Dear Alison,

Thank you for your decision regarding our preprint PCIEcology #687.

We note that there are still some comments remaining. However, comment #1 and #2 stem directly from comments in previous revisions on which we (in part or as a whole) disagreed with the suggestions. We argue that we had already responded to comment #1 during the previous revision, such that no further change is needed. Regarding comment #2, our disagreements remain here, and we also have not made any further changes in response as a result. We provide further elements to justify our choices below. On the other hand, we have changed the relevant paragraph in response to comment #3.

We hope this version will be well-received nonetheless.

Best regards,

Maxime Dahirel, on behalf of the authors

COMMENT 1

"I understand that the model with the interaction term has an AICc of 323.1 which is larger than 322. However, the difference in AICc is < 2 meaning these models are equivalent. This means that you cannot say that the model without the interaction is the better model -the models with and without the interaction are comparable. In this scenario you should discuss that you can't distinguish whether there is or isn't an interaction between size and urbanisation and future work needed to uncover this."

ANSWER TO COMMENT 1> This is not accurate to what we were writing, already in the previous version. We were and are saying explicitly that the interaction *when it is included* is not statistically significant, and that including it does not change the overall effect of urbanisation anyway. See lines 288-290 (283-285 in previous version) of the main text:

"In addition and as a post-hoc exploration, we re-ran our model set adding size × urbanization interactions, and found no significant interaction, and no evidence that the urbanization effect changed in response (Supplementary Material S4)."

Or an excerpt of the Supplementary Material S4 mentioned in the above sentence: " There was no significant size × urbanization interaction (Chi2 = 3.06, df = 2, p = 0.22)."

Thus, contra this comment, we can actually say that there is no *detectable* interaction, and no changes are needed in response.

The fact that the best interaction model and the best "non-interaction" model come within 2 AIC points of each other does not come into play at any point of the reasoning here.

COMMENT 2

"I agree that you have limited power to detect all interactions. However, it would be interesting for the reader to compare models that include different 2-way interactions restricted to effects already included in the model. Please can you do this (at least) for the 'Degree of Urbanization categories (SMOD)' metric with each of the phenotypic measures. You can include fusion versus no fusion as a

categorical variable. There should not be a problem for estimating the best fit model using AICc if only including these 2-way interactions.

Only including these interactions are justified based on the fact that it is interesting to see how changes in different phenotypic measures across an urbanisation gradient change encapsulation and risk of nematode infection.

This information can be included in the Supplementary materials."

ANSWER TO COMMENT 2> We have a fundamental disagreement here. We strongly believe that even as a Supplementary Material, this would still be a fishing expedition with a high risk of returning spurious results, given all the parameters in consideration. The previous suggestion to explore just the size x urbanization as a post-hoc exploration had value given both size and urbanization showed significant effects and given the centrality of body size as an ecological trait (hence why we followed it, but see below). However, we fail to see similar rationales for the other (non-significant) variables, or at least none that justify the increased risks of just being wrong linked to all-out data dredging.

We note for the record that a great value of PCI is that all data and code are required to be open and accessible, and ours of course are. The analyses here are not excessively complicated ones, so any reader who would be interested in these interactions, despite our own principled objections, is 100% free to explore them by themselves.

Even if we were to add only Urbanisation x phenotype 2-way interactions as suggested, this would either multiply the models (if we are adding only one interaction at a time per model, and doing one model per phenotype interacting) or still multiply the parameters in a model (if adding the urbanization x phenotype interaction all at once and doing only one model _ with SMOD a three-level factor, each interaction added to SMOD models adds two parameters).

Furthermore, the recommender suggests to only do that with the SMOD model, i.e. the best model in the absence of interaction; while we would not necessarily disagree with that choice were we to re-run models, we want to reassert for the record that there is no a priori reason that the SMOD model would remain the best model in the presence of an interaction parameter. This is after all why we re-ran all models when asked to explore the size x urbanisation interaction by a reviewer, rather than only the SMOD model.

Altogether and added with our previous critiques of this suggestion which remain in our opinion valid, this means that we respectfully decline to change the manuscript in response to this comment.

COMMENT 3

"You need to be more explicit in your discussion with regards to the 5 sites with a high proportion of nematodes. State that you cannot identify any cause of why these 5 sites have > 75% encapsulated nematodes."

ANSWER TO COMMENT 3> We have added to the open code for this manuscript a brief exploratory analysis that shows that all else (phenotype, city) equal, variation in built-up or population density within the Urban Centre category does not explain this variability. We have largely modified this paragraph to refer to this, and then to better segue into the possible other explanations that we do not

have enough data to act on yet (i.e. the vegetation, landscape and socio-economic parameters already mentioned in the previous version) (Lines 269-283 in current version, see tracked changes for comparison).