

Variation of parasite burden within the European badger (*Meles meles*): the effect of season, habitat, body condition, gender & age on the prevalence of *Eimeria melis* and *Capillaria*

Submitted by Elizabeth Rosemarie Anne Cottrell to the University of Exeter as a thesis for the degree of Master of Science by Research in Biosciences in October 2011

This thesis is available for library use on the understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

I certify that all material in this thesis which is not my own work has been identified and that no material has been previously submitted and approved for the award of a degree by this or any other University.

Signature.....

Table of Contents

Research Project – <i>Variation of parasite burden within the European badger (Meles meles): the effect of season, habitat, body condition, gender & age on the prevalence of Eimeria melis and Capillaria</i>	1
Introduction	2
Materials and Methods	7
Results	10
Discussion	12
Acknowledgements	18
References	19
Certificate of Trapping and Vaccination Training	23
Literature Review – <i>Managing Wildlife Disease</i>	24
Introduction	24
Why Manage Disease?	25
Methods of Disease Management	26
Conclusion	35
References	36

Variation of parasite burden within the European badger (*Meles meles*): the effect of season, habitat, body condition, gender & age on the prevalence of *Eimeria melis* and *Capillaria*

E. R. A. Cottrell^{1,2}

¹Food and Environment Research Agency, Woodchester Park, Tinkley Lane, Nympsfield, Gloucestershire, GL10 3UJ; and ²Centre for Ecology and Conservation, University of Exeter Cornwall Campus, Tremough, Treliever Road, Penryn, Cornwall, TR10 9EZ.

Summary

1. Parasites, although naturally occurring can have severe impacts on both an individual host and on the wider population and ecosystem.
2. This study^{1,2} investigates the relationship of parasite burden within the European badger (N=175) with several life history characteristics such as age, condition, gender and co-infection of bovine tuberculosis and with the environmental factors of habitat and season.
3. Using two general linear mixed models results showed significant positive relationships between *Eimeria melis* burden and age and gender, and between *Capillaria spp.*, age and month of sampling. A significant negative correlation was also observed between *Capillaria spp.* and badger body condition index. No significant results were found for habitat type or in the further GLMM's (N=124) run to investigate co-infection of bovine tuberculosis.
4. The opportunity to investigate complex parasite interactions in a wild population of known individuals is rare and a valuable opportunity. Parasite burdens in *Meles meles* were found to be extremely variable with some exhibiting very high faecal egg/oocyst output. Results suggest that such burdens of gastro-intestinal parasites do have a relationship with life history characteristics and condition and therefore should be taken into account when wildlife disease management protocols or ecological studies are carried out.

Key-words: badger, coccidia, *Capillaria*, helminth, *Eimeria melis*, *Meles meles*, nematode, parasite.

