

The Sphagnum Ponds of Simmelried in Germany: A biodiversity Hot-Spot for Microscopic Organisms. Martin Kreutz and Wilhelm Foissner
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Anyone interested in microscopic organisms, specialist or amateur, will be delighted with this work. The paper by M. Kreutz and W. Foissner is actually an unprecedented album (or “field guide”) of microscopic organisms from bacteria through the smallest Metazoa. Of course, protists make up the bulk of the list. Altogether 656 species are presented on 229 beautifully arranged plates of breath-taking micrographs. Apart from the indisputably great aesthetic value, the pictures are very informative. Most images were taken from living specimens using differential interference contrast. Thus the organisms can be seen in their natural shape and colour without any distortion usually caused by fixatives. All possible morphological aspects visible by means of light-microscopy, such as: cilia, surface sculpture, loricas, mucus envelopes, extrusomes and so on, are shown with astonishing precision. In several instances even parasites are presented. Very well reproduced natural colours add to the beauty and to the scientific value of the pictures. The characteristic colour of cytoplasm, symbionts, and food vacuoles, rarely shown in ciliate literature, are all important aspects of taxonomic description. Those who have ever tried to photograph living ciliates or fast moving flagellates will certainly appreciate these pictures. Such astonishing images of moving protozoans could be obtained by using an electronic flash integrated with a special collector providing Köhler illumination. Pictures of living organisms are often accompanied with three-dimensional SEM views. Some plates with ciliates contain in addition bright-field micrographs of silver-impregnated specimens to demonstrate their complex ciliary patterns. The text, except for a short introduction, is reduced to very instructive figure legends. A well organized index makes it easy to find any species by genus or species name.

All the organisms presented in this monograph were found in Simmelried, a three-hectare wetland with six small ponds, located in southern Germany. The ponds were investigated for microscopic organisms from 1994 to 2005. The species documented in the monograph are actually only about two thirds of species recorded at the site. Interestingly, among about 800 protistan species found, the authors recorded at least 100 undescribed species. This monograph is certainly an important contribution to the knowledge on protistan biodiversity, however, it leaves the main controversy unresolved. The astonishing diversity of species recorded at such a restricted area seems to support the “everything is everywhere” hypothesis. On the other hand, the surprisingly large number of undescribed species, even among relatively well known euglenids and chrysophytes, suggests that the total number of protistan species may be vastly underestimated. Also, the apparent absence of some common species in Simmelried ponds, in spite of intense research, indicates that we are far from understanding the mechanisms that control structure of microbial communities.

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