



Sequence-based genotyping clarifies conflicting historical morphometric and biological data for 5 *Eimeria* species infecting turkeys

S. El-Sherry^{1,2}, M. E. Ogedengbe¹, M. A. Hafeez¹, M. Sayf-Al-Din², N. Gad² and J. R. Barta^{1,*}

Abstract:

Unlike with *Eimeria* species infecting chickens, specific identification and nomenclature of *Eimeria* species infecting turkeys is complicated, and in the absence of molecular data, imprecise. In an attempt to reconcile contradictory data reported on oocyst morphometrics and biological descriptions of various *Eimeria* species infecting turkey, we established single oocyst derived lines of 5 important *Eimeria* species infecting turkeys, *Eimeria meleagridis* (USMN0801 strain), *Eimeria adenoides* (Guelph strain), *Eimeria gallopavonis* (Weybridge strain), *Eimeria meleagridis* (USAR9701 strain), and *Eimeria dispersa* (Briston strain). Short portions (514 bp) of mitochondrial cytochrome c oxidase subunit I gene (mt COI) from each were amplified and sequenced. Comparison of these sequences showed sufficient species-specific sequence variation to recommend these short mt COI sequences as species-specific markers. Uniformity of oocyst features (dimensions and oocyst structure) of each pure line was observed. Additional morphological features of the oocysts of these species are described as useful for the microscopic differentiation of these *Eimeria* species. Combined molecular and morphometric data on these single species lines compared with the original species descriptions and more recent data have helped to clarify some confusing, and sometimes conflicting, features associated with these *Eimeria* spp. For example, these new data suggest that the KCH and KR strains of *E. adenoides* reported previously represent 2 distinct species, *E. adenoides* and *E. meleagridis*, respectively. Likewise, analysis of the Weybridge strain of *E. adenoides*, which has long been used as a reference strain in various studies conducted on the pathogenicity of *E. adenoides*, indicates that this coccidium is actually a strain of *E. gallopavonis*. We highly recommend mt COI sequence-based genotyping be incorporated into all studies using *Eimeria* spp. of turkeys to confirm species identifications and so that any resulting data can be associated correctly with a single named *Eimeria* species.

Keywords:

coccidiosis oocyst mitochondrial cytochrome c oxidase subunit I turkey *Eimeria* morphometrics

Published In:

Poultry Science , , peu007