IRGC NEWS

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EDITORIAL

Our association showed again during 2009 a strong vitality with a lively participation in the 16th meeting of the Group of European Charophytologists in Ohrid, Macedonia, wonderfully organized by Sasho and Sonja Trajanowski, and the progressive publication of the proceedings of the Rostock 2009 Conference in the journal *Charophytes*. Other projects, mainly about conservation of charophyte-rich ecosystems, are in course elsewhere and are also led by members of our association. Some aspects still need to be improved in the IRGC and one of them is making the association more visible worldwide through the web. Adriana García and the University of Wollongong (Australia) provided the framework of our website and now it needs to be completed with your contributions. The Executive Committee encourages you to participate since we are convinced that the website is a significant way to make people aware of the scientific interest and practical usefulness of charophyte research.

Carles Martín-Closas

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The task of the Regional Correspondents is **to collect relevant information about meetings, books, individuals etc. from their area and forward it to the IRGC Secretary** (see also 'Regional Groups of the IRGC' in this issue).

NEW IRGC MEMBERS

Welcome to new members of IRGC from Spain, Brazil, Estonia and Serbia. We like to inform that IRGC now includes membership by a company, Petroleum Abstracts, a division of the University of Tulsa.

MINUTES OF THE 16th GEC ASSEMBLY (Group of European Charophytologists) - Ohrid 2009

The General Assembly of the 16th GEC was convened on Sunday 13 September at the conference room of Millennium Palace, Ohrid, Macedonia and was attended by all 21 delegates to the meeting: Estonia (3), France (1), Germany (1), Lithuania (2), Macedonia (4), Poland (3), Russia (1), Serbia (2) and Spain (4).

The IRGC-President, Carles Martín-Closas, introduced the GEC General Assembly by thanking the organisers of the GEC. He highlighted the excellent atmosphere of the meeting due to the efficient organisers, Sasho and Sonja Trajanovski, and the generous support and collaboration of the Hydrobiological Institute, Ohrid. On behalf of all delegates, Carles Martín-Closas heartily expressed our sincere thanks to Professor Goce Kostoski, head of the Hydrobiological Institute, Ohrid for the excellent logistics and for hosting such a wonderful meeting. Gratitude was also expressed to the Ministry of Education and Sciences of Macedonia for financial support. The IRGC, as usual, had provided a modest contribution of 300 Euro. Moreover, congratulations went to Sasho and Sonja Trajanovski, the happy parents of twins (Sara and Konstantin) who were born just only 6 weeks ahead of the meeting.

The frequency of the GEC-meetings was the first point discussed. The majority of the assembly expressed the wish to continue holding meetings of the Group of European Charophytologists every year. The official proposal by Prof. Georg Martin, from the Estonian Marine Institute, to convene the next, 17th GEC in Tallinn was unanimously agreed. Given the northern location of Tallinn, the meeting should preferably take place in August 2010. After that, C. Martín-Closas recalled the decision made in 2003 (13th GEC in Iffeldorf) to have a "moving presidency" of the GEC. Thus, Sasho Trajanovski, as the successor of Professor Jelena Blažencic, shall act as the president of the GEC until the forthcoming meeting, and Jelena expressed to him her very best wishes for the task.

All the participants took part in the discussion about future activities. It was suggested that the GEC could/should have a symbolic object, i.e. a 3D-reproduction of an enlarged oospore, which should be given from the past president to the next, and thus would actually represent the transfer of presidency.

Ingeborg Soulié-Märsche, France

REPORT OF PAST MEETINGS

2009

16th Symposium of the GEC Meeting in Ohrid (Macedonia), 12-16 September 2009 (Scientific Report and Symposium fieldtrip)

Scientific report

On Saturday, 12 September, the conference started with the opening ceremony in Millenium Palace Hotel. After some organizational information by Sasho Trajanovski, Jelena Blazencic, as the GEC President, gave a short presentation of the history of charophyte investigations in the Balkans and officially opened the conference. Konstantin Zdraveski acted as a very competent simultaneous translator. Then, the welcome address was given by Professor Goce Kostoski, the President of the Organizing Committee and Director of the Hydrobiological Institute, who invited all participants to a nice welcome cocktail by the swimming pool.

Sonja Trajanovska opened the first session **Environmental pollution and ecology of charophytes**, chaired by Ingeborg Soulié-Märsche (France) and Andrzej Pukacz (Poland), with a plenary lecture "The present status of Charophyta flora in Lake Ohrid and its surrounding". That was a very interesting presentation about the past and present investigations of charophyte flora and vegetation of Lake Ohrid, emphasizing the exceptionality of this special lake. Then we had 3 more very interesting presentations:
Jelena Blazencic, Svetislav Krstic and Zlatko Levkov (Belgrade, Serbia) presented ***Arsenic accumulation in* Chara contraria *var.* nitelloides *from Alshar, Macedonia***. Svetislav presented surprising results about the As uptake by charophytes and their possible significance in utilization of this poisonous element. Kaire Torn and Georg Martin (Estonia) presented ***Recovery of charophyte communities from different types of mechanical disturbances.*** This presentation showed the effects of different types of disturbance on a charophyte community that was studied in Rame Bay (Baltic Sea). As the last presentation of the morning session Mariusz Pelechaty, representing the scientific group of Karina Apolinarska, Andrzej Pukacz, Marcin Siepak, Patrycja Boszke P, Joanna Krupska and Maciej Sinkowski (Poland), presented: ***Does the stable isotope composition of* Chara tomentosa *incrustation reflect environmental conditions?*** This presentation showed the results of interdisciplinary investigation on the relationship between the stable isotope composition in calcium carbonate precipitated by *Chara tomentosa* and the chemistry of surrounding waters.

After a nice lunch break with a view on beautiful Lake Ohrid, we had 5 more presentations, concerning the ecology and distribution of charophytes in Europe.

The afternoon session started with the presentation by Ingeborg Soulié-Märsche (speaker), Frederic Triboit, Marc Despreaux, Aurélie Rey-Boissezon, Isabelle Laffont-Schwob and Alain Thiéry (France) who gave a talk on ***Evidence of an "alien"* Chara *species in South France.*** Ingeborg presented the latest data about *the new and not yet described for Europe species from the genus* Chara, that has been found in Southern France. For this new species, a few years observations of habitat conditions as well as its morphological structure were described. Andrzej Pukacz and Mariusz Pelechaty (Poland) presented: ***Habitat requirements of selected charophytes occurring in lakes of Lubuskie Region (mid-Western Poland)***. That was a characteristic of some habitat preferences for selected charophytes, showing also that charophytes (the same taxon) occur not only in clear and hard water lakes but also in very eutrophicated and even degraded ecosystems. Elena V. Chemeris and Alexander A. Bobrov (Russia) presented: ***Chara globularis in rivers in the North of European Russia: some aspects of ecology and biology.*** Elena presented very interesting data about morphology and ecology of *Chara globularis* occurring in rivers of the north part of European Russia. The presentation was embellished with beautiful

pictures of the natural and wild areas of Russia. From the cold North of Europe, Nuria Flor-Arnau, representing a team with A. Galan-Cubero, R. Ortiz-Lerin and J. Cambra (Spain), moved the whole GEC audience into the warm south of Europe, presenting: ***Distribution and ecology of the Charophytes from the Ebro Basin.*** The presented results being a part of a big project realized in Ebro river basin, showed that in this part of the Iberian Peninsula we can find 14 charophyte species, distributed in different ecosystems along the river. The results were discussed in the context of habitat differentiation of the studied sites. At the end of the first lecture day, Lothar Ratai (Germany) presented: ***Some remarks on the identification of the species*** **Nitella capillaris, Nitella syncarpa, Nitella flexilis *and* Nitella opaca**. Lothar shared with the audience his doubts about identification difficulties in distinguishing young forms of *N. capillaris, N. syncarpa, N. flexilis* and *N. opaca*.

The second day of 16th GEC Meeting (13 September 2009) started with a plenary lecture given by Carles Martin-Closas (Spain) and entitled ***Charophyte fossil thalli: the unexplored planet.*** This interesting scientific story concerned possibilities and problems arising with the use of morphological features of extant charophyte thalli in systematics. It was an excellent introduction to the session **Fossil Charophytes/Systematics of Charophytes**, chaired by Carles. The first presentation was given by Sheila Villalba-Breva and the co-author was Carles Martín-Closas (Spain). The main idea of their presentation entitled ***Palaeoecology of* Peckichara-*dominated lakes in the Maastrichtian (Latest Cretaceous) of the eastern Pyrenees (Catalonia, Spain)*** aimed to elucidate the palaeoecology of fossil charophytes and associated fossils. After this presentation Carles Martín-Closas presented ***Oldest records of* Tolypella *s.s. (Lower Cretaceous, Catalonia, Spain) and the evolution of modern Characeae.*** Co-authors were S. Villalba-Breva, J.A. Moreno-Bedmar, A. García-Sellés and R. Salas. The authors presented a new locality of fossil *Tollypella* that appeared to be at least 55 million years older than the oldest known record. Possible consequences for the evolution of modern charophytes were also discussed.

After this oral presentation, the poster session started near the swimming pool. Jacek Urbaniak (Poland) presented results of his and co-authors study on oospore morphology (Magdalena Drill and Jacek Urbaniak ***Morphology and oospore wall ornamentation of the members of Charales (Charophytacae) from Poland***, Karolina Bojar, Magdalena Drill and Jacek Urbaniak ***Oospore dimensions in several species of* Chara *section Hartmania***). The wall ornamentation was discussed as a significant morphological trait, helpful in species identification. Maria A. Rodrigo (Spain) presented on behalf of co-authors Jose L. Alonso-Guillen and Andrea Campos poster entitled ***Can polluted sediments from a coastal lagoon house charophyte growth?*** Two experiments performed with the use of polluted sediments sampled from the previously charophyte-dominated lagoon proved that there still exists possibility to recover charophyte vegetation in the studied lagoon despite high level of eutrophication. Anastasiia Kovtun, Kaire Torn, Martin Georg and Helle Mäemets (Estonia) carried out a charophyte survey in varied aquatic environments of Estonia which resulted in the poster ***Distribution of charophytes in Estonian coastal waters and lakes***. Based on the results obtained between 2000 and 2008 *Chara aspera* and *Tolypella nidifica* were found to be the most common species in the coastal areas of Estonia. Zofija Sinkeviciene (Lithuania) presented ***Artificial water bodies as important habitats of* Nitella *and* Tolypella *species*** and pointed at the significance of man-made aquatic environments in charophyte occurrence and conservation as well as the need for vascular plant elimination and periodical renewal to maintain discovered *Nitella* and *Tolypella* localities.

The afternoon session was chaired by Nuria Flor-Arnau (Spain) and Marina Talevska (Macedonia). Lence Lokoska gave the fist talk ***Dynamic of the cellulolytic bacteria in the belt of Charophyta from Lake Ohrid.*** The bacterial assemblage, more abundant in the charophyte vegetation as compared to other

lake regions, can be considered indicators of carbohydrates. In the next presentation ***Charophytes: a life conditioned (predefined) habitat for the existence of* Dreissena *species in Macedonian lakes?*** Sasho Trajanovski, Biljana Budzakoska-Gjoreska, Sonja Trajanovska and Teodora Trichkova (Macedonia) presented clear relationships between the biomasses of *Dreissena* species and charophytes and thus enhanced the importance of charophytes as a life habitat. Trajce Talevski, Marina Talevska, Dragana Milosevic and Aleksandra Talevska (Macedonia) presented the theme ***Cyprinide spawning grounds and macrophyte vegetation in Lake Prespa.*** The authors listed different types of substratum accessible for spawning and stressed the role of macrophytes as spawning substratum for cyprinids occurring in Lake Prespa. The penultimate presentation ***Depth distribution of submerged macrophytes in localities Grasnica and Metropol from Lake Ohrid*** was based on the results achieved by Marina Talevska and Sonja Trajanovska, who studied the depth distribution of macrophytes of Lake Ohrid along two different vertical profiles. The authors documented differences in vegetation development and species distribution reflecting varied bottom slope and so, habitat conditions. The last talk was given by Trajce Talevski, Marina Talevska, Dragana Milosevic and Aleksandra Talevska who presented ***Cyprinids spawning grounds and macrophyte vegetation in Lake Ohrid.*** This contribution clearly showed that most of cyprinids of Lake Ohrid are typical phytophyllic species and any change in vegetation may affect fish composition.

All the presentations met warm welcome and those concerning Lake Ohrid biocoenosis and ecological conditions gave a good theoretical background for the two-day cruise and sampling on Lake Ohrid by the researching vessel of the Hydrobiological Institute.

Mariusz Pelechaty & Andrzej Pukacz, Poland

Field trips in Lake Ohrid during the 16th GEC meeting 2009

On Monday, 14 September 2009 at 9:30, a keen and excited group of charophytologists met in front of the Hotel Millenium in Ohrid, Macedonia. After a short walk to the Hydrobiological Institute (HBI), we managed to fit all onto the research vessel of HBI, where our captain Zoran Brdaroski advised us not to move to one side of the boat simultaneously, a piece of advice that seemed especially reasonable after the horrible accident on Lake Ohrid a few weeks before our visit.

On Monday, we took samples at sites 1 to 3 (Figure 1 and Table 1), which all seemed rather unpolluted and were relatively close to the HBI. At all sites, we started sampling in shallower areas, and moved on into deeper waters. Samples were taken by hook and grab from the boat, and some brave snorkeling colleagues provided especially interesting material even from up to several metres depth. The huge charophyte mats which were present at all sampling sites from shallow water up to several metres depth were amazing. The mats consisted mainly of *Chara tomentosa*, but also *Chara polyacantha*, *Chara globularis* and a largely ecorticated form which gave rise to intense discussions in the afternoon determinations were found in significant amounts. Home-made Rakia kept sampling moods at its best, and we returned somewhat late to have a delicious and more than sufficient lunch at the restaurant close to the HBI. But after a nice cup of coffee, charophytes soon managed to fascinate us again, and the binoculars at the HBI were intensely used. Periphytic "brown hemispheres" which where found covering the charophytes caused some discussion. They were rather prominent at many sites, and were later determined to probably be a *Rivularia* species (cyanobaceria).

Next morning we met at 10:00 at HBI, and we took the boat out to sample at points 4 to 6, which are located north-west of Ohrid. Location 4 was especially interesting from a limnological point of view, since a large pipe with sewage out-fall influenced this site. Correspondingly, we found mats of blue-green

algae covering the sediment in the shallower areas, and *Potamogeton perfoliatus* was prominent. However, in deeper waters (deeper than approximately 4 to 5 meters), huge *Chara tomentosa* stands still are present and no obvious signs of eutrophication were observed.

The *Chara tomentosa* was mixed with *Chara globularis* and an ecorticated form which in the evening was determined to correspond to Krause`s description of *Chara ohridana*. It is amazing how the lake seems to be able to cope with sewage influence. Site 5 is in front of a creek flowing into lake Ohrid, which obviously also causes some eutrophication. In shallow water, *Zannichellia* was collected, and only very few and small charophytes in between. Our last sampling site was close to the city of Struga, where once again huge stands of *Chara tomentosa* fascinated all of us. The fact that the rope got entangled into the propeller caused some worries, but our captain Zoran managed with the help of Andrzej Pukacz (who was the most resistant snorkeller) to cut the rope rather quickly, such that we could go on with only short delay. Zoran provided us once again with delicious "fluid supplies" on the boat.

After a quick visit to the cave church at the Monastery of Kalishta, we went to Struga to have a delicious lunch. *Nitella hyalina* was collected at the outlet of lake Ohrid in Struga. The day was ended either in the laboratory to have a look at charophytes, or in the local Cuban bar with some drinks.

We would like to thank Sasho Trajanovski, Goce Kostoski (the director of HBI), our captain Zoran Brdaroski and all the other organizers for these very interesting, instructive and at the same time entertaining field trips.

Susanne Schneider, Oslo

site number	coordinates
1	41°05.911 N 020°48.205 E
2	41°06.009 N 020°48.078 E
3	41°06.439 N 020°47.795 E
4	41°06.904 N 020°47.032 E
5	41°07.301 N 020°46.159 E
6	41°09.798 N 020°40.802 E

Table 1: Coordinates of sites sampled (coordinates were taken at the shallow part, and sampling *continued towards deeper areas)*

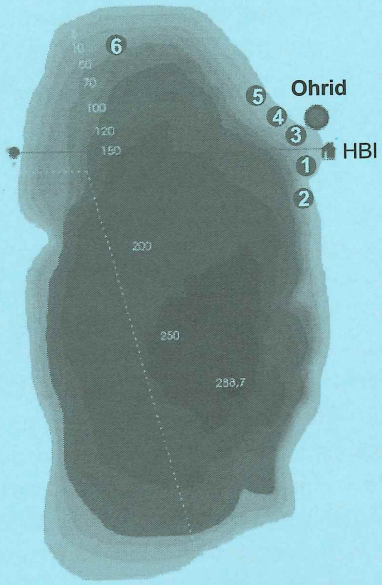

Figure 1: Rough map of sampling sites *(the map basis was kindly provided by Sasho Trajanovski)*

Figure 2: Zoran collecting *Chara tomentosa*

1-5 July 2009
6th Regional Symposium of the International Fossil Algae Association, Milano, Italy

This very lively meeting was nicely organized by Daniela Basso and collaborators and included more than 50 presentations, mostly devoted to marine fossil algae. However, during the field-trip excursion in the beautiful Piedmont region the participants were able to collect well preserved *Nitellopsis meriani* gyrogonites from a new locality in the Oligocene of Santa Giustina (Savona).

Carles Martín-Closas

2-8 August 2009
9th International Phycological Congress, Tokyo, Japan

The 9th International Phycological Congress, Tokyo was successfully finished on 8 August 2009. The congress attracted more than 500 participants from 44 countries world wide. The next IPC will be held in Orlando, Florida, U.S.A. in 2013. The meeting offered the possibility to discuss and learn about new advances in Phycology. Especially within charophytes, aspects of evolution and relation with land plants origin were enlightening. We enjoyed also presentations at the Workshop on Advances in Freshwater Algae, organised by Prof. Hisayoshi Nozaki (particularly on charophytes: Adriana García and Hidetoshi Sakayama talked about insights on Australian charophyte taxonomy based on molecular and oospore analyses. In the poster sessions, Dr Sakayama presented on molecular analyses of *Chara fibrosa* s.l., Mr Soyu Kato showed molecular relationships within *C. braunnii* morphotypes, and Dr García discussed oospore/molecular results on Section Hyella.
Apart from enjoying the beauty and food from Japan, scientifically the meeting was a great success!

Adriana García, Australia

14-17 October 2009
10th National Conference and 25th Annual Academic Conference of Palaeontological Society of China (PSC) Nanjing, China

More than 600 palaeontologists and students attended the conference in Nanjing, it was a big congress including several parallel sessions, with the activities for the commemoration of 80th anniversary of the Palaeontological Society of China.

Qi-fei Wang, P. R. of China

FORTHCOMING MEETINGS

There is a large variety of meetings where Charologists can take an active part and promote the significance of our favourite plants. Make your choice:

2010

1-4 June
4th EPCN Conference, Berlin (Erkner) Germany

More than 100 participants are expected for this bi-annual meeting of the EPCN (European Pond Conservation Network) to contribute to the main theme: "Eyes of the landscape – value of ponds in the 21st century".
Website: http://www.4epcn2010.de/
European Pond Conservation Network

11-13 June 2010
The 7th Meeting of the German Working Group on Charophytes (AGCD) Munich, Germany

The venue will take place in Freising (north of Munich) organised by Thomas Franke. A pre-meeting excursion is planed to lead to waterplaces in Franconia on June 10.
Contact: thomas.franke@ivl-web.de

The previous meeting of the AGCD was organised by Angela Doege at the Kulkwitzer See near Leipzig, East Germany, from 5-7 June, 2009. The activities were shared between oral presentations, collection and determination of Characeae. The participants could benefit from facilities provided by the local diving club, the *Dolphins*.

10-14 July
13th Symposium of the Micropalaeontological Society of China (MSC) and the 6th National conference of Fossil Algal Association of China (FAAC), Korla, Xinjiang, China

The Micropalaeontological Society of China and Fossil Algal Association of China will hold their combined congress on 10 July, 2010 in Korla, Xinjiang, China. About 200 palaeontologists and students are expected to participate in the meeting and field excursion. Korla is the capital of the Bayangol Mongol Autonomous Prefecture, in the southern part of Xinjiang. Korla City has a long history of the ancient Silk Road routes. http://www.silkroadcn.com/xinjiang/korla.htm
Contact: Dr. Qifei Wang, Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, 39 East Beijing Road, 210008 Nanjing, China. E-mail: qfwang@nigpas.ac.cn or qfwanghm@hotmail.com

26-29 August
17th Group of European Charophytologists (GEC) Meeting, Tallinn, Estonia

The next meeting of the Group of European Charophytologists will be organized by Kaire Torn at the Estonian Marine Institute (University of Tartu), during the month of August, which is the best period for charophyte observation in Northern Europe. The meeting will include presentations and a two and a half day excursion to western Estonia and Saaremaa Island. A leaflet is added to the News 21 for more information.
Contact: Kaire Torn, e-mail: kaire.torn@ut.ee
Information of this meeting will be added also to the IRGC website (http://irgc.uow.edu.au)

2013

6th International Symposium of IRGC Malargüe, Argentina (mid-end January, days to be determined yet)

Eduardo Musacchio is the organizer of the meeting with the help of Adriana García, Leandro Rojo (Palynologist) and others. The venue will be the *Centro de Convenciones y Exposiciones Thesaurus* of Malargüe. The area is very pretty, still with endemic fauna such as *'guanaco'* and *'choike'*, about 420 km south of Mendoza city. Geologically, Malargüe is entailed in the Neuquén Basin.

The region exhibits well exposed Mesozoic and Paleogene non-marine sediments including charophyta fossil-remains as well as excellent exposures of different orders of cyclicity in stratigraphy.

The majestic Andes towards the west as well as several impressive volcanic centres, including peculiar desert forests, invite to the scientific tourism. Two or three fieldtrips will be on offered (one of them devoted to non-marine sequences with charophytes) and, probably, some workshops. **Please take note of this date!**

Eduardo Musacchio, Argentina

Research Article: **The isotopic composition of charophyte carbonate encrustations in Polish lakes**

Lake sediments containing a high proportion of autochthonous carbonates can be explored as "environmental archives" and successfully used in palaeoreconstructions. Photosynthetic activities of aquatic

macrophytes, in the littoral zone (Wetzel 1960), and phytoplankton, particularly autotrophic picoplankton, in the pelagic zone (e.g. Dittrich & Obst 2004) are leading mechanisms of carbonate precipitation. Depending on the lake morphometry and intra-biocoenotic interrelationships, the importance of each group of primary producers can be different. In deep stratified lakes phytoplankton takes over the majority of photosynthetic productivity, whereas macroalgae and plants covering most of the lake basin are responsible for the biomass production in shallow macrophyte lakes. Carbonate precipitation is a consequence of a specificity of photosynthesis in the aquatic environment and CO_2 uptake from soluble bicarbonates. By carbon dioxide removal, bicarbonates are converted into insoluble carbonates, deposited onto the surface of photosythetically active organisms and, consequently, in the marl lake sediments. Among macrophytes, mineral encrustation is a feature typical of charophytes, effectively using bicarbonates over a wide range of their concentrations in the water. Accordingly to our unpublished study, charophytes can precipitate calcium carbonate in amounts reaching usually 40-60% of their dry weight (DW). That is consistent with the literature data (summarized by Kufel & Kufel 2002), reporting $CaCO_3$ precipitation up to 60% DW. Those amounts can be even higher. Depending on the species and environmental conditions, we observed carbonate encrustations constituting between 5 and 80% of the thalli DW. The study performed in Lake Wigry (unpublished data), one of the largest Polish lakes with extensive areas of charophyte carpets (dominated by *Chara contraria* A. Braun ex Kützing), revealed summer carbonate precipitation reaching between 71 and 685 g $CaCO_3$ m^{-2}; 438 gm^{-2} on an average. After charophyte decay, large amounts of the carbonates can be preserved in sediments and serve as an important record of environmental changes (Dittrich & Obst 2004).

Charophytes, and particularly their oogonia, can be well preserved in lacustrine sediments, being common in postglacial deposits. Known ecological requirements of modern species allow using their remnants in the reconstruction of past environments, and the stable isotope composition of charophyte carbonates can be a useful tool for palaeoreconstructions. The study of $^{13}C/^{12}C$ and $^{18}O/^{16}O$ stable isotope ratios in lacustrine carbonates can reflect environmental conditions under which the carbonates were precipitated. Good examples are studies performed by Apolinarska (2009) in late glacial and Holocene lacustrine marls, and Anadon et al. (2000) in older, Paleogene and Neogene sediments. However, the relationships between carbon and oxygen isotope composition in charophyte encrustations and $\delta^{18}O$ in water and $\delta^{13}C$ in dissolved inorganic carbon (DIC) must be well understood. As yet, the problem has been dealt with in only few papers (e.g. Coletta et al. 2001, Pentecost et al. 2006). Still, research on the interdependencies between isotope values of different charophyte species and water parameters as well as the dynamics of the stable isotope composition of charophyte encrustation throughout the growth season are required.

In recent years, a systematic study has been performed, which aims to determine relationships in isotope signatures ($\delta^{13}C$ and $\delta^{18}O$) between carbonate encrustations of different charophyte species and water characteristics studied in varied lake ecosystems. Month-to-month dynamics of isotope composition in charophyte carbonates as related to the vegetation structure and physical and chemical properties of water, as well as changes along the stem (so called "age gradient") are included. Since 2008, the study concerning five species (*Chara aspera* Detharding ex Willdenow, *C. contraria* A. Braun ex Kützing, *C. rudis* A. Braun in Leonhardi, *C. tomentosa* Linné *and Nitellopsis obtusa* (Desvaux in Loiseleur-Deslongchamps) J. Groves) has been carried out in four morphologically and hydrologically varied lakes in Western Poland. Apart from the above aspects we expect to find if there exist clear inter-specific differences in the carbonate stable isotope composition as well as intra-specific, site- or lake-related variability. Interdependencies with environmental factors

and temporal dynamics are included along with recognition of differences in the isotope signal of water between charophyte vegetation and macrophyte-free pelagic zones.

For the time being, results for *Chara rudis* growing in a shallow charophyte lake (Pełechaty et al. 2009a) and *Chara tomentosa* from a deep lake with a shallow littoral zone overgrown by charophytes and vascular plants (Pełechaty et al. 2009b) have shown clear temporal dynamics in stable isotope signatures of encrustation, with tendencies to a certain extent comparable in both species. Neither charophyte revealed statistically significant site-to-site differences. Of primary importance seems to be the intensity of photosynthesis, related to the natural temporal changes of temperature and light availability with clear enrichment of encrustations in heavier carbon isotope, presumably due to preferential uptake of ^{12}C. Partially opposite tendency of $\delta^{18}O$ changes in encrustations seems also related to the photosynthesis rate but a reasonable explanation of the mechanisms involved cannot be offered at this stage of study. Water temperature, retention time and evaporation can be listed as significant factors. Importantly, we found numerous relationships between $\delta^{18}O$ and $\delta^{13}C$ of encrustations and stable isotope composition of water above studied charophytes, and environmental variables. Irrespective to the species studied, $\delta^{13}C$ of charophyte carbonates was related to Ca^{+2}, alkalinity, bicarbonate concentration and water colour, and $\delta^{18}O$ was correlated with pH, electrolytic conductivity, oxygen content, nutrient budget and temperature. The strength and direction of correlations was dependent on the species studied. The contribution of encrustation, depth of site and structure of vegetation were less important. The state of isotopic equilibrium during carbonate precipitation was species- and lake-specific. In a shallow charophyte lake, *Chara rudis* precipitated carbonates out of equilibrium with respect to both carbon and oxygen isotopes, exceeding 2‰ difference as compared to waters above the studied patch. In contrast, *Chara tomentosa*, studied in a deeper and less vegetated lake, expressed with a few exceptions the state of equilibrium. As our conclusions are limited to two species and two lakes only, further study is needed to find out if the correlations and tendencies described here are of broader significance.

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M. Pełechaty, K. Apolinarska, A., Pukacz, J. Krupska and M. Siepak
Adam Mickiewicz University, Poznań
Poland

NEWS FROM THE REGIONAL GROUPS

News from the German Group

Updated distribution maps of recent and past occurence of all *Chara* species from Germany have been compiled. They appeared in the *Rostocker Meeresbiologiosche Beiträge* 19, which can be downloaded for free from:
Website: http://www.biologie.uni-rostock.de/oekologie/RMB.htm, you must follow "RMB19"; then the data is on pages 57-108.

Please check, the *Rostocker Meeresbiologiosche Beiträge* 22 which has also published several *Chara*-related papers,. Of special interest are the matrix keys of Joop van Raam (RMB22; p.53-55) also downloadable from the above homepage together with a provisional Synopsis of the Characeae.

Hendrik Schubert, Rostock, Germany

News from South America

Prof. Eduardo Musacchio is working on the systematics and biostratigraphy of the organo-genera *Mesochara* and *Peckisphaera* from Patagonia, Argentina (from the oil productive areas of Neuquén, Cañadón Asfalto and Golfo San Jorge), in order to review their chronology and distribution.

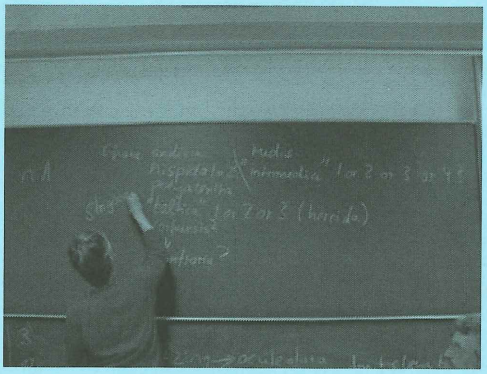
Dr Adriana García and Prof. Allan Chivas (University of Wollongong, Australia) started a collaborative project with Argentinean colleagues dedicated to reconstruct Quaternary palaeoenvironments of Laguna Llancanelo, Malargüe, Argentina. Some of the proxies to investigate are charophytes, ostracods, molluscs and geochemistry.

Eduardo Musacchio, Argentina

NEWS FROM INDIVIDUALS

Collaborative research on molecular Taxonomy of diplostichous Chara hispida *group and allies*

During the workshop in the last IRGC, a project idea concerning the relationship between diplostichous *Chara* species was developed by all delegates. Concentrating on the rather complicated *Chara intermedia – baltica – hispida – rudis – horrida* etc. (see photograph) group, the delegates believed that this problem should be tackled by the whole community in a rather "global approach". Now, as agreed on the workshop, the Rostock group started sending around requests for collecting morphological and genetic samples during the field season 2010 for this ambitious project of the IRGC.



Everyone interested in participating or needing more information, please check the website: http://www.biologie.unirostock.de/oekologie/dicaro.htm

Contact: Prof. Dr. Hendrik Schubert, Universität Rostock, Inst. Biosciences / Ökologie, D-18051 Rostock, Germany, telephone 03831 498 6070, website: http://www.biologie.uni-rostock.de/oekologie/home.html

Hendrik Schubert, Germany

PROCEEDINGS OF THE 2008 ROSTOCK CONFERENCE ARE ON THE WEB

The conference proceedings from the 2008 meeting of the IRGC are starting to appear in the electronic journal *Charophytes* for download for subscribers of the journal. The abstracts (both in English and other languages) of the articles are available to everyone free of charge (go to www.charophytes.com). At the time of writing, five articles have appeared (see below), the others are in various stages of preparation and will appear over the next few months. I will announce these on the *charophyte-L* list when they appear. As editor I would like to thank all the researchers who have submitted manuscripts. The process of publication can be time-consuming and relies on the efforts and goodwill of a number of people: firstly the guest editors who assist in processing the manuscripts, the referees themselves (always busy people), the authors who undertake the necessary changes and corrections, the copy editor and the web-master (in this case web-mistress).

Michelle Casanova
Editor, *Charophytes*

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Photosynthetic characterisation of *Chara vulgaris* in bioremediation ponds (Ronny Marquardt and Hendrik Schubert)

Charophytes from the Upper Albian of Rose Creek, Nebraska, USA (Carles Martín-Closas and David Dilcher)

***Lychnothamnus barbatus* in Poland: habitats and associations** (M. Pełechaty, M. Gąbka, P. Sugier, A. Pukacz, S. Chmiel, H. Ciecierska, A. Kolada and P.M. Owsianny)

***Lychnothamnus barbatus*: global history and distribution in Poland** (P. Sugier, M. Pełechaty, M. Gąbka, P. M. Owsianny, A. Pukacz, H. Ciecierska, A. Kolada)

Morphological variation in *Lychnothamnus barbatus* (Meyen) Leonh. in Lake Balsys (Lithuania) (Zofija Sinkevičienė)

NEW IRGC MEMBERS AND CHANGES IN ADDRESSES

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CHAROPHYTE DISCUSSION FORUM

Dr Robin Scribailo (USA) has now established the **charophyte-L**, our quick and new way of communication.

<charophyte-L> is an open forum for discussion about all aspects of Charophyte research.

How to suscribe to charophyte-L?

Just send the message to the listserver: listserv@pnc.edu
In the body (not the subject) of the message type: ***subscribe charophyte-L*** **your name**

Leave the subject blank. Also make sure your signature is turned off for this email. It must be sent as a text message. You will receive an automatically generated message telling you how to make use of the list. Once you are subscribed, you can send messages to the list server which will distribute it to all subscribers.

CHAROPHYTES ON THE WEB

The **IRGC** homepage is hosted at: http://irgc.uow.edu.au/

Members who would like to have their personal homepage connected with the IRGC-website please send relevant information to Adriana García.

The **GEC** homepage is the responsibility of the organizers of the successive GEC meetings. The 17th GEC website will be soon available.

Landelijk Informatiecentrum voor Kranswieren (**LIK**): http://www.kranswieren.nl (in dutch)

The International Fossil Algae Association (**IFAA**): http://www.ku.edu/~ifaa/

The Charophycean Green Algae Home Page: http://www.life.umd.edu/labs/delwiche/Charophyte.html

Homepage of the German Working Group on Characeans (**AGCD**): http://www.biologie.uni-rostock.de/oekologie/agcd

Homepage of the electronic journal *Charophytes*: http://www.charophytes.com

International Phycological Society (**IPC**): http://www.intphycsoc.org/links.lasso

MEMBERSHIP FEES

Please **do not forget** to send your membership fee payment for 2010. Multiple-year payments are encouraged!

20 Euros (c. US$25) per year

Thanks to the efforts of our treasurer the payment can be done by credit card.

Please find enclosed a membership form or download the payment form from the IRGC-webpage at:

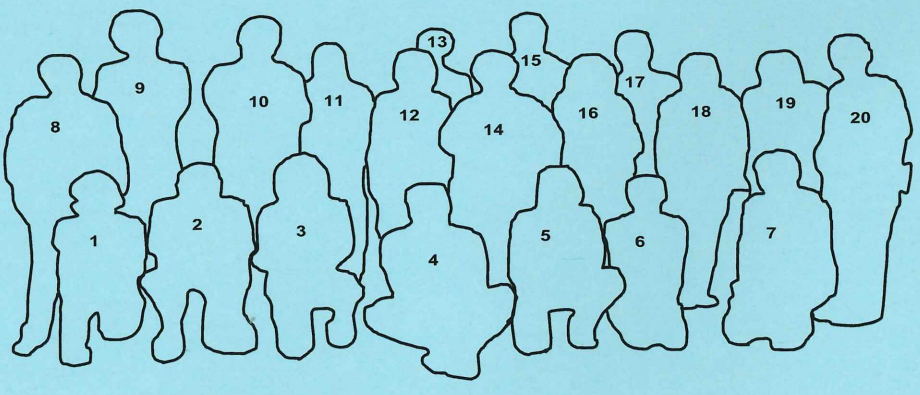
http://irgc.uow.edu.au/

(**click on** Membership, **then** Payment Form Download)

Any questions about membership fees should be addressed to:

IRGC-Treasurer Dr Emile Nat:
e.nat@kranswieren.nl

16th GEC Meeting, Ohrid, Macedonia
Group Photograph, 2009



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