Symbiont influence on mating and reproduction in *Oryzaephilus sp.*

Bachelor or Master of Science thesis

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Start: flexible starting from February 2020

The saw-toothed grain beetle *Oryzaephilus surinamensis* is associated with two endosymbiotic bacteria. Besides a Bacteroidetes bacterium that supplements chorismate derivatives (incl. tyrosine) that are important precursors for cuticle synthesis, it also carries *Wolbachia*. *Wolbachia* is a common bacterium of insects that is in many cases a reproductive manipulator (via male killing, cytoplasmatic incompatibility), but sometimes also a B-Vitamin supplementing mutualist.

Based on this background, both might be involved in alteration, either active or passive, of the beetle’s mating signaling and behavior as well as reproduction. We found in recent experiments evidence for both: females preferentially mate with symbiotic males and symbionts represent a cost in terms of the onset of the reproductive stage of females. However, both effects have to be tested in more detail.

Possible projects will make use of experimental manipulation of the symbioses, molecular tools to monitor symbiont status (DNA-extraction, quantitative PCR, Fluorescence in situ hybridization), behavioral experiments and analytical chemistry (gas chromatography – mass spectrometry).

The following planned projects are currently available, but additional possibilities can arise at any time or developed upon interest.

- Testing the symbiont influence on epicuticular chemicals and their importance for mating
- Replicating the reproductive cost of harboring symbionts in additional populations and species

Fluorescence in situ hybridization of *Wolbachia* (stained in green) and the Bacteroidetes symbiont (stained in red) in a sagittal section of a female *O. surinamensis* larva.