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To whom it may concern

Assessment of MSc thesis by Vojtech Brik

I had the pleasure of reading Vojtech Brik's MSc thesis on "A range-wide assessment of carry-over effects within the full annual cycle of the Great Reed Warbler with a focus on sex and population differences".

Aims of the study

In his study, Vojtech set out to investigate carry-over effects in the timing of successive migration events and particularly, the role of habitat quality in the non-breeding grounds in causing or modifying carry-over effect. To this end, he used tracking data of Great Reed Warblers from three populations in the Czech Republic, Sweden and Bulgaria and assessed habitat conditions in the non-breeding grounds by remotely-sensed data and stable isotope ratios in feathers.

The thesis has a paper-like structure and consists of Introduction, predictions, methods, results and discussion.

The **introduction** is an excellent summary of the state-of-the-art in the specific topics of migration ecology that this thesis covers. It shows thorough coverage of recent and older literature and a high level of mastering the field. It introduces carry-over effects, how and why they might differ in males and females and for populations breeding in different latitudes, which role feather moult may play in mediating carry-over effects and how habitat condition in the non-breeding grounds can be assessed by remote sensing.

Finally, the aims of this study are stated and specific predictions made based on current knowledge.

In the **Material and Methods**-section, Vojtech introduces the study populations of which Great Reed Warblers were equipped with geolocators. The section also details the analyses of geocator and stable isotope data as well as the analyses of remote-sensing data for habitat characteristics. Furthermore, this section explains the statistical approach used for the identification of carry-over effects – path models.



The most important **Results** of this study were that:

- The strongest carry-over effects were found between the timing of breeding site departure and non-breeding ground arrival, and between non-breeding ground departure and breeding site arrival;
- No differences could be found between males and females in carry-over effects;
- Greenness of non-breeding sites negatively affected stopover duration and timing of breeding site arrival in males but not in females;
- The three populations differed in their dependencies in timing and in the relation of timing to greenness of non-breeding habitat;
- Habitat conditions in the non-breeding grounds did not affect subsequent timing.

These and the more detailed results were then set in relation to current knowledge in the **Discussion**. Again, this was done very thoroughly, and every result of this study was compared to results of earlier studies – might they have been contrasting or supporting. Vojtech also put a lot of emphasis on explaining why particular results were not in line with the expectation raised.

General assessment

This thesis goes far beyond what is usually expected of an MSc thesis and I would assess it to be among the top 5%. The thesis itself is well-written, with clearly formulated aims and predictions, it uses state-of-the-art analyses methods and shows excellent use of literature. Results are thoroughly discussed. If there is anything that I would be forced to criticize, it would be the writing style that is not particularly concise, especially in the discussion. However, I do realize this is not a paper that is under review but an MSc thesis and obviously, the requirements and standards differ accordingly.

I had two questions resulting from the thesis:

- This study's results are in line with several others in the Palaeo-African migration system in finding not particular strong carry-over effects or none at all. Thus, this seems to be a general pattern – at least for migration between Europe and Africa - and apparently in contrast to the migration in the Americas. Leaving the methodological difficulties aside, what does the candidate think might be the ecological reasons behind this difference?
- Identifying carry-over effects might be difficult with geolocator data as Vojtech elaborately pointed out. Again, putting methodological issues aside, which experiments (field, lab, modelling, etc.) could the candidate think of that could be used to unambiguously identify or predict carry-over effects and their magnitude?

Overall, I think this is an excellent thesis and I can only commend Vojtech on this great work. Therefore, I recommend this thesis to be accepted without modification.

Please do not hesitate to contact me should you have further questions.

Yours, sincerely,

Silke Bauer