Final Report of the FWF Project P23415-B17

Monograph of the Hypotricha (Ciliophora). Volume 6

by

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The major goal of the present project (1 person, 3 years, 20 h per week) was to write the final volume of a monographic series about the hypotrichous ciliates. Ciliates are microorganisms (mostly 0.05–0.30 mm long) which have a nucleus composed of two parts, the macronucleus and the micronucleus. Hypotrichs are mainly characterised by (i) cirri (= bundles of cilia) on the ventral side; (ii) a prominent oral apparatus composed of an adoral zone and two undulating membranes; and (iii) rows of bristles (= usually short, stiff cilia) on the dorsal side. Hypotrichs have a worldwide distribution and live in all major habitats, namely freshwater (lakes, ponds, running waters), saltwater (sea, salt lakes), and soil. Research on hypotrichs started with Otto Friedrich Müller who published his main results in 1773 and 1786. In the 1800s, Ehrenberg, Stein, and several other workers from Europe and North America (e.g., Stokes) described many species from limnetic and marine habitats. In the early 20th century, Alfred Kahl – a German teacher – wrote the last detailed revision (about 130 pages) of this group of ciliates. Since then, many further new species have been described, mainly from terrestrial habitats (for example by the Foissner-group, Austria) and marine sites in the Yellow Sea, China (Song-group). The first volume of the series was published in 1999 (Oxytrichidae), the second in 2006 (Urostyloidea), the third in 2008 (Amphsiellidae and Trachelostylidae), and the fourth in 2011 (Gonostomatidae and Kahliellidae). The penultimate part will appear in 2014 and deals mainly with two difficult groups, the Uroleptidae and Keronopsidae. The last volume treats all taxa not yet revised in the previous volumes, among others those species that have a twisted body. An important part of volume 6 will be a key to all taxa revised in the six-volume treatise. Other major parts are introductions to the groups and details about synonymy, nomenclature, taxonomy, morphology, and occurrence and ecology of each species. In addition, for each species almost all figures published so far as well as some original data are included so that the user gets a comprehensive overview about the biology of the hypotrichs without searching more than 7.000 papers published since 1758, the starting point of zoological nomenclature. The whole series will comprise more than 5000 pages. Besides volume 6, six peer-reviewed, multi-authored papers dealing with sophisticated taxonomic problems of hypotrichs result from the present project. Molecular data in combination with detailed analyses of morphological and ontogenetic features indicated that some species have been misclassified previously. It is estimated that only a small part (about 800 valid species) of all existing species of hypotrichs has been discovered so far. Consequently, the phylogenetic relationships within the group are not yet fully understood although there are some taxa which seem to have a stable position within the many trees published each year. Thus, the monographic series on the hypotrichs is "only" a preliminary study summarizing the hypotrich research of the past 250 years. However, the treatise, including volume 6, is not only important for basic research, but it is also a usable tool for practitioners who, for example, have to evaluate the quality of running waters and lakes. Last but not least, it should be mentioned that the series could never have been written without the generous support by the Austrian Science Fund (3 projects) and the Austrian Academy of Sciences (1 project). For more details on the project, see http://www.protozoology.com/Monograph_volume_6/index.html