50%), adult longevity in days (50% alive) and fecundity (no. of eggs/10 females) in *Aedes krombeini* maintained at constant and fluctuating temperatures

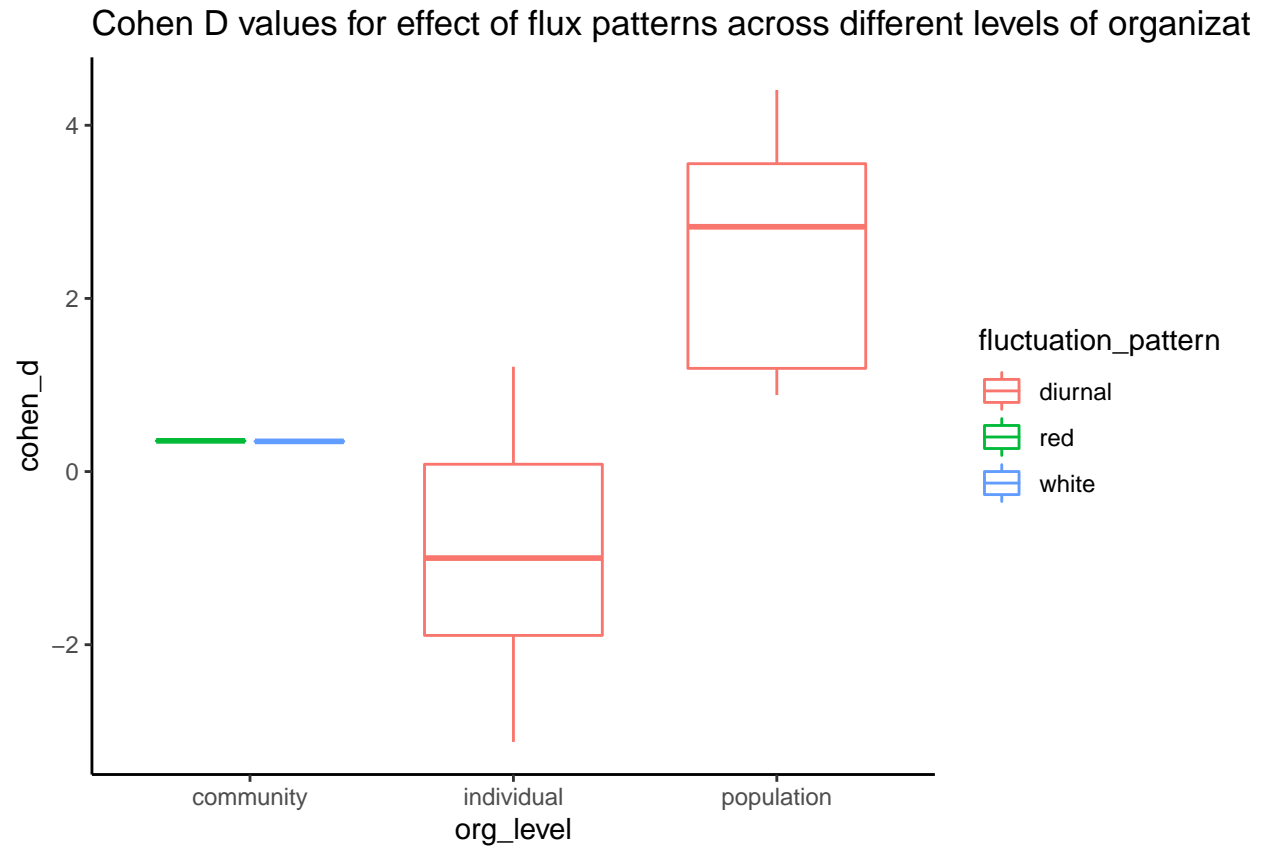
| Temperature (°C) | Developmental time (days) | | | | Adult longevity (days) | | | | Fecundity (eggs/10 females) | |
|--|------------------------------|------|---------|------|---------------------------|------|---------|------|--------------------------------|-------|
| | Males | | Females | | Males | | Females | | Mean | ±SE |
| | Mean | ±SE | Mean | ±SE | Mean | ±SE | Mean | ±SE | | |
| Experiment I: Results of constant temperatures | | | | | | | | | | |
| 14 ^a | 29 | 2.71 | 39 | 6.27 | 2 | 0.29 | 4.0 | 0.15 | 0 | 0 |
| 18 | 21 | 2.28 | 24 | 2.83 | 18 | 1.9 | 23 | 1.8 | 1027 | 9.8 |
| 22 | 7.4 | 0.75 | 10.3 | 0.76 | 56 | 3.46 | 64 | 5.58 | 8430 | 159.6 |
| 26 | 5.1 | 0.36 | 6.3 | 0.71 | 56 | 2.48 | 70 | 7.23 | 10,090 | 31.3 |
| 30 | 4.6 | 0.42 | 5.0 | 0.36 | 22 | 2.14 | 29 | 2.1 | 3970 | 66.25 |
| 33.5 | 4.1 | 0.47 | 5.5 | 0.35 | 2 | 0.09 | 3 | 0.7 | 0 | 0 |
| 35 ^b | 4.0 | 0.68 | 4.0 | 0.49 | 1 | 0.03 | 0 | 0 | 0 | 0 |
| Experiment II: Results of fluctuating temperatures | | | | | | | | | | |
| 16–12 | 21 | 1.7 | 26 | 1.81 | 4.0 | 0.61 | 5.06 | 0.39 | 0 | 0 |
| 22–14 | 16 | 2.05 | 18 | 2.62 | 26 | 2.11 | 32.8 | 4.0 | 4850 | 50.83 |
| 26–18 | 8.3 | 1.39 | 9.3 | 0.83 | 64 | 4.1 | 71 | 5.95 | 10,650 | 220.4 |
| 30–22 | 4.6 | 0.49 | 7.1 | 0.43 | 64 | 4.02 | 81 | 3.79 | 12,600 | 363.0 |
| 33–27 | 4.1 | 0.41 | 5.2 | 0.41 | 29 | 3.18 | 41 | 3.7 | 6140 | 24.12 |

^aLarvae hatched and maintained at 26°C and then transferred to 14°C as early second instars.

^bDuration up to pupal development, the females did not eclose.

Preliminary Results

Warning: package 'dplyr' was built under R version 4.0.2



Current concerns and questions about selecting studies:

1. Hard to find studies that are very explicit about their variation regime and I'm not sure if I should be binning diurnal cycles that are sinusoidal or square in their pattern into different groups
2. How should I bin diurnal cycles that vary in amplitude?
3. How should I be calculating effect size?
 - Should I split Petchey et al Figure by community composition number?
4. SD vs SE? Should these be treated differently and if so, how?
5. I'm now thinking about whether it would be good to section off time series data (like population density over time, or biomass over time) and mean effect sizes (an aggregate of all time series as well as just effect sizes listed in study)