IRGC NEWS

INTERNATIONAL RESEARCH GROUP ON CHAROPHYTES

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23

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EDITORIAL

The 6th International Symposium of the IRGC in Mendoza, Argentina, 25 – 27 November, 2012 (22 November - 2 December including field-trips) approaches and I would like to encourage you all to attend the most significant event of our association. Be active by preparing your presentations, helping young scientists to get the funds necessary to attend the meeting, nominating and voting for the candidates for the election of the IRGC executive committee and, finally, taking part in the discussions during the meeting. Our symposium is carefully prepared by our Secretary Adriana García, with the help of Argentinian and Australian colleagues and is intended to honour Eduardo Musacchio. He enthusiastically began to organize this event but died tragically in 2011. Two more dear colleagues also passed away in the last months: Joop Van Raam, who was a very active member of the Charophyte Group in the Netherlands and kept the IRGC bibliography updated, and Jean-Pierre Berger, founder of the GEC (Group of European Charophytists), cofounder of our association and secretary of the IRGC in 1990-2000. Please read their short biographies included in this issue and you will realize that all of them were, in their own different ways, an unforgettable reference for their students and colleagues.

Carles Martín-Closas

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Eduardo A. Musacchio (South and Central America, deceased 18 May 2011)

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

WELCOME TO NEW IRGC MEMBERS

It is a great pleasure to welcome our new members Mitchell Alix, from the USA, Olena Borysova from Ukraine and Laura Grinberga from Latvia. They are interested in modern charophytes.

IN MEMORIAM

Eduardo Aldo Musacchio (1940-2011)

Eduardo passed away on 18 May 2011, under very sad circumstances. He was one of the victims of an aeroplane accident, as he was returning to his home town Comodoro Rivadavia from Mendoza. He was born in Mendoza on 9 November 1940, and this trip to Mendoza was to plan details of the organisation of the 6th International Symposium on Charophytes.

Eduardo finished his degree in Geology in the Universidad Nacional de La Plata in 1964, and in 1971 finished his PhD thesis 'Estratigrafia del Jurásico en inmediaciones de la Sierra de Agnia de la Provincia de Chubut' ('Stratigraphy of Jurassic deposits close to Sierra de Agnia, Chubut'). After a period working at the Argentinian state petrol company (YPF), his passion for microfossils (which he could not pursue at YPF) made him to return to the Universidad de La Plata where he started a prolific teaching and research career (Mineralogy, Biological Evolution, and Micropalaeontology), receiving a scholarship to study Cretaceous microfossils from the Neuquén Basin. A few years later he won a von Humboldt post-doctoral scholarship to continue with his micropalaeontological studies at the University of Kiel, Germany.

In 1983, he decided to move to Comodoro Rivadavia, Chubut, where he organised several undergraduate and postgraduate courses at the Universidad de la Patagonia 'San Juan Bosco', where he was Professor of Palaeontology (Geology) and Philosophy of Sciences (Biology) until his death. He was also coordinator of the IGCP Project 381: South Atlantic Mesozoic Correlations.

Eduardo established scientific and educational links with Brazilian organizations, organizing postgraduate courses for Geociencias of Universidad Federal do Rio Grande do Sul, Porto Alegre, and Universidad Estadual Paulista,

Rio Claro, and pursuing collaborations with the Brazilian state oil company (Petrobras), extending his knowledge and contribution towards the understanding of palaeogeographical aspects (mainly using charophytes and ostracods).

During his last years he started deepening his knowledge and engaging with the Philosophy of Sciences, presenting his thoughts and philosophical aspects applied to Geology at different regional meetings.

His love for Patagonia (Cuenca Neuquina, Golfo de San Jorge) was evident, always commenting about the 'grandeur' of this landscape, contributing to a better understanding of the Mesozoic events from South America and Gondwana, and establishing links with South American colleagues.

As a person, he was very generous with his knowledge and his time, always finding a moment to discuss scientific issues with his students. I had the privilege to be his undergraduate and PhD student. Some of his remarkable characteristics were his knowledge, his humbleness, his desire to help students to advance, encouraging everybody to increase their aspirations. On top of this, his sense of humour and irony, his generosity and respect, made working with him a pleasurable event, it didn't matter how many hours we spent at the microscope or discussing interesting matters. It is for all these reasons that Eduardo has left in all the people who studied or worked with him a very warm indelible imprint, which was evident with the spontaneous celebration that his students prepared at the University (UNPSJB) when he died.

Regarding our IRGC, as a Regional Correspondent for South and Central America, he always collected news from our colleagues; and he was committed to the organization of the 6th International Symposium on Charophytes. As the chairman of the meeting, Eduardo was preparing an extensive post-symposium field-trip to several fossil localities from Neuquén and Mendoza provinces. Although we can not fulfil his plans; our meeting will be a celebration to his trajectory, his friendship and recognition of a great man. He leaves behind four children and his much loved wife, Margarita Simeoni, dedicated also to the study of microfossils. Hasta siempre!

Eduardo's selected papers on Charales

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MUSACCHIO, E.A. 1972. Charofitas de la Formacion Yacoraite en Tres Cruces, Yavi Chico; Jujuy. Argentina. Revista de la Asociación Paleontológica Argentina 9: 223-237, Buenos Aires

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ULIANA, M., MUSACCHIO, E.A. 1978. Microfósiles calcáreos no marinos del Cretácico Superior en el Zampal, Provincia de Mendoza.

Argentina. Revista de la Asociación Paleontológica Argentina 15(1-2): 111-135, Buenos Aires.
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MUSACCHIO, E.A. 2006. Charophyta del Cretácico Tardío y el Paleoceno del centro oeste de Argentina. Revista Brasileira de Paleontologia 9(1): 93-100, Río de Janeiro.
MUSACCHIO, E.A., 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: 273-278.
MUSACCHIO, E.A., 2010. Upper Cretaceous *Lychnothamnus*, *Nitella* and *Tolypella* (Charophyta) from Zampal, Argentina. Cretaceous Research 31: 461-472.

Adriana García, Wollongong

Joop van Raam (17-08-1941, 01-10-2011)

On 1 October 2011, we learnt the sad news from his daughter Rosalie that our colleague and friend Joop, **Johannes Cornelis,** died at the age of 70 years.

Joop at the boat tour during the Excursion of the 5th IRGC-Symposium in Rostock, Oct 2008

Joop had performed his studies of Biology from 1962-1969 and defended his PhD thesis at the University of Amsterdam, The Netherlands. During his studies and afterwards, he spent much time in the wetlands of Holland. He focused early on collecting stoneworts which grew abundantly in that region. During about 12 years, he was in charge of ecological investigations in western Holland for the Gewest Gooi and Vechtstreek organisation.

In the early 80s, he was allowed to retire and then he turned his entire interests to charophyte research, although, since the 90s, he was suffering from Menière's disease (a disorder of the inner ear leading to vertigo and intermittent hearing loss).

In 1996, he started the "Dutch Newsletter of Stoneworts" (Nieuwsbrief Kranswieren) and wrote the first issue. This publication continued until present with Joop van Raam, Jan Simons, Emile Nat and John Bruinsma as the editorial team.

At the National Herbarium of the Netherlands in Leiden, he took charge of the inventory and revision of the characeae (on a volunteer basis) and acquired a solid reputation as a competent charophyte specialist. He received samples for determination from the entire world. Joop built up a unique personal library and herbarium which he generously opened to visitors. He had an extraordinary knowledge of stonewort literature and, patiently, he created the bibliographic data base of fossil and recent charophytes which he offered free on CD to the IRGC members (you may access it at the following site <http://www.kranswieren.nl/>).

Both at the herbarium and at his home, Joop offered hospitality to colleagues. I remember once in 1992, he had organised a charophyte course in his house in Hilversum where the 15 participants could enjoy not only his teaching but also binoculars, field equipment, fresh plants, meals and accommodation – as much as his house and garden could provide.
Joop was a collector. His home was filled with stoneworts from all over the world. Outside Europe, he had visited Madagascar, Tasmania and New Zealand. His synthesis about "Charophytes of Tasmania" (van Raam, 1995), with the description of two new species (*Nitella monopodiata* and *Nitella haagenii*) will remain as a reference book for charophyte studies. The latter species was dedicated to his wife Ellen van Haagen, the mother of his son and two daughters.

Despite his broad knowledge, the publication list of Joop van Raam is not fully appreciated, with most papers in Dutch, such as the very significant book "Manual of Stoneworts" (van Raam, 1998). Another important paper is the determination key for Charophytes from the BENELUX countries (Bruinsma et al., 1998) illustrated with the drawings of Werner Krause (1997).

For a long time, Joop suffered from serious health problems, due to Morbus Menière's disease, which worsened recently by a brain tumor. He courageously kept silent about his problems. In October 2008, he attended the 5th IRGC-Symposium in Rostock, and it became obvious that Joop van Raam was considered an authority in charophyte determination.

Later, in winter that year, Joop slipped in the street, a disaster followed by complications of his broken bones. From then on, he was confined to the house. His last public appearance was in May 2011, at the meeting of the German and Dutch working groups. Probably most of the participants felt that this might be their last contact with Joop van Raam.

With Joop van Raam, the scientific community has lost an important personality who contributed significantly to the knowledge of stoneworts. His books, samples and herbarium sheets will become part of the collections of the Nationaal Herbarium Nederland in Leiden and thus stay available for science and perpetuate his memory.

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VAN RAAM, J.C., 1998a. Handboek Kranswieren. *Chara* boek, Hilversum. 229 pp., 38 (7 maps, 5 distribution maps) + 122 figs., 27 pl., 41 maps.
VAN RAAM, J.C., 1998b. De ontwikkeling van de kranswiervegetaties in de Loosdrechtse plassen. De Wijde Blik 98/3: 65, fig. 1-4.
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VAN RAAM, J., 2008b. *Chara muscosa* J. Groves & Bullock-Webster 1924 nu ook in Duitsland. Nieuwsbrief Kranswieren 12: 17-18, 3 figs. (1 map).
VAN RAAM, J., 2008c. De taxonomie van kranswieren 3. *Nitella batrachosperma*, *Nitella confervacea*, *Nitella brebissonii*, *Nitella nordstedtiana*. Nieuwsbrief Kranswieren 12 (17): 19-22, 3 figs.
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I thank John Bruinsma and Eduard Maier for helping with their notes and memories.

Emile Nat, Leiden, NL

Jean-Pierre Berger (8 July 1956 – 18 January 2012)

At the age of 56, Jean-Pierre Berger died suddenly of liver cancer. The diagnosis felt like a hammer two days before Christmas 2011. He struggled courageously but, fatally, couldn't win. We share the sadness of his wife Marie Claire, who used to participate in the GEC and IRGC-meetings, and his son Marc.

Jean-Pierre made his first steps in charophyte research during repeated visits to the palaeobotany team in Montpellier. In 1984-85, he widened his palaeontological skills through postdoctoral fellowships at the Universities of Tübingen and Munich (Germany) where he acquired knowledge about palynology and plant macrofossils as well as vertebrate and bivalve palaeontology. He advanced the study of Cenozoic charophytes from the Swiss Molasse Basin (1985). Already his thesis showed his interest for global palaeoecological interpretation combining facies analysis and biostratigraphy using all the fossils present in the molasse. After that, he started teaching at the University of Fribourg (Switzerland); his career progressed and in 1997, he was appointed to Associate Professorship. He quickly got involved in the academic and social life of the University of Fribourg with the charge of councillor of the students, organising the new fashioned "scientific café sessions", promoting palaeontology and evolution through public conferences, participating in many commissions and getting funds for scientific projects. Jean-Pierre liked teaching and both his colleagues and his students expressed their high regard for him. In October last year, he was unanimously elected Dean of the Faculty and should have taken the position in spring 2012.

The research of Professor Jean-Pierre Berger had a wide scope within palaeontology. Besides his main studies in palaeobotany, he is cited as the initiator and mentor of palaeontological research related to the roadworks of the new Swiss motorway A61, called "Transjurane". In 2001-2002, the works led to spectacular finds with the discovery of an Oligocene (30 My old) fossil forest and of a dinosaur trackway from the Late Jurassic. Jean-Pierre was then the coordinator of a team of 20 collaborators. Despite all these activities, Jean-Pierre kept watch that palaeontologists, especially the vertebrate people, didn't neglect the presence of fossil charophytes. He has supervised an incredible number of Masters and diplomas related to gyrogonites.

Jean-Pierre was strongly committed with the organisation of an international charophyte association. Thus, in 1987, he first had the initiative of organizing an international meeting devoted to charophytes in Lausanne. A handful of colleagues from many European countries, all working on fossil charophytes, participated in this workshop and decided to call the newly emerged working group "Groupe Européen des Charophytes". Later the group included colleagues working with living charophytes and became the present Group of European Charophytists **(GEC)**. As you all know, this initiative has continuity until today. Jean Pierre was also co-founder of the IRGC, created after the international charophyte meeting convened in Montpellier in 1989, and acted as the Secretary of our organization in its first terms (1990-2000). In parallel, he continued as the informal president of the Group of European Charophytists until the beginning of the new century, when the GEC changed to its present format, with the president being the last organizer of a meeting and having the commitment of promoting the next meeting.

The research of Jean Pierre in charophyte palaeontology was mainly devoted to Tertiary palaeoecology and biostratigraphy. As a pioneer, he integrated charophyte biozones of the Cenozoic into the international stratigraphical chart (Berger, 1992). This initiative gave rise to the common effort of the charophyte palaeontologists among the IRGC towards the "European Mesozoic-Cenozoic charophyte biozonation" (Riveline et al. 1996), a paper that remains a worldwide reference for the geological correlation and dating based on charophytes.

Those who knew Jean-Pierre will remember his joviality, communicative enthusiasm and his flair for enhancing public interest for scientific research. Unfortunately he leaves us too soon, but the remembrance of his friendly character and the usefulness of his scientific legacy will stay with us for long time.

Selected papers dealing with Charophytes

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BERGER, J.P., 1998a. "Rochette" (Upper Oligocene, Swiss Molasse): a strange example of a fossil assemblage. Review of Palaeobotany and Palynology 101: 95-110, 6 figs. (1 map).

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RESEARCH: PhD THESIS REPORT

Charophytes in restoration of aquatic ecosystems. A case study within *Albufera de València* Natural Park (València, Spain)

Student: **José L. Alonso-Guillén**; Supervisor: Maria A. Rodrigo. Defended at the University of Valencia (Spain) 21 October 2011

This thesis deals with the participation and use of charophytes in the restoration of degraded littoral aquatic environments. One of the first steps in restoration tasks is knowing the local diversity, thus, the thesis firstly describes the current charophyte richness within Albufera de València Natural Park, an area of high ecological value and international importance (Ramsar site since 1990 and special area for bird protection - EU Bird Directive- since 1991), but affected by severe environmental degradation since several decades ago. The Natural Park has an extension of 21,000 ha and it is composed by (i) a large shallow lagoon which is surrounded by marshlands mainly devoted to rice crops and orchards; (ii) small freshwater-brackish ponds (locally called malladas) patchily scattered among a sandy dune area which separate the lagoon from the Mediterranean Sea (iii) a set of small subterranean water springs (locally called ullals), (iv) the rice fields; (v) a web of channels used for irrigation which connect the rice fields to the lagoon; (vi) newly created artificial wetlands. Water was sampled but also sediments searching for charophyte fructifications. 15 taxa (species and varieties) of charophytes were identified within the Natural Park, 14 of them as growing specimens: *Chara aspera*, *Chara baltica*, *Chara braunii*, *Chara canescens*, *Chara globularis*, *Chara hispida*, *Chara vulgaris* (several varieties), *Lamprothamnium papulosum*, *Nitella hyalina* and *Tolypella glomerata*. One of the taxa was represented only by sediment oospores (*Tolypella prolifera*). Rice field were one of the systems with higher charophyte richness, in spite of the pesticides used in the agricultural practice. Around 33% of the Iberian charophyte flora (46 taxa) is represented within Albufera de València Natural Park, and 58% of the València province charophyte flora (26 taxa). Eleven taxa belonging to genus *Chara* are present in the Iberian Peninsula and seven of them are nowadays also found within the limits of the Natural Park.

Albufera de València, the largest littoral lagoon of the Iberian Peninsula, lost submerged vegetation at the end of the sixties-beginning of seventies of 20th century due to eutrophication. The only way of knowing the detailed dynamics of charophytes is searching in the lagoon sediments. Several sediment cores (around 90 cm long) were studied, which represent a time period somewhat longer than three centuries. Oospores and gyrogonites identified as belonging to 10 taxa were obtained: *Chara aspera*, *C. globularis*, *C. baltica*, *C. major*, *C. vulgaris*, *C. tomentosa*, *Lamprothamnium papulosum*, *Nitella hyalina*, *Tolypella glomerata* y *T. hispanica.* Moreover, one form of *Chara* gyrogonite that did not fit in any known species was also found. The majority of the gyrogonites of this morphological type had smooth, concave spirals mixed with ornamented specimens displaying tubercles on the lime spirals. Charophyte fructifications varied in terms of specific composition and abundance throughout the different sediment layers, revealing a gradual change mainly in the salinity of the lagoon waters. During the saline period, from around 1665, *L. papulosum* dominated. In the oligohaline stage, other species were the dominant (*C. vulgaris*, *C. major*, etc.). In the upper part of the cores only *C. hispida* fructifications remained frequent. In spite of the age of the fructifications, some of them were still viable (some were even more than 60 years old) and the germination was achieved. Cultures from these germlings are available for restoration tasks. Albufera de València has been receiving inorganic and organic nutrients and pollutants for more than 40 years (heavy metals, pesticides, etc.) and these compounds are stored in the sediments. However, it has been demonstrated that the most recent sediment layers (last three decades) allow the germination and vegetative

growth of charophytes; although there is an influence of the age of the sediments on these rates probably due to the substances the sediments house.

With the aim of improving Albufera de València water quality (with the setup of several ‘‘green filters’’ formed by emergent macrophytes, *Typha* spp.) as well as increasing Natural Park biodiversity, an area near the lagoon (40 ha surface of former rice fields, called Tancat de la Pipa) was transformed to reestablish the previous ecosystems by the Spanish Water Authorities: a water spring fed by groundwater inputs and two shallow marsh areas mainly fed with the water passing through a the green filter system were constructed. The final part of this thesis was devoted to the monitoring of submerged vegetation in these three environments. Submerged vegetation introduced by the managers as well as that spontaneously growing was monitored. Recolonization has also been promoted by transplanting charophytes from the waterspring to the marsh areas and by introducing charophyte cultures obtained from germination of sediment oospores in the laboratory. Small biodegradable flowerpots made of peat and filled with charophytes and sediment with their rhizoid system were used (same kind of pots also for cultures). The pots were transplanted in marsh sediments and a plastic net fence was placed around them to prevent the possible negative effects of predation by fish, crayfish and/or waterfowl. It was concluded that the final result of the vegetation restoration depended on a large variety of factors: state and kind of substrate, variations in nutrient concentrations, development of epiphytes, herbivory pressure and other effects caused by waterfowl, direct and indirect effects of fish, crayfish, etc., natural interannual variability. All of them, with their synergistic and/or antagonistic interactions, make difficult to stress the relevance of each of them on the success of vegetation restoration. Charophytes used in this restoration indicate they can resist the chemical conditions of the waters but, in turn, are very fragile or vulnerable as components of the complex ecosystem that is being restored.

This thesis has been partially funded by the Spanish Ministry of Economy and Competitiveness (project CGL2009-10292).

María Antonia Rodrigo, València

REPORT OF PAST MEETINGS

2011

27-29 May 2011
8th Meeting of the German working group on Characeae (AGCD) and Dutch Kranswieren Group, Lage Vuursche (Hilversum, The Netherlands). Co-organised by John Bruisma, Klaus van de Weyer, Gertie Arts. There were 9 participants from The Netherlands, 1 from Belgium and 20 from Germany (including 2 guests from Iran).

Charopyte collecting was organised from dusk till dawn during the first two days of the program. We had (SCUBA) diving and dredge sampling sessions. The 27th of May started with excursions in the Pleistocene part of The Netherlands where some fens and ditch areas were visited in the transition zone of Pleistocene sand to clay soils in the southern part of the country. This is what we discovered, in bold the ones found during the excursion:

Vlijmens ven (fen):** Since 1989 the following charophyte species were found here: ***Chara aspera, Chara globularis* var. *globularis, *Chara globularis var. hedwigii****, Chara virgata, Nitella capillaris, Nitella flexilis, Nitella translucens,*** *Tolypella intricate***.** Some other accompanying species are: *Potamogeton gramineus, P. natans, P. lucens, P.* x *angustifolius, Eleocharis acicularis, Elodea Canadensis, Baldellia ranunculoides* subsp. *repens.*

***Labbegat (ditches complex)**
Since 1995 the following charophyte species were found here: ***Chara globularis var. globularis***, *Chara globularis var. hedwigii*, *Chara hispida*, ***Chara virgata***, ***Chara vulgaris*** **var. *vulgaris***, *Nitella capillaris*, *Nitella flexilis*, *Nitella mucronata var. mucronata*, *Nitella translucens*, *Tolypella intricata*, *Tolypella prolifera.*

In the afternoon we visited the **Vinkeveense Plassen (Vinkeveen Lakes)** in the western part of The Netherlands. These lakes arose from peat excavation from the 17th century till the beginning of the 20th century. Sand extraction after 1945 formed deep pools (30-40 m deep).

Here some members of the group sampled by SCUBA diving and the rest dredged from boats.
Fig. 1 shows one of the hotspots of this lake area.
Since 1993 the following charophyte species were found in the Vinkeveen Lakes: ***Chara aspera, Chara connivens*** (most plants sterile at the time of sampling), ***Chara contraria***, *Chara globularis*, *Chara hispida*, ***Chara virgata***, *Chara vulgaris* var. *vulgaris* and var. *papillata*, *Nitella flexilis*, *Nitella mucronata*, ***Nitellopsis obtusa***, ***Tolypella glomerata***, ***Tolypella intricata***. There was discussion about the latter species, since some of the participants declared it was *Tolypella prolifera*. The discussion has not ended yet. Hopefully DNA-research will give the correct answer.

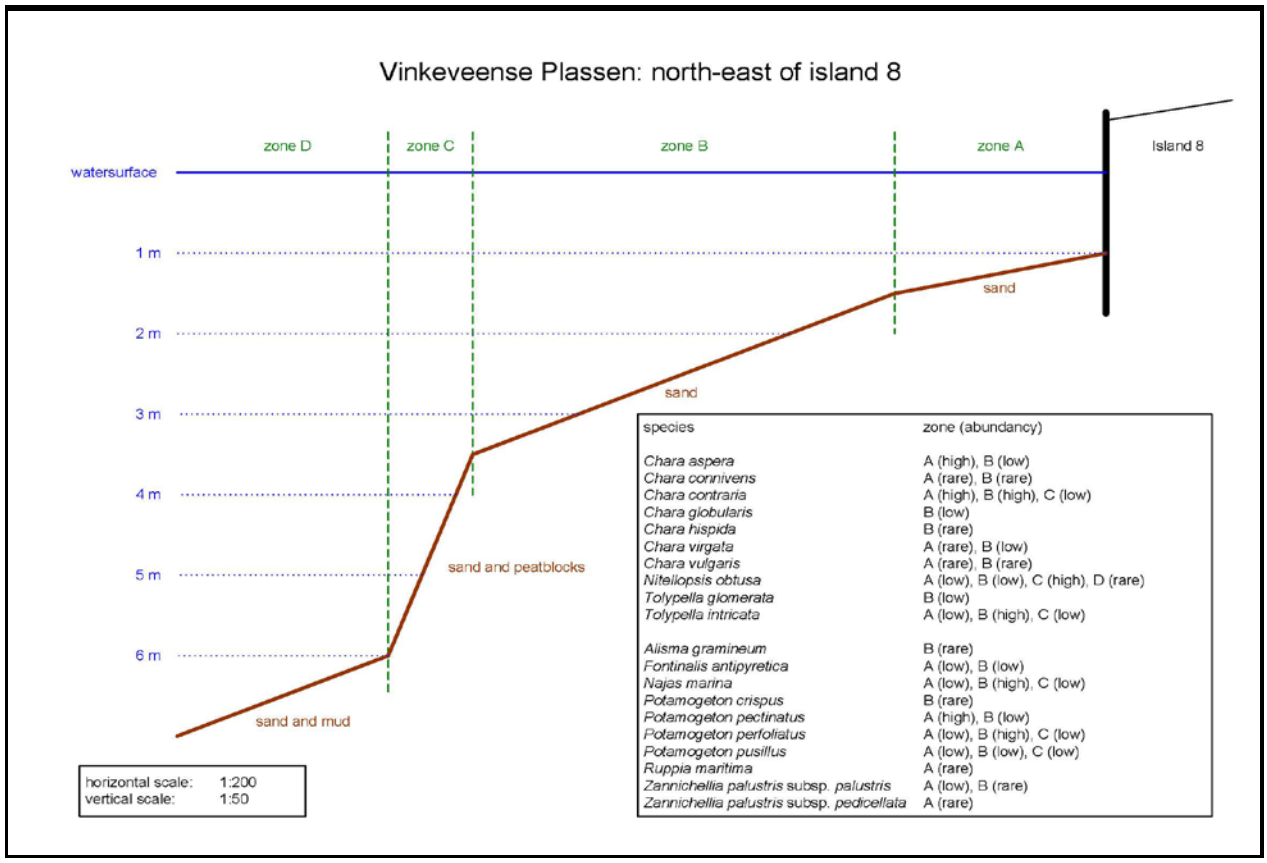

Fig. 1. Hotspot of Lakes Vinkeveen with depth zonation/aquatic plant species found since 1993 (Source: Jeroen Huls)

lutea, *Potamogeton crispus*, *P. lucens*, *P. pectinatus*, *P. perfoliatus*, *P. pusillus*, *Ruppia maritima*, *Zannichella palustris* subsp. *palustris* and subsp. *pedicellata*.
After fieldwork we drove to Lage Vuursche where we had dinner at the Koos Vorrinkhuis (a place where friends of nature can meet and reside). In the evening there was time for examining the sampled charophytes by giving them a closer look using binoculars and microscopes while enjoying a beer or wine. The next morning the group split up, the diving

section went for the Maarsseveense Plassen (Lake Maarsseveen), a 32 m deep sand pit, and

Veluwemeer, a shallow lake between mainland and polders in the IJsselmeer area. The dredging section visited the Naardermeer (Lake Naarden).

*** Naardermeer**
Charophyte species found since 1924: ***Chara aspera, Chara connivens, Chara contraria var. contraria,*** *Chara contraria var. hispidula,* ***Chara globularis,*** *Chara hispida,* ***Chara virgata,*** *Chara vulgaris, Nitella flexilis, Nitella hyalina, Nitella mucronata, Nitella opaca,* ***Nitellopsis obtusa,*** *Tolypella glomerata, Tolypella intricata. Chara aspera and Nitellopsis obtusa* formed really dense Charophyte meadows. Accompanying species were *Ceratophyllum demersum, Elodea canadensis, Elodea nuttallii, Fontinalis antipyretica, Hydrocharis morsus-ranae, Lemna minuta, Myriophyllum spicatum, Najas marina, Nuphar lutea, Nymphea alba, Phragmites autralis, Potamogeton lucens, P. mucronatus, P. natans, P. obtusifolius, P. pectinatus, P .pusillus, Ranunculus circinatus, Sagittaria sagittifolia, Schoenoplectus lacustris, Typha angustifolia, en T. latifolia.* Some species from the riparian zone were *Acorus calamus, Butomus umbellatus, Carex acutiformis, C. acuta, C. canescens, C. paniculata, C. pseudocyperus, C. riparia, Cicuta virosa, Lathyrus palustris, Lysimachia thyrsiflora, Potentilla palustris, Rumex hydrolapathum, Sium latifolium, Stellaria palustris, Thelypteris palustris.*

****MAARSSEVEENSE PLASSEN***
Charophyte species found since the seventies were ***Nitella capillaris*** (new in the locality), *Chara aspera, Chara connivens,* ***Chara contraria***, ***Chara globularis***, *Chara hispida, Chara virgata, Chara vulgaris,* ***Nitella hyalina***, *Nitella opaca,* ***Nitellopsis obtusa***. Accompanying species: *Najas marina s. l.*

***Veluwemeer**
Charophyte species found since 1937: ***Chara aspera***, ***Chara contraria***, *Chara globularis, Chara vulgaris, Nitella flexilis, Nitellopsis obtusa, Tolypella prolifera.*

In the afternoon some of the group visited dune pools in the coastal are of Duin- en Kruidberg. The rest went to Laegieskamp, a nature reserve with ponds, pools and ditches where seepage water comes to the surface from glacial deposits.

***Duin- en Kruidberg**
We only visited a small part of this dune area. Since 1996 the following charophyte species were found: ***Chara aspera, Chara contraria (*var. *hispidula)***, ***Chara globularis*** (new in the locality), ***Chara hispida*** , ***Chara virgata*** (new in the locality), ***Chara vulgaris (*var. *longibracteata, papillata*** and ***vulgaris)***, ***Tolypella glomerata.***

***Laegieskamp**
Charophyte species found since 1974: ***Chara vulgaris* var. *papillata*** (new in the locality), ***Chara vulgaris* var. *vulgaris***, ***Nitella flexilis*** (new in the locality), ***Nitella translucens***

A list was made of 98 vascular plants, 19 mosses and 4 fungi. Vascular plants: *Berula erecta, Butomus umbellatus, Callitriche platycarpa, Calluna vulgaris, Carex acuta x nigra, C.arenaria, C.diandra, C.echinata, C.hirta, C.nigra, C.oederi subsp. oederi, C.oederi subsp. oedocarpa, C.ovalis, C.panicea, C.paniculata, C.pilulifera, C.rostrata, Cirsium dissectum, Dactylorhiza incarnata, D.majalis subsp. praetermissa, Drosera rotundifolia, Eleogiton fluitans, Elodea nuttallii, Equisetum fluviatile, Erica tetralix, Eriophorum angustifolium, Genista anglica, Hottonia palustris, Hydrocharis morsus-ranae, Hypericum elodes, Lemna minor, L. minuta, L. trisulca, Luzula multiflora, Lycopodiella inundata, Lysimachia thyrsiflora, Menyanthes trifoliata, Molinia caerulea, Nuphar lutea, Oenanthe fistulosa, Osmunda regalis, Pedicularis palustris, Pedicularis sylvatica, Pilularia globulifera, Potamogeton berchtoldii, P.compressus, P. pusillus, P. trichoides, Sagittaria sagittifolia, Schoenoplectus lacustris, S. tabernaemontani, Stellaria palustris, Succisa pratensis, Utricularia minor, Utricularia vulgaris, Zannichellia palustris* subsp. *palustris.*
Mosses*: Aulacomnium palustre, Philonotis fontana* var. *fontana, Riccardia chamaedryfolia, Sphagnum cuspidatum, S.denticulatum, S.fallax, S.fimbriatum, S.flexuosum, S.palustre, S.squarrosum, S.subnitens, Warnstorfia fluitans*
Fungi*: Galerina jaapii, Hygrocybe coccineocrenata, Psathyrella typhae, Tephrocybe (Lyophyllum) palustre.*

The fieldwork ended at 4 pm and was followed by a determination session. Joop van Raam joined the group teaching us how to determine charophytes using oospore membranes. That was ostensible the last public appearance of our colleague. Despite his illness, Joop appeared very concentrated and he joined us later when we visited a pancake restaurant.

The Sunday morning (29 May) was reserved for oral presentations. Every presentation was followed by a lively discussion. About 1 am the meeting was over. The Dutch and Belgian participants were invited to join the next meeting of the German working group on Characeae (AGCD) in 2012. A new tradition is born?

Topics presented:

Speaker(s)	Topic
Rob van de Haterd	Scuba diving investigations in Zevenhuizerplassen, near Rotterdam
Heiko Korsch	Charophytes in Sachsen-Anhalt (Germany)
Heiko Korsch	Charophytes in Germany - Progress with mapping
Luc Denys	Charophytes in the coastal dunes of Belgium
Egbert Korte & Thomas Gregor	Comments on the Red List of the charophytes of Hessen (Germany)
Angela Doege	Some remarks about the ecorticated *Chara* species
Hendrik Schubert	Book project Charophytes of Germany

This report is based on the report compiled by John Bruinsma and others.

Emile Nat, Leiden, NL

21-27 July 2011
XVIII INQUA, Bern, Switzerland

The International Union for Quaternary Research held in Bern attracted more than 2,100 participants and was a great success. Palaeolimnological presentations, based on different proxies, occupied a whole session within the meeting. It is intended to publish the abstracts in the journal *Quaternary International*.

15-18 September 2011
18th Symposium of the GEC (Group of European Charophytists) in Poznań (Poland) **(Group Photo p. 24)**

New GEC president
The IRGC president thanked the organizers of the 18th GEC in Poznan for a fruitful meeting. As is the custom in GEC, the organizer automatically becomes GEC president until the next meeting. Mariusz Pełechaty received a model of a fossil charophyte gyrogonite (*Raskyella peckii*) as a symbol of GEC presidency.

IRGC membership
The IRGC president invited all non-IRGC members to join the IRGC and reminded everybody to pay the annual membership fee of 20 Euro.

The 6th IRGC meeting in Mendoza, Argentina, and the **IRGC elections,** to take place during this meeting, were discussed.

Next GEC meeting
Since the IRGC meeting is at the end of November 2012, a GEC meeting held in summer 2013 would be only approximately half a year after the IRGC meeting, which is a rather short time. Zofia Sinkevičieně volunteered to organize a GEC meeting in 2014 in Lithuania. However, since many GEC participants probably cannot participate in the IRGC in Argentina, some participants would nevertheless prefer to have a GEC meeting also in 2013. Sixteen meeting participants voted for having an additional GEC meeting in 2013, while 7 voted against. There was, however, nobody in the audience who volunteered to organize a GEC meeting in 2013. The GEC president Mariusz Pełechaty will contact Nicolas Haas from Innsbruck and ask if he would be willing to organize a meeting in 2013 in Austria, since Nicolas Haas agreed, in principle, to organize a GEC meeting some years ago.

Susanne Schneider, Norway

18th GEC Scientific Report

The historical town of Poznań was the place of our 18th GEC-meeting. The organisation was in the hands of Prof. Marius Pelechaty assisted by the very active polish charophyte-group: (A. Pukacz, J. Krupska, M. Gabka, Jacek Urbaniak) and the Department of Hydrobiology. This GEC-meeting again proved international with 32 participants coming from 11 different countries (abbrev. CH, D, E, F, LT, LV, NO, PL, RS, RU, UK) The brand new building of the *Collegium Biologicum* of the Adam Mickiewicz University of Poznań was easily reached by tramway from downtown where most of us had booked hotels at reasonable price. Every day lunch was included and we enjoyed delicious food, nicely prepared and served at the university in a comfortable room reserved for our group.
Six scientific sessions of 4 oral presentations each and a poster session with 7 presentations were held during two days. You may still access the abstracts on the remarkable website of the GEC: **http://www.gec.amu.edu.pl/**

Charophyte flora and distribution
This session gave an overview of the great variety of Characeae and made us travel and visit lakes and ponds through various countries: from Israel (by Barinova & Romanov), to Latvia (by Zviedre & Grinberga about *Chara polyacantha* and by Sinkeviciene & Urbaité-Macevic about the drastic reduction of *Lychnothamnus barbatus*), to Switzerland (Auderset & Rey-Boissezon) and Ukraine (by Borysova) and also to North Africa (Soulié-Märsche et al.). After that, Roman Romanov et al. presented the current state of Charophyte research in Russia. Uwe Raabe told us more about *Chara baueri*, and its new discovery in Poland (Pukacz & Raabe); *Tolypella salina* was re-discovered in France (Lambert et al.).

These oral presentations and posters gave an overview of the great variety of Characeae and the influence of habitat and climatic zones. Alexandra Vesic (in collaboration with the Rostock team) discussed possible species concepts for diplostichous Chara, and Iakushenko and Borysova presented problems of syntaxonomy of the *Charetea* Fukarek ex Krausch. Late in the evening, the participants continued discussing during the excellent conference dinner hosted by the Department of Hydrobiology.
The second day started with the visit of the different sections of the *Collegium Biologicum*. We closely followed the guide, as one can get lost in this impressive, spacious building. We could admire the very modern equipment for solid work in the fields of genetics, isotope analyses, coring etc.; all you need to do a good job. What a pleasure to see the walls of the botany exposition decorated all around with nice herbarium sheets. The herbarium also holds precious old specimens as for instance *Nitella hyalina*, labelled Montpellier, June 10, 1882. I liked very much the Department of Anthropology where more than a hundred human skulls look at you from the shelves, waiting for statistical treatment.

The space and the furniture available for archiving both modern and fossil scientific samples particularly impressed me. Each category, beetles, butterflies, molluscs, fossils etc., all were perfectly labelled and stored in drawers (especially ordered from the U.K.) adapted to each type of material.

Palaeoecology of Charophytes
Stable isotopes were analysed from Jurassic (180 My old) gyrogonites and ostracods of the North American Morrison Formation (Schudack) and from recent charophytes collected in lakes in Poland (Pelechaty et al.). Charophyte assemblages from the Upper Cretaceous (c. 100 My) were analysed to demonstrate cyclicity in palaeolakes (Villalba and Martín-Closas). Sediments from glacial and Holocene lakes revealed interesting successions of species in Poland (Kowalewski).

Charophyte genetics, ecology and threats

Rey-Boissezon et al. presented the life cycle of *Nitellopsis obtusa* monitored over two years. Rubio et al. showed the results of microcosm experiments on *Chara hyalina* and *Chara polyacantha.* Schneider et al. had analysed the uptake of organic pollutants by *Chara rudis* and conclude that Characeae could, to a certain extent, operate for bioremediation in organically polluted lakes. Nowak et al. discussed the advantages and disadvantages of different methods available for molecular analyses of charophytes.

In the late afternoon, we visited the old town with an expert guide who told us amazing events of Poznan's history. The evening ended in one of the nice and comfortable taverns at Poznan's Old Market Square.

On behalf of all the participants, I have great pleasure to thank Marius Pelechaty, his team and the Department of Hydrobiology for this great meeting !! If you regret having missed this very interesting place, you might like to make a virtual trip through Poznań at:
http://www.poznan.pl/mim/turystyka/en/

Maybe this will motivate you to attend the "International Symposium of Aquatic Plants" organised again by the Department of Hydrobiology of the *Collegium Biologicum* in August 2012.

Ingeborg Soulié-Märsche, Montpellier

18th GEC Excursion Report

The two-day field trip to the lakes and most celebrated places of interest started on Saturday 17 September at 8:00 from A. Mickiewicz Square in front of the University building *Collegium Minusi* in Poznań. Our group consisted of 22 foreign participants and seven kind and encouraging organizers of the trip. At the beginning of trip a local guide Krzysztof Jarczyński accompanied us. We knew him already from the previous evening when he guided a tour in Poznań city. Our guide was very talkative and told us that somebody had called him Mister Follow Me – as he like to use this expression very much – we started to call him so, too. During the trip we joked a lot and listened to the stories of our guide. The first stop was Lake Lednica which is situated 40 km north-east of the city centre of Poznań. This is the region of the historical origins of the Polish nation. Lake Lednica is one of the most popular historical, tourist and in recent years – religious places in the Wielkopolska region. There have been numerous important palaeolimnological studies. We had the possibility to have short walk and to get to know this important place. Afterwards we moved to another site of this lake. There were prepared two boats for charophyte investigations. The weather was nice for a boat trip and most of us entered the lake. Nowadays, 10 species of charophytes, representing four genera, can be found in Lake Lednica. We collected only four species - *Chara globularis*, *C. contraria*, *Nitella mucronata*, *Nitellopsis obtusa*. Because it was the end of season we did not find a rare Polish charophyte species *Tolypella glomerata* which was reported from the lake also.

After an excellent lunch we drove to Łagów Lubuski town. Łagów Lubuski is a small town more or less mid-way between Poznań and Berlin. This old town, claimed to be one of the most beautiful resorts in the region, developed in the middle of old beech forests. In the town we visited Johannites Castle's tower. The castle is built on a moraine hill in the vicinity of the place where two lakes join. At the top of the tower Mariusz Pełechaty told us about lakes and the vicinity and we took a lot of beautiful landscape photos and group photos from colleagues. When we went down from the tower it was already near dusk. We went to the shore of Lake Łagowskie where Andrzej Pukacz told us about charophytes growing in the neighbourhood. He showed us charophytes that he had collected together with other polish colleagues. We saw *Nitellopsis obtusa*, *Chara contraria*, *Lychnothamnus barbatus*. Our final destination of the first day was Słubice were we had an excellent, delicious dinner in Polish style. We finished dinner at midnight and went to the study rooms in *Collegium Polonicum* where we were ready to start the determination workshop. *Collegium Polonicum* is a crossborder (Poland and Germany) academic institution. It is a modern building, the biggest investment in

Polish higher education in the recent decade. Charophytologists with the greater endurance finished their work late in the night. We slept in very cozy rooms, which usually accommodate professors.

Our second field excursion day started at 9 am. It drizzled a little and we all hoped that the rain would stop soon. We boarded our bus and started our trip to the first place of that day - Lake Reczynek. Lake Reczynek is located in the centre of Lubuskie Lakeland. Most of the drainage basin is dominated by urban infrastructure as well as extensive agriculture, it has strong recreational pressure. Irrespective of it the lake's phytolittoral is dominated by dense charophyte meadows. The most common and abudant in the lake are communities build by *C. hispida* and *C. virgata*. We collected *Nitellopsis obtusa*, *Nitella mucronata* and sterile *N. flexilis*. Then we walked along corn field and through forest to Lake Lubińskie. The whole lake is surrounded by forests. Nevertheless agricultural fields make up most of its drainage basin. This is an outflow, postglacial lake, constantly supplied by a few ground springs. This lake has a meromictic character which is an uncommon type of lake in Poland. The aquatic vegetation is dominated by underwater meadows and consists of charophytes and mosses (*Fontinalis antipyretica*). The most abundant components of charophyte vegetation are *Chara globularis*, *C. virgata* and *Nitellopsis obtusa*. We found *C. globularis*, *Najas marina*, *Myriophyllum spicatum*, *Elodea canadensis*, *Fontinalis antipyretica*.

In a very good mood we returned to the bus and went to the last lake of our field trip – Lake Jasne. This lake belongs to the group of moderately shallow, tachymictic lakes and is one of the clearest, meso-eutrophic lakes within Lubuskie Lakeland, characterized by high visibility and low nutrient concentrations. Over 60% of the littoral is overgrown by charophyte meadows. For us were arranged two boats and all of us had possibility to take a short passage in Lake Jasne. We saw many species here – *Nitellopsis obtusa*, *Chara tomentosa*, *C. rudis*, *C. globularis*, *C. polyacantha*. After the boat trip we went to the wonderful restaurant "Ostoja" where we enjoyed delicious meal in a very good ambiance. We had the possibility to taste different Polish dishes - traditions dumplings, żurek soup and other. After the meal we sat confortably in the bus and returned to Poznań.

This trip was very useful and encouraging for all of us, but especially for younger researchers and students because more experienced colleagues were very kind and shared their knowledge with them. We would like to thank all organizers of this trip for these very interesting two days that we had possibility to get new impressions and inspiration!

To write this field report, much information was used from the Field Excursion Guide (elaborated by M. Pełechaty, A. Pukacz, K. Apolinarska, G. Kowalewski).

Egita Zviedre, Latvia

FORTHCOMING MEETINGS

There is a large variety of meetings where Charologists can take an active part although this year we have our international symposium in Mendoza, Argentina (Second Circular included)

2012

2-6 July 2012
XVIth Congress of the Iberian Society of Limnology

Organized by the University of Minho and the Iberian Society of Limnology (AIL) at Guimarães (Portugal).
http://cbma.bio.uminho.pt/limnologia2012.com/index.php?lang=en

5-10 August 2012
34th International Geological Congress (IGC), Brisbane, Australia

Covering the interests of all in the global geoscience community, industry, academia, government and beyond, the IGC is expecting the participation of more than 5,000 researchers!
Website: www.34igc.org

21-24 August 2012
12th International Paleolimnology Symposium to be held in Glasgow, Scotland

The 12th International Paleolimnology Symposium (IPS2012) will be held on the 21-24 August 2012, in Glasgow, Scotland. Visit the website for details, register your email for updates and find out how we are embracing social networking.
New: Session titles and abstracts, keynote speakers, fees and excursions.
Website: http://www.paleolim.org/ips2012

27-31 August 2012
13th EWRS International Symposium on Aquatic Plants & 2nd International SIL Workshop of Working Group on Macrophytes, Poznan, Poland

International Symposium on Aquatic Plants 'Plants in hydrosystems: from functional ecology to weed research'.
In this meeting there will be a **special session devoted to charophytes** and there is a call for presentation and abstract submission. The session theme is: Multifunctional charophytes: indicative value and environmental importance.
Contact: marpelhydro@poczta.onet.pl

General Secretary of the meeting: Dr Krzysztof Szoszkiewicz (Email: kszoszk@au.poznan.pl)
www.aquaticplants2012.pl/main-menu-2/contacts

24-28 September
Annual Meeting of the German Limnological Society ("Deutsche Gesellschaft für Limnologie e.V")

Organized by the University of Koblenz and the Bundesanstalt für Gewässerkunde in Koblenz

http://www.dgl2012.de/DGL_2012/Start.html

17-19 October
Journées Internationales de Limnologie JIL Clermont-Ferrand, France

The meeting will be held at the University "Les Cézeaux". Four half-day sessions are planned.
Session 1: Biodiversité et fonctionnement des écosystèmes aquatiques.
Session 2: Impact des changements globaux sur la biodiversité en milieu aquatique et effets retour.
Session 3: Gestion des milieux aquatiques et services écosystémiques.
Session 4: Aspects méthodologiques.
Contact : Christian Amblard, christian.amblard@univ-bpclermont.fr

25 November - 27 December 2012 (22 November to 2 December with field-trips)

6th International Symposium of IRGC, Mendoza, Argentina

The Second Circular is included as a hard copy with this Newsletter 23, although the circular will be sent electronically as well. You will find more information regarding the venue, as well as instructions to submit your abstract (Abstracts Format), Final Registration Form and Payment Form.

Please send any questions about the symposium to: adriana@uow.edu.au

2014

28 September - 3 October
IV International Palaeontological Congress, Mendoza, Argentina

The next IPC will be held in Mendoza, Argentina, with the organizers of the Congress promising a very exciting meeting, so please make a note of the dates and start planning to participate! The Congress will be accompanied by field excursions before and after the meeting, still not defined.

Contacts: Dra. Claudia V. Rubinstein; crubinstein@mendoza-conicet.gov.ar and Dr. Beatriz G. Waisfeld: bwaisfeld@efn.uncor.edu;

NEWS FROM THE REGIONAL GROUPS AND INDIVIDUALS

The space ***News from South America*** needs to be filled. Eduardo Musacchio was the South American correspondent, and ensured every year to contact colleagues and provide an update of activities and research in South America!
Now, we have to ask our colleagues from South America to put forward their names and collaborate with the IRGC News. A final discussion will occur at the 6 IRGC in Mendoza. We should also encourage participation and discussion about the activation of other regional groups.

News from Individuals

An "Oscar" for stoneworts

Would you like to discover a photo of *Chara* in your daily newspaper? That's what happened to me during a Christmas vacation in Heidelberg. Not yet in Hollywood, but in Germany, the Botanical Society has elected stoneworts the **"Algae of the Year 2012"**

The decision was made public on January 2, 2012 by the prestigious newspaper "Die Welt". Entitled "Armleuchter des Jahres", the info was taken over by many national and local newspapers. "Stoneworts represent an important habitat for any kind of animals and provide food for many sorts of birds" and "The election honours a group of algae with holds 20 species on the Red List of threatened plants in Germany" - the journal says. They explain that « Armleuchter » derives from the whirled structure of the plants, reminding a *candelabrum* (candle lighter), but the amazing point is that, in German, « Armleuchter » has a double rather negative sense : meaning also a silly, narrow-minded person.
Most articles also show a nice *Chara vulgaris*, from a photo published earlier by Monique Feist ©dpa. The initiative for nomination probably started from the University of Greifswald.
Wish to read more and get stoneworts celebrated in YOUR country ? see for instance the following website: <http://www.berliner-zeitung.de/wissen/alge-des-jahres-2012--armleuchteralge-chara,10808894,11381680.html > (in German).

Ingeborg Soulié-Märsche
(Montpellier)

Online Charales database

Where to look when you're interested in the distribution data of all the Characeae of the world? Where to find up-to-date species lists? How to maintain your own database for field observations, photos and herbarium material? How to compare your sightings directly with other observers around the world? How to compare pictures from specimens from different localities? The biodiversity website http://observado.org might be an answer to all these questions and many more.

What is Observado.org? Observado.org is a free online biodiversity database. Its objective is to collect nature observations and make the biodiversity of the world accessible to everyone. Data can be entered, shared and retrieved. It is not only a database, it is also a large network of people interested in nature. The origins of Observado are in the Netherlands, where it started as "Waarneming.nl" in 2003. From there it has evolved into an international project with a global view. Observado cooperates with local, national and international organisations e.g. with the Global Biodiversity Information Facility (GBIF). This cooperation varies from sharing data to providing Study Groups with screens to build into their websites. The group of people who use observado.org is diverse; from the occasional observer, to citizen scientists, to experts. Observers enter their data "real-time" into the database, volunteers with expertise of different species groups check the data on a regular basis. This way Observado can maintain its high quality. Observado.org (together with the Dutch "Waarneming.nl" and the Belgian "Waarnemingen.be") has at the moment over 25 million wildlife and plant observations and almost 3 million photos in its database and these numbers are growing every day.
What could you do with it? How does it work? Observado can be viewed by everyone. You can

watch distribution maps, pictures and sightings of other users, but if you want to use Observado to the full extent, you need to be logged in. Registration is easy and free (It's necessary to register, to keep fake observers out). Once you are logged in, there are many extra possibilities. You can enter new observations, manage your own sightings, upload pictures, create your own distribution maps, compare your observations with others, make your herbarium into a digital version, etc. etc. When entering a new observation, you can pinpoint the exact location on a map, work with a kilometre grid or enter coordinates directly into the system. There are so many possibilities, that it is hard to make a selection for this announcement. The best thing is to just try it. If you want a preview of what it looks like and how you can enter a new observation, there's a tutorial movie clip on Youtube:
http://www.youtube.com/watch?v=xGksc6xHrd4 Network for people interested in Charales Observado.org has recently added a list of all the species of the Characeae in the world. This total list can be found here: http://observado.org/familie/view/10204 . It is based on the synopsis made by Joop van Raam and Nick Stewart. The list is in progress and still needs to be expanded with vernacular names and varieties. Also some species might be still missing or species status might be argued. Observado hopes that experts on Characeae will start using the website to record their observations and share their knowledge with other users. Observado hopes this will enthuse other people to enter the world of the Charales. There's for instance a large group of plant recorders who might also like to work on Characeae. In order to get this work, Observado needs many new users and observations.

If you are interested in the project and would like to contribute, please register on http://observado.org or contact the website at info@observado.org

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NEW IRGC MEMBERS AND CHANGES OF ADDRESS

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CHAROPHYTE DISCUSSION FORUM

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

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

How to suscribe to charophyte-L?

Just send the message to the listserver:
listserv@pnc.edu

In the body (not the subject) of the message type: ***subscribe charophyte-L*** **your name**. **Leave the subject blank. Also make sure your signature is turned** off **for this email. It** must **be sent as a text message.** You will receive an automatically generated message telling you how to make use of the list. Once you are subscribed, you can send messages to the list server which will distribute them to all subscribers.

CHAROPHYTES ON THE WEB

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

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

The **GEC** homepage is the responsibility of the organizers of the successive GEC meetings. The last GE homepage was:
http://www.gec.amu.edu.pl/

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

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

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

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

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

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

MEMBERSHIP FEES

Please **do not forget** to send your membership fee payment for 2011. Multiple-year payments are encouraged!

20 Euros (c. US$25) per year

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

Please find on **page 23** the membership payment form or download it from the IRGC-webpage at:
http://irgc.uow.edu.au/

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

Any questions about membership fees should be addressed to:

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

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

E-MAIL ADDRESSES OF 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. **Updated March 2012**.

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INTERNATIONAL RESEARCH GROUP ON CHAROPHYTES (IRGC)

MEMBERSHIP FEES

The annual membership fees since 2009 are 20 Euro (ca. 25 $US) and are due **by January each year**. Multiple-year payment is encouraged to reduce mailing and banking costs.

Choose your **METHOD OF PAYMENT** and tick the appropriate field:

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Grote Ruwenberg 17'
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18th GEC Meeting, **Poznań**, Poland
Group Photograph, 2011

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