



WG-1 Population structure, inbreeding management, and genetic diversity

Christoph Sandrock

christoph.sandrock@fibl.org

Challenges

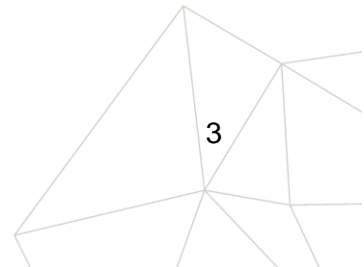
- Poorly understood population structure
- Insects are seldom “picked”-, fit- or bred-for-purpose
- No information on the effect of “domestication” or cultivation
- Diverse perspectives: Entomologists, Evolutionary biologists, Breeders, Producers... (harmonising knowledge base)
- Within-species genetic variation is a fundamental requirement for (natural + artificial) selection!

Understanding the (structuring of) genetic diversity within the target species is crucial for long-term success & genetic sustainability!



Research coordination objectives

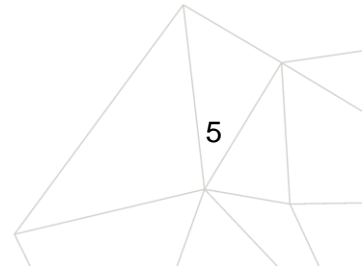
- Coordinate research efforts on suitable genotyping methods for core species
- Refine statistical & bioinformatics tools necessary to call variants & analyse genotypes
- Consolidate work on population structure & the impact of domestication events on wild-then-farmed insect populations



Deliverables

- Recommendation / white paper for genetic diversity management in farmed insects
- Review paper on population structure & domestication effects in farmed insects

- 104 applicants
- 3 online meetings (20-35 attendants)
 - 2 impulse talks
 - Global population genetic structure of the black soldier fly
 - Does early domestication of yellow mealworm affect life history traits QTLs?
 - Joint & break-out group discussions on WG1 topics/target-species/network:
 - Potentials & gaps, chances & constraints, possible solutions & prioritization...
 - Data/sample/protocol sharing (google-drive); genotyping task-force; dissemination activities...
- Working in smaller groups on dedicated manuscripts



- Working in smaller groups on two (invited) manuscripts
 - BugBook (technical review for *Journal of Insects as food & feed*)

conceptual approaches to genetic research, diversity management and selective breeding of insects farmed for food and feed
 - Molecular genetics, Evolutionary & population genetics; quantitative genetics; Functional genetics (incl. focus genetic diversity management)
- *Animal* board invited review (Position paper)

A genetics perspective on insect livestock - population structure in the context of evolution, domestication and selection
- Population structure, Evolutionary, ecological & farming relevant implications, signatures of domestication, relevance for selective breeding

- Outlook

- Strengthen interactions (platform for tools, protocols, sample opportunities...)
 - collaborative projects (connect ongoing & initiate new projects)
- Highlight industry perspectives/needs
- Genotyping task-force
- Nagoya (issues) task-force
- In-person meeting?

