

## Ecologia- Ecology

### EC01 - PHYLOGENETIC RELATIONSHIPS AND A REVISED CLASSIFICATION OF THE CLASSES NASSOPHOREA AND PHYLLOPHARYNGEA (PHYLUM CILIOPHORA)

Gong, J.<sup>1,2,\*</sup>, Stoeck, T.<sup>3</sup>, Yi Z.<sup>4</sup>, Miao, M.<sup>4</sup>, Zhang, Q.<sup>4</sup>, Roberts, D. McL.<sup>1</sup>, Warren A.<sup>1</sup>, Song, W.<sup>1</sup>

<sup>1</sup> Department of Zoology, Natural History Museum, London, SW7 5BD, UK.

<sup>2</sup> College of Life Science, South China Normal University, Guangzhou, 510631, China.

<sup>3</sup> Department of Ecology, Universität of Kaiserslautern, D-67663 Kaiserslautern, Germany.

<sup>4</sup> Laboratory of Protozoology, Ocean University of China, Qingdao 266003, China.

\* jgong@126.com

The hypostome ciliates have been generally classified into two classes, Phyllopharyngea and Nassophorea. The status of Nassophorea and its relationship with Phyllopharyngea is one of the most controversial issues in ciliate systematics. Here we focus on the phylogenetic interrelationships of Nassophorea and Phyllopharyngea based on small subunit ribosomal RNA gene sequences. The three nassophorean subgroups, synhymeniids, microthoracids and nassulids, each emerged as monophyletic, with synhymeniids as a sister group of Phyllopharyngea, and microthoracids as a sister of the synhymeniids + Phyllopharyngea clade in all phylogenies. The exact placement of the nassulids, however, remains uncertain. Following a detailed analysis of phenotypic characters, we hypothesize that: (1) the Phyllopharyngea could have evolved from synhymeniids, with the further development of their subkinetal microtubules as one of the major events; and (2) the development of monokinetid structures, as well as the reduction and specialization of the cyrtos and cortex, might have occurred during the diversifications of the microthoracids, synhymeniids, and Phyllopharyngea from a common ancestor. Expanding the class Phyllopharyngea to include the synhymeniids as a subclass, and designating a new subclass Subkinetalia nov. subcl. for the group comprising cyrtophorians, chonotrichians, rhynchodians and suctorians, are proposed. Supported by a Marie Curie Fellowship to J. G.

### EC02 - Photoprotective strategies in freshwater ciliates

Sonntag, B.\* , Summerer, M., Sommaruga, R.

Laboratory of Aquatic Photobiology & Plankton Ecology, Institute of Ecology, University of Innsbruck, Innsbruck, Austria.

\*bettina.sonntag@uibk.ac.at

Solar ultraviolet radiation (UVR, 290–400 nm) is a stress environmental factor for many freshwater organisms, particularly causing damage on DNA and other cell components. Here, we assessed different photoprotective mechanisms to minimize UV stress in i) one heterotrophic and six algal-bearing planktonic ciliates sampled from lakes of different transparency and ii) in cultures of *Paramecium bursaria*. We assessed the concentration of mycosporine-like amino acids (MAAs), a family of UV sunscreen compounds which are colorless, water-soluble, and maximum absorption between 309 and 362 nm. MAAs are putatively synthesized by the shikimic acid pathway present in algae, but unknown for ciliates. In planktonic ciliates, we found seven MAAs (e.g., shinorine, palythine), one to several MAAs per species, and quantitative differences among species from UV transparent and a turbid lake. The MAAs in the heterotrophic *Bursaridium pseudobursaria* originated from algal food, whereas in the mixotrophic species MAAs were synthesized by the algal symbionts. In *B. pseudobursaria*, qualitative and quantitative differences in MAAs were found among three lake populations. In *P. bursaria* and its symbionts no MAAs were detected which is in agreement with its colonization of less UV transparent waters. However, another strategy was observed in this ciliate when exposed to UVR and PAR. Namely, the *Chlorella* symbionts were dislocated and shifted to the posterior end accumulating in several cell layers. Estimations based on an optical model indicate that eight *Chlorella* layers provide 100% shelter from UVR for the underlying ciliate cell organelles. Moreover, in the presence of UVR, the individuals of *P. bursaria* gathered in spots of ca. 1 mm diameter ('collective shields'). In summary, two different photoprotective strategies in planktonic ciliates and *P. bursaria*, i.e., presence/absence of MAAs and physical shelter by the symbionts will be discussed.

Supported by the Austrian Science Fund FWF (P21013-B03, P16559-B06).

**EC03 - CONTRASTING PATTERNS OF MORPHOLOGICAL AND MOLECULAR DIVERGENCE IN  
EPIBIONT *OPERCULARIA* SPP. (CILIOPHORA, PERITRICHIA) FROM DIFFERENT LOCALITIES  
IN RIO GRANDE DO SUL STATE, BRAZIL**

Utz, L.R.P.\*; Simão, T.L.L., Hrycai, R.R., Eizirik, E.  
Faculdade de Biociências, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil  
\*laurautz@yahoo.com

Peritrich ciliates are generally found colonizing living and non-living substrates in lakes, rivers, estuaries, and marine environments. Among living substrates, crustaceans, insects, and aquatic plants are the most common hosts for these ciliates. The genus *Opercularia* includes colonial peritrichs characterized by the presence of basal and lateral stalks that do not contract, and elongated zooids. There are ca. 40 described species of *Opercularia*, most of which live as epibionts on aquatic invertebrates. In the present study, specimens of the genus *Opercularia* were collected from freshwater environments in Rio Grande do Sul state, southern Brazil, as epibionts on the crustacean *Trichodactylus fluviatilis* (collected from a creek in Maquiné Municipality), the aquatic hemipteran *Belostoma* sp. (collected from a rice paddy in Eldorado do Sul) and the naucoridean insect *Cryphocricos granulosus* (collected from rivers Maquiné and Forqueta). Specimens were analyzed *in vivo*, and some were fixed in Bouin's fluid for the application of the protargol staining technique, while others were kept in a cell lysis buffer for DNA extraction, PCR amplification and sequencing of a fragment of the 18S ribosomal DNA. Morphological measurements indicated that the epibionts of *T. fluviatilis* and *C. granulosus* from the Forqueta River were *Opercularia allensi*, while a different, unidentified species of *Opercularia* was attached to *Belostoma* sp. and the *C. granulosus* from Maquiné. In contrast, molecular analyses revealed two well-supported phylogenetic clades that were different from those identified with morphology, raising questions on which criterion should be employed for taxonomic distinction in this group. These results highlight the need for detailed morphological and molecular studies focusing on the genus *Opercularia*, and raise broader taxonomic issues that will be of interest for investigation in other ciliate genera.

**EC04 - Measuring Influences of Aromatic Hydrocarbons in Trophic Relationships Between  
Benthic Free Living Protists, Sampled from Marine Sediments and Marine Bacteria, Sampled  
from Seaweed.**

Bitencourt, J. A. P.<sup>1\*</sup>; Silva, F. S.<sup>2</sup>; Pereira, D. C.<sup>1</sup>; Simões, O. C.<sup>3</sup>; Chequer, L. P. T.<sup>1</sup>; Maciel, M. S.<sup>4</sup>;  
Neto, I. D. S.<sup>3</sup>; Crapez, M. A. C.<sup>1</sup>.

<sup>1</sup>Instituto de Biologia, Departamento de Biologia Marinha, UFF. Niterói, Brasil;

<sup>2</sup>Instituto de Geociências, Departamento de Geologia, UFRJ. Rio de Janeiro, Brasil;

<sup>3</sup>Instituto de Biologia, Departamento de Zoologia, UFRJ. Rio de Janeiro, Brasil;

<sup>4</sup>Museu Nacional, Departamento de Zoologia, UFRJ. Rio de Janeiro, Brasil.

\*jbitencourt@gmail.com

Petroleum was made by a complex of recalcitrant substances. Bacteria have a plastic metabolisms and capacity to form consortiums. When they join a union of inter- and/or intra specific organisms, some recalcitrant substances can be biodegradable. Free-living protist take part of microbial loop, a chain of processes that have some competences, and in one of this is recycling nutrients in water. These protists activities must enhance bacterial biodegradation and they will an energetic linker between bottom and up trophic levels. The aim of this work was to check influences of Light Arabic oil (LA) in bioassays, on 0, 24, 48, 72, 96 hours, including measuring of biofilm length, organic carbon produced by protists (OCP), isolated from three points of Guanabara bay, during interactions with organic carbon produced by hidrocarbonoclastic bacterial consortium (OCB), sampled from *Laurencia obtusa*. It was used ANOVA tests and optical microscope techniques like phase contrast (PH 3 Filter) to measuring biofilm and epifluorescence to measuring OCP and OCB. In all samples was observed, including in samples from bottom of the bay, a Cryptomonadida Senn, 1900. Near a mouth from São Gonçalo's polluted river, it was isolated Scuticociliatida, Small, 1967. Near of entrance of the bay, it was isolated *Euplotes sp.1* and *Euplotes sp.2*. When was included LA, bacteria improve their biofilm from 1.4 to 1.7 µm (0h to 96h) (p<0.05). OCP appeared before 72 h of bacterial incubation in test-tubes. These would showed that low OCP were influenced by bacterial prey resistance and/ or can showed some fragilities during biodegradations process (p<0.05). Bacterial consortium showed more OCB in presence of protists sampled from bay entrance, either in LA presence (p<0.05). That date showed possibility that these protists reduce bacterial substrate competition and this act would auto financed themselves (OCP 235.5 µgC/cm<sup>3</sup>, in 72h without LA).

Supported by: Agência Nacional de Petróleo, Gás Natural e Biocombustíveis (PRH-ANP 11).

### EC05 - *JOENIA ANNECTENS*: A TERMITE GUT FLAGELLATE HARBORING A GREAT PHYLOGENETIC DIVERSITY OF BACTERIAL SYMBIONTS

Strassert, J. F. H.<sup>1</sup>, Radek, R.<sup>1</sup>, Desai, M. S.<sup>2</sup>, Brune, A.<sup>2\*</sup>

<sup>1</sup>Institute of Biology, Free University of Berlin, Königin-Luise-Str. 1–3, 14195 Berlin, Germany.

<sup>2</sup>Max Planck Institute for Terrestrial Microbiology, Karl-von-Frisch-Str., 35043 Marburg, Germany.

\*brune@mpi-marburg.mpg.de

The hindgut of lower termites harbors a multitude of symbiotic microorganisms. The flagellates (parabasalids and oxymonads) are known to degrade the cellulosic food of the termites, but in most cases, the identity and function of the uncultivable prokaryotic symbionts (bacteria and archaea) are completely obscure. This is particularly true for the bacteria associated with the flagellates. Ultrastructural investigations of the parabasalid *Joenia annectens* (from *Kaloterms flavicollis*) showed that this termite flagellate is densely colonized by different morphotypes of ectobiotic and endobiotic bacteria. A phylogenetic analysis of the SSU rRNA allowed the identification of these symbionts. Sub-cellular localization by fluorescence *in situ* hybridization revealed that the ectobiotic bacteria form lineages of Bacteroidales and Spirochaetales, whereas the intracellular symbionts belong to the Endomicrobia. Members of Bacteroidales as well as Endomicrobia apparently play a major role in the flagellate/bacteria symbiosis. The host specificity of these bacteria leads to the assumption that metabolite exchange is responsible for the symbiosis. The hypothesis that these bacterial symbionts are involved in nitrogen metabolism was recently confirmed by complete genome sequence analyses in other studies.

Supported by the DFG.

### EC06 - ROLE OF CILIATED PROTOZOA IN ENERGY TRANSFER THROUGH PLANKTONIC COMMUNITY IN SHALLOW ESTUARINE LAKES

Rychert K.\*, Wielgat-Rychert M., Lauda D., Myszka M.

Institute of Biology and Environmental Protection, Pomeranian University in Slupsk, Poland

\*krychert@wp.pl

Ecological importance of ciliates was estimated in the pelagic zone of very shallow, eutrophic, and estuarine lakes (Gardno and Lebsko, Northern Poland). The authors defined ecological role as fraction of energy bound by primary producers that is transferred through ciliate community. Samples were taken between 2006 and 2008 (Gardno, two years) and in 2007 (Łebsko, growing season only). Abundance, biomass, and composition of ciliate community was analysed under an inverted microscopy in Lugol-fixed samples. Ciliate production was estimated on the basis of literature-derived models relating ciliate growth rate to cell volume and ambient temperature. Primary production was measured with light-and-dark bottles method after 24-hour incubations. High mean annual biomasses of ciliates were observed in both lakes:  $113 \mu\text{g C l}^{-1}$  (Lake Gardno) and  $95 \mu\text{g C l}^{-1}$  (Lake Lebsko, growing season only). In both lakes, ciliate communities comprised of oligotrichs mainly. Peritrichs, prostomatids were of minor importance whereas haptorids and scuticociliatids comprised only few percent of ciliate biomass. Annual, depth-integrated ciliate secondary production corresponded to 10–13 % (Lake Gardno) and 12–15 % (Lake Łebsko) of primary production. Assuming that growth efficiency of ciliate is about one third, food demand of ciliates could amount to 30–45 % of primary production. This range corresponds well with higher estimates noted in other water bodies, however, because of the estimation method, ciliate production should be treated as potential (maximal).

### EC07 - DEPENDENCE BETWEEN VOLUMES OF PROTOPLAST AND LORICA IN LUGOL-FIXED TINTINNID CILIATES

Rychert K.\*

Institute of Biology and Environmental Protection, Pomeranian University in Slupsk, Poland

\*krychert@wp.pl

Relationship between volume of tintinnid loricae and protoplasts was studied on the basis of bulk data derived from samples taken from a range of temperate environments: riverine, lacustrine, estuarine, and marine. Dependence was described by the equation:  $V_L = 2.6 \times V_P + 10233$ , where  $V_L$  and  $V_P$  are volumes [ $\mu\text{m}^3$ ] of loricae and protoplast, respectively. Model was highly significant ( $p < 0.001$ ,  $n = 430$ ,  $R^2 = 0.73$ ). One species, *Helicostomella subulata* was excluded from the calculation and treated separately as this ciliate has a relatively large lorica. Variation that was not explained by the equation could be a result of fixation with acid Lugol solution and also intra- and interspecific differences. The interspecific variation was of rather minor importance comparable to intraspecific variation calculated for the most commonly observed species. Relationship established between lorica and protoplast volumes enables recalculation of incomplete data. Because during growth of tintinnid ciliates significant part of energy is allocated to the construction of lorica, the author discusses usefulness of theoretical models relating growth rate to cell volume for tintinnid production studies. Supported by Polish Ministry of Science and Higher Education (grant N304120434).

### EC08 - THE UNEXPECTED LOCAL DIVERSITY OF HETEROTROPHIC FLAGELLATES AND OTHER NANOEUARYOTES IN THE RIVER DANUBE - A HUGE DIVERSITY OF RARE SPECIES IS EXPLORED.

Kiss, Á. K.\*, Ács, É., Kiss, K. T.

Hungarian Danube Research Station, Institute of Ecology and Botany, Hungarian Academy of Sciences, Göd, Hungary

\*aronkevekiss@yahoo.co.uk

The perspective to access the local diversity of protists has become an important issue of recent diversity researches. The local protistan species diversity is in close connection to functional diversity and ecosystem stability, as well as to conservational biological questions. Our aim was to reveal the species number of heterotrophic flagellates and other small heterotrophic eukaryotes (<30  $\mu\text{m}$ ) in a given volume of river plankton. A single plankton net sample comprising 48 l water was collected from the River Danube above Budapest (Hungary). The sample was cultured without enrichment, and investigated by intensive light microscopic observation with video recording for a 37 day long period. Altogether 183 small heterotrophic eukaryote morphospecies has been detected, including 130 heterotrophic flagellates and other picoeukaryotes, 28 naked amoebae, 11 testaceans and 14 heliozoans. This local species richness highly exceeds the present morphological or clone library-based molecular investigations. Fifty-five species of heterotrophic flagellates (44 %) are undescribed, and likely new for science. Along the whole observational period, 23 flagellate species were represented by only two and 48 species by only one specimen. The probable reason for this high species number is the successful reduction of under-reporting by our method (a species present in a sample but not observed/noticed). Although cautious generalisations can be made from one sample, the results from this random sample suggest the followings. 1. The local diversity of heterotrophic flagellates is much larger than previously reported. 2. The high proportion of new species does not really support the ubiquity model. 3. The total number of morphospecies may be much more than previously thought, a high number of morphospecies is still undescribed in freshwater habitats. 4. In large rivers, besides the abundant species, a huge background diversity exists with a high number of rare species. Supported by GVOP-3.2.1-2004-04-0151/3.0.

**EC09 - PHENOTYPIC VARIABILITY WITHIN TWO DIFFERENT POPULATIONS OF A NEW  
PROTASPIS SPECIES FROM FRESHWATER HABITATS**

Kiss, Á. K.\*, Ács, É., Kiss, K. T.

Hungarian Danube Research Station, Institute of Ecology and Botany, Hungarian Academy of  
Sciences, Göd, Hungary

\*aronkevekiss@yahoo.co.uk

Two different populations of a new *Protaspis* species were investigated in mixed cultures. One population was found in a small shallow pond in the floodplain area of the River Tisza, the other in the plankton of the River Danube (Hungary). Specimens were investigated by high resolution video microscopy. Typical specimens have a broad or elongated oval shape, which is flattened dorsoventrally. A shallow broad ventral groove may be present. The two flagella originate from a common flagellar canal, from a hump, right to the middle line of the cell. The proximal part of the canal is oriented dorsally, and towards right. The two flagella cross each other in the flagellar insertion: the trailing flagellum is erected anteriorly, while the anterior flagellum is erected posteriorly. A large nucleus with 1-3 spheric nucleoli and two nuclear caps is situated posterior to the flagellar insertion. A contractile vacuole is in the left anterior part of the cell. The cell wall is consisted of minute globules attaching closely to each other. Pseudopodia emerge from the ventral surface. Cells wobble very fast and swim above surfaces; the trailing flagellum attaches temporally and partially to the surface. The River Tisza population was characterised by larger (10.9-20.6  $\mu\text{m}$ ), broader and more flattened specimens, being often concave in cross section. They produced pseudopodia frequently, even during swimming. The River Danube population was consisted of smaller (10.8-15.6  $\mu\text{m}$ ), narrower specimens, with a more circular cross section and a convex ventral side. They produced pseudopodia infrequently. Despite the great differences in general appearance, all specimens were common in the position of contractile vacuole (generic trait), nuclear caps (found in many species in the genus), type of the flagellar insertion, position of the nucleus and in the structure of the cell wall (differential characters). Supported by GVOP-3.2.1-2004-04-0151/3.0.

**EC10 - ALLELOPATHY OF DITERPENIDS ON THREE SPECIES OF SOIL CILIATES**

NING Ying-Zhi\*, LIU Han-Cheng, ZOU Tao, WANG Xiao-Jing, MA Zheng-Xue, DING Lan  
College of Life Science, Northwest Normal University, Lanzhou 730070, P. R. China

\*ningyz@nwnu.edu.cn

Allelopathy of diterpenoids extracted from plants of the genus *Robdosia* on three common species of soil ciliates, *Colpoda inflata*, *Colpoda cucullus* and *Euplotes muscicola*, was studied by acute toxicity test, chronic toxicity test and morphological observation. The results of acute toxicity test showed that there was remarkable toxicity of the diterpenoids on the individuals of the three species of ciliates, and there was positive correlation between toxicity and concentration of the diterpenoids ( $p < 0.05$ ). 12h-LC<sub>50</sub> of the diterpenoids on the individuals of *Colpoda inflata*, *Colpoda cucullus* and *Euplotes muscicola* were 161.40mg/L, 94.80mg/L and 83.70mg/L respectively, and 24h-LC<sub>50</sub> were 114.90mg/L, 92.30mg/L and 65.80mg/L separately. The results of chronic toxicity test suggested that there existed significant inhibition of the diterpenoids on population growth of the three ciliated species, and population density and growth rate of the test group was lower obviously than that of the control group, and there was significant negative correlation between population density and growth rate of the three ciliated species and concentration of the diterpenoids ( $p < 0.01$ ). The result of morphological observation indicated that diterpenoids affected the individual form of the three ciliates and made them shorter and thicker, and the higher the concentration of diterpenoids, the greater the affection. Supported by National Natural Science Foundation of China (No. 30470208; 30870273)

### EC11 - A NEW APPROACH TO SEPARATING PROTISTS FROM MARINE SEDIMENTS FOR QUANTITATIVE AND QUALITATIVE INVESTIGATION

Xu Kuidong<sup>\*</sup>, Du Yongfen, Lei Yanli, Dai Renhai  
Institute of Oceanology, Chinese Academy of Sciences, 266071 Qingdao, China  
[\\*kxu@ms.gdio.ac.cn](mailto:*kxu@ms.gdio.ac.cn)

The methodological impediment has long been the main problem in evaluating the ecological role of ciliates and other protists in marine sediments. Percoll density centrifugation is currently the most efficient technique for extracting marine microbenthos from fine-grained sediments, while the high cost and low density of Percoll limit its wide application. We developed a new approach, namely the Ludox-QPS method, which uses Ludox density centrifugation replacing the Percoll method to extract protists and the quantitative protargol stain (QPS) to simultaneously enumerate and identify marine benthic ciliates and other protists. The protocol comprises sample desalinization, extraction with the cheap sol Ludox HS 40, and preparation with the QPS method. The recovery efficacy of Ludox centrifugation was first tested with azoic sandy and muddy sediments, and 94 to 100% recovery of ciliates was obtained. The approach was further tested with natural sandy, muddy-sand and muddy sediments and produced consistently excellent extraction efficiency of on average  $97.6 \pm 0.8\%$  for ciliates and  $97 \pm 1.3\%$  for diatoms, indicating a reliable enumeration for eukaryotic microbenthos. In addition, the method produced high extraction efficiencies of on average 97.3% for total meiobenthos, 97.9% for nematodes and 97.8% for copepods from sands, muddy sands and mud. The high efficiencies indicate the method might allow for simultaneous enumeration of diatom, protozoa and meiobenthos. Moreover, the comparatively high taxonomic resolution of the method, especially for diatoms and ciliates, provides the feasibility of investigating microbial ecology at community level. The advantages of using the method include: (i) reliable and cost-efficient operation; (ii) appropriate density gradients for both micro- and meiobenthos; and (iii) applicability of large samples and routine ecological surveys.

Supported by the Knowledge Innovation Program of Chinese Academy of Sciences (No. KZCX2-YW-417) and the Natural Science Foundation of China (No. 40871128, 40576072, 40706047).

### EC12 - ASSESSMENT OF MARINE CILIATE COMMUNITY AS BIOINDICATOR OF COASTAL WATER POLLUTION

XU Kuidong<sup>1</sup>, CHOI Joong Ki<sup>2\*</sup>, LEI Yanli<sup>1</sup>, YANG Eun Jin<sup>2</sup>, LEE Kyu Chul<sup>2</sup>  
<sup>1</sup>Institute of Oceanology, Chinese Academy of Sciences, Qingdao 266071, China  
<sup>2</sup>Regional Research Center for Coastal Environments of Yellow Sea, Inha University, Incheon 402-751, Korea  
[\\*jkchoi@inha.ac.kr](mailto:*jkchoi@inha.ac.kr)

Ciliates can respond to pollution stress through community degradation. We evaluated marine ciliate community as bioindicator of coastal water pollution in the Yellow Sea based on samples collected from four selected stations during six cruises in summer of 2000. The bioassessment of ciliate communities was also compared with data obtained in winter-spring of the same year. Neither species number in each samples nor abundance had any correlation with the main chemical factors. However, Margalef's, Shannon's, and Simpson's diversity indices all had significantly negative correlation with chemical oxygen demand (COD), dissolved inorganic nitrogen (DIN) and phosphate (DIP) and the eutrophication and chemical evaluation indices. Statistical analyses indicated that Margalef's index was a better indicator of COD pollution than other variables ( $P = 0.0065$ ), while Shannon and Simpson's diversity indices appeared pertinent indicators of eutrophication ( $P = 0.0003, 0.0004$ ) and chemical evaluation indices ( $P = 0.0009, 0.0014$ ). In comparison with other variables, Margalef's index indicated a long-term and integrated monitoring of marine pollution effects and thus generally discriminated the pollution status of the four stations. In addition, the total number of species detected at each of the four stations coincided with the water conditions. Our study indicated the dominant species *Tintinnopsis baltica* and *Favella ehrenbergii* were good indicators of low levels of nutrients/eutrophication, and *Uronema marinum*, on the contrary, a good indicator of high levels of nutrients/eutrophication but low levels of dissolved oxygen. Furthermore, we observed compositional and functional shifts from the algivorous oligotrich/choreotrich ciliate dominance to nonselective-omnivorous gymnostomatid dominance, and then to bacterivorous-detrivorous scuticociliatid dominance along with the increase of eutrophication.

Supported by the Regional Research Center for Coastal Environments of Yellow Sea in Korea (KOSEF-RRC), the Knowledge Innovation Program of Chinese Academy of Sciences (No. KZCX2-YW-417) and the Natural Science Foundation of China (No. 40871128, 40706047).

**EC13 - MORPHOLOGY AND PHYLOGENETIC POSITION OF *BERGERIELLA OVATA* LIU ET AL., 2009 (CILIOPHORA, STICHOTRICHIA, UROSTYLA), WITH A BRIEF OVERVIEW OF THE CONVERGENT EVOLUTION OF THE MIDVENTRAL PATTERN WITHIN THE SPIROTRICHEA**

Liu, W.<sup>1</sup>, Shao, C.<sup>2</sup>, Gong, J.<sup>1,3\*</sup>, Li, J.<sup>1</sup>, Lin, X.<sup>1</sup>, Song W.<sup>1,2</sup>

<sup>1</sup>Laboratory of Protozoology, South China Normal University, Guangzhou, China

<sup>2</sup>Laboratory of Protozoology, Ocean University of China, Qingdao, China

<sup>3</sup>Department of Zoology, the Natural History Museum, London, UK

\* jgong@126.com

The morphology, infraciliature, morphogenetic events and small subunit ribosomal RNA (SSU rRNA) gene-based phylogeny of a stichotrichous ciliate, *Bergeriella ovata* Liu et al., 2009, found in coastal waters off Daya Bay, Guangdong, south China, were investigated. These species has an atypical midventral pattern and are characterized by several rather unusual morphological features: frontal cirri forming an irregular tricorn; one non-migratory row located right of the midventral rows, which is morphogenetically derived from the posteriormost FVT-streak; possessing the conspicuously enlarged postoral ventral cirri, whereas the left ventral cirri are delicate and arranged in oblique rows. Based on both the morphological and morphogenetical data, a family, Bergeriellidae Liu et al., 2009, was proposed. In the SSU rRNA phylogenetic trees, *B. ovata* groups with the classic urostylids (urostylids s. str.) with high nodal supports. Our phylogenetic analyses have revealed at least seven separate clades for midventral-pattern-bearing taxa (e.g. *Pattersoniella*, *Neokeronopsis*, *Rigidothrix*, urostylids s. str., Uroleptidae, Holostichidae + Psammomitridae, and Pseudoamphisiellidae), suggesting that the order Urostylida Jankowski, 1979 sensu Lynn, 2008 is a polyphyletic assemblage, and that the convergent evolution of the urostylid midventral pattern might have occurred more times among the spirotrichs than previously recognized.

Supported by NSFC and a Marie Curie Fellowship to J. G.

**EC14 - Night and Day Morphologies in a Planktonic Dinoflagellate**

John R. Dolan

Microbial Ecology and Biogeochemistry, Laboratoire d'Océanographie de Villefranche, UMR 7093 CNRS Université Paris6, Station Zoologique, B.P. 28, 06230 Villefranch sur-Mer, France, dolan@obs-vlfr.fr

We describe diurnal changes in the morphology of the planktonic dinoflagellate *Ceratium ranipes*. The species is distinguished by the remarkable appendages, known as toes or fingers protruding from its horns. Varieties have been described based on the characteristics of the fingers. We discovered that cultures, maintained on a 12:12 photoperiod, when examined during the dark period were composed of 'finger-less' cells. Monitoring of isolated cells revealed a diurnal cycle of changes in morphology with daytime cells showing appendages, well-stocked with chlorophyll and the loss of the fingers at the end of the photoperiod. Sampling the Bay of Villefranche, we found similar trends in a natural population at night and during the day.

**EC15 - THE CILIATE *VORTICELLA OCEANICA* ZACHARIAS, 1906 (CILIOPHORA, PERITRICHIA) EPIBIONT ON THE MARINE PLANKTONIC DIATOM *CHAETOCEROS COARCTATUM* LAUDER, 1864 FROM THE COAST OF BRAZIL**

Dias, R.J.P.<sup>1\*</sup>, Silva-Neto, I.D.<sup>1,2</sup>, Utz, L.R.P.<sup>3</sup> & Simões, O.C.<sup>1</sup>

<sup>1</sup>Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.

<sup>2</sup>Centro de Biologia Marinha/CEBIMAR, Universidade de São Paulo, São Paulo, Brasil.

<sup>3</sup>Faculdade de Biociências, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, Brasil.

\*rjuniodias@hotmail.com

The marine peritrich ciliate *Vorticella oceanica* Zacharias, 1906 has previously been recorded attached to *Chaetoceros* spp. in many parts of the world. During a survey of planktonic ciliates collected from the coast of São Sebastião, São Paulo, Brazil, we found *V. oceanica* colonizing *Chaetoceros coarctatum*. The main objective of the research was to provide a morphological characterization of a Brazilian strain of *V. oceanica* based on light and scanning electron microscopic examinations. Plankton material was collected on April 2006 using a 20- $\mu$ m plankton net. These samples yielded large numbers of *C. coarctatum* infested by vorticellids. Some of the ciliates were photographed *in vivo* using a microscope equipped with DIC and others were fixed in Bouin's fluid for

protargol staining, or preserved in glutaraldehyde for SEM examination. Conical zooids of the Brazilian strain of *V. oceanica* ranged in size from 17-33  $\mu\text{m}$  (mean 32  $\mu\text{m}$ ) *in vivo*. A single contractile vacuole and the micronucleus lie in the upper half of the cell body. The macronucleus is vermiform and usually J-shaped. The diameter of the peristomial collar measures 40mm on average. The stalk (100-188  $\mu\text{m}$  long) presents a conspicuous adhesive disc. The ciliature of *V. oceanica* was typical of sessile peritrichs, the peristomial region comprises an inner polykinety and an outer haplokinety. The three peniculi consist of three rows of kinetosomes. The aboral ciliary wreath encircles the zooid in the posterior region. Scanning electron microscopy revealed the absence of striations and pores on the surface of the zooid. The overall morphology of the Brazilian strain of *V. oceanica* is very similar to that of the Japan population studied by Nagasawa & Warren (1996), so we considered both conspecific. Nevertheless, in the Brazilian strain striations on the pellicle were not observed with scanning electron microscopy.

Supported by CAPES, CNPq, FAPERJ and FAPESP.

#### **EC16 - LONGITUDINAL CHANGE IN THE CILIATE ASSEMBLAGE AND SAPROBIC EVALUATION OF WATER QUALITY IN AN URBAN STREAM IN BRAZIL**

Dias, R.J.P.<sup>1\*</sup>, Wieloch, A.H.<sup>2</sup>, Silva-Neto, I.D.<sup>1</sup>, D'Agosto, M.<sup>3</sup>

<sup>1</sup>Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.

<sup>2</sup>Departamento de Zoologia, Universidade Federal de Minas Gerais, Belo Horizonte, Brasil.

<sup>3</sup>Departamento de Zoologia, Universidade Federal de Juiz de Fora, Juiz de Fora, Brasil.

\*rjunodias@hotmail.com

Ciliated protozoans are an important component of the benthos of freshwater environments. In recent years many studies have examined the composition, distribution and dynamics of ciliate communities in lotic systems, as well as their value as water quality indicators. Ciliated protozoa were collected from five stations during one year from water-sediment interface of an urban stream of southeast Brazil. Two stations were located in a rural region and receives a low sewage charge, while others three stations are located in considerably populated regions, receiving high sewage loads. Five parameters of the water samples were evaluated: dissolved oxygen concentration, conductivity, pH, temperature and bacterial density. A total of 42 species of ciliates were found. Their distribution and abundance varied greatly along the stream. Community structures were analysed using some statistical methods and this allowed the determination of similarities among stations and relationships between species and stations. The saprobic index and valency methods were used to evaluate the water quality at the five stations. A marked change in the ciliate community was observed between stations located in rural region and stations located in urban region being influence by organic pollution. The stations in rural region were composed mainly of  $\beta$ -mesosaprobic species, typical of moderately polluted waters, while stations in urban region were composed mainly of  $\alpha$ -mesosaprobic and polysaprobic species, typical of very heavily polluted waters. Our results suggest that the organic pollution influence the composition and structure of ciliate assemblage in São Pedro stream, Juiz de Fora city, Brazil. The combination of the biological indicators and physical-chemical analyses therefore proved itself to be an efficient method of evaluating water quality, and has excellent potential to support decisions on the conservation of headwaters and recuperation of degraded environments in lotic systems. Supported by FAPEMIG and CAPES.



**EC17 - The study on the morphology of *Fabrea salina*, heterotrich ciliate, and its occurrence in the salt pond.**

Joong Ki Choi<sup>1\*</sup>, Hongwei Ma<sup>2</sup>, Hyun Pyo Hong<sup>1</sup>, Yanli Lei<sup>3</sup> and Sun Young Kim<sup>1</sup>

<sup>1</sup>Department of Oceanography, Inha University, Incheon 402-751, Korea

<sup>2</sup>Department of Coastal Sciences, the University of Southern Mississippi, Ocean Spring, MS 39564, USA

<sup>3</sup>Institute of Oceanology, Chinese Academy of Sciences, 266071 Qingdao, China

Heterotrich ciliate, *Fabrea salina* Henneguy, 1890, occurred in the range 58--311 psu of salinity in a solar saltern of the Yellow Sea. *Fabrea salina* dominated in the ciliate community of crystallization ponds which has high salinity range from 82.2 to 311 psu, showing maximum abundance of  $181.02 \times 10^3$  cells  $\ell^{-1}$  at high salinity of 147.6 psu. The morphology and morphogenesis of this Korean population of *Fabrea salina* were investigated using pyridine silver carbonate and protargol impregnation. The organism is very large, pear-shaped and densely covered with cilia. Cilia in somatic and buccal field are clearly distinguishable. The highly developed adoral zone of membranelles (AZM) is characterized by a deep spiral invagination. The paroral membrane (PM) is short and locates along the AZM into the cytostome, C-shaped macronucleus exhibits obvious polymorphism during the binary division. The cyst is covered with a thick mucoid sheath. The cyst wall is made up of two layers, of which the ecotocyst is more hyaline and thicker than that of endocyst. A hyaline plug is present at one side of the cyst. Before encystment the organism attaches to the substrate, and then part of its basal bodies in somatic and oral apparatus is resorbed. The somatic kineties in both dividers are derived from the parental oral apparatus is inherited by the proter, and no reorganization is observed in the old oral ciliature.

This work was supported by the Korea Research Foundation through the BrainKorea(BK)21 Industrial Biotechnology & Marine Resources Center in Inha University.

**EC18 - Spatial distributions of microbial communities in various sediments with special reference to ciliates**

Lei, Y.L. <sup>1,2\*</sup>, Stumm K. <sup>3</sup>, Wickham, S.A. <sup>1</sup>, Berninger, U.-G. <sup>1</sup>

<sup>1</sup> Universität Salzburg, FB Organismische Biologie, A-5020 Salzburg, Austria

<sup>2</sup> Institute of Oceanology, Chinese Academy of Science, 266071 Qingdao, PR China

<sup>3</sup> Alfred Wegener Institute for Polar and Marine Research, Am Handelshafen 12, 27570 Bremerhaven, Germany

\*leiyanli@qdio.ac.cn

The quantitative importance of micro- and meiofauna and composition of ciliate communities were spatially studied in various (marine, brackish and freshwater) sediments. There were large differences in ciliate species composition among sites. The occurrence of dominant ciliates and their allocation to feeding types indicated that herbivory was the most common and important feeding strategy, while the importance of bacterivory varied significantly among sediments. Statistical results suggested that chlorophyll *a* concentrations were more important in regulating ciliate diversity and micro- and meiofauna biomass than abiotic factors such as temperature and salinity. The abundance and biomass of micro- and meiofauna varied greatly among sites, usually, ciliates dominated in terms of abundance but meiofauna contributed most of the biomass. Based on biomass ratios and estimated weight-specific metabolic rates, ciliates accounted for about 34% of the estimated metabolic rate of the micro- and meiobenthic consumers in the respective sediments. The importance of ciliates in benthic microbial food webs and the potential ecological significance of cysts are discussed.

Supported by the Knowledge Innovation Program of CAS under Grant (No. KZCX2-YW-417) and the National Science Foundation of China (Nos. 40706047, 40576072).

## EC19 - Diversity and distribution of agglutinated foraminifera in the Yellow Sea and East China Sea

Lei, Y., Zheng, S. Xu, K. \*

Institute of Oceanology, Chinese Academy of Sciences, 266071 Qingdao, PR China

\*kxu@qdio.ac.cn

The specific faunal trends and non-specific faunal trends of benthic foraminifera can serve as indicators of ocean environments. We studied the diversity and distribution of benthic agglutinated foraminifera based on sediment samples collected from the Yellow Sea and East China Sea. The distribution of foraminifera showed distinct patterns which matched well with the locations and characters of ocean current and continental shelf in these sea areas. *Polskiammina asiatica* and *Rotalidium annectens* are the typical inner continental shelf species; *Textularia foliacea* is typical inner to middle continental shelf species; *Trochammina globigeriniformis*, *Martinotiella minuta*, *Martinotiella communis* and *Eggerella bradyi* are typical outer continental shelf species. The following species are considered as typical cold water species found in the cold water mass of northern region of the Yellow Sea: *Pseudobolivina torquata*, *Reophax communis*, *Pseudobolivina antarctica*, *Spiroplectammina typica*, *Spiroplectammina biformis* and *Cuneata arctica*. In contrast, *Ammobaculites catenulatus* and *Siphogaudryina huanghaiensis* were considered as endemic species in the southern region of the Yellow Sea.

Supported by the Knowledge Innovation Program of CAS under Grant (No. KZCX2-YW-417) and the National Science Foundation of China (Nos. 40706047, 40576072).

## EC20 - CILIATE FEEDING BEHAVIOUR IN A WARM-MONOMIC TIC HYPOSALINE LAKE WITH AN ANOXIC HYPOLIMNION: AN EXPERIMENTAL AND VACUOLE CONTENT ANALYSIS APPROACH

Macek, M. <sup>1,2\*</sup>, Bautista-Reyes, F. <sup>1</sup>, Fermani, P. <sup>3</sup>, Martínez-Pérez, M.E. <sup>1</sup>

<sup>1</sup>Facultad de Estudios Superiores Iztacala, Universidad Nacional Autónoma de México, Tlalnepantla, México

<sup>2</sup>Institute of Hydrobiology, Biology Centre v.v.i., České Budějovice, Czech Republic

<sup>3</sup>Instituto Tecnológico de Chascomús, Chascomús, Argentina

\*mirek@campus.iztacala.unam.mx

A ciliate assemblage structure, picoplankton feeding and growth in distinct layers was analysed in a high altitude, athalassohaline maar-crater lake Alchichica, Mexico (18°10'N; 93°10' W, altitude 2340 m). DAPI, Quantitative Protargol Staining and CARD-FISH protocols were used for ciliate counting, identification and estimation of food selection, respectively. Growth rates of ciliates were evaluated in fractionated samples, put in dialysis bags and exposed at different layers. Autotrophic picoplankton feeding peritrichs (mainly *Pelagovorticella natans* and *Vorticella aqua-dulcis* complex) and scuticociliates (*Cyclidium glaucoma*) often numerically dominated the ciliate assemblage; their growth was not significantly affected by the sample transplantation to a different layer. However, ciliates typical for well established thermocline/oxycline below 26 m, mixotrophic *Euplotes* cf. *daidaleos* and *Pelagothrix* sp., grew significantly better being exposed at the upper metalimnion layer with considerable photosynthesis-active radiation (PAR) even though below 1 %. Among bacteria (EUB probe) found in ciliate vacuoles, significant feeding selection against Alfa-Proteobacteria (including genus *Paracoccus*) was proven typically in the oxycline (comparing to the water layer bacterial group composition), meanwhile in hypolimnion, supposing symbiotic sulphate-reducing bacteria (SBR) were observed in the present haptorids (*Phialina* sp., *Pelagolacrymaria* sp.). Archaea were observed in strictly anaerobic ciliates (e.g., *Caenomorpha* sp., *Isocyclidium globosum*) however, not dominating. Episymbionts of *I. globosum* have not been identified, yet, but they were stained with bacterial probe (EUB). Possible nucleus symbionts visualised in the samples should be studied in following research. Generally, a selective behaviour of ciliates was confirmed throughout the transition layer – metalimnion - with both PAR and dissolved oxygen gradients; within the mixed water column, a selection was not apparent.

Supported by projects CONACYT 52387 and PAPIIT IN207206; F. Bautista was supported with CONACYT scholarship for PhD Thesis; P. Fermani stay was partly supported from the project IN207206.

## EC21 - DIVERSITY OF CILIATES IN TANKS OF BROMELIADS FROM SOUTHERN BRAZIL

Hrycai, R.R.\*, Utz, L.R.P., Mondin, C.A.  
 Faculdade de Biociências, Pontifícia Universidade Católica do Rio Grande do Sul, Brazil  
 \*Hrycai@yahoo.com.br

Ciliates have been found in a variety of environments such as fresh and salt water, soil, and the digestive tract of animals; however, their diversity is poorly known. Few studies, until now, have focused on the biodiversity of ciliates in the water cisterns of bromeliads, and these are generally based on a single sampling without identification of the bromeliad species. However, these investigations have shown that the diversity of ciliates in bromeliads is very high, including genera and species new to science. In the present study we surveyed the ciliate community present in the tanks of four bromeliad species (*Vriesea platynema*, *V. platzmannii*, *Aechmaea nudicaulis*, and *A. gamosepala*) found in three municipalities (Dom Pedro de Alcântara, Arroio do Sal, and São Francisco de Paula) in Rio Grande do Sul state, southern Brazil. The ciliates were analyzed *in vivo* using a compound microscope and identified to genus level, when possible. In *Vriesea platynema* from São Francisco de Paula we found *Cyclidium sp.*, *Paramecium sp.*, *Colpidium sp.*, *Glauconema sp.*, *Tetrahymena sp.*, and *Bursaria sp.*, while in *V. platzmannii* from Arroio do Sal *Vorticella sp.*, *Spirostomum sp.*, *Dileptus sp.*, and unidentified species of hymenostomes were present. *Aechmea nudicaulis* from Dom Pedro de Alcântara presented a ciliate community composed by *Stentor sp.*, *Spirostomum sp.*, *Paramecium sp.*, *Colpoda sp.*, as well as by unidentified species of hymenostomes, while *Spirostomum sp.*, *Dileptus sp.*, *Urostyla sp.*, *Stentor sp.*, *Paramecium sp.*, *Glaucoma sp.*, and *Litonotus sp.* were found in *A. gamosepala* from the same municipality. In addition to ciliates, we also found unidentified species of flagellates and amebas. Metazoans including copepods, copepod nauplii and the rotifer *Phylodina* were also present. These preliminary results revealed that more detailed studies are needed to know the real diversity of ciliates and other organisms that inhabit the tanks of bromeliads.

## EC22 - SPATIAL AND TEMPORAL PATTERNS OF PROTOZOAN COMMUNITIES AND RESPONSES TO ENVIRONMENTAL CONDITIONS IN SONGHUA RIVER, NORTHEAST CHINA

Tan, X.<sup>1,3</sup>, Shi, X.<sup>1,3\*</sup>, Liu, G.<sup>1</sup>, Xu, H.<sup>2</sup>, Wang, L.<sup>3</sup>

<sup>1</sup>College of Life & Environmental Sciences, Hangzhou Normal University, Hangzhou 310036, P. R. China.

<sup>2</sup>Laboratory of Protozoology, KLM, Ocean University of China, Qingdao 266003, P. R. China.

<sup>3</sup>School of Life Science, Harbin Normal University, Harbin 150026, P. R. China.

\*shixl56@163.com

Spatial and temporal variations of protozoan communities and the responses to environmental conditions were studied from March to December, 2003 in Songhua River northeast China. Samples of protozoa communities were obtained at four stations, i.e. Hulan Estuary, Zhushun County, Dading Mountain and Ashi Estuary, by PFU (polyurethane foam unit) method over a year. Water samples also were taken from the stations for the water chemical quality analysis. A total of 12 sampling events were monthly carried out at each station. Physico-chemical parameters (e.g. water temperature, DO, pH, BOD<sub>5</sub>, COD, N-NH<sub>3</sub>, suspension, total cyanide, N-NO<sub>3</sub>, N-NO<sub>2</sub>) were measured synchronously. A total of 78 species were identified comprising 24 ciliates, 45 flagellates, 9 sarcodines, accounted for about 30.77%, 57.69% and 11.54% percent of the total respectively. The abundance and biomass reached the highest peak in May in four stations with the order of Hulan Estuary > Zhushun County > Dading Mountain > Ashi Estuary. The results of cluster analyses revealed that the spatial patterns of protozoan communities of the station Dading Mountain and Hulan Estuary represented high similarity comparing to that of the station Ashi Estuary, whereas the patterns in the station of Zhushun County were different from these in three other stations. It also reveals that the protozoan Margalef diversity index is significantly correlated with water temperature except the station Hulan Estuary, while the protozoan abundance/biomass is significantly correlated with COD and BOD<sub>5</sub>. It suggests that the most important environmental factors associated with the variations of protozoan communities in Songhua River are water quality rather than the seasonal factors. The results demonstrate that protozoa are helpful bioindicator of water quality in flowing river systems.

Supported by the NSFC (project no. 30670222) and State Key Laboratory of Freshwater Ecology and Biotechnology, Chinese Academy of Sciences (No.2009FB11).

**EC23 - Seasonal dynamics of a highly diverse protist community from a pristine peat bog**Lara, E. <sup>a, b, c, d</sup>, Mitchell, E.A.D. <sup>b, c, d</sup>, Moreira, D. <sup>a</sup>, López García, P. <sup>a</sup><sup>a</sup> Unité d'Ecologie, Systématique et Evolution, UMR CNRS 8079, Université Paris-Sud, bâtiment 360, 91405 Orsay Cedex, France.<sup>b</sup> Swiss Federal Research Institute WSL, Wetlands Research Group, Lausanne, Switzerland<sup>c</sup> École Polytechnique Fédérale de Lausanne (EPFL), Laboratory of Ecological Systems, Station 2, Lausanne, Switzerland<sup>d</sup> University of Neuchâtel, Institute of Biology, CH-2009 Neuchâtel, Switzerland**Keywords:** peat bog, eukaryotic diversity, novel clades, clone library, seasonal patterns

Culture-independent molecular methods based on the amplification, cloning and sequencing of small-subunit ribosomal RNA genes (SSU rDNAs) are a powerful tool to study the diversity of unicellular microorganisms. Despite so, the eukaryotic microbial diversity of many ecosystems, including peatlands has not yet received much attention. We analysed the eukaryotic diversity by molecular surveys in water from the centre of a pristine *Sphagnum*-dominated peatland in the Jura Mountains of Switzerland during a complete seasonal cycle. The clone libraries constructed from five different temporal samplings revealed a high diversity of protists with representatives of all major eukaryotic phyla. In addition, four sequence types could not be assigned to any known high-level eukaryotic taxon but branched together with a rather good support, raising the possibility of a novel, deep branching eukaryotic clade.

The analysis of seasonal patterns of sequence types showed a clear change in the eukaryotic communities between the warm period (late spring and summer) and the cold period (autumn and winter). Chrysophytes typically dominated the samples from the cold period while testate amoebae (Arcellinida and Euglyphida) and a few other groups peaked in summer. Some sequence types including a cryptomonad and a perkinsean showed bloom-like dynamics.

**EC24 - Ciliated protozoans (Protozoa: Ciliophora) from Cojimar river, Havana city, Cuba: ecological notes.****Ymas, G. I.**<sup>1\*</sup>, **Prieto, T.D.**<sup>2</sup><sup>1,2</sup> Havana University, 25, # 455, Vedado, Havana city, Cuba.

\*isa@fbio.uh.cu

The role of ciliated protozoans as consumers of bacteria and organic matter, makes them good models to study and predict the effects of contaminants on aquatic environments. Cojimar river is one of the most contaminated rivers from Cuba and lacks from biondication and ciliate protozoans studies. The goals of our study were to characterize ciliate communities taking in account taxonomic composition, similarity between stations, apparition frequency and trophic structure; to establish the relation between ciliate communities and chemical oxygen demand (COD) values and to determine saprobic index as a measurement of contamination's level. It was registered 49 species of ciliate protozoans for the first time in the river. More representative orders were Hypotrichida, Hymenostomatida and Peritrichida. Similarity values between sampling station were low. *Cyclidium glaucoma* y *C. citrullus* were registered as constants species while *Vorticella convallaria* was registered as accidental one. Bacterivorous species dominated. There was a positive correlation between COD values and species richness. Most of the species were  $\alpha$ -mesasaprobic. Saprobian indexes corresponding to the III category of quality (it corresponds with water strongly polluted with organic matter). The characteristics of ciliate protozoans communities besides its relationship with COD, reflected the heavy pollution present in the river. The importance of ciliates as bioindicator was corroborated.

Key words: ciliates, contamination, Cojimar.

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## EC25 - INFLUENCE OF ORGANIC POLLUTION ON DISTRIBUTION OF EPIBIONT PERITRICH CILIATES IN A LOTIC SYSTEM OF SOUTHEAST BRAZIL

Cabral, A. F.<sup>1\*</sup> Dias R. J. P.<sup>2</sup>, Oliveira, V.C.<sup>1</sup>, Alves, R. G.<sup>1</sup>, D'Agosto, M.<sup>1</sup>.

1. Departamento de Zoologia, ICB, Universidade Federal de Juiz de Fora, Minas Gerais, Brasil.

2. Departamento de Zoologia, CCS, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.

\*adalgisacabral@hotmail.com

With the objective to evaluate the influence of organic pollution on spatial distribution of epibiont peritrich ciliates attached to chironomid larvae in a urban lotic system of Brazil, were investigated rural and urban areas of a stream located at Juiz de Fora count, Minas Gerais, Brazil. Were made 12 collections at five sampling stations along the stream, being two of them located at the rural area where receive a low sewage load and three sampling stations located in a heavily populated urban area and receive high sewage loads. Was observed epibiont ciliates *Rhabdostyla chironomi* colonizing chironomid larvae from genus *Chironomus* gr. *decorus* only at the sampling stations located at the urban area, however, this larvae has been found in all sampling stations, what reinforce the hypothesis that peritrich ciliates have preference for locations with high concentration of organic matter. There was a statistic difference of mean values of physical-chemical parameters between the rural and urban area, where the higher values of parameters that indicate organic pollution were observed at sampling stations located at urban area, what denotes the high degree of pollution of this region. This fact was confirmed through chironomid fauna analysis, where were observed a greater number of taxa that are sensitive of pollution at the rural sampling stations, while at urban ones, the most representative larvae was *Chironomus* gr. *decorus*, that is tolerant of organic pollution. There was a statistic correlation between bacterial density and prevalence of infestation by epibionts at the urban sampling stations, S3 ( $p=0.0322$ ;  $rs=0.353$ ), S4 ( $p=0.002$ ;  $rs=0.121$ ), and S5 ( $p=0.0295$ ;  $rs=0.233$ ). The results of this study confirm the potential of epibiont peritrich ciliates as indicators of water quality in lotic ecosystems and instigate the development of more studies in others tropical lotic systems.

Supported by FAPEMIG.

## EC26 - TEMPORAL AND SPATIAL DISTRIBUTION OF TINTINNIDS (CILIOPHORA, SPIROTRICHA) IN THE GUANABARA BAY (TROPICAL EUTROPHIC BAY)

CAVALCANTE-JUNIOR, A.C.<sup>1\*</sup>, SILVA-NETO, I. D.<sup>1</sup> & SIMÕES, O. C.<sup>1</sup>

<sup>1</sup>Departamento de Zoologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil.

\*accjr@biologia.ufrj.br

The tintinnids ciliates are ubiquitous in marine environmental. In order to study the temporal variation of planktonic ciliates were performed 12 monthly sampling, from February 2005 to January 2006 from Guanabara Bay (Urca, Paquetá and Ramos). To estimate the spatial distribution of tintinnids were done 10 samples in January 23, 2006 in the sites Urca, Paquetá, Ramos and seven additional sites. The samples were collect from Guanabara Bay with a van Dorn bottle, fixed with sodium tetraborate buffered formaldehyde with 2% final concentration and counting in inverted microscopy. The tintinnids abundance ranging from 0 to 2920 Ind/ L and average 42.9 ( $\pm 203$ ) Ind/L, in amount of 15 species, meanly represented to *Helicostomella longa* (60.4%), *Favella ehrenbergii* (11.47%), *Eutintinnus lusus-undae* (10.53%) and *Tintinnopsis beroidea* (5.93%) making up 88.3% of tintinnid assemblage. *H. longa* was sampled with great frequency and abundance in Urca. The spatial distribution of *H. longa* was more representative in bay entrance sites. *F. ehrenbergii* was more abundant in Paquetá with greater frequency in Urca, was prevalent in inner sites of study area in contrast with outer areas, located close to bay entrance. *E. lusus-undae* was sampled with frequency and in great number in Urca, fewer representatives in Paquetá. *Tintinnopsis beroidea* was recorded, with higher frequency in Urca and Ramos instead of Paquetá. From *Tintinnopsis* genera, the most abundant, were recorded five species (33.3 %), *Metacylis*, three species (20%), and *Eutintinnus* and *Sapingella* (13.3%), two species each one. The eutrophization seems to limits the distribution of several species, as well as changes in the ambient conditions, such as low the salinity and water turbidity, hampering the survival of majority of species of tintinnids. The dominance of such species is probably due to your tolerance to environmental variations.

Supported by CAPES, CNPq and FAPERJ.

## EC27 - FACTORS DRIVING THE ABUNDANCE OF PLANKTONIC FLAGELLATE COMMUNITY IN THE UPPER PARANA RIVER FLOODPLAIN

Segovia, B. T.<sup>1\*</sup>, Pereira, D. G.<sup>1</sup>, Velho, L. F. M.<sup>1</sup>, Lansac-Tôha, F. A.<sup>1</sup>  
<sup>1</sup>Nupelia/PEA, Universidade Estadual de Maringá, Paraná, Brasil.  
 \*biaologa@hotmail.com

Floodplains have strongly marked seasonality and provide various habitats which have specific dynamics, including lentic and lotic environments. In this study we examined how the flood cycle and the spatial heterogeneity influence the density and biomass dynamics of pigmented and heterotrophic planktonic flagellates. The samples were taken during two distinct hydrological periods (limnophase and potamophase) in environments with different hydrodynamics and connectivity (rivers, channels, connected and disconnected lakes) in the upper Paraná River floodplain (Brazil). There were significant differences in abundance of flagellates among environments and between periods. However, the significant interaction (two-way ANOVA) evidenced that these differences depended on the environments and the periods studied. Thus, difference between environments was observed only during limnophase, with the greatest flagellates abundance recorded in connected and disconnected lakes. Between periods, in general, higher abundances were observed during the limnophase in lentic environments, whereas in lotic environments, flagellates were more abundant during the potamophase. Important abiotic and biotic variables related to the flagellates variability between periods and environments were ciliates, nitrogen, phosphorus, chlorophyll and temperature. The lack of differences in the abundance of planktonic flagellates among environments during the potamophase evidenced the importance of the flood as a homogenization factor driving aquatic community structure in river-floodplain systems. On the other hand, the limnophase period was marked by spatial heterogeneity, mainly related to the hydrodynamics of the system, which seems to be another important factor that drives flagellate abundances.

Supported by CNPq/PELD, CAPES and Nupelia.

## EC28 - STRUCTURE AND DYNAMICS OF PLANKTONIC CILIATES COMMUNITY IN A RIVER-FLOODPLAIN SYSTEM

Pauleto, G. M.<sup>1</sup>, Velho, L. F. M.<sup>1\*</sup>, Buosi, P.R.B.<sup>1</sup>, Lansac-Tôha, F. A.<sup>1</sup>  
<sup>1</sup> Universidade Estadual de Maringá - Nupelia/PEA, Maringá, PR, Brazil.  
 \*felipe.velho@gmail.com

In freshwater ecological researches the importance of protozoa is underestimated when compared to other organisms. However, the ciliate community, for instance, usually shows clear structural changes in response to environmental alterations, and it could be an useful resource to better understand freshwater ecosystems. In the present study we investigated spatial and seasonal patterns of planktonic ciliates richness and abundance in the Upper Paraná river floodplain, MS – Brazil. Samplings were carried out in 12 environments (lotic and lentic) during two hydrological periods (potamophase and limnophase). A total of 61 species were recorded, among them, 18 exclusive for the potamophase and 14 for the limnophase. *Balanion planctonicum* was the dominant specie in the floodplain, during the potamophase, whereas the most important species in the limnophase was *Tintinnidium* sp. This species was also the most abundant for the whole studied periods. Ciliates richness and abundance were significantly higher in lentic environments, during the limnophase. On the other hand, during the potamophase those attributes showed intermediate values in both lotic and lentic environments. Finally, restating the seasonal differences in the ciliates community structure, a detrended correspondence analysis showed two distinct groups of species in the studied environments, related to the hydrological periods. The species *Cyclidium glaucoma*, *Cyrtolophosis mucicola* and *B. planctonicum* were describers of the potamophase, whereas *Coleps hirtus*, *Ctadoctema acanthocryptum* and *Tintinnidium* sp. were describers of the limnophase. Results pointed the flood pulse as a homogenizer factor for the ciliates communities attributes, in addition to determining changes in species dominance in the floodplain.

Supported by CNPq/PELD, CAPES and NUPELIA

## EC29 - CHANGES IN PLANKTONIC CILIATE COMMUNITY IN A FLOODPLAIN LAKE: RESPONSE TO THE FLOOD PULSE

Pauleto, G. M.<sup>1</sup>, Buosi, P.R.B.<sup>1</sup>, Velho, L. F. M.<sup>1\*</sup>, Lansac-Tôha, F. A.<sup>1</sup>  
<sup>1</sup> Universidade Estadual de Maringá - Nupelia/PEA, Maringá, PR, Brazil.  
 \*felipe.velho@gmail.com

The objective of this study was to evaluate temporal (limnophase and potamophase) and vertical (surface, middle and bottom) changes in ciliates community composition, richness and abundance in a lake (Guaraná Lake) of the Upper Paraná River floodplain (Brazil). To achieve this objective, lake water was sampled monthly (March 2007-February 2008), in triplicates, from the surface, bottom and intermediate layer of the water. A total of 112 species belonging to 13 orders was identified. Among them, the more representative orders, in number of species, were Prostomatida and Hymenostomatida. The first one dominated in the surface and intermediate water layers, and during the limnophase months, whereas the second presented the greatest number of species near the bottom and during the potamophase. Considering richness and abundance, the greatest values were, in general, observed during the limnophase months, and mainly near the bottom of the water. Among the recorded species, *Ballanion planctonicum* and *Tintinidium* sp. were the most abundant which changed dominance between studied periods. Thus, *B. planctonicum* predominated during the potamophase, whereas *Tintinidium* sp. was more abundant during the limnophase. Although vertical differences have been observed, the main changes in community structure, as well in water quality, were observed between limnophase and potamophase, suggesting the effect of flood pulse as the main factor structuring planktonic ciliates communities in the Paraná River floodplain lakes. Supported by CNPq/PELD and NUPELIA

## EC30 - Intercontinental dispersal of relatively large Hyalospheniidae morphospecies (Amoebozoa: Arcellinida) as inferred from CO1 sequences

Heger, T.J.<sup>1,2,3,4,5\*</sup>, Pawlowski, J.<sup>2</sup>, Lara, E.<sup>1,3,4</sup>, Leander, B.S.<sup>5</sup>, Mitchell, E.A.D.<sup>1,3,4</sup>

<sup>1</sup> WSL, Swiss Federal Institute for Forest, Snow and Landscape Research, Ecosystem Boundaries Research Unit, Wetlands Research Group, Station 2, CH-1015 Lausanne, Switzerland

<sup>2</sup> Department of Zoology and Animal Biology, University of Geneva, Sciences III, CH-1211 Geneva 4, Switzerland

<sup>3</sup> École Polytechnique Fédérale de Lausanne (EPFL), Laboratory of Ecological Systems, Station 2, CH - 1015 Lausanne, Switzerland

<sup>4</sup> Institute of Biology, University of Neuchâtel, CH-2009 Neuchâtel, Switzerland

<sup>5</sup> Departments of Botany and Zoology, University of British Columbia, Vancouver, BC, Canada V6T 1Z4

\*thierry.heger@epfl.ch

The biogeography of microorganisms is of great importance to the use of testate amoebae as paleobioindicators on a global scale and for diversity estimations. There is a controversial debate whether free-living protists are cosmopolitan or whether at least some species have limited geographical distributions. An often-cited example of the latter case is a terrestrial testate amoeba of the Arcellinida group, *Apodera vas*, which has thus far only been found in the Southern Hemisphere and parts of the northern tropics. In contrast, most other species of the Arcellinida group are thought to have a cosmopolitan distribution. However, the geographical distributions of testate amoeba have only been studied within the context of morphological species descriptions. Such morphological observations must be viewed with caution because of the potential existence of cryptic and pseudo-cryptic species. Here, we used partial sequences of the mitochondrial Cytochrome c Oxidase Subunit 1 gene to investigate the genetic diversity within three well characterized Hyalospheniidae morphospecies (*Hyalosphenia papilio*, *Nebela carinata* and *Nebela marginata*) of distant oligotrophic peat-bogs in Europe and North America. Our results show very little genetic variation within each morphospecies even between geographically very distant sites, with identical sequences occurring at European and American sites. These data support the interpretation that comparatively large free-living microbes (e.g., *H. papilio* >100 µm, *N. carinata* >140 µm and *N. marginata* >140 µm) can have unexpectedly wide geographical distributions.

This work was funded by Swiss NSF projects n° 205321-109709 / 1 and PBELP2-122999 and the National Science and Engineering Research Council of Canada (NSERC 283091-04).

**EC31 - Vertical transmission of *Blastocrithidia cyrtomeni* n. sp (Kinetoplastea: Trypanosomatidae) on *Cyrtomenus bergi* Froeschner (Hemiptera: Cydnidae)**

Caicedo, A.M.\*<sup>1</sup>, Gallego, G<sup>2</sup>, Muñoz J.E.<sup>3</sup>; Suárez, H<sup>2</sup>, Torres, G.A<sup>4</sup>; Posso, A.M.<sup>3</sup> & Montoya-Lerma,

<sup>1</sup>Department of Biology, Universidad del Valle, Cali-Colombia; <sup>2</sup>Biodiversity and Biotechnology Program, International Center of Tropical Agriculture. <sup>3</sup> Molecular Biology Laboratory, Universidad Nacional de Colombia, Palmira; <sup>4</sup>Microscopy Laboratory, Universidad del Cauca;Colômbia.

\*anamcaicedo@yahoo.com / jamesmon@gmail.com

The recent named new species, *B. cyrtomeni* was found harboured in salivary glands, haemocel, Malpighian tubules and digestive tract of *Cyrtomenus bergi*, its Hemipteran host. The high prevalence (100%) of *B. cyrtomeni* infection in all stages and the absence of negative morphological or behavioural symptoms with the infection led us to suspect a transovarial transmission. Wild bugs were field caught and reared under laboratory conditions. Presence of infection was verified by analysis of haemolymph and intestine contents of 30 individuals per stage (eggs, nymphs and adults) by phase-contrast microscopy and PCR. Then, in order to determine transovarial transmission, 100 pairs of adult bugs were kept in laboratory trays, until eggs and viable offspring were obtained during two generations. Eggs, nymphs and adults were examined as above mentioned. The 5S and Spliced Leader rRNA genes were amplified from about 10 ng of genomic DNA. All samples from eggs to adults showed one band of 0.8 kb corresponding to a monomeric repeat unit; some samples presented another band with high molecular size that corresponds to dimmers and trimmers. The sequence of the monomeric amplicons of SL rRNA and 5S rRNA allowed us to determine that all samples were positive for *B. cyrtomeni*. The results allow us to conclude, for first time, the existence of transovarial transmission in a trypanosomatid species.

Work supported by COLCIENCIAS, Colombia (grant No.021-2005).