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Monograph of the Urostyloidea (Ciliophora, Hypotricha)

by

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Dedication

For my wife, Elisabeth, and my daughters, Magdalena, Eva, and Helena

Contents

Preface

The present book is a monograph about a relatively large group of hypotrichous ciliates. It is the second of several volumes, which review the Hypotricha, one of the three major parts of the spirotrichs. The first volume treats the Oxytrichidae, also a large group, most species of which have 18 highly characteristically arranged frontal-ventral-transverse cirri and, more importantly, a comparatively complex dorsal ciliature due to fragmentation of dorsal kineties during cell division (Berger 1999).

The present volume treats the Urostyloidea, which are characterised by a zigzag-arrangement of the ventral cirri. Although this pattern is often very impressive, it is a rather simple feature originating by a more or less distinct increase of the number of frontal-ventral-transverse cirral anlagen to produce cirral pairs, which are serially arranged in non-dividing specimens. Some users will be astonished that the monograph does not include *Uroleptus*, a group of tailed species, which also have a distinct zigzagging cirral pattern. However, molecular and morphological data indicate that the zigzag pattern of *Uroleptus* evolved independently, that is, convergently to that of the urostyloids. Thus, it was excluded from the present review.

Urostyloids are common in all major habitats, that is, freshwater, sea, and soil. The last detailed illustrated guide to this group of hypotrichs was provided by Kahl (1932). Of course, Kahl's book – which comprises all hypotrichs and the euplotids – is outdated in many respects, for example, synonymy and faunistics. Moreover, in Kahl's review the urostyloids are not treated as a group because he did not accept the "Urostylinae Bütschli, 1889". Borror & Wicklow (1983) briefly reviewed the urostyloids and provided a valuable introduction, a partly illustrated key to 48 species, and a synonymy, which is, however, not very detailed. Thus it was not too early for a monographic treatment of this group, which comprises 154 species at the present state of knowledge. As in the first volume, almost all available data (morphology, ontogenesis, ecology, faunistics) of each species have been included. For each species, a detailed list of synonyms is provided, followed by a nomenclature section. In the remarks, all important data concerning taxonomy, synonymy, phylogeny, and similar taxa are treated. The morphology section contains a thorough description of the species, following the same sequence in every species. If the data on various populations or synonyms do not agree very well, then the morphology data are kept separate so that even workers who do not agree with the synonymy proposed can use the revision. For several species, cell division data are available. They are also included because ontogenetic data are often important to understand the interphasic cirral pattern correctly. The occurrence and ecology section contains a description of the type locality and all other localities where a species was recorded. In addition, almost all illustrations published so far have been included. Thus, the present book is not only a "field guide" like Kahl's paper, but also a reference book so that the general microscopist need not refer back to the widely scattered original literature. Specialists, however, should always check both the present treatise *and* the original description or authoritative redescription when redescribing a known species.

The most prominent and productive workers on urostyloid taxonomy are, in chronological order, Ehrenberg, Stein, Claparède & Lachmann, Stokes, Kahl, Jerka-Dziadosz, Borror, Foissner, Hemberger, Song, and Hu. However, many others wrote important papers on the alpha-taxonomy of the urostyloid hypotrichs. In total they described about 260 species in urostyloid genera from 1758 to 2005. 154 species are considered as valid in the present revision, 67 are synonyms, that is, the synonymy rate is about 45%, which is very similar to that of the Oxytrichidae (48%). 29 species (= 20%) have one or more synonyms; the record holder is *Holosticha pullaster* with 16 synonyms! 17 species are species indeterminata, two are nomina nuda, and 29 species belong to non-urostyloid taxa. *Anteholosticha*, which is likely not monophyletic, comprises 37 species, two genera comprise 10 species each, and three genera include 9 species each. Thus, these six genera include about 57% of the valid species. 10 genera are monotypic, that is, comprise only the type species.

Recently I started on the next volumes of the series, which treat the remaining groups, for example, the Amphisiellidae and the Kahliellidae. Fortunately, the Austrian Academy of Sciences is sponsoring the last part of the series so that the monographic treatment of the hypotrichs can be completed in a few years. I hope that many ciliate-lovers gain from the series.

Salzburg, May 2006 Helmut Berger

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