

Master Thesis opportunity at FiBL Switzerland 2018/2019

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| Title | Fitness assessment of distinct inbred strains of the Black Soldier Fly, <i>Hermetia illucens</i> , and their reciprocal crosses for evaluating genotype-phenotype correlations, the effect of maternal background and interbreeding compatibility |
| Problem definition | <p>For efficient and sustainable nutrient cycling from organic residues into insect protein for aquaculture and poultry feeding, more detailed knowledge on the potential for optimising Black Soldier Fly (BSF) breeding management and population genetic monitoring is urgently needed in order to make insect production more efficient.</p> <p>To date, no data exists on potentially detrimental impacts of genetic bottlenecks and inbreeding on economically relevant life history traits and fitness in BSF. Outcrossing is supposed to increase vitality, but could also be disadvantageous if comparatively huge genetic distances across BSF strains may cause genetic incompatibilities (pre- or post-zygotic). This study will help to make recommendations on optimising future breeding strategies for BSF larval protein production.</p> |
| Goal / Method | <p>Characterisation of distinctly differentiated BSF strains using nuclear and mitochondrial markers (PCR protocols established) based on the criteria of diagnostic allele patterns for microsatellites and representative to maximum possible distances for COI. Eventually establishment of experimentally bottlenecked iso-female lineages of different origins from all over the world.</p> <p>Assessment of several (inbred) strains and their reciprocal crosses on one or few feed substrates regarding relevant life history traits, e.g. egg hatching success, larval development time, growth performance over time and survival, pupal hatching and adult reproductive success (for parental, F₁ and eventually F₂-generations). Monitoring of allelic segregation in the F₂-generation.</p> |
| Preconditions | High motivation and no reservation to work with insects, fluent in English (or German), ability to work in a team, self-dependance, driver's licence, |

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| | Main supervisor from any international university (co-supervision by FiBL) |
| Contact | Dr. Christoph Sandrock E-mail: christoph.sandrock@fibl.org |
| Period | As of November 2018 (4-9 months) |
