

11 February 2023

Dear colleagues,

It was a great pleasure to evaluate the habilitation thesis of Dr. Robert Tropek. Dr. Tropek is an internationally well-known expert in the field of pollination ecology. His research focuses on Lepidopteran biodiversity patterns and plant-pollinator interaction network in African ecosystems. African ecosystems are unique and diverse, but information about them is underrepresented in the global peer-reviewed literature. My evaluation of the thesis is that it is truly outstanding and represents a unique and very important contribution to science.

Dr. Tropek is rare in his ability to combine taxonomic expertise with modern ecological study. Currently, our ability to prioritize conservation efforts is limited by the fact that much biodiversity is not yet described, particularly in the tropics. Despite the importance of basic taxonomic work, it is not easy to get taxonomic-based research funded. Dr. Tropek has received funding for his cutting-edge ecological field research. In combination with these endeavors, he has described and named for the first time several species of butterflies and moths. I was touched by the thoughtful names he gave to the new species he described. His goal is to connect these species to the local communities that can protect them, and the names serve this purpose. His taxonomic work has also highlighted, for the first time, new local hotspots for biodiversity of Alucitidae moths.

His ecological research has advanced our understanding of pollination syndromes. In particular, he has shown that the importance of floral traits depend on the pollinator group and the environmental context. Color, nectar, tube length, flower size and flower shape differ in their relative importance for individual pollinator groups. The relative importance of individual floral traits also depends on environmental conditions, such as altitude and season.

His approach to understanding pollination syndromes combines behavioral observations of pollinators with reproductive success of plants. These approaches enable an understanding of whether floral visitors are having positive, neutral or negative effects on plant reproductive success. Further, other behavioral observations, such as those of sunbirds attacking bees, provide information on indirect effects that animals can have on the reproductive success of plants. These approaches are important, because community-wide studies that only look only at visitation will conclude that interactions are more generalized than they are. Dr. Tropek's research on *Hypericum* species highlights that plant species will appear generalized based on their visitation, but are specialized when considering contacts of animals with anthers and stigmas.

His research papers often point out the potential harm from methods and publications that present incomplete information about a system. Patterns change across seasons, altitudes and other environmental gradients, and papers with limited spatio-temporal grains will make conclusions of the importance of

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global change drivers on biodiversity and interaction networks that will only prevail under limited conditions. Choosing the right field techniques for measuring biodiversity, pollination and plant reproductive success is important since there are several possible methods with various weaknesses and benefits. I want to highlight for the evaluation committee the incredible sampling effort that went into each of the papers that are part of this thesis. For example, there are 7853 and 16040 insects that were collected and curated for papers 5 and 6, respectively. 26000 hours of recordings of pollinator visitations were included in paper 15. Given the thoroughness of each paper, it is incredible that Dr. Tropek has been so productive.

Further, I want to highlight that the focus on diverse, African ecosystems is a unique strength of his research. However, this type of research is extremely difficult. The logistics of the field work are unbelievably complicated. There is less background knowledge to build upon, and thus basic information must be collected before cutting-edge ecological questions can be asked. This includes identifying and describing species and their feeding habitats for the first time.

Finally, it is clear that Dr. Tropek is already connecting his research program to the global scientific community. Two of the papers in this thesis highlight his collaborative work with colleagues from around the world towards understanding of how biodiversity changes across continental and global gradients, such as productivity and latitude. Bringing data together is an essential step in understanding and addressing the challenges posed by biodiversity loss and promoting the global conservation of our diverse species and ecosystems.

In summary, the excellence of this habilitation thesis is the result of a combination of its originality, expertise, research methodology, collaboration, persistence, and clear communication. I am looking forward to hearing the next discoveries of Dr. Tropek.

Sincerely,

Tiffany Knight
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