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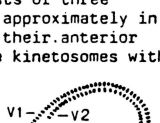
Redescription of Acineria incurvata DUJARDIN, 1841, Trochiliopsis opaca PENARD, 1922, and Trimyema compressa LACKEY, 1925 (Protozoa, Ciliophora), HANNES AUGUSTIN, WILHELM FOISSNER, and HANS ADAM, Institut für Zoologie der Universität Salzburg, Akademiestrasse 26, A-5020 Salzburg (Austria).

These species were found in activated sludge. Acineria comprises four species: A. acuta, A. incurvata (type), A. nasuta, A. unicata; however, only A. incurvata and A. unicata are reliable. The genus Acineria can be separated from the most closely related genus Litonotus by the anteriorly rolled up mouth slit overlapping to the left side and forming (together with the anterior dorsal margin) an oblique spoon-like excavation. Trochiliopsis is monotypic and most probably closely related to the autochthonous soil ciliate Stammeridium kahli. Trimyema comprises eight species: T. alfredkahli, T. claviformis, T. compressa (type), T. echinometrae, T. kahli, T. marina, T. minuta, T. pleurispiralis. T. alfredkahli and T. claviformis are very probably synonyms of T. marina. The vestibular ciliature of T. compressa (Fig.) consists of three vestibular kineties (V1-3). Two kineties are arranged approximately in a semicircle at the left margin of the vestibulum. At their anterior ends there are 4 to 5 pairs of basal bodies (or single kinetosomes with parasomal sacs). V 1 is a bit longer than V 2. V 3 being located near the cytostome consists of only 6-7 cilia. In stained specimens all kinetosomes appear to be paired, but electron microscopic investigations show that the anterior granule is a parasomal sac (DETCHEVA, PUYTORAC, and GROLIERE, 1981). (Supported by the "Fonds zur Förderung der wissenschaftlichen Forschung, Projekt Nr. P 5889").



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Species Separation in Hypotrichous Ciliates by Classical Morphological Methods, BRUNO GANNER, WILHELM FOISSNER, and HANS ADAM, Institut für Zoologie der Universität Salzburg, A-5020 Salzburg (Austria).

There is an increasing trend to use morphogenetic and biometric characters to separate hypotrichous ciliates at species level. However, few data are available about the variability of such characters between populations (P). Thus, we compared 4 P of Urosomoida agiliformis FOISSNER, 1982. 3 P were found in various soils of Austria and Israel and 1 P occurred in the river Salzach near Salzburg. They are morphologically and biometrically poorly distinguishable. However, two P have 2 transverse cirri and two have normally 4. Considering the high variability of this character in the Urosoma-Urosomoida-Gonostomum-group it is very likely not sufficient to separate these P at species level. The same is true for some minor morphogenetic differences because there is the remarkable similarity that the 4 P have 7 isolated fields of kinetosomes during the early morphogenetic stages. From these data we conclude a conspecifity of the 4 P investigated and maintain that U. agiliformis is very similar to both Oxytricha longa GELEI & SZABADOS, 1950 and O. similis ENGELMANN, 1862. Our investigations suggest that classical morphological methods do not allow a clear decision on the species status of the 4 P of U. agiliformis and the 2 Oxytricha-species.
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Guide-Lines for the Alpha-Taxonomy of Hypotrichous Ciliates, HELMUT BERGER and WILHELM FOISSNER, Institut für Zoologie der Universität Salzburg, Akademiestrasse 26, A-5020 Salzburg (Austria).

In many modern descriptions and redescriptions of hypotrichs only the ventral aspect of the infraciliature is shown. Such deficient characterizations impede or even make impossible a correct determination of species, e.g. in ecological research. In our opinion the following criteria are absolutely necessary for the description of a hypotrichous ciliate: 1.) the habitat (fresh or sea water, soil); 2.) the approximate in vivo body size; 3.) the in vivo body shape in ventral view observed without cover glass; 4.) the nuclear apparatus; 5.) the position and shape of the contractile vacuole; 6.) the colour of the cytoplasm; 7.) the subpellicular granules (very important; absent or present, shape, size, colour, arrangement); 8.) the ventral and dorsal infraciliature with notes on length of dorsal cilia; 9.) the size and variability of continuous (e.g. body length, length of the AZM) and meristic (e.g. No. of adoral membranelles, marginal cirri) characters of stained specimens with the tabulated sample statistics $\bar{x}$, M, s, $SE_{\bar{x}}$, CV, Min, Max, and n; and 10.) a discussion of the taxonomic position including differences to related species especially when a new species is described. These criteria should be completed by information about: 1.) in vivo lateral view and degree of flexibility; 2.) food and inclusions in the cytoplasm; 3.) movement; 4.) shape and size of the cyst; 5.) biometrical characterization of populations of different localities; 6.) the silver line system of the Aspidiscids and Euplotids; and 7.) special characters, e.g. notes on the morphogenesis. In any case, the obligatory criteria 3 - 5, 7, and 8 should be figured by line drawings to facilitate evaluations. (Supported by the FWF, Projekt Nr. P 5889).

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On the Biology of Mycophagous Soil Ciliates, WOLFGANG PETZ, WILHELM FOISSNER, and HANS ADAM, Institut für Zoologie der Universität Salzburg, Akademiestrasse 26, A-5020 Salzburg (Austria).

FOISSNER (Zool. Jb. Syst., 1980, 107, 391-432) discovered an enigmatic group of ciliates, the Grossglockneridae, with a tube-like structure in the oral apparatus resembling ultrastructurally a suctorian tentacle. In spite of this, the somatic fibrillar systems show a colpodid pattern. Thus, these ciliates which have been found in the meantime in many soils of the world, have been classified as a separate order within the class Colpodea. Experiments showed that they feed exclusively on fungi and yeasts (PETZ et al., Soil Biol. Biochem., 1985, 17, 871-875). In this study, we investigated by SEM and TEM the feeding mechanism of Grossglockneria acuta. The feeding tube is used in perforating the chitinous cell wall of the prey. It is ca. 2x1-1.5 µm across, slightly tapering distally with a small disc-like tube entrance. A tiny membrane-bounded endocytotic duct pervades the tube. Feeding begins with the establishment of a rather firm contact between the oral tube and the fungus. It lasts ca. 3-23 min during which the ciliate enlarges, due to the uptake of host cytoplasm. In the SEM, various penetration stages of the fungal wall are observed. At first, there is a ring, 1.5-2 µm in dia, surrounding a central area, 0.7-1 µm across, which is gradually deepening later on until the prey is perforated. The exact mechanism of breaking up the fungi is unknown, yet it is conceivable that lytic enzymes are used. Rows of microtubules in the oral tube may participate in ingesting the cytoplasm, a mechanism reported from suctorian tentacles. The electron dense granules surrounding the microtubular lamellae of the feeding tube are perhaps membrane reserves for the food vacuoles.
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The Micro-Edaphon in Organically and Conventionally Farmed Arable Land near Vienna, WILHELM FOISSNER, Institut für Zoologie der Universität Salzburg, Akademiestrasse 26, and THOMAS PEER, Institut für Botanik der Universität Salzburg, Freisaalweg 16, A-5020 Salzburg (Austria).

The micro-edaphon, the activity of some soil enzymes, and a few abiotic factors were analyzed in 2 organically (K,M) and 2 conventionally (L,N) farmed wheat fields near Vienna. The means of 4 sampling occasions show many marked differences, but most are statistically insignificant probably due to the low sample size. Thus, the investigations will be continued. Means and significant differences invariably show that the organically farmed plots have higher abundances of animals and higher enzymatic activities than the nearby located conventionally farmed fields. One reason for this is perhaps the humus content which is significantly higher in the organically farmed plots. (Supported by the FWF, Projekt Nr. P 5889).

Parameter	Site pairs K	L	M	N
TESTACEA (direct method)				
Individuals/g dry mass (dm)	76	23	87	60
Biomass mg/1000g dm	1.9	0.7	2.6	1.9
Number of species	6	6	10	10
CILIATES (culture method)				
Individuals/g dm	365	78	39	31
Biomass mg/1000g dm	6.3	0.6	1.2	0.7
Number of species	11*	6	8	8
NEMATODS, individuals/g dm	91*	24	38	28
KATALASE-activity ml O_2/g dm	1.2*	0.6	0.5	0.6
UREASE-activity mg N/g dm	0.08*	0.07	0.06	0.06
CO_2-release mg/g dm	0.3*	0.2	0.2	0.2
HUMUS (%)	2.2*	1.8	1.9*	1.8

* significantly different (P = 0.05 - 0.1); two-way analysis of variance.

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Ciliatostasis and Its Disruption by Human Influences, GABRIELE LÜFTENEGGER, WILHELM FOISSNER, HELMUT BERGER, and HANS ADAM, Institut für Zoologie der Universität Salzburg, Akademiestrasse 26, A-5020 Salzburg (Austria).

To demonstrate the nullification of ciliatostasis, the effect of the organic fertilizer Biosol (B; dried fungal mycelium) was studied. A smoothed ski-run was fertilized every year in July since 1982. For comparison, an undisturbed pasture (NV) and a smoothed ski-run without any treatment (PL) were examined. The investigations took place in the Austrian Central Alps (2800 m above sea level) in October 1985. The mean abundance and biomass of active ciliates in B (331.7; 15.9 µg/g dry mass) are significantly higher ($P<0.05$) than in PL (3.1; 0.2) and NV (2.3; 0.1). Total numbers of species obtained with a culture method are highest in NV (44; B 36; PL 31). These findings indicate that the ciliates in natural soils are restricted in growth and excystation (=ciliatostasis). With the culture method air-dried soil is remoistened. This procedure causes the destruction of plant biomass and the liberation of nutrients. This might be responsible for the increased cyst "germination". However, in undisturbed soils, nutrient addition is not enough to annul ciliatostasis (BERGER et al., Pedobiologia, in press). Our experiments show that the removal of the old, evolved topsoil is necessary for the nullification of ciliatostasis. The low number of active ciliates in the unfertilized, smoothed PL plot suggests that the fertilizer is not the primary agens for the nullification. It provides perhaps only the food for the organisms via increased bacterial activity.
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