

Infectivity and virulence of two *Helicosporidium* spp. isolates in the mosquito, *Anopheles quadrimaculatus*

Helicosporidia are a group of algal entomopathogens with a wide host range including at least 24 mosquito species. We examined the effectiveness of two helicosporidial isolates (weevil and blackfly) against mosquito larvae under various conditions. Of the three mosquito species tested, *Anopheles quadrimaculatus* was the most susceptible. When comparing the two isolates, we found no significant difference in the mortality or infection rate of *An. quadrimaculatus* larvae. The weevil isolate, however, consistently produced cyst melanization in the infected larvae, with and without corresponding cyst development in the haemocoel. The blackfly isolate rarely produced melanization of cysts, and melanization was always accompanied by cyst development in the haemocoel. The use of cryoprotectant when storing weevil isolate cyst suspensions at -70°C decreased the mortality of *An. quadrimaculatus*. Both isolates retained infectivity through refrigeration and freezing. The use of well water as opposed to deionized water for rearing the mosquito larvae did not have a significant effect on the mortality or infection rate. Mortality and infection rate increased with increasing initial dose of helicosporidia with both isolates. A field study conducted by introducing blackfly isolate to a concrete pool filled with mosquitoes and other non-target organisms produced no infection in any of these organisms. Infection was not transmitted to predatory *Toxorhynchites rutilus* larvae feeding directly on infected *An. quadrimaculatus*. Preliminary histological work indicates that helicosporidia enter the haemocoel through the mosquito midgut, and that, in the final stages of infection, the larval haemocoel becomes filled with cysts and vegetative stages.