



Graduate School Event

Thesis Defense: Social immunity in a tri-partite host pathogen relationship

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Ants are frequently challenged by different pathogens, which they counter with individual and collective responses. Usually, the pathogens like fungi or viruses are solitary and passive pathogens transmitted from host to host. Here, we use a nemato bacterial pathogen complex to study worm-borne disease in black garden ants. These entomopathogenic nematodes are active parasites with an own behavior and chasing pray. In the first chapter, we investigated the basic biology of the host-pathogen relationship. We tested different ant life stages and found that adult ants are generally resistant to nematode infection, whereas brood is highly susceptible. In the case of worker pupae, we found a slight protective effect of the cocoon. When larvae are accompanied by adults, meaning a queen or a group of workers, survival is significantly enhanced. Moreover, we found that nematodes can transmit from infected cadavers to healthy worker larvae, confirming a transmissible disease in ants. Again, worker presence significantly reduces transmission risk. This can be attributed to behavioral responses of adults to nematode exposure. In the end, we were also able to disentangle the pathogen system and investigate the pathogenic effect of the bacterial and nematode components. In the second chapter, we studied the effect of multiple infections in adult queens and queen larvae. By multiple exposures in the mode of coinfection and superinfections, we wanted to assess the detrimental effect of combined fungal and nematode exposure to better understand how the pathogens interact with each other in an ant host. We found instances where combined exposure lead to higher mortality in a given time frame in both, adult queens and queen larvae. Overall entomopathogenic nematodes are a promising model to study worm infections in ants which extend our knowledge on collective disease defense.

Tuesday, May 27, 2025 02:00pm - 03:00pm

Moonstone Bldg / Ground floor / Seminar Room E (I24.EG.030e) and Zoom



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