



# IRGC NEWS



INTERNATIONAL RESEARCH GROUP ON CHAROPHYTES

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# 19

## March 2008

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### **PRESIDENT'S REMARKS**

2007 again was a busy year for charophytologists. The German Group (AGCD) and the European Group (GEC) held successful annual meetings as you can see from the enthusiastic report on the latter (see p. 8, group photograph p. 20). Don't miss the major event of 2008, the **5<sup>th</sup> IRGC Symposium** (see circular enclosed). Held every four years, this forum is a unique opportunity to meet and discuss with colleagues you may know only from papers and to establish new contacts worldwide. The IRGC Executive Committee has to be renewed and we count on your participation in further activities. I'd like also to remind you to make use of Charophyte-L, the discussion forum set up in 2006 by our list administrator Dr R. Scribailo. Here you can ask any question concerning "all you ever wanted to know about Charophytes". The IRGC is almost 20 years old - I hope and wish the society will continue long into the future and give strength to all its members to promote the importance of charophytes as a structuring element of modern and past aquatic ecosystems. Best wishes

**Ingeborg Soulié-Märsche**

Executive Committee  
**Ingeborg Soulié-Märsche (President)**  
**Carles Martín-Closas (Vice-President)**  
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The task of the Regional Correspondents is to collect relevant information about meetings, books, individuals etc. from their area and to forward these to the IRGC Secretary (see also 'Regional Groups of the IRGC' in this issue).

**ISSN NUMBER FOR THE IRGC NEWS**

Since 2007, the IRGC News has an ISSN number (**ISSN 1834-6030**), which permits contributions published in the News to be considered as a publication. Your contribution in any area of charophyte research is welcome, though the articles have a one page maximum length.

**Adriana García, Australia**

**NEW IRGC MEMBERS**

IRGC welcomes colleagues who have joined our society recently. Our new members are Lothar Ratai (Germany), Chrysoula Christia (Greece), Egita Zviedre (Latvia) and Jose-Luis Alonso (Spain).

**ELECTIONS OF IRGC EXECUTIVE COMMITTEE**

The election of the new Executive Committee will be finalised during the 5<sup>th</sup> IRGC Symposium in Rostock, September 2008. After eight years as President and working hard to make the IRGC strong and well positioned, Ingeborg is retiring. Please find the “**call for nominations**” as a separate document within NEWS 19. As the other incumbents of the Committee have expressed their willingness to continue in office for another period, at least one volunteer will be needed.

As established in the IRGC's statute, voting is by ballot and the names of the nominees will be circulated at least 3 months before the forthcoming IRGC Symposium to allow our members to vote. The votes will be counted at the General Assembly during the 5<sup>th</sup> IRGC Symposium.

During the Rostock General Assembly we will also discuss future activities and how to make 'our' IRGC a more dynamic organisation.

**Adriana García, Australia**

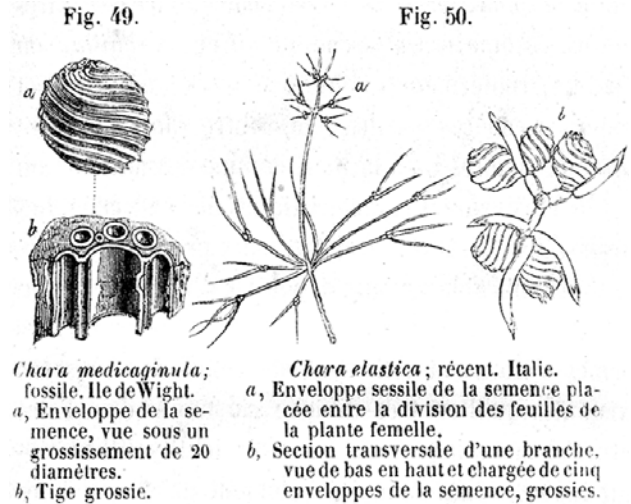
**HISTORY OF CHAROPHYTE RESEARCH**

First applications of fossil charophytes in Geology, 170 years ago

Most geologists, when asked about what charophytes are useful for, would answer “to know the age of ancient lacustrine rocks”. This is probably the most important application of fossil charophytes at present and represents as well a source of economic income for biostratigraphers. However, in 1838 when the

English geologist, Charles Lyell wrote what we now consider the first modern treatise on Geology, *Elements of Geology*, charophytes were considered mainly interesting from the point of view of palaeoecology. In this book, Lyell tried to find out which fossils could characterise the rocks deposited under freshwater conditions, in comparison to marine fossils, which form the bulk of the fossil record. Freshwater molluscs such as *Lymnaea* or *Planorbis* were considered in first place but at the end he concluded that these shells were not so easily distinguished from other similar shells of marine species. In contrast, charophytes were seen as good indicators of freshwater rocks. In a figure documenting charophytes (Figs 49-50 below), he shows a gyrogonite called *Chara medicaginula* (now *Gyrogona medicaginula*) from the Oligocene of the Isle of Wight and a portion of a fossil thallus showing cortication. Also he compares these remains with a drawing of an extant charophyte called “*Chara elastica*” (now *Nitella syncarpa*) from Italy. In the text, we find what may be one of the first attempts to compare fossil and extant gyrogonites. For Lyell, the globular gyrogonites of *Gyrogona medicaginula* looked more similar to the sublate gyrogonites of the Italian *Nitella* (for “*Chara elastica*”). We now know that the globularity of gyrogonites is not sufficient to characterise fossil species, but this part of charophytology would be developed more than 100 years after Lyell’s work!

The books of Charles Lyell had a significant impact in the birth of Geology as a modern science since they allowed him to incorporate the importance of studying present Earth dynamics to understand ancient geological processes. This was in contrast to previous attempts that mixed science and religion or superstition. It is thus a privilege that our field of study was included in the *Elements of Geology*, making fossil charophytes an important tool for early geologists.



**Figures 49 and 50 of Lyell’s *Elements of Geology* (French version published by Pitois-Levrault et Co. in Paris, 1839). *Chara medicaginula* is a later synonym of *Gyrogonites medicaginula* Lamarck 1804, now *Gyrogona medicaginula*, and was the very first fossil charophyte to be described from the Paris Basin. *Chara elastica* Amici 1827 was recognised by A. Braun to be a *Nitella* as early as 1867.**

At present, the use of fossil charophytes for palaeoecology is not well developed. Geologists know that charophytes may not only occur in freshwater but also in brackish to hypersaline water bodies, and that a deeper, species-specific knowledge is required before interpreting their palaeoecology correctly. Unfortunately, palaeoecological studies about charophytes are not abundant, except for the Quaternary. Let’s hope that the extraordinary boom in the research about extant charophytes ecology will encourage palaeontologists to improve their research in palaeoecology of the whole stratigraphic record, in a similar way Charles Lyell’s learning from botanists how to use fossil charophytes in geology.

**Carles Martín-Closas, Spain**

## PLAGIARISM IN CHAROPHYTES

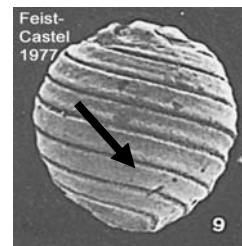
Although one is loath to publish facts that tarnish the reputation of a colleague in science, and understanding that inexperienced researchers may inadvertently or through ignorance be guilty of minor plagiarism, occasional cases of what might be termed “serial plagiarisers” are becoming apparent.

Between 1996 and 2003 Mostafa Mansour Imam was the author of 6 papers dealing with calcareous algae: red and green algae and Charophytes. The fraudulent nature of 3 of these papers was first revealed by Aguirre (2004) and subsequently widely publicized.

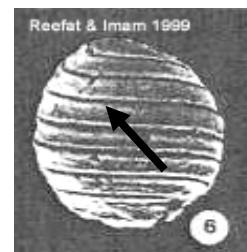
In 1999, Refaat & Imam published an article where Figures 9 and 10 illustrated respectively 22 and 16 gyrogonites of charophytes allegedly collected in Eocene strata of Egypt. All 38 images were “borrowed” from 4 publications (Feist-Castel, 1977; Feist & Ringeade, 1977; Grambast-Fessard, 1980; Grambast & Grambast-Fessard, 1981). They include nothing less than the holotypes of several species: *Harrisichara heteromorpha* Grambast-Fessard, 1980, *H. muricata* Grambast-Fessard, 1980, *H. regularis* Grambast-Fessard, 1980, *Gyrogona lamarcki* Grambast & Grambast-Fessard, 1981, *G. morelleti* Grambast & Grambast-Fessard, 1981, *Nitellopsis (Microstomella) aptensis* Feist-Castel, 1977, and *Stephanochara oodea* Feist-Castel, 1977. Most figures were reproduced without change, but in some cases gyrogonites were rotated 180° and thus appear upside down (their base upward), a point which should have alerted a smart reviewer. All species names from the already published figures have been changed (with a single exception). Even holotypes have been renamed and ascribed incorrect dates, for example, species from the stratotype Dano-Montian (Grambast-Fessard, 1980) were alleged to occur in the Oligocene. We also noted fictitious names, such as the unknown “*Gyrogona subglobosa* Grambast and Feist”, as well as erroneous author attributions: “*Stephanochara vectensis* Lyell”, “*Rhabdochara cf. attilis* Lamarck”.

The following year, in the *Arab Gulf Journal of Scientific Research* (Imam, 2000), the author again “borrowed” photographs of Charophytes from 4 publications (Feist & Ringeade, 1977; Feist & Grambast-Fessard, 1984; Martín-Closas & Grambast-Fessard, 1986; Soulié-Märsche, 1994). We identified 20 of the 22 specimens reproduced in his Plate 1. Again he includes the holotypes of two species, *Stephanochara berdoutensis* Feist & Ringeade, 1977, and *Musacchiella maestratica* Martín-Closas & Grambast-Fessard, 1986.

Though the denunciation of the fraud was given some publicity, the falsified data have already begun to pollute science (stratigraphic errors). Errors in palaeofloristic areas would be also regretful. The most regrettable aspect is that Imam’s frauds might tarnish the reputation of honest and professionally ethical colleagues from the African-Middle-Eastern region (after Granier et al., 2008).



*Stephanochara oodea* Feist



“*Stephanochara vectensis* Lyell”

**Figure :** Besides the morphological similarities, all the imperfections of the original (Fig. 9) are present in the fake figure (Fig. 6); in particular, the small line at the basal part of the gyrogonite, on the right side of Feist-Castel image is found again at the apical part, on the top left of the Refaat & Imam figure (they rotated the image!).

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**Monique Feist, France**

### **NEW BOOK**

#### **“The Freshwater Algal Flora of the Iberian Peninsula”**

By S. Cirujano, J. Cambra, P.M. Sánchez-Castillo, A. Meco & N. Flor-Arnau

Publication of the large *Flora Iberica* (vascular plants) by the Real Jardín Botánico de Madrid (CSIC) began in 1980. Since then, other series of *Fauna Iberica*, *Flora Mycologica Iberica*, *Flora Phycologica Iberica* (marine seaweeds), *Flora Bryologica Iberica* have been published. Historically, the Iberian Peninsula has suffered from a lack of classical flora and fauna volumes, which elsewhere in Europe were published at the beginning of XX<sup>th</sup> century and revised since the 1980s. At present, a large scientific taxonomical work is going on in the new edition of the Iberian fauna and flora, similarly to those of other European countries.

One of the still unpublished taxonomical groups in the broad scope of the “Iberian fauna and flora” concerns the freshwater algae, a historically neglected group in spite of the very interesting and diverse freshwater ecosystems that exist in the whole Iberian Peninsula. The main work till now was done mainly by Professor Margalef and P. González-Guerrero, considered the pioneers of the study of freshwater algae in Spain. The fact that the Iberian Peninsula has many types of epicontinental water systems, as well as several climates and biogeographic areas explains the high biodiversity within many groups of organisms, including algae. Currently, around 3500 species of algae are

recorded, though the number is probably higher because many areas are still unexplored.

Volume 1 of the "*Flora Ibérica de las algas continentales*" is devoted to charophytes (*Charophyta*). The work was done during five years by three phycological teams located in Madrid, Barcelona and Granada. Our research group did many sampling field trips throughout the Iberian Peninsula, reviewed herbarium material and compiled the extensive existing bibliographical data.



The aim of this *Flora* is to publish useful books, with easy and clear taxonomic keys. For each taxon, a morphological description, information of the habitats and geographical distribution are included. The illustrations were done very carefully, including plates of very detailed drawings, photographs under the stereomicroscope, herbarium specimens and in many cases SEM photomicrographs of oospores, to help the users of the book to distinguish *Nitella* taxa. This is the first volume of the series that will continue with the edition of the "*Flora Ibérica de las algas continentales*".

Final price for the volume will be around 20-25 Euro. Colleagues interested in the volume, should contact Dr Jaume Cambra Sánchez (e-mail: [jcambra@ub.edu](mailto:jcambra@ub.edu))

### Volume 1

CIRUJANO, S., CAMBRA, J., SÁNCHEZ CASTILLO, P., MECO, A & FLOR-ARNAU, N. 2007. *Flora Ibérica. Algas continentales. Carófitos (Characeae)*. Real Jardín Botánico, Madrid. 132 pp.

Finally, we want to express our gratitude to all the people and institutions that believed in our work and gave us support in the works and edition of this volume and very especially we are indebted to the Real Jardín Botánico de Madrid.

**Nuria Flor-Arnau, Spain**

## NEWS FROM MEMBERS

### *In memoriam* Michèle Massieux

With deep regret we inform you that our former colleague, Michèle Massieux, has passed away in spring 2007. She retired more than 10 years ago, mainly to nurse her mother who reached the age of 100 years. Michèle died from cancer six months after her mother's death.

Michèle received her PhD in micropaleontology from the University of Paris. Her initial focus was on fossil foraminifera and dasycladalean algae, with a first paper in 1961. Her second thesis (habilitation) entitled *Micropaléontologie stratigraphique de l'Éocène des Corbières septentrionales (Aude)* was published in 1973. Michèle was a member of the Charophyte team in Montpellier for more than 20 years, and her studies on Cretaceous and Lower Tertiary Charophytes from South of France, including the description of 16 new species, will remain a reference far beyond the present.

### *Publications dealing with charophytes by Michèle Massieux*

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## Ingeborg Soulié-Märsche

### PAST MEETINGS

#### 2007

#### 28 July-3 August 2007

#### XVII INQUA Congress, Australia.

The International Union for Quaternary Research organised with great success the XVII INQUA congress in tropical Cairns, Australia. More than 1,000 participants presented 1,500 papers in oral and poster sessions, and the meeting involved various pre- and post-conference fieldtrips. Prof. Allan Chivas (one of our members) was elected President of INQUA for a 4-year period.



Several people presented results on palaeolimnological work using macrophytes, though use of charophytes as palaeo-indicators still lags, in part due to a lack of knowledge on their taxonomy and ecology!!!

Symposium abstracts can be downloaded from: <http://www.inqua2007.net.au>

**Adriana García**

***19-20 September 2007***

**9th International Symposium on Fossil Algae, Zagreb (Croatia)**

The International Symposia on Fossil Algae are celebrated each 4 years, very much with a similar aim as our IRGC meetings. These symposia gather a diverse group of palaeophycologists, working mainly with marine calcareous algae, meaning cyanobacteria, red algae and chlorophytes from the whole geological record. The meeting in September 2007 was organised, with extraordinary care, in the beautiful city of Zagreb, by Tonći Grgasović and Igor Vlahović from the Croatian Geological Survey. Even if charophytes are usually less represented in this type of meeting, a number of presentations and discussions held in Zagreb may be of interest to specialists in charophytology. Two presentations were devoted specifically to charophytes. Climent-Domènech et al. (Barcelona, Spain) presented a palaeoecological model for Early Cretaceous wetlands of the Iberian Ranges based on the microfacies analysis of freshwater limestones. Microfacies ranging from deep lakes to shallow marshes were defined and the habitat separation between freshwater clavatoraceans and brackish porocharaceans was outlined. Martín-Closas (Barcelona, Spain) presented the first results of a current research project on the palaeobiogeography of Cretaceous charophytes showing the patterns of origin and migration of particular cosmopolitan species, such as *Atopochara trivolvis*. Several other presentations were related to our field of research. Granier et al. (Brest, France) reported the latest results in the investigation of Imam's

fraud. The latter author employed data and figures from other authors, including charophyte specialists, to build false publications about the geology and palaeontology of Egypt and Libya (see p. 3). Finally, a couple of presentations dealt with the origin and formation of different types of travertines. Mu Xinan (Nanjing, China) presented new results about the microstructures produced by microbial activity in the travertines of the World Heritage Huanglong Valley in Sichuan (China). Also Golubić et al. (Boston, USA) presented several examples allowing the distinction between calcareous tufa and travertines, the latter term being more appropriately used for thermal spring deposits. Many of the properties of calcareous tufa formation were discussed as well during the Pre-Symposium field trip, when we visited the breathtaking scenery of the Plitvice Lakes National Park (World Heritage listing). The Symposium abstracts and field trip volume can be freely downloaded from

[http://www.geologija.hr/symposium/pdf/9th\\_Int\\_Symp\\_on\\_Fossil\\_Algae.pdf](http://www.geologija.hr/symposium/pdf/9th_Int_Symp_on_Fossil_Algae.pdf)

**Carles Martín-Closas**

***24-28 September 2007***

**15<sup>th</sup> Meeting of the Group of European Charophytologists (GEC), Belgrade, Serbia** (see group photograph on p. 20)

**Minutes of the General Assembly of the 15<sup>th</sup> GEC meeting**

The General Assembly of the 15<sup>th</sup> GEC meeting was held at the Institute of Nature Conservation of Serbia, on Monday 24 September, 2007. The main discussions concerned the venue for the next GEC meeting to be held in 2009. The proposal by Sonja and Saja Trajanovski to host the meeting at the Hydrological Institute of Ohrid, located at Lake Ohrid, Macedonia was unanimously agreed. Also, as a result of the current structure of the GEC, Jelena Blaženčić and Branka



Stevanović assume now the direction of the GEC, in substitution of Jaime Cambra and Núria Flor, and will transfer the necessary information and advise the organizers of the next GEC in Macedonia.

## Scientific Report of the 15<sup>th</sup> GEC

The meeting was organised by Prof. Jelena Blaženčić and Dr Branka Stevanović with Dr Jasmina Šinžar-Sekulić acting as Secretary General, helped by many of their collaborators from the Faculty of Biology, University of Belgrade. Upon arrival on Sunday 23 September, participants congregated for an informal warm-up meeting and visited the laboratory and equipment of the Institute of Botany. The office of our charophytologist colleagues is located in a nice and intimate house inside the historical “Jevremovac” Botanical Garden of Belgrade. The meeting took place in the modern building of the Institute for Nature Conservation of Serbia in New Belgrade and was attended by 32 participants from all over Europe (13 countries) and by Prof. Mu Xinan as a guest from China.

### Monday 24 September

The opening session started with welcoming words by Professor Lidija Amidžić, the Director of the Institute, and by Prof. Jelena Djordjević, Dean of the Faculty of Biology.

The scientific session started with a plenary lecture by **Irmgard Blindow** (Germany): *The Swedish Action Plans for threatened Charophytes*. Irmgard reported about the initiative of the Swedish Environmental Protection Agency aiming to reduce by 30 % the list of threatened species by 2015. Six action plans for the protection of 16 threatened species have been promulgated. Actions included determination courses, publication of identification key for the Swedish charophytes, field investigations and revisiting older and recent sites to record the distribution and occurrence of species. Ecological field and

laboratory studies as well as genetic analyses will fill other gaps in knowledge. Protection of localities, measures against eutrophication, creation of small waterbodies and, for some species, re-introduction to former sites have been also proposed. These action plans are now operational and will be evaluated after 5 years.

After a short coffee break, we had 6 oral presentations dealing with ecological and floristic subjects on living charophytes.

**Ingeborg Soulié-Märsche** (France) *The importance of life cycle studies for the conservation of rare charophyte species*. Ingeborg demonstrated how important it is, in terms of conservation of biodiversity, to understand the life cycle of annual species living in temporary ponds and to protect the dynamics of aquatic ecosystems. As an example, the time and duration of flooding as well as the salinity range of the habitat appeared to be the main factors for germination and growth of *Lamprothamnium papulosum*.

**Dominique Auderset-Joye** (Switzerland). *First application of the IUCN Red List categories and criteria to charophytes species found in Switzerland*. The study aims to classify the species recorded in Switzerland into IUCN categories of threat, using the IUCN criteria. According to the quality of our data and the characteristics of charophytes, the geographic criterion (B) appears as the best exploitable at the present. In one year of investigation on 170 historic sites, 17 species out of 24 expected in Switzerland were recorded. The species were evaluated on the basis of several geographic sub-criteria (area of occupancy, number of locations and decline of subpopulation). The results showed that the majority of the species are classified as threatened (CR, EN, VU, NT). Additional field investigations are planned and will define the distribution and thus the status of the species.

**Branka Stevanović** (Serbia) *Red data list of charophytes in Serbia*. From Branka we learned which species out of the 20 species recorded in Serbia are on the Red List,

according to the IUCN categories. Based on their distribution in Serbia, 10 species are critically endangered (CR), 3 extinct in the wild (EW), 2 endangered (EN), 2 vulnerable (VU) 2 Low Risk (LR) and one was categorized as Data Deficient.

**Sonja Trajanovska** (Macedonia). *A view into the ecology and distribution of endemic Chara ohridana* (Kostic) Krause from Lake Ohrid. Sonja told us about Lake Ohrid, an old, deep, oligotrophic lake and a hot spot of charophyte diversity located in the Balkan Peninsula. Investigations were made to study the distribution of the endemic *Chara ohridana*. The results showed that this species is distributed from low to deep littoral zones and can grow in individual mats or in mixed stands with other *Chara*.

**Egita Zviedre** (Latvia). *The genus Nitella in Latvia*. Egita showed the results of a survey on *Nitella* occurrence and distribution. Five species were found in the 150 localities. *Nitella confervacea*, *N. syncarpa* and *N. translucens* are very rare (1-3 localities); *N. flexilis*, *N. mucronata* are more common (10-27 localities). It is possible that *N. gracilis*, *N. opaca* and *N. tenuissima* are growing in Latvia too.

**Michael Boegle** (Germany). *Chara baltica*, *C. horrida*, *C. liljeblandii* – *C. intermedia* (Charales, Charophyceae) distinct species or habitat-specific modification? The species belonging to the *Chara baltica* - *C. intermedia* complex are morphologically difficult to differentiate. The species from the four populations studied were characterized by genetic analyses using (AFLP). The genetic results support the hypothesis that *Chara baltica* and *Chara intermedia* are reproductively isolated from each other, even though they are not morphologically distinguishable (cryptic species). Populations from intermediate salinity regime were shown to be genetically intermediate. The ecophysiological characteristics were confirmed by the genetic results.

After an excellent lunch buffet break, served in the Institute of Nature Conservation of Serbia,

we had two oral presentations about fossil charophytes.

**Carles Martín-Closas** (Spain). *Evidence of habitat exclusion between early angiosperms and charophytes in the early Cretaceous of Spain. Monsechia vidalii*, the most abundant early angiosperm from non-marine Barremian fossil record of Iberia grew in deep and long-lived lakes where lithographic limestones were deposited. Calcified fructifications of charophytes are abundant in a facies representing heavily vegetated palustrine and shallow lacustrine environments. These results are relevant in the debate on early angiosperm ecology and environment. The results may indicate that the competition included an initial phase of relegation of early angiosperms to deep, weakly illuminated and weakly oxygenated habitats of tropical freshwater bodies during the Barremian, followed by a later colonization of lake shores. The pattern occurring in aquatic habitats seemed to be similar to the one used by the early angiosperms in lowland open ecosystems.

**Nadezda Krstić** (Serbia). *Lower Miocene Charophyta of Gacko (Dinaric Alps)*. This mountain area appeared to be rich in fossil charophytes. The fossil assemblage found between 100 – 175 m depth in the borehole of Gacko was shown and compared to two other occurrences in the Dinaric Alps. The genera and species found in this area are well in accordance with taxa known from the Lower Miocene in Western Europe.

The afternoon continued with the presentation of six posters:

**Maria Rodrigo** (Spain). *In situ nitrate uptake rates by Chara species*.

**Katarzyna Poplonska** (Poland). *Immunogold studies of protamine synthesis during spermiogenesis of Chara vulgaris*.

**Jelena Kriznanić** (Serbia). *A comparative study of periphyton communities on the Chara vulgaris var. gymnophylla (A. Br.) Nam. and Nitella gracilis (Sm.) Ag. from Vrujci spa water*.

**Dubravka Hafner** (Bosnia and Herzegovina). *Epiphytic diatoms on Charophyceae.*

**Shasho Trajanovski** (Macedonia). *Summer settlement of Hirudineae in the belt of Charophyta from Lake Ohrid.*

**Kaire Torn** (Estonia). *Long term dynamics of the charophyte population in shallow bays of western Estonia.*

**Bojan Zlatković** (Serbia). *Charophytes of salt marsh springs and swampy habitats of central and southern Serbia.*

Following the scientific sessions there was a general discussion about the criteria for the categorization of endangered charophytes, chaired by **Valdimir Stevanović** and **Dominique Auderset-Joye**.

Vladimir said how difficult it is to apply the five IUCN criteria to Charophytes and wondered if and how they should be adapted to the characteristics of this particular flora. Many criteria are based on population size, reduction or decline and he questioned how to define what a charophyte population is. Irmgard was confronted by the same problem when she elaborated the Red List for Sweden. Dominique has until now used the geographic criteria, area of occupancy and extent of occurrence. However, IUCN criteria are supposed to be applicable to any kind of organism. Dominique thinks that one should start to apply geographic criteria and remember that a Red List is an evolving process that will be improved with increasing knowledge about charophytes.

In the evening, we came together for an excellent Congress Dinner. Our hosts took us to the very nice **Jevrem Restaurant**, in the old town where there were many nice photographs of Belgrade from the 1920s.

## Tuesday 25 September

The scientific sessions started with a plenary lecture by **Susanne Schneider** (Norway) about *Morphological adaptations of Charophytes to different light intensities*. Her lively talk and expressive gestures miming the

growth and curving of the *Chara*-branches gave the impression it had been a short talk of 15 instead of 45 minutes. Growth of plants or plant organs towards more light is commonly interpreted as an adaptation to low light conditions. Here, we learn, in a study of charophyte branches, a growth-based orientation towards light functioning as a mechanism to protect the plant from excessive light. *Chara contraria* and *Chara hispida* were exposed to five different intensities of photosynthetically active radiation and species traits and pigmentation were measured. Branches of plants exposed to higher light intensities were convergent and pointed steeply upwards, whereas those exposed to lower light intensities grew nearly straight and were less curved. Only branches that increased in length during the experiments reacted to differences in light intensity. This indicates that branch orientation is determined by a light-dependent growth reaction. Orientation of charophyte branches towards light is accompanied by a decrease in chlorophyll *a* (Chl *a*) content and a lower Chl *a*: carotenoid ratio, which clearly indicates that the plant is taking protective measures against potentially damaging excess light conditions. The authors suggest that the growth-based orientation of *Chara* branches towards light may protect sexual organs, which grow on adaxial branch sides, from light damage. In addition, the upward orientation of branches might lead to increased light transmission within dense charophyte beds, thus enabling an enhanced gross production.

## Three poster presentations closed the scientific sessions:

**Hasdrúbal Climent-Domènech** (Spain). *Barremian non-marine palaeoenvironments characterised from charophyte microfacies in the Eastern Iberian Chain (Spain).*

**Rajka Radojčić** (Serbia). *Charophyta of the Jurassic and Cretaceous sediments of Montenegro and Dalmatia – External Dinarides and Western Serbia – Internides*

**Darivojka Ljubović-Obradović** (Serbia). *The review of Cretaceous charophytes of Serbia.*

A copious buffet lunch served in the Institute of Nature Conservation gave us energy to climb into the bus for a long trip to the south, to discover Montenegro. On behalf of all the participants, I would like to say a very strong “thank you” to all those who helped with the organisation of this GEC-15.

**Dominique Auderset-Joye, Switzerland**

### **Field trip report of the 15 GEC Mount Durmitor lakes and Lake Skadar in Montenegro**

The field trip to two National Parks in Montenegro began on Tuesday 25 September 2007 at 14:00 hours after a great lunch at the Institute for Nature Conservation of Serbia. The nine foreign participants in the 15<sup>th</sup> GEC meeting who attended the excursion were fitted into a van with some of the conference organizers. The rest of organizers travelled in another van. Two expert drivers drove for us during the whole excursion. Three kind students of Biology (Aleksandra Vesić, Tomica Mišljenović and Nataša Ratkov) joined the excursion. We started from Belgrade to reach Žabljak in Mt. Durmitor after approximately 400 km. During the journey we enjoyed nice landscapes. We arrived at dinner time at the Hotel Bjelobor.

Next morning we got up early and after a good breakfast we drove to Mt. Durmitor National Park where several “stopovers” were programmed. The Park, proclaimed in 1952, is situated in the northwest of Montenegro and occupies the Durmitor massif and canyons of rivers Tara, Draga and Sušica as well as the upper part of the canyon valley of the river Komarnica. There are 18 glacial lakes in the area and we visited the largest and most attractive one, Crno Jerezo (Black Lake, composed by two basins: Big Lake and Little Lake). The lake is located on limestone bedrock and waters originate from permanent and tributary and sublacustrine springs, its water level varies seasonally as much as 8-10 m. The lake was surrounded by an impressive forest of *Picea abies* and *Abies*

*alba*. We enjoyed very much taking photographs of the surroundings. The weather was cold due to the high altitude (around 1500 meters a.s.l.), but we did not mind. Our guide, Professor Dmtar Lakušić (with the aid of Aleksandra in the translation to English) gave some explanations and data about the Park, its fauna and flora. Three boats were waiting for us in the lake shore and we could paddle around the lake (Big Lake, which has 24.5 m of maximum depth) searching for charophytes and other aquatic plants. Professor Jelena Blaženčić used her hook for sampling charophytes and Dominique Auderset-Joye also used her hook brought from Switzerland, specially designed for sampling shallow waters. In the lake, we found several species of charophytes of the genus *Chara* (*C. hispida*, *C. virgata*, *C. aspera*) and *Nitella* (*Nitella opaca* and *N. flexilis*) as well as *Potamogeton natans*, *Potamogeton perfoliatus*, *Potamogeton crispus*, *Equisetum fluviatilis*, *Myriophyllum spicatum* and *Eleocharis palustris*. After collecting charophytes we stopped again at Rivulet Otoka, an outflow from Black Lake when the water level is high. There it is easy finding *Chara contraria*, *C. hispida*, *Nitella opaca*, *C. globularis*, *Potamogeton natans*, *Equisetum fluviatile*, *Sparganium ramosum*, *Ranunculus paucistamineus* and *Myriophyllum spicatum*. We also sampled for charophytes. After a short rest at our hotel (where we got some food and drinks), we visited Lake Vražje. It represents a good example of deleterious human impact on aquatic vegetation due to the introduction of fish and the harmful habit of fishermen to remove vegetation from the bottom to better catch the fish. Less than 20 years ago 13 species of macrophytes were recorded in the lake and today no charophyte species are present. Near this lake, we visited a shallow lake (Riblje) formed in the moraine hollow after a glacier retreat. There, the vegetation is composed of *Chara aspera*, *Chara virgata*, *Phragmites australis*, *Schoenoplectus lacustris*, *Utricularia bremii*, *Potamogeton natans* and *Nuphar luteum*. Jelena and Tomica sampled the lake for charophytes.

After this visit we went to have lunch at a traditional country house near Lake

Zmijničko (The Snake's lake). There was a nice fire in the house for which we were grateful since it was raining outside (we were quite wet) and it was cold. The house owners offered us some drinks and the strong "rakija", a spirit. We got an abundant and good lunch and we tried a special cheese called "kajmak" in Serbian language. We also could try the dessert "uštipci", a sweet fritter which is eaten with honey.

After such a great lunch we departed for Virparzar which was located 174 km away. When we arrived we checked in a nice hotel located at the shore of Lake Skadar. Lake Skadar (Skadarsko Jerezo, or Skutari See in German) is located in a karst terrain in the outer part of the south eastern Dinaric Alps. It is the largest of the Balkan lakes (370-600 km<sup>2</sup> depending on water-level fluctuations). The lake is transparent, clean and relatively shallow, representing an extraordinary favourable habitat for the development of charophytes. Twenty one species of charophytes have been recorded in the Montenegrin part of the lake (of the genus *Chara*, *Nitella*, *Tolypella* and *Nitellopsis*).

On Thursday morning, after breakfast, we took a boat onto Lake Skadar. Other colleagues from Podgorica, Montenegro, joined us and gave some explanations about the lake. The lake was wonderful, covered by a lot of aquatic vegetation. We enjoyed the landscapes. The lake was sampled for aquatic vegetation: we recovered *Trapa natans* sensu lato, *Valisneria* sp., *Potamogeton* sp., *Najas marina*, *Najas minor*, etc. Almost everybody tasted the water chestnuts, which in my opinion were very good. However, water chestnuts were not the only "food" on the boat, we could also eat good cheese, ham, olives, and drink good red wine and spirits. It was raining a little but we were in a covered boat. Later, a group of people (Jelena, Ingeborg, Irmgard, Jasmina, Kaire, and some others) took a small boat and went to another place in the lake to look for more charophytes. There, Irmgard Blindow snorkelled to directly view the charophyte meadows. The remaining people went with the large boat to see a place (Gornje Malo Blato) were sublacustrine springs feed the lake, at the NW part. At the

shore of the lake there was a place where we could take coffee and tea. In that place there were grapevines and kiwi fruit trees used to make shade cover and many *Punica granatum* trees. At the end of the morning it stopped raining, the sun was shining and the lake and landscapes were even more beautiful.

After a late lunch at our hotel, we made an excursion to Hoti Bay near Božaj to find fossil charophytes. In the ditch by the abandoned railway line towards the Albanian-Montenegrin border there were fossil remains (mostly utricles and gyrogonites) in marl layers and lenses on Lower Cretaceous limestone. There, Goran Ćulafić from the Natural History Museum of Podgorica showed us the right place. The palaeontologists took some samples of that layer and some rocks. After dinner we examined the charophyte specimens collected throughout our excursion because an improvised lab (binoculars, guides, trays, forceps, etc.) was set up for us at the hotel.

Next morning (Friday 28) we were ready to leave for Belgrade. But firstly we stopped at the Lake Skadar Reception Centre in Vranjina. There, we were welcomed by the director of the centre, we saw a film about Lake Skadar National Park, made a quick visit to the centre (exhibition rooms, gift shop), and some people bought Montenegrin wine in a cellar located outside the reception centre. On the road, we had our last late lunch, which was one of the best in my opinion. We were driven back to Belgrade. Once there we were transferred to our respective hotels and said goodbye to everybody. We were tired after a long trip but very satisfied with the field excursion.

We want to say THANKS to all the organizers (including the students that so kindly helped us with translations and everything) for this end to the 15<sup>th</sup> GEC meeting in Serbia-Montenegro, which we really enjoyed very much.

**María A. Rodrigo, Spain**

**10-12 October 2007**

**The 13<sup>th</sup> Meeting of Fossil Algal Association of China (FAAC), Guiyang in Guizhou Province, China**

More than 50 association members and students participated in the meeting with the discussion on different groups of algae from Precambrian to Quaternary. During the meeting the organizers guided a field excursion on Triassic karst geology of Guizhou Province.

**Qifei Wang**

**12-14 October 2007**

**Characeen Deutschlands, in Riedstadt, Hessen, Germany**

This was the annual meeting of the German Working Group on Charophytes (AGCD), organised as a workshop, mainly devoted to Red Lists and conservation issues in Germany. During the excursion to gravel pit lakes, Characeae were sampled by colleagues with diving equipment and by boat.

**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:

**2008**

**6-14 August 2008**

**33<sup>rd</sup> International Geological Congress, Oslo, Norway, : "Earth System Science: Foundation for Sustainable Development"**

The 33<sup>rd</sup> International Geological Congress is organised by the National IUGS Committees in the five Nordic Countries (Norden): Norway, Denmark, Finland, Iceland and Sweden, with the collaboration of the International Union of

Geological Sciences (IUGS) and many other international and national organisations. The 33<sup>rd</sup> IGC will be a showcase for themes related to the International Year of Planet Earth and the International Polar Year, and will aim at showing the world that the Earth system sciences are the foundation for sustainable development. This international congress attracts usually more than 5000 people. Abstracts due 7 March 2008. Please see details in: <http://www.33igc.org/coco/>

**23-26 September 2008 (21 September - 1 October including optional field trips and workshops)**

**5<sup>th</sup> International Symposium of the IRGC, Rostock, Germany**

The meeting is organised by Dr Irmgard Blindow and Prof. Hendrik Schubert and will take place at the University of Rostock, an historic city in North Germany with an ancient harbour of the "Hanseatic League". Rostock can easily be reached from airports in Berlin or Hamburg.

**Contact:** Prof. Hendrik Schubert, University of Rostock, [hendrik.schubert@uni-rostock.de](mailto:hendrik.schubert@uni-rostock.de) Please use the subject: **IRGC Symposium** for any mail relating to the meeting!!

**The Second Circular and Registration Form are included as a separate document with this Newsletter. For updates check also at the IRGC Website: <http://irgc.uow.edu.au/>**

**10-14 November 2008**

**5<sup>th</sup> Asian Pacific Phycological Forum, Wellington, New Zealand**

The Fifth Asian Pacific Phycological Forum is jointly sponsored by the APPA (Asian Pacific Phycology Association) and ASPAB (Australasian Society for Phycology and Aquatic Botany), and local organizations (NIWA and VUW). This is the first international phycological meeting in New Zealand. A call for papers and registration

details will be announced in January 2008, with registration/abstract due about May/June. Webpage: [www.appf2008.com](http://www.appf2008.com)

**Mid- October 2008**  
**12<sup>th</sup> Symposium of the**  
**Micropalaeontological Society of China,**  
**Beihai City, Guangxi Province, China**

The Micropalaeontological Society of China will held its 12<sup>th</sup> bi-annual meeting at Beihai City, Guangxi Province of China, mid-October, 2008. More than 80 micropalaeontologists and students are expected to participate in the meeting and field excursion on Quaternary coastal environments in Beihai City and some localities in Vietnam. For more information, please 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](mailto:qfwang@nigpas.ac.cn) or [qfwanghm@hotmail.com](mailto:qfwanghm@hotmail.com)

**2009**

**2-8 August 2009**  
**9<sup>th</sup> International Phycological Congress,**  
**Tokyo, Japan**

The 9<sup>th</sup> International Phycological Congress which will be held in Tokyo, Japan, 2009. The topics included in the preliminary program are: comparative evolutionary genomics; phytoplankton dynamics and life cycle; chemical ecology; shifting concepts of speciation; symbioses; algae, bio-fuel and CO<sub>2</sub> sequestration; algae under multiple stress; biodiversity and ecological function; algal disease; alien algae and invasive species; phylogeny - new advances and insights; algae and bioremediation. **Several of these fields are of interest to IRGC members, and an opportunity to share our research with the wider phycological community!** Information about the conference and pre-registration form

is now available at: <http://www.ec-japan.jp/ipc9/index.html>

**September 2009 (date to be determined)**  
**16<sup>th</sup> Meeting of the Group of European**  
**Charophytologists**

The next meeting of the GEC will be held at the Hydrological Institute of Ohrid, located at Lake Ohrid, Macedonia. Organizers: Sonja and Sasha Trajanovski.

**NEWS FROM REGIONAL GROUPS**

**Current research in South America**

The Group of the Federal University of Campinas (Brazil) formed by Fresia Ricardi-Branco ([fresia@ige.unicamp.br](mailto:fresia@ige.unicamp.br)), Rafael Souza de Faría and Isabel Cortez Cristiano de Souza are researching the Permian charophytes of the Paraná Basin in Brazil. This project forms part of a comprehensive study of bryophytes and lycophytes of the Late Permian associated with the *Glossopteris* flora. This research is financed by FAPESP ([www.fapesp.br](http://www.fapesp.br)), São Paulo, Brazil. The repository of these charophytes is the Palaeontological Collection of the *Instituto de Geociências* in the UNICAMP, were the material from the Passa Dois Group is deposited.

**Publications:**

Faria, R. de S.; Ricardi-Branco, F. and Rohn, R. Associação paleoflorística de um Afloramento da Formação Corumbataí, Piracicaba, SP. In: I. S. Carvalho & R.C. T. Cassab. (eds.). (Org.) *Paleontologia: Cenários da Vida*. Rio de Janeiro: Editora Interciência, 2007, v. 1, p. 61-70.

Faria, R. de S. and Ricardi-Branco, F. First record of a thallus with organically connected reproductive structures from *Leonardosia langei* Sommer (Porocharaceae, Charophyta) from Corumbataí Formation (Guadalupian),



Piracicaba, SP, Brazil (submitted to *Ameghiniana*).

Simone Baecker Fauth of the *Laboratorio de Micropaleontologia* in the UNISINOS University, Rio Grande do Sul, Brazil (sbfauth@unisinis.br), is currently studying Cretaceous charophytes from the Brazilian continental margin. She is interested in systematics and palaeoecology.

Cláudio Magalhaes de Almeida, currently in the *Departamento de Geociências* of the University of Brasília, ([claudiopaleo@unb.br](mailto:claudiopaleo@unb.br)) has begun studies on Permian charophytes of the Corumbatai Formation (Paraná Basin-Brazil) associated with ostracods.

#### First results:

Almeida, C.M. 2005. Taxonomia e paleoecologia de ostracodes do Permiano da bacia do Paraná, Estado de Goiás, Brasil: Considerações paleoambientais e cronoestratigráficas. Universidade de Brasília. Programa de Pós-Graduação em Geologia. Dissertação de Mestrado, 59 p. [Currently, he is studying Cretaceous charophytes of the Santos Basin (Brazil)].

Adriana García, University of Wollongong, Australia ([adriana@uow.edu.au](mailto:adriana@uow.edu.au)) has continued collaborating in research projects from South America. A new multi-disciplinary project on palaeolimnological analyses, geochemistry, volcanic activity and Quaternary climatic changes will start on Laguna Llançanelo, Mendoza (participating also Allan Chivas from Australia). The Argentinian researchers involved are Roberto Violante, Universidad de La Plata; Margarita Osterrieth, Universidad de Mar del Plata and colleagues from SEGEMAR and University of Buenos Aires amongst others.

Adriana has recently completed a paper on Quaternary palaeolimnology and fire history from a freshwater body from the Andes:

#### Reference:

Markgraf, V., Anderson, S.R., Whitlock, C. & García, A. 2008. Late Quaternary vegetation and fire history in the northernmost *Nothofagus* forest region: Mallín Vaca Lauquen, Neuquén Province, Argentina. Submitted to *Journal of Quaternary Sciences*.

Your correspondent is dedicated to Patagonian Cretaceous charophytes. He is currently interested in "provincial" assemblages differing from others previously described of Barremian-Aptian and Campanian-Maastrichtian, both the later including instead, widely distributed charophytes. He looks for ancient representatives of recent genera and attempts to approach the Gondwanian-relationships for the "provincial" taxa.

#### Recent papers:

Musacchio, E. 2006. Charophyta del Cretácico Tardío y el Paleoceno del centro oeste de Argentina. *Revista Brasileira de Paleontología*, 9 (1): 93-100. 2006, Rio de Janeiro. See: [http://www.sbpbrasil.org/revista/edicoes/9\\_1/Musacchio.pdf](http://www.sbpbrasil.org/revista/edicoes/9_1/Musacchio.pdf)

Musacchio, E.A. and Vallati, P., 2007. Late Cretaceous non marine microfossils of the Plottier Formation at Zampal, Argentina. *Cuadernos del Museo Geominero*; Instituto Geológico y Minero de España, 8: 288-293. See: <http://www.igme.es/4EMPSLA>

If the above-mentioned teams from South America remain active and in mutual contact, we will have a great opportunity to formalize a strong regional group in the following years. This group could embrace Palaeozoic, post-Palaeozoic and Recent charophytes, dealing with systematics, as well as palaeoecological and palaeo-biogeographical topics.

**Eduardo A. Musacchio,  
Comodoro Rivadavia, Argentina**

## **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 subscribe to charophyte-L?**

Just send the message to the listserv:

[listserv@pnc.edu](mailto: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 these 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.

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:  
<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)**

**IMPORTANT:** Information sent recently by the IRGC Committee to the e-mails of our membership list found that several of these e-mails are not currently valid!

Please, send any changes to <[adriana@uow.edu.au](mailto:adriana@uow.edu.au)>. It is the only way possible to keep the addresses updated and be able to communicate!!!

### **New addresses:**

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<b>MEMBERSHIP FEES: ELECTION YEAR</b>
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Please do not forget to send your membership fee payment for 2008!!! **You need to be a financial member of IRGC in order to nominate for office and to vote for the membership of the next committee.**

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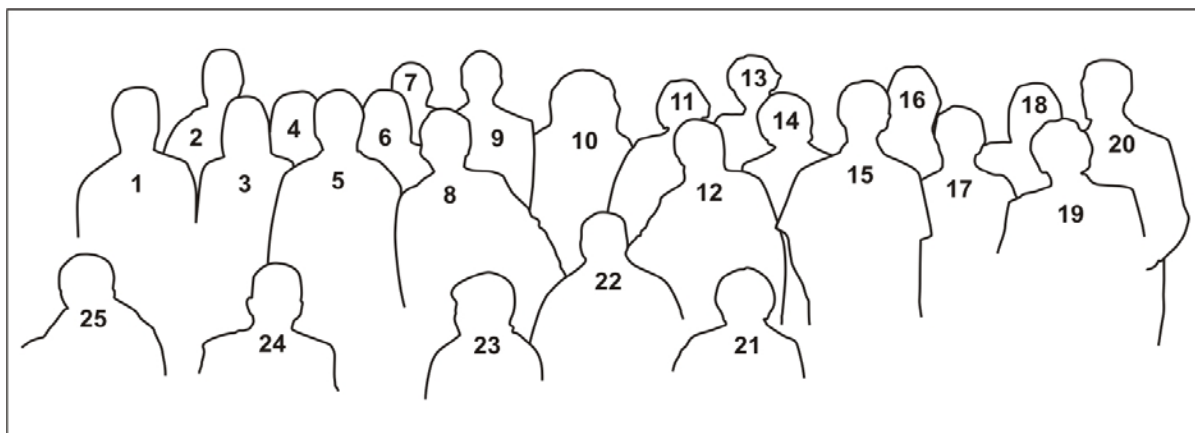
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## 15<sup>th</sup> GEC, Beograd: Group Photograph



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