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FIRST ELECTRON MICROSCOPICAL RECORD OF AN OOMYCETOUS FUNGUS PARASITIZING RESTING CYSTS OF THE HYPOTRICH CILIATE KAHLIELLA SIMPLEX

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Both organisms occured in a soil from the surroundings of Salzburg. Infection starts with one to several zoospores (diameter ca. 6 µm) lying on the outer mucilagous layer of the cyst. Their infection tubes (diameter 1-3 µm) penetrate the cyst wall. The fungal cytoplasm then accumulates in the host cytoplasm and forms a spherical thallus bounded by two membranes of the parasite and host respectively. The host membrane becomes covered with a layer of small electron transparent vesicles just as the membranes of the ciliate nuclei. The parasites store reserve material and grow at the expense of the host cytoplasm which degenerates. The contours of the parasites become irregular as growth continues and space is limited. Adjacent fungal individuals may fuse and produce a single thick-layered oospore (diameter ca. 15 µm) of the peronosporacean type (central reserve globule, peripheral lipid droplets, periplasm). Mature vegetative thalli become vacuolated and protrude a thick hypha (diameter up to 40 µm) into the medium thereby rupturing the ciliate cyst wall again. Some of them were observed to transform holocarpically into pyriform zoosporangia. These are thin-walled, 30x50 µm in diameter, and bear a distinct apical papilla. The zoospores are cleaved inside the zoosporangia by fusion of cleavage vesicles. They have two flagella, one of the whiplash and one of the tinsel type. The nucleus is beaked, with one nucleolus, and surrounded by microtubules and several dictyosomes. The general morphology and especially the sexual mode of reproduction suggest that this fungus is best placed in the family Lagenidiaceae. (Supported by the "Fonds zur Förderung der Wissenschaftlichen Forschung", Proj. Nr. P 5226)

FINE STRUCTURE OF THE SOIL CILIATES ENCHELYDIUM POLYNUCLEATUM AND FUSCHERIA TERRICOLA (CILIOPHORA, HAPTORIA)

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The general organization of the infraciliature of Enchelydium polynucleatum Foissner, 1984 is similar to that of Spathidium and some buetschliids, because the anterior ends of the somatic kineties are condensed and obliquely bent. The somatic kinetids are monokinetids with the classical fibrillar associates. Unlike Spathidium and all other haptorids so far investigated ultrastructurally, serial sections show that there are no oral dikinetids, as in the endocommensal buetschliids and balantidiids. Instead, three to six anterior kinetids in each ciliary row have nematodesmal bundles extending into the cytoplasm and surrounding the cytopharynx. These kinetids lack cilia and all fibrillar associates except enlarged transverse ribbons which extend anteriorly and inwards to support the cytopharynx. As in other haptorids, Enchelydium has two types of toxicysts and one type of mucocyst. These observations strongly suggest that Enchelydium belongs to the ancestral stock of both the Haptorida and the Archistomatida. The similarities in the somatic and oral ultrastructure of the Haptorida and the Archistomatida suggest that they belong to the same subclass Haptoria Corliss, 1974.

Fuscheria terricola Berger, Foissner & Adam, 1983 has somatic monokinetids and oral dikinetids with nematodesmal bundles. In addition, the upper 5-10 somatic kinetids of each kinety possess nematodesmata which form a rather irregular rhabdos. This species has only one type of highly specialized toxicyst and mucocyst. Its organization is similar to that known from Acropisthium and Actinorhabdos. Hence, we suggest to unit these three genera in the new family Acropisthiidae. (Supported by the "Fonds zur Förderung der Wissenschaftlichen Forschung, Proj. Nr. P 5226)

PROTOZOA AS INDICATORS IN TERRESTRIAL ECOSYSTEMS

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Protozoa are a major component of the saprobic systems of Liebmann and Sládecek which are widely used for the evaluation of water quality. In spite of this, their bioindicative potential for terrestrial ecosystems has been largely ignored, although recent studies proved that they are important constituents of the soil animal community in which they share about 10-70% of the standing crop, depending on soil type, climate, and geographical location. Earlier studies show that the testacea are excellent indicators for soil evolution and for distinguishing the major humus forms mull and moor. Like plants, protozoa can be used for soil and site characterization. Recent experimental field and laboratory studies make clear that testacea and ciliates react very quickly and sensitive to changes of the soil water content and agricultural practice, to soil compaction, fertilizers, "acid rain", and pesticides. Improvement or deterioration of the soil quality are indicated by an increase or a decrease of the abundance and/or species number and/or species composition of the protozoan community. It is unknown, if the protozoa are directly influenced or indirectly by changes of other main habitat variables, such as food resources and decrease or increase of competition and predation. Soil protozoology and the use of soil protozoa as bioindicators suffers from two major deficiences, namely the often inappropriate methods of population estimation and the great taxonomical deficit. To show only one example, during the last 7 years about 120 new species of soil ciliates and about 50 new species of soil testacea have been described many of which are autochthonous and promising canditates for bioindicative purposes. In consequence, most of the faunal lists given by soil ecologists must be so incorrect and/or incomplete that they are nearly useless.

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