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Review of the thesis "Ecological specializations in avian assemblages with a special focus on environmental gradients in Africa"

Dr. David Hořák's habilitation thesis entitled **'Ecological specializations in avian assemblages with a special focus on environmental gradients in Africa'** consists of an introductory chapter and nine articles published in peer-reviewed scientific journals. The introduction could be treated as a guidance for reviewers and committee or a personal justification of the choice of research topics, and I found it very interesting as such. The thesis can be divided into three parts from the substantive view-point. The first four papers are strictly related to bird – habitat associations in selected mountain forests areas in Cameroon. Then, we have three studies on birds' nesting ecology which were conducted in Cameroon and South Africa. Finally, dr. Hořák presents two broad scale-analyses concerning spatial variation in reproductive investment, habitat specialization and some other (evolutionary salient) species traits. The two last studies were done on European avian assemblages.

The first part of the achievement presented by dr. Hořák is related to a very interesting finding, which was - to my knowledge - firstly published in 2006 in the Journal of Biogeography. Authors, including Hořák, described there an unusual relation between birds' abundance and species range size in an Afromontane avian community. Basically, authors did not find neither a positive nor negative abundance-range size relationships, moreover they clearly indicated that some range restricted endemic species currently occur in high abundances. This initial finding, which does not correspond with leading view of macroecological theory was a driving force for further research. Starting from the first paper on this topic dr. Hořák presented some possible explanations for the pattern found and later studies were designed in a way enabling testing at least some of the appearing hypotheses. So, within the thesis we have a study where a more specific topic, concerning forest-savannah border effect on birds' assemblages was studied (African Journal of Ecology), and research linking avian assemblage structures with elevation gradient, which were done on Mt. Cameroon (Biodiversity and Conservation, Oecologia). Biogeographical theory predicts that restricted-range species should occur at lower densities than ecologically similar, but widespread species. In the above-mentioned papers Hořák

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indicated an important exception where endemics occupy distinctive habitats in mountains. These findings were later supported by other authors working on birds in E Africa (e.g. Ostrich 81, 7-17) or in Indo-Pacific bird communities (e.g. Ecography 39, 990-997). This finding is well cited in literature, including influential reviews of the topic (e.g. Quarterly Review of Biology 85, 3-25). I really appreciate all these papers and for me they are of key importance for understanding evolution of bird species inhabiting forests in the mountains of central Africa, with a pronounced value for any conservation action in this region. They of course have potential of general importance as one may expect finding similar patterns wherever specialized species from space and time isolated 'islands' (here volcanic mountains) meet widespread generalists from the surrounding matrix.

In the next three papers, Hořák has limited his research focus to a particular but important life history trait, namely clutch size (or – more generally - reproductive investment). Firstly, he used Mount Cameroon as a testing site for finding how altitudinal gradient (and its consequences as vegetation structure etc.) affect survival rate of nests (Biotropica). The main finding, indicating that there is a complicate relationship (interaction) between nest type, elevation (and different vegetation layer coverage) and nests' survival, is very interesting. This study has of course several limitations resulting from the use of artificial nests, focus on birds' nesting only in low layer of the forest etc. Anyway, it is a first and important step and likely it was the maximum which could be done at the beginning. I am writing from the perspective of a person who personally know conditions for work in this region and mountain habitats.
Secondly, Hořák (Ostrich, Global Ecology and Biogeography) moved toward testing more general hypotheses and placed his research in wider geographical scale. He confirmed that clutch sizes increase with productivity and seasonality across different habitats in South Africa, and found no evidence for any relationship between clutch size and nest predation rate for ground-nesting species. In the last paper from this part of the thesis, he supported Ashmole's seasonality hypothesis.

The final two papers of the thesis (Journal of Avian Biology, Oikos) keep us with wide geographical scale of the continent but moved the focus on European bird assemblages. In the first paper, Authors have focused on differences between altricial and precocial species in reproductive investment. In the second, they tried to find links between species specializations and habitat niche breadth. They found that clutch size is higher in more productive and seasonal environments, and that longer breeding season increases number of breeding attempts. Simultaneously, the patterns observed differ between precocial and altricial birds. Finally, Hořák corroborated positive link between habitat and diet niche breadth estimates and indicated birds' traits responsible for species specialization. These last two papers are a little bit further from leading topic of the thesis (at least further from Africa case), but as usually with such kind of good meta-analyses they are important source of ideas which could be more directly tested in the future, including studies contrasting temperate and tropical environment.

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Hořák seems to be aware the weak points of the papers which make up the thesis. It is well visible, for example, in the discussion about use of the artificial nests for evaluating predation pressure. The one I would like to mention, but mostly in order to encourage future work and for discussion, is the aspect of within- and between-year variation in abundance and composition of avian communities in tropics. I am pretty sure that after many seasons spent in Africa, dr. Hořák realize that year-to-year changes for some birds' species are pretty huge and our knowledge about possible limiting factors which could be found outside top-breeding season is insufficient.

David Hořák demonstrates a good record of research and scientific publications in the field of ecology. His work is well known among different groups of ecologists and ornithologists working both in Europe and Africa. He has presented in his thesis only selected papers from his much larger published achievements (around 40 papers in peer-reviewed journals) and he has proofed that he should be promoted to the position of associate professor ("docent"). I am really impressed with his work done in Africa, as I know personally how demanding is both field work there and the logistic of conducting projects in such countries as Cameroon.

Yours sincerely,

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