

New data on octosporous microsporidia parasitizing gammarids (Crustacea: Amphipoda)

Piotr Wróblewski¹, Mykola Ovcharenko^{2,1}, Karolina Bącela-Spychalska³

¹Witold Stefański Institute of Parasitology, Polish Academy of Sciences, Twarda 51/55, 00-818 Warsaw, Poland

²Institute of Biology and Environmental Protection, Pomeranian University, Arciszewskiego 22b, 76-200 Słupsk, Poland

³Department of Invertebrate Zoology and Hydrobiology, University of Łódź, Banacha 12/16, 90-237 Łódź, Poland

Corresponding Author: Piotr Wróblewski; e-mail: piotrekw@twarda.pan.pl

Infection of the amphipod hosts by an octosporous microsporidian pathogen was described more than 100 years ago. The majority of microsporidia, described from amphipods in 20th Century, have been assigned to the genus *Thelohania* based on octosporous sporogony. After revision of octosporous microsporidia by Hazard and Oldacre (1975) no species, infecting amphipods, were determined belonging to *Thelohania*, but all 7 named and 4 unnamed species, described from these hosts, were still retained in this genus. A group of eight SSU rDNA sequences provisionally designated as a new genus *Dictyocoela*, was created by Terry et al. (2004). Recently 125 DNA and RNA sequences of *Dictyocoela* belonging to Microsporidia were registered in GenBank. Seven named species were noted as *Dictyocoela* parasites. All species were proposed based solely upon molecular data, but the validity of the genus has not yet been confirmed by morphological and ultrastructural characteristics. Representatives of three species – *D. muelleri*, *D. duebenum*, and *D. berillonum* were studied based on microscopical, ultrastructural, and molecular data. The study was carried out on original material, collected in Poland, Ukraine, Belarus, Germany, and the Netherlands within 2006–2011. Obtained data confirm many parallels between ultrastructure of *Thelohania* belonging species infecting gammarids and *Dictyocoela*. An isofilar polar filament, bipartite lamellar polaroplast and three-layered exospore confirm their ultrastructural identity. Parasites infect primary the muscle tissues but are never found in the digestive system (intestinal wall, hepatopancreas). Phylogenetic analysis based on 16S rDNA sequences places all studied species outside the morphologically related genus *Thelohania*. The obtained complete data verified the validation of the clade *Dictyocoela* as valid genus based on monomorphic life cycle with octosporoblastic sporogony. Sporogony of all inspected *Dictyocoela* species underwent plasmotomy of tetranucleate plasmodium and binary division of each on four early sporoblasts inside sporophorous vesicle, contrary series of three binary divisions observed in *Thelohania* spp.