



BIOLOGY CENTRE CAS

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Supervisor's report: Thesis of Joel J. Brown

Joel's position was initially funded by NERC grant of Owen Lewis from University of Oxford and Owen also acted as Joel's co-supervisor. The idea was to use the planned sampling of *Drosophila* – parasitoid food webs in Australia for a study of insect associated microbiomes and see what role the microbes play in this food web. We knew very little about the study system then. The initial plan was to focus on endosymbionts, but we didn't find *Spiroplasma* in the Australian *Drosophila* and have therefore shifted the study towards the entire microbiome. We soon got a junior Czech Science Foundation grant that allowed the microbiome sequencing.

The next challenge came in Australia, when Joel had to pull out long-term experiment, described in Chapter 4, due to major cyclone warning and bunker down. Cyclone Debbie eventually hit a few hundred kilometers south of our sites and the research could continue. Joel came to Australia more than a month before I arrived and was super excited by everything there and thus became also my first guide to the luxury of fieldwork there.

Back in the Czech Republic, Joel showed he can lock-in very well on task and throw energy where is needed until there is a result. This approached showed when Joel was working on his review and getting it published (now Chapter 2), and when he didn't lose patience when insect metabarcoding kept failing, and helped Anna Jandová to make it eventually succeed.

For microbiome metabarcoding we teamed up with Eva Nováková from Department of Parasitology which showed as a great decision and the metabarcoding runs went very smoothly. Joel ended up collaborating more closely with Eva, went for field sampling of triatomines to the US and pushed one of the project in Eva's lab to publication (now Chapter 5). The thesis is a result of a number of collaborations which Joel helped to put together. Joel is very social and likes to discuss science. He especially thrives at conferences, where he played a big role in introducing our research.

All the personal qualities I have described show up in Joel's thesis. The second chapter brings microbiome analysis closer to ecological theory. The third and fourth chapters are rare examples of studying microbiome in the context of insect communities. Interestingly, elevational gradient seems to play little role in *Drosophila* microbiome. The thesis has clear implications for *Drosophila* microbiome research in the laboratory and in the field. Further, it shows the importance of host development for microbiome structure in triatomines.



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Overall, I think this is an excellent thesis integrating insect and microbe community ecology and I wish Joel all the very best for future career and life in general.

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Jan Hrček