

Dr. Martin Wiemers
Researcher
Department of Community Ecology
fon +49 345 558 5322
fax +49 3212 6968883
martin.wiemers@ufz.de

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Review of PhD thesis of Jana Šlancarová „Land Abandonment in the Mediterranean – Effects on Butterfly Communities with Respect to Life History Traits“

The PhD thesis of Jana Šlancarová mainly consists of three publications (chapters II-IV), which are complemented by an introduction (chapter I) and a summary and perspectives chapter (no. V), a total of 140 pages. Jana is the first author of all three publications which have appeared in renowned peer-reviewed journals indexed by Web of Science. (The IF stated in the PhD thesis actually constitute the 5 year impact factors for the year 2014.) Two of the publications (chapters II & IV) deal with the main topic of the PhD thesis (the effect of land abandonment on Mediterranean butterfly communities) whereas the third one (chapter III) exemplifies a study of life history traits in three closely related sympatric butterfly species. All of these three publications are of high quality and present interesting pieces of research in the understudied Mediterranean region, using a well-established model group of organisms for ecological studies in terrestrial – and especially grassland – habitats.

Chapter I sets the scene and argues that land abandonment threatens biodiversity in the Mediterranean and thus is of conservation concern. This might come as a surprise to some because forest encroachment could be seen as reversing the detrimental effect of centuries of forest destruction and overexploitation in the Mediterranean. The existence of many Mediterranean endemic butterfly species, however, provides evidence for the persistence of grasslands and other open habitats already in prehistoric times, e.g. due to grazing by large mammals.

Chapter II presents the evidence to support the claim that such open habitats are more species-rich than forested land and of importance especially for Mediterranean endemics. This study was done in three countries of the Balkan Peninsula.

Chapter IV represents a similar study carried out in extensively managed Portuguese oak woods. Here, the effect of forest encroachment on butterfly communities turned out to be much less apparent, possibly due to the lower butterfly diversity in this region, and mostly concealed by variation along an oceanicity-continentality gradient.

**Helmholtz Centre for
Environmental Research – UFZ**

Company domicile: Leipzig

Permoserstrasse 15
04318 Leipzig | Germany
or
PF 500136
04301 Leipzig | Germany
Tel +49 341 235 0

info@ufz.de
www.ufz.de

Registration court: Leipzig district court
Commercial register No. B 4703

Chairman of the Supervisory Board:
MinDirig Wilfried Kraus

Management Board:
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The third study (chapter III – the numbering does not conform to the one used in chapter I and seems to be mistaken) is not directly related to chapters II & IV, but constitutes a nice example of a more detailed species-specific study to figure out differences in life history traits and resource use of three closely related sympatric species with overlapping larval foodplant resources. Jana managed to detect differences in egg-laying preferences which could explain the coexistence of the three species.

In the concluding chapter V, Jana argues convincingly that land abandonment should be of conservation concern in the Mediterranean and presents ideas how open landscapes could be preserved. She also correctly states as a limitation of her study that butterflies are probably not the best indicator group to evaluate forest ecosystems and other groups of organisms (such as moths) are probably superior for those.

All of the three publications are of a high standard, both according to formal criteria (such as structure, grammar and style) as well as content, and have generated significant new knowledge on Mediterranean butterfly communities. The methods are sound and up-to-date, the results presented clearly and well-illustrated, and the discussions demonstrate a good understanding of the context and familiarity with other research in the field. Referencing to the work of other scholars is done in an appropriate way throughout the thesis, and a diligent selection of references is presented in the bibliographies of the respective chapters.

A few questions of interest which came up while reading Jana's thesis:

1. I am missing a little bit the connection between chapter III and the other chapters. What do you think about the response of these three *Aristolochia*-feeding Papilionids to encroachment? According to their life history traits they could either profit from encroachment (as they only have one generation) or be negatively affected (because they feed on herbs and inhabit small Mediterranean ranges).
2. Can you say something about the influence of different management options on butterfly communities, e.g. mowing vs. grazing or grazing by different animals (e.g. sheep vs. cattle or goats)?
3. What do you think about the role of fire in keeping open landscapes, both in prehistoric times as well as a means of conservation?

To conclude, in my opinion the thesis fulfils all requirements to award the PhD degree to the candidate, and I wish Jana a very successful career, especially in order to pursue further research on life history traits in lepidoptera. I hope we will have a chance to collaborate in the near future, e.g. within the working group sECURE (see https://www.idiv.de/sdiv/working_groups/wg_pool/secure.html), which has recently been granted by sDiv, the Synthesis Centre of iDiv (German Centre for Integrative Biodiversity Research).



Dr. Martin Wiemers

Review of the PhD Thesis
“Land Abandonment in the Mediterranean
– Effects on Butterfly Communities with Respect to Life History
Traits”

by RNDr. Jana Šlancarová,
submitted to the Faculty of Science,
University of South Bohemia

The PhD thesis of RNDr. Jana Šlancarová deals with the effects of changing land use, following landscape abandonment, on butterfly communities in the Mediterranean Basin. It consists of three case studies. The first one focuses on the effects of forest encroachment on butterflies in the Southern Balkans; the second one studies butterfly communities in Portuguese 'montados' and the third one explores demography and life histories of three co-occurring Papilionidae butterfly species (*Archon apollinus*, *Zerynthia polyxena* and *Zerynthia cerisy*) in Greek Thrace.

The results describe shifts in butterfly communities, detectable even at the level of individual species life history traits, with increasing forest encroachment. The preference of range-restricted Mediterranean endemics for either grasslands or open woodland formations contributes to falsifying the forested Mediterranean hypothesis, favouring the hypothesis of finely grained landscape mosaic. This mosaic is currently threatened by land use change and biodiversity homogenisation. Maintaining habitat and landscape heterogeneity is crucial for conserving the Mediterranean biodiversity hotspot.

The Thesis includes a general introduction, three chapters based on published papers in good journals (it is worth noting that the third paper was published in the prestigious journal Plos One) and the summary of results and future perspectives. The applicant was always the first author and contributed substantially to each of the papers. The structure of the PhD thesis as papers published in journals and books is very positive, ensuring an easy, effective and fast dissemination of the results.

From the Curriculum vitae of the applicant it follows that apart from the three above-mentioned papers, she has published three additional ones, even if they were in lower quality journals and she was not the first author of one of these. Despite of this, I feel that the publication record of RNDr. Jana Šlancarová is really impressive for a PhD student. Worth mentioning are also active contributions at four international conferences.

In view of the fact that all three papers have undergone a strict peer review in the journals, it is not surprising that it is hard to raise any serious concerns regarding their contents. Thus, instead of criticism of the contents, I would like to pose several questions with the aim to create a discussion on the topic of the Thesis and possible conclusions that may follow from it. They are:

1. You are claiming that the regional habitat diversity, created during millennia of human activity, is currently threatened by land abandonment. Do you think this negative trend of land abandonment can be reversed somehow and if so, how to achieve it?

2. You say that the loss of open, non-forested habitats increases the representation of more northerly species, which somehow contradicts the frequent predictions that northern species should retreat northwards from their southern distribution margins due to ongoing climate change. This may be the state-of-the-art now. However, climatic change may continue and escalate, while the speed of land abandonment may slow down in the future. If this will be the case, what do you predict about the species shifts under such conditions? Can a straightforward prediction be made, or does the result depend on the relative speeds of both processes?
3. At the very end, you raise the question: which traits define rarity? Even if you present it as a problem for future research - do you already have some preliminary ideas of what the answer may be and how does it depend on the group in question?

To conclude, the PhD Thesis by RNDr. Jana Šlancarová presents interesting results and draws sound conclusions. Therefore I recommend RNDr. Jana Šlancarová to be awarded with the title PhD.


Prof. RNDr. Pavel Kindlmann, DrSc.

Prague, September 10, 2016