Trentino Nature & Science Museum
Limnology & Phycology Section

Autonomous Province of Trento

2nd Central European Diatom Meeting

12 June 2008 - 15 June 2008

Trento (Italy)

Abstract Book

Editors: Marco Cantonati, Alessia Scalfi & Ermanno Bertuzzi

Foreword

Last year (2007) in Berlin the *21. Deutschsprachiger Diatomologen Treffen* became at the same time the *1st Central European Diatom Meeting*. This change was underlined by an evident increase in the number of participants. This trend continued with the second edition of the congress: The *2nd Central European Diatom Meeting* in Trento. This was somewhat unexpected since this year (2008) also the *International Diatom Symposium* will take place in a few months (07-13/09/2008) in Dubrovnik, Croatia, and several delegates announced that they would not be able to attend both meetings. In spite of this, as can be seen in Fig. 1, about hundred delegates registered for the Congress. It is therefore with satisfaction that we have the possibility to observe that their nationalities are very diverse, with an important contribution from non-German speaking countries (Italy – “location effect” -, Czech Republic, Russia). We feel very honoured in acknowledging that some participants made long journeys to join our Congress, coming e.g. from Scotland, the eastern part of Russia, Israel, and Canada!

Not surprisingly most of the participants work in Universities, but a significant share carries out its diatom investigations in other research institutions (e.g. Research Councils), and in Museums and Botanical Gardens (Fig. 2). This last observation is of special interest for us, since this year the Congress is organized in a Museum. In such Institutions, fundamental research (in particular biodiversity documentation), collections, and educational issues and popularization are topics of prominent importance.

The topics covered by the contributions of the participants are diverse, but could be grouped into the categories shown in Fig. 3. These give an idea of ongoing diatom research in Central Europe. Not surprisingly biodiversity remains an important topic. Less obvious and – in our opinion encouraging – is the attention still given to taxonomy, a discipline which has difficulties in being acknowledged as a fundamental tool of ecological and applied research by administrators and decision makers.

In thanking the participants for coming to Trento and contributing to the Congress, we are happy that the Trentino Nature & Science Museum of Trento, a town that is not German speaking but that has always been a gate for those coming from Italy and approaching the German-speaking area, can contribute to the continuation of the *Central European Diatom Meetings*, formerly *Deutschsprachige Diatomologen Treffen*.

Marco Cantonati
Ermanno Bertuzzi
Alessia Scalfi

Trentino Nature & Science Museum Trento, June 2008

Acknowledgements:
The colleagues of the Museum who contributed to the organization: Nicola Angeli, Daniel Spitale, Claudia Marcolini, Massimiliano Tardio, Antonia Caola, Chiara Rinaldi, Elisabetta Pacher, Lorena Celva, Enrico Rossi, Paolo Zambotto, Paolo Bonvecchio, Giuliano Sartori.

SPONSORS:
Under the Patronage of the *Autonomous Province of Trento*
University and Scientific Research Service of Autonomous Province of Trento: Bianca Angelini
Trentino S.p.A. and APT Trento (Trentino and Trento Marketing Companies respectively)
Centro Duplicazioni PAT (Printing Center of Autonomous Province of Trento)
Foradori (wine tasting at the end of the excursion). Maria Buffa
Koeltz Scientific Books (book exhibition)
Italian Ministry of the Environment and Territory Protection Friuli Museum of Natural History (Italian Habitats)

Fig. 1

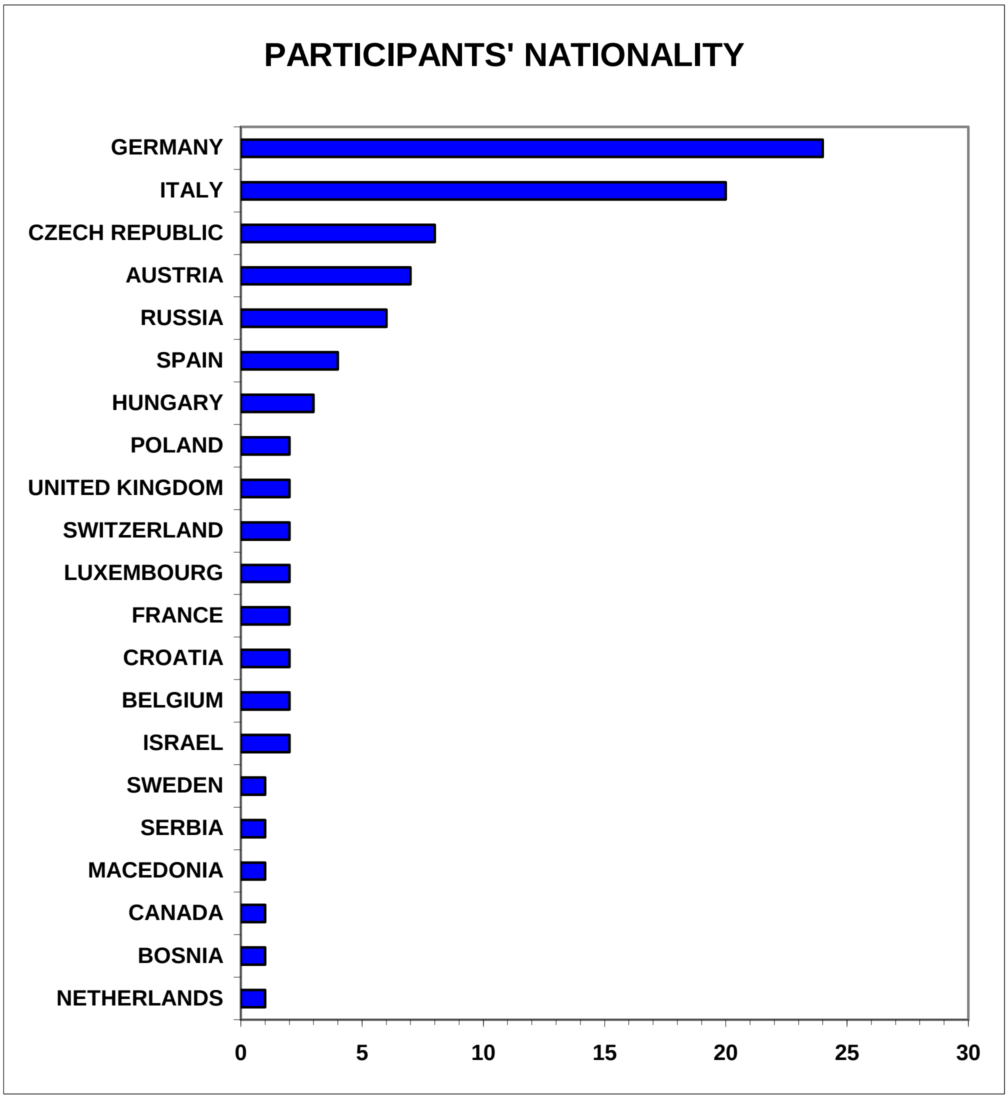


Fig. 2

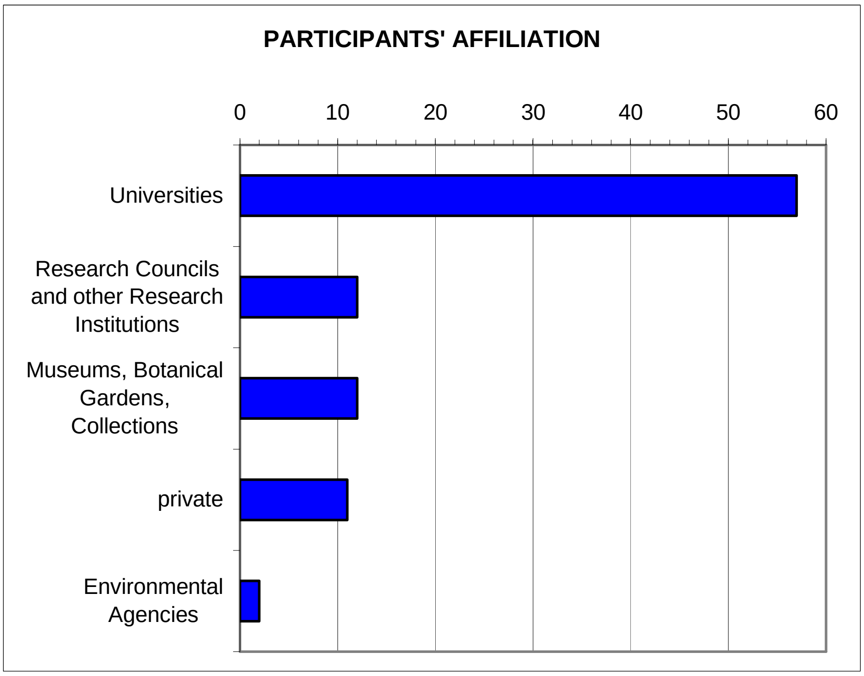
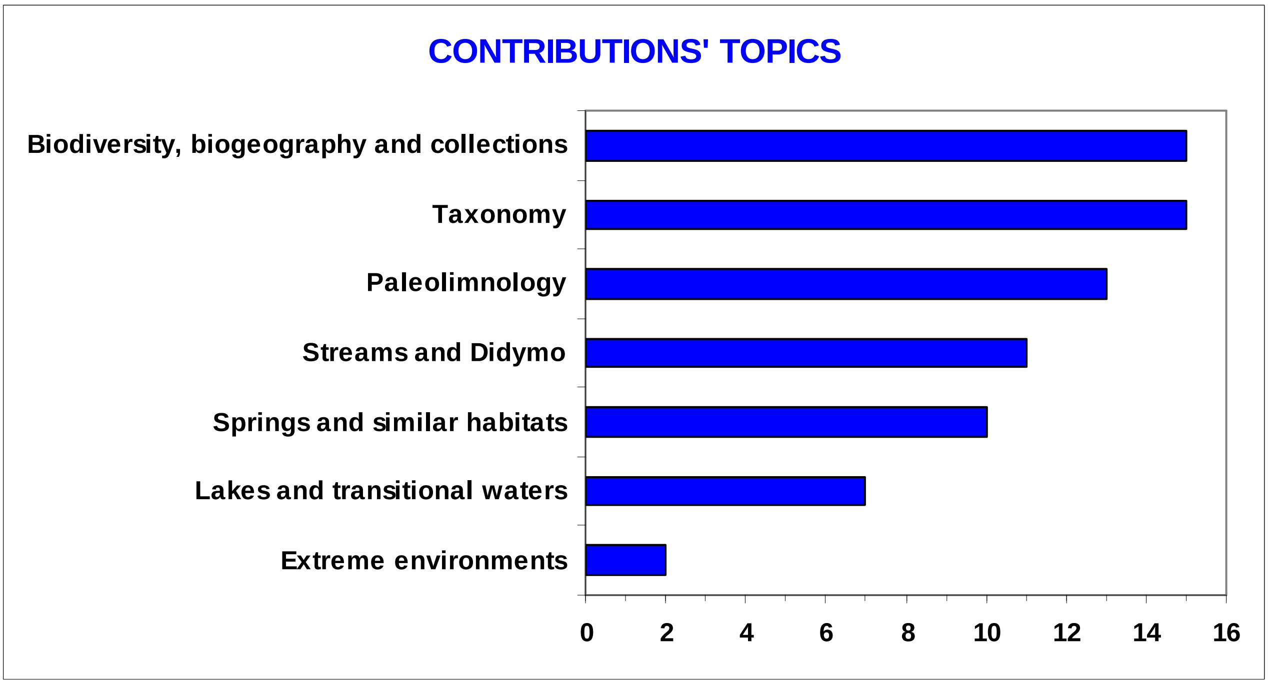


Fig. 3

Oral presentations = 20 **Posters = 53**



SCHEDULED PROGRAMME CE-DiatoM2

	Thursday **12/06**	**Friday** **13/06**	**Saturday** **14/06**	**Sunday** **15/06**
8-9			8:30 - 9:00 Registration	8:30 - 9:00 Registration
9-10			9:00 - 9:30 Welcome speech 9:30 - 10:30 oral session	9:00 - 10:00 invited speakers
10-11			10:30 - 10:50 coffee break	10:00 - 11:00 oral session 10:40 - 11:00 coffee break
11-12			10:50 - 12:30 oral session	11:00 - 12:00 oral session
12-13		8.20 a.m. – 7 p.m. Excursion at Lake Tovel *****	12:30 lunch in the Museum Halls	12:00 - 12:45 poster session 12:50 - 13:30 closing ceremony
13-14			13:30 - 15:00 poster session	13:30 - lunch in the Museum Halls
14-15	Arrival of participants in Trento			
15-16			15:00 - 16:00 oral session	
16-17	16:30 - 19:30 Registration		16:00 - 16:20 coffee break 16:20 - 17:00 oral session	
17-18			17:00 - 19:00 poster session	
18-20				
20-22	20:00-22:00 dinner*****	20:00-22:00 dinner*****	20:00-22:00 dinner*****	

*****not included in the Congress fee

Social events

Thursday 12-06:
- h 20:00 - getting together dinner (meeting point at the Museum).

Friday 13-06:
- h 8:15 – excursion (meeting point in Piazza Dante Square, in front of the Regione building).
- h 20.00 - dinner (meeting point at the Museum).

Saturday 14-06:
- h 20.00 - dinner (meeting point at the Museum)

SCIENTIFIC PROGRAMME CE-DiatoM2

SATURDAY, 14 June 2008

9.00 - 9.30	**Welcome addresses** Dr. M. Cantonati (Organizer and Keeper of the Limnology and Phycology Section) Dr. M. Lanzinger (Director of host Institution) Dott. M. Cogo (Vice-President and Cultural Aff. Minister of the Autonomous Province of Trento)
9.30 – 10.30	**DIATOMS IN SPRINGS** Chair: ROTT E.
9.30 - 9.50	New diatom genera and species in springs of the Alps, and their suitability for an ecological characterization of springs CANTONATI M., LANGE-BERTALOT H., ANGELI N., BERTUZZI E., SCALFI A. & SPITALE D.
9.50 – 10.10	Diatom indices and springs BERTUZZI E., ANGELI N. & CANTONATI M.
10.10 - 10.30	Diatoms along a pH/calcium gradient in Western Carpathians spring fens FRÁNKOVÁ M., POULÍČKOVÁ A., MARVAN P., BOJKOVÁ J. & HÁJKOVÁ P.
10.30 – 10.50	**COFFEE BREAK**
10.50 - 12.30	**PALEOLIMNOLOGY and EPIPELON** Chairs: PIENITZ R. & SCHMIDT R.
10.50 - 11.10	Water-level changes in Alpine lakes (NE Italy), and their reflection in the diatom sediment record LEIRA M., FILIPPI M. & CANTONATI M.
11.10 – 11.30	Diversity and ecology of lake epipelon POULÍČKOVÁ A.
11.30 – 11.50	Epipelic diatom communities in stagnant water bodies located close to the River Nysa Luzycka (Lausitzer Neisse), SW Poland PICIŃSKA-FAŁTYNOWICZ J.
11.50 – 12.10	Pliocene - Pleistocene freshwater diatom flora of Bylot Island, Nunavut, Canadian High Arctic PIENITZ R., ZIMMERMANN C. & POULIN M.
12.10 – 12.30	Diatoms from the Upper Miocene deposits of the Vitim Plateau, Russia USOLTSEVA M.V., VOROBYOVA S.S., MASLENNIKOVA M.M., RASSKAZOV S.V., BRANDT I.S. & BRANDT S.B.

12.40- 13.40	**LUNCH in the museum**
13.40 – 15.00	**POSTER SESSION I** Chairs: ECTOR L., JÜTTNER I. & ROTT E. **Springs and similar habitats (1-7)** **Streams and Didymo (8-15)** **Lakes and transitional waters (16-20)**
15.00 - 16.00	**DIATOMS IN STREAMS** Chair: JÜTTNER I.
15.00 - 15.20	Diatom flora of Kobylanka stream. How many taxa can exist in a very small water-body? WOJTAL A.Z.
15.20 – 15.40	Diatoms of periphyton assemblages in small rivers in north-western Russia KOMULAYNEN S.
15.40 – 16.00	Distribution of *Didymosphenia geminata* in SW Piedmont (Italy): Invasion or just lack of reference data? BATTEGAZZORE M.
16.00 – 16.20	**COFFEE BREAK**
16.20 – 17.00	**DIATOMS IN EXTREME ENVIRONMENTS** Chairs: SABBE K. & VAN DE VIJVER B.
16.20 – 16.40	Diatom communities in soils influenced by the wandering albatross MORAVCOVA A., VAN DE VIJVER B. & BEYENS L.
16.40 – 17.00	Diatoms inhabiting young successional biotopes in a district of surface coal-mining in Western Bohemia SKÁCELOVÁ O.
17.00 – 19.00	**POSTER SESSION II** Chairs: CREMER H. & REICHARDT E. **Paleolimnology (21-29)** **Taxonomy (30-41)**

SUNDAY, 15 June 2008

9.00 – 12.00	**DIATOM BIODIVERSITY AND BIOGEOGRAPHY** Chairs: CANTONATI M. & LANGE-BERTALOT H.
9.00 – 9.30	Recent insights into the biogeography of diatoms SABBE K., MANN D.G., VERLEYEN E. & VYVERMAN W.
9.30 – 10.00	Geographic distribution of cyanobacterial morpho- and genotypes KOMÁREK J.
10.00 – 10.10	Ciliates in spring habitats: At which conditions can morphotaxonomy be used? DINI D., DI GIUSEPPE F., SPEAKER: SPITALE D.
10.10 - 10.30	How can DNA barcoding help diatomists? EVANS K.M., VANORMELINGEN P. & MANN DG.
10.30 – 10.40	Discussion on session topic (Chairs)
10.40 - 11.00	**COFFEE BREAK**
11.00 – 11.20	The genus *Luticola* in the Antarctic Region: Diversity, morphology, and biogeography VAN DE VIJVER B.
11.20 – 11.40	Current and future concept of the taxonomy of *Amphora* sensu stricto and its impact on biogeography and autoecology LEVKOV Z., METZELTIN D., ECTOR L., PAVLOV A., KRSTIC S. & NAKOV T.
11.40 – 12.00	From cleaning the valves to cleaning the data: European diatom biodiversity data on the Internet KUSBER W.H., ZIPPEL E., KELBERT P., HOLETSCHEK J., HAHN A., GÜNTSCH A. & BERENDSOHN W.G.
12.00 – 12.45	**POSTER SESSION III** Chairs: CANTONATI M. & KUSBER W.H.
	Biodiversity, biogeography, and collections (42-53)
12.50 – 13.30	**CONGRESS CLOSING DISCUSSION** CHAIRS: GEISSLER U. & RAEDER U.
12.50 – 13.10	Student prizes (best presentation)
13.10 – 13.30	3rd Central European Diatom Meeting in Utrecht - 2009 CREMER H., Utrecht
13.30 – 14.30	**LUNCH in the museum**

POSTERS

SPRINGS AND SIMILAR AQUATIC HABITATS

1. Diatoms in the karstic springs of Herzegovina (Bosnia and Herzegovina)
Hafner D.
2. The diatoms of the "Vepsskiy forest" Natural Park's springs
Nesterovich A.
3. Benthic diatoms of springs and streams in the central Apennines (Italy)
Torrisi M. and Dell'Uomo A.
4. Diversity of diatoms dominating biofilms on tufa stromatolites of hard water creeks
Brinkmann N., Arp G., Jahn R. and Friedl T.
5. Diatoms in two heathland creeks in Bosnia and Herzegovina
Hafner D., Carić M., Kapetanović T., Jasprica N. and Lončar A.
6. Diatoms of mountain fens in Bosnia and Herzegovina – first results
Kapetanović T. and Jahn R.
7. Diatoms of Mallorca (Balearic Islands): Springs and spring-fed streams
Delgado C., Ector L., Novais M.H., Hoffmann L. and Pardo I.

STREAMS AND DIDYMO

8. Monitoring of running waters in the potable water protection area Mangfalltal with diatoms
Hoffmann M and Raeder U.
9. The planktonic and benthic diatoms of the river Adige
Centis B., Tolotti M., Zignin A. and Salmaso N.
10. The diatom flora of Galicia rivers (NW Spain): A first assessment of their biodiversity
López Rodríguez, M.C. and Penalta Rodríguez M.
11. Freshwater diatoms of the Tiber River basin (Central Italy)
Mancini L., Puccinelli C., Della Bella V., Marcheggiani S., Beltrami M.E., Cappelletti C. and Ciutti F.
12. Epilithic diatom communities and biological quality of Trentino South – Tyrol region watercourses (Northern Italy)
Ciutti F., Beltrami M.E., Monauni C., Pozzi S., Lösch B., Cappelletti C. and Ector L.
13. Preliminary studies on the photosynthetic activity of benthic stream algae
Üveges V., Stenger-Kovács C. and Padisák J.
14. *Didymosphenia geminata* (Lyngbye) M. Schmidt: Distribution, invasiveness and bibliometric data
Ector L. and Blanco S.
15. Distribution and ecology of *Didymosphenia geminata* (Lyngbye) in the Natisone River
Zorza R. and Honsell G.

LAKES AND TRANSITIONAL WATERS

16. Littoral diatoms and trophic status of two strongly modified lakes: lake Toblino and lake S. Massenza (SW Trentino, Italy)
Cappelletti C., Beltrami M.E. and Ciutti F.
17. Spring diatom plankton of Lake Baikal
Popovskaya G., Bondarenko N. and Usoltseva M.

18. Do the planktonic diatoms of Nyanza Gulf, L. Victoria indicate spatial variations in water quality?
Sitoki L. Kling H. and Rott E.
19. Relationships between planktonic diatoms fluctuations and meteorological variability during 10 consecutive ice-free periods in two small high-mountain lakes in the Italian Alps
Poggi C., Squartini A. and Trevisan R.
20. Distribution of freshwater diatoms along salinity and nutrients gradients in transitional waters
Puccinelli C., Della Bella V., Marcheggiani S. and Mancini L.

PALEOLIMNOLOGY

21. Lake Ladoga level fluctuations and resulting palaeoenvironmental changes in the Karelian Isthmus (NW Russia) inferred from diatom records
Ludikova A., Subetto D., Sapelko T. and Kuznetsov D.
22. Palaeoecological study of a peat core from Ile de la Possession (Crozet archipelago, sub-Antarctic)
Ooms M., Temmerman S., Beyens L. and Van de Vijver B.
23. Holocene siliceous microfossils in Lake Balaton system, Hungary
Stenger-Kovács C., Buczkó K., Magyari E., Korponai J.
24. An unknown environmental event at ~4550 cal years BC reflected in the sedimentary diatom assemblages of lake Vielbecker See, Northern Germany
Dreßler M.
25. The paleoecology of Lake IJsselmeer, The Netherlands
Cremer H., Bunnik F.P.M and Lammens E.H.R.R.
26. Diatomeenstratigraphische Untersuchung eines Voralpensees zur Ermittlung des Referenzzustands gemäß EG-WRRL
Fein M., Klee R. and Schamburg J.
27. Diatom frustule dissolution and its effect on quantitative reconstructions
Koinig K.A., Milan M., Trevisan R. and Psenner R.
28. The genus *Navicula* in Paleogene sediments
Strelnikova N. I., Kociolek J. P. and Fourtanier E.
29. Use of diatoms in paleoecological reconstruction in the Carpathian region
Buczkó K., Magyari E.K., Braun M., and Bálint M.

TAXONOMY

30. *Gomphonema olivaceum* (Hornemann) Brébisson species complex in Lake Ohrid, Macedonia
Pavlov A., Dulic T. and Levkov Z.
31. Morphological characterization of the type material of *Gomphonema rosenstockianum* Lange-Bertalot et Reichardt and related taxa from European rivers
Novais Maria H., Ector L., Gomà J., Falasco E., Delgado C., Hlúbiková D., Ivanov P., Van de Vijver B., Blanco S., Morais M.and Hoffmann L.
32. A new *Gomphonema* species from Farfa stream (Latium, Central Italy)
Beltrami M.E., Ector L., Ciutti F., Cappelletti C., Bouillon C.' Mancini L. and Hoffmann L.
33. Biogeography and taxonomy of *Nitzschia pura* and *N. sublinearis*: Comparison of the type material of Hustedt with different populations from European rivers
Hlúbiková D., Blanco S., Falasco E., Gomà J., Hoffmann L. and Ector L.
34. To be or not to be: *Pinnularia divergentissima* on the subantarctic islands
Moravcová A. and Van de Vijver B.

35. Tricky *Eunotia* taxonomy – examples from Lake Isbenttjønn sediments, Norway
Werner P.
36. A new *Perinotia* species from Northeastern Brazil
Wetzel C.E., Ferrari F., Ector L., Viana J.C. and B.D.de Campos
37. Morphological observations in the *Sellaphora stroemii* complex: Light and electron microscopy analysis of type materials and of some European populations
Falasco E., Blanco S., Bona F., Gomà J., Hlúbiková D., Novais H., Hoffmann L. and Ector L.
38. Ultrastructure of an interesting *Hyalodiscus* species (Subclass: Coscinodiscophycidae) from brackish waters on two coral islands of Tonga, South Pacific.
Rott, E., W. Kofler and R. Schabetsberger
39. The last chapter of the *Discoplea* Story
Kusber, W.-H. and Jahn R.
40. Synurophyceae: Siliceous structures of a group of chrysophyte algae that are often found in samples together with diatoms
Kristiansen J. and Preisig H.R.
41. Automatic Diatom Identification applied for *Nitzschia*
Rivognac L. and Horn M.

BIODIVERSITY, BIOGEOGRAPHY AND COLLECTIONS

42. Diatom richness or rareness – key features for alpine lotic habitats?
Gesierich D., Rott E. and Beltrami M. E.
43. Überarbeitung der Roten Listen und Florenlisten für Diatomeen und Desmidiaceen in Deutschland
Hofmann G.; Werum M.; Kusber W.-H. and Lange-Bertalot H.
44. Adding content to content - a generic annotation system for biodiversity data
Güntsch A., Berendsohn W.G., Ciardelli P., Hahn A.; Kusber W-H; Li J. and Oancea, C.
45. Does *Elodea* affect periphyton? A comparison of epiphytic diatoms on natural and artificial plants
Fukamori Y., Pledl A., Erhard D. and Raeder U.
46. Phytogeographic analysis of the diatom algal flora of continental Israel
Barinova S., Krassilov V., Nevo E.
47. New and interesting non-marine diatom species from James Ross Island (Antarctic Region)
Kopalová K., Nedbalová L. and Van de Vijver B.
48. *Psammothidium abundans*: The unmasking of an Antarctic endemic
Van de Vijver B., Kelly M., Blanco S., Jarlman A. and Ector L.
49. Assemblages of *Mastogloia* species in the Greek Mediterranean coast line: diversity and distribution.
Ulanova A. and Snoeijs P.
50. The *Cyclotella comensis* complex in alpine and pre-alpine lakes
Schmidt R., Huber K.,Weckström K.and Klee R.
51. *Cavernosa kapitiana* Stidolph, an unusual centric diatom from the subantarctic region
Cremer H. and Van de Vijver B.
52. The Van Heurck Collection: A phoenix rises from its ashes
Van de Vijver B., Cocquyt C. and Rammeloo J.
53. The diatom species described by John R. Carter (1962) from Tristan da Cunha and Gough Island
Kopalová K., Nedbalová L., Gremmen N.J.M. and Van de Vijver B.

ABSTRACTS - TALKS

New diatom genera and species in springs of the Alps, and their suitability for an ecological characterization of springs

CANTONATI M.[1], LANGE-BERTALOT H.[2], ANGELI N.[1], BERTUZZI E.[1], SCALFI A.[1] and SPITALE D.[1]
[1] Trentino Nature & Science Museum, Limnology and Phycology Section, Via Calepina 14, I-38100 Trento, Italy.
[2] Institute for Ecology, Evolution, Diversity, University of Frankfurt, Siesmayerstraße 70, and Senckenberg Research Institute, Senckenberganlage 31-33, D-60054 Frankfurt/M., Germany
E-mail: cantonati@mtsn.tn.it

Springs are special habitats that include a variety of types characterized by specific environmental conditions, such as: lithology of the aquifer, microhabitat-mosaic structure, nutrient status, flow permanence, shading, presence of humic acids etc. This heterogeneity of ecological conditions is one of the reasons justifying the relevant amount of aquatic biodiversity found in spring habitats.

Thanks to the CRENODAT Project (2004-2008), financed by the Autonomous Province of Trento, we had the opportunity to carry out detailed investigations on the biota (including diatoms) of 110 springs located in Trentino (south-eastern Alps). Further 16 carbonate springs were studied thanks to the support of the Dolomiti Bellunesi National Park (south-eastern Alps).

Detailed taxonomic studies, including LM and SEM morphology, observations on plastids, and use of diatom collections and datasets for the ecological characterizations, allowed to identify and to describe diatom genera and species new to science. Some of these are presented in this contribution, and their suitability for spring-type characterization is discussed.

Microfissurata H. Lange-Bertalot, M. Cantonati and B. Van de Vijver gen. nov.: The striae / alveoli are simple, mostly uninterrupted, transapical slits. It includes two new species: *Microfissurata paludosa* Cantonati and Lange-Bertalot sp. nov. and *M. australis* Van de Vijver and Lange-Bertalot sp. nov., found in Europe and on an austral island respectively. The new genus was found to thrive (mostly epiphytic) in freshwater, at least seasonally dry dystrophic habitats (pool and seepage springs, mires, and lakes), and in alternately wet terrestrial microhabitats.

Achnanthidium dolomiticum Cantonati & Lange-Bertalot (2006): The most characteristic morphological features are a narrow, but distinctive fascia, and a very narrow and straight axial area on the raphe valve, the convex-shaped rapheless valve, the length / width ratio, and valve outline. Mainly epiphytic in carbonate springs and lakes of the Italian Alps, fed by drainage basins dominated by dolomite lithology, and affected by seasonal desiccation.

Geissleria gereckei M. Cantonati and H. Lange-Bertalot sp. nov.: The most characteristic morphological features are the valve outline, the size and length / width ratio, and the pattern of the striae around the central area. Epilithic, characteristic of the leaf-litter covered stones of very shaded carbonate mountain springs with very-low discharge (likely to be affected by seasonal desiccation).

Cymbella tridentina H. Lange-Bertalot, M. Cantonati & A. Scalfi sp. nov.: valves moderately dorsiventral; ventral margin slightly convex to straight; length / width ratio about 5; ends from slightly protracted to almost subcapitate; one (not rarely 2) stigma(ta); single H-shaped plastid with a ventral and a dorsal lobe. The new species appears to thrive in carbonate oligotrophic rheocrenes and spring-fed streams. In its seasonal development it shows two peaks, the main one being in late autumn.

The finding of these new taxa in a well-investigated area like central Europe highlights the diatom species richness of spring habitats. Their occurrence (usually as subdominant or rare elements within the diatom associations) is proving to be a useful tool for spring type identification.

References:
Cantonati M. & H. Lange-Bertalot, 2006. *Achnanthidium dolomiticum* sp. nov. (Bacillariophyta) from oligotrophic mountain springs and lakes fed by dolomite aquifers. *Journal of Phycology*, **42**(6): 1184-1188.

[*Diatoms in springs*. Oral presentation]

Diatom indices and springs

BERTUZZI E.[1,2], ANGELI N.[1] and CANTONATI M.[1]
[1]Trentino Nature and Science Museum – Limnology and Phycology Section, Via Calepina 14, I-38100 Trento, Italy
[2]University of Urbino, Environmental Sciences Faculty, Campus scientifico Sogesta, Loc. Crocicchia, Urbino, Italy

In the frame of a multi-disciplinary Project called CRENODAT, 110 springs were sampled throughout the Autonomous Province of Trento (south-eastern Alps). The springs studied are located in a wide range of elevations (170 - 2792 m a.s.l.) and lithologies (limestones, dolomites, siliceous metamorphic rocks, magmatic rocks). One aim of this project was the development of evaluation procedures and criteria for spring integrity/naturalness. Since diatoms are a key group in spring habitats, a detailed and extensive sampling was devoted to those algae. To get a data-set of the diatom biodiversity of these springs 180 diatom samples (epilithon and epiphyton) were prepared and analysed. These data are reconsidered with different approaches in order to develop implemented procedures and criteria for the evaluation of springs' integrity / naturalness and quality. Trophic Index (Rott et al. 1999) and EPI-D (Dell'Uomo, 2004), developed for the assessment of running waters, were applied. TI values resulted in a slight overestimation of the trophic status in comparison to the total phosphorus values recorded. Furthermore, TI values obtained from epilithic and epiphytic diatoms allowed to obtain similar results. Bryophytes are suggested as the most suitable substrate for the evaluation of springs ecosystems.
The development of integrated procedures relaying on more than one component of the spring biota (e.g. as represented by the articulated and rich CRENODAT datasets) are discussed.

References:
Dell'Uomo A., 2004. *L'indice diatomico di eutrofizzazione/polluzione (EPI-D) nel monitoraggio delle acque correnti. Linee guida*. APAT, 107 pp.
Rott E., Pfister P., Pipp E., Pall K., Binder N. & K. Ortler, 1999. Projekt BMLF: I*ndikationslisten für Aufwuchsalgen in Fließgewässern Österreichs, Teil 2: Trophieindikation und autökologischen Anmerkungen* - WWK, Bundesministerium Land- und Forstwirtschaft, Wien. 248 pp.

[*Diatoms in springs*. Oral presentation]

Diatoms along a pH/calcium gradient in Western Carpathian spring fens

FRÁNKOVÁ M.[1,2], POULÍČKOVÁ A.[3], MARVAN P.[4], BOJKOVÁ J.[1] and HÁJKOVÁ P.[1]
[1] Department of Botany and Zoology, Faculty of Science, Masaryk University, Kotlarska 2, CZ 61137 Brno, Czech Republic
[2] Department of Ecology Brno, Institute of Botany, Academy of Sciences of the Czech Republic, Poříčí 3b, CZ 603 00 Brno, Czech Republic
[3] Department of Botany, Faculty of Science, Palacky University Olomouc,Svobody str. 26, CZ 77146 Olomouc, Czech Republic.
[4] Limni, Kalvodova 13, CZ 602 00 Brno, Czech Republic.
E-mail: marketka.kozakova@seznam.cz

Pristine spring fens are unique aquatic biotopes presenting very good ecological status and serving as references of virtually intact ecosystems. Nevertheless they are endangered by different human activities and their number decreases. The aim of this study is to describe phytobenthic assemblages with emphasis on diatoms and to assess main environmental factors influencing them. We chose 13 sampling sites differing in water chemistry and substrate characteristics to cover the complete variability of treeless helocrenes of Czechoslovak borderland in the Western Carpathians. These localities cover a so called poor-rich (pH/calcium) gradient, with pH from 2.8 and conductivity 42 $\mu S\ cm^{-1}$ (poor fens) to pH 8.3 and conductivity 540 $\mu S\ cm^{-1}$ (extremely rich fens with calcium carbonate precipitation). The study was carried out on the 23rd and 24th of May 2006. Algae were sampled quantitatively from moist (containing less water) and wet (containing more water) bryophyte at each site (together 26 samples). The following physico-chemical parameters were recorded: pH, conductivity, oxygen saturation, temperature, TOC, and nutrients. For identification the compendium Süβwasserflora von Mitteleuropa was mainly used, together with volumes of Diatoms of Europe and Diatoms in springs. Altogether 210 diatom taxa were recorded, 2 of them classified as critical, 6 as endangered, 13 as vulnerable, 10 as susceptible and 24 as near threatened in the Red List of freshwater diatoms of Germany by Lange-Bertalot. Moreover, with special reference to Czech conditions the species *Achnanthes flexella*, *Amphora normannii*, *Campylodiscus hibernicus*, *Cocconeis neodiminuta*, *Eunotia serra*, *Gomphonema lagerheimii*, *Pinnularia streptoraphe*, *Stauroneis gracillima*, *Stenopterobia delicatissima*, *S.* cf. *densestriata*, and *Surirella spiralis* are considered as rare. Diversity of diatom taxa increased along the gradient from poor fens (min. number of taxa in a sample 19) to extremely rich fens (max. number of taxa in a sample 60). Higher diversity was found in samples from wet bryophytes. The lowest abundance of algae was in the middle of the gradient. Higher abundance was in samples from bryophytes with higher water content. The share of living diatoms was always at least 50%. In samples from poor fens a higher portion of living diatom cells was found, which might be due to slower decomposition known to occur in acid waters. Diatoms were the dominant algal group in all samples from wet bryophytes, whereas in some samples from moist bryophytes they were in minority. In these cases green algae played an important role in samples from poor fens and cyanobacteria in samples from extremely rich fens. Typification of Carpathian spring fens based on algae (already achieved by means of higher plants, bryophytes, molluscs, testacean and macrozoobenthos) will be discussed.

References:

Krammer K. & H. Lange-Bertalot, 1986-1991: *Süßwasserflora von Mitteleuropa (H. Ettl, J. Gerloff, H. Heynig & D. Mollenhauer, eds), Bacillariophyceae. Naviculaceae **2/1**: 1-876; Bacillariaceae, Epithemiaceae, Surirellaceae **2/2**: 1-596; Centrales, Fragilariaceae, Eunotiaceae, **2/3**: 1-576; Achnanthaceae **2/4***: 1-437. G. Fischer, Stuttgart. New York.

Lange-Bertalot H., 1996: Rote Liste der limnischen Kieselalgen (Bacillariophyceae) Deutschlands. - *Schriften-Reihe für Vegetationskunde* **28**: 633-677.

Werum M. & H. Lange-Bertalot, 2004: Diatoms in Springs from Central Europe and elsewhere under the influence of hydrogeology and anthropogenic impacts. In Lange-Bertalot H. [Ed.] *Iconographia Diatomologica* **13**. Koeltz, Koenigstein, 1–417 pp.

[*Diatoms in springs*. Oral presentation]

Water level changes in Alpine lakes (NE Italy) and their reflection in the diatom sediment record

LEIRA M.[1, 2], FILIPPI M.[2] and CANTONATI M.[2]
[1] Faculty of Sciences, Campus da Zapateira, University of A Coruña, 15071 A Coruña,
[2] Museo Tridentino di Scienze Naturali, Limnology and Phycology Section, Via Calepina, 14 - 38100 Trento, Italy
E-mail: mleira@udc.es

The natural water levels of a number of high altitude lakes in Adamello-Brenta Natural Park (PNAB) in the Italian south-eastern Alps have been altered and artificially controlled for almost half a century for water supply and hydro-electric industry. However, artificial manipulation of lake levels can alter lake ecology and dynamics. Further, recent deregulation has prompted the feasibility of restoring these lakes to their original shore-line status. This research explores the sediment record of two of these high altitude lakes (Garzonè and Serodoli, 1941 m asl and 2371 m asl respectively) to establish the effects of lake-level regulation in the structure of the diatom communities.
A first glance to sedimentological aspects immediately reveal recent changes in the depositional environment (sediment composition, granulometry), both for shallow and deep short cores. From the diatom point of view, using the planktonic/benthic ratios it has been estimated that water-level fluctuations can have an important effect on lake dynamics. The planktonic assemblage is reduced to ca. 25% during the last decades, while it represented up to 60% of the diatom communities in the sediments before the onset of the lakes exploitation. Remarkable changes in littoral diatom assemblages were also noted in the sediments from both lakes, where the diversity and composition of periphytic assemblages has changed during last decades.

[*Paleolimnology and epipelon*. Oral presentation]

Diversity and ecology of lake epipelon

POULÍČKOVÁ A.
Department of Botany, Faculty of Science, Palacký University Olomouc, Svobody str. 26, CZ-77146 Olomouc, Czech Republic
E-mail: aloisie.poulickova@upol.cz

Epipelic algae can perform a range of ecosystem functions, that include biostabilisation of sediments, regulation of benthic-pelagic nutrient cycling, and primary production. There is a growing need to understand their ecological role in light of current and future alterations in sediment loading resulting from land-use change and land management practices.

Epipelic cyanobacteria and algae were studied in bottom sediments from 69 ponds and lakes in the United Kingdom and the Czech Republic, covering a trophic gradient from deep, oligotrophic, glacial lakes to shallow, eutrophic, urban man-made ponds.

Our present study, supported by project GACR 206/07/0115, focuses on the diversity, distribution, taxonomy, reproduction and autecology of epipelic species.

Freshwater epipelic assemblages are mainly dominated by diatoms (*Navicula*, *Neidium*, *Sellaphora*, *Pinnularia*), cyanobacteria (*Oscillatoria, Phormidium, Pseudanabaena, Komvophoron*), euglenopytes (*Euglena*, *Trachelomonas*, *Phacus*) and desmids (*Cosmarium, Closterium*). These genera represent autochtonous epipelic assemblages, occurring in surface upper layers of the sediments throughout the year and exhibiting seasonal variation in their abundancy. The occurrence of individual species is influenced by sediment quality, particularly the proportion of fine mud and organic detritus.

Although the majority of freshwater epipelic species seems to be observed across large geographic areas, supporting the „ubiquity“ hypothesis, existence and ecological differentiation of cryptic (semicryptic/pseudocryptic) species can be demonstrated within the epipelon. A total of 29 *Sellaphora* morphospecies were found in British lakes, where *Sellaphora* was very frequent (>10%). The genus was rare in Czech ponds (<1%). Most lakes contain several different morphospecies and certain morphospecies often co-occur without loss of identity. Some morphospecies appear to be restricted to oligotrophic lakes, whereas others are characteristic for eutrophic waters. Our preliminary results show that such species complexes exist also within other epipelic genera (*Navicula, Neidium*).

[*Paleolimnology and epipelon*. Oral presentation]

Epipelic diatom communities in stagnant water bodies in the vicinity of the river Nysa Łużycka (Lausitzer Neisse), Poland

PICIŃSKA-FAŁTYNOWICZ J.
Institute of Meteorology and Water management, Wrocław Branch, Department of Ecology, Parkowa 30, PL-51-616 Wrocław,
E-mail: joanna.faltynowicz@imgw.wroc.pl

On the Polish side of the River Nysa Łużycka, numerous stagnant water bodies are located. Among them, there are ox-bow lakes and various opencast workings flooded by water. In the years 2003-2007, epipelic diatoms were studied in two ox-bow lakes situated in Koźlice village and two opencast working ponds: in Bielawa Dolna and Przewóz. They are small (area: 440 – 5600 m^2) and shallow (maximum depth: 1.4 – 2.5 m, medium depth: 0.6 – 1.0 m) water bodies with slightly alkaline (pH 7.3 – 8.0) and moderately mineralized water (conductivity 139 – 291 $\mu S\ cm^{-1}$). In spring, only the ox-bow lakes may be flooded by the river's water. Diatom epipelon is well developed in all the water bodies studied. The most diverse communities occurred in ox-bow lakes in Koźlice (more than 150 taxa) and consisted of diatoms preferring low trophic level (oligo- and mesotraphentic) as well as high trophic conditions (eutraphentic). The first group was represented by e.g. *Eunotia incisa* Gregory, *E. pectinalis* (Dillwyn) Rabenh., *E. praerupta* var. *bidens* (Ehr.) Grun., *E. soleirolii* (Kütz.) Rabenh., *Fragilaria capucina*. var. *mesolepta* (Rabenh.) Rabenh., *Fragilariforma bicapitata* (Maier) D.M. Williams & Round, *Pinnularia subcapitata* Greg., *P. undula* (Schumann) Krammer, *Surirella helvetica* (Brun) Meister, and *Tabellaria flocculosa* (Roth) Kütz. The eutraphentic group incended e.g. *Amphora libyca* Ehr., *Cymbella subcistula* Krammer, *Frustulia amphipleuroides* (Grun.) A. Cleve, *Navicula radiosa* Kütz., *Planothidium frequentissimum* (Lange-Bert.) Round & Bukht., *P. lanceolatum* (Breb.) Round & Bukht. and *Staurosira construens* Ehr. The most abundant were *Eunotia pectinalis*, *Fragilariforma bicapitata* (A. Meyer) D.M. Williams & Round, *Fragilaria capucina* var. *mesolepta*, *Achnanthidium minutissimum* (Kütz.) Czarnecki, and *Staurosira construens*. Species composition of epipelon in opencast working ponds in Bielawa and Przewóz was less rich, but involved many *Eunotia* taxa (e.g. *E. exigua* (Breb) Rabenh., *E. botuliformis* Wild, Noerpel-Schempp & Lange-Bert., *E. naegeli* Migula), *Frustulia crassinervia* (Breb.) Lange-Bert. & Krammer, *F. weinholdtii* Hust., *Surirella roba* Leclerq, and many *Pinnularia* species. The most abundant were diatoms preferring low trophic level, mainly *Achnanthidium minutissimum, Achnanthes linearioides* (Lange-Bert.) Lange-Bert., *Eunotia exigua,* and *Frustulia crassinervia*. Many species, rarely indicated in Poland were found in the studied communities, for example *Achnanthes linearioides, Brachysira neoexilis* Lange-Bert., *Cymbopleura subcuspidata* (Krammer) Krammer , *Eunotia botuliformis*, *E. naegeli*, *Frustulia amphipleuroides*, *F. weinholdtii*, *Pinnularia mesogongyla* Ehr., *P. peracuminata* Krammer, *P. pisciculus* Ehr., *P. schoenfelderi* Krammer, *P. parvulissima* Krammer, *Stauroneis gracilior* Reichardt, *S. neofossilis* Lange-Bert. & Metzeltin, and *Surirella roba*.

[*Paleolimnology and epipelon*. Oral presentation]

Pliocene–Pleistocene freshwater diatom flora of Bylot Island, Nunavut, Canadian High Arctic

PIENITZ R.[1], ZIMMERMANN C.[1] and POULIN M.[2]
[1] Centre d'études nordiques, Université Laval, Pavillon Abitibi-Price, 2405, rue de la Terrasse, Québec (QC), G1V 0A6, Canada,
[2] Canadian Museum of Nature, Research Division, PO Box 3443 Stn. D, Ottawa (ON), K1P 6P4, Canada
E-mail: reinhard.pienitz@cen.ulaval.ca

During the summer of 2001, the fossil remains of a former forest-tundra environment were discovered on Bylot Island, located just north of Baffin Island (72-74°N, 60-80°W), more than 2000 km north of the present-day treeline. The sediments associated with this fossil forest have been tentatively dated at about 2-2.5 Ma BP corresponding to the late Pliocene-early Pleistocene period.

Several other late Tertiary and early Pleistocene fossil beds in North American arctic regions have yielded abundant well-preserved remains of plants and animals (mostly arthropods), documenting the past existence of coniferous forests at high latitudes. However, the microfossil assemblages of these sites have not been documented until the present and our knowledge of the late Pliocene - early Pleistocene diatom flora is still scarce.

Nine out of a total of 30 analyzed samples contained enough diatom frustules for paleoenvironmental interpretations. These samples originated from three different outcrops within an organic-rich layer assigned to the late Pliocene. We recorded a total of 225 diatom taxa in 46 genera, mostly dominated by pennate forms belonging to the genera *Eunotia*, *Navicula* sensu lato, *Pinnularia*, and *Cymbella* sensu lato. Less than 2% belonged to the centrales, represented by *Ellerbeckia arenaria* and taxa of the genus *Aulacoseira*.

Changes in the composition of the diatom assemblages in the fossil forest mainly reflect different stages of peatland development, including shallow pond habitats and slowly flowing brooks. The poor preservation of several diatoms only allowed a coarse interpretation of the environmental and ecological conditions of these ancient habitats.

Surprisingly, none of the diatom taxa recorded in this study are known to be extinct today. As pointed out in previous studies, it appears that many fossil freshwater diatom assemblages strongly resemble modern populations, and that most diatoms of Pliocene age have continued to exist until the present-day. More substantial differences seem to exist between diatom assemblages that formed at the same time but under different environmental conditions, rather than between assemblages that formed at very different times but under similar conditions. Thus, it was impossible to specify the exact age of the examined fossil forest deposits through the use of extinct diatom taxa.

The Pliocene–Pleistocene freshwater diatom flora of the fossil forest from Bylot Island will soon be published within the series *Iconographia Diatomologica*.

[*Paleolimnology and epipelon*. Oral presentation]

Central European Diatom Meeting (*CEDIATOM2)*
Trentino Nature & Science Museum, Trento , Italy, 12-15 June 2008
Abstract Book (M. Cantonati, A. Scalfi & E. Bertuzzi Eds.)

Diatoms from the Upper Miocene deposits of the Vitim Plateau, Russia

USOLTSEVA Ì.[1], VOROBYOVA S.[1], MASLENNIKOVA M.[1], RASSKAZOV S.[2], BRANDT I.[2] and BRANDT S.[2]
[1]Limnological Institute of the Siberian Branch of the Russian Academy of Science, Ulan-Batorskaya 3, Irkutsk 664033, Russia,
[2] Institute of the Earth's Crust of the Siberian Branch of the Russian Academy of Science Lermontova 128, Irkutsk 664033, Russia
E-mail: marinaus@lin.irk.ru

Diatom algae from Upper Miocene depositions of Vitim upland were studied by means of light and scanning electron microscopy (SEM). We studied borehole N. 7236 that was drilled by FGP «Sosnovgeologia» in the eastern region of the Amalat paleovalley on the Amalat plateau in the Dzhilinda subformation. The borehole revealed lacustrine sediments with three basalt horizons. The K-Ar age dating for lower horizon (200m depth) was calculated by the procedure described in Rasskazov *et* al. (2000). The obtained age was 9.8 ± 0.5 Myr (Ê = 1.24 %, $^{40}Ar_{рад.}$ = 47×10^{-5} нмм^{3}/г, $Ar_{âîçä.}$ = 85 %), that corresponded to the age of the upper Dzhilinda subformation.

The total depth of borehole was 123 m. 85 samples of sedimentary rocks were studied. Planktonic diatoms prevailed over benthonic ones in all samples: the number of valves of planktonic diatoms varied from 7000 to 923 millions valves g^{-1}, whereas the number of valves of benthonic diatoms varied from 40000 to 37 millions valves g^{-1}.

Two genera - *Actinocyclus* Ehr., Aulacoseira Thw. represented by both extinct (*Actinocyclus gorbunovii*, *A. krasskei, Aulacoseira ñanadensis, A. spiralis, A. praegranulata* var. *ðraegranulata*) and living species (*Aulacoseira valida*, *A. italica*, *A. ambigua*, *A. granulatà*, *A. distans*, *A. pusilla*) were the dominant taxa in the core. *Tetracyclus lacustris*, *T. ellipticus*, *Tetracyclus* sp. were accessory species. One could also observe representatives of the following species and genera: *Melosira undulata*, *Ellerbekia teres, Actinella brasiliensis, Desmogonium quianense, Eunotia polyglyphoides, виды родов Gomphonema, Tabellaria, Fragilaria, Achnanthes, Cymbella, Navicula, Pinnularia, Synedra, Diatoma.* Such complex is typical for the Late Miocene diatom flora, which is consistent with K-Ar age dating.

In contrast to previous investigations of the diatom flora in this region (Yendrichinsky, Cheremisinova, 1970; Moiseeva, 1980; Chernyaevaet al, - 2007), we did not observe such species as *Alveolophora jouseana*, *Pseudoaulacoseira moisseeviae*, *Aulacoseira baicalensis*. But we were the first to observe *A. ñanadensis*, *A. spiralis, and A. pusilla.*

At a first glance the diatom valves from the 190-167 m depth resembled those of *A. baicalensis*. However, the ultrastructure differed from present-day inhabiting Lake Baikal.

This work was supported by the Integrated Project of the SB RAS and FEB RAS (N. 6.2, 06-II-ÑÎ-07-027, 7.10.3/2006, 06–1–П16–065).

References:

Rasskazov S.V., Logachev N.A., Brandt I.S., Brandt S.B. & A.V. Ivanov, 2000. *Geochronology and geodynamics of Late Cenozoic*. Novosibirsk, Nauka. 288 pp. (In Russian)
Yendrichinsky A.S. & Cheremisinova Ye.A, 1970. On finding of Miocene deposits on Vitim plateau. Dokl. AN SSSR. 191(4): 885-888. (In Russian)
Moiseeva A.I., 1971 *Atlas of Neogene Diatoms in Primorsky Kray*. Leningrad, Nedra, 151 pp. (In Russian)
Chernyaeva G.P., Lyamina N.A., Rasskazov S.V., Rezanov I.N. & V.V. Savinova, 2007. Biostratigraphy and sedimentation environments of the Miocene volcanosedimentary stratum in the Dzhilinda basin, Western Transbaikalia. *Geology and Geophysics*. 48(4): 460-471

[*Paleolimnology and epipelon*. Oral presentation]

Diatom flora of Kobylanka stream. How many taxa can exist in a very small water-body?

WOJTAL A.Z.
W. Szafer Institute of Botany, PAS, Lubicz 46, 31-512, Kraków, Poland
E-mail: ibwojtal@ib-pan.krakow.pl

Diatom species richness is related to environmental conditions, habitat heterogeneity, and depends from the sample size. European small water systems, especially those antropogenically altered, are characterized by a relatively simple and predictable diatom flora, that reflects environmental conditions related to the water-body character and water quality. The small area of water systems also offers little natural environmental changes significant to the organisms under study. In the case of small first-order streams the range of physical, chemical variables and microhabitats diversity is much more limited than in the case of large rivers.

The very small Kobylanka stream (7.3 km long, of average depth 20 cm) is one of typical southern Wyżyna Krakowsko-Częstochowska upland streams, running through an area covered by loess sediments. Its upper course is affected by tourism and agriculture, whereas the lower course is additionally vulnerable to sewage pollution and channel modifications.

As the result of examination carried out on 480 samples collected since 1993, c.a. 300 morphotaxa have been identified, i.e. approximately 20% of the best-catalogued German fresh, brackish and terrestrial diatom flora that included 1437 diatom taxa in 1998. Diatom species richness per sample, was generally low, with most samples dominated by 1-2 species. Typical samples included about 20 taxa each, and were dominated by common meso-eutraphentic diatoms. Most of the taxa, were recorded in low or very low frequencies, in several cases only once during 13 years of study. In contrast to the predominant diatoms, these taxa represented a much wider range of autecological spectra. Diatom assemblage composition was related to microhabitats rather than to other variables which were of minor importance.

High diatom species richness of such a small stream could suggest large underestimation of biodiversity during standard studies, and an important contribution of small aquatic environments in regional diversity, despite inconspicuous stream area and far from near-natural condition. General absence of taxa, common in northern part of the upland streams (covered by postglacial sands) highlights substantial role of area geology, and could suggest the importance of the area history, even on a local scale.

[*Diatoms in streams*. Oral presentation]

Central European Diatom Meeting (*CEDIATOM2)*
Trentino Nature & Science Museum, Trento , Italy, 12-15 June 2008
Abstract Book (M. Cantonati, A. Scalfi & E. Bertuzzi Eds.)

Diatoms of periphyton assemblages in small rivers in north-western Russia

KOMULAYNEN S.
Institute of Biology, Karelian Research Center Russian Academy of Sciences,
185910 Petrozavodsk, Pushkinskaya str. 11, Russia

The periphytic diatom flora of small rivers in the north-western Russia was studied from 1987-2003. Altogether 386 diatom taxa were identified in the periphyton communities of 66 rivers. The majority of taxa belonged to the genera *Eunotia, Navicula, Cymbella* and *Achnanthes,* while the most numerous diatoms were *Tabellaria fenestrata, T. flocculosa, Synedra ulna*, *Achnanthes minutissima, Eunotia pectinalis, Frustulia rhomboides, Cocconeis placentula, Cymbella affinis, Didymosphenia geminata, Gomphonema constrictum* and *G. parvulum.*

Taxonomic structure of periphyton displays a tendency for the concentration in a small number of genera and families, while, at the same time, a considerable amount of genera and families comprised only few species which reflects the complexity of florogenetic processes. This trend suggests the significant role played by the allochtonous way of development in the formation of periphyton of the studied rivers. Biodiversity of periphyton is determined by its zonal situation, region history as well as characteristic features of the landscape that determine the morphometry of the basin. The majority of the most abundant algae species determined are typical of cold water, oligotrophic basins. During the taxonomic analysis of the periphyton algae flora various northern features were observed .

Diversity of algal communities is formed either due to the introduction of new taxa into them or at the expense of combinatorial change within the same species. The first is determined by inputs to the periphyton of allochthonous species from plankton and benthic algae communities. The composition of allochtonous algae changes in dependance on the number of lakes, their morphometry, and trophic status. Current is the main factor determining a biomass reduction, causing a mosaic character of the periphyton communities distribution, and regulating the periphyton succession. Highest species richness was typically observed downstream of lakes and in riffles with stable substrata and current velocity of about 0.2-0.3 m s^{-1}.

Increase of anthropogenic effect leads to some enlargement of benthic species diversity, and also to the trivialization of the structure, which is followed by the decrease in dominant species number. Minimization of anthropogenic effect and stabilization of hydrologic regime lead to a rapid reconstruction of the algocenosis natural structure.

Diatom species succession appeared to be strongly influenced by seasonal changes related to changing temperature and light. The poorest community development invariably occurred during high water, and in winter when rivers are covered by ice. The diatom cell densities and biomass had two seasonal peaks: in spring or early summer and in autumn. The greatest diatom development occurred on rocks in late August –early September.

[*Diatoms in streams*. Oral presentation]

Distribution of *Didymosphenia geminata* in SW Piedmont (Italy): Invasion or just lack of reference data?

BATTEGAZZORE M.
Agenzia Regionale per la Protezione Ambientale del Piemonte, Dipartimento di Cuneo,
Via Vecchia di B. S. Dalmazzo 11, 12100 Cuneo, Italy
E-mail: m.battegazzore@arpa.piemonte.it

In Italy, large-scale monitoring of diatoms for river quality evaluation has not yet been implemented. Diatom communities were sampled in 39 stations of the SW sector of the Piedmont macroinvertebrate-based biological quality monitoring network situated along 14 watercourses. Among these are some of Italy's most important rivers such as the R. Po and the R. Tanaro. The species *Didymosphenia geminata* – considered to be invasive in various parts of the world - was found in 13 watercourses and in 25 stations (93% and 64% of the total, respectively). Where present, abundances of *D. geminata* were generally quite low, except for 6 stations where this species counted for more than 3% of the individuals of the community. The peak of relative abundance in a single sampling station resulted to be 12%. Due to the relatively high biomass of individuals of *D. geminata* and of the stalks with which they are attached to the substrate, these relative abundances represent a much stronger dominance in terms of biomass than in terms of individuals within the community. Fortunately, blooms with mats of *D. geminata* determining complete cover of the river bottom, as known from other areas around the world, were not observed. No significant correlation resulted between abundance of *D. geminata* and altitude, N. of diatom species and diatom indices of water quality such as the Italian EPI-D, the French IBD and the British TDI. A slight degree of correlation was observed between the macroinvertebrate–based IBE index and the EPI-D index (ρ= 0,67) and between the same IBE index and *D. geminata* abundance (ρ= 0,41). The distribution of *D. geminata* was also compared with chemical variables and with ecological indicator values (van Dam *et. al*. 1994).

The presence of this species results to be more widespread than could be imagined. However, it cannot be excluded that the species has been present in all or many of these watercourses for quite a long time, and a certain degree of fluctuation in distribution and abundance is typical of most species. The scarcity of past data (indicating however the presence of the species in Piedmont since the final decade of the XIX Century), does not in fact allow to reach precise conclusions regarding the present trends in terms of geographical distribution and population densities in the studied area. Therefore, the situation described in this study deserves to be monitored in the future.

References:
van Dam H., Mertens A. & J. Sinkeldam, 1994. A coded checklist and ecological indicator values of freshwater diatoms from the Netherlands. *Netherlands Journal of Aquatic Ecology* **28**: 117-133.

[*Diatoms in streams*. Oral presentation]

Diatom communities in soils influenced by the wandering albatross

MORAVCOVÁ A.[1], VAN DE VIJVER B.[2] and LOUIS B.[3]
[1] Department of Ecology, Faculty of Sciences, Charles University, Viničná 7, 128 44, Prague 2, Czech Republic
[2] National Botanic Garden of Belgium, Department of Bryophyta & Thallophyta, Domein van Bouchout, 1860 Meise, Belgium
[3] Department of Biology, Unit of Polar Ecology, Limnology and Paleobiology, Universitet Antwerpen, Universiteitsplein 1 , 2610 Wilrijk, Belgium
E-mail: adela.moravcova@gmail.com

It is generally known that activities of nesting birds greatly influence the organisms living in or nearby bird colonies. Although there are several studies dealing with this topic, only some of them were carried out in the sub-Antarctic region. The aim of our study was to assess, whether the disturbances caused by nesting wandering albatrosses (*Diomedea exulans*) were the main factor responsible for the changes in species composition and diversity of soil diatom communities.

The wandering albatross is present on almost all sub-Antarctic islands. One of its major colonies was observed on Ile de la Possession (Crozet Archipelago, southern Indian Ocean). Samples were collected during the austral summers of 1998-1999 and 2004-2005. Ten nests were randomly chosen from two big albatross colonies (Pointe Basse, Bollard). Half of sampled nests were still occupied by nesting birds, whereas the other half was represented by nests abandoned for several years. Samples were taken every 50 cm along the approach routes of the birds to their nests. Eight samples were collected in undisturbed soils in the same area serving as control samples.

A total of 165 diatom species was identified in 116 samples. Cluster analysis of species data clearly separated the two sampling areas. This is easily explainable, because the two colonies differ considerably in the number of breeding pairs (Pointe Basse – 250, Bollard – 50) and in some characteristics of the soil (e.g. content of water). The most important diatom species were similar in both areas [*Diadesmis ingeae* Van de Vijver, *Naviculadicta seminulum* Grunow, *Eunotia paludosa* Grunow var. *paludosa*, *Pinnularia divergentissima* Grunow var. *divergentissima*, *Pinnularia subantarctica* var. *elongata* (Manguin) Van de Vijver & Le Cohu, *Chamaepinnularia australomediocris* (Lange-Bertalot & Schmidt) Van de Vijver]. However, in the Bollard sampling site *Diadesmis ingeae,* considered to be mainly oligotrophenthic dominated the flora,, while on Pointe Basse the eutraphentic *Naviculadicta seminulum* dominated.

Principal Component Analysis on the Pointe Basse species data divided samples in two main groups – one group containing all samples from occupied nests, and one group with samples from the abandoned nests and the control samples. The values of β-diversity (turnover) for the samples in occupied nests show a clear trend – the communities close to the nests are composed by eutrophentic species, whereas, with increasing distance from the nests, we can observe the return to the undisturbed stage (dominance of oligotrophentic species comparable to control sample flora). There were no considerable changes in species diversity.

Our research shows that activities of nesting wandering albatrosses are an important factor influencing soil diatom species composition in the vicinity of their nests. Similar to European diatoms, sub-Antarctic non-marine diatom species seem to react sensitively to changes of environmental conditions.

[*Diatoms in extreme environments*. Oral presentation]

Diatoms inhabiting young successional biotopes in a district of surface coal-mining in Western Bohemia

SKÁCELOVÁ O.
Moravian Museum, Laboratory of Hydrobiology, Zelný trh 6, 659 37 Brno, Czech Republic
E-mail: oskacelova@mzm.cz

Young successional biotopes were studied on spoil heaps "Velká Podkrušnohorská výsypka" (Sokolov coal basin, Western Bohemia, Czech Republic; 800 million m³ of material deposited on 20 km^2) formed mainly by Cypris clays (aluminium silicates with high content of alkaline elements, namely calcium). In contrast to other regions with surface mining (Northern Bohemian Mostecko), this landscape was rich in rivers and ponds before mining. Therefore water is leaking out the heap, and must be drawn into streamlets and shallow reservoirs to keep the hill stable and also to precipitate minerals.

Wetlands are inhabited with organisms preferring or tolerating extreme ecological conditions: extremely high conductivity, alkalinity, high concentration of ions, namely sulphates (over 3000 mgL^{-1}) and bicarbonates (598-1055 mgL^{-1}), iron, zinc and manganese ions, but low nitrogen concentration.

A specific biotope, Krustový mokřad (Crust wetland) originated on the base of spoils heap after filling the drainage ditch with precipitated minerals. Water is slowly leaking in a thin layer over an area about 30 x 30 m. From this young habitat, a new cyanobacterium species, *Dichothrix ledereri* was described in 2006.

In new small pools with alkaline water, situated in the upper part of the heal, biodiversity is low and mesohalob and halophilous algal flora prevails (*Achnanthidium* and *Mastogloia* being dominant among diatoms), then charophytes (*Chara hispida*) and diatoms of other genera (*Rhopalodia, Denticula, Entomoneis* etc.). During succession, alkalibiont and alkaliphilous diatoms prevail (*Navicula oblonga, Diatoma tenuis* etc.).

Microflora of contemporary wetlands on spoils heap "Velká Podkrušnohorská výsypka" resembles that known from Tertiary basins below Krušné hory Mts. (Komořanské jezero drained in 19th century and SOOS) and comprises species now rare in the Czech Republic.

[*Diatoms in extreme environments*. Oral presentation]

Recent insights into the biogeography of diatoms

SABBE K.[1], MANN D.[2], VERLEYEN E.[1] and VYVERMAN W.[1]
[1] Lab. Protistology & Aquatic Ecology, Dept. Biology, Ghent University
Krijgslaan 281-S8, B-9000 Ghent, Belgium
[2] Royal Botanic Garden Edinburgh, Edinburgh, Scotland, EH 5LR UK
E-mail: Koen.Sabbe@ugent.be

During the past ten years, the biogeography of microbial organisms has been hotly debated, with some authors claiming microbial ubiquitism and cosmopolitanism, and others suggesting widespread endemism. In combination with the description of a spate of new taxa since the 1990's, this debate has revived interest in the geographic distributions of diatoms.

As for other groups of micro-organisms, recent studies on diatom biogeography have yielded complex and often conflicting evidence. This can partly be attributed to our incomplete knowledge of the nature of diatom biodiversity, and hence species recognition, which remains a crucial issue with major implications for the assessment of geographic distribution patterns. However, even in studies which combine molecular data and crossing experiments with morphology, an approach which has greatly improved our understanding of species limits, convincing evidence for both endemism and cosmopolitanism has been observed. At present, more case studies, and a better geographic coverage of existing studies, are needed before any general conclusions can be drawn from these studies. The available data however do suggest that like macro-organisms, diatom taxa, depending on their specific biological and ecological features, may be differently affected by the processes determining geographic distributions.

Meanwhile, other approaches can be adopted to investigate geographic distribution patterns in diatoms. One such approach is to partition the effects of purely environmental and historical (dispersal-related) factors on diatom distribution patterns in large data sets. These analyses have revealed that dispersal limitation does affect diatom biogeography, with connectivity between suitable habitats and isolation having a pronounced effect on species and genus richness. In addition, experimental evidence is revealing marked differences between different diatom species in their tolerance to desiccation and low temperatures, factors which play a crucial role during dispersal events.

[*Diatoms biodiversity and biogeography*. Oral presentation]

How can DNA barcoding help diatomists?

EVANS K.M.[1], VANORMELINGEN P. and MANN D.G.
[1]Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh, EH3 5LR
E-mail: k.evans@rbge.ac.uk

Using DNA sequence data to identify and discover new species of plants, animals and macroalgae (DNA barcoding) is now well-established. Recently, the potential of DNA barcoding to distinguish cryptic entities within the freshwater diatom morphospecies *Sellaphora pupula* was demonstrated (Evans *et al.* 2007). As for animals and macroalgae, the proposed region of choice was the mitochondrial gene cytochrome oxidase I or *cox*1. We now routinely use *cox*1 barcoding to facilitate various aspects of our research, including (i) discovery of cryptic species when sampling *Sellaphora* worldwide: for example we have so far found six new Australian *S. pupula* agg. species. (ii) Establishing biogeographies of constituent cryptic species of *Sellaphora* morphospecies: while some species appear to be geographically restricted, we have documented others, for example *S. auldreekie*, as far afield as Scotland and Australia. (iii) Selecting isolates for inclusion in investigations of gene flow between populations of *S. capitata*: in combination with DNA sequence data, we employed microsatellite markers to establish that gene flow (and probably dispersal) was highly restricted. (iv) Describing new species: in our recent preliminary revision of British *Sellaphora*, wherever possible, we included a *cox*1 barcode with each putative species (Mann *et al.* 2008). Through collaborations, we are now extending DNA barcoding to *Pinnularia* and *Nitzschia.* Although morphological investigations are vital in providing an initial assessment of diatom assemblages, we believe that barcoding is the fastest and most accurate way to establish the true diversities and distributions of diatoms. Furthermore, to help overcome the current problem with synonyms and taxonomic 'drift', we propose that, wherever possible, DNA barcodes should accompany the description of new species.

References:

Evans K.M., Wortley A.H. & D.G. Mann, 2007. An assessment of potential diatom "barcode" genes (*cox*1, *rbc*L, 18s and ITS rDNA) and their effectiveness in determining relationships in *Sellaphora* (Bacillariophyta). *Protist*, **158**: 349–364.
Mann D.G., Thomas S.J. & K.M. Evans K.M., 2008. Revision of the diatom genus *Sellaphora*: a first account of the larger species in the British Isles. *Fottea,* **8**: 15–78.

[*Diatoms biodiversity and biogeography.* Oral presentation]

The genus *Luticola* in the Antarctic Region: Diversity, morphology, and biogeography

VAN DE VIJVER B.
National Botanical Garden, Departement of Bryophyta & Thallophyta, Domein van Bouchout,
B-1860 Meise, Belgium
E-mail: vandevijver@br.fgov.be

The genus *Luticola* is quite widespread in the (sub-)Antarctic Region. Several species, such as *Luticola muticopsis* (Van Heurck) Mann and *Luticola mutica* (Kützing) Mann belong to the most common species in terrestrial environments. The number of records of these species in the (older) literature is quite large. Since the beginning of diatom studies on the islands and archipelagos in this region, scientists have reported the presence of this genus. In the first papers, several species such as *L. gaussii* (Heiden) Mann, *L. muticopsis* and *L. murrayi* (West & West) Mann were described as being endemic for the (sub-)Antarctic region. Unfortunately, following incorrect identifications, the use of inappropriate (i.e. European and North American) diatom guidebooks and a species concept that was far too broad, the number and the distribution of the typical Antarctic species are only poorly known.

A detailed study of only a few samples from Deception Island and James Ross Island has resulted in the description of 7 new *Luticola* species that used to be identified as *L. mutica* or *L. muticopsis*.

The objective of this presentation is to show that our knowledge of the Antarctic diatoms is very poor despite the growing efforts in the immediate past. Based on light and scanning electron microscopy, it is clear that several distinct borders exist between the species. The presentation shows some new and older, but better delimited, species. The present distribution based on the new data will be compared with literature data using the traditional taxonomic ideas. That way it will become clear that an endemic flora does certainly exist in the different parts of the Antarctic Region.

[*Diatoms biodiversity and biogeography*. Oral presentation]

Current and future concept of the taxonomy of *Amphora* sensu stricto, and its impact on biogeography and autecology

LEVKOV Z.[1,2], METZELTIN D.[3], ECTOR L.[4], PAVLOV A.[1], KRSTIC S.[1] and NAKOV T.[1,5]
[1] Institute of Biology, Faculty of Natural Sciences, Gazi Baba bb, 1000 Skopje, Macedonia
[2] Friedrich Hustedt Study Centre for Diatoms, Alfred Wegener Institute for Polar and Marine Sciences, Am Handelshafen 12, 27570 Bremerhaven, Germany
[3]Am Stegkreuz 3a, Hofheim, Germany
[4]Public Research Center - Gabriel Lippmann, Department Environment and Agro-biotechnologies (EVA), Rue du Brill 41, L-4422 Belvaux, Grand-duchy of Luxembourg
[5]University of Texas at Austin, 1 University Station (A6700) 311, Biological Laboratory, Austin, TX 78712, USA
E-mail: zlevkov@iunona.pmf.ukim.edu.mk

During this study a large-scale observation on freshwater *Amphora* species was performed. The type materials of many species deposited in different collections were observed using LM and SEM. Additionally, samples from ancient lakes Baikal, Tanganyika, Ohrid, Prespa, Hövsgöl, Teletskoye, as well as many younger lakes as Michigan, postglacial lakes in Austria, Germany, Finland, Macedonia, and Alaska were examined. Analyses showed the existence of more than 90 freshwater *Amphora* species. The greater diversity was observed in Lake Baikal (~30 taxa), Lake Ohrid (26 taxa), and Lake Tanganyika (~20 taxa).

The identity of several "cosmopolitan" species was also revised. Former synonymization of *Amphora affinis* Kützing 1844 and *A. minutissima* W. Smith 1853 with *A. copulata* (Kützing) Schoeman et Archibald 1986 is rejected, while *A. fogediana* Krammer in Krammer & Lange-Bertalot 1985 is proposed as a synonym of *A. eximia* J.R. Carter in Haworth 1974.

Detailed observations of the *A. copulata* species complex reveal the existence of many cryptic species, which differ among each other in the valve shape and size, shape and size of central area, the number of areolae per ventral striae, shape of raphe ledge, marginal ridge, and proximal raphe endings.

[*Diatoms biodiversity and biogeography*. Oral presentation]

From cleaning the valves to cleaning the data: European diatom biodiversity data on the Internet

KUSBER W.H.[1], ZIPPEL E.[1], KELBERT P.[1], HOLETSCHEK J.[1], HAHN A.[2], GÜNTSCH A.[1] and BERENDSOHN W.G.[1]
[1] Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin Königin-Luise-Str. 6-8, D-14195 Berlin, Germany
[2] Global Biodiversity Information Facility (GBIF) Secretariat, Universitetsparken 15, DK-2100 Copenhagen, Denmark
E-mail: w.h.kusber@bgbm.org

In diatom research, a wide range of data is produced and published, partly in print, partly in online databases or web pages. Almost all data are linked to scientific names, the most common types of information being specimen data (primarily nomenclatural types) and observation data (accompanied by georeferences and/or pictures of cleaned valves or living cells). Individual online databases focus on differing content and none of them is complete in terms of names, taxa, types, and specimens (e.g. www.algaterra.org, www.algaebase.org). As a consequence, their Internet portals have to be queried separately to gain access to the entire amount of information already available.

Advanced Internet-based biodiversity data portals such as the GBIF Data Portal (data.gbif.org) and the BioCASE Portals (search.biocase.org, search.biocase.de) partially overcome this problem by providing common access to specimen and occurrence data provided by different databases in different places. Such access to distributed information is an increasingly important information resource for taxonomy and ecology. The GBIF Data Portal as a discovery mechanism provides fast access to a restricted set of common data elements, stored in a central index database and in several distributed mirror databases. The BioCASE Portal adds further data display functionality, for example rendering the raw information (e.g. a highly structured record using the ABCD data schema [www.tdwg.org/activities/abcd/]) into a human-readable format by means of a style-sheet transformation. Up to date, 127 million records have been made available using the GBIF infrastructure - 1 billion (10^9) records is a short term aim.

Apart from the problem of data availability, data quality issues pose a big challenge. Within the data cleaning efforts both in the BioCASE infrastructure (funded by the EU project SYNTHESYS) and in GBIF, the following problem areas have been identified:
1. Technical indexing issues (service availability, software configuration, access permissions etc.); 2. Mapping issues (making the correct link between the data field in the database and the corresponding data element in the data standard used by GBIF - DarwinCore or ABCD providing all mandatory data elements as well as meaningful metadata); 3. Misspellings of scientific names, localities, collectors etc.; 4. Lack of information; 5. Geospatial issues (e.g. mismatches between coordinates and country information, coordinates falling out of the valid range, etc.); 6. Versioning problems (databases, XML-files, GBIF index, output); 7. Duplicates of records.

The presentation will give examples on how content problems can be solved, i.e. by analysing GBIF's event logs, by using the GBIF feedback mechanism and the SYNTHESYS annotation system (search.biocase.org; see also poster by Güntsch et al). We will give an outlook on future changes of data portals to better meet the needs of users.

[*Diatoms biodiversity and biogeography.* Oral presentation]

ABSTRACTS - POSTERS

Diatoms in the karstic springs of Herzegovina (Bosnia and Herzegovina)

HAFNER D.
Faculty of Science and Education, University of Mostar,
Matice hrvatske bb, BiH – 88000 Mostar, Bosnia and Herzegovina
E-mail: dubhafner@net.hr

Karstic streams are very interesting biotopes. The broad variablity of ecological factors and specific chemical properties give them a special character. In Herzegovina, there are many hydrological phenomena, such as karstic springs, waterfalls, subterranean streams, and estavels.

In Bosnia and Herzegovina, diatoms, both floristically and ecologically, are scarcely known. This particularly concerns the karstic springs, which are important water resources in this specific geo-hydrological area. The lack of data on diatom populations causes problems in the classification of springs and in water quality assessment.

In this study, the quantitative and qualitative analysis of benthic diatom communities in karstic springs was carried out at Ljubovija (near Mostar), Lištica (near Široki Brijeg) and Klokun (near Vitine-Ljubuški). Physico-chemical parameters and water quality were also analysed.

The waters of the analysed springs are oxygen–rich (8.4 mg L^{-1} in Klokun spring to 12.2 mg L^{-1} in Ljubovija spring, in October 1987). The Klokun spring showed the lowest amount of oxygen in all samples. $KMnO_4$ consumption values were low during the investigated period. Carbonate amounts were highest at the Klokun spring and lowest at the Lištica spring. The pH values and other parameters indicate alkaline waters. According to water hardness, Lištica and Ljubovija can be classified as having moderately hard water and Klokun, very hard water.

A total of 110 taxa of diatoms was determined, with the highest biodiversity at Ljubovija (94 taxa), slightly lower at Lištica springs (90), and the lowest at Klokun spring (71 taxa). Biodiversity was highest at the end of spring, lower in summer and autum, and very low in winter (March).

The indicator values of the species were determined according to Wegl (1983) and the saprobiological evaluation of populations according to the Pantle-Buck index of saprobity (1955).

In total, 58 of all taxa (54%) are saprobity indicators. The majority of these (58%) indicate oligo to oligo-mesosaprobic waters.

[*Springs and similar aquatic habitats*. Poster N. 1]

The diatoms of the "Vepsskiy forest" Natural Park's springs

NESTEROVICH A.
Department of Botany, St. Petersburg State University, Universitetskaya emb., 7/9, 199034 St. Petersburg, Russia,
E-mail: ANesterovich@gmail.com

The "Vepsskiy forest" Natural Park is located in the Eastern Leningrad region. The territory has never been investigated by algologists. The largest part of the Natural Park is covered by bogs and forest swamps where the most common algae are representatives of the genus *Pinnularia* Ehrenberg, *Eunotia* Ehrenberg, *Kobayasiella* Lange-Bertalot, *Achnanthes* Bory de Saint-Vincent.

This research is devoted to a unique reserve of the Natural Park, where springs are widespread. Material was collected in springs in the place where they go out from the ground, and in two sites downstream. Some chemical parameters (pH, concentration of Fe and Ca) and temperature are identical in all springs. The bottom of four streams was covered by *Tribonema* sp., in three of them *Fragilaria capucina* var. *vaucheria* (Kützing) Lange-Bertalot dominated, in the fourth — *Tabellaria flocculosa* (Roth) Kützing was the most common species. There is a small lake at the junction of these streams where the variety of diatoms is the lowest.

In two further streams there were no algae except diatoms forming a loose film on stones. In one of them *Nitzschia* spp. dominated, in other *Cymbella* spp.

The flora was more various downstream where all the brooks merged. *Fragilaria capucina* var. *vaucheria* (Kützing) Lange-Bertalot dominated again, accompanied by *Cocconeis* sp., *Nitzschia* sp., *Synedra* sp., *Gyrosigma* sp.

A difference in the species composition downstream may be determined by a change in nutrient aviability. Factors that determined dominance in the sources of streams demands further studies.

[*Springs and similar aquatic habitats.* Poster N. 2]

Benthic diatoms of springs and streams in the central Apennines (Italy)

TORRISI M. and DELL'UOMO A.
Department of Environmental Sciences, Section of Botany and Ecology, University of Camerino,
Via Pontoni 5, I-62032 Camerino (MC), Italy.
E-mail: mariacristina.torrisi@unicam.it

The diatom communities of the central Apennines rivers were carefully studied during the years 1996-2008. In this contribution report there are the results concerning the springs of the following watercourses: Foglia, Esino, Musone, Potenza, Chienti, Tenna, Tronto, Clitunno, Nera and Volturno. The sources investigated, almost all above the altitude of 500 m, mainly have a limestone substratum and a relatively high bicarbonate concentration, with pH values shifting between 7.5 and 8.5. All the springs are rheocrenic except for the "Fonti del Clitunno", which include both rheocrenic and limnocrenic springs that mix their waters into the watercourse. In these springs epilithic diatoms were collected, following the methods reported by Kelly et al. (1998) and European Standard Normative EN 13946 (2003). The samples were cleaned by heating with hydrogen peroxide, and then mounted in Naphrax®. Krammer & Lange-Bertalot's monographs (1986-1991) above all were used for taxa determination. Among the most interesting taxa, from both ecological and chorological points of view, found in the sites investigated there are *Diatoma hyemalis* (Roth) Heiberg, *Eucocconeis flexella* (Kützing) Brun, *Navicula jakovljevicii* Hustedt. The ecological spectra of all the diatoms found, concerning pH, nutrients, organic matter, and salinity of the water, were processed consulting numerous data from literature, particularly those supplied by Van Dam *et al*. (1994), Hofmann (1994), and Lange-Bertalot (1979). The biological quality of the sites was assessed using the Eutrophication/Pollution Index Diatom-based or EPI-D (Dell'Uomo, 2004). This index is based, above all, on the high diatom sensitivity to organic matter, nutrients and mineral salts, particularly chlorides, dissolved in the waters. Calculation of the EPI-D was carried out with the assistance of the software OMNIDIA 4.2 (Lecointe *et al*., 1999 and later updates). All sites investigated turn out to be of excellent to good quality, since they are slightly influenced by human activities or sometimes still uncontaminated.

References:

European Standard EN 13946, 2003. European Committee for Standardization, Brussels,14 pp.
Dell'Uomo A., 2004. *APAT, ARPAT, CTN_AIM*, Roma, Firenze, 101 pp.
Hofmann G., 1994. *Bibliotheca Diatomologica*, 30: 1-241.
Kelly M.G. *et al*., 1998. *Journal of Applied Phycology*, 10: 215-224.
Krammer K. & Lange-Bertalot H., 1986, 1988, 1991a,b. *Süsswasserflora von Mitteleuropa,* G. Fischer, Stuttgart, Jena, 2 (1-4), 876 + 596 + 576 + 437 pp.
Lange-Bertalot H., 1979. *Nova Hedwigia*, 64: 285-304.
Lecointe C. *et al*., 1999. *Cryptogamie, Algologie*, 20 (2): 132-134.
Van Dam H. *et al*., 1994. *Netherland Journal of Aquatic Ecology*, 28: 117-133.

[*Springs and similar aquatic habitats.* Poster N. 3]

Diversity of diatoms dominating biofilms on tufa stromatolites of hard water creeks

BRINKMANN N.[1], ARP G.[2], JAHN R.[3] and FRIEDL T.[1]
[1] Experimental Phycology and Culture Collection of Algae (SAG), Georg-August University of Göttingen, Germany,
[2] Department of Geobiology, Center for Geosciences, Georg-August University of Göttingen, Germany,
[3] Botanic Garden and Botanical Museum, Free University of Berlin, Germany
E-mail: Nicole.Brinkmann@biologie.uni-goettingen.de

Biofilms dominated by diatoms and cyanobacteria are involved in stromatolite forming processes in freshwater water creeks. This ongoing project aims to assess the diversity of diatoms in relation to calcium carbonate precipitation in two hydrochemically different hard water creeks in Germany, the Westerhöfer Bach (Harz Mountains) and the Deinschwanger Bach (Franconian Alb). Both creeks were analysed by the combination of both culture and culture-independent approaches. A total of 34 distinct diatom phylotypes were retrieved from cloning / sequencing and culturing together. They were distributed on 24 lineages and clades within a large monophyletic clade representing the raphid pennate diatoms, and three genera of araphid pennate diatoms (*Diatoma*, *Staurosira*, and *Ulnaria*). Both creeks harboured about the same amount of diatom diversity, i.e. they had 19 phylotypes in common. However, with respect to key player (detected at three and more sites), and frequent phylotypes (detected at 2-3 sites), both creeks were different, and this may reflect their hydrochemical peculiarities. Three key player diatoms were detected at almost all calcified sites and in both creeks: *Navicula* sp5, *Navicula* sp3, and *Achnanthidium minutissimum* s.l. Other very frequent phylotypes were *Amphora*, *Gomphonema*-related, and two more *Navicula*-like phylotypes, *Navicula* sp1 and *Fistulifera pelliculosa*. The number of detected phylotypes differed between the calcified sampling sites from 7 to 17. No diatoms were detected at the two non-calcified, i.e. the spring sites. However, at the non-calcified spring sites of both creeks members of the *Xanthophyceae* (e.g., *Heterococcus* sp.) were frequently found which were not recovered at any of the calcified sites. The 18S rDNA sequence comparisons revealed high genetic similarities with diatom sequences already deposited in GenBank for most of the phylotypes recovered in this study. This may indicate that most of the creek diatoms were recovered at least at the genus level, those with highest similarities (> 98.5%) probably even at the species level. No other phylotypes than already recovered by the culture-independent approach were revelaed by the cultures. In terms of assessing biodiversity, culturing was even much less successful than the culture-independent method. Although a total of 59 cultures were established, they represented only 9 phylotypes. One culture appeared to be very closely related to an unidentified photosynthetic symbiont in the marine dinoflagellate *Peridinium balticum*. In other cases the detected phylotypes appeared not yet being represented by sequences deposited in GenBank, and, therefore, a taxonomic identification was possible only at the generic level or even no suitable genus name could be found. For a better identification, morphological criteria need to be studied, and, therefore, it is essential to establish further cultures. So far, a small selection of available diatom cultures has already been studied by SEM in order to identify them at the species level.

[*Springs and similar aquatic habitats*. Poster N. 4]

Diatoms in two heathland creeks in Bosnia and Herzegovina

HAFNER D. [1], CARIĆ M. [2], KAPETANOVIĆ T. [3], JASPRICA N.[2] and LONČAR A.[1]
[1]Faculty of Science and Education, University of Mostar, Matice hrvatske bb, BiH - 88000 Mostar, Bosnia and Herzegovina,
[2]Institute for Marine and Coastal Research, University of Dubrovnik, PO Box 83, HR-20000 Dubrovnik, Croatia
[3]Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Str.6-8, D - 14195 Berlin, Germany
E-mail: dubhafner@net.hr

In this study two heathland creeks on Mt. Ozren near Sarajevo were phycologically studied, with an emphasis on diatoms. Sampling was carried out between June 2005 and May 2007 by collecting mosses and sediment for an analysis of epiphytic and epipsammic diatoms. Conductivity, pH and temperature were measured in the field. Nutrient concentrations were analyzed in the laboratory using standard spectrophotometric methods (APAHA,1995). The first results are presented in this work.

During the investigated period, a total of 141 taxa were determined within 29 genera. The predominant genera are: *Eunotia* (18), *Pinnularia* (17), *Navicula* (16), *Cymbella* (14), *Fragilaria* and *Gomphonema* (12). Taxa present regularly in samples were: *Cymbella naviculiformis* (Auersw.) Cleve, *Decussata hexagona* (Torka) Lange-Bert., *Eunotia inflata* (Grunow) Nörpel-Schempp & Lange-Bert., *Frustulia vulgaris* (Thwaites) De Toni, *Pinnularia borealis* Ehrenb. and *Pinnularia viridis* (Nitzsch.) Ehrenb. The majority of taxa (71%) indicate oligo and oligo-beta mesosaprobic waters.

Five taxa were recorded for the first time in Bosnia and Herzegovina: *Aulacoseira* cf. *alpigena* (Grunow) Krammer, *Decussata hexagona* (Torka) Lange-Bert., *Diploneis* cf. *fontium* E. Reichardt & Lange-Bert., *Stauroneis kriegeri* R.M. Patrick, and *Pinnularia brandeliformis* Krammer

[*Springs and similar aquatic habitats*. Poster N. 5]

Diatoms of mountain fens in Bosnia and Herzegovina – first results

KAPETANOVIĆ T. and JAHN R.
Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Straße, 14195 Berlin, Germany
E-mail: t.kapetanovic@bgbm.org

In former phycological investigations in Bosnia and Herzegovina little attention was paid to algae of fens, which are rare and cover relatively small areas. These are threatened biotopes because of drainage, agricultural practice and global warming trends. The benthic diatoms communities of a variety of poor and rich fen habitats in montane or subalpine belts of Jahorina, Vranica, Zvijezda, Čvrsnica, and Ozren mountains were studied. The first year sampling was carried out in May, August and October in 2007 by squeezing water from aquatic macrophytes and/or taking sluggy material from the surface of pools.

Results of the first sampling season show a high biodiversity and many species were discovered which are new for Bosnia and Herzegovina such as: *Navicula tridentula* Krasske, *Brachysira neoexilis* Lange-Bert., *Pinnularia obscura* Krasske, *Pinnularia brandelli* Cleve, *Stauroneis thermicola* (J.B.Petersen) J.W.G. Lund, *Nitzschia terrestris* (Petersen) Hust., *Neidium alpinum* Hust. A significant difference can be noticed in diatom populations of different localities and mountains and there is a broad range of microhabitats within short geographical distances.

[*Springs and similar aquatic habitats*. Poster N. 6]

Diatoms of Mallorca (Balearic Islands): Springs and spring-fed streams

DELGADO C.[1,2], ECTOR L.[2], NOVAIS M.H.[2,3], BLANCO S.[2], HOFFMANN L.[2] and PARDO I.[1]
[1]Departamento de Ecología y Biología Animal, Universidad de Vigo,
E-36330 Vigo, Spain,
[2]Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux,
Grand-Duchy of Luxembourg,
[3]Laboratório da Água, Instituto de Ciências Agrárias Mediterrânicas, Universidade de Évora,
Parque Industrial e Tecnológico, Rua da Barba Rala nº 1,
P-7005–345 Évora, Portugal
E-mail: cdelgado@uvigo.es
E-mail: ector@lippmann.lu

The epilithic diatom communities from two springs (Font des Pì and Font de s`Olla) and three spring-fed streams (Torrente des Prat, Torrente de Son Vic and Son Sant Joan) from the north of Mallorca island (Balearic Islands, West Mediterranean Sea) were collected in May and November 2005, and in March and May 2006. The Mallorca Island is characterized by a Mediterranean climate, karstic geology and waters with high values of pH (6.9-8.4) and conductivity (356-3084 µS cm^{-1}). All the localities are located in the Tramuntana Mountain Range at altitudes ranging between 55-756 m a.s.l., except Son Sant Joan, which is situated in Alcudia at sea level. A total of 113 diatom taxa belonging to 38 genera were found in the samples. Most of the identified taxa are common for the Iberian Peninsula. 52 taxa were recorded for the first time in Balearic Islands, but only 8 of them are new records for the Iberian Peninsula: *Achnanthes lemmermanii* Hustedt, *A. lutheri* Hustedt, *Achnanthidium zahovschikovii* Potapova, *Diploneis separanda* Werum et Lange-Bertalot, *Eunotia arcubus* Nörpel et Lange-Bertalot, *Fragilaria delicatissima* (W. Smith) Lange-Bertalot, *Gomphonema occultum* E. Reichardt et Lange-Bertalot and *Navicula cataracta-rheni* Lange-Bertalot. *Achnanthidium minutissimum* (Kützing) Czarnecki was the only diatom that appeared in all the localities with high abundances. Among the 19 taxa with a relative abundance over 5%, 12 taxa were recorded for the first time in Balearic Islands: *Achnanthidium pyrenaicum* (Hustedt) H. Kobayasi, *Denticula kuetzingii* Grunow, *Diadesmis contenta* (Grunow ex Van Heurck) D.G. Mann, *Encyonopsis krammeri* E. Reichardt, *E. minuta* Krammer et E. Reichardt, *Gomphonema lateripunctatum* E. Reichardt et Lange-Bertalot, *G. micropus* Kützing, *Navicula cryptotenella* Lange-Bertalot, *N.* cf. *margalithii* Lange-Bertalot, *N. reichardtiana* Lange-Bertalot, *Nitzschia inconspicua* Grunow and *Planothidium frequentissimum* (Lange-Bertalot) Lange-Bertalot. Light microscope and scanning electron microscope photographs were taken of all dominant as well as interesting taxa, e.g. *Cymbella lange-bertalotii* Krammer, *C. vulgata* Krammer, *Encyonopsis cesatii* (Rabenhorst) Krammer, and other species of the genus *Encyonopsis*, such as *E. minuta* Krammer et E. Reichardt, *E. krammeri* E. Reichardt and *E. subminuta* Krammer et E. Reichardt.

[*Springs and similar aquatic habitats*. Poster N. 7]

Monitoring of running waters in the potable water protection area Mangfalltal with diatoms

HOFFMANN M. and RAEDER U.

The Mangfalltal is the main source of potable water for Munich, the capital city of Bavaria.
Since the springs were tapped in the late 19th century the ecological state of the surface waters wasn't examined. In 2007 a first attempt was under taken to monitor the running waters of the Mangfalltal. 36 sample sites at 8 different streams within the potable water protection area were selected. During the scientific investigation the monitoring points were sampled twice, in July and in November. All samples contained benthic diatoms, gathered from stones with a size of 5 to 20 centimetres. The analysis of the samples was conducted according to the procedure guidance of SCHAUMBURG et al. 2006. To estimate the trophic and ecological status of the running waters, a new software (PHYLIB) programmed by the Bayrischen Landesamt für Umwelt was used.

The following streams were sampled during the scientific investigation: Mangfall, Schlierach, Farnbach, Steinbach, Heiterbach, Fentbergbach, Filzengraben, Nudler Senke.

Generally, the analysis showed that the species number in the selected creeks of Mangfalltal deceased to about 17 taxa from July to November. Anyhow at individual running waters a rise in taxa number could be detected. Due to seasonal fluctuations the composition of the diatom associations of the sampled places changed depending on the prevailing ecological and location factors. However, these changes didn't affect the calculated trophic indices significantly.

In the course of the investigation long periods of strong rainfall occurred. From all running waters, however, only the Heiterbach showed significant changes in its trophic status.
In the other creeks the trophic status fluctuated only at few sample sites. The changes were due to anthropogenic pollution by municipal wastewater and material from diffuse sources. For example, the river Mangfall showed a sudden rise of the trophic level in the area of the purification plant Loisenthal. On the other hand, surface runoff of polluted rainwater caused an increase of the trophic level in the river Schlierach. The influence of diffuse sources could not be determined.

The results of the diatom index were correlated with the chemical and physical parameters at the sample sites to characterise the running waters.

In the following table the trophic and ecological status of the monitored running waters are summarized:

running water	trophic level	ecological status
Mangfall	oligo-mesotrophic to eutrophic	excellent - good
Schlierach	oligo-mesotrophic to meso-eutrophic	excellent
Farnbach	oligo-mesotrophic to meso-eutrophic	good
Steinbach	meso-eutrophic to eu-polytrophic	good - middling
Fentbergbach	meso-eutrophic	good
Filzengraben	meso-eutrophic	good
Heiterbach	meso-eutrophic	good
Nudler Senke	mesotrophic to eutrophic	good - middling

References:

Schaumburg Dr.J., Schranz C., Stelzer D.D., Hofman Dr.G., Gustowski Dr. A. & J. Foerster, 2006 (JANUAR). *Verfahrensanleitung für die ökologische Bewertung von Fließgewässern zur Umsetzung der EU Wasserrahmenrichtlinie: Makrophyten und Phytobenthos*. Bayrisches Landesamt für Umweltschutz.

[*Streams and Didymo*. Poster N. 8]

The planktonic and benthic diatoms of the river Adige

CENTIS B., TOLOTTI M., ZIGNIN A. and SALMASO N.
Fondazione Edmund Mach- Istituto Agrario di San Michele all'Adige- Via E. Mach 1- 38010 San Michele all'Adige (Trento)
E-mail: barbara.centis@iasma.it

The main objective of the research project PlanAdige - The river plankton as a tool to investigate the ecological quality of the river Adige (funded for the years 2007-2010 by the Authority of Basin of River Adige)- is embodied in the study of biodiversity and ecological dynamics of algal assemblages, with particular focus reserved at the investigation of the role played by abiotic driving variables. In fact, species richness and composition, abundance and seasonal variability of river phytoplankton is known to be strongly affected by factors such as water turbulence, transparency and suspended solids, especially in rivers which are characterised by pronounced changes in water discharge due to both hydrology and regulation.

Within the context of the project, fortnightly samplings in five characteristic stations of the river Adige are being carried out, aiming at investigating the ecology of diatom assemblages according to an integrated approach. Due to the peculiar hydrological regime of the river itself, particular attention is given not only at the study of euplanktonic diatoms in the potamal river ranges, mainly represented by centric taxa, but also at the benthic and meroplanktonic taxa, which characterizes a diverse and abundant component of the microalgal communities of the upper river course as a consequence of drift phenomena.

[*Streams and Didymo.* Poster N. 9]

The diatom flora of Galicia rivers (NW Spain): A first assessment of their biodiversity

LÓPEZ RODRÍGUEZ M.C. and PENALTA RODRÍGUEZ M.
Departamento de Botánica. Facultad de Biología. Campus sur.
Universidad de Santiago de Compostela.
Santiago de Compostela. A Coruña, Spain.
E-mail: bvcarlop@ usc.es

The periphytic diatoms of Galicia rivers (NW Spain) have been studied.

There are few studies of these algae in this part of Spain, in spite of the great number of rivers in Galicia. The results reveal a great diatom diversity, and many new cites for Galicia and Spain.

The study area includes rivers that flow out the Galicia Atlantic coast (rivers of Galicia-Coast Hydrographic Confederation, CHGC), and those which are located in two mountain systems: Galician Central Macizo (GCM), and Serra da Enciña da Lastra (SEL). Both have been catalogued as "Sites of Community Importance" proposed by the Local Government in the framework of the "Habitats Directive" (92/43/EEC) of the "Natura 2000" network.

A total of 47 locations were sampled between 2001 and 2007 in 29 rivers distributed in the following way: 20 in CHGC, 8 in GCM, and 1 in SEL.

The physical characteristics of these areas are different in terms of climate, with Atlantic and Mediterranean zones. As for the geological substrate differences also exist: The SEL is a limestone area while the other two are predominantly granitic, as most of the Galician geography.

Epilithic diatoms were sampled following the Standard European Protocol (Kelly et al., 1998; European Committee for Standardization, 2002). Further pH, T°C, conductivity, and dissolved oxygen were also measured during the diatom sampling.

So far 171 taxa were identified: 156 in CHGC, 66 in MCG, and 58 in SEL. The results include 22 new cites for Galicia: *Achnanthes brevipes*, *Amphora inariensis*, *Aulacoseira alpigena*, *Aulacoseira ambigua Bacillaria paradoxa*, *Cavinula variostriata*, *Craticula accomoda*, *Cymbella tumida*, *Diadesmis gallica*, *Diadesmis laevissima*, *Eunotia diodon*, *Fragilaria parasitica*, *Gomphonema pseudagur*, *Gyrosigma acuminatum*, *Kolbesia suchlandti*, *Navicula clementis*, *Platessa conspicua*, *Planothidium distinctum*, *Planothidium peragalli*, *Pinnularia borealis* var. s*ublinearis*, *Stauroneis prominula* and *Ulnaria biceps*.

References:

Kelly M.G., Cazaubon A., Coring E., Dell Uomo A., Ector L., Goldsmith B., Guasch H., Hürlimann J., Jarlman A., Kawecka B., Kwandrans J., Laugaste R., Lindstrøm E-A, Leitao M., Marvan P., PadisÁk J., Pipp E., Prygiel J., Rott E., Sabater S., Dam H. & J. Vizinet., 1998. Recommendations for routine sampling of diatoms for water quality assessments in Europe. *Journal of Applied Phycology*, 10: 215–224.

European Committee for Standardization, 2002. *Water quality – Guidance standard for the routine sampling and pretreatment of benthic diatoms from rivers*. prEN 13946. 14 pp.

[*Streams and Didymo.* Poster N. 10]

Freshwater diatoms of the Tiber River basin (Central Italy)

MANCINI L.[1], PUCCINELLI C.[1], DELLA BELLA V.[1], MARCHEGGIANI S.[1], BELTRAMI M.E.[2], CAPPELLETTI C.[2] and CIUTTI F.[2]
[1] National Institute of Health (*Istituto Superiore di Sanità*) Dep. Environmental and Primary Prevention, V.le Regina Elena, 299 00161 Rome Italy
[2] IASMA Research Centre - Natural Resources Department, Fondazione E. Mach, Via E. Mach, 1 - 38010 S Michele All'Adige (Trento) Italy
E-mail: laura.mancini@iss.it

Pilot projects for the implementation of the Water Framework Directive 2000/60/EC were developed within the Common Implementation Strategy. In Italy the Tiber River and the Cecina River were chosen as pilot river basins.
The aim of this study is to investigate the distribution of the diatom species in the basin of the Tiber River (Central Italy), and to estimate the ecological quality of the freshwater ecosystems by exploiting the sensitivity of these organisms to the physical-chemical variables of the water.
The study area includes the Italian regions of Umbria, Toscana, and Lazio. A total of 45 sites were investigated: 11 on the main course of the Tiber, and 34 on its tributaries (Nestore, Chiascio, Topino-Marroggia, Treja, Farfa, and other minor watercourses).
Biotic and saprobic indices were calculated to better investigate the main pressures influencing different sites.
We identified 200 species belonging to 29 different genera; the presence of *Didymosphenia geminata* (Lyng.) Schmidt was also detected.
The main course of Tiber River showed conditions of good quality in Umbria, and then got worse near the city of Rome. Regarding tributaries, those belonging to the sub-basins of the high and medium course of the Tiber River showed conditions of good or moderate quality. We found similar results for the Farfa River, belonging to the sub-basin of the low course of the Tiber River. More altered conditions characterized instead the Treja River.
The results underlined the extreme sensitivity of diatoms to pressures of anthropic nature, which makes them useful instruments of water quality evaluation, along with other biological elements.
This study represents one of the first concerning the diatom communities in the hydrographical network of the Tiber River, and helps forming a cognitive frame of the ecological characteristics of the main watercourses of Tiber River basin.

[*Streams and Didymo.* Poster N. 11]

Epilithic diatom communities and biological quality of Trentino South – Tyrol region watercourses (Northern Italy)

CIUTTI F.[1], BELTRAMI M.E.[1], MONAUNI C.[2], POZZI S.[2], LÖSCH B.[3], CAPPELLETTI C.[1] and ECTOR L.[4]
[1]: IASMA Research Centre – Fondazione Edmund Mach, Via E. Mach 1, 38010 S. Michele all'Adige (TN), Italy.
[2]: Environmental Agency, Province of Trento (APPA), Via Lidorno 1, I- 38100 Trento, Italy
[3]: Environmental Agency, Province of Bolzano, Biological Laboratory, Via Sottomonte 2, 39055 Laives (BZ), Italy
[4]: Department of Environment and Agro-Biotechnologies (EVA), Public Research Centre-Gabriel Lippmann, Rue du Brill 41, L-4422 Belvaux, Grand-Duchy of Luxembourg
E-mail: francesca.ciutti@iasma.it

Phytobenthos is an important biological quality element for the assessment of the ecological status of rivers following European Water Framework Directive requirements. Diatoms in particular can well describe the biological quality of rivers, as they are particularly sensitive towards nutrient loading and oxygen requirements. In this study epilithic diatoms of the Trentino South – Tyrol region main watercourses, differing for geology, typology and degree of human impact, were investigated and some diatom-based indices were calculated (Eutrophication/Pollution Index EPI-D, Austrian Trophic Index TI and Specific Polluo-sensitivity Index IPS).

Results on 25 sampling stations belonging to 13 watercourses revealed a good correlation between indices values. Biological quality of sites varied from bad (IV class) to very good (I class) for EPI-D; IPS and TI gave in general higher and lower judgements respectively, due to different database used for their definition.

During the study the presence of some species of particular scientific interest has also been observed. *Achnanthidium atomoides* Monnier, Lange-Bertalot et Ector and *Achnanthidium temniskovae* Ivanov et Ector in particular were first described for Luxembourg and Bulgarian rivers respectively, and these observations represent one of the first records for Italy; *Didymosphenia geminata* (Lyngbye) M. Schmidt, whose invasive behaviour is still in discussion for Italy, was recorded in several sampling stations, but no massive benthic growths were observed.

This work represents the first monitoring program based on diatoms made at a regional scale for Italy.

[*Streams and Didymo.* Poster N. 12]

Preliminary studies on the photosynthetic activity of benthic stream algae

ÜVEGES V.[1], STENGER-KOVÁCS C.[1] and PADISÁK J.[1]
[1]Department of Limnology, University of Pannonia, H-8200 Veszprém, Egyetem u. 10., Hungary
E-mail: uviki@almos.uni-pannon.hu

Benthic algae play a key role in the carbon and nutrient dynamics in streams. They are applied as biological indicators in the biological monitoring by the Water Framework Directive. Substrate type, current velocity, nutrient availability, wash out, grazing and light availability are the master variables influencing the community structure and function of benthic stream algae. Light is also a very important determinant having influence on the biomass, productivity and taxonomic composition of the community. The first step of studying light response of benthic algae was to construct an incubation system, which makes us able to measure algal photosynthetic activity in laboratory under controlled conditions. The incubation system contains an aquarium, Tungsram F74 tubes as light sources and a Neslab ultratermostat regulating the temperature. The aquarium was divided into 8 cells with shifted double septum. The walls of the cells were made by mirror excepting one side where the artificial light enters the cell. This was made by simple glass covered by different number of layers of neutral filter making the light gradient. Sterilized semi-natural limestone substrates (defined surface ~ 25 cm^2) were exposed in the stream Torna (Hungary) for 3 weeks. Sampling was carried out on 7 April 2008. Samples were collected for two purposes (i) to measure their photosynthetic activity in the laboratory, and (ii) to analyse them taxonomically. The photosynthetic activity of the benthic community dominated by *Navicula lanceolata* (Agardh) Ehrenberg and *Gomphonema olivaceum* (Hornemann) Brébisson was measured on the sampling day at 9 different light intensities (1230, 820, 450, 150, 80, 30, 8, 5 and 0 µmol m^{-2} s^{-1}) in triplicates using LDO instrument (HQ40d) to follow the changes in the concentration of dissolved oxygen during 2 hours. After this time the chlorophyll-*a* content of each sample was measured spectrophotometrically. Photoinhibition was observed at the highest irradiance, the highest photosynthetic activity was measured at 450 µmol m^{-2} s^{-1}. Respiration rate was estimated from oxygen consumption at 0 µmol m^{-2} s^{-1}. After preliminary measurements, it can be stated that the photosynthetic activity of benthic communities can be appraised with the incubation system.

[*Streams and Didymo.* Poster N. 13]

Didymosphenia geminata (Lyngbye) M. Schmidt: Distribution, invasiveness and bibliometric data

ECTOR L.[1] and BLANCO S.[1,2]
[1]Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg, e-mail:
[2]Department of Biodiversity and Environmental Management, University of León, E-24071 León, Spain
E-mail: ector@lippmann.lu
E-mail: sblal@unileon.es

There exists an increasing concern about the recent dispersal and negative environmental effects of the freshwater diatom *Didymosphenia geminata* (Lyngbye) M. Schmidt, which is currently indicated as one of the most harmful invasive organisms in lotic systems worldwide. In order to account for existing records of *D. geminata* worldwide, a near exhaustive investigation was performed in the scientific literature, phycological inventories, technical reports and Internet databases. ~900 references –both recent and fossil– were found from 1800 to 2008. The distribution area of fossil *D. geminata* corresponds essentially to its current native geographical range, which, apparently, covers the whole of the Northern Hemisphere above the 30º parallel. This species was virtually absent in the Southern Hemisphere until it was found in New Zealand in 1928, although massive growts have been occurring only since 1990s. Excessive growths do not only appear in areas where this species is presumably exotic. Contrarily to general statement, reports of mass developments of *D. geminata* date back to the 19th century. World references to *D. geminata* have increased exponentially during the last decades; however; with respect to the whole diatom literature during the XIX and XX centuries (~145.000 references), the relative frequency of citations has decreased progressively.

[*Streams and Didymo.* Poster N. 14]

Distribution and ecology of *Didymosphenia geminata* (Lyngbye) in the Natisone River

ZORZA R.[1] and HONSELL G.[2]
[1] University of Udine. Department of Agricultural and Environmental Sciences, via delle Scienze 208, 33100 Udine, Italy.;
[2] University of Udine, Department of Agro-Industrial Economics and Biology: Plant Biology Section, Via Cotonificio 108, 33100 Udine, Italy
E-mail: zorza.raffaella@uniud.it

The diatom *Didymosphenia geminata* (Lyngbye) M. Schmidt is a species of cold and oligo-mesotrophic freshwaters. Historically it has a Northern Hemisphere distribution, and after the mid-1980s expanded also in Europe and North America.

The presence of this alga was revealed in the Natisone river (Friuli Venezia Giulia), a torrential prealpine stream, characterized by gravel and stones, belonging to the Isonzo river basin . This finding widens knowledge on the distribution of this species in the Italian Alps.

The investigation was conducted in June and October 2005 in ten sites and showed 93 different species. *D. geminata* was present in all the ten stations but with high abundances only in four sites in summer, and in one station in autumn. These data were very important to understand the distribution and the origin of D. geminata in the Isonzo basin. Regarding its presence in the watercourses of Friuli Venezia Giulia, there are no previous records and for this reason more sites have to be investigated to understand the origin of D. geminata in the Natisone.

D. geminata occurs over a wide ecological range: The sampling sites were characterized by plenty of light and natural vegetational associations along the shores.

A very important ecological factor is water temperature that influenced its presence in the two sampling seasons.

The other most numerous diatoms of the sampling sites were *Cymbella caespitosa*, *Cocconeis pediculus*, and *Nitzschia palea*.

The presence of this alga doesn't show invasive features and is related with oligotrophic-mesotropich conditions, that confirm the good quality of this river (EPI-D Class Quality I-II).

[*Streams and Didymo.* Poster N. 15]

Littoral diatoms and trophic status of two strongly modified lakes: lake Toblino and lake S. Massenza (SW Trentino, Italy)

CAPPELLETTI C., BELTRAMI M.E. and CIUTTI F.
IASMA Research Centre – Fondazione E. Mach, Via E. Mach 1,
38010 S. Michele all'Adige (TN), Italy
E-mail: cristina.cappelletti@iasma.it

Lakes Toblino and S. Massenza are two connected piedmont lakes (242 m s.l.m.) located in SW Trentino (Italy) and classified as "strongly modified" due to the presence of the S. Massenza power plant, located upstream of the two lakes. This plant, built at the beginning of the last century is mainly fed by cold and turbid glacial water from the Adamello-Presanella and Brenta mountain ranges. Physical, chemical and biological features of both lakes have been strongly modified by this hydroelectric exploitation.

The present study is part of a wider research project financed by Autonomous Province of Trento with the aim to assess the ecological status of lakes, according to Water Framework Directive 2000/60/EC, and to identify possible lakes rehabilitation strategies.

The study of the epilithic littoral diatom community was carried out in spring and autumn 2005. Several shore sites were selected to describe: i) the trophic status of lakes (TI - Hofmann, 1994, 1999) compared with that evaluated according to OCDE (1982); ii) the biodiversity of the two lakes; iii) possible local deterioration among sites, because the littoral community can be influenced by the effects of nutrient drainage from agricultural areas in the lake catchment.

Diatom community composition and diatom-based index seem to demonstrate a general alteration of trophic status in both lakes, according to the OCDE metric used. Seasonal differences could be observed: in spring TI were worse, especially in Lake Toblino, because of an extended shutdown of the power plant, while species richness and Shannon index were higher in both lakes with respect to the autumn samples.

Littoral diatoms are one of the biotic indicator group included in the WFD to assess the ecological status of lakes. A fundamental step for implementation is the definition of standard protocols for sampling. This study shows that the choice of sampling periods and sampling sites is critical, in particular in the anthropogenically modified lakes as compared to the more natural ones, that generally show high homogeneity along the shores. Further investigations on lakes belonging to different trophic states are needed. Specific diatom trophic values for Italian lake typologies and diatom - based indices should be developed, as other European country have already done (e.g. Germany, Austria, Hungary).

References:
Hofmann G., 1994. *Aufwuchs-Diatomeen in Seen und ihre Eignung als Indikatoren der Trophie*. Bibliotheca Diatomologica. Berlin Stuttgart 241 pp.
Hofmann G., 1999. Trophiebewertung von Seen anhand von Aufwuchsdiatomeen. In Tümpling, W. & G. Friedrich (eds.), *Biologische Gewässeruntersuchung* 2: 319-333.
OCDE, 1982 E*utrophication of waters, Monitoring, Assessment and Control.* OCDE, Parigi. 155 pp.

[*Lakes and transitional waters*. Poster N. 16]

Spring diatom plankton of Lake Baikal

POPOVSKAYA G., BONDARENKO N.and USOLTSEVA M.
Limnological Institute SB RAS, 3, Ulan-Batorskaya, Irkutsk 664033, Russia
E-mail: marinaus@lin.irk.ru

Diatoms play a special role in the formation of primary organic matter in Lake Baikal, the oldest and deepest lake of the world. One of the peculiarities of Baikal diatoms is their intensive growth under ice and after ice breaking. Baikal spring diatom assemblages are represented by *Aulacoseira baicalensis* (K. Meyer) Simonsen, a spore forming diatom, *A. islandica* (O. Müll.) Simonsen, *Stephanodiscus meyeri* Genkal et Popovsk., *Cyclotella baicalensis* Skv., and *C. minuta* (Skv.) Antipova which is abundant in some years. The most common diatom species which dominate in spring are *Synedra acus* subsp. *radians* (Kütz.) Skabitsch. and *Nitzschia graciliformis* Lange-Bertalot et Simonsen emend Genkal et Popovskaya. The following species are subdominant in Lake Baikal: *Fragilaria crotonensis* Kitt., *Synedra ulna* subsp. *danica* (Kütz.) Grunow, and *Asterionella formosa* Hass. Diatom assemblages inhabit the major part of the Baikal water area: pelagic zone, large bays and near-delta areas of large rivers. Sharp inter-annual fluctuations in abundance are attributed to pelagic diatoms of Lake Baikal. Taking into account the biomass of spring diatom plankton (biomass over 1000 mgm^{-3}), may be distinguished highly-productive, average productive (from 500 to 1000 mgm^{-3}), and low productive years (below 500 mgm^{-3}). Maximal biomass values in this period can reach 5-7 gm^{-3}. In highly productive years the abundance of diatoms may make up 90%, while phytoplankton biomass – 95% (without picoplankton) (Popovskaya et al., 2002). The most abundant representatives of spring diatom assemblages have worked out a number of morphological and physiological adaptation features. For example, *A. baicalensis* has special winter stages at which cells have frustules with thickened walls, while *A. islandica* (*A. skvortzowii*) possess resting spores.

One more specific feature of their biology has been revealed. They appear to be ice algae (Bondarenko et al., 2006). After ice freezing, their mucous colonies are preserved directly under the ice, attaching to it and freezing in it. Such a mode of life allowed them to survive under unfavourable light conditions during winter. Under favourable light conditions algae begin to propagate in interstitial ice water and form mucous strands trailing from the lower ice surface. The strands drop off because of their own weight and underwater currents, and float in the water like snow flakes. Thus, algae get into the ice plankton (-).

Some representatives of Baikal assemblages have an age which may be compared with that of the lake. For instance, the divergence of *A. baicalensis* and *A. islandica* happened 8.8-8.3 mln years ago (Sherbakova, 2004). *A. baicalensis* and *C. baicalensis* became the most abundant inhabitants of the lake pelagic zone relatively not long ago – about 100 and 146 thousand years ago, respectively (Grachev et al., 1998-). Spring diatom assemblages acquired their own present image only in the Holocene (Bradbury et al., 1994 -). The roots of their origin are vividly seen in the Baikal record of bottom sediments.

References:
Bondarenko N.A., Timoshkin O.A., Roepstorf P. & N.G. Melnik, 2006. The under-ice and bottom periods in the life cycle of Aulacoseira baicalensis, a principal Lake Baikal alga. *Hydrobiologia*. 568 (S). 107-109.
Bradbury J.P., Bezrukova Ye.V., Chernyaeva G.P., Colman S.M., Khursevich G.K., King J.W. & Ye.V Likhoshway, 1994. A synthesis of post-glacial diatom records from Lake Baikal. *J. Paleolimnol.* (10): 213-252.
Grachev M.A., Vorobyova S.S., Likhoshway E.V., Goldberg E.L., Ziborova G.A., Levina O.V. & O.M Khlystov, 1998. *A high resolution diatom record of the palaeoclimates of East Siberia for the last 2.5 my from Lake Baikal.* Quaternary Sci. Rev.; (17):1101-1106.
Popovskaya G.I., Genkal S.I. & YE.V. Likhoshway, 2002. *Diatoms of the plankton of Lake Baikal*. Atlas and Key. Novosibirsk: Nauka 168 pp.

Sherbakova T.A, 2004. *Studies of diatom phylogenetic relationships of the genus* Aulacoseira *Thw., prevailing in Lake Baikal ecosystem*. Abstract of Thesis. – Vladivostok. 22 pp.

[*Lakes and transitional waters*. Poster N. 17]

Do the planktonic diatoms of Nyanza Gulf, L. Victoria indicate spatial variations in water quality?

SITOKI L.[1,2] KLING H.[3] and ROTT E.[2]
[1]Kenya Marine & Fisheries Research Institute, P. O. BOX 1881, Kisumu, Kenya
[2]Institut für Botanik Univ. of Innsbruck Sternwrtestraße 15,
6020 Innsbruck, Austria
[3]Algal Taxonomy and Ecology Inc., 31 Lava Dr, Winnipeg, Mb, R3T 2X8, Canada
E-mail: sitoki@hotmail.com

Although diatoms are often used as water quality indicators in temperate latitudes, little is known on their use in tropical environments. This is a first approach to relate diatoms to water quality parameters for the Kenyan part of Lake Victoria. Planktonic diatoms were studied using LM and SEM. During the dry season subsurface water samples were collected from seven stations along a transect from nearshore to offshore areas towards the central lake basin including investigations on the lateral effects of inflows from urban centres and rivers.

Some key taxa recorded for Lake Victoria from early studies were confirmed (e.g. *Cyclostephanos* species, *Synedra cunningtonii* and *Urosolenia victoriae*). We encountered problems delimiting the frequent *Aulacoseira*-species (*A. granulata, A. ambigua*, and *A. agassizii*) as well as the frequent *Nitzschia*-species (especially the long thin taxa, and taxa around *N. palea* and *N. fonticola*). These problems eventually may require studies of existing type materials from earlier investigations by Hustedt, O. Mueller and other authors.

Overall, there were more pennate diatoms than centrics at most sampling sites but higher abundances of centrics (*Aulacoseira*, *Cyclostephanos*) and short *Nitzschia*-species in the nearshore areas. A striking size reduction was observed for the long *Nitzschia*-species nearshore as compared to offshore areas. From nearshore stations of Kisumu, Asembo and Soklo out to about 40 km, two species were dominant (> 80%), *Aulacoseira* cf. *ambigua* and *Nitzschia* cf. *palea*. In contrast, offshore waters were dominated (> 80%) by thin long *Nitzschia lacustris*, *Nitzschia* cf *subacicularis* and *Nitzschia* cf. *graciliformis*.

The abundance of *Nitzschia* cf *subacicularis* and *Nitzschia* cf. *graciliformis* was highest near river mouths (> 65%) due to the high silica loads from the rivers in the eastern part of the lake catchment. *Nitzschia* cf *palea* and *Fragilaria capucina* var. *vaucheriae*, potential indicators of eutrophication and organic pollution, were most abundant in nearshore areas of Kisumu, Asembo and Soklo. *Nitzschia lacustris* appeared to prefer clear water environments as it constituted about 50% of the diatom community in the offshore sites. The diatom community in the Nyanza Gulf of Lake Victoria reflects eutrophication effects by organic pollution originating from urban sites nearshore and agricultural farmlands brought in from extended catchments by the main rivers.

[*Lakes and transitional waters*. Poster N. 18]

Relationships between planktonic diatoms fluctuations and meteorological variability during 10 consecutive ice-free periods in two small high-mountain lakes in the Italian Alps

POGGI C.[1], SQUARTINI A.[2] and TREVISAN R.[1]
[1]Dipartimento di Biologia, Università di Padova, Viale G.Colombo 3, 35129, Padova.
[2]Dipartimento di Biotecnologie Agrarie, Università di Padova, Viale dell'Università 16, 35020, Legnaro, Padova.
E-mail: clafu_erbivora@yahoo.it

High mountain lakes usually show a strong year-to-year variability in the structure and dynamics of the phytoplankton communities, which is presumably a consequence of allogenic perturbation rather than being due to biogenic interactions (Reynolds, 1984).

The Colbricon Superiore and Inferiore Lakes have been studied for ten years, from 1998 to 2007, in the ice-free season, monitoring physical and chemical parameters and taking samples for phytoplankton analysis. A first elaboration of the data collected until 2003 has shown the importance of pH and water level variation in affecting the specific composition of algal biocoenoses (Morabito & Trevisan, 2006). These variables also change in relation to meteorological phenomena, being conditioned by inflowing water from the catchment basin.

The present contribution addresses the relationships between diatoms fluctuations and meteorological variables.

Diatoms, more than other phytoplankton groups, depend for their growth on silica, that for the 3-20% is supplied via inflowing water (Willén, 1991). We have therefore studied the interannual variation of diatoms in relation to the silica concentration measured in the first and last month of each ice-free period.

Moreover, in the two lakes about 100 species of Bacillariophyceae were recognized, grouped in 23 genera. Some dominant species have been found in all the years. These include *Achnanthes minutissima* and *Cyclotella* sp., that are indicators of high alkalinity and low acidification sensitivity. The genus *Aulacoseira* however only rarely present in the samples is an indicator of nutrient-poor waters.

References:
Morabito G. & R. Trevisan, 2006. Fluttuazioni interannuali delle associazioni fitoplanctoniche nei laghi alpini d'alta quota in relazione alla variabilità meteorologica: il caso dei laghi Colbricon (Trentino) *Atti XIV Congresso AIOL (Ass. Italiana di Oceanologia e Limnologia*) Napoli 3-7 luglio 2006 p. 46.
Willén E., 1991. Planktonic diatoms; an ecological review. *Algological studies* 62: 69-106.
Reynolds C.S., 1984. *The ecology of freshwater phytoplankton*. Cambridge University Press, Cambridge: 384 pp.

[*Lakes and transitional waters*. Poster N. 19]

Distribution of freshwater diatoms along salinity and nutrients gradients in transitional waters

PUCCINELLI C., DELLA BELLA V., MARCHEGGIANI S. and MANCINI L.
National Institute of Health (*Istituto Superiore di Sanità*) Dep. Environmental and Primary Prevention, V.le Regina Elena, 299 00161 Rome Italy.
E-mail: laura.mancini@iss.it

Diatoms are effective sensors of environmental condition of freshwater ecosystems, and they are regularly used as indicators in rivers and in lakes. Consequently diatom communities of these ecosystems are well known. On the contrary, the diatom species that grow and live in transitional waters are little investigated . Transitional waters are bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows. The aim of this study is to asses the reliability of these algae as biological indicators in transitional waters. We investigated three types of transitional waters: river mouths, brackish ponds, and artificial water body mouths along the Tyrrhenian cost near Rome. We identified 203 species, and diatoms communities are mainly composed by freshwater diatoms. The most abundant species identified are: *Navicula veneta*, *Amphora veneta, Nitzschia constricta,* and *Gomphonema parvulum*. The Principal Component Analysis indicated that certain species were closely associated with each transitional water type, and their distribution mainly depended on nutrient and chloride contents: pollution tolerant species (*Luticola goeppertiana*, *Mayamaea atomus, Navicula subminuscula*) in river mouths, halophilous species and also marine littoral species (*Nitzschia elegantula, Amphora coffeaeformis, Achnanthes brevipes* var. *intermedia, Epithemia adnata* var. *porcellus*) in brackish ponds, and both pollution tolerant and halophilous and marine littoral species in artificial water body mouths (*Amphora coffeaeformis, Achnanthes brevipes* var. *intermedia, Brachisyra aponina, Navicula veneta, Navicula recens*). Urbanization and agriculture practices in the study area affect the catchments of these small watercourses and continuously expose them to a high anthropogenic pressure; to investigate in which sites organic pollution significantly contributes to the eutrophication, we calculated the saprobic index Taxa Pollution Tolerant. This study show the usefulness of these benthic algae as bioindicators in transitional ecosystems.

[*Lakes and transitional waters*. Poster N. 20]

Lake Ladoga level fluctuations and resulting palaeoenvironmental changes in the Karelian Isthmus (NW Russia) inferred from diatom records

LUDIKOVA A.[1], SUBETTO D.[2], SAPELKO T.[1] and KUZNETSOV D.[1]
[1] Institute of Limnology, Russian Academy of Sciences,
Sevastyanova str. 9, 196105 St. Petersburg, Russia,
[2] Herzen State University, Moika 48, bl. 12, 191186 St. Petersburg, Russia
E-mail: anna_geo2000@yahoo.co.uk

Lake Ladoga, nowadays known as the largest European lake with the area of 18 135 km^2, maximum depth of 230 m, and the catchment covering 258 600 km^2, underwent, in retrospective, several stages when the water level, area and position of its outlet differed significantly from those of today. Located in the glaciated region, Lake Ladoga experienced major transgressive and regressive events through the Late-Pleistocene – Holocene resulted from the glacio-isostatic rebound of the area.

The study is focused on the mid-Holocene Ladoga transgressive stage when its waters inundated vast areas including those in the Karelian Isthmus, a strip of land west from Lake Ladoga, affecting the drainage pattern of the area and water levels in small lakes and streams. The Ladoga level is generally believed to have raised up to 18-22 m above the sea level, and its outlet was situated in the northern part of the Karelian Isthmus. The subsequent regression was associated with a present outlet formation in the south-western corner of Lake Ladoga, which caused a rapid lake level lowering up to present 5 m a.s.l. However, there are still several debatable issues in this story, concerning palaeoenvironmental changes resulted from the transgressive event, the exact time of the termination of the transgression as well as the maximum transgressive level.

Invaluable archives of relevant paleodata can be found in the sediments of small lakes once inundated by Ladoga waters during its transgressive stage. The penetration of Ladoga waters into a small lake's basin must have affected its limnological variables changing its level, pH, nutrients concentration, which, in turn, had a noticeable effect on lake's biota including diatoms.

The signals of flooding by Ladoga waters in four lake sediment sequences obtained along the northern part of the Karelian Isthmus were recorded as a specific diatom assemblage composition. Two of them located in the vicinity of the present Lake Ladoga shoreline unambiguously indicate Ladoga waters penetration dominated by *Aulacoseira islandica*, *Cyclotella schumannii*, *Ellerbeckia arenaria*, *Eunotia clevei*, *Navicula aboensis*, *N. jaernefeltii*, *N. jentzschii*, and other taxa typical of Ladoga (a large and deep cold-water oligotrophic lake) throughout its history. The above taxa are naturally much scarcer in the other two sequences situated 60 km west from Ladoga, along the route of the former Ladoga outlet, where they are overdominated by common small-lake species (*Achnanthes minutissima*, *Aulacoseira ambigua*, *A. subarctica*, *Fragilaria construens* et var., *F. pinnata*), suggesting Ladoga waters to have been "diluted" by the waters of the system of interconnected lakes and streams which Ladoga drained through. Disappearance of "Ladoga" species from the diatom records accurately dates the termination of the transgression. The lack of the "Ladoga" taxa in the diatom record of another small lake located near the western shore of Lake Ladoga at 16 m a.s.l., which was already in existence when the transgression started, implies the transgression level to have been lower than it was previously thought. Fossil diatoms from terrestrial sediment sections also provide evidences for Lake Ladoga level changes contributing to palaeoenvironmental reconstructions.

The study was performed within the framework of RFBR project № 07-05-01115a.

[*Paleolimnology*. Poster N. 21]

Palaeoecological study of a peat core from Ile de la Possession (Crozet archipelago, sub-Antarctic)

OOMS M.[1], TEMMERMAN S.[1], BEYENS L.[1] and VAN DE VIJVER B.[2]
[1]Universiteit Antwerpen, Department of biology, Unit of Polar Ecology, Limnology & Geomorphology, Universiteitsplein 1, B-2610 Antwerp, Belgium
[2]National Botanic Garden of Belgium, Department of Bryophytes & Thallophytes, Domein van Bouchout, B-1860 Meise, Belgium
E-mail:: vandevijver@br.fgov.be)
E-mail: marijke.ooms@msn.com)

This poster shows a reconstruction of the ecological events that took place during the last 7000 years at Vallée des Branloires (Ile de la Possession, Crozet Archipelago, southern Indian Ocean) based on diatom communities found in a 2 meter long peat core. Diatom communities of 71 samples in the peat core were identified and analysed using a transfer function for reconstructing humidity (Van de Vijver & Beyens, 1999) and altitude (as a proxy of temperature) (Gremmen et al., 2007).

In the core 10 different ecological events were found, displaying the evolution of the terrestrial bryophytes vegetation and climate changes in the valley. In this 7000-year history, 3 interesting events took place. First, evidence of an ancient eruption of the Morne Rouge Volcano was found. Secondly, after the eruption the diatom community quickly recolonised the valley, forming a community dominated by species such as *Pinnularia obscura* that is considered to be a pioneer species. After this early phase, the vegetation is replaced by fell-field conditions. The presence of *Naviculadicta seminulum*, *Pinnularia angliciformis* and the (reconstructed) high humidity (low F-value) indicate the presence of small, shallow stagnant waterbodies although a large lake is never formed. Thirdly, the small pool is frequently visited by elephant seals that increase the amount of nutrients in the soil, explaining the dominance of species such as *P. angliciformis*, *P. subantarctica* var. *elongata* and *Gomphonema subantarcticum*.

References:
Van de Vijver B. & L. Beyens, 1999. Moss diatom communities from Ile de la Possession (Crozet, sub-Antarctica) and their relationship with moisture.- In: *Polar biology*, 22: 219-231
Gremmen N.J.M., Van de Vijver B., Frenot Y. & M. Lebouvier, 2007. Distribution of moss-inhabiting diatoms along an altitudinal gradient at sub-Antarctic Îles Kerguelen.- In: *Antarctic Science*, 19(1): 17-24

[*Paleolimnology*. Poster N. 22]

Holocene siliceous microfossils in Lake Balaton system, Hungary

STENGER-KOVÁCS C.[1], BUCZKÓ K.[2], MAGYARI E.[2] and KORPONAI J.[3]
[1] Department of Limnology, University of Pannonia, Egyetem u. 10, P O. Box 158, H-8200 Veszprém, Hungary
[2]Department of Botany, Hungarian Natural History Museum, Hungary.
[3] West-Transdanubian District Environmental and Water Authority, Department, Kis-Balaton
E-mail: stenger.kovacs@almos.uni-pannon.hu

Holocene lacustrine sediments from Zalavári pond (part of Lake Balaton system) were investigated for siliceous microfossils (diatoms and chrysophycean statospores). Diatom flora was photodocumented (i) to explore diatom diversity in the historical Lake Balaton**,** (ii) to revise the poor documentation of its diatom flora, and (iii) to describe the water-level fluctuation of the lake based on diatom life-forms.

Samples were taken in 2001 using a 7 cm diameter Livingstone piston corer with a chamber length of 100 cm from Zalavári pond. The core was dissected into 2 cm increments for diatom analysis. The material was treated with hot hydrogen peroxide, nitric acid, and it was mounted in Zrax©. Approximately 300 diatom valves were counted at each level. For light microscope analysis, LEICA DM LB2 (100 X HCX PLAN APO and Fujifilm Digital Camera FinePix S2 Pro) was used. Scanning electron microscopy was performed with a Hitachi S-2600N.

Altogether 155 diatom taxa were identified, and 120 of them were presented on 12 plates. Five different pond sediment sequences were distinguished in the material:

(1) ZAL-1 *Staurosira construens – Staurosirella pinnata* zone; ZAL 152-126 cm
Low diatom diversity and species number (10-20) were the main feature of this zone. Mainly small celled (< 20 µm) diatoms were present. The almost complete absence of planktonic species indicated the lack of deep water.

(2) ZAL-2 *Aulacoseira ambigua – A. granulata* zone; ZAL 64-50 cm
The diatom flora of this zone was characterized by high number of taxa (46-72). Planktonic forms were the fairly frequent (>50 %) indicating high water level.

(3) ZAL-3 *Navicula tenelloides – Fallacia tenera* zone; ZAL 50-38 cm
Decline in *Aulacoseira* spp. and rise of benthic taxa were found. The ratio of other planktonic taxa remained relatively high indicating a gradual decrease in the water depth. Besides the nominal species, *Achnanthes delicatula* and *Platessa conspicua* showed peaks, further supporting reduced depts of the lake.

(4) ZAL-4 *Staurosirella pinnata – Gyrosigma attenuatum* zone; ZAL 38-14 cm
Benthic forms became dominant. Diatom preservation was extremely poor between 16-22 cm. The diatom assemblages did not change, only their preservation was unsatisfactory.

(5) ZAL-5 *Pseudostaurosira brevistiata - Cocconeis placentula* zone; ZAL 14-0 cm
This zone is characterized by high taxonomic diversity, and abundant occurrence of benthic taxa (up to 90 %) which indicated low water level.

Wind disturbed, very shallow water, without macrophytes was reconstructed between 8000-7000 cal yr BP. The lake reached the highest level in the Holocene in the period of 4800-1800 cal yr BP. Gradually decreasing water depth can be inferred from 1800 cal yr BP.

[*Paleolimnology.* Poster N. 23]

An unknown environmental event at ~4550 cal years BC reflected in the sedimentary diatom assemblages of lake Vielbecker See, Northern Germany

DREßLER M.
University of Rostock, Institute for Botany, Department of Bio-Science
Wismarsche Str. 8, D-18051 Rostock, Germany
E-mail: mirko.dressler@gmx.de

Due to its exceptionally high trophic state (>160 μgL^{-1} total phosphorus) the polymictic, shallow lake Vielbecker See, Northern Germany, was subject to extensive paleolimnological analyses. The main objective of this project was to determine the lake's natural trophic status, and thus, the definition of precise goals for a restoration project planned by the Ministry of the Environment of Mecklenburg-Western Pomerania (Germany). However, a first superficial examination of the sediment core (~16 m length) revealed a distinctive feature: The whole core that represented the last ~7000 years was coloured uniformly in light brown without any bands, varves or other colour anomalies. Only at a sediment depth of 1488–1493 cm (~4550 cal years BC), few, very distinct white bands were visible. A thin section examination identified annually laminated sediments (varves) in this area that did not occur in higher (above 1488 cm) or lower (beneath 1493 cm) sediment layers.

To answer the question why such distinct varves were found only in this small section of the core from lake Vielbecker See, this section and adjacent layers were analysed without gap with regard to fossil diatoms, pollen, and sediment geochemistry. The results of diatom analysis, which are presented here, revealed no sudden but continuous changes in the diatom flora in accordance with the varve formation, i.e. diatom assemblages differed the most from younger and older assemblages, where varves were most pronounced. Based on the diatom-inferred total phosphorus levels no changes in the trophic status occurred in this period. Instead, the results of the diatom analysis indicate that climate changes might have caused the varve formation.

[*Paleolimnology.* Poster N. 24]

The paleoecology of Lake IJsselmeer, The Netherlands

CREMER H.[1], BUNNIK F.P.M.[1] and LAMMENS E.H.R.R. [2]
[1] TNO Built Environment and Geosciences, Geological Survey of the Netherlands, Princetonlaan 6, 3584 CB Utrecht, The Netherlands
[2] RWS Waterdienst, Zuiderwagenplein 2, 8224 AD Lelystad , The Netherlands
E-mail: holger.cremer@tno.nl

IJsselmeer is the biggest lake and also one of the largest recreation areas in the Netherlands. IJsselmeer and adjacent lakes were separated from the former marine Zuiderzee (which was part of the Wadden Sea) by the completion of a dam (the Afsluitdijk) in 1932. As a consequence, IJsselmeer became a freshwater body within a year. For this project we studied the development of IJsselmeer during the past 75 years based on paleoecological data.

The transition from the marine Zuiderzee to the freshwater lake IJsselmeer is clearly documented in the sedimentological, micropaleontological and palynological data of the studied sediment cores. At the Zuiderzee-IJsselmeer transition zone, the sediment changes from sand to clayey gyttja, the diatom assemblage changes from marine-brackish to freshwater, and the marine foraminifera and dinoflagellates disappear. This marine-freshwater transition in 1932 and the deposition of maize pollen from c. 1980 provide two dates that allow the description of an age model for IJsselmeer. Based on this model, the sedimentation rate could be calculated to be ca. 5 mm per year.

Diatoms have been used to estimate the development of the ecological status of IJsselmeer. A qualitative survey of the trophic indicator values of the most abundant diatom species indicates that oligo-to mesotrophic species were mainly deposited before 1960. After 1960, diatom assemblages mainly consist of meso- to eutrophic and eutrophic taxa. This might indicate a change of the ecological state from highly mesotrophic/eutrophic in the 1940s and 1950s towards strongly eutrophic/hypertrophic conditions from the 1960s onwards.

A quantitative reconstruction of the total phosphorus concentration using a transfer function from the European Diatom Database Initiative (EDDI) indicates three stages of eutrophication history of IJsselmeer. A first hypertrophic phase was observed around 1945 followed by a period of relatively stable eutrophy. From 1970, total phosphorus concentrations strongly increased and were distinctly above 200 $\mu g\ l^{-1}$ during the 1980s and 1990s. This development reflects *in-situ* nutrient measurements that are carried out since 1975. However, the steady decrease of nutrient concentrations that is observed since 1985 is not (yet) visible in the diatom data. Recently, IJsselmeer has relatively high nutrient concentrations (phosphorus: ~ 100 $\mu g\ L^{-1}$) and still is a strongly eutrophic lake.

[*Paleolimnology.* Poster N. 25]

Diatomeenstratigraphische Untersuchung eines Voralpensees zur Ermittlung des Referenzzustands gemäß EG-WRRL

FEIN M., KLEE R. and SCHAMBURG J.
Bayer. Landesamt für Umwelt, Demollstr. 31, D-82407 Wielenbach, Deutschland;
E-mail: markus.fein@lfu.bayern.de

Die EG-Wasserrahmenrichtline sieht eine leitbildbezogene ökologische Bewertung von Fließgewässern und Seen vor. Diese soll durch die biologischen Qualitätskomponenten Phytoplankton, Makrophyten & Phytobenthos, Makrozoobenthos und Fische ermittelt werden. Ziele dieser Richtlinie sind unter anderem die Erreichung des guten ökologischen Zustands bis zum Jahr 2015 bzw. der Erhalt des sehr guten und des guten Zustands.

Die ökologische Qualitätsbewertung im heutigen Zustand ist durch den Vergleich mit dem Referenzzustand zu ermitteln. Dieser ist bei den großen tiefen Seen der Alpen und des Alpenrandes fachlich gut dokumentiert. Für die Voralpenseen sind die Referenzbedingungen eher unklar. Sie sind heute oft belastet und naturnahe Referenzgewässer existieren kaum.

Mit Hilfe diatomeenstratigraphischer Untersuchungen, Belegexemplaren aus Diatomeenherbarien und des rezenten Diatomeenplanktons der wenigen Referenzgewässer, soll der naturnahe Zustand des Pilsensees dokumentiert werden.

Bei der Untersuchung des 78 cm langen Sedimentkerns konnten deutliche Veränderungen der Häufigkeiten von pennaten und centrischen Planktondiatomeen nachgewiesen werden. Der Kern wurde deshalb in 3 Bereiche unterteilt:
1 Bereich: 0-15 cm, 2. Bereich: 16-30 cm, 3. Bereich: 31-78 cm

Im ersten, jüngsten Abschnitt, der die letzten 50 Jahre repräsentiert, ist ein vermehrtes Auftreten von *Stephanodiscus minutulus* zu beobachten, was auf eine hohe Nährstoffbelastung ab Ende der 50er Jahre schließen lässt. Mit Sanierungsmaßnahmen zur Abwasserfernhaltung wurde der Nährstoffgehalt ab 1978 reduziert. Die Reoligotrophierung des Sees ab 1986 (6-7 cm) ist durch den Rückgang von *Stephanodiscus minutulus* und der Zunahme von *Cyclotella costei*, die nährstoffärmere Milieubedingungen indiziert, deutlich erkennbar.

Der mittlere Abschnitt, kann Aufgrund der Cs-137-Datierung ermittelten Sedimentationsraten der ersten Hälfte des letzten Jahrhunderts zugeordnet werden. Es dominiert *Cyclotella costei*, die jedoch durch erhöhten Nährstoffeintrag nach dem 2. Weltkrieg durch *Asterionella formosa* und *Fragilaria crotonensis* zurückgedrängt wurde.

Im unteren, ältesten Abschnitt, der die Sedimente vor 1900 widerspiegelt ist eine weitere Abnahme der Nährstoffbelastung zu erkennen. Sie wird durch ein dominantes Auftreten von *Cyclotella comensis* (Morphotyp *pseudocomensis*) dokumentiert. In den untersten Sedimentlagen ab 50 cm wurde zusätzlich *Cyclotella comensis* (Morphotyp *comensis*) nachgewiesen, die rezent im oligotrophen Lustsee (Osterseen) vorkommt und als Indikator für extrem nährstoffarme Gewässer gewertet werden kann.

[*Paleolimnology*. Poster N. 26]

Diatom frustule dissolution and its effect on quantitative reconstructions

KOINIG K.A.[1], MILAN M.[1,2], TREVISAN R.[2] and PSENNER R.[1]
[1]Institute of Ecology, University of Innsbruck, Technikerstr. 25, 6020 Innsbruck,
[2]Department of Biology, University of Padua
E-mail: karin.koinig@uibk.ac.at

Diatoms are frequently used for reconstructing palaeo-environmental conditions from lake sediments. Commonly a core is obtained from the deepest part of the lake. Here we compare the results from two cores, one obtained from the deepest anoxic part (at 17 m water depth), the other from the oxic part (at 14.5 m) of the lake Schwarzsee ob Sölden. In the anoxic core, diatom valves were increasingly dissolved below 5.5 cm sediment depth, and they could not be quantified below 11 cm sediment depth. Below these layers, sediment composition indicated strong anoxic and alkaline conditions with low manganese to iron ratios and precipitation of siderite ($FeCO_3$). In contrast, the diatoms in the oxic core were well preserved throughout the 119 cm long core spanning the Holocene. Comparing the diatom species composition of the two cores, it was evident that frustule dissolution was not equally strong for all species. This was most evident for the small form *Aulacoseira* cf. *nygaardii* with its thin valves, which was scarcely present in the anoxic core (max. abundance 2%) while it was one of the most frequent species in the oxic core (max. abundance 50%, min. 6%). The pH optimum of *Aulacoseira* cf. *nygaardii*, inferred from a local transfer set, is pH 5.56. In Schwarzsee o.S., *Aulacoseira* cf. *nygaardii* was among the species with the lowest pH optima. Consequently, the reconstructed pH from the anoxic core without *Aulacoseira* cf. *nygaardii* was higher than the pH reconstructed from the diatom assemblages of the oxic core. This study emphasizes the need for multiple core studies in anoxic/alkaline conditions where species-dependent frustule dissolution may lead to wrong palaeo-environmental reconstructions.

[*Paleolimnology.* Poster N. 27]

The genus *Navicula* in Paleogene sediments

STRELNIKOVA N. I.[1], KOCIOLEK J. P.[2] and FOURTANIER E.[3]
[1] Department of Botany, Biological Faculty, St.Petersburg State University, Universitetskaya Emb. 7/9, St.Petersburg, 199034, Russia.
[2] Museum of Natural History, University of Colorado, Boulder, Colorado, 80309, U.S.A.
[3] Diatom Collection, California Academy of Sciences, 875 Howard St.
San Francisco, CA 94103-3098, U.S.A.
E-mail: diatomspb@mail.ru
E-mail: Patrick.Kociolek@Colorado.edu
E-mail: efourtanier@calacademy.org

The genus *Navicula* Bory de St. Vincent (1822) s.l. is the oldest genus of pennate diatoms with a raphe. The first mention this genus from Paleogene sediments was made by Witt (1886). The species *Navicula hennedyi* W. Smith and *N. praetexta* Ehrenberg were found by Witt (1886) from Lower Paleocene marine sediments of the Volga River basin. This is in contrast to the better-studied pennate diatoms from Eocene sediments, from which more than 50 species were described from New Zealand, Oamaru by Schrader (1969) and Desikachary and Sreelatha (1989). But very little is known about the morphology of the valves of these old species.

Several pennate diatoms were studied with light and scanning electron microscopy, and described from Lower Eocene-early Middle Eocene diatomite quarry Kirgizskoe, Emba River basin (Kazakhstan). We studied samples from diatomite alternating with diatomitic clay and glauconitic sand, and diatomite with sand lenses, belongs to the *Pyxilla gracilis* zone, corresponding to the nannoplankton zone NP12 (CP10) Early Eocene. We also investigated samples from silted clays with an admixture of sand, belonging to the *Pyxilla oligocaenica* var. *tenuis* zone and corresponding to Early Eocene - early Middle Eocene NP13-NP14 (CP11-CP12) nannoplankton zones. The samples investigated here have a rich, well-preserved flora of marine planktonic centric diatoms and several pennate forms. Well represented in the samples are *Oestrupia powellii* (Lewis) Heiden, *Clavicula polymorpha* Pantocsek, *Navicula* spp., *Grunowiella* sp., *Amphora* sp., *Amphiprora* sp., *Nitzschia* sp. and *Rhaphoneis* sp.

We carried out detailed light and scanning microscope studies on two pennate taxa, *Navicula hennedyi* W. Smith and *N. praetexta* Ehrenberg, to better understand the morphology of these early raphid species. We present new information on their morphology.

References:

Desikachary T. V. & P. M. Sreelatha, 1989. Oamaru diatoms. *Bibliotheca Diatomologica,* Bd.19, 330 p., 145 pls. *(J. Cramer, Berlin-Stuttgart)*

Schrader , H.-J., 1969. Die pennaten Diatomeen aus dem Obereozän von Oamaru, Neuseeland. *Beihefte zur Nova Hedwigia, Heft* 28, 124 S. 39 Taf. *(3301 Lehre, Verlag von J. Cramer)*

Witt O. N. 1886. Ueber den Polierschiefer von Archangelsk-Kurojedovo im Gouv.Simbirsk. *Verhandlung. Russische Mineral. Geselschaft. Ser.*2. (22) 137 - 177.

[*Paleolimnology.* Poster N. 28]

Central European Diatom Meeting (*CEDIATOM2)*
Trentino Nature & Science Museum, Trento , Italy, 12-15 June 2008
Abstract Book (M. Cantonati, A. Scalfi & E. Bertuzzi Eds.)

Use of diatoms in paleoecological reconstruction in the Carpathian region

BUCZKÓ K.[1], MAGYARI E.K.[1], BRAUN M.[2] and BÁLINT M.[3]
[1]Department of Botany, Hungarian Natural History Museum, H-1476 PO. Box 222, Hungary;
[2]University of Debrecen, Department of Inorganic and Analytical Chemistry, H–4010 Debrecen, PO.Box 21, Hungary
[3]Babes Bolyai University of Cluj, Str.Clincilor 5–7, RO–3400 Cluj-Napoca, Romania
E-mail: krisztina@buczko.eu

In the past few years several high-resolution, radiocarbon-dated diatom records were published from Europe especially with reference to the Alps and NW Europe, for a better understanding of climate-induced changes in aquatic environments. These data, together with other proxies, allowed making scenarios for the predicted global warming of 1.4-5.8 ^{o}C in wetlands and lakes.

For a general picture of climate-driven changes in Europe, new data from the unexplored Eastern sector are essential since earlier, sporadic paleolimnological studies are either incomplete or lack absolute dating. With the development of dating techniques, we have the opportunity to compare climatic fluctuations in the Carpathian region (including the plains and alpine areas). This contribution aims at driving attention on on-going paleolimnological research in the Carpathian region.

In the last decade the sediments of five lakes have been studied using a multi-proxy approach. They include shallow lakes, crater lake, and alpine lakes above and below the tree line.

The detailed analysis of diatoms of a shallow lake (Zalavári pond in Lake Balaton 106 m a.s.l.) and of a crater lake (Lake Saint Anna 950 m a.s.l.), have already been completed and published, while the others are under investigation. The diatom flora of Lake Taul dintre Brazi (1740 m a.s.l.) from the sub - alpine belt, and Lake Gales (2000 m a.s.l.) from the alpine belt will be presented here. Lake Bucura (2041 m a.s.l.) from the alpine belt is also in the focus of our interest. In additional to the floristical results and diatom based environmental reconstruction, oxygen isotope analysis of diatom silica from Lake Taul dintre Brazi is also carried out for the estimation of palaeotemperatue.

The lowest altitude site, Zalavári pond (part of the Lake Balaton system), provided a 165cm longsediment sequence. On the basis of 155 diatom taxa, a wind disturbed, very shallow water lake lacking macrophyte vegetation between 8000-7000 cal yr BP, was inferred. The highest lake level in the Holocene was reconstructed for the period between 4800-1800 cal yr BP, and gradually decreasing water depth was inferred from 1800 cal yr BP onward.

The reconstruction of the Holocene lake-level changes of Lake Saint Anna was based on 74 diatom taxa, and the plant macrofossil records in a 420 cm long core. Low water depths characterised the early Holocene until *ca.* 8800 cal yr when the open water became overgrown by a Sphagnum carpet. From *ca.* 7050 cal yr BP, the water depth increased gradually and shallow water conditions prevailed until *ca.* 5500 cal yr BP, when a marked increase was detected, accompanied by increasing trophic level. The highest lake levels were found between 2700 and 700 cal yr BP.
We hope that our research may provide useful data for palaeo-climate researchers, whose aim is to reconstruct Holocene climate changes on a European scale.

[*Paleolimnology.* Poster N. 29]

Gomphonema olivaceum **(Hornemann) Brébisson species complex in Lake Ohrid, Macedonia**

PAVLOV A.[1], DULIC T.[2] and LEVKOV Z.[1,3]
[1] Institute of Biology, Faculty of Natural Sciences, Gazi Baba bb, 1000 Skopje
[2] Department of Biology and Ecology, Faculty of Natural Sciences University of Novi Sad, Republic of Serbia
[3] Friedrich Hustedt Study Centre for Diatoms, Alfred Wegener Institute for Polar and Marine Sciences, Am Handelshafen 12, 27570, Bremerhaven Germany
E-mail: pavlovaleksandar@gmail.com

Detailed LM and SEM observations of *Gomphonema olivaceum* (Hornemann) Brébisson complex in Lake Ohrid were performed. Analyses reveal the existence of six taxa belonging to this species complex in Lake Ohrid. Four of them were already known from previous studies, while two new species were identified during this study. All species share the same ultrastructural features: biseriate striae and lack of stigma in the central area. The differences were observed in the valve shape and size (length and breadth), as well as in the striae density. Members of *G. olivaceum* species complex from Lake Ohrid were compared with populations from other sites in Macedonia e.g. Lake Dojran and River Vardar.

[*Taxonomy*. Poster N. 30]

Morphological characterization of the type material of *Gomphonema rosenstockianum* Lange-Bertalot et Reichardt and related taxa from European rivers

NOVAIS MARIA H.[1,2], ECTOR L.[1], GOMÀ J.[1], FALASCO E.[1], DELGADO C.[1], HLÚBIKOVÁ D.[1], IVANOV P.[3], VAN DE VIJVER B.[4], BLANCO S.[1,5], MORAIS M.[2] and HOFFMANN L.[1]
[1] Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg
[2] Laboratório da Água, Instituto de Ciências Agrárias Mediterrânicas, Universidade de Évora, Parque Industrial e Tecnológico, Rua da Barba Rala nº 1, P-7005–345 Évora, Portugal,
[3] Sofia University "St. Kliment Ohridsky", Faculty of Biology, Department of Botany, 8 Dragan Tzankov blvd., BG-1164 Sofia, Bulgaria
[4] Jardin Botanique de Belgique, Département de Bryophytes et Thallophytes, Domein van Bouchout, B-1860 Meise, Belgium
[5] Department of Biodiversity and Environmental Management, University of León, E-24071 León, Spain
E-mail: hnovais@uevora.pt

The type material of *Gomphonema rosenstockianum* Lange-Bertalot et Reichardt from La Gomera (Canary Islands) and epilithic material from several European countries were examined with light (LM) and scanning electron microscopy (SEM) in order to improve the knowledge about the taxonomy of two species: *G. rosenstockianum* and *G. tergestinum* (Grunow) Fricke sensu Reichardt et Lange-Bertalot 1991. In the present study the type material of *G. tergestinum* was not investigated because it could not be found in the Grunow Diatom Collection in Vienna.

G. rosenstockianum and *G. tergestinum* can easily be misidentified at the first sight, especially in LM because of their similar valve morphology. These two species have the following characteristics in common:
1) the central area unilaterally developed to the margin of the valve;
2) 1 to 3 short striae on the same side of the stigma;
3) the round areolae in external view (SEM);
4) the striation formed by areolae covered by papillas in internal view (SEM).

G. rosenstockianum has been identified in samples collected in Mallorca (Balearic Islands) and south of Portugal, while *G. tergestinum* was present in samples from Bulgaria, Italy, Slovakia and Spain. After the analysis of the type material and populations of *G. rosenstockianum* and *G. tergestinum*, it was possible to define the main criteria to allow morphological differentiation:
1) the presence of a collar-shaped ring around the opening of the stigma in internal view in *G. tergestinum* and its absence in *G. rosenstockianum* (only visible by SEM);
2) in external view the stigma is in a more central position, almost in between the central nodules, in *G. tergestinum*;
3) the more evident stigma in *G. tergestinum* (LM);
4) the presence of a wider central area in *G. tergestinum*, with the striae of the central area more radiant, while in *G. rosenstockianum* these striae are almost parallel.

A geometric morphometric analysis, based on the LM photos of the different populations of the two species, was performed to evaluate the validity of these morphological criteria. This analysis proved clearly the separation of the two taxa considering the dimensions of the central area and the position of the stigma.

[*Taxonomy*. Poster N. 31]

A new *Gomphonema* species from Farfa stream (Latium, Central Italy)

BELTRAMI M.E.[1], ECTOR L.[2], CIUTTI F.[1], CAPPELLETTI C.[1], BOUILLON C.[2], MANCINI L.[3] and HOFFMANN L.[2]
[1]IASMA Research Centre – Fondazione E. Mach, Via E. Mach 1, 38010 S. Michele all'Adige (TN), Italy.
[2]Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg
[3]Department of Environment and Primary Prevention, National Institute of Health, Viale Regina Elena 299, 00161 Rome, Italy
E-mail: mariaelena.beltrami@iasma.it

Studies of the diatom flora of Farfa stream (calcareous watercourse of Latium, Central Italy) conducted during 2003-2004, revealed the presence of an interesting *Gomphonema* species, probably new to science. *Gomphonema* sp. was found in all the four sampling seasons and in different sites along the stream.

Taxonomic investigation with light microscopy did not allow us to identify it as belonging to any described species. Further analyses with scanning electron microscopy revealed the presence of interesting morphological features, which could support its description as a species new to science. *Gomphonema* sp. has clavate valves, striae slightly radial, the median one shorter than the others. One stigma and some stigmoids are present in the central area, only the central stigma is easily resolvable with LM. In girdle view an uninterrupted line of puncta is visible in front of each stria on the valve mantle. SEM analyses revealed that striae have double rows of , bean-shaped areolae. The apical pore field at the foot pole is separated from the striae by a hyaline area. Only the central stigma, located between the proximal raphe ends, is visible in internal view as a slit in the central nodule, while the others are variable in numbers (one to four), and only visible on the external side of the valve (stigmoids). Reichardt (2007, 2008) described several *Gomphonema* species with double punctuated striae, but none of them seems to correspond to our finding.

The most common diatom taxa associated with this new *Gomphonema* discovered near Rome were *Achnanthidium minutissimum, Amphora pediculus*, *Cocconeis euglypta*, *C. pediculus*, *Gomphonema olivaceum, G. pumilum* var. *elegans,* and *Rhoicosphenia abbreviata*.

References:
Reichardt E., 2007: Neue und wenig bekannte *Gomphonema*-Arten (Bacillariophyceae) mit Areolen in Doppelreihen. *Nova Hedwigia* 85: 103-137
Reichardt E., 2008: *Gomphonema intermedium* Hustedt sowie drei neue, ähnliche arten. *Diatom research* 23: 105-115

[*Taxonomy*. Poster N. 32]

Biogeography and taxonomy of *Nitzschia pura* and *N. sublinearis*: Comparison of the type material of Hustedt with different populations from European rivers

HLÚBIKOVÁ D.[1,2], BLANCO S.[3], FALASCO E.[1,4], GOMÀ J.[1,5], HOFFMANN L.[1] and ECTOR L.[1]
[1] Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg
[2] Water Research Institute, National Reference Laboratory for Waters, Nabr. L. Svobodu 5, SK-81249 Bratislava, Slovakia
[3] Department of Biodiversity and Environmental Management, University of León, E-24071 León, Spain
[4] Università degli Studi di Torino, Laboratorio di Ecologia, Dipartimento di Biologia Animale e dell'Uomo, I-10123 Torino, Italy
[5] Departament d'Ecologia, Universitat de Barcelona, Av. Diagonal 645, E-08028 Barcelona, Catalonia, Spain
E-mail: ector@lippmann.lu

Nitzschia pura Hustedt and *N. sublinearis* Hustedt are two of the few representatives of the genus that mostly occur in oligotrophic fast flowing rivers and streams. Based on literature data, both species appear to have a cosmopolitan distribution occurring in recent as well as fossil samples. Regarding their autecological preferences they can be easily distinguished from other similar *Nitzschia* taxa. However, determination of the two taxa still remains problematic, because literature data show significant overlap of their basic morphological characteristics, e.g. fibulae density and dimensions, making their separation difficult as typical for the whole systematic group of *Nitzschia*. In order to clarify the identity of both species, and to document the range of variation within the type populations based on morphological criteria, type material of Hustedt of *N. sublinearis* and *N. pura* was examined by light and scanning electron microscopy and compared with several similar populations of *Nitzschia* from European rivers.

Morphological comparisons revealed that the valve shape, valve width, density of fibulae and shape of areolae are the most stable and the most reliable taxonomical characters within the type materials, clearly separating *N. sublinearis* and *N. pura*. Surprisingly, none of the other studied populations corresponded to the type of *N. pura*. Based on the results, two new *Nitzschia* species were recognized in Europe, both occurring mostly in rivers and streams of high altitudes and in oligotrophic conditions. One of the new species, misidentified previously as *N. pura*, seems to be fairly common in European rivers and has been apparently overlooked so far. The latter species was only found in Slovakia, but with high frequency of occurrence and sometimes in high abundances at sites. Based on literature data, world distribution of *N. sublinearis* sensu lato and *N. pura* sensu lato is presented as well.

[*Taxonomy*. Poster N. 33]

To be or not to be: *Pinnularia divergentissima* on the subantarctic islands

MORAVCOVÁ A.[1] and VAN DE VIJVER B.[2]
[1] Department of Ecology, Faculty of Sciences, Charles University, Viničná 7, 128 44, Prague 2, Czech Republic
[2] National Botanic Garden of Belgium, Department of Bryophyta & Thallophyta, Domein van Bouchout, 1860 Meise, Belgium

Pinnularia divergentissima (Grunow) Cleve is a cosmopolitan species inhabiting both terrestrial and aquatic habitats. The species is well-defined by easily recognizable features: central area forming a broad fascia and an acute angle between two striae in the half-way to the ends of valves, where the striae change from being strongly radiate towards the valve centre to being strongly convergent towards the ends.

Our poster discusses the morphological variability in *Pinnularia divergentissima* var. *divergentissima* found in soils from the subantarctic islands in the southern Indian Ocean (Prince Edward Islands, Crozet Archipelago, Kerguelen, Heard Island). Whereas the European populations are relatively stable in morphology, we observed considerable changes in valve features mentioned above for the populations from Subantarctica. Based on these variations, we defined four morphological groups: the true *Pinnularia divergentissima*, a group with specimens lacking a broad fascia, specimens with insufficiently developed angle between the two striae groups and specimens comprising both of the last-mentioned variations. Apparently, these morphological groups seem to have similar ecological preferences, so there is a question whether we deal with new taxa or with a complex of morphologically very variable *Pinnularia divergentissima* populations.

[*Taxonomy*. Poster N. 34]

Tricky *Eunotia* taxonomy – examples from Lake Isbenttjønn sediments, Norway

WERNER P.
Universität Osnabrück, Institut für Geographie, Seminarstr. 19 a/b, 49074 Osnabrück, Germany
E-mail: pw_bln@yahoo.com

Subfossil chironomids (B. Lüder) and pollen (S.M. Peglar, J. Birks) have been investigated from Lake Isbenttjønn sediments to identify the potential of non-alpine lakes for quantitative Holocene palaeotemperature reconstructions (Lüder 2007). The reconstructed temperatures from chironomids and pollen differed during certain periods. Thus, diatoms are currently investigated to identify if changes in the water chemistry that mainly affect the chironomids but not the terrestrial pollen assemblages may be the reason for the discrepancy. Lake Isbenttjønn is a small (5 ha), shallow (Z_{max} = 9.4 m) lake in southern Norway (787 m asl.) with a pH of 6.4 in 1996. Preliminary results demonstrate that various *Eunotia* species are abundant (up to 11%) in the most recent sediments (past ~1000 years).

The taxonomic identification of these *Eunotia* species according to the key presented in Krammer & Lange-Bertalot (1991) will be shown and discussed.

References:

Krammer K. and H. Lange-Bertalot, 1991. Bacillariophyceae, 3. Teil. In H. Ettle, J. Gerloff, H. Heynig and D. Mollenhauer (eds.). *Süßwasserflora von Mitteleuropa* Band 2/3 – Gustav Fischer Verlag, Stuttgart/Jena.

Lüder, B., 2007. *The potential of non-alpine lakes for quantitative palaeotemperature reconstructions based on subfossil chironomids: A comparative palaeolimnological study from southern* Norway. Dissertation von Britta Lüder 2007, Universität Bremen.

[*Taxonomy.* Poster N. 35]

A new *Perinotia* species from Northeastern Brazil

WETZEL C.E.[1,2], FERRARI F.[1], ECTOR L.[2], VIANA J.C. and DE CAMPOS B.D.[1]
[1]Instituto de Botânica, Seção de Ecologia, Av. Miguel Stéfano 3687,
CEP: 04301-012, São Paulo, SP, Brazil,
[2]Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg
[3]Universidade Federal da Bahia, Campus de Ondina, CEP: 40210-170, Salvador, BA, Brazil
E-mail: catiwetzel@yahoo.com.br

Tropical freshwater environments of South America have a peculiar diatom flora when compared with temperate areas of the continent such as the Austral and Antarctic zones, where the species composition tends to include many cosmopolitan elements. This work presents a new diatom species from the Chapada Diamantina National Park, a semi-arid region of Northeastern Brazil, belonging to the recently discovered genus *Perinotia* Metzeltin et Lange-Bertalot and supplies morphological and morphometric complementation of Metzeltin et Lange-Bertalot, genus circumscription including details of valve ultrastructure observed by scanning electron microscopy (SEM), and light microscopy (LM). Epilithic diatom samples were collected from the Piabinha creek during the dry (February 2006) and rainy season (May 2006). Epilithon was scrubbed off from the upper surfaces of submerged stones, treated with H_2O_2 and HCl, then mounted on permanent slides with Naphrax®.

LM and SEM observations were performed to justify the description of the new species *Perinotia diamantina* Ferrari et Wetzel that differs from the genus type-species *P. jankae* Metzeltin et Lange-Bertalot mainly by having larger dimensions related to valve width and minor length/width ratio.

Evident siliceous deposits in valve surface (irregular ornamentation), and puncta irregularly distributed around the terminal raphe endings in *P. diamantina* also differ from *P. jankae.* Preliminary observations reveal the absence of rimoportula. This character is an important feature within the Eunotiales, and further observations are needed to clarify reflections related to the evolutionary relationships within Eunotiophycidae. Both *Perinotia* species were found until now exclusively in oligo/dystrophic and predominantly acid waters with low electric conductivity in lotic freshwater environments. *P. jankae* occurred in the two samples collected during the dry and rainy season, whereas the unique population of *P. diamantina* was observed during the rainy season. When occurring together, *P. diamantina* was scarcer than *P. jankae*, and both were extremely rare representing less than 1% of the diatom assemblage.

[*Taxonomy.* Poster N. 36]

Morphological observations in the *Sellaphora stroemii* complex: Light and electron microscopy analysis of type materials and of some European populations

FALASCO E.[1,2], BLANCO S.[1,3], BONA F.[2], GOMÀ J.[1,4], HLÚBIKOVÁ D.[1,5], NOVAIS H.[1,6], HOFFMANN L.[1] and ECTOR L.[1]
[1]Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies (EVA), 41 rue du Brill, L-4422 Belvaux, Grand-Duchy of Luxembourg,
[2]DBAU, University of Turin, via Accademia Albertina 13, I-10123 Turin, Italy,
[3]Department of Biodiversity and Environmental Management, University of León, E-24071 León, Spain
[4]Departament d'Ecologia, Universitat de Barcelona, Av. Diagonal 645, E-08028 Barcelona, Catalonia, Spain
[5]Water Research Institute, National Reference Laboratory for Waters, Nabr. L. Svobodu 5, SK-81249 Bratislava, Slovakia
[6]Laboratório da Água, Instituto de Ciências Agrárias Mediterrânicas, Universidade de Évora, Parque Industrial e Tecnológico, Rua da Barba Rala nº 1, P-7005–345 Évora, Portugal
E-mail: ector@lippmann.lu
E-mail: elisa.falasco@unito.it

Krammer and Lange-Bertalot, in the Süßwasserflora von Mitteleuropa, considered *Navicula stroemii* Hustedt 1931 as a complex of species. According to these authors several taxa, such as *Navicula subbacillum* Hustedt 1937, *N. vasta* Hustedt 1937, *N. ventraloides* Hustedt 1945 and *N. aggerica* Reichardt 1982, should be considered as synonyms of *N. stroemii*, currently belonging to the genus *Sellaphora* C. Mereschkowsky 1902.

In the present study the type materials of Hustedt's and Reichardt's collections of these species were examined by light and scanning electron microscopy, in order to explore the complex of these taxa. Principal Component Analysis based on geometric morphometric features was performed and the results of this analysis were finally compared with some natural populations found in different countries such as Italy, Slovakia and Spain.

According to the valve shape analysis, performed with the image software and based on the ecological preferences and biogeography of the species, we can conclude that the *N. stroemii* complex should at least be divided in two groups. These results, combined together with the traditional systematic analysis, allowed us to define *N. stroemii*, *N. ventraloides* and *N. aggerica* as three separated taxa, clearly distinct from *N. vasta* (synonym with *N. subbacillum*).

Regarding the taxonomical status of the species group, results of morphological examination indicated that all examined species belong to the genus *Sellaphora*, as *S. stroemii* already transferred by Kobayasi in 2002.

[*Taxonomy*. Poster N. 37]

Ultrastructure of an interesting *Hyalodiscus* species (Subclass: Coscinodiscophycidae) from brackish waters on two coral islands of Tonga, South Pacific.

ROTT E.[1], KOFLER W.[1] and SCHABETSBERGER R.[2]
[1] Institut für Botanik, Univ.Innsbruck, Sternwartestrasse 15, A-6020 Innsbruck, Austria
[2] Division of Organismal Biology, University of Salzburg, Hellbrunnerstrasse 34, A-5020 Salzburg, Austria

Within the context of an extended expedition through Pacific islands made by the 3rd author with the intention to raise unknown treasures of biodiversity of inland waters, plankton and littoral samples were taken also from Tonga. We found an interesting centric diatom belonging to the genus *Hyalodiscus* in 3 out of 39 samples from various other islands. The samples were in one case from a freshwater spring pool (app. 33 m long, 3 m wide and 1.5 m deep, 2656 µS cm^{-1} conductivity, 6.9 pH, Temp 27 °C) influenced by tidal inflowing seawater (Nioatoua spring pool on Niuatoputapu Island; 2 m above sea level). In the other cases the species was found in a large, brackish crater lake (Vahi Lahi; approx. 2 km long, 500 m wide and 100 m deep, 3642 µS cm^{-1} conductivity, 8.6 pH, 30.2 °C) and a smaller adjacent lake (Vahi Si'i; 2.5 km long, 0.5 km wide), both situated on Niuafo'ou ("tin can") Island. Whereas in the spring pool we mostly found the centric diatom in long mucilagineous bands associated with a few minute parts of a marine red alga and a brown alga, in the crater lake several phytoplankton taxa from freshwater environments (e.g. *Anabaena* sp., *Chlamydomonas* sp., *Gyrodinium* sp., *Quadricoccus* cf. *ellipticus*) were additionally recorded. The latter taxa indicate that there must be a strong saline gradient in the system.

Taxon description: Large (50-80 µm) but delicately silicified cells, lense-shaped and occurring mostly in pairs united by numerous copula (up to 10 and more). Cell content with numerous small discoid plastids. Cell paires attached by mucilage threads which seem to originate from the area between valve mantle and copulae. Valves flat to slightly convex (epitheca) or concave (hyptheca), watchglass shaped with delicate ornamentation visible in LM as a rough, non-differentiated structure extending from the margin to 1/3 or ½ of the radius with irregular endings, thus leaving a somewhat irregularly delimited, central area open. Radial raws of punctae dense (30-40 / 10 µm) with 35-40 points/10 µm (seen in detail only in the SEM). Central valve area of epitheca thickned and appearing slightly convex, central valve area of hypotheca slightly depressed. In some valves the central part is ornamented by a rough discoidal (unclear if umbilicate?) structure, but leaves an unstructured ring open. In SEM the irregular central endings of bundles of radial points (round perforations closed by rotae toward the interior sensu Round et al.1990) were observed with a few scattered, but roughly evenly dispersed small rimoportulae (labiate processes) evident only from the inside, similar but less dense to what is shown for *Podosira* (Fig. h) in Round et al. 1990. On broken valves in the central area the tubular, sponge-like (bullulate) interior of the valve becomes visible for the areas ornamented with areaolae (punctae), but these structures are gradually replaced by a massive silica layer in the central unstructured area. We could not find a marginal ring of rimpoportulae as shown for *H. laevis* Ehrenberg by Round et al. 1990. We detected no fultoportulae on the mantle or in the central area.

We will follow the question if this taxon corresponds to more widely distributed marine littoral species of the genus *Hyalodiscus* (e.g. *H. laevis* Ehrenberg), or if it could be a specific Pacific element. In order to solve this question, we would be glad for all detailed comments from experts.

References:
Round, F.E., Crawford, R.M. & D.G. Mann, 1990. The diatoms, biology and morphology of the genera. – 747 pp. Cambridge University Press, Cambridge.

[*Taxonomy.* Poster N. 38]

The last chapter of the *Discoplea* Story

KUSBER W.-H. and JAHN R.
Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universität Berlin
Königin-Luise-Str. 6-8, D-14195 Berlin, Germany
E-mail: w.h.kusber@bgbm.org

C.G. Ehrenberg named a number of genera within the centric Bacillariophyta which are still in use, such as *Actinocyclus, Actinoptychus, Amphitetras, Chaetoceros, Coscinodiscus, Stephanodiscus, Stephanopyxis,* and *Triceratium.* A smaller part of his centric genera fell into oblivion such as *Discoplea.*

The genus *Discoplea* was introduced by C.G. Ehrenberg in 1840 by describing two different centric species, one from German freshwaters, one from fossil Greek material. The genus was originally classified within the Polygastrica (vernacular name: "Infusionsthierchen"). Because C.G. Ehrenberg never provided a diagnosis for *Discoplea*, the genus and all of its included specific and infraspecific names have been invalidly published, as stated by Silvia in 2003. At this time, Håkansson (1986) had already provided lectotypes for most of Ehrenberg's *Discoplea* names. Her evaluation of *Discoplea comta* led to a questionable conserved type in W (Vienna), which has been linked to *Cyclotella comta* in the most recent ICBN. Two species names were not validated, neither by C.G. Ehrenberg nor by later researchers: *Discoplea kuetzingii* and *Discoplea sorrentina* because Ehrenberg's preparations were considered to be lost or even destroyed.

What is the identity of these species? Are they taxonomically relevant? To clear up these questions we searched the Ehrenberg Collection Berlin.

References:
Silvia P.C., 2003. Nomenclatural notes on *Discoplea* Ehrenberg. *Diatom Research* 18, 123-130
Håkansson H., 1986. A study of the *Discoplea* species (Bacillariophyceae) described by Ehrenberg *Diatom Research 1*, 33-56

[*Taxonomy.* Poster N. 39]

Central European Diatom Meeting (*CEDIATOM2)*
Trentino Nature & Science Museum, Trento , Italy, 12-15 June 2008
Abstract Book (M. Cantonati, A. Scalfi & E. Bertuzzi Eds.)

Synurophyceae: Siliceous structures of a group of chrysophyte algae that are often found in samples together with diatoms

KRISTIANSEN J.[1] and PREISIG H.R.[2]
[1]Department of Biology, Section of Phycology, University of Copenhagen, Øster Farimagsgade 2 D, DK-1353 Copenhagen K, Denmark
[2]Institute of Systematic Botany, Zollikerstrasse 107, University of Zürich, CH-8008 Zürich, Switzerland
E-mail: joergenk@bio.ku.dk
E-mail: preisig@systbot.uzh.ch

A new volume on Synurophyceae has recently been published in the series „*Süsswasserflora von Mitteleuropa*" (Freshwater Flora of Central Europe, Vol. 1/2), replacing the corresponding outdated parts on the family Synuraceae in volume 1 on Chrysophyceae and Haptophyceae by Starmach (1985). The need of a replacement has become increasingly obvious, as the previous volume was based mainly on light microscopy, whereas electron microscopy of the silica structures now has become the basis for taxonomy and identification in the Synurophyceae, and has also resulted in numerous additional taxa. Accordingly, keys and descriptions have been totally revised, and the illustrations now include electron micrographs of the silica structures for all taxa, in addition to habitus figures drawn from the light microscope. Thus it is possible to identify all the 212 taxa of Synurophyceae described by electron microscopy with a high degree of certainty (i.e., 180 taxa of *Mallomonas*, 30 taxa of *Synura*, and the single species of *Chrysodidymus* and *Tessellaria*). Even though the 128 taxa occurring in Europe are emphasized, and details of their distribution are given, the volume includes all taxa described worldwide. 12 of the European taxa have so far been recorded exclusively from this continent and are possibly endemic. Most of the other taxa occurring in Europe have a northern temperate distribution and have also been reported from North America, 40 taxa are cosmopolitan or almost so. Of the remaining more than 80 taxa, several will certainly sooner or later also be found in Europe, other mainly tropical species, almost certainly not. A limit between these two groups cannot be drawn; accordingly this volume covers the whole world.

References:

Kristiansen J. & Preisig H.R., 2007. Chrysophyte and Haptophyte Algae, 2. Teil (2nd part): Synurophyceae. - In: Büdel, B., Gärtner, G., Krienitz, L., Preisig, H.R. & Schagerl, M. (eds): *Süsswasserflora von Mitteleuropa (Freshwater Flora of Central Europe*), Band (vol.) 1/2, 2. Auflage (2nd edition), 252 pp. Spektrum Akademischer Verlag / Springer-Verlag, Berlin.

Starmach K., 1985. Chrysophyceae und Haptophyceae. - In: Ettl, H., Gerloff, J., Heynig, H., Mollenhauer, D. (eds): *Süsswasserflora von Mitteleuropa*, vol. 1, 515 pp. Gustav Fischer Verlag, Stuttgart.

[*Taxonomy*. Poster N. 40]

Automatic Diatom Identification applied for *Nitzschia*

RIVOGNAC L.[1] and HORN M.[2]
E-mail: michel.horn@gmail.com
E-mail: laurent.rivognac@gmail.com

The identification of objects is a part of important problems of images treatment and analysis because it interests a large number of applications allowing to avoid repetitive and boring tasks.

In this contribution, we present a part of our work which we have been conducting for four years. The study presented consists in classifying the *Nitzschia* taxa found in the waters of Basse-Normandy (France) in the last ten years, and to compare the results with those obtained using the identification literature by H. Lange-Bertalot

Our identification technique combines shape and texture descriptors. For instance, we use the wavelet transform to extract very interesting characteristics concerning the texture of the images.

The extraction of the parameters allows us to build the characteristic vector. By means of this vector, which includes the parameters of our various descriptors, we identify the species thanks to the K-Nearest Neighbor (K-NN).

[*Taxonomy*. Poster N. 41]

Diatom richness or rareness – key features for alpine lotic habitats?

GESIERICH D.[1], ROTT E.[1] and BELTRAMI M.E.[2]
[1]University of Innsbruck, Institute of Botany, Sternwartestrasse 15, 6020 Innsbruck, Austria;
[2]IASMA Research Centre – Fondazione E. Mach, Natural Resources Department, Via E.Mach,1, 38010 S. Michele all'Adige, Italy

In recent years diatom assemblages are increasingly used for identification of pristine situations in applied conservation studies beside environmental quality assessments. In most cases however common and widely distributed taxa (e.g. *Achnanthes* species around *A. minutissima*) with little or / and unknown indicative value are dominant whereas oligotraphentic key taxa are only found within subdominant and / or rare species. However even common taxa can be misinterpreted from LM studies only. On the other hand the role of rare diatoms (<2% relative abundance) as indicators for the possible absence of pollution in rivers that were less affected by human activities was recently stressed by Potapova & Charles (2004) on the basis of a large dataset in the USA.

Based on studies from different lotic habitats from different altitude and trophic status we want to draw attention onto both (A) the common taxa potentially misinterpreted in routine studies and (B) rare indicative taxa representative for underexplored alpine environments (e.g. springs, little buffered streams, glacier streams).

We will set a few flashlights on diatoms from recent studies carried out in high altitude streams, mountain streams and springs in the E- and SE-Alps (including glacial streams). Special attention will be given to common and rare Achnanthoids (taxa groups around *A. minutissima* / *A. biasolettiana* and oligotraphentic arctic-alpine taxa).

Re-investigations of slides for updating identification of "common but misinterpreted" taxa and for detection of rare taxa can be promising although diatom slides quality can be poor by various reasons (e.g. turbidity), even when prepared with care. These additional LM studies supplemented by additional SEM studies (especially of rare species) can be a time and money-consuming effort. Therefore we want to discuss ways to optimize approaches to quantify rare key taxa which may include habitat reference taxa relevant to optimize the Redlists approach. This could be based on a species "hunt" (richness assessment by using multiple replicates scanning for rare species), or just a weighting up the importance of rare taxa portions in routine counts.

The former approach would require long time spent on slide checking, but may result into a more sound and complete list of key taxa, while the latter could use counts from earlier datasets, being less time consuming, but could underestimate the presence of rare (and potential key) taxa.

References:
Potapova M. & D.F Charles, 2004. Potential use of rare diatoms as environmental indicators in USA rivers. Pages 281-295 in: *Proceedings of the 17th International diatom symposium, M Poulin* - Editor, Biopress Limited, Bristol.

Überarbeitung der Roten Listen und Florenlisten für Diatomeen und Desmidiaceen in Deutschland

HOFMANN G.[1], WERUM M.[2], KUSBER W.-H.[3] and LANGE-BERTALOT H.[4]
[1]Hirtenstraße 19, D-61479 Glashütten
[2]Karl-Bieber-Höhe 23, D-60437 Frankfurt am Main
[3]Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin Königin-Luise-Str. 6-8, D-14195 Berlin
[4]Johann Wolfgang Goethe-Universität Frankfurt am Main; Fachbereich Biologie, Institut für Ökologie, Evolution und Diversität, Senckenberganlage 31-33, D-60054 Frankfurt am Main
E-mail: GM.Hofmann@t-online.de
E-mail: werum@aglhh.de

Mit den Florenlisten und Roten Listen für Diatomeen (Kieselalgen) und Desmidiales (Zieralgen) wurde 1996 ein weltweit einzigartiges Werkzeug geschaffen, welches eine naturschutzrelevante Bewertung von limnischen Lebensräumen anhand von Mikroalgen ermöglicht (Lange-Bertalot 1996, Gutowski & Mollenhauer 1996). Der Bearbeitungsstand beider Gruppen war bei Erstellung der Listen sehr unterschiedlich. Die Bearbeitung der Diatomeen für die erste Auflage der Süßwasserflora von Mitteleuropa war abgeschlossen, so dass mit der Roten Liste gleichzeitig eine einheitliche Standardliste der Diatomeen Deutschlands vorgestellt wurde. Entsprechend dem nationalen und internationalen Kenntnisstand wies die Diatomeen-Liste von Anfang an über Deutschland hinaus und hatte den Anspruch, zumindest für Mitteleuropa anwendbar zu sein.

Im Falle der Desmidiales musste dagegen viel Aufbauarbeit geleistet werden, da die meisten monographischen Bearbeitungen Jahrzehnte zurücklagen und weder für Deutschland noch für Europa eine einheitliche Bearbeitung aller Gattungen vorlag. Bei den Desmidiales war und ist der Fokus Deutschland (In den Niederlanden und in Österreich existieren Rote Listen, die aufgrund unterschiedlicher naturräumlicher Gegebenheiten und taxonomischer Traditionen von der deutschen Liste abweichen).

Beide deutschen Listen (Diatomeen und Desmidiales) haben sich in der Praxis bewährt, wobei die Diatomeen-Liste in einem weiteren Spektrum von Gewässertypen einsetzbar ist. Die Desmidiales-Liste, ermöglicht eine besonders gute Auflösung in Moorgewässern. Seit der Erstellung der ersten Listen hat es bei den Diatomeen starke, bei den Desmidiales geringfügige Veränderungen bei den Gattungskonzepten ergeben. Bei der Überarbeitung beider Listen wurde das zu Grunde liegende System maßvoll modernisiert und neue Erkenntnisse wurden eingearbeitet.

Die Liste der Diatomeen wurde erheblich erweitert (ca. 486 neue Taxa) die der Desmidiales leicht (27 neue Taxa). Basis für die Erweiterung sind neubeschriebene Taxa (z.B. *Hippodonta coxiae* Lange-Bertalot, *Cosmarium ornulatulum* var. *depressum* Coesel) und Neufunde für Deutschland (z.B. *Staurastrum bloklandiae* Coesel et Joosten). Einige Taxa werden aufgrund von Kenntnisgewinn oder leicht veränderten Kriterien günstiger bewertet (z.B. *Didymosphenia geminata* (Lyngbye) M. Schmidt, *Navicula hofmanniae* Lange-Bertalot, *Staurastrum tetracerum* Ralfs), einige als stärker gefährdet eingestuft als bisher (z.B. *Cymbella helvetica* Kützing).

Der Großteil der Taxa ist jedoch hinsichtlich der Einstufung stabil geblieben. Die kompletten neuen Florenlisten und Roten Listen für Deutschland sollen Ende 2008 in gedruckter Form vorliegen und zur Diskussion stehen.

References:
Lange-Bertalot H., 1996. Rote Liste der limnischen Kieselalgen (Bacillariophyceae) Deutschlands. *Schriftenreihe Vegetationsk.*, H 28, 633-677.
Gutowski, A. & D. Mollenhauer 1996: Rote Liste der Zieralgen (Desmidiales) Deutschlands. - *Schriftenreihe Vegetationsk*. 28: 679-708.

[*Biodiversity, biogeography and collections.* Poster N. 43]

Adding content to content - a generic annotation system for biodiversity data

GÜNTSCH A.[1], BERENDSOHN W.G.[1], CIARDELLI P.[1], HAHN A.[2], KUSBER W.-H.[1], LI J.[3] and OANCEA, C.[1]
[1]Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin Königin-Luise-Str. 6-8, D-14195 Berlin, Germany; BiodiversityInformatics[at]bgbm.org
[2]Global Biodiversity Information Facility (GBIF) Secretariat, Universitetsparken 15, DK-2100 Copenhagen, Denmark
[3]Northwestern University, Department of Industrial Engineering & Management Sciences, 2145 Sheridan Road, Evanston, IL 60208, USA

Traditionally, biological collection objects consist of representative material collected at a single place at a certain point in time. For example, an object may be mounted on cardboard, with a label containing information provided by the collector. Over time, a variety of other information is added in the form of annotations representing corrections, confirmations and results of scientific analyses. Annotations increase the value of biological collections and ensure that scientists working in collections have access to scientific results of previous studies associated with the objects of interest.

Electronic collection information systems now provide access to many millions of objects via common Internet portals, but have also interrupted the traditional flow of annotation information. A convincing method for adding information to the electronic surrogate of a collection object, and for feeding the information back to the collection holder, has yet to be developed.

The EU 6th Framework project SYNTHESYS has tackled the problem and developed a structured annotation system for the European collection information network BioCASE (Biological Collection Access Service, search.biocase.org). Instead of sending annotations as unstructured free text, the system allows users to correct collection data records directly and send them back to collection holders; the collection holders then compare different "versions" of a record and decide which corrections, changes or additions should be fed back into the collection database. Additionally, all annotations to an object - and therefore the change history of the information - are accessible via public server.

[*Biodiversity, biogeography and collections.* Poster N. 44]

Does *Elodea* affect periphyton? A comparison of epiphytic diatoms on natural and artificial plants

FUKAMORI Y., PLEDL A., ERHARD D. and RAEDER U.

Various abiotic and biotic factors determine the periphyton composition, among others nutrients, light availability, and the substrate. In our study effects of the macrophyte *Elodea*, an allelopathically active species, were investigated in lakes as well as in running waters.

The composition of diatoms on *Elodea nuttallii* and as well on similar artificial plants was compared in a shallow bay of Lake Starnberg. At the sampling site in the Sindelsbach, a creek in South-Bavaria, diatom composition on *Elodea canadensis* and on plastic analogs were compared. The diatom samples were collected monthly from June 2007 to November 2007.

Although both substrates were covered with the same diatom species, and exhibited a similar seasonal trend in diatom composition, the relative importance of the species was somewhat affected by the substrate. At Lake Starnberg significant differences between the natural and the artificial plants concerning the frequency of occurrence of a few species could be observed at some sampling days. The diversity of the diatom assemblages was higher on the natural than on the artificial leaves particularly from September onwards.

All natural and artificial substrates were colonized by nearly the same diatom communities. There was no evidence for any effect of *Elodea* on its diatom periphyton.

[*Biodiversity, biogeography and collections.* Poster N. 45]

Phytogeographic analysis of the diatom algal flora of continental Israel

BARINOVA S., KRASSILOV V. and NEVO E.
Institute of Evolution, University of Haifa, Mount Carmel, Haifa, 31905, Israel
E-mail: barinova@research.haifa.ac.il

The previously recorded (Nevo & Wasser, 2000) and recently revised taxonomic diversity of freshwater algae of Israel includes 1621 species of 289 genera from ten divisions (Barinova, et al., 2004, 2005, 2006a,b). The taxonomic and ecological information is integrated in the data-base (Barinova, et al., 2006c) used in the following analysis. We defined a leading group comprising more than 50% of all species that determines the aspect of the regional algoflora. These species belong to three divisions: Bacillariophyta, Cyanoprokaryota, and Chlorophyta. The diatoms constitute 32% (523 species). A notable feature of the taxonomic structure is a large proportion of species represented by a single variety only.

Israel presents a unique diversity of algal environments for such a small territory. The freshwater algae were collected from a wide range of altitudinal belts, from coastal plains to mountainous areas about 2000 m high, and over the four phytogeographic realms recognized on the basis of the higher plant differentiation. Here we analyze statistical regularities of diatom distribution, and compare them with the phytogeographic zonation based on higher plants. We recognized 42 types of geographic ranges combined in six phytogeographic domains. Four clusters of diatom taxa correspond to the coastal plains (I), the Judean and Galilean highlands (II), piedmonts (III), and the Dead Sea – Kinneret Lake Rift Valley (IV).

The prevailing species are cosmopolitan or widespread in the Northern hemisphere, but there is also a considerable participation of rare and endemic elements. Remarkably, the algoflora contains both circumpolar and tropical species. The species traditionally ascribed to the arctic-alpine group, such as *Pinnularia alpine*, are found both in the piedmonts and in the Rift valley, therefore being scarcely restricted to the highland habitats. The group of Mediterranean species is represented not only in the corresponding terrestrial vegetation domain, but also in the Rift Valley. However, a close correspondence was found in distribution of higher plants and diatoms of the Paleotropical, Sakharo-Arabian and Sudano-Zambesian provinces. Generally, the boundaries marked by the diatom distribution appear less distinct, with more ecotonal species, than the corresponding terrestrial vegetation boundaries.

The endemic diatoms, altogether 10 species (about 1% of the algoflora, which is not a negligible number for a small territory), are confined to the Rift Valley and the adjacent areas of Central Negev. They are mostly interpreted as neoendemics, reflecting the Quaternary history of the Rift Valley environments and biota. On paleopalynological evidence (Horowitz, 1979) climatic conditions in the Negev were relatively humid during the Pliocene and the pluvial phases of the Quaternary, supporting Mediterranean type vegetation. The freshwater ecosystems under such climates might have approached those of present - day northern Israel. Differentiation of endemic species might have occurred under the impact of aridization through the Holocene, and the recent warming.

References:

Barinova S.S., Anissimova O.V., Nevo E., Jarygin M.M. & S.P. Wasser, 2004. Diversity and Ecology of Algae from Nahal Qishon, Northern Israel. *Plant Biosystems*, 138(3): 245-259.

Barinova S.S., Anissimova O.V., Nevo E., & E. Wasser, 2005. Diversity and ecology of phytoplankton and periphytonof the Nahal Oren, Alon Natural Park, Northern Israel. *Algological Studies* 116:169-197.

Barinova S.S., Tavassi M. & E. Nevo, 2006a. Algal indicator system of environmental variables in the Hadera River basin, central Israel. *Plant Biosystems* 140 (1): 65-79.

Barinova S.S., Tavassi M. & E. Nevo, 2006b. Diversity and ecology of algae from Alexander River (Central Israel). *Flora Mediterranea* 16: 111-132.

Barinova S.S., Medvedeva L.A. & O.V Anisimova, 2006c. *Diversity of algal indicators in the environmental assessment.* Pilies Studio, Tel Aviv, 498 pp. (in Russian). http://herba.msu.ru/algae/materials/book/title.html
Horowitz A., 1979. *The Quaternary of Israel. New York*: Acad. Press, 394 pp.
Nevo E. & S.P. Wasser (Eds.), 2000. Biodiversity of cyanoprocaryotes, algae and fungi of Israel. Cyanoprocaryotes and algae of continental Israel. A.R.G. Gantner Verlag, Ruggell /Leichtenstein.

[*Biodiversity, biogeography and collections.* Poster N. 46]

Central European Diatom Meeting (*CEDIATOM2)*
Trentino Nature & Science Museum, Trento , Italy, 12-15 June 2008
Abstract Book (M. Cantonati, A. Scalfi & E. Bertuzzi Eds.)

New and interesting non-marine diatom species from James Ross Island (Antarctic Region)

KOPALOVÁ K.[1], NEDBALOVÁ L.[1,2] and VAN DE VIJVER B.[3]
[1] Charles University in Prague, Faculty of Science, Department of Ecology, Viničná 7, Prague 2, 128 44, Czech Republic
[2] Academy of Science of the Czech Republic, Institute of Botany, Section of Plant Ecology, Dukelská 135, 379 82 Třeboň, Czech Republic
[3] National Botanical Garden, Departement of Bryophyta & Thallophyta, Domein van Bouchout, B-1860 Meise, Belgium
E-mail: k.kopalova@hotmail.com

In 2006, the first Czech Antarctic station was built on James Ross Island (64°10'S, 57°45'W), a large (2450 km²) island situated in the north-western part of the Weddell Sea, close to the northern tip of the Antarctic Peninsula. More than 75% of the island is covered with a permanent icecap, leaving only the northern part ice-free.

During the Antarctic summers of 2004 - 2007 a large number of samples were collected from seepage areas and streams. The analysis of these samples resulted in the observation of a well-developed diatom flora consisting of 55 non-marine diatom species. Until recently, it was commonly accepted that most species of non-marine diatoms occurring in the Antarctic Region are cosmopolitan. Only a very low percentage of the listed species showed a limited (Antarctic) distribution.

However, recent detailed morphological investigations presented substantial evidence that this was an incorrect assumption based on force-fitting and the use of non-appropriate taxonomic literature. After detailed morphological research, four species, within the list of observed species of James Ross Island, proved to be new to science.

Two of the new species belong to the genus *Luticola*: *Luticola truncata* Kopalová & Van de Vijver sp. nov. and *L. austroatlantica* Van de Vijver, Kopalová, Spaulding & Esposito sp. nov. The latter species was also found on the Antarctic Continent. These two species can be separated from the well-known, Antarctic endemic *Luticola muticopsis* s.s. (Van Heurk) Mann by having a different outline and dimensions. A third species, *Diadesmis inconspicua* sp. nov., is characterized by having a very large number of striae and a very simple raphe structure lacking any typical raphe endings. The fourth species, *Eolimna jamesrossensis* sp. nov., is distinguished from all other *Eolimna* and *Mayamaea* species by its valve outline and a different striae density.

This poster presents these four new species, together with some other interesting Antarctic taxa.

[*Biodiversity, biogeography and collections.* Poster N. 47]

Psammothidium abundans: The unmasking of an Antarctic endemic

VAN DE VIJVER B.[1], KELLY M.[2], BLANCO S.[3], JARLMAN A.[4] and ECTOR L.[5]
[1]National Botanic Garden of Belgium, Department of Bryophytes & Thallophytes, Domein van Bouchout, B-1860 Meise, Belgium
[2]Bowburn Consultancy, 11 Monteigne Drive, Durham DH6 5QB, United Kingdom
[3]Area de Ecología, Universidad de León, E-24071 León, Spain
[4]Jarlman HB, Stora Tvärgatan 33, S-223 52 Lund, Sweden
[5]Public Research Center - Gabriel Lippmann, Department of Environment and Agro-Biotechnologies, 41, rue du Brill, L-4422 Belvaux, Luxemburg
E-mail. vandevijver@br.fgov.be

Psammothidium abundans (Manguin) Bukhtiyarova & Round was described 50 years ago from the sub-Antarctic Kerguelen archipelago (southern Indian Ocean). Apart from single occurrences in South Africa, southern Australia and Tierra del Fuego, the reported distribution of this species is restricted to the (sub-)Antarctic Region. In the northern hemisphere, the species was only very sporadically reported from two rivers in Scotland. During surface water surveys in Sweden, United Kingdom and Ireland (as part of water quality investigations), several populations of an Achnanthoid species similar in appearance to *P. abundans* have been found in rivers and brooks.

The morphological analysis of the European forms, together with a thorough examination of the type material (including lectotypification of *P. abundans*), could not reveal any morphological differences between the European and sub-Antarctic (type) populations.

This poster is the result of the morphological study of this species and raises questions about how the species ended up so far from its original distributional range. After elimination of all possible dispersion abilities, it is most likely that the species has always been present in the European rivers but has been overlooked till now. Possible causes for this are a.o. the lack of appropriate identification literature during standard European water monitoring, species drift & force-fitting and the fact that many rivers have not been thoroughly studied. Taxa that might present some confusion such as *P. abundans* var. *rosenstockii* (Lange-Bertalot) Bukhtiyarova or *Rossithidium petersenii* (Hustedt) Round et Bukhtiyarova are shown on the poster and the differences with *P. abundans* are discussed.

References:

Van de Vijver B., Kelly M., Blanco S., Jarlman A. & L. Ector, 2008. The unmasking a sub-antarctic endemic: *Psammothidium abundans* (Manguin) Bukhtiyarova et Round in European rivers. *Diatom Research*, 23 (1), 233-242.

[*Biodiversity, biogeography and collections.* Poster N. 48]

Assemblages of *Mastogloia* species in the Greek Mediterranean coast line: Diversity and distribution.

ULANOVA A. and SNOEIJS P.
Department of Botany, Biology and Soil Sciences Faculty, St. Petersburg State University, Universitetskaya emb., 7/9, 199034, St. Petersburg, Russia
Department of Systems Ecology, Stockholm University, SE-10691 Stockholm, Sweden
E-mail: anna_ulanova@yahoo.com

About 100 diatom samples were collected from littoral pools and from the sub-littoral zone at 30 sampling sites on of the Mediterranean Sea coast on four Greek Islands between 2004 and 2007. These islands are part of different archipelagos: Skiathos (to the North), Samos (to the East) and Karpathos and Crete (to the South). Our choice of islands reflects the diversity and distribution of diatom taxa along ecological gradients.

Diatom communities and assemblages were composed of epilithic, epiphytic and epipsammic species. Preliminary results revealed that about about 350 diatom taxa occurred in the samples. The genus *Mastogloia* was the most abundant and species-rich genus. At least 29 different *Mastogloia* species were identified and studied by light and scanning electron microscopy. Some samples, collected from submerged stones at sandy beach areas from Skiathos in 2004 and from Samos in 2007, contained only different Mastogloia species and no other diatoms.

The most abundant species was *Mastogloia cocconeiformis* Grunow. We found this species in every sample containing sand grains. Some other species abundant at some of the sampling sites were *Mastogloia corsicana* Grunow, *M. binotata* (Grunow) Cleve, *M. fimbriata* (Bright) Cleve and *M. splendida* Hustedt. It seems that differences in distribution and species richness of *Mastogloia* spp. among different sites on the Greek islands coast depend on substrate type and the degree of exposure to wave action. The highest diversity of *Mastogloia* taxa was recorded in samples with sand and with stagnant water, as well as in samples where sand was associated with some small macroalgae.

[*Biodiversity, biogeography and collections.* Poster N. 49]

The *Cyclotella comensis* complex in alpine and pre-alpine lakes

SCHMIDT R.[1], HUBER K.[1], WECKSTRÖM K.[1] and KLEE R.[2]
[1]Institute of Limnology, Austrian Academy of Sciences, Mondseestrasse 9, A-5310 Mondsee, Austria
[2]Bayerisches Landesamt für Umwelt, Demollstrasse 32, D-82407 Wielenbach, Germany
E-mail: roland.schmidt@oeaw.ac.at

Cyclotella comensis was described 1882 by Grunow from Lago di Como, Italy. The valves indicate major depressions associated with punctae in the central area, which are arranged in a more or less distinct radial pattern. Beside the type, Wunsam et al. (1995) distinguished four morphotypes in sediment surfaces of lakes from the Alps and pre-Alps, which they assigned to *C. comensis*. These types mainly differ in structure and ornamentation of the central area: (1) valves with a punctate radial ornamentation, (2) with a colliculate ornamentation, (3) with a tangentially undulated central area, (4) with an irregularly shaped ("frinsed") central area. These types are shown in light and electron microscopical (SEM) images. The morphotypes were related to chemical measurements in the lake data set; mean summer epilimnetic water temperature (T °C), pH, conductivity, ammonium and nitrate, and total phosphorus (TP). This lake data set was amalgamated with another one from mountain lakes in the Austrian Alps, where the same morphotypes were counted (Schmidt et al. 2004, and unpublished) resulting in a data set of, altogether 86 lakes. Ammonium and nitrate were summarised as total inorganic nitrogen (TIN). Statistical analyses were applied to determine if these morphotypes differ in their ecological preferences. We used "HOF", a gradient analysis using Huisman-Olff-Fresco models with maximum likelihood (Oksanen & Minchin 2002). "HOF" species response curves indicated no significant difference in the ecological preferences between the *C. comensis* type and the morphotype (1), only a gradual one. The latter tends to prefer lower T °C, showing highest abundancies in the colder, high-alpine lakes. Transitional morphological features are in agreement with the ecological gradient, and hence suggest conspecifity. The morphotypes (2), (3), and (4) showed higher temperature and conductivity optima and a tendency to higher nutrient concentrations (slightly mesotrophic).

References:
Oksanen J. & P.R. Minchin, 2002. Continuum theory revisited: what shape are species responses along ecological gradients? *Ecological Modelling* 157: 119-129.
Schmidt R., Kamenik C., Kaiblinger C. & M. Hetzel, 2004. Tracking Holocene environmental changes in an alpine lake sediment core: application of regional diatom calibration, geochemistry, and pollen. *J. Paleolimnol.* 32: 177-196.
Wunsam S., Schmidt R. & R. Klee, 1995. *Cyclotella*-taxa (Bacillariophyceae) in lakes of the Alpine region and their relationship to environmental variables. *Aquat. Sci*. 57: 361-386.

[*Biodiversity, biogeography and collections.* Poster N. 50]

Cavernosa kapitiana Stidolph, an unusual centric diatom from the subantarctic region

CREMER H. [1] and VAN DE VIJVER B.[2]
[1]TNO Built Environment and Geosciences, Geological Survey of the Netherlands, Princetonlaan 6, 3584 CB Utrecht, The Netherlands
[2]National Botanical Garden of Belgium, Department of Bryophyta & Thallophyta, Domein van Bouchout, 1860 Meise, Belgium
E-mail:holger.cremer@tno.nl
E-mail: vandevijver@br.fgov.be

The genus *Cavernosa* was originally described by Stidolph in 1990 from a small island off the Northern Island of New Zealand. It is characterized by the presence of a series of large cavities, so-called caverns, in the valve interior and the absence of carino- and fultoportulae, thus distinguishing *Cavernosa* from similar centric genera such as *Orthoseira* or *Melosira*.

During a sampling survey of the soil-inhabiting diatoms on Ile de la Possession (Crozet Archipelago, southern Indian Ocean) several populations of *Cavernosa* were found, living in narrow scratches in the cliffs bordering the ocean. A morphological study of these populations indicates that the subantarctic specimens belong to the single known species within *Cavernosa, C. kapitiana* Stidolph. However, more detailed LM and SEM observations of the subantarctic material revealed several new features in addition to the original description by Stidolph.

In the subantarctic material chains of up to 14 individuals of *C. kapitiana* were found thus contradicting Stidolph`s statement of a solitary life form of this species. The populations from Ile de la Possession contain also a considerable number of circular frustules with an irregular cavity pattern and two rimoportulae. These frustules most likely represent initial cells that were not described from the original material. The newly identified ultrastructural features support an emended description of both the genus *Cavernosa* and *C. kapitiana*.

This poster illustrates the new observations and compares the morphology of the subantarctic populations is compared with *Cavernosa kapitiana* in the type material from New Zealand.

References:

Stidolph, S.R., 1990. *Cavernosa kapitiana*, a new diatom genus and species from Kapiti Island, New Zealand. *Nova Hedwigia* 50: 97-110.

[*Biodiversity, biogeography and collections.* Poster N. 51]

The Van Heurck Collection: A phoenix rises from its ashes

VAN DE VIJVER B., COCQUYT C. and RAMMELOO J.
National Botanic Garden of Belgium, Department of Bryophytes & Thallophytes, Domein van Bouchout, B-1860 Meise, Belgium
E-mail: vandevijver@br.fgov.be

Henri Ferdinand Van Heurck (1838-1909) is considered to be the most famous Belgian diatomist of the past 200 years. During his life, Van Heurck maintained an intensive correspondence with almost all contemporary diatomists such as de Brébisson, Grunow, Kützing, Janisch, H.L. Smith and Walker Arnott. The exchange of material and information between Van Heurck and his colleagues resulted in the creation of an immense diatom collection, comprising nowadays about 19.000 microscopical slides. Among these slides, a lot of type material can be found, making this collection even more valuable.

Van Heurck was not only a collector of interesting slides. His bibliographic oeuvre comprises a wide variety of papers dealing with various diatom and microscopical topics such as the important "Synopsis des diatomées de Belgique" (1880-1885) and the report of the diatoms of the Belgica expedition (published several months after his death in 1909).

Besides the impressive diatom collection, Van Heurck established also a very important herbarium, a large collection of dried spices and fungi, bezoars, plant models and insects. His collection of microscopes, including one of the last remaining Van Leeuwenhoeck microscopes, was world famous. His book "Le Microscope" (1878) became a standard work in microscopy of which several editions were published.

After long negotiations on one hand between the city of Antwerp, the Antwerp Zoo and on the other hand the National Botanic Garden of Belgium, all botanical parts of this collection are transferred to the National Botanic Garden where they will be made accessible to scientists from all over the world. Visitors to the collection are welcome on appointment. Due to the fragility of certain preparations, no material can be loaned but need to be consulted in situ.

References:
Van Heurck H. F., 1878. *Le Microscope*. Troisieme édition. Ramlot, Bruxelles, 346 pp.
Van Heurck H. F., 1880–1885. *Synopsis des Diatomées de Belgique*. Anvers, 235pp
Van Heurck H.F., 1909. *Résultats du Voyage du S.Y. Belgica. Botanique* – Diatomées. Anvers, 127pp + 13 planches.

[Poster N. 52]

The diatom species described by John R. Carter (1962) from Tristan da Cunha and Gough Island

KOPALOVÁ K.[1], NEDBALOVÁ L.[1,2], GREMMEN N.J.M.[3] and VAN DE VIJVER B.[4]
[1] Charles University in Prague, Faculty of Science, Department of Ecology, Viničná 7, Prague 2, 128 44, Czech Republic
[2] Academy of Science of the Czech Republic, Institute of Botany, Section of Plant Ecology, Dukelská 135, 379 82 Třeboň, Czech Republic
[3] Data-Analyse Ecologie, Hesselsstraat 11, Nl-7981 CD Diever, The Netherlands
[4] National Botanical Garden, Departement of Bryophyta & Thallophyta, Domein van Bouchout, B-1860 Meise, Belgium
E-mail: k.kopalova@hotmail.com

In 1962 John R. Carter analyzed 12 samples from Tristan da Cunha (37°06′ S, 12°16′ W) and nearby Gough Island (40°20′ S, 10°0′ W). In these samples, he described 56 new species, varieties and formas, published in *Nova Hedwigia*. The type slides were deposited in the British Museum.

In the framework of an ongoing extensive survey of the non-marine diatoms from Gough Island, it was necessary to re-analyze these species using modern light and scanning electron microscopy, since all new species were only illustrated by one or a few, sometimes very small, drawings.

Although the quality of the type slides is fairly good, we encountered several problems during the slide analysis. The poster discusses these problems and possible solutions.

1. Some species could not be found in the reported type slides, for instance *Achnanthes sumara* Carter and *Navicula nienta* Carter.
2. The reported species list for each sample did not always correspond to the actually observed species list in some samples.
3. We observed several species in these slides, most probably also new to science, which were not described by Carter.
4. Several species were not described validly according to the International Code of Botanical Nomenclature (invalid holotype designation)
5. There does not seem to exist any non-mounted material of these collections, which would have made it possible to produce SEM images for these species.

Despite these difficulties, the re-analysis of the material resulted in a better understanding of most species described by Carter. The poster presents some of these species, such as *Achnanthes (Psammothidium) investians*, *Eunotia diverta*, *E. morbida*, *E. pectinoides* (under its new name *E. johncarteri* Williams), *Gomphonema asymmetricum*, *Navicula amerinda*, *Pinnularia restituta*, *P. seriata*, and *Pseudoeunotia linearis*. Comments on their morphology and their present taxonomical position are given. Several other (so far unidentified) species are also shown.

The results will later be used when we analyze the diatom diversity in a set of 250 recently collected samples from Gough Island.

[Poster N. 53]

Participants

Dr. **Angeli**, Nicola
Museo Tridentino di Scienze Naturali, Limnology and Phycology Section
Via Calepina 14, 38100 Trento, Italy
[angeli@mtsn.tn.it]

Dr. **Barinova**, Sophia
Institute of Evolution, University of Haifa
Mount Carmel Haifa, 31905, Israel
[barinova@research.haifa,ac,il]

Dott. **Battegazzorre**, Maurizio
ARPA Piemonte
Via Comunale Mondovì 11, 12013 Chiusa di Pesio (CN)
[m.battegazzorre@arpa.piemonte.it]

Dott. **Beltrami**, Maria Elena
Fondazione E. Mach - Istituto Agrario di San Michele all'Adige
Via E. Mach 1, 38010 San Michele all'Adige (TN), Italy
[mariaelena.beltrami@iasma.it]

Dr. **Bertuzzi**, Ermanno
Museo Tridentino di Scienze Naturali, Limnology and Phycology Section
Via Calepina 14, 38100 Trento, Italy
[bertuzzi@mtsn.tn.it]

Brinkmann, Nicole
Georg-August University of Göttingen, Experimental Phycology and Culture Collection of Algae (SAG)
Nikolausberger Weg 18, 37073 Göttingen
[nbrinkm@uni-goettingen.de]

Dr. **Buczkó**, Krisztina
Hungarian Natural History Museum, Department of Botany
Budapest, PB 222, 1476, Hungary
[buczko@bot.nhmus.hu]

Dr. **Cantonati**, Marco
Museo Tridentino di Scienze Naturali, Limnology and Phycology Section
Via Calepina 14, 38100 Trento, Italy
[cantonati@mtsn.tn.it]

Dott. **Cappelletti**, Cristina
Fondazione E. Mach - Istituto Agrario di San Michele all'Adige
Via E. Mach 1, 38010 San Michele all'Adige (TN), Italy
[cristina.cappelletti@iasma.it]

Dott. **Centis**, Barbara
Fondazione E. Mach - Istituto Agrario di San Michele all'Adige
Via E. Mach 1, 38010 San Michele all'Adige (TN), Italy
[barbara.centis@iasma.it]

Dott. **Ciutti**, Francesca
Fondazione E. Mach - Istituto Agrario di San Michele all'Adige
Via E. Mach 1, 38010 San Michele all'Adige (TN), Italy
[francesca.ciutti@iasma.it]

Dr. **Cremer**, Holger
TNO Built Environment and Geosciences, Geological Survey of The Netherlands
Princetonlaan 6, 3584 Cb Utrecht, The Netherlands
[holger.cremer@tno.nl]

Dreßler, Mirko
University of Rostock, Institute for Botany, Department of Bio-Science
Wismarsche Str. 8, D-18051 Rostock, Germany
[mirko.dressler@gmx.de]

Dulic, Tamara
Department of Biology and Ecology, Faculty of Natural Sciences, University of Novi Sad
Stevana Musica 15, 21000 Novi Sad, R. Serbia
[dulici@neobee.net]

Ector, Luc
Public Research Center - Gabriel Lippmann, Department Environment and Agro-biotechnologies (EVA)
Rue du Brill 41, L-4422 Belvaux, Grand-duchy of Luxembourg
[ector@lippmann.lu]

Erhard, Daniela
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[Daniela.Erhard@wzw.tum.de]

Dr. **Evans** Katharine
Royal Botanic Garden Edinburgh
20A Inverleith Row, Edinburgh, EH3 5LR, United Kingdom
[k.evans@rbge.ac.uk]

Fein Markus
Demollstrasse 31 82407 Wielenbach, Germany
[markus.fein@lfu.bayern.de]

Fránková Kozáková Markéta
Department of Botany and Zoology, Faculty of Science, Masaryk University, Kotlarska 2, CZ 61137 & Brno Institute of Botany, Academy of Science of the Czech Republic
[marketka.kozakova@seznam.cz]

Fukamori, Yumi
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
Phone-No. 0049 8856 8100

Prof. Dr. **Geissler**, Ursula
Lepsiusstr. 88, 12165 Berlin, Germany
[Tel. 0049 30 7925469]

Mag. **Gesierich**, Doris
Institut für Botanik der Universität Innsbruck
Sternwartestrasse 15, 6020 Innsbruck, Austria
[Doris.Gesierich@uibk.ac.at]

Dr. **Goos**, Conni
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[connigoos@goos.de]

Dr. **Goos**, Frank-Martin
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[fmgoos@goos.de]

Dr. **Hafner**, Dubravka
University of Mostar, Faculty of Natural-Mathematic Sciences and Education
Matice hrvatske bb street, BiH-88000 Mostar, Bosnia and Herzegovina
[dubhafner@net.hr]

Heger, Herta
Wehrgasse 11a/7, 1050 Wien, Austria
[hegerh@aon.at]

Hoeg, Sigrid
Dannenreicher Pfad 35, 12589 Berlin, Germany
[sigrid.hoeg@t-online.de]

Hoffmann, Markus
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[Markus_A_Hoffmann@web.de]

Dr. **Hofmann**, Gabriele
Hirtenstraße 19, 61479 Glashütten (Taunus), Germany
[GM.Hofmann@t-online.de]

Prof. **Honsell**, Giorgio
Università degli Studi di Udine - Biologia e Protezione delle Piante
Via del Cotonificio, 108 33100 Udine
[giorgio.honsell@uniud.it]

Horn, Michel
ADLaF
11 rue des Coursières, 14280 St. Germanin la Blanche Herbe, France
[michel.horn@ecologie.gouv.fr]

Dr. **Jarlman**, Amelie
Jarlman HB
Stora Tvärgatan 33, Se-223 52 LUND, Sweden
[jarlman@mac.com]

Prof. Dr. **Jasprica**, Nenad
Institute for Marine and Coastal Research, University of Dubrovnik
P.O. Box 83, HR - 20000 Dubrovnik, Croatia
[nenad.jasprica@unidu.hr]

Dr. **Jüttner**, Ingrid
National Museum Wales, Department of Biodiversity and Systematic Biology
Cathays Park, Cardiff, CF10 3NP, United Kingdom
[Ingrid.Juettner@museumwales.ac.uk]

Kapetanović, Tatjana
Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin, Königin-Luise-Straße, 14195 Berlin, Germany
[t.kapetanovic@bgbm.org]

Dr. **King**, Lydia
Lancaster University
Amberg 1, 88326 Aulendorf-Zollenreute, Germany
[.l.king@lancaster.ac.uk]

Klamt, Anna-Marie
Uni Rostock
Erich-Schlesinger-strabe 19 (Zi.-Nr. 1.05.03.01) 18059 Rostock
[Anna-Marie.Klamt@uni-rostok.de]

Dr. **Koinig**, Karin
Institute of Ecology, University of Innsbruck
Technikerstr. 25, 6020, Innsbruck, Austria
[karin.koinig@uibk.ac.at]

Prof. **Komárek**, Jiří
Faculty of Biological Sciences, University of South Bohemia, Ceské Budejovice &
Institute of Botany, Algology Department, AS CR, Třeboň, Czech Republic
[komarek@butbn.cas.cz]

Komulaynen Sergey
Institute of Biology, Karelian Research Center, Russian Academy of Science
185910 Petrozavodsk, Pushkinskaya str. 11, Russia
[komsf@krc.karelia.ru]

Kopalová, Kateřina
Department of Ecology, Faculty of Science, Charles University in Prague
Albertov 6, Prague 2 ,12000, Czech Republic
[k.kopalova@seznam.cz]

Prof. **Krassilov**, Valentin
Institute of Evolution, University of Haifa
Mount Carmel Haifa, 31905, Israel
[krassilo@research.haifa.ac.il]

Dr. **Kusber**, Wolf-Henning
Botanischer Garten und Botanisches Museum Berlin-Dahlem, Freie Universität Berlin
Königin-Luise-Straße 6-8, 14195 Berlin, Germany
[w.h.kusber@bgbm.org]

Prof. Dr. **Lange-Bertalot**, Horst
Johann Wolfgang Goethe-Universität Frankfurt am Main; Institut für Ökologie, Evolution und Diversität
Privat: Silberweg 3, 61350 Bad Homburg v.d.H., Germany
[FAX: 06172-301197]

Dr. **Leira**, Manel
Faculty of Sciences, Campus da Zapateira, University of A Coruna
15071 A Coruña Spain & Trentino Nature & Science Museum Trento
[mleira@udc.es]

Dr. **Levkov**, Zlatko
Institute of Biology, Faculty of Natural Sciences
Friedrich Hustedt Study Centre for Diatoms, Alfred Wegener Institute for Polar and Marine Sciences
Gazi Baba, Bb. 1000 Skopje, Republic of Macedonia
[zlevkov@iunona.pmf.uim.edu.mk]

Dr. **Lopez, Rodriguez** Mª Carmen
Facultad Biologia University of Santiago de Compostela
Campus sur. 15706 Santiago de Compostela, Spain
[bvcarlop@usc.es]

Dr. **Ludikova,** Anna
Institute of Limnology, Russian Academy of sciences
196195 Sevastyanova str. 9 St. Petersburg, Russia
[anna_geo2000@yahoo.co.uk]

Dott. **Macor**, Arianna
Università degli Studi di Udine - Biologia e Protezione delle Piante
Via del Cotonificio, 108 33100 Udine
[arianna.macor@uniud.it]

Dott. **Mancini**, Laura
Department of Environment and Primary Prevention, National Institute of Health, Italy
Viale Regina Elena 299 00161, Roma
[laura.mancini@iss.it]

Dott. **Milan**, Manuela
Fondazione E. Mach - Istituto Agrario di San Michele all'Adige
Via E. Mach 1, 38010 San Michele all'Adige (TN), Italy
[milan.manuela@iasma.it]

Moravcová, Adéla
Charles University in Prague, Faculty of Sciences, Department of Ecology
Viničná 7, 128 44 Prague 2, Czech Republic
[adela.moravcova@gmail.com]

Dr. **Nedbalovà,** Linda
Charles University in Prague, Faculty of Science, Department of Ecology
Viničná 7, 128 44 Praha 2, Czech Republic
[lindane@natur.cuni.cz]

Nesterovich, Anna
Department of Botany, Faculty of Biology and Soil Sciences
Saint-Petersburg State University
Universitetskaya Emb., 7/9, 199034 Saint-Petersburg, Russia
[ANesterovich@gmail.ru]

Novais, Maria Helena
Public Research Center - Gabriel Lippmann, Department Environment and Agro-biotechnologies (EVA)
Rue du Brill 41, L-4422 Belvaux, Grand-duchy of Luxembourg
[hnovais@uevora.pt]

Pavlov, Aleksandar
Institute of Biology, Faculty of Natural Sciences, Skopje
Bul. "ASNOM" 40/38, 1000 Skopje, R. Macedonia
[pavlovaleksandar@gmail.com]

Penalta Rodriguez, Maria
Facultad Biologia, University of Santiago de Compostela
Campus sur. 15706 Santiago de Compostela
[bvmaria@usc.es]

Dr. **Picińska-Fałtynowicz**, Joanna
Institute of Meteorology and Water Management, Wroclaw Branch, Department of Ecology
Parkowa 30, 51-616 Wrocław, Poland
[joanna.fałtynowicz@imgw.wroc.pl]

Prof. **Pienitz**, Reinhard
Centre d'études nordiques, Université Laval
Pavillon Abitibi-Price, 2405, rue de la Terrasse, Quebec (QC) G1V 0A6, Canada
[reinhard.pienitz@cen.ulaval.ca]

Pledl, Andrea
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[AngiePL@gmx.de]

Dott. **Poggi**, Claudia
Università di Padova, Dip. di Biologia
Via Ugo Bassi 58 B, 35141 Padova, Italy
[clafu_erbivora@yahoo.it]

Prof. **Poulíčková**, Aloisie
Dept. of Botany, Faculty of Science, Palacky University Olomouc
Svobody str. 26, 77146 Olomouc, Czech Republic
[aloisie.poulickova@upol.cz]

Dr. **Preisig,** Hans
Institut für Systematische Botanik, Universität Zurich
Zollikerstrasse 107, 8008 Zürich, Switzerland
[preisig@systbot.uzh.ch]

Dott. **Puccinelli**, Camilla
Department of Environment and Primary Prevention, National Institute of Health, Italy
viale Regina Elena 299 00161, Roma
[camilla.puccinelli@iss.it]

Dr. **Pum**, Manfred
A 2344 Ma. Enzersdorf, Sudstadtzentrum 4
[Manfred.Pum@.nua.co.at]

Dr. **Raeder**, Uta
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[uta.raeder@wzw.tum.de]

Reichardt, Erwin
Bubenheim 136, 91757 Treuchtlingen, Germany
[erwin.reichardt@freenet.de]

Rivognac Laurent
Association Normande de Limnologie
34, rue du docteur Heulin, 75017 Paris
[laurent.rivognac@gmail.com]

Prof. Dr. **Rott**, Eugen
Institut für Botanik
Sternwartestrasse 15, 6020 Innsbruck, Austria
[Eugen.Rott@uibk.ac.at]

Prof. **Sabbe**, Koen
Protistology & Aquatic Ecology, dept. Biology
Ghent University
Krijgslaan 281-S8, B-9000 Belgium
[Koen.Sabbe@ugent.be]

Sanftenberg, Linda
Limnologische Station TUM Iffeldorf
Hofmark 1-3, 82393 Iffeldorf, Germany
[linda.santferberg@gmx.de]

Dott. **Scalfi**, Alessia
Museo Tridentino di Scienze Naturali, Limnology and Phycology Section
Via Calepina 14, 38100 Trento, Italy
[alessia.scalfi@mtsn.tn.it]

Prof. Dr. **Schmidt**, Roland
Institute of Limnology, Austrian Academy of Sciences
Mondseestrasse 9, 5310 Mondsee, Austria
[roland.schmidt@oeaw.ac.at]

Sitoki, Lewis
Institut für Botanik
Sternwartestrasse 15, 6020 Innsbruck, Austria
[sitoki@hotmail.com]

Dr. **Skácelová**, Olga
The Moravian Museum – Hydrobiological Laboratory
Zelnỳ trh 6, 65937 Brno, Czech Republic
[okacelova@mzm.cz]

Dr. **Spitale**, Daniel
Museo Tridentino di Scienze Naturali, Limnology and Phycology Section
Via Calepina 14, 38100 Trento, Italy
[spitale@mtsn.tn.it]

Dr. **Stenger-Kovács**, Csilla
Pannon University, Department of Limnology
H-8200 Veszprém, Egyetem str. 10. Hungray
[stenger.kovacs@almos.uni-pannon.hu]

Prof. **Strelnikova**, Nina Ivanova
S.Petresburg State University
Konnogvardeysky bulvar, h.6,apt. 41
[diatomspb@mail.ru]

Taxböck, Lukas, M.Sc.
Universität Zürich, Institut für Systematische Botanik
Zollikerstrasse 107, 8008 Zürich, Switzerland
[lukas.taxboeck@systbot.unizh.ch]

Dr. **Torrisi**, Mariacristina
Department of Environmental Sciences, Section of Botany and Ecology, University of Camerino
Via Pontoni 5, I-62032 Camerino (MC), Italy
[mariacristina.torrisi@unicam.it]

Prof. **Trevisan**, Renata
Università degli Studi di Padova
Via Ugo Bassi 58 B, 35141 Padova
[renata.trevisa@unipd.it]

Dr. **Ulanova**, Anna
Botany Department of the St. Petersburg State University, Russia
System Ecology department of the Stockholm University, Sweden
Botany department, Biology and Soil Faculty, St. Petersburg State University, 199034 St. Petersburg, Russia
Room 308, Frescati Backe, Svante Arrhenius vag 21A, System Ecology department, Stockholm University, SE-10691 Stockholm, Sweden
[anna_ulanova@yahoo.com]

Dr. **Usoltseva**, Marina
Limnological Institute. Siberian Branch of the Russian Academy of Science.
664033 Russia Irkutsk Ulan-Batorskaya 3
[marianus@lin.irk.ru]

Üveges, Vicktoria
University of Pannonia, Department of Limnology
H-8200, Veszprém, Egyetem u. 10
[uviki@almos.uni-pannon.hu]

Dr. **Van de Vijver**, Bart
National Botanic Garden of Belgium
Domein van Bouchout, B-1860 Meise, Belgium
[vandevijver@br.fgov.be]

Vogel, Andrea
Inninger Str. 17, 82229 Seefeld-Hechendorf, Germany
[andrea_vogel@gmx.net]

Dr. **Werner**, Petra
Universität Osnabrück, Fachbereich Geographie
Seminarstr. 19 a/b, 49074 Osnabrück, Germany
[pw_bln@yahoo.com]

Dr. **Wojtal**, Agata Z.
Institute of Botany, Polish Academy of Sciences
ul. Lubicz 46, 31-512 Krakow, Poland
[ibwoital@ib-pan.krakow.pl]

Dr. **Zorza**, Raffaella
Università degli Studi di Udine - Dipartimento di Scienze Agrarie ed Agroambientali
Via delle Scienze, 20
33100 Udine (UD)
[zorza.raffaella@uniud.it]

Index of Authors