

# SCIENTIFIC PROGRAM

## WORKING GROUPS

To date, following working groups have been created:

### 1. ULTRASTRUCTURE

#### COORDINATORS

David Bruce Conn, School of Mathematical and Natural Sciences, Berry College, Mount Berry, GA, USA ([bconn@berry.edu](mailto:bconn@berry.edu))

Zdzisław Piotr Świdorski, W. Stefanski Institute of Parasitology, Polish Academy of Sciences, Warsaw, Poland ([z.swider@twarda.pan.pl](mailto:z.swider@twarda.pan.pl))

#### ANNOTATION TO WORKING GROUP

Ultrastructural studies often provide the most accurate information available related to function of cestode systems, because they are based on cellular and subcellular aspects of functional morphology. Ultrastructural studies can also provide insight into phylogenetic relationships among cestode taxa, by careful analysis of and discrimination among plesiomorphic versus apomorphic structures and systems. When combined with other microscopical methodologies, such as histochemistry, cytochemistry, and morphometric analysis, ultrastructural data can complement molecular data to help resolve critical phylogenetic questions, and can complement ecological data (including life cycles) to help elucidate patterns of cestode diversification. Our current knowledge of cestode ultrastructure varies widely from characters that have been studied extensively (e.g., spermatozoa), to characters that have scarcely been studied (e.g., asexually generative tissues). This working group will seek to develop consensus regarding the actual current state of our knowledge of cestode ultrastructure, the best ultrastructural characters for yielding future insight into phylogeny, appropriate standardization of terminology based on current knowledge, and the most appropriate approaches and methodologies for continuing work.

#### NOTES FOR ACTIVE PARTICIPANTS

These overlapping sessions will be primarily open for roundtable discussion, but contributed presentations to focus each discussion topic (see below) will also be welcomed. Such talks may be formal or informal, but should be limited to 7-10 minutes. To propose presenting such a talk, please contact Bruce or Piotr. All participants are urged to bring micrographs, reprints, and/or other materials that might facilitate discussion of specific topics.

#### SESSIONS AND SPECIFIC TOPICS FOR DISCUSSIONS

Session 1. Cestode ultrastructure - overview and status of knowledge. Where do we currently stand on ultrastructure as a source of characters for phylogenetic analysis?

Session 2. Cestode ultrastructure - prognosis and outline development. Which characters show the greatest promise? Which areas require further work, greater consensus, or standardization of terminology?

Session 3. Cestode ultrastructure - building consensus and standardization. Progressive development of consensus or standardization on selected characters.

Session 4. Cestode ultrastructure - collaborating and communicating. Further progress toward standardization. In what ways is broad collaboration among experts positive or negative? Are there ways we can enhance and expedite communication?

Session outcomes. Cestode ultrastructure - Report on results, points of consensus, and recommendations for future priorities.

## **2. CESTODE RECIPES: LABORATORY TECHNIQUES FOR THE STUDY OF CESTODES**

COORDINATOR

Florian B. Reyda, Department of Ecology and Evolutionary Biology, University of Connecticut, Storrs, USA ([florian.reyda@uconn.edu](mailto:florian.reyda@uconn.edu))

ANNOTATION TO WORKING GROUP:

Participants in the Fourth and Fifth International Cestode Workshops expressed interest in developing a book on the laboratory techniques for cestode study. The book would be generated from individual contributions from cestode experts on a variety of laboratory techniques useful in the study of cestodes. The goal behind this is to assemble into one source the variety of methods and techniques that are utilized by researchers in the cestode community.

At Cestode Workshop VI, the participants in this working group will have the opportunity to review the various submissions that will have been made by cestode experts by the time of the meeting.

This working group will meet for 2 sessions. In the first session, we will review each of the submissions. In the second session we will discuss the assembly of these submissions into a book. Participants in these sessions will have input on the final format of the book.

NOTES FOR ACTIVE PARTICIPANTS: Will be supplemented later

The key to this session is to have a large number of contributions from individual cestode experts in hand BEFORE Workshop VI takes place. Each participant in the workshop will receive a letter requesting their contributions in January, 2008.

### 3. LIFE CYCLES

#### COORDINATORS

Tim D. J. Littlewood, The Natural History Museum, London, UK  
([t.littlewood@nhm.ac.uk](mailto:t.littlewood@nhm.ac.uk))

Boyko B. Georgiev, Parasite Biodiversity Group, Central Laboratory of General Ecology, Bulgarian Academy of Sciences, Sofia, Bulgaria ([bbg@ecolab.bas.bg](mailto:bbg@ecolab.bas.bg))

#### ANNOTATION TO WORKING GROUP

Life cycle studies of tapeworm have been a central means of determining the interaction of the parasites with their surroundings. Life cycles provide knowledge of ecology, ontogeny, host-parasite interactions and host specificity. Comparing life cycles provides a means of revealing past evolutionary events, and (arguably) the opportunity to target and reveal cryptic biodiversity of cestode infections in hitherto unsampled hosts and biomes. Modern molecular methods offer the opportunity of completing life cycle by providing diagnostic markers that link larval forms that are difficult or impossible to classify by morphology alone, with adults. Here we investigate what is known about cestode life cycles and the tools, which we can add to, and share this knowledge.

#### NOTES FOR ACTIVE PARTICIPANTS

Open session can include additional contributions from speakers either in a formal or informal setting, but are intended to focus on specific topics (see below) for discussions. Anyone wishing to contribute a talk ( $\leq 10$  mins), please contact Tim or Boyko.

#### SESSIONS AND SPECIFIC TOPICS FOR DISCUSSIONS:

##### Session 1. Cestode life cycles - overview

The advantages, ethics and likelihood of experimentally deriving additional life cycles.

##### Session 2. Cestode life cycles - a dedicated database

Enhancing the CLC database: additions, corrections and cooperation.

Session 3. Cestode life cycles - the evolution of life cycles  
Priorities for additional resolution/testing.

Session 4. Cestode life cycles - molecular methods  
Agreeing to a set of tools for molecular diagnostics.

#### 4. DATABASE UPDATE

Data on cestodes of two freely accessible electronic databases, Fauna Europaea ([www.faunaeur.org](http://www.faunaeur.org)) and Global Cestode Database ([www.cestodedatabase.org](http://www.cestodedatabase.org)) will be updated.

##### COORDINATORS (FAUNA EUROPAEA)

Rodney A. Bray, The Natural History Museum, London, UK  
([rod.bray@adslmaster.com](mailto:rod.bray@adslmaster.com))

Yde de Jong, University of Amsterdam, Amsterdam, The Netherlands  
([yjong@uva.nl](mailto:yjong@uva.nl))

Vladimíra Hanzelová, Parasitological Institute, Slovak Academy of Sciences,  
Košice, Slovakia ([hanzel@saske.sk](mailto:hanzel@saske.sk))

##### ANNOTATION TO WORKING GROUP

Fauna Europaea ([www.faunaeuropaea.org](http://www.faunaeuropaea.org)) represents a database of scientific names and distribution of all living multicellular European land and fresh-water animals including *cestodes* and at present, is accessible to everyone. The database was finished in 2001, however, the update of the cestode part of this database and identification of existing gaps are necessary to be done. The updating will be carried out in a co-operation with Dr. Yde de Jong from the University of Amsterdam who coordinates this database project.

##### NOTES FOR ACTIVE PARTICIPANTS

Participants of the workshop (not only partakers from Europe) are kindly asked to verify scientific names and classification of a cestode group of their interest. In a case of any incorrectness, please, make notes or carry relevant reprints with in June. FaEu database will be opened during the workshop and everyone will get a possibility to supplement most recent data or make corrections if necessary.

##### COORDINATOR (GLOBAL CESTODE DATABASE)

Janine N. Caira, Department of Ecology and Evolutionary Biology, University of Connecticut, Storrs, USA ([janine.caira@uconn.edu](mailto:janine.caira@uconn.edu))

#### ANNOTATION TO WORKING GROUP:

Progress to date on the entry of taxonomic names and literature will be summarized. We are developing a plan to migrate the Global Cestode database from its existing configuration as multiple FileMaker Pro databases (one for each order and cyclophyllidean family) to a single MySQL database. This will allow much easier access and tracking of database elements. The plan is to make it possible to directly enter data and upload PDFs from any site in the world that has internet access. At this point one of the most critical aspects of the project is the verification of the data that has already been entered into the database.

NOTES FOR ACTIVE PARTICIPANTS: Will be supplemented later

## 5. MICROSCOPIC DEMONSTRATIONS

Two cestode groups, Proteocephalidea and the other one not yet selected group, were selected for microscopic demonstrations:

#### COORDINATORS (PROTEOCEPHALIDEA)

Tomáš Scholz, Institute of Parasitology, Biology Centre of the Czech Academy of Sciences, České Budějovice, Czech Republic ([tscholz@paru.cas.cz](mailto:tscholz@paru.cas.cz))

Alain de Chambrier, The Natural History Museum, Geneva, Switzerland ([alain.dechambrier@ville-ge.ch](mailto:alain.dechambrier@ville-ge.ch))

#### ANNOTATION TO WORKING GROUP

The order Proteocephalidea includes almost 400 species parasitic predominantly in freshwater fish, but with a number of taxa described from reptiles and amphibians, and one species found in a mammal. Life cycles of proteocephalideans probably always include cyclopid copepods as intermediate hosts, but it is uncertain whether another host, mainly prey fish, may be involved in the life cycles of some taxa. Members of the order typically possess four muscular suckers on the scolex, which may also have an additional apical structure of different appearance, including a rostellum-like organ armed with hooklets, thus resembling the rostellum of cyclophyllideans. However, a close relationship of proteocephalideans with "tetraphyllidean" cestodes, especially with *Acanthobothrium* (Oncobothriidae), is now unquestionable. Molecular data also suggest that the existing classification of the order, based on the position of internal longitudinal musculature to the genital organs and the presence/absence of a metascolex, may be artificial, because most major taxa, including subfamilies and the most abundant genera, such as *Proteocephalus* and

*Ophiotaenia*, appear to be artificial assemblages of unrelated taxa. During the workshop **microscopical slides** of selected representatives of the order will be presented, with focus on species from different host groups and geographical regions. In addition, examples of a variety of morphological structures typical of the Proteocephalidea will also be demonstrated, with the emphasis given to the morphology of the scolex, its apical structures, and different topology of genital organs.

NOTES FOR ACTIVE PARTICIPANTS

Participants, which are interested in the topic, are welcome to present their own slides.

COORDINATORS (not yet selected group)

Vasyl V. Tkach, University of North Dakota, Department of Biology, Grand Forks, USA ([vasyl.tkach@und.nodak.edu](mailto:vasyl.tkach@und.nodak.edu))

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