

MSc. Paolo Biella

PhD. Thesis: A conservation perspective on the mechanisms that influence plant pollinator interactions

Supervisors' evaluation

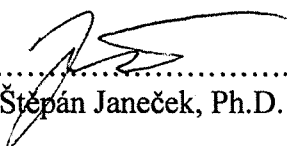
The aim of Paolo Biella's PhD. Thesis was to develop a better mechanistic understanding of plant-pollinator interactions, especially at the community level, and to explore implications for conservation of biodiversity. He addressed these aims by innovative field studies of entire networks of plants and flower-visiting insects in combination with studies focused on various aspects of biology of selected species of both pollinators and plants. He achieved a lot during his PhD. study and his Thesis is a very valuable contribution to our knowledge of plant-pollinator interactions.

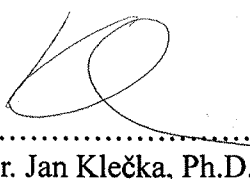
Three chapters of the Thesis are devoted to detailed analyses of entire communities, or networks of plants and pollinators. Chapter 1 describes how a small number of species plays a key role in structuring seasonally dynamic plant-pollinator communities and proposes to focus conservation efforts on such species. Results of a manipulative experiment conducted in the field presented in Chapter 4 reveal that the loss of a small number of generalised plants leads to declines in local pollinator abundance with knock-on effects on pollinator foraging and visitation of the remaining plants mediated by species traits. Chapter 5 shows that such species loss leads to systematic changes of the structure of plant-pollinator networks, shifts in species roles, and extensive rewiring of species interactions.

Two more chapters provide novel results concerning biology and conservation of bumblebees, which are among the most important pollinators. In Chapter 2, Paolo and his collaborators presented evidence for a negative effect of climate change on populations of a rare bumblebee living in the Alps and recommended possible conservation measures. Chapter 3 reports results of a field experiment with bumblebee colonies, which revealed that bumblebees appear unable to adjust their foraging behaviour in response to the reduction of the number of colony's workers, with potential implications for survival of bumblebee colonies in the face of adverse effects.

During the work on his PhD. Thesis, Paolo was able to combine observational field studies and field experiments manipulating entire plant-pollinator communities with more detailed studies targeting bumblebees. These projects generated complex datasets whose analyses required substantial computational and statistical skills, which Paolo acquired during his study at a very good level. He clearly demonstrated that he is capable of carrying out complex research projects with a high level of independence. Apart from that, he also showed a good collaborative spirit, which is evidenced also by his collaborations with a number of colleagues abroad. Apart from papers and manuscripts included in his PhD. Thesis, Paolo authored several additional papers. Overall, Paolo already published nine papers in journals with IF, a few more in other journals, and a few more are currently under review. These contain a healthy combination of first-authored papers and papers led by other collaborators. Paolo also regularly presented his findings at international conferences throughout his study and completed two stays in foreign labs. Paolo thus not only fulfilled, but clearly exceeded what is generally expected of PhD. students. We can thus unambiguously recommend his PhD. thesis for defence.

In České Budějovice, 5.11.2018


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Mgr. Štěpán Janeček, Ph.D.


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RNDr. Jan Klečka, Ph.D.