

OR351*Fire ant viruses: host-parasite dynamics and transcriptomics of the infection***Fabio Manfredini**, DeWayne Shoemaker, Christina Grozinger

The fire ant *Solenopsis invicta* is an invasive pest at a global scale. In most recent invasive ranges such as South-East Asia and Australia, fire ant colonies are not affected by natural parasites, as predicted by the Enemy Release Hypothesis. Conversely, in less recent areas of expansion such as North America, fire ants are commonly infected by microsporidia and viruses. These parasites can have a negative impact on fire ant colonies, in particular after translocation from the field to the lab. In this study, we characterized the association between two RNA viruses (SINV-1 and SINV-2) and *S. invicta* founding queens at multiple levels, by examining the dynamics of the infection and correlating this with changes in the physiology and transcriptome of infected queens. We collected newly mated queens and we reared them in the lab for two months. The two viruses showed different patterns of infection, with SINV-1 infecting more queens than SINV-2 at time 0 while SINV-2 was detected more frequently after one and two months. SINV-2 infection was also associated with lower fertility in founding queens (fewer eggs produced) while SINV-1 infection had no visible effect on queens fitness. Finally, transcriptomic analysis with whole-genome microarrays on a subset of queens revealed that viral infection altered the expression of ~4000 genes, many of which related to reproductive functions and immune processes. Interestingly, infection by SINV-2 alone or co-infection by both viruses altered the expression of these genes more than infection by SINV-1, despite the fact that SINV-1 was more prevalent than SINV-2 as revealed by subsequent quantification of viral titres with QPCR. We conclude therefore that the two viruses follow different dynamics of infection: SINV-1 is more prevalent but less virulent than SINV-2, which may indicate a longer history of coevolution of SINV-1 with its fire ant host.