

Dear Editors and Reviewers,

We are happy that you provisionally accepted our manuscript for publication.

All final issues raised were resolved in the new manuscript version. The specific changes are documented below. We also updated the doi for the Zenodo repository since minor changes were made to the figure in the last revision. This required an update of the scripts in the repository. The updated Zenodo repository will be published as soon as the paper is published. This allows me to also add a proper reference to the published paper in the repository.

Note that the cited paper from Díaz-Yáñez et al. is still in press and we are waiting for the DOI, which we will probably get within a few days. Therefore we shall be able to include the DOI during typesetting.

Please let us know if we can assist the publication process in any way.

Thank you for the very constructive and smooth review processes.

Best regards,
Yannek Käber on behalf of all co-authors

Point-by-point response

Reviewer 1

In the revised version, the authors considerably improved the manuscript with regard to the criticisms of my earlier review. In particular, the introduction has been significantly improved, thus enabling readers to get a foothold in the article. In addition, some inconsistencies have been removed.

Overall, I still consider this a highly technical manuscript, which, however, is for the most part well worked out and definitely of interest to the modelling community; it should therefore be published.

I list some smaller technical issues:

Line 274: This sentence, as written, still makes no sense logically because $\log[Ps(ys | \theta)]$ is not a sum over s . I suspect the authors want to say something like this: "Summing the expressions in 10) over all plots i , we obtain the log-likelihood $\log[Ps(ys | \theta)]$ for a species s , and further summing this over s we arrive at the joint log-likelihood $\log[P(y | \theta)] = \sum \log[Ps(ys | \theta)]$, which we here analyze in a scaled form

$\log[P(y | \theta)]/N_{\text{species}} = \sum \log[Ps(ys | \theta)]/N_{\text{species}} \dots$ "

As I understand it, the scaling is merely a technical point in algorithm (the authors added some explanation here) and therefore not an issue. As indicated, I recommend to reserve probability expressions such as $\log[P(y | \theta)]$ for the unscaled version.

Response: We changed the explanation of the likelihood to resolve these issues. For this we included the suggested formulation and made small changes to the equations to avoid using the probability expression.

Line 389: "therefor": Should probably be "therefore".

Response: fixed.

Line 936 (equation A1): While an assignment expression like $x = x + 1$ is a common idiom in many programming languages, such "equations" are unacceptable for a mathematical presentation. The authors should therefore use different variable names for the preliminary PESts and the updated PESts (or perhaps an additional index) to make the distinction clear.

Response: We changed the name of the first variable to PEStEF_s. This makes the equation also valid for a mathematical presentation.