

Prevalence of intestinal protists among captive animals in wildlife parks across Kent.

Emma L. Betts¹, Eleni Gentekaki², Angus I. Carpenter³, Adrian Harland⁴, Anastasios D. Tsaousis¹

1. *Laboratory of Molecular and Evolutionary Parasitology, RAPID group, School of Biosciences, University of Kent, Canterbury, Kent, UK*

2. *School of Science, Mae Fah Luang University, Chiang Rai, Thailand*

3. *Wildwood Trust, Herne Common, Herne Bay, Kent, UK*

4. *Howletts Wild Animal Trust, Canterbury, Kent, UK*

Microbial eukaryotes (protists) are part of the gastro-intestinal tract microbiome of both humans and animals and are mostly considered harmless. Nonetheless, some, including *Giardia* and *Cryptosporidium* are known to cause gastro-intestinal illness in humans. Yet the pathogenicity of most gut protists in humans and animals alike is disputed since many are present without causing any symptoms. The aim of this study is to investigate the distribution and prevalence of selected protists all of which present health concerns in animals and humans. A total of 144 faecal samples were collected from 33 vertebrate species across two wildlife parks in Kent. A combination of cell culturing techniques, microscopy and molecular biology was used to positively identify protists including

Blastocystis, *Cryptosporidium*, *Eimeria*, *Entamoeba*, *Giardia*, *Isospora* and *Toxoplasma*. Sixty six percent of faecal samples were positive for at least one protist, with *Blastocystis* being the most commonly occurring (59%) one. Twenty three percent of faecal samples were positive for two or more different protist species. Interestingly, we identified novel hosts for some *Blastocystis* subtypes, which were considered to have narrower animal host specificity (e.g. ST 4 in Eurasian Elk). In addition, we identified *Giardia Assemblage B* – an assemblage associated with human infection, in wild water voles brought into captivity.

This study provides the first thorough investigation on the prevalence of microbial eukaryotes in wildlife parks in the UK and can be used as a platform for further examining the frequency and distribution of eukaryotic gut microbes in various animals, both in captivity and in the wild.