Parasites of the African painted dog (*Lycaon pictus*) in captive and wild populations: Implications for conservation

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

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Abstract

The African painted dog (*Lycaon pictus*) is a highly endangered carnivore of sub-Saharan Africa, which in the last century has suffered a population decline of almost 99%. With only 3,000-5,500 animals remaining in the wild it is imperative to understand all threatening processes to which these animals may be exposed. The impact that parasites and other infectious agents have on wildlife has been increasingly recognized within conservation programs. Stressors such as human encroachment and habitat destruction are altering the incidence and effect that these pathogens have on wildlife populations, especially those endangered and under stress.

A parasitological study was conducted on captive and wild populations of the African painted dog over a three year period. Collaborations with three captive animal facilities and three *in situ* conservation groups within Africa allowed for a broad sample base from which variation in parasite prevalence and diversity could be identified. A combination of traditional microscopy techniques and molecular characterisation of parasite species were employed to obtain comprehensive data on the prevalence and diversity of gastrointestinal parasites observed in faecal samples collected from painted dogs.

Parasite prevalence within wild populations was 99% with a similar parasite community composition observed among all three wild populations. Five of the seven parasite genera observed in this study have not been reported before in this host. Additionally, molecular characterisations identified the potentially zoonotic species *Giardia duodenalis, Ancylostoma braziliense* and an ambiguous species of taeniid, all of which have also not been previously reported in this host.

The prevalence of parasites within captive populations was 15% with *Giardia duodenalis* being the dominant of the only two parasite species observed. The overall lack of prevalence and diversity of parasites observed in captive populations could be of significance for facilities involved in reintroduction programs. Particularly as immunologically naïve captive animals may be unable to cope with exposure to a 'natural' parasite load in the wild environment, leading to an ultimate decrease in reintroduction success.

Gastrointestinal parasites detected in faecal samples from wild and captive populations of the African painted dog during this study

	Wild	**Captive**
Parasite Taxon observed	Taeniid *Ancylostoma* *Spirometra* *Giardia* Coccidia *Sarcocystis* *Filaroides*	*Giardia* *Spirometra*

This study has obtained detailed baseline data of parasitism within populations of the African painted dog in captive and wild environments. The large proportion of new discoveries in this study demonstrates the paucity of information currently available on parasitism within this host species. It is hoped this information will assist in conservation efforts by a) recognising the challenges of parasite control in captive populations, particularly those involved in reintroduction and/or translocation programs, and b) being able to identify deviations from baseline parasite levels in wild populations which could be indications for emerging exotic and/or zoonotic disease.

Publications

Refereed journal articles:

Ash, A., Lymbery, A., Lemon, J., Vitali, S., Thompson, R.C.A. (2010). Molecular epidemiology of *Giardia duodenalis* in an endangered carnivore – the African painted dog. Veterinary Parasitology, 174, 206-212.

Conferences

Ash, A., Lymbery, A., Lemon, J., Thompson, R.C.A. (2010). Significance of parasitism in an endangered carnivore - the African painted dog. Conference Proceedings: XX11 International Congress of Parasitology, Melbourne, Australia. (Abstract)

Ash, A., Lymbery, A., Lemon, J., Vitali, S., Thompson, R.C.A. (2009). *Giardia duodenalis* isolates from captive and wild populations of the African painted dog (*Lycaon pictus).* Conference Proceedings: ASP & ARC/NHMRC Research Network for Parasitology Annual Conference. Sydney, Australia, pp 54. (Abstract)

Ash, A., Lymbery, A., Lemon, J., Thompson, R.C.A. (2009). Parasites of the African Painted dog (*Lycaon pictus)* in wild and captive populations: potential conservation impacts. Conference Proceedings: 22nd Conference of the World Association for the Advancement of Veterinary Parasitology (WAAVP), Calgary Canada, pp 86. (Abstract)

Ash, A., Lymbery, A., Lemon, J., Thompson, R.C.A. (2008) Parasites of the African painted dog (*Lycaon pictus*) in wild and captive populations: potential conservation

impacts. Conference Proceedings: 21st Australasian Wildlife Management Society Conference. Fremantle, Australia, pp 44. (Abstract)

Ash, A., Lymbery, A., Lemon, J., Thompson, R.C.A. (2007). Parasites of the African painted dog (*Lycaon pictus)* in wild and captive populations: potential conservation impacts. Conference Proceedings: ASP & ARC/NHMRC Research Network for Parasitology Annual Conference. Canberra, Australia, pp 95. (Abstract)

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