

MONOGRAPH OF THE OXYTRICHIDAE
(CILIOPHORA, HYPOTRICHIA)

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Monograph of the Oxytrichidae (Ciliophora, Hypotrichia)

by

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Dedication

This book is dedicated to my family, Elisabeth, Magdalena, Eva, Helena Valentina and my parents, Maria and Johann † Berger

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Preface

I have written this book because there is, as in almost all supraspecific ciliate taxa, an urgent need for an up-to-date revision of the oxytrichids, which are common in terrestrial, limnetic, and marine biotopes. The last comprehensive, illustrated guides to this group of hypotrichs were provided by KAHL (1932) and STILLER (1974b); however, as regards synonymy and faunistics, these works are outdated and not as detailed as EHRENBERG'S outstanding book from 1838. In KAHL'S revision, the oxytrichids *sensu stricto* are described on about 30 pages, whereas in the present book the systematic section comprises about 830 pages. This extraordinary increase in page number is mainly due to the following points: (i) Species number increased from about 80 in KAHL to about 170 in the present book. (ii) KAHL usually provided only a single illustration of each species, whereas almost all published illustrations on oxytrichid ciliates are included in my book. (iii) Modern, phylogenetic systematics of oxytrichids without morphogenetic data is impossible; consequently, almost all detailed descriptions, usually dealing with the type species, have been included. (iv) Synonymy is discussed, and not only mentioned, as is unfortunately usual. (v) Modern descriptions of oxytrichids, and ciliates in general, are much more comprehensive than the descriptions by KAHL; note, however, that STEIN'S (1859b) description on, for example, *Stylonychia mytilus* is 14 (folio-sized) pages long and includes 34 incomparable live drawings on 3 plates! (vi) Almost all physiological, ecological, and faunistic literature available on each species is mentioned; the present book is therefore not only a "field guide", but also a reference book.

Most species treated in the present book have a highly characteristic 18 frontal-ventral-transverse cirral pattern strongly indicating that they are a monophylum. However, the sole apomorphy of the last common ancestor of all species revised is a different character, namely the fragmentation of a dorsal kinety. This feature, which can be clearly seen only during morphogenesis, was recognised rather late because it needs silver impregnation. It is so curious that convergent evolution is very unlikely.

From 1758 to 1997 about 440 species were described in oxytrichid genera, however, only 169 species are considered as valid in the present book. Five species were discovered by O. F. MÜLLER in the second half of the 18th century, 39 species were described in the 19th century, and the majority was found after the turn of the century. The most productive and prominent workers on oxytrichid taxonomy are, in chronological order, EHRENBERG, STEIN, STOKES, KAHL, and FOISSNER; however, many others provided important contributions to the alpha-taxonomy of the oxytrichids. 82 species are synonyms, the synonymy rate is thus about 48 %. Nine species – all of them are very common and known for a long time – have more than two synonyms. However, 81 % of the valid species have no synonym. More than 140 species cannot be identified from the original description, that is, they are species indeterminata. 32 genera are considered as valid; 12 of them are monotypic, five contain 10 or more species each. These comprehensive genera include 60 % of all species. *Oxytricha*, the most voluminous group, comprises 54 species; how-

ever, only a part of them is described by modern methods, making the identification of these “inconspicuous” species rather difficult.

This revision was my “leisure pursuit” for many hundreds of hours distributed over a period of 13 years. Originally it was planned as volume 6 (Hypotrichia) of the Protozoenfauna (Gustav Fischer Verlag), a detailed monograph of all freshwater protozoa. However, only few groups (Suctoria, Urceolaridae, Nackte Rhizopoda, Heliozoa, Colpodea) were published before this series was suspended in 1996. Fortunately, Prof. Dr. H. J. Dumont (Ghent, series editor of the *Monographiae Biologicae*) and Kluwer Academic Publishers were interested in my manuscript.

Now, I hope that this revision, whatever its shortcomings, is of more or less great help to all who deal with oxytrichids. Hopefully, they will be encouraged to tackle the many remaining problems, great and small, that is, redescribe poorly defined species, elucidate their morphogenesis, ultrastructure, physiology, molecular biology, ecology, and their phylogenetic relationships. Furthermore, many species in freshwater, soil, and marine habitats in Europe and especially in the other continents are waiting to be discovered and thoroughly described.

Salzburg, January 1999

Helmut Berger

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