

Microsporidia against Spotted Wing Drosophila?

Antagonistic potential of underestimated pathogens in biological control

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Microsporidia are obligate intracellular parasites infecting many organisms up to vertebrates. Mostly, infection starts by peroral ingestion of spores from the environment followed by invasion of host gut tissue where replication occurs. Then, the pathogen spread monotrophic or polytrophic, often leading to systemic host infections. Microsporidia infections often occur chronically with low mortality rates, but fertility and fecundity mostly decrease significantly. Retarded developmental time and reduced fitness of host individuals are also recognized regularly. For biological control, these characteristics can be advantageous if a pest insect has rapid reproduction time and plentiful offspring or when control of the pest is complicated by preference of hardly accessible habitats.

The spotted wing drosophila (SWD, *Drosophila suzukii* MATSUMURA) shows additional problems for effective biological control as oviposition and development of larvae and pupae occur inside ripe fruits causing massive crop losses.

Moreover, SWD is polyphageous and not all habitats, possible host fruits and overwintering strategies are known already. SWD samples obtained from USA showed microsporidian infections of unknown species, why we focused in introducing a microsporidia infection into our German breeding line of SWD.

Microsporidia were isolated from SWD and molecular markers based on SSU rDNA were amplified by PCR using universal primer pairs. Sanger sequencing of the PCR fragments suggested that the isolated microsporidium belonged to the genus *Tubulinosema*. With the molecular marker RpB1 (largest subunit of RNA polymerase II) a differentiation between closely related and genetically very similar species of one genus is possible, such as for *Nosema* and *Tubulinosema*. For further description of this species, tissue tropism and developmental stages are examined by light and electron microscopy. Infection experiments to evaluate median lethal concentration (LC50) as well as possible impacts on developmental times are ongoing.