IRGC NEWS

INTERNATIONAL RESEARCH GROUP ON CHAROPHYTES

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EDITORIAL

I am pleased to introduce this issue describing the various activities of IRGC and its members during 2006. Firstly I'd like to thank Adriana Garcia and Allan Chivas for the excellent job they did in editing the proceedings of the Robertson-meeting in record time. Don't miss to purchasing your personal copy of this volume (see p. 14). The European Charophyte Group (GEC) had a very successful 14th meeting in Barcelona, as you may see from the enthusiastic reports. Thanks again to the organisers, Nuria Flor and Jaume Cambra. The 15th GEC meeting (September 2007 in Belgrade) is on its way and will be of prime importance for charophytologists, with focus on the value of the Characeae as water quality indicators and in conservation. I'd also like to encourage your subscription to our discussion forum. *Charophyte-L* thanks to Robin Scribailo, is alive and is easy to use. Starting with this issue, the IRGC-NEWS is officially registered (ISSN Number) and counts as a publication. Please consider attending the next quadrennial IRGC-Symposium in 2008, to be held in North Germany - an opportunity to discover the Baltic Sea area.

Ingeborg Soulié-Märsche

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

ISSN NUMBER FOR THE IRGC NEWS

It is a great pleasure to notify all the members of IRGC that the News has been accepted as a regular publication of scientific interest and provided with an ISSN Number, which appears in the first page of this issue (**ISSN 1834-6030)**. A hard copy of every issue has to be sent to the Australian National Library to be kept as a record. I hope everybody will renew their interest in sending scientific notes for the IRGC News, as having the ISSN number makes possible the inclusion of these notes/short articles as a publication.

Adriana García, Australia

NEW IRGC MEMBERS

IRGC welcomes colleagues who have joined our society recently. Our new members are Dr Pere Anadon, Institut de Ciencies de la Terra, Barcelona, Spain; Dr Dominique Auderset-Joye, Université de Genève, Genève, Switzerland; Prof. Katarzyna Bociag, University of Gdansk, Gdansk, Poland, Miss Sara Damino, Messina, Italy; Dr Sabrina Naz, University of Rajshahi, Rajshahi, Bangladesh; Dr Marius Pelechaty, Adam Mickiewicz University, Poznan, Poland; Dr Katarzyna Poplonska, University of Łodz, Łodz, Poland; Dr Milena Primavera, Dipto di Geologie e Geofisica, Universita di Bari, Italy; Dr Andrzey Pukacz, Collegium Polonicum Stubice, Poland; Dr Maria A. Rodrigo, Universitat de Valencia, Valencia, Spain; Dr Susana Romo, Unidad Ecologia, Edificio Investigation, Campus Burjasot, Burjasot-Valencia, Spain; Prof. Hendrik Schubert, Universität Rostock, Rostock, Germany; Mr Piotr Skurzynski, University of Gdansk, Gdansk, Poland, Miss Agnieszka Woytczak, University of Łodz, Łodz, Poland (for full addresses see page 24)

PUBLICATION OF PROCEEDINGS OF THE 4th SYMPOSIUM OF IRGC (ROBERTSON, AUSTRALIA: AS A SPECIAL ISSUE OF CRYPTOGAMIE, ALGOLOGIE

The special issue of *Cryptogamie-Algologie* 27(4) was published at the end of 2006 as was promised by the editors of the journal, and included 12 scientific papers dealing with different aspects of charophytes research (please find on page 14 the contents of the volume and details of how to purchase it).

Several authors expressed their pleasure with the final product, and we think that this is the general feeling. We take this opportunity to thank the reviewers and contributors for the rapid response to the deadlines, and the work of the editors of *Cryptogamie-Algologie* (Dr John Huisman, Australia, and Mr Denis Lamy, France) for their final input. The experience was fulfilling for us despite feeling overwhelmed at times.
Thanks again to all of you,

Adriana García &Allan R. Chivas, Australia
Guest Editors of *Cryptogamie-Algologie*

HISTORY OF CHAROPHTYE RESEARCH

20TH ANNIVERSARY OF THE GEC (GROUP OF EUROPEAN CHAROLOGISTS)

In the spring of 1987, a number of charologists were invited by Prof. Jean-Pierre Berger in Lausanne (Switzerland) to discuss common problems in the study of fossil charophytes. This was the first time that a European group of charophyte specialists met outside the Laboratoire de Paléobotanique in Montpellier, which was at that time the European Mecca of fossil charophytes. I was then a PhD student in pre-doctoral stage at Montpellier, and the first impression I got was that J.-P. Berger was assembling a sort of heterodox Diaspora. The meeting was a clear success. The group was a mixture of young PhD students and senior experienced researchers who exchanged freely their doubts and solutions, without imposing any kind of dogma. The final commonly accorded resolution was that the group should meet again under the name of GEC, without any legal structure, very much in the informal spirit of our first host. This is how the GEC was born before the IRGC and inspired very much the origin of our present international (or global) association. In the first years the GEC was mainly a francophone (French-speaking) group clearly dominated by palaeontologists, although colleagues studying extant charophytes soon joined the first. Also, the group became little by little polyglot, reflecting the real being of Europe. From the first meetings, devoted mainly to taxonomic aspects of fossil charophytes, new subjects on charophyte research arose, such as biogeography, limnology or cytology. The structure of the GEC-meetings consisted generally in a first day of presentations followed by a field-trip and a laboratory session, where members discuss while looking at real material through binocular microscopes. This latter part is clearly the keystone of success of the GEC-meetings.

The first decade of the GEC, between 1987 and 1998, was a time of intense activity since the group met almost every year in different countries of Europe. All of us wanted to "organize a GEC" to welcome the colleagues who became soon our friends. Thus, after Lausanne, we met in **Montpellier 1988** (organized by Monique Feist and Ingeborg Soulié-Märsche), **Paris 1990** (organized by Janine Riveline), **Berlin 1991** (organized by Michael Schudack), **Angers 1992** (organized by Micheline Guerlesquin and Elisabeth Lambert), **Łodz 1993** (organized by Maria Kwiatkowska and Janusz Maszewski), **Barcelona 1994** (organized by myself), **Bremen 1997** (organized by Ursula Winter) and **Amsterdam 1998** (organized by Jan Simons). During that period the GEC was animated by Jean Pierre Berger, who took the responsibility of ensuring that new meetings were organized. During the IRGC meetings of Montpellier, in 1989, and Madison, in 1996, small GEC-office meetings were held as well.

By the turn of the new century the GEC suffered a crisis produced by its particular structure and fell, like charophyte gyrogonites, into a dormancy period. Finally, the IRGC board decided to restart the European meetings and taking advantage of the European Paleobotanical-Palynological Conference in **Athens 2002** we celebrated a short but refreshing meeting. The next GEC was organized in **Iffeldorf 2003** by Susanne Schneider and the Limnological Institute, and finally Jaume Cambra and Núria Flor organized a very successful GEC meeting in

Barcelona 2006. In Iffeldorf the assembly decided that the organizer of a GEC meeting will become at the end automatically the GEC president, taking over the responsibility of motivating a new GEC meeting. The new period seems very promising since the last meetings were attended by 30-40 people, which represents an increase in relation to the meetings of the first period. Also a very active new generation of charologists, mainly neo-charologists, makes the new GEC meetings very diverse and rich in debates, which is the best guarantee of continuity in the future.

Carles Martín-Closas, Spain

NEWS FROM POLAND

Professor Izabela Dąmbska's collection of charophytes from Poland: a source of information on the morphological features of oospores

Herbaria specimens, in particular from old collections, are commonly used as a source of very valuable data of which species were collected in the past, their spatial distribution and changes in the distribution occurring over time. In Poland, Prof. Izabela Dąmbska made one of the most significant collections of aquatic plants, in particular Characeae, which are stored at the Department of Hydrobiology, Adam Mickiewicz University, Poznań.

Prof. Izabela Dąmbska was among the first Polish researchers dealing with charophytes after World War II. She worked on different groups of macrophytes and their communities, and on varied aspects of hydrobiology, but she became a leading charophyte specialist and published the identification key for Polish charophytes (Dąmbska 1964). Her charophyte collection at Adam Mickiewicz University in Poznań was created in the years 1954-1984 and, among others, covers 29 species collected in Poland and about 1,400 exsiccates (with duplicates and series compiled for distribution – ca. 3,000 exsiccates (Gąbka et al. 2001, Gąbka & Pełechaty 2004). In the years 1954-1966, smaller regional compilations were published, including morphological descriptions, as a series of the "Charotheca Polonica" (e.g. Dąmbska 1954). Therefore, this precious collection had become an inspiration for the multi-dimensional systematic, distributional and ecological investigations in recent years.

This contribution, apart from highlighting the significance of Prof. Dąmbska's work and collection of Charophytes of Poland, will present a current research project dedicated to the study of oospore morphology, mainly from specimens from Dąmbska's collection. More than 800 oospores were collected from Dąmbska's herbarium materials of Characeae, representing 13 species (Boszke, PhD thesis in prep.). Five genera are known from Poland, 10 species of the genus *Chara*, whereas only 3 species of *Nitella* had been studied because the other specimens did not have properly developed oospores. Unfortunately, oospores of *Tolypella*, *Nitellopsis* and *Lychnothamnus* were not found in the exsiccates. Nevertheless, materials of the genera *Tolypella* and *Lychnothamnus*, obtained from other collections will be included in this study. The largest amount of oospores recovered belonged to *Chara globularis* Thuillier and *Chara contraria* Kütz. Characters such as oospore length, maximal width, ISI index, number of ridges and width of fossa were studied. Since many authors emphasized the importance of oospore morphological investigations using scanning electron microscopy (SEM) (e.g. John & Moore 1987, Ray et al. 2001, Sakayama et al. 2005), the ornamentation patterns of oospore walls have also been taken into consideration. The research's main objective is to evaluate oospore morphological features for an oospore-based species identification. Rare and so far poorly recognized species, e.g. *Tolypella glomerata* (Desvaux) v. Leonhardi, *Lychnothamnus barbatus* (Meyen) v. Leonhardi, *Chara braunii* Gmel., as well as varieties of common and morphologically diverse species are of special interest.

Additionally, ecological aspects producing morphological variability, which is also evident on the morphology of the oospores, have been considered, in particular for *Chara globularis* Thuillier oospores (Boszke & Pełechaty 2006). This species belongs to the group of species best represented in Dąmbska's collection and Poland in general. Oospores collected from specimens found in lakes, peat-bogs, ponds and ditches of mid-Western Poland were compared, and a statistically sound variation among the examined aquatic ecosystems was demonstrated. Visible differences were noted among lakes and ponds, with the later being particularly different from the rest of the habitats studied. Ditches and peat-bogs represented intermediate values of most oospores characters between the groups collected from lakes and ponds. Specimens collected from lakes showed the longest and widest oospores, with the highest number of ridges and widest fossa, while oospores from ponds, revealed the lowest values of length, width, and fossa, but not of the ISI index and number of ridges. In our study, oospore length and width appeared to be the best differentiating features. It seems that wall ornamentation under SEM does not particularly well reflect the above habitat-dependent variability of oospore morphology as clear differences were not found. It must be said, however, that a limited number of oospores from each habitat was studied under SEM and, so, further study is required.

Future research will involve the analyses of oospores of all the common Polish species of charophytes, and their interregional variability in relation to characteristics of the ecosystems.

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Mariusz Pełechaty & Patrycja Boszke, Poland

Status of the investigation of charophytes from mid-Western Poland

Research on charophytes has a long history in Poland (see Urbaniak 2006), with more extensive studies carried on in mid-Western Poland during recent years. The postglacial relief of this region has produced diverse types of aquatic ecosystems, reflected not only in the morphology of the water-bodies, but also in

their ecological and biological characteristics. Many of these ecosystems are protected by forests (e.g. Lubuskie province is the most forested region in Poland; the restricted territories of Wędrzyn Military Training Ground (Pełechaty & Pukacz 2006a)). Probably because of its difficult access, this region has been poorly researched from a hydrobiological point of view, though earlier charophyte investigations were conducted in this area (Dąmbska 1962). Dąmbska focused on the occurrence of species of *Characeae* and their social interrelationships with other plants (Dąmbska 1962, 1964, 1966). Recently, since the year 2000, extensive investigations concerning charophytes and other vegetation, their ecology, interrelationships with biotic and abiotic elements of aquatic ecosystems have occurred.

During the years 2000-2006, fifty six lakes of different morphometry and trophic status were surveyed. Among these lakes, charophytes were found in 43, from which 30 lakes show charophytes dominating and building large communities (charophyte meadows), and 13 lakes had charophytes dispersed, as individuals or forming small patches. This research involved also old river-beds, fishponds and ditches, in which interesting and rare charophytes were found (Pukacz & Pełechaty 2004, Pełechaty & Pukacz 2006b). In general, from the 34 charophyte species expected in Poland, twenty two were found in mid-Western Poland, represented by 5 genera (*Chara*, *Nitellopsis*, *Lychnothamnus*, *Nitella* and *Tolypella*). It is worth emphasizing, that the very rare *Lychnothamnus barbatus* (threatened at an international scale) and *Nitella batrachosperma* (firstly recorded in Poland in the year 2004; Pełechaty & Pukacz 2005, Pełechaty & Pukacz 2006b), were found in this region.

A special emphasis of this research is being placed on charophyte ecology (Pełechaty et al. 2004), in particular, the interaction of charophytes with phytoplankton and habitat conditions (Pukacz et al. 2005). The results stressed the application of charophytes as bioindicators and their possible role to assess the ecological status of aquatic environments (Pełechaty et al. 2006, Pełechaty & Pukacz 2006b, Pukacz & Pełechaty 2006c).

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Mariusz Pełechaty & Andrzej Pukacz, Poland

PAST MEETINGS

2006

14th Meeting of the Group of European Charophytologists (GEC)

20-22 October, Barcelona, Catalonia, Spain. Organized by Dr Jaume Cambra and Núria Flor-Arnau, Dept. Biologia Vegetal, Facultat Biologia, University of Barcelona.

Scientific Report of the 14th GEC

The meeting was attended by 43 participants from 11 European countries, and for the first time Italy was represented with four attendants. The venue was also joined by two colleagues from Australia and one from USA **(see Group Photograph page 24).**

Friday, 20 October, was a full day with oral and poster presentations, which took place in the IEC (Institut d'Estudis Catalans), in the centre of Barcelona. It is a beautiful old baroque building which was in the past (17 – 19th century) a centre for medical studies, especially surgery. We admired the beautiful lecture room where in former days a surgery professor taught his pupils, demonstrating the internal parts of a dead body laying on a stone-table which is fixed in the centre of the room! Fortunately our lectures were in another room.

In the morning session there were 6 oral presentations:

1. Carles Martín-Closas (Barcelona): *Biogeography of early Cretaceous Clavatoraceae (fossil Charophyta) - State of the art, 2006*. Carles gave a nice review of the family Clavatoraceae from the Early-Cretaceous. At that time charophytes were the only macrophytes in freshwaters and were not yet hindered by phanerogamic macrophytes. The species-rich Clavatoraceae had a worldwide (sub)tropical distribution. As recently, monoecious species had a worldwide distribution while dioecious species had a more restricted/endemic distribution, e.g. species of *Globator* and *Ascidiella* in the area of the Tethys sea. For the transport from the area of origin in S. Europe and N. Africa towards Asia and America primitive water birds and/or migratory dinosaurs could have been responsible. From the Mid-Cretaceous onwards the Clavatoraceae were replaced by the Characeae.
2. Adriana García (Australia): *Palaeolimnological study of the Macquarie Marshes, Australia: evidence of channel movement during the Holocene based on algae (charophytes, diatoms), macrophytes and invertebrates.* Based on these palaeodata it could be demonstrated how from about 1000 years ago river channels moved eastward and how water levels fluctuated. Involved charophytes: *Chara globularis*, *C. fibrosa*, *C. muelleri*, *Nitella subtilissima*, *Nitella* sp. and *Sphaerochara intricata*.
3. Katarzyna Bociag (Gdansk, Poland): *Some traits of Chara rudis A.Braun life strategy.* This was an interesting approach to try to incorporate *Chara rudis*, which dominates a large lake near Gdansk, into the well-known strategy types of Grime: C-type: competition strategy, S-type: stress tolerant, R-type: disturbance tolerant. This was done by determinations and observations on biomass, whole-plant architecture, and reproduction over a depth gradient (10 metres). As a conclusion, the R-strategists would occur in shallow, littoral water whilst C-type lived in deeper water and R-strategists in the deepest lake.

4. Maria Kwiatowska, Katarzyna Poplonska & Agnieszka Wojtczak (Lodz, Poland): *Spermiogenesis of Chara spp. – the results of ten-year observations*. Katarzyna explained the cytological processes leading to spermatozoids and these give the insight that this type of spermiogenesis is very advanced and comparable to mammals, including *Homo sapiens*.
5. Ralf Schaible & Hendrik Schubert (Rostock, Germany): *Genetic investigation of sexual and parthenogenetical reproducing Chara canescens individuals.* Ralf presented the state of affairs in the research about sex ratio (ratio of dioecious sexual versus parthenogenetic female plants) in *Chara canescens*. Parthenogenetic plants occur from north to south-east Europe, while sexual plants are only known from a few sites in central and south-east Europe. Both types occur intermingled in the study area: 63 shallow pools in Neusiedler See/Seewinkel area (Austria). A molecular marker was discovered and this made it possible to discern both types also in vegetative condition. Both types appear to occur in the same habitat, the parthenogenetic type being by far dominant. Ecological differences could not yet be found. At present, the evolutionary significance of this phenomenon, is still speculative.
6. Mary Beilby (Australia): *Electrophysiology of hypertonic regulation in* Lamprothamnium succinctum. This was for our kind of audience a rather difficult story about voltage differences between outside and inside the central cell in relation to the activity of proton-pumps and certain ion channels at different salinities/osmolarities. Based on the observations, mathematical models were developed.

After a comfortable lunch break (13.00 – 14.30h), we had 8 more oral presentations, predominantly dealing with ecological and floristic subjects:

7. Angela Doege (Saxony, Germany): *What is known about the stoneworts in Saxony in connection with the EU-Water Framework Directive*. This presentation showed the mapped distribution of 10 species of *Chara*, 9 species of *Nitella*, *Nitellopsis obtusa*, *Tolypella glomerata* and *T. intricata*, determining also the Red List categories. In the framework of the EU-Water Directive all Characeae species are proposed as indicators of good water quality. Some taxonomic problems were discussed regarding intermediate forms between *Chara globularis* and *C. virgata* and between *C. intermedia* and *C. polyacantha*.
8. Nuria Flor-Arnau & Jaume Cambra (Barcelona): *Contribution to the knowledge of charophytes and ecological classification of the wetlands from the Duero basin (Spain).* Nuria (main organizer of the symposium) presented the results of this nearly finished project. The occurrence of 8 Characeae species at 71 sites was studied. The sites can be grouped into 4 ecological types by means of multivariate analysis of physical, chemical and biological parameters. Compared to 1987 it was stated that the charophyte flora has been impoverished with recent increase of eutrophication-tolerant species as *Chara vulgaris*, *C. globularis* and *Nitella flexilis.*
9. Jacek Urbaniak (Poland): *An interesting Charophyte flora in Lubelszczyzn region (Eastern Poland)*.The charophyte flora of this secondary mountain area appears to be rich and contains 28 species out of the 33 species present in Poland. Good habitats here are lime-rich deep lakes and peat marshes. A rare species is *Chara filiformis*. Special sites with *Chara hispida* are small pools hidden in high vegetation of *Cladium mariscus.*
10. Zane Dekere (Latvia): *The travelling tribe – Characeae*. This subject concerned the distribution of 10 Characeae species along the Baltic coast of Latvia. This sandy and exposed coast is not suitable for charophytes. Only in some sheltered bays in the Gulf of Riga do charophytes occur. It is supposed that by storm events charophyte oospores and vegetative parts are transported with sand and can germinate and grow at new sites.

11. Mariusz Pełechaty & Andrzej Pukacz (Poznan, Poland): *Characeae and Charetea of mid-western Poland against the background of the state of Polish charophytes*. In this area which is rich in aquatic biotopes (lakes, old river branches, fish ponds, ditches) 22 Characeae species occur among which the most rare are *Lychnothamnus barbatus* and *Nitella batrachosperma*. Ten of these species are protected by law. The highest number of species per lake was 8.
12. Catherine Henricson (Helsinki, Finland)*: Chara tomentosa under the ice.* This species is decreasing by mechanical disturbance and eutrophication. Also there are fluctuations from year to year, in relation to climatic influences. In this framework winter survival was studied. In aquaria the impact of oxygen depletion and freezing was investigated. It appeared that vegetative parts of the charophytes survived freezing to - 4º C vegetatively, and new plants developed from the nodes during spring, as was indeed observed in situ.
13. Klaus Schmieder (Konstanz, Switzerland): *Charophytes as a food source for wintering waterbirds at lake Constance*. The herbivorous water birds Coot, Redcrested pochard, and Pochard consume extensively charophytes in shallower parts of this big lake (< 1m depth), especially in winter. Yet, the impact on charophyte regeneration after winter is not high, thanks to the abundant oospore production by the grazed charophyte meadows.
14. Andrzej Pukacz, Aleksandra Pełechata, Marius Pełechaty (Poznan, Poland): *The diversity of phytoplankton structure and habitat properties in lakes with differential development of charophyte vegetation – case studies from Lubuskie Lakeland (mid-western Poland)*. In 3 groups of lakes with different abundance of charophyte vegetation the biomass and species diversity of the phytoplankton community was analysed. It appeared that the plankton has the lowest biomass and highest diversity in lakes with highest charophyte biomass and diversity. A low plankton biomass and high diversity was also found in more eutrophic lakes where other macrophytes richly occurred together with charophytes.

After a short break, we continued with a poster session, in which 10 posters were shown and explained by the authors. To make this report not too long, only one remarkable point: this concerns the poster of Frederic Triboit & Ingeborg Soulié-Märsche: *In situ remediation of sediments in motorway retention ponds in South of France.* In these ponds along motorways, called 'technotopes' by Ingeborg, which catch the water running from the roads, sediment accumulates which is strongly contaminated by heavy metals, PAC, herbicides and so on. This infected sediment must regularly be removed. The presented research deals with the question to which extent the charophytes that spontaneously grew there, *Chara vulgaris* and *C. globularis*, can accumulate the pollutants and so help 'to clean' the sediments. This is a typical case of 'phycoremediation', and we never thought about such an application of pollution sensitive charophytes!

Tired but very satisfied, most of us had a rich evening dinner in a nice Barcelonese 'Restaurant Hotel España', built at the turn of the 19th Century in Modernist Style.

Jan Simons, The Netherlands

The field trip to Basturs lakes and the paleolake of La Cerdanya in the Pyrenees

The field trip started on Saturday 21 October. We gathered in the cool dark morning before 8 am on Carme street, near the conference venue. Most of us fitted into a comfortable bus, with a few people travelling in a van with some of the conference organizers. We headed north and passed the great land-mark of Montserrat. The weather was clear in Barcelona, but as we started climbing into the Pyrenees foothills, we found ourselves in a thick and cold fog. Nuria Flor-Arnau was at the front of the bus, telling us about points of

interest. We stopped for a coffee and cake at a roadside stop - both much better than they would be in a similar place in Australia. We emerged from the fog to drive over a flat, seemingly barren high plateau dotted with villages. High mountains appeared on the horizon: Sant Corneli Mountains and Montsec, still shrouded in clouds and fog. We parked in a grove of poplars with golden leaves. The air had autumnal smell with a fresh tang of juniper.

The Basturs Gran Lake is quite round with steep sides overgrown with sharp-edged reeds on top and loose gravel closer to the water's edge. This lake is 640 m above sea level, 70 m in diameter and 20 m deep. I was surprised how much the lake looked as if it was of volcanic origin. But different processes created it. It is a karstic lake: a deep aquifer emergence is recharged in the elevated ground nearby. The water has a high lime content and blue green colour. The lakes have a monomictic cycle. In the summer there are two well-differentiated layers, the epilimnion and hypolimnion, separated by thermocline. For the rest of the year the water column is undifferentiated. While there are crop fields around the lakes, the lakes are protected and their importance is recognized by the authorities.

People teetered on the slippery gravel near the lake's edge, trying to see plants in the water. Fortunately, nobody fell in. Inflatable boat was needed to collect charophytes. With the help of Hendrik Schubert, intrepid Nuria Flor-Arnau and Zofia Sinkeviciene got in and paddled around the lake. They collected a lot of samples to be sorted out later in the afternoon.

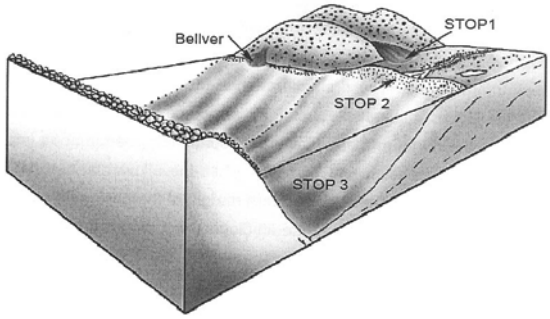
In the meantime, we followed Jaume Cambra to Bastur Petit Lake 220 m over a rather muddy field. This lake has a lot of reeds around it. We had to fight our way in and more charophytes were collected. All was packed into plastic bags, we photographed the mountain range as it emerged from clouds and we trooped back on the bus.

We drove to village Tremp where lunch was organized in the Black Lake restaurant. The food was great - my duck with pears was just scrumptious. After lunch we walked to the local museum, where a lab was set up for us with microscopes and trays to spread out the plants. The charophytes were identified as several types of *Chara hispida* - huge plants more than a metre tall. Also we could see some specimens of the rare *Lychnothamnus barbatus*, brought by Zofia Sinkeviciene from a place in Latvia. I also looked at *Utricularia vulgaris*, the bladder plant. It was a great time for everybody to admire the plants with plenty of lively discussion.

We got back into the bus and drove further into the mountains, following hairpin bends in the narrow road. The sun was setting, illuminating the gold and red deciduous trees on the dark background of the evergreens. After darkness fell, the drive became somewhat hair-raising, but we arrived safely in the La Cerdanya basin in the picturesque town of Bellver. We were staying in an old Hotel Fonda, operating for about hundred years. The fog descended and it became quite cold outside. A large table was set up for us, and the meal was again very good. But I could not do it justice after the great lunch.

The following morning (after a great breakfast) we drove out of the fog to see the valley spread bellow us and ragged mountain peaks on all sides. Three hot air balloons drifted just above the fog. Carles Martin-Closas gave us a lecture on the geology of the region.

La Cerdanya is the widest valley in the Pyrenees and the only one with east to west orientation, historically important for the communication between people living on both sides of the mountains. The valley used to be a palaeolake with the bottom deposits dating within 10-13 million years ago to higher deposits dating within 4.9-6.8 million years ago. The first stop took us 200 m above the valley.



Reconstruction of La Cerdanya palaeolake from the field trip guide book, with stops 1 – 3 indicated. Stop 4 corresponds to another stage in the evolution of the lake.

The second stop (palustrine belt) took us to Sanavastre open cast mine for lignite (which was of poor quality), also used as a quarry. We looked for fossils, but charophytes were not expected here. We did find some beautiful oak and beech imprints. What a strange feeling to look upon a leaf hidden for millions of years! In the next stop (the diatomic lake) we found ourselves on a steep slope over a creek near road from Bellver to Pi. Again we found leaves and pine needles and phosphatic nodules.

The next two stops (late stages of the Vallesian lake) were near roads in the valley of Ridolaina and this time we expected to find charophytes. People found some oospores, but no gyrogonites. These were uncovered in the last place. We also found ghostly white impressions of *Lychnothamnus barbatus*. A great day!

We were driven back to Bellver to a nice late lunch. We departed for Barcelona at about 4 pm after saying goodbye to some of the group, who had flights to catch and departed with the van. We in the bus got caught in traffic and arrived in Barcelona late at about 8 pm. The bus driver, who drove brilliantly on mountain roads, was equally at home in narrow city streets. It was sad to say goodbye to everybody. Many thanks to Jaume Cambra, Nuria Flor-Arnau and Carles Martin-Closas for a brilliantly organized trip!

Mary J. Beilby, Australia

FORTHCOMING MEETINGS

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

2007

17 - 20 May
International Conference of Polish Phycological Society**,** Lublin, Poland.
The meeting will be held in Lublin, which is a beautiful town, with fine and old architecture (including an old castle), and localized nearby Naleczow town, a popular resort.

27 May - 02 June
International Field Symposium, Lithuania.
Quaternary of Western Lithuania: from the Pleistocene glaciations to evolution of the Baltic Sea, Lithuania.

Website:
http://193.219.150.148/fileadmin/user_upload/Informacija/Second_circular.pdf

10 – 13 July
1st International Symposium of Palaeobiogeography, Université Pierre et Marie Curie (Paris 6), France.
Website:http://sgfr.free.fr/rencontrer/seances/s07-07paleobiogeo.html

11 - 14 July
ILIC 2007 - 4th International Limnogeology Congress**,** Barcelona, Catalonia (Spain).
This meeting will cover all aspects related to palaeolimnology including lacustrine records of global to regional palaeoenvironmental changes, palaeobiological views from lacustrine records, techniques in limnogeology, and modelling ancient to recent lakes.
Website: http://www.ilic2007.com

12 - 18 August
International Association of Theoretical and Applied Limnology**,** Montreal, Canada.
This huge and expensive Congress (registration fees $ 850 CAD) is organised as a co-venue with the 30th Congress of the International Society of Limnology. The fifteen Regular Sessions proposed at this meeting, include topics that might be of interest for charophytologists: i.e. Biodiversity in Aquatic Ecosystems, Limnology of Brackish Waters, Paleolimnology.
Website: http://www.sil2007.uqam.ca/

28 July-3 August
XVII INQUA Congress, Cairns, Australia.
The International Union for Quaternary Research is organising the XVII INQUA congress in Australia, dedicated to Quaternary research. More than 1,500 papers will be presented as oral/poster, and the meeting involves various pre- and post-conference fieldtrips. Registration costs increase on 31 March 2007.
Website: http://www.inqua2007.net.au

Autumn 2007, Germany

4th conference of the AGCD, Germany
The **4th conference of the Working Group on Characeae of Germany** is planned to take place in autumn 2007, though place and date are not yet determined. Work on determination problems will be the most important issue of the forthcoming conference.

19 - 20 September
9th International Symposium on Fossil Algae, Zagreb, Croatia.

This symposium of the **International Fossil Algae Association** is organized by the **Croatian Geological Survey**, the **Department of Geology**, Faculty of Science, University of Zagreb, and the **Croatian Geological Society**. Two field-trips are planed: pre-symposium field trip to Dinarides and the Adriatic Coast, and a post-symposium field trip to NW Croatia and Zagreb surroundings.
Presentations on any aspect of calcareous algae and microbes are welcome, including: Biomineralization and algal- or microbe-induced sedimentation, Stromatolites, Taxonomy and Systematics, Evolutionary history, Living vs. fossil records, Biogeography and palaeoclimatology, Ecology and palaeoecology, Biostratigraphy, Taphonomy and diagenesis, Significance of algae in hydrocarbon and mineral resources formation. **The dates and the location of Zagreb near Belgrade allow combination of this meeting with the GEC-15 Meeting in Belgrade, one week later**.

Dates to remember are: 31 May 2007: Symposium and field trip registration; 31 May 2007: Submission of abstracts; 1 July 2007: Final payment of all fees.
Contacts: Tonći Grgasović**,** Hrvatski geološki Institute (Croatian Geological Survey)**,** Sachsova 2, POB**,** HR-10000 Zagreb**,** Croatia**, E-mail:** tonci.grgasovic@hgi-cgs.hr**; Skype:** tgrgasovic**; Telephone:** 385-1-6160-707**; Fax:** 385-1-6144-718**, and** Alisa Martek**,** Hrvatski geološki Institute (Croatian Geological Survey)**,** Sachsova 2, POB**,** HR-10000 Zagreb**,**

Croatia; **E-mail:** alisa.martek@hgi-cgs.hr; **Telephone:** 385-1-6160-786; **Fax:** 385-1-6144-718
Website: Croatian Geological Society.

24 - 27 September
***15th Meeting of the Group of European Charophytologists* (GEC),** Belgrade, Serbia.

PRELIMINARY ANNOUNCEMENT AND EXPRESSION OF INTEREST

Prof. Dr Jelena Blazencic & **Prof. Dr Branka Stevanovic** have kindly offered to organise the next GEC meeting at the Faculty of Biology, University of Belgrade, Belgrade, Serbia.
The program will include two days of lectures and one/three days of a field trip to some of the varied and beautiful ecosystems in the area.

This is a first announcement and people wishing to express their interest in participating should contact **Dr Jasmina Sinzar-Sekulic (see email address below)**

FIRST CIRCULAR AND REGISTRATION FORM WILL BE AVAILABLE SOON, AND ALSO INCORPORATED IN THE IRGC WEBSITE.

Contact person:
Dr Jasmina Sinzar-Sekulic
Institute of Botany and Botanical Garden «Jevremovac», Faculty of Biology, University of Belgrade, Takovska 43, 11000 Belgrade, Serbia, Telephone:381 11 32 44 923 , Fax :381 11 32 43 603, e-mail : jsekulic@bfbot.bg.ac.yu

Mid-October
The 13th Meeting of Fossil Algal Association of China (FAAC), Guiyang in Guizhou Province, China
The meeting includes a field excursion, Wengan Area, Precambrian Doushantuo Formation, yielding the earliest animal embryos and lichens on earth.

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

2008

5th International Symposium of the IRGC, September 2008

PRELIMINARY ANNOUNCEMENT

The meeting will be organised by Dr Irmgard Blindow and Prof. Hendrik Schubert and will take place at the University of Rostock, a historic city in North Germany ancient harbour of the "Hanseatic League". Rostock can easily be reached from the airports of Berlin or Hamburg.
The provisional schedule includes:
1) 22-23 September - Pre-symposium excursion (two days) to freshwater lakes with Charophytes in the area called "Feldberger Seenplatte" north of Berlin and to brackish water habitats with charophytes at the Baltic Sea. Participants should gather together on 21 September, preferably via Berlin. The excursion will use buses and will end at Rostock.
2) 24-26 September - three days of Scientific sessions. Attendants who don't participate in the excursion can arrive directly in Rostock by train from Berlin or Hamburg.
3) a 5-day post-conference excursion is "under consideration". Depending on practical issues this excursion will possibly lead either to the Island of Gotland (Sweden) – visiting the locality with the oldest known Charophytes (425 million years old gyrogonites) as well as collecting living Characeae on and around the island; or visit sites in the Hannover area, south of Rostock, to sample fossil Charophytes (of Jurassic and Cretaceous age) under the guidance of Dr Michael Schudack.
The first circular and registration form will be sent by the organisers in April 2007.

Webpages for Rostock (town and university):
http://www.hhog.de/en/showCity_en.php?cityID=10016
http://www.uni-rostock.de/index.asp

CRYPTOGAMIE, ALGOLOGIE 27 (4): 309-490. NOVEMBER 2006 ISSUE (PROCEEDINGS OF THE 4TH SYMPOSIUM OF THE IRGC)

This volume compiles 12 papers from the Fourth International Symposium of the International Research Group on Charophytes (IRGC), held in Robertson, Australia, 24-26 September 2004.

Content of the volume:

1. Jelena BLAŽENČIĆ, Branka STEVANOVIĆ, Živojin BLAŽENČIĆ & Vladimir STEVANOVIĆ - Distribution and ecology of charophytes recorded in the west and central Balkans.
2. Adriana GARCÍA & Allan R. CHIVAS - Diversity and ecology of extant and Quaternary Australian charophytes (Charales).
3. S.B. BHATIA - Ecological parameters and dispersal routes of *Lychnothamnus barbatus* (Characeae) in the Early-Middle Holocene from the Ganga plain, India.
4. Carles MARTÍN-CLOSAS, Jan J. WÓJCICKI & Laia FONOLLÀ - Fossil charophytes and hydrophytic angiosperms as indicators of lacustrine trophic change. A case study in the Miocene of Catalonia (Spain).
5. Monique FEIST, Raimund FEIST & Mark WARNE - New Early Devonian Charophyta from Gondwana.
6. Christopher J. GARVEY, Jozef KECKES, Ian PARKER, Mary BEILBY & Garry S. H. LEE - Polymer nanoscale morphology in *Chara australis* Brown cell walls studied by advanced solid state techniques.
7. Mary J. BEILBY & Virginia A. SHEPHERD - The electrophysiology of salt tolerance in charophytes.
8. Catherine HENRICSON, Eva SANDBERG-KILPI & Riggert MUNSTERHJELM - Experimental studies on the impact of turbulence, turbidity and sedimentation on *Chara tomentosa* L..
9. Núria FLOR-ARNAU, Ferran REVERTER, Ingeborg SOULIÉ-MÄRSCHE & Jaume CAMBRA - Morphological differentiation of *Chara aspera* Detharding ex Willdenow and *Chara galioides* De Candolle under different environmental variables.
10. Jacek URBANIAK - Zinc accumulation by two species of *Chara* (Charophyta).
11. Wei-Lung WANG & Jui-Yu CHOU - Biogeography of *Lychnothamnus barbatus* (Charophyta): molecular and morphological comparisons with emphasis on a newly discovered population from Taiwan.
12. Usha KRISHNAN - Differentiation of *Chara gymnopitys* A. Br. and *Chara hydropitys* Reich. by morphological characters, isozyme analysis and oospore wall ornamentation.

Cost of the issue and Contacts to purchase it
The cost of the volume is 60 Euros.
Ordering and payment shall be made on-line through the **ADAC-Cryptogamie. Website**:
http://www.cryptogamie.com/pagint_en/catalogue/catalogue.php
Go to "catalogue" to find the volume and put it in your basket. Only in case you cannot make an internet connection, you may contact the sales officer, Mrs E. Bury. E-mail:
edithbury@cryptogamie.com

NEWS FROM THE REGIONAL GROUPS

News from the Working Group on Characeae of Germany (AGCD)

The group was founded at the University of Rostock in March 2004 during the 1st Conference on Charophytes of Germany, which was organised by Prof. H. Schubert and

his team. Since then, the AGCD has met every year and has an attractive website, created by C. Blümel and hosted at the University of Rostock: (http://www.biologie.uni-rostock.de/oekologie/agcd). The 2nd Conference of the group was held in Karlsruhe, South Germany, organised by A-M Radkowitsch and Prof. Lehnert.

*Report on the **3rd Conference of the AGCD**, September 2006*

This 3rd Conference on "Charophytes of Germany", organised by Mr. Ratai and Prof. Schubert, was held in Thomsdorf, Feldberger Seenplatte, NE Germany, from 15 to 17 September 2006. More than 40 participants, interested in Charophytes, attended the meeting, which consisted of two lecture blocks, a field excursion and a determination workshop.

In the oral sessions on 15-17 September, reports about the occurrence of Charophytes in Brandenburg (by Kabus), Mecklenburg-Vorpommern (by Spiess, Täuscher), Niedersachsen (by Becker), and Thüringen (by Korsch) were presented. I. Blindow presented an introduction into the Swedish Species Protection Program. Further, related topics such as: status and problems in the preparation of the German red list (van de Weyer), online tools for electronic preparation of red lists (Ludwig), and evaluation forms for macrophyte assessments in the frame of the EC fauna flora habitat directive (Teppke) were presented and discussed. A lecture of special interest was given by Sänger & Küchler, who presented the status of a project targeting on the use of Characeans in the passive treatment of mining waste water. Most of the lectures (in German) will be made available for the public on the above-cited homepage.

On 16 September, boat excursions to lakes Carwitzer See, Dreetzsee and Krüselinsee were followed by a determination workshop targeting species delimitation problems. Dr. Blindow gave a summary about these problems and about possible solutions the next day – this summary will also be available on the homepage. Whereas a rich Charophyte community had already been described earlier for Dreetzsee and Krüseliner See, the finding of 10 Charophyte species in the Carwitzer See, as a result of the diving and boat excursion was very welcomed by the local organizer. This lake also showed the interesting occurrence of the macroscopic Cyanobacteria *Nostoc pruniforme* and *Aphanothece stagnina*.

As already done for the 1st and 2nd conference which were respectively published in (1) *Rostocker Meeresbiologische Beiträge* 13 (2004): 9-202; and (2) in *Berichte der Botanischen Arbeitsgemeinschaft Südwestdeutschlands*, Beiheft (2006 in press), the lectures as well as selected results of this 3rd conference of the AGCD will be published. This publication will appear at the end of 2007 in a forthcoming issue of *Rostocker Meeresbiologische Beiträge*.

Program for the 2007 AGCD meeting:
The next conference of the AGCD is the Fourth and is planned to take place in autumn 2007 though it has not been established yet when and where. The most important issue of the forthcoming conference will be to discuss taxonomic problems. At present, the following problems have been identified which will be tackled during the next field season and dealt with in the next conference:

A) Discrimination between the three *Lamprothamnium* species described for Germany, including further investigations whether they are real "species" or not, a problem already rose by W. Krause for *L. hansenii*.
B) Determination difficulties between species of genus *Chara*, e.g. discrimination between *Chara globularis* and *C. virgata*, *Chara hispida* and *C. rudis*, *Chara baltica* and *C. horrida* and *C. Liljebladii*, *Chara vulgaris* and *C. contraria*
C) Distinction of certain *Nitella* species, especially the cluster of *Nitella mucronata*, *N. gracilis* and *N. confervacea* .

During the field season 2007, all members of the working group will focus on these problems and then present the difficulties

encountered and possible solutions gained from their experience. At the next conference, herbarium material as well as fresh plants will be examined and compared with type-material if available. The aim of the group is to work out a guide for the determination of species complexes.

Hendrik Schubert, Rostock

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 who 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 are invited to send relevant information to Adriana García.

The **GEC** homepage will be held by the organizers of each GEC Meeting. The present page was prepared by Núria Flor and Jaume Cambra is located in: http://es.geocities.com/gecbarcelona/

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

NEW ADDRESSES (of new members and changes of address)

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NEWS FROM INDIVIDUALS

Dr Fateh Mebrouk obtained a 1 1/2 year research fellowship at the Institut des Sciences de l'Evolution (Montpellier). His focus is on fossil Charophyte gyrogonites from the Tertiary deposits in North Africa. The fossil

localities in Algeria, Morocco, Libya are the subject of pluri-disciplinary studies including vertebrates, mammals, primate and Afrothere. This study includes systematics, biostratigraphy, morphometry and the isotopic analysis of carbon and oxygen starting from the gyrogonites of charophytes.

Dr Susanne Schneider has moved to the Norwegian Institute for Water Research in Olso (NIVA; http://www.niva.no). She will continue her research in freshwater biomonitoring, with a special focus on the phytobenthic community.

MEMBERSHIP FEES

Please do not forget to send your membership fee payment for 2007!!!

10 Euros (c. US$12) per year

Thanks to the efforts of our treasurer the payment can be done by credit card.
Please 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 the IRGC-Treasurer Dr Emile Nat: e.nat@kranswieren.nl

xxxxxxxxxxxxxxxxxxxxxxxxxxxx

E-Mail addresses of ALL IRGC Members

Please check the e-mail list and address directory carefully. **We particularly urge members to send any address changes (both surface mail and e-mail)** to the IRGC-Secretary, Adriana García adriana@uow.edu.au to ensure you will receive forthcoming information.

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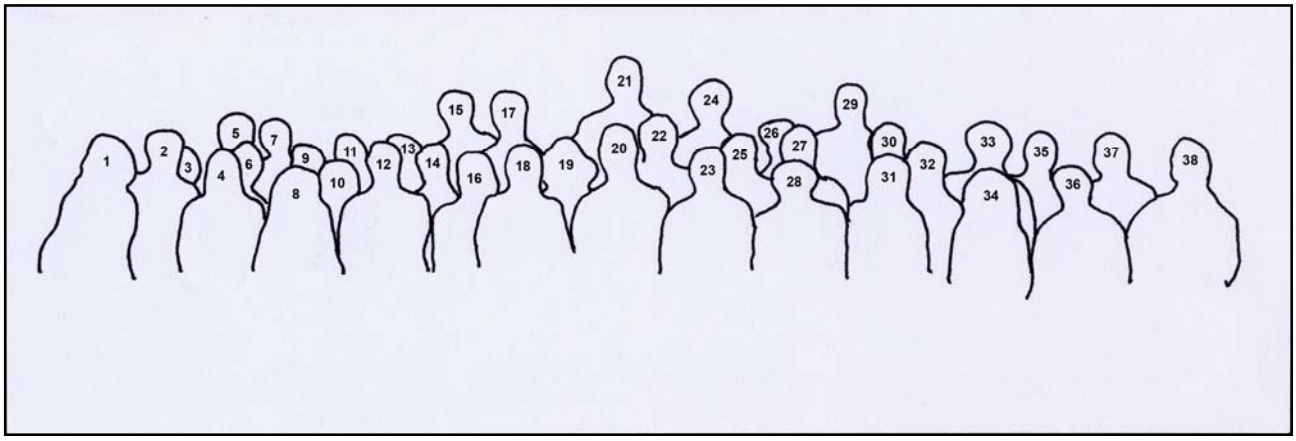

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