

Dear Sara Magalhaes, I have resubmitted a revised version of the preprint

<https://doi.org/10.1101/305730>

"Multi-model inference of non-random mating from an information theoretic approach". I also attached a pdf with the changes in red.

Thank you very much for your effort. I really appreciate your positive feedback. Please find below my response to your questions/comments. The questions appear in black bold and the answer in normal font.

Comment from the editor

We have received the revised version of your manuscript, which represents a great improvement relative to the first version, especially concerning the clarity of the message. In line with this, I will not send it out to the reviewers again, but I'd like to ask you to consider still doing a few changes, which I think will make the article even clearer. While you do these changes, I will prepare a recommendation.

Here it goes:

- Line 38: there is still disagreement on its actual definition.

RESPONSE

Done

- Line 39: has been challenged.

RESPONSE

Done

- Lines 43-44: which 'various aspects' are you talking about?

RESPONSE

Done: (evolutionary, behavioral or social role)

- Line 44: I would replace "to make things worse" by "Moreover".

RESPONSE

Done

- I would remove all the text that goes from lines 45 to 55. Lines 45-49 repeat a bit what was written before and the paragraph on patterns and processes I think is not needed.

RESPONSE

Done

- I would also remove the paragraph from lines 70 to 77, it does not provide much new information.

RESPONSE

Done

- Line 82: remove "same".

RESPONSE

Done

- Line 98: the comma should come after “frequencies”, not after “that”.

RESPONSE

Done

- Line 101: remove “when measured with matings”.

RESPONSE

It said “when measured within matings” I removed “when measured”

- I would also remove the paragraph from lines 103-108, as it is quite clear what mating at random is, we don’t need this to be explained.

RESPONSE

Done

- Lines 120-123: isn’t it more the opposite: formulating random mating as the zero information model allows expressing the patterns obtained in the other models, right?

RESPONSE

Done. Though I think both expressions are right, they are two sides of the same coin. Originally I found the conditions going from the saturated to the random mating model and so I expressed in that way in the ms. But the opposite view is also true. I have no problem changing this if it seems clearer.

- Line 170: remove “the” before “model”.

RESPONSE

Done

- Line 210: you haven’t explained what an “information index” is. Please do this before you use the term.

RESPONSE

I just changed information indices by information.

- Line 349: kinds.

RESPONSE

Done

- Line 355: remove “as” before “caused”.

RESPONSE

Done

- Line 373: replace “be produced” by “occur”, then end the sentence, and state “In fact, in this case...”.

RESPONSE

Done

- Line 374: replace “as” by “it is”.

RESPONSE

I changed:

“... i.e., as measured by the overall index of sexual isolation I_{PSI} ”
by
“ i.e., the overall index of sexual isolation $I_{PSI} = 0$ ”

- **Line 375:** I would put “see also....” Inside the brackets.

RESPONSE

Done

- **Line 438:** another, not other.

RESPONSE

Done

- **Line 459:** replace “at” by “in”.

RESPONSE

Done

- **Line 466:** to apply information criteria to select.

RESPONSE

Done

- **Line 539:** replace “that” by “as”.

RESPONSE

Done

- **Line 568:** to generate.

RESPONSE

Done

- **Line 627:** replace “were” by “was”.

RESPONSE

Done

- **Line 655:** to estimate.

RESPONSE

Done

- **Lines 659-661:** I still think there is insufficient detail in the description of data collection. Do you sample all individuals present? What is a ‘copulation pair’? With which criteria do you distinguish between species? Are these criteria also what you think is involved in sexual selection?

RESPONSE

I changed copulation pair by mating pair. As your first question, not all the individuals were sampled but “Mating pairs were collected jointly with the 15 nearest non-mating individuals.”

Please, note that I am re-analyzing already published data that I did not sample. All the information you are asking for is present in the original article. However, I

understand the convenience of giving the necessary information to follow the example without reading the original ms. Therefore I have added the following paragraph:

“
The classification of morphs was made by considering as pure morphs those snails that had their shell ridged and banded (RB morph) or smooth and unbanded (SU morph). The hybrids (HY) were those snails that had a complete set of bands but lacked ridges, or viceversa, or those that, having both ridges and bands, had at least two incomplete bands (see details in Cruz et al. 2001).
“

Concerning your last question, currently it seems that sexual selection is mainly due to size differences, however this is work still in progress.

- Lines 715-722: I miss a summary of what happened in the absence of replacement and in the empirical example.

RESPONSE

It think it appears but “absence of replacement” was not mentioned explicitly. I changed this now in lines 739 and following:

“
In such cases, the mating process resembles a sampling without replacement and the population phenotype frequencies may be altered during the reproductive season so that the sexual selection and assortative mating patterns would be more difficult to detect (Carvajal-Rodríguez 2019). In fact, the simulations (see Appendix C) showed that the performance of the multimodel inference is affected by the sampling and the mating system (polygamous or monogamous) but it is still quite robust for detecting non-random mating deviation in the parameter values except in the worst scenario of monogamous species with small population sizes
“

Regarding the empirical example a bit of discussion appears in the general section (in the previous round of review I understood that you suggested that the summary about the empirical example should be discussed in the general section not apart as appeared in the previous ms version). The empirical example is now summarized in lines 771-783.

- Lines 723-724: mating tables are not a set-up, please rephrase.

RESPONSE

Done

- Line 741: population sizes.

RESPONSE

Done

ADDITIONAL REQUIREMENTS OF THE MANAGING BOARD:

As indicated in the 'How does it work?' section and in the code of conduct, please make sure that:

-Data are available to readers, either in the text or through an open data repository such as Zenodo (free), Dryad (to pay) or some other institutional repository. Data must be reusable, thus metadata or accompanying text must carefully describe the data.

RESPONSE

Done. I uploaded to Zenodo the simulations data set jointly with an explanatory Readme file: <https://doi.org/10.5281/zenodo.2749692>. This information is given in the article before the acknowledgement section.

-Details on quantitative analyses (e.g., data treatment and statistical scripts in R, bioinformatic pipeline scripts, etc.) and details concerning simulations (scripts, codes) are available to readers in the text, as appendices, or through an open data repository, such as Zenodo, Dryad or some other institutional repository. The scripts or codes must be carefully described so that they can be reused.

RESPONSE

Done. The source code is provided in the author web page as indicated in the article. Appendices are provided with the theoretical and simulation procedures.

-Details on experimental procedures are available to readers in the text or as appendices.

RESPONSE

No experimental procedures.

-Authors have no financial conflict of interest relating to the article. The article must contain a "Conflict of interest disclosure" paragraph before the reference section containing this sentence: "The authors of this preprint declare that they have no financial conflict of interest with the content of this article." If appropriate, this disclosure may be completed by a sentence indicating that some of the authors are PCI recommenders: "XXX is one of the PCI XXX recommenders."

RESPONSE

Done

Sincerely,

Antonio

*Antonio Carvajal-Rodríguez
Facultad de Biología, Campus Lagoas-Marcosende
Departamento de Bioquímica Genética e Inmunología
Universidad de Vigo, Vigo 36310, Spain
Email: acraaj@uvigo.es
Web: <http://acraaj.webs.uvigo.es>*