

**Gastro-intestinal parasites of red foxes
(*Vulpes vulpes*) and feral cats (*Felis catus*)
in southwest Western Australia**

This thesis is presented for the Honours degree in Biomedical Science at
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Declaration

I declare that this thesis is my own account of my research and contains at its main content, work which has not been previously submitted for a degree at any tertiary educational institution.

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Abstract

Red foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) are present throughout a wide range of habitats and landscapes across much of Australia. In addition to the competition and predatory impacts of these two pest species, red foxes and feral cats harbour a wide range of parasites, many of which may have important conservation, agricultural and zoonotic repercussions. This project investigated the occurrence of helminth parasites from the intestines of 147 red foxes and 47 feral cats collected from 14 and 11 locations respectively, throughout southwest Western Australia.

Helminth parasites were detected in 58% of foxes and 81% of cats. Helminth species identified from red foxes were: *Dipylidium caninum* (27.7% of individual foxes examined), *Uncinaria stenocephala* (18.2%), *Toxocara canis* (14.9%), *Spirometra erinaceieuropaei* (5.4%), *Toxascaris leonina* (4.7%), *Taenia spp.* (4.1%), *Taenia serialis* (1.4%), *Taenia hydatigena* (0.7%), *Brachylaima cribbi* (0.7%), *Plagiorchis maculosus* (0.7%) and an Acanthocephalan identified to family Centrorhynchidae (2.1%). Helminth species identified from feral cats were: *Taenia taeniaeformis* (39.1% of individual cats examined), *Toxocara cati* (34.8%), *Spirometra erinaceieuropaei* (19.6%), *Oncicola pomatostomi* (15.2%), *Toxascaris leonina* (6.5%), *Dipylidium caninum* (6.5%), *Ancylostoma spp* (2.2%) and the Acanthocephalan Centrorhynchidae (2.2%).

Infracommunity richness varied from 1-3 and 1-4 species per host in red foxes and feral cats respectively. Average parasite burdens varied from 1-39 worms

across all helminth species. Several environmental factors were significantly related to the presence of some parasites in red foxes. For red foxes, the percentage remnant vegetation cover at each sampling location was significantly positively correlated with the presence of *T. canis* and *U. stenocephala* ($p < 0.001$). Average relative humidity was significantly positively correlated with the presence of *S. erinaceieuropaei* ($p < 0.001$), *T. leonina* ($p < 0.01$) and *U. stenocephala* ($p < 0.01$). Five year average minimum temperature had an effect on *S. erinaceieuropaei* and *U. stenocephala* ($p < 0.001$). For feral cats, a significant positive correlation was detected between the presence of *T. cati* and five year annual rainfall ($p < 0.001$) as well as individual head/body length and *T. taeniaeformis* ($p < 0.001$).

Helminth species associations were detected between *U. stenocephala* and *D. caninum*, *S. erinaceieuropaei*, *T. canis* and *T. leonina* in red foxes. A significant association was also detected between *S. erinaceieuropaei* and *T. leonina* in red foxes. In feral cats helminth species associations were detected between *T. taeniaeformis* and *O. pomatostomi* as well as between *T. taeniaeformis* and *T. cati*. The only parasite that was positively correlated with body condition (assessed by body mass) was *S. erinaceieuropaei* in foxes. The species richness within a host was not observed to affect body condition in either foxes or cats.

In conclusion, red foxes and feral cats in southwest Western Australia harbour a wide range of helminth parasites, which are of veterinary significance for wildlife and livestock. Control of red foxes and feral cats in this region may

therefore provide an important mechanism of control of these parasites.
Importantly, *Echinococcus granulosus*, a parasite of major zoonotic concern,
was not recorded in this study.

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