Annals of Parasitology 2023, 69, Supplement 1, s21

X[th] International Workshop on Cestode Systematics and Phylogeny, 4–10 August 2023, Warsaw, Poland

The hidden diversity of cyclophyllidean cestodes in wild African carnivores

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Cyclophyllidea are the largest mammal cestode order, encompassing more than 3000 known species and the majority still waiting to be described (Caira *et al*., 2017). With molecular methods such as gene sequencing facilitating the classification and discovery of species, it has become apparent that the true biodiversity of tapeworms exceeds what can be observed morphologically. Little is known about cestodes in wild mammals of sub-Saharan Africa, partly because the acquisition of samples from wildlife hosts is restricted.

The present study analysed cestode samples (eggs, adults) that were opportunistically collected from 75 individual definitive hosts, belonging to 16 different species of wild African carnivores. A total of 38 distinct cyclophyllidean cestode species were found and could be assigned to the seven genera *Taenia*, *Hydatigera*, *Echinococcus*, *Dipylidium*, *Joyeuxiella*, *Pseudandrya* and *Mesocestoides*, based on molecular and morphological data. Only 11 of the 38 species (~29%) could be identified by comparison with previously published sequence data (*nad1*, *cox1*, *cob*, *12S-rRNA*, *18S-rRNA*). Among the genetically unknown species are a total of 18 taeniid tapeworm lineages that are currently being examined.

The phylogenetic analyses of the non-taeniid cestodes revealed an interesting result in relation to *Joyeuxiella* and raise the question of a re-evaluation of this genus.

As the opportunistically collected cestode material is often of insufficient quality, morphological descriptions and comparisons with reference material are challenging. Nevertheless, this study – although small in sample size – demonstrates a high diversity of African mammal cestodes and highlights hat a large proportion of species are still waiting to be discovered. Further studies will provide new insights and material to connect molecular and morphological data for a better understanding of tapeworm diversity.