Leicht & Seppälä subjected two generations of a freshwater snail to above optimal, but realistic, short term changes in temperature to determine the effect of "heat waves" on offspring. Using a full-factorial experimental design, they found evidence of transgenerational effects on offspring investment and performance. Importantly, they found that some maternal effects occurred at the same magnitude as the direct effects of temperature, indicating that they should not be overlooked.

While I feel that this paper has the potential to be a valuable contribution to both the fields of climate change and maternal effects research, there were a few aspects that need improvement and clarification. That being said, they are all (most likely) minor issues and should not thwart the recommendation of this paper.

Introduction

I may be interpreting the results from Vaughn 1953 incorrectly, as I only gave it a cursory read, but it appears that the analysis in that paper was done on juvenile snails, not adults. Does it make sense to consider their research applicable to adult stages as well?

While it may not be necessary to provide in full detail all the hypotheses and predictions regarding the effect of temperature on offspring investment and performance, some more background on what was been previously found for these snails might provide the reader with some context for what might be expected.

Methods

A map of the region that the stock pond is representative of, highlighting the location of the stock pond, would be useful in determining the scope of the research.

L128, the number of snails haphazardly collected (113) does not line up with the number of snails that were assigned to the temperature treatments (56 + 60). Also, why subject 56 snails to one treatment and 60 to another? Were there mortalities or other issues that prevented you from having equal numbers in each treatment?

By placing the snails from the maternal generation in perforated cups, hence the same water circulating between all the cups, is there the possibility that hormonal or other chemical cues could be affecting the study? I noticed that this is the only treatment with the use of perforated cups.

You never mention the possibility that some snails may not have eggs, you allude to it by saying they can store eggs so they don't need a mate in the cup, but is there a chance that they haven't stored eggs? It is unclear to me if it isn't mentioned because it isn't possible, or because it wasn't considered.

Line 150 – effect on reproduction-do you mean fecundity? There could possibly be a trade-off between egg size and number that should at least be mentioned.

L152-158-This justification could be condensed to come across less vague. It may also be better suited for the Discussion.

L-176 Could this be included as a variable in the analysis?

After the number of snails undergoing the maternal treatments is provided, the rest of the data is provided as proportions (or no information at all). It would be beneficial to provide the actual numbers (i.e. # of eggs/clutches, # of juvenile snails) as well. It can be deceiving when just proportions are provided. For example, L166- mean clutch size? L182 – how many clutches to each treatment? L189-This resulted in how many hatchlings at each temperature? L203 – two clutches were not included, without knowing how many clutches there were to begin with, it is difficult to determine the impact of this exclusion.

There were a few transformations performed on the data (e.g. L195, L210, L212, L224) without reasons provided.

L-227 Were the excluded snails equally distributed between treatments?

Results
A graphical illustration of the results would be beneficial for understanding the effect of the different treatments; the factorial design of the experiment would make this quite "easy" to do.

Discussion
While the magnitude of the transgenerational and direct effects of temperature were similar for hatching success and survival, there was a large difference for the other traits, which should be mentioned.

L325 - *maturation