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Ciliate Phylogeny Inferred from Ontogeny, WILHELM FOISSNER, Universität Salzburg, Institut für Zoologie, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria.

The phenomenology of ontogenesis in ciliated protozoa has been reviewed, with emphasis on stomatogenic data published between 1870 and 1993. Three basic types of fission (homothetogenic, enantiotropic, parallel), two basic modes of division (active, cystic), and five main modes of stomatogenesis (apokinetal, parakinetal, buccokinetal, telokinetal, mixokinetal) were distinguished. Within the main stomatogenic patterns several subtypes occur, some of which, however, possibly evolved convergently in different ciliate groups. There is an urgent need for refined studies, especially in most heterotrichs, thigmotrichs, apostomes and prostomatids and in all karyorelictids,chonotrichs and rhynchodids. Hennig's cladistic method was applied to the ontogenetic data and several morphological features as well as molecular markers. Although it was not possible to determine all character states unequivocally and to harmonize all data, the cladogram suggests main pathways in ciliate evolution and three major conclusions: (i) A subphyletic division of the Ciliophora based on a cyrtos or rhabdos type of oral apparatus is not supported; (ii) Some stomatogenic modes evolved either convergently or are only superficially similar, viz. by light microscopy; (iii) The "eociliate" possibly possessed the following character constellation: a dividing, homomerous macronucleus without a reorganization band; a cyrtos-type oral apparatus with adoral membranelles and a paroral membrane; somatic dikinetids with postciliodesmata; homothetogenic fission, and buccokinetal stomatogenesis.

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Tropical Soil Protozoan Diversity: The Ciliates (Protozoa, Ciliophora) of a Giant Pancake, Etosha in Namibia (Southwest Africa), WILHELM FOISSNER, Universität Salzburg, Institut für Zoologie, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria.

12 soil samples were investigated for ciliates from the centre and periphery of the Etosha Pan. The pan soil is a very special mixture of salt, clay, and lime having a pH range of about 8.0-9.7; the air-dried mixture is like a stone, but quickly doubles its volume and becomes a fluffy pancake when it is rewetted. Most of the soil is covered with a more or less distinct layer of filamentous cyanobacteria. 153 ciliate species were found, 53(!) of them were new to science. Most belong to one of the following groups: hypotrichs (43 species), colpodids (35), gymnostomatids (33), nassulids (15). The high number and frequency of nassulid ciliates, usually sparsely occurring in soil, is obviously related to the commonness of cyanobacteria, which are their preferred food. A transect from the pan to the surrounding savanna showed that the salt shrub (Suaeda) region has the highest species richness and the number of species sharply decreases above pH 8.6: pan centre (saline desert, pH 9.7-8.7, 9-21 species), Suaeda zone (pH 8.6-8.4, 43-57 species), thorn bush savanna (about 1km distant from pan margin, pH 7.7, 28 species), Mopane (Colophospermum) savanna (about 15km distant from pan margin, pH 7.7, 37 species). Refined ecological research about these special ciliate communities is pressingly needed but difficult to realize because of the high number of new, not yet described species. (The help of Dr. Lindeque, director of the Ecological Research Station of the Etosha National Park, is greatly acknowledged.)

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Fine Structural Specializations in a Jumping Peritrichous Ciliate, Hastatella radians Erlanger, 1890 (Ciliophora, Peritrichia), ILSE FOISSNER and WILHELM FOISSNER, Universität Salzburg, Institute für Pflanzenphysiologie and Zoologie, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria.

Hastatella radians is a rare planktonic ciliate living in temporary pools and in the pelagial of lakes and slowly running, large rivers. It lacks a stalk but possesses an anterior and equatorial girdle of mobile spines continuous with the somatic cortex. The length and number of the spines decreases drastically, i.e. by 50% and more in laboratory cultures, obviously due to the lack of environmental stress. Previous light microscopic studies have suggested that the spines are passively moved by contractions of the cell and/or of individual myonemes, thereby producing the conspicuous jumps driving the cell through the medium. However, our electron microscopic investigations suggest that the spines can move independently of the myonemes, because they contain specialized structures lacking in other peritrichs, viz. subcortical fibres and microtubules. The closely packed fibres extend underneath the epiplasm and have a complicated periodic structure reminiscent of that known from flagellar rootlets. Underneath the striated fibres is a layer of loosely arranged microtubules extending to the top of the spines. The general ultrastructure of H. radians is very similar to that of other peritrichs. There is, for instance, a scopula organelle composed of short cilia lacking the central microtubule pair and the axosome. The oral infraciliature consists of ciliated adorals and a paroral having only the distal basal bodies of the dikinetids ciliated.

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Dr. Merkle's Life Crystals and Chondrianas, a Chance for Cancer and HIV Patients or Dividing and Excysting Colpodid Ciliates? WILHELM FOISSNER, Universität Salzburg, Institut für Zoologie, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria.

George Merkle, Ph.D., a nuclear physicist from the USA, states in a 55 min video presentation: "This program documents a major breakthrough in medical science and molecular biology. For the first time, living, intelligent, pre-cellular organisms, from which all life forms evolved have become visible. The discovery points directly to a new generation of biologists and physicians, who will have the ability to prevent the diseases that now afflict human kind". The discoveries mentioned are "Life Crystals", developing from "free energy", and organisms which he calls "Chondriana". A careful analysis of the film, which is of poor technical quality, proved the following: The Life Crystals are bacteria and the "superintelligent and polymorphic Chondriana", which are the "precursor to our killer T-8 cells and lymphocytes", are trophonts, dividing, and excysting ciliates of the genera Colpoda and Pseudoplatyophrya. Thus, Dr. Merkle's "discovery" is nonsense and would be not worth to be mentioned. Unfortunately, he sells a serum containing these Life Crystals and Chondrianas and mentions that the serum has successfully applied in many countries. The serum is applied intravenously (as I know from a physician who tried it in a self-experiment - and got a sepsis) and should heal all diseases, including cancer and AIDS. A microscopic investigation of the serum showed that it contains a lot of bacteria, yeast, and ciliates. Thus, if it is injected, very likely a heavy toxaemia and eventually death will result.