Review History

RSOS-191577.R0 (Original submission)

Review form: Reviewer 1

Is the manuscript scientifically sound in its present form?
Yes

Are the interpretations and conclusions justified by the results?
Yes

Is the language acceptable?
Yes

Do you have any ethical concerns with this paper?
No

Have you any concerns about statistical analyses in this paper?
No

Recommendation?
Accept as is
Comments to the Author(s)
I enjoyed reading the manuscript and the flow is coherent and clear. The authors explored whether phenotypic plasticity on the Drosophila suzukii ovipositor, a key feature, that allows this species to cause severe damage to fruit crops, plays a role on this pest global expansion. In this case, it seems that robustness allied with a broad capacity of performance is helping the success of this pest species. This assessment will contribute to our knowledge of the role of plasticity on biological invasions and new niche colonizations. I also want to add that I particularly appreciated the combination of SEM and photogrammetry techniques and geometric morphometrics to address the 3dimensionality of the ovipositor structure.

Typos/small mistakes:
Fig. 4 (Legend) - it is written "effect of developmental temperature", when in reality it should be "geographic location"

Review form: Reviewer 2

Is the manuscript scientifically sound in its present form?
Yes

Are the interpretations and conclusions justified by the results?
Yes

Is the language acceptable?
Yes

Do you have any ethical concerns with this paper?
No

Have you any concerns about statistical analyses in this paper?
No

Recommendation?
Reject

Comments to the Author(s)
The manuscript of Varón-González and colleagues is a very well conceived study that investigates the phenotypic plasticity of Drosophila suzukii ovipositor at different temperatures in population from different origin. The manuscript is well written and the techniques adopted for the geometric morphometry are robust and well suited to investigate the subject. Said that, the study is primarily confirmative of already published results and its novelty is limited to the comparison among three disjoint populations and the finding that the ovipositor structures remain highly stable across a large geographical range. Maybe, a more large sampling of natural populations to better cover the species distribution, than with just three samples, would have make this study more attractive.

While I may understand the need to build a story on a running hypothesis I cannot find the one proposed by authors as a reliable one. Indeed, affirming that “It is thus conceivable that D. suzukii ovipositor might present some adaptive plasticity to temperature, allowing it to pierce fruits skins of (thermally induced) varying resistance” (page 3, lines 81-83) implies that the ovipositor structures may undergo to relaxation when the species face soft fruit skin or
conversely gain robustness when the populations oviposit on hard skin fruit. However, D. suzukii is a highly polyphagous species that use small fruits of a large array of crop and non-crop species (Burrack, H. J. 2013. Variation in selection and utilization of host crops in the field and laboratory by Drosophila suzukii Matsumura (Diptera: Drosophilidae), an invasive frugivore. Pest Manag Sci 69(10): 1173; Kenis, M., Tonina, L., Eschen, R., van der Sluis, B., Sancassani, M., Mori, N., ... & Helsen, H. (2016). Non-crop plants used as hosts by Drosophila suzukii in Europe. Journal of Pest Science, 1-14; Tonina, L., Mori, N., Giomi, F., & Battisti, A. (2016). Development of Drosophila suzukii at low temperatures in mountain areas. Journal of Pest Science, 1-12), thus it encounters a large variety of skin textures and hardness within the very same generation. On this premise, it is hardly conceivable that a weaker form of ovipositor may be selected in warmer climates. Thus, the hypothesis should be based on a more robust and likely theoretical background.

The titles of figure 3 and 4 are the same and this is a bit misleading.

Decision letter (RSOS-191577.R0)

12-Nov-2019

Dear Dr Varón-González

On behalf of the Editors, I am pleased to inform you that your Manuscript RSOS-191577 entitled "Limited thermal plasticity and geographic divergence in the ovipositor of Drosophila suzukii" has been accepted for publication in Royal Society Open Science subject to minor revision in accordance with the referee suggestions. Please find the referees' comments at the end of this email.

The reviewers and handling editors have recommended publication, but also suggest some minor revisions to your manuscript. Therefore, I invite you to respond to the comments and revise your manuscript.

- Ethics statement
If your study uses humans or animals please include details of the ethical approval received, including the name of the committee that granted approval. For human studies please also detail whether informed consent was obtained. For field studies on animals please include details of all permissions, licences and/or approvals granted to carry out the fieldwork.

- Data accessibility
It is a condition of publication that all supporting data are made available either as supplementary information or preferably in a suitable permanent repository. The data accessibility section should state where the article's supporting data can be accessed. This section should also include details, where possible of where to access other relevant research materials such as statistical tools, protocols, software etc can be accessed. If the data has been deposited in an external repository this section should list the database, accession number and link to the DOI for all data from the article that has been made publicly available. Data sets that have been deposited in an external repository and have a DOI should also be appropriately cited in the manuscript and included in the reference list.

If you wish to submit your supporting data or code to Dryad (http://datadryad.org/), or modify your current submission to dryad, please use the following link:
http://datadryad.org/submit?journalID=RSOS&manu=RSOS-191577
• Competing interests
Please declare any financial or non-financial competing interests, or state that you have no competing interests.

• Authors’ contributions
All submissions, other than those with a single author, must include an Authors’ Contributions section which individually lists the specific contribution of each author. The list of Authors should meet all of the following criteria; 1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published.

All contributors who do not meet all of these criteria should be included in the acknowledgements.

We suggest the following format:
AB carried out the molecular lab work, participated in data analysis, carried out sequence alignments, participated in the design of the study and drafted the manuscript; CD carried out the statistical analyses; EF collected field data; GH conceived of the study, designed the study, coordinated the study and helped draft the manuscript. All authors gave final approval for publication.

• Acknowledgements
Please acknowledge anyone who contributed to the study but did not meet the authorship criteria.

• Funding statement
Please list the source of funding for each author.

Please ensure you have prepared your revision in accordance with the guidance at https://royalsociety.org/journals/authors/author-guidelines/ -- please note that we cannot publish your manuscript without the end statements. We have included a screenshot example of the end statements for reference. If you feel that a given heading is not relevant to your paper, please nevertheless include the heading and explicitly state that it is not relevant to your work.

Because the schedule for publication is very tight, it is a condition of publication that you submit the revised version of your manuscript before 21-Nov-2019. Please note that the revision deadline will expire at 00.00am on this date. If you do not think you will be able to meet this date please let me know immediately.

To revise your manuscript, log into https://mc.manuscriptcentral.com/rsos and enter your Author Centre, where you will find your manuscript title listed under "Manuscripts with Decisions". Under "Actions," click on "Create a Revision." You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript and upload a new version through your Author Centre.

When submitting your revised manuscript, you will be able to respond to the comments made by the referees and upload a file "Response to Referees" in "Section 6 - File Upload". You can use this to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the referees. We strongly recommend uploading two versions of your revised manuscript:

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2) A 'clean' version of the new manuscript that incorporates the changes made, but does not highlight them.
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5) All supplementary materials accompanying an accepted article will be treated as in their final form. Note that the Royal Society will neither edit nor typeset supplementary material and it will be hosted as provided. Please ensure that the supplementary material includes the paper details where possible (authors, article title, journal name).

Supplementary files will be published alongside the paper on the journal website and posted on the online figshare repository (https://rs.figshare.com/). The heading and legend provided for each supplementary file during the submission process will be used to create the figshare page, so please ensure these are accurate and informative so that your files can be found in searches. Files on figshare will be made available approximately one week before the accompanying article so that the supplementary material can be attributed a unique DOI.

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Once again, thank you for submitting your manuscript to Royal Society Open Science and I look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.

Kind regards,
Lianne Parkhouse
Editorial Coordinator
Royal Society Open Science
openscience@royalsociety.org

on behalf of Dr Richard Benton (Associate Editor) and Kevin Padian (Subject Editor)
openscience@royalsociety.org

Editors' comments to Author:

Thanks for your submission. One reviewer is happy with it as is and the other seems to think it does not show much that is new. However the study of geographical variation in the ovipositor is
useful and I hope you will consider that reviewer's suggestions for the literature relevant to the question. Best wishes for your revision.

Reviewer comments to Author:

Reviewer: 1
Comments to the Author(s)

I enjoyed reading the manuscript and the flow is coherent and clear. The authors explored whether phenotypic plasticity on the Drosophila suzukii ovipositor, a key feature, that allows this species to cause severe damage to fruit crops, plays a role on this pest global expansion. In this case, it seems that robustness allied with a broad capacity of performance is helping the success of this pest species. This assessment will contribute to our knowledge of the role of plasticity on biological invasions and new niche colonizations.

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Author's Response to Decision Letter for (RSOS-191577.R0)

See Appendix A.

Decision letter (RSOS-191577.R1)

27-Nov-2019

Dear Dr Varón-González,

It is a pleasure to accept your manuscript entitled "Limited thermal plasticity and geographic divergence in the ovipositor of Drosophila suzukii" in its current form for publication in Royal Society Open Science.

Please ensure that you send to the editorial office an editable version of your accepted manuscript, and individual files for each figure and table included in your manuscript. You can send these in a zip folder if more convenient. Failure to provide these files may delay the processing of your proof. You may disregard this request if you have already provided these files to the editorial office.

You can expect to receive a proof of your article in the near future. Please contact the editorial office (openscience_proofs@royalsociety.org) and the production office (openscience@royalsociety.org) to let us know if you are likely to be away from e-mail contact -- if you are going to be away, please nominate a co-author (if available) to manage the proofing process, and ensure they are copied into your email to the journal.

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Thank you for your fine contribution. On behalf of the Editors of Royal Society Open Science, we look forward to your continued contributions to the Journal.

Best regards,
Lianne Parkhouse
Editorial Coordinator
Royal Society Open Science
openscience@royalsociety.org

on behalf of Dr Richard Benton (Associate Editor) and Professor Kevin Padian (Subject Editor)
openscience@royalsociety.org

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Appendix A

Dear Editor,

We would like to start by thanking you, the associate editor and the reviewers for your work on our manuscript. We appreciate their comments and suggestions, which we hope we have sufficiently addressed in this revision.

First, we have changed the title of the figure 4, which was erroneous as both reviewers noticed. We have now adopted the correction suggested by reviewer 1.

Second, we do not share the opinion expressed by reviewer 2 on the possible adaptive value of the (limited) plasticity we describe in the manuscript, in relation to fruits texture and temperature. Drosophila suzukii populations certainly ‘encounter a large variety of skins texture and hardness’ as put by the reviewer but, as shown in the first citation (Burrack 2013), not all fruits are equally affected. It is conceivable that producing a very stiff ovipositor is developmentally costly. The hypothesis of an adaptive developmental adjustment of the ovipositor depending on the temperature (and its associated impact on fruit firmness) seems plausible, although there is no data available to formally assess it. Whether this hypothesis is sufficiently robust or not to be considered is subjective and we think it constitutes an interesting possibility, worth mentioning in the paper.

Given its limited influence on the manuscript (only briefly mentioned in the introduction), we prefer to leave that sentence as it is.

Kind regards,

The authors.