

Project name
Invertebrate-parasite models for assessment of Ecotoxicology and Drug potency
Project description
<p><b>Ecotoxicology</b></p> <p>Pathogens and associated diseases are important regulators of host populations. In nature, pathogens often interact with pesticides, which may exacerbate disease pathology. The principal mechanisms behind these interactions remain unknown despite huge potential ramifications to ecosystem services, pest control and drug development.</p> <p>We experimentally investigate the outcome of and mechanisms behind host/pathogen/ chemical interactions in a flour beetle model exposed to the rat tapeworm (<i>Hymenolepis diminuta</i>) and a pathogenic fungus (<i>Beauveria bassiana</i>) and three common groups of pesticides.</p> <p><b>Drug potency</b></p> <p>Vertebrate testing of a pharmaceutical is an important requirement before it can be licenced for sale. However using invertebrate models for the initial screening of potential drugs presents several ethical and economic advantages.</p> <p>We assess the anthelmintic effects of well known drugs (e.g. praziquantel ) and less well known alternatives (e.g. bioactive plant products) on a flour beetle – rat tapeworm model. Our model allows us to study the effect of drugs on larval tapeworms removed from the host (in vitro) as well as the effect on parasites inside their beetle host.</p>
<div style="text-align: center;"> <p>The diagram illustrates the interactions between three entities: Host (a flour beetle), Chemical (a chemical structure), and Parasite (a rat tapeworm). Red arrows represent direct interactions: Host to Chemical, Host to Parasite, and Chemical to Parasite. Blue dashed arrows represent indirect interactions: Chemical to Host and Parasite to Host.</p> </div> <p>Direct interactions (red) and indirect interactions (blue) between a host organism, pathogens, and chemical stress.</p>
Participants
<p>Environmental Toxicology at the Department of Plant and Environmental Sciences, University of Copenhagen.</p> <p>The Veterinary Parasitology Group at the Department of Veterinary Disease Biology, University of Copenhagen.</p> <p>Evolutionary and Ecological Entomology at the University of Sheffield, UK.</p>
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