Progress Report STP 2012-229 (FY 2015-2016)

The role of *Toxoplasma gondii* in declining populations of the woylie (*Bettongia penicillata ogilbyi*)

Animal Science

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Progress Report

The aim of this study is to increase understanding of the role of the protozoan parasite *Toxoplasma gondii* in wild woylie populations, particularly with regard to the recent population declines. *T. gondii* can infect virtually any warm-blooded vertebrate, and has a worldwide distribution. In asymptomatic laboratory and wild rodents, *T. gondii* is reported to cause changes in behaviour that may make infected hosts more susceptible to predation. If *T. gondii* alters the behaviour of woylies, this could predispose infected individuals to predation and increase mortality rates, thus contributing towards the decline of woylie populations. Serum samples collected by Department of Parks and Wildlife staff between 2008-2010 have been analysed to determine *T. gondii* infection status based on presence or absence of antibodies. Testing of these samples revealed a very low sero-prevalence (~5%) of *T. gondii* antibodies in woylies, which is in agreement with work by previous students. Due to this low sero-prevalence, it has been difficult to investigate whether *T. gondii* affects woylie behaviour. This outcome will be ongoing and is likely to be descriptive rather than statistical. Testing of longitudinal serum samples in the current project has revealed that sero-diagnosis is complicated, and false negatives may be common. This has important implications for wildlife disease monitoring that relies on serology. In conjunction with the woylie project, we have also investigated mouse behaviour in response to experimental *T. gondii* infection; particularly behaviours related to activity level, anxiety behaviour and cat urine avoidance behaviour. In contrast to many other studies, we found limited evidence for *T. gondii*-induced behavioural changes in mice. Three posters and one oral presentation have been presented on this work at conferences. Two scientific journal articles concerning the effect of *T. gondii* on rodent host behaviour have been published so far.