

Thesis Abstract: The Ecology of a Host-Parasite Relationship: Haemogregarines & the Eastern Water Skink, *Eulamprus quoyii*.

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The study of wildlife disease has gained importance in the last two decades as a result of theoretical insights into its possible roles in host evolution, population biology and ecology. However, knowledge of how hosts and parasites interact in natural systems remains limited, and there is a critical need for further research. Therefore, this thesis examines the ecology and interactions between wild populations of hosts, the eastern water skink, *Eulamprus quoyii*, and a parasite, the haemogregarine protozoan *Hepatozoon hinuliae*.

I carried out a two-year mark-recapture study of eastern water skinks at Blackdown Tableland, Queensland, Australia, and analysed blood slides to measure haemogregarine blood parasite infection. Prevalence (the proportion of the host population infected) increased with host age, did not differ between the sexes, and varied little during the two-year study. Parasite load (the intensity of infection within individuals) was significantly higher in males than in females, and is highly correlated in individuals over time.

Eastern water skinks are viviparous, and therefore reproductive output can be accurately measured by housing pregnant females in captivity shortly before they give birth. High haemogregarine loads reduced female water skink fecundity, by approximately one offspring per litter, compared to females with low parasite loads. Body condition and fat reserves were not responsible for this reduced fecundity. There

was no effect of maternal haemogregarine parasite load on offspring size/number trade-offs, or on the performance of offspring measured by growth rates, sprint speed or competitive ability.

Using microsatellite markers, I carried out a preliminary investigation of the effect of blood parasites on female mating strategy. Fifty per cent of analysed litters showed evidence of multiple sires, but the propensity to multiple mating was unaffected by female haemogregarine parasite load.

Because *Eulamprus quoyii* occupies a large geographical range spanning the Australian tropical and temperate zones, I investigated whether patterns of parasite abundance are affected by climate. Parasite load, but not prevalence, is related to temperature, but is independent of rainfall.

In conclusion, I argue that haemogregarine blood parasites affect the life-history of their natural host, the eastern water skink, and that continued study of the Blackdown Tableland population should offer further insights into the evolutionary ecology of a wild host-parasite relationship.

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