

Invited lecture:

Time to fight agricultural pests: The olive fruit fly circadian clock in the context of SIT

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Hour: 1:00 p.m.

**Room: Institute of Parasitology,
Boardroom**

Lecture is organised in frame of MODBIOLIN project (FP7, GA 316304).

You're welcome!



Bactrocera oleae, the olive fruit fly, is a member of the Tephritidae family and the most important pest of cultivated olives causing extensive agricultural and economic damage. The Sterile Insect Technique (SIT) is a biological method to suppress reproduction in a wild pest population by a large-area release of an excess number of sterile insects of the same species (Knipling, 1955). Altered diurnal mating rhythms between mass-reared strains and insects in the wild have been one of the restricting factors of successful SIT applications in the past. In *Bactrocera*, the daily rhythm of mating activity is controlled by an endogenous circadian clock (Tychsen and Fletcher, 1971) and differences in mating time were shown to have a genetic basis (Smith, 1979).

Therefore, we aim to identify and characterize the olive fly circadian oscillator at genetic, anatomical and behavioral levels. We isolated major clock gene homologs based on their known *Drosophila* and *Bactrocera* counterparts, namely, *period* (*per*), *cycle* (*cyc*), *clock* (*clk*) and the circadian photoreceptor encoding *cryptochrome* (*cry*) and investigated their temporal mRNA expression profiles using real-time quantitative PCR (qPCR). This was followed by a comparative study between different olive fly strains. Furthermore, antibodies targeting different epitopes of *B. oleae* PER and CRY were tested along with antibodies detecting *Drosophila* clock (-associated) proteins on olive fly whole mount brains using immunohistochemistry. We also started to monitor locomotor activity rhythms, a robust and reliable output of the circadian clock, using a commercially available automated system. Regarding SIT, entrainment of mass-reared flies to the local environmental conditions prior to release (e.g., photoperiod and temperature) might improve their fitness and performance in the field..