

Dear Thierry and co-authors,

The two reviewers and I are satisfied with the revisions you have made. Your efforts in addressing the concerns raised by the reviewers and conducting additional analyses are greatly appreciated. Before I proceed to write the recommendation, could you please address the minor additional remarks raised by Adèle, as well as the following points:

- Abstract **end of introduction**: Please consider replacing "with or without predation threat" with "with or without predation cues" since the risk of predation was non-existent (the predator was absent but the water was scented with the predator). **Done**
- Line 152 **142**: Consider changing "caught in February in the Vouge River" to "caught in February 2012 in the Vouge River." **Done**
- Lines 166-169: The provided sentence outlines the start and end of the experiment but does not specify the frequency at which measurements for both behaviors were recorded. While this will be evident in the results section (on the x-axis in Figures 2 and 3), it would be helpful to mention the recording frequency for these two traits here or in the paragraphs describing the procedure for measuring these traits. **Done L. 158**
- Line 159 mentions "Twenty control gammarids." In lines 170-188 (description of the procedure for refuge use measurements), does this mean that ten of these control individuals were tested with scented water and ten with unscented control water? Consider adding this information. **Done, L. 161-162**
- Line 200 **190**: Consider removing the second part of the sentence, "...and the test was not made at day 83 for technical reasons." This is already mentioned earlier that "The experiment was stopped after 83 days post-exposure." **Done**. Additionally, it's essential to clarify and standardize the terminology used to describe the three categories of gammarids: (i) infected individuals vs. (ii) unexposed-control individuals vs. (iii) exposed-uninfected individuals throughout the manuscript (also refer to the comment from referee 1). In this particular sentence (line 200), there is a double confusion: the term "gammarids unexposed to parasite eggs" is not the same as the one used in line 159: "Twenty control gammarids." Furthermore, it contradicts the beginning of this paragraph, which states: "The activity of infected and uninfected gammarids was recorded the day after the refuge use measurement." At this stage in the manuscript, the "uninfected gammarids" logically refer to the "20 unexposed control gammarids" as it is not yet mentioned that some exposed individuals remained uninfected. Yet the end of this paragraph states (lines 200) that "The 20 gammarids unexposed to parasite eggs were not measured for this trait". To avoid this confusion consider replacing "uninfected gammarids" in this sentence with "exposed-uninfected individuals" to make the distinction with the unexposed-controls. **We took care about removing denominations that were remains of the very first version. We hope there are no oddities remaining.**
- Line 228: The sentence "The effects of water type (scented vs. control), infection status (control vs. infected), and their interaction were investigated along time" is a bit confusing given that unexposed-control and exposed-uninfected specimens were pooled together. Should this sentence, therefore, read "uninfected" instead of "control"? **Done**

Best wishes,

Thierry

**Reviews**

*Reviewed by Adèle Mennerat, 06 Nov 2023 12:02*

PCI Zoology #215

Review, round 2 – comments to authors

Dear authors,

First of all, thanks for your thorough revision and patient clarifications. The paper reads very well now, and I have no further general comments (good job clarifying the intro and discussion!) - just a few minor ones.

L45: critical to fitness of such parasites -> critical to the fitness of such parasites **Done**

L133: remove parenthesis before Franceschi, move it to before 2008 **Done**

L286: whatever -> regardless of **Done**

L327: to increase clarity, add “with” before “significantly” **Done**

L328: "increased activity according to time" could be changed to “increased activity with time” **Done**

L456: rephrase to: “Such hypotheses nevertheless explain neither why..., nor... “ **Done**

L477: to avoid repetition of the word “behavior”, consider rephrasing to e.g. “the first component of the ‘protective’ behavioral manipulation” **Done**

L489, consider rephrasing to “while high and low refuge use are beneficial to the acanthella and cystacanth stages, respectively.” **Done**

Thanks again for your answers! **You are welcome !**

*Reviewed by anonymous reviewer, 21 Oct 2023 22:38*

I have meticulously reviewed the revised version of the manuscript, the supplementary material, and the authors' response to the reviewers. I genuinely appreciate the effort with which the authors addressed and integrated our feedback. This is a very nice study.

In my previous review, I had suggested rerunning the experiment to validate the results. I recognize the inherent challenges and constraints in doing so. My initial recommendation stemmed from the ambiguity and some over-interpretations present in the first version. In this revised manuscript the authors prudently focused on their more robust findings. I am now more confident about the replicability of the strong effects observed in this study.

That said, I'd like to point out some lingering inconsistencies, notably with the terms “not infected” and “uninfected.” For instance, I think that it can be observed in figure 1 and possibly on line 228. It would be good to go through the manuscript for that, since this detail created a fair amount of confusion for me in the earlier version. **We created the « uninfected » category by merging unexposed and exposed-uninfected animals on L. 236. We therefore used this terminology for Figure 1. We took care of well defining categories as control unexposed / exposed-uninfected / exposed infected before L. 236.**

To address further things that I pointed out before, and to go in the sense of the authors. The data, now in supplementary material, unambiguously indicates that both the exposed-non infected and non-exposed groups exhibit the same mortality rate. It is also reasonable to conclude that the behaviour of exposed-non infected individuals doesn't significantly differ

from their non-exposed counterparts in a meaningful way. Therefore, it is justified to combined them in the analyses.

Lastly, I found the supplementary material to be a valuable complement to the manuscript. The French annotations in the code are, I believe, acceptable but it may be a decision of the journal.