8 February 2016

Dear Editorial Board,

Please find below my response and rebuttal to the Editor and reviewer comments for my manuscript "Response diversity of free-floating plants to nutrient stoichiometry and temperature: Growth and turion formation." My responses to individual comments are in red text.

I feel that my revisions have sufficiently addressed the concerns and comments of the Editor and reviewer.

Thank you for your consideration of this manuscript for publication in PeerJ. It has been a pleasure working with you.

Best,

Michael J. McCann, Ph.D.

**Reviewer 1 (Jeff Hartman)**

**Basic reporting**

- The author would benefit from citing a study from 2015 on the relative in vitro growth rates of duckweed (Ziegler et al. 2015 Plant Biology).

**Response:** Agreed. Zielger et al. 2015 is now cited in the Introduction (line 45) and Discussion (line 380).

**Experimental design**

- The author should explain why the replicates for Exp I and II different. Briefly explaining the reasoning is sufficient.
**Response:** This was addressed in the Methods. Line reads: “A smaller number of replicates per each treatment combination (6 vs. 8 replicates) was used in this experiment because of the relatively low variance observed in Experiment I.” (line 141)

- Author needs to explain why plants were grown at 30 C in Experiment II, and not at the range of temperature as in Exp I. Although maximum growth rates was the stated reasoning, the author states in the Discussion that species had similar growth rates under high temperatures, and species differences were more likely to be recorded under lower temperatures. I was curious as to why a range of temperatures with various nutrient stoichiometries was not used in Exp II, and I expected a single experiment combining the nutrient combinations and temperatures, which would essentially be Exp I and II together. I was unclear as to why these studies were conducted in two separate experiments, and I think more justification is needed.

**Response:** This was addressed in the Methods.

Line 89

“Although conducting a single, large experiment to determine the response to all environmental conditions of interest would have some advantages, I conducted two separate experiments to allow for a manageable amount of effort, and still maintaining adequate sample sizes in each experiment.”

Line 144

“Plants were grown at approximately 30°C, which had similar growth rates as the 24 °C treatment and resulted in the maximum growth rates in Experiment I. This temperature would ensure that only nutrient stoichiometry would limit plant growth in this experiment.”

**Validity of the findings**

- I think the author needs to address in the Discussion how the results may impact applied uses of floating plants. This argument was highlighted in the Introduction, and should be reflected in the Discussion/Conclusion as well. Speculation as to which species could be advantageous would be welcome. I think this was the biggest missing piece in the Discussion/Conclusion sections.

**Response:** paragraph added to the Discussion (Line 299).

**Comments for the author**

- Overall, this manuscript was very well written and easy to read.

- Figures were easy to interpret, simplified, and relevant to the results.

- I appreciated the clear explanation of methods in the appendices.

- I have included an annotated PDF for briefer comments and edits.

**Annotated manuscript**

The reviewer has provided feedback as [annotations on the manuscript PDF](https://peerj.com/submissions/8375/reviews/87474/attachment/?rid=15367).

**Response:** These minor changes are made in the text throughout.

**Reviewer 2 (Phyllis Higley)**

**Basic reporting**

The article is well written and the reporting is clear. The background information is appropriate to orient the reader, and the biological significance of the system and the rationale for the study are explained to show how the work fits into the broader field of knowledge. Citations are included and are appropriate. The structure of the article fits the template, and tables and figures are appropriately expressed. This is a coherent body of work.

**Experimental design**

The article reports original primary research, and the stated objectives are relevant. The methods are clearly reported and reproducible. Statistical analyses seem appropriate although I am not aware of an appropriate use of systematic assignment of treatments (L110).

**Response:** additional justification for a systematic assignment of treatments to experimental units is provided in the Methods (Line 107).

**Validity of the findings**

The data are robust and clearly reported. The conclusions are clearly stated and reflect the objectives of the study. Limitations of the study are clearly stated, and interpretation of the results are appropriate. The need for future studies are included and provide direction for the further elucidation of response diversity in floating plant species.

**Comments for the author**

Title
L 1 uses the term "free-floating". However, in the body of the paper he primarily uses the term "floating". These terms should be reconciled.
**Response:** Added a parenthetical statement that “free-floating plants” and “floating plants” can be used interchangeably (Line 30)

Abstract
L 23 "floating plant polycultures were not more dominant": awkward wording
**Response:** Text changed to “Water bodies with three or more species of floating plants were not more frequently dominated by this plant group” (Line 23).

Introduction
L 77 The surveys were not used to determine response variability. They were used to address the second objective regarding plant dominance.
**Response:** Correct. The line was changed to: “I used laboratory experiments to determine the response diversity (i.e., unique response to abiotic conditions) among floating plant species” (Line 70).

Material & Methods
L 106 Insert "fronds" after "white or brown".
**Response:** Fixed in text as reviewer suggests (Line 102).

L 108 refers to "many previous studies": Author should cite more than one.
**Response:** Landolt & Kandeler 1987 is a review. Parenthetical citation changed to (reviewed by Landolt & Kandeler 1987) (Line 104).

L 119 Indicate which component of "growth"; i.e., surface area

**Response:** Fixed in text as reviewer suggests (Line 122).

L 152 refers to "many experiments": Author should cite more than one.

**Response:** Landolt & Kandeler 1987 is a review. Parenthetical citation changed to (reviewed by Landolt & Kandeler 1987) (Line 159).