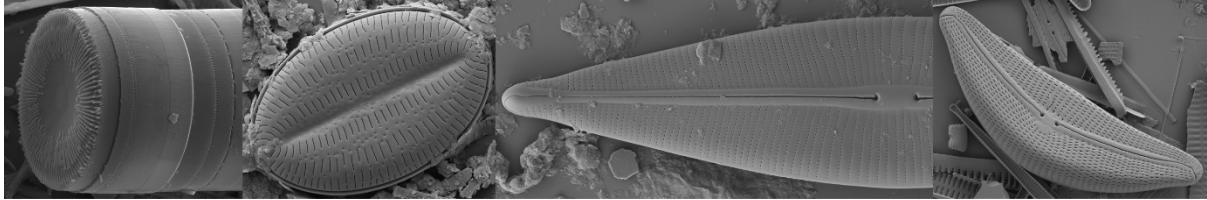




national
museum
wales
amgueddfa
cymru



Ellerbeckia

Cocconeis

Craticula

Cymbella

13th European Diatom Meeting

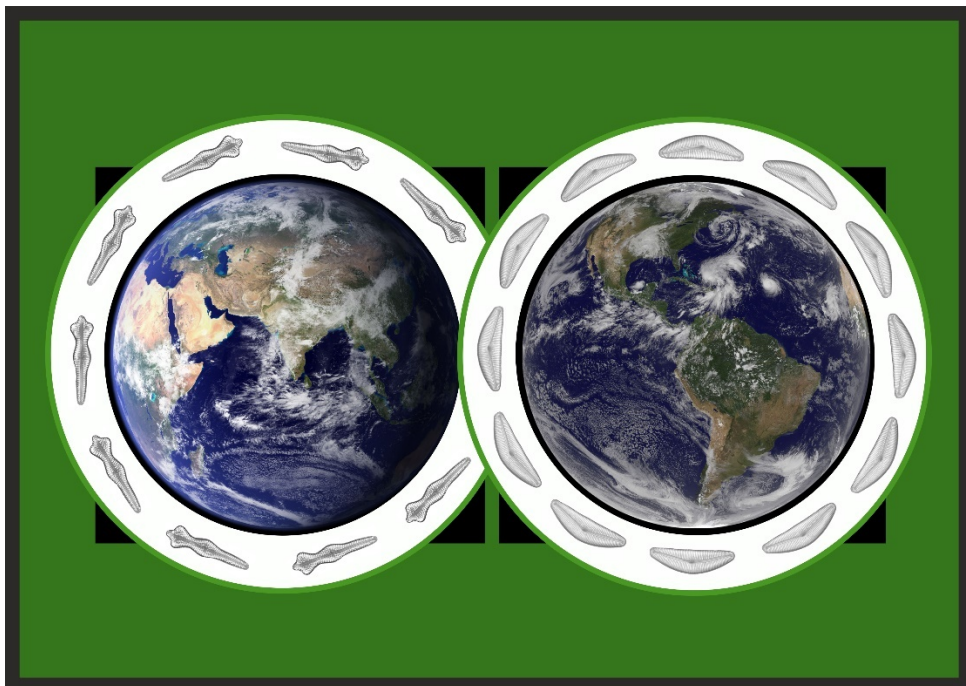
Progress in Diatom Biogeography: Explanations for Microbial Endemism

2-4 March 2021

Amgueddfa Cymru – National Museum Wales

Online - <https://naturalhistory.museumwales.ac.uk/conference/edm>

Programme and Abstracts



Dear Participants,

We would like to welcome you to the 13th European Diatom Meeting (formerly Central European Diatom Meeting) to be held at Amgueddfa Cymru – National Museum Wales, St Fagans National Museum of History, Cardiff, United Kingdom. We are delighted to host the first online European Diatom Meeting with over 270 participants from more than 40 countries around the world.

Amgueddfa Cymru – National Museum Wales is a major centre for taxonomic research and has the largest and most comprehensive collection of Welsh botany, zoology and geology specimens in the world. Our collections include over 3.5 million natural history specimens and provide a unique record of the natural history of Wales. St Fagans National Museum of History has completed its Making History redevelopment project in 2018. It is one of Wales' most popular visitor attractions offering an exciting collection of historic buildings, heritage objects, and public programmes, to create history with the people of Wales. It is part of a 100-acre parkland with over forty original buildings from different historical periods. In 2019 it was declared the winner of the Art Fund Museum of the Year, the largest arts award in Britain.

The Systematics Association of the United Kingdom has provided funding to support the 13th European Diatom Meeting. A special issue on biogeography will be published in the journal *Diatom Research*. Four keynote lectures will be presented on the major theme of the conference '*Progress in Diatom Biogeography: Explanations for Microbial Endemism*'. Historical biogeography in microbial organisms, especially many lower eukaryote groups, is not particularly well developed. In 2009, The Systematics Association addressed some general issues on this subject with a symposium and a book '*Biogeography of Microscopic Organisms: Is Everything Small Everywhere?*', (D. Fontaneto, ed.), Cambridge, Cambridge University Press (2011). For the last three decades diatom systematists have been documenting the extent of diatom endemism, a topic previously thought to be of little significance. It is now clear that diatom endemism is extensive (Everything Small Isn't Everywhere) and certain patterns of taxon differentiation exist, especially in the southern hemisphere. The meeting aims to discuss what the discovery of diatom endemism might mean in the context of the global historical biogeography of all organisms, addressing issues concerning freshwater diatom endemism and its explanation, biogeography in the marine realm and the influence of ecology and palaeoecology on the distributional limits of individual species.

Oral and poster presentations are taking place on the 2nd and 3rd March 2021 covering topics including diatom biogeography, environmental monitoring, palaeoecology, biodiversity, morphology, molecular biology and taxonomy. A one-day taxonomic workshop on the complex of species in the *Fragilaria capucina* group takes place on the 4th March 2021 with lectures and microscope sessions.

On behalf of the Organizing Committee, we wish you a pleasant time and an interesting meeting.

Ingrid Jüttner & David M. Williams

Programme

Tuesday 2nd March 2021

Time: GMT

9.00 – 9.20

Welcome address

Kath Davies

Ingrid Jüttner

David Williams

Session 1 – Freshwater monitoring

Chairs – Zlatko Levkov, Ingrid Jüttner

9.20 – 9.40

Martyn Kelly, Steve Juggins, Geoff Phillips, Nigel Willby

The search for the perfect river: re-evaluating expectations for phytobenthos assessment in the UK

9.40 – 10.00

Annika Vilmi, Satu Maaria Karjalainen, Jukka Aroviita

A decade of lake and stream diatom sampling: temporal trends and land use impacts

10.00 – 10.20

Bart Van de Vijver, Adrienne Mertens, Carlos E. Wetzel, Luc Ector

How type material revision can influence biomonitoring analysis: a case study of *Fragilaria capucina*

10.20 – 10.50

Break

10.50 – 11.00

Stijn Van de Vondel, Lieven Bervoets, Bart Van de Vijver (Poster)

Assessment of biological activity along a metal pollution gradient applying macroinvertebrates and diatoms

11.00 – 11.10

Petra Thea Mutinova, Maria Kahlert, Benjamin Kupilas, Brendan G. McCie, Nikolai Friberg, Francis J. Burdon (Poster)

Benthic Diatom Communities in Urban Streams and the Role of Riparian Buffers

- 11.10 – 11.20 **Wolfgang Kűfner**, Andrea Hofmann, Stefan Ossyssek, Jürgen Geist, Uta Raeder (Poster)
Climate change in Bavarian mountain lakes – differential diatom responses among different lakes
- 11.20 – 11.40 **Kálmán Tapolczai**, François Keck, Agnès Bouchez, Frédéric Rimet, Maria Kahlert, Valetin Vasselon
Strategies to handle taxonomic and bioinformatical biases in metabarcoding-based diatom indices.
- 11.40 – 11.50 **Zlatko Levkov**
Announcement – 14th European Diatom Meeting in North Macedonia
- 11.50 – 12.00 **Bart Van de Vijver**
Announcement – 15th European Diatom Meeting in Belgium
- 12.00 – 14.00 **Break**

Session 2 – Biogeography of marine diatoms

Chairs – Eveline Pinseel, Ingrid Jüttner

- 14.00 – 14.50 Keynote lecture
Jenny Pike
Diatoms from the sub-polar North Atlantic: variations through time and space
- 14.50 – 15.10 **Geraldine Reid**
Endemism in marine diatoms
- 15.10 – 15.30 **Eveline Pinseel**, Teovil Nakov, Koen Van den Berge, Kala Downey, Karthryn Judy, Olga Kourtchenko, Anke Krempf, Elisabeth Ruck, Conny Sjöqvist, Mats Töpel, Andrew J. Alverson
Transcriptional response of the marine diatom *Skeletonema marinoi* during acclimation along a salinity gradient
- 15.30 – 15.40 **Jason Hall-Spencer**, Ben Harvey, Shigeki Wada, Sylvain Agostini (Poster)
Diatoms thrive in areas where seawater has naturally high levels of carbon dioxide

15.40 – 16.10 **Break**

Session 3 – Palaeoecology

Chairs – Eveline Pinseel, Ingrid Jüttner

16.10 – 17.00 Keynote lecture

Anson Mackay

Long term trends in diatom diversity from Lake Baikal, southern Siberia: a 15,800 year multidecadal study

17.00 – 17.20 **Catarina Ritter**, Pedro Miguel Raposeiro, Sergi Pla-Rabes, Erik de Boer, Armand Hernández, Alberto Sáez, Nora Richter, Linda Amaral-Zettler, Mario Benavente-Marín, Ricardo Trigo, Roberto Bao, Santiago Giralt, Vítor Gonçalves

The last millennium of natural and anthropogenic disturbances on a remote island on the edge of Europe: a diatom-based paleolimnological approach

Wednesday 3rd March 2021

Session 4 – Diatom Taxonomy

Chairs – Carlos Wetzel, Ingrid Jüttner

9.00 – 9.20 **Eileen Cox**

Generic concepts, the type method and descriptive terminology

9.20 – 9.40 **Nélida Abarca**, Jonas Zimmermann, Wolf-Henning Kusber, Oliver Skibbe, Regine Jahn

Taxon complexes within the Gomphonemataceae: evaluation of morphological and molecular data

9.40 – 10.00 **Konrad Schultz**, Josephine Franke, Mirko Dreßler, Thomas Hübener

Colony formation in *Stephanodiscus* and *Cyclostephanos*: morphological and taxonomic implications

10.00 – 10.20 **Break**

- 10.20 – 10.30 **Edgley César**, Jo Wilbraham, David Williams (Poster)
Diatom Collections at the Natural History Museum: Using digitisation to maximise research potential
- 10.30 – 10.40 **Malin Alf**, Thomas Hübener, Konrad Schultz, Mirko Dressler (Poster)
Identification of *Cyclostephanos* species using molecular and morphological methods
- 10.40 – 10.50 **Josephine Franke**, Thomas Hübener, Konrad Schultz, Mirko Dressler (Poster)
Molecular and morphometric analyses of the *Cyclotella meneghiniana* species complex
- 10.50 – 11.20 **Break**

Session 5 – Freshwater diatom biodiversity and distribution

Chairs – David Williams, Ingrid Jüttner

- 11.20 – 11.40 **Lydia King**, Marco Cantonati, Wolfgang Schütz
Diatom depth distribution in the large peri-alpine Lake Constance
- 11.40 – 12.00 **Ingrid Jüttner**, Smriti Gurung, Anu Gurung, Chhatra Sharma, Subodh Sharma
Diatom diversity in high altitude lakes of the Himalaya
- 12.00 – 12.10 **Jordan Bishop**, Jane Wasley, Melinda Waterman, Tyler J. Kohler, Bart Van de Vijver, Sharon Robinson, Kateřina Kopalová (Poster)
Epiphytic diatom community shows larger response to bryophyte and lichen vegetation type than nutrient and water additions within Windmill Islands, East Antarctica
- 12.10 – 12.20 **Leila Ben Khelifa** (Poster)
Diatom flora of Tunisia

- 12.20 – 12.30 **Tereza Cahová**, Barbora Chattová, Bart Van de Vijver (Poster)
Soil diatom communities of Amsterdam Island
(TAAF, South Indian Ocean)
- 12.30 – 12.40 **Jasper Foets**, Carlos E. Wetzel, Adriaan J. Teuling, Lauren Pfister (Poster)
Ecohydrological characterization of terrestrial diatoms
- 12.40 – 12.50 **Charlotte Goeyers**, Bart Van de Vijver (Poster)
Moss-inhabiting diatoms from Campbell Island (sub-Antarctic Region)
- 12.50 – 13.00 **Maija Lehtpuu**, Sirje Vilbaste (Poster)
Benthic diatoms in small Estonian lakes – two substratum type comparison
- 13.00 – 13.10 **Danijela Vidaković**, Jelena Krizmanić, Luc Ector, Carlos Wetzel,
Bojan Gavrilović, Miloš Ćirić (Poster)
Nitzschia species from inland saline waters in the Vojvodina Province
(Serbia)
- 13.10 – 14.00 **Break**

Session 6 – Biogeography of freshwater diatoms

Chairs – Martyn Kelly, Ingrid Jüttner

- 14.00 – 14.20 **David Williams**
Diatom biogeography: is there a point to it?
- 14.20 – 15.10 Keynote lecture
Janne Soininen
Diatom biogeography – new insights from species distribution
and biodiversity analyses
- 15.10 – 15.50 **Break**

Session 6 – Biogeography of freshwater diatoms

Chairs – Martyn Kelly, Ingrid Jüttner

- 15.50 – 16.10 **David Mann**
The interpretation of absence revisited: the challenges of establishing alien status and biogeographical range
- 16.10 – 17.00 Keynote lecture
Patrick Kociolek
Freshwater diatom biogeography: a phylogenetic approach
- 17.00 – 18.00 Discussion – the road ahead: how to combine taxonomy, ecology and biogeography

Thursday 4th March 2021

Workshop on the *Fragilaria capucina* complex

Bart Van de Vijver, Meise Botanic Garden, Belgium

Adrienne Mertens, Diatomella, Netherlands

Luc Ector, Carlos Wetzel, Luxembourg Institute of Science and Technology, Luxembourg

The workshop on the complex of species in the *Fragilaria capucina* group will consist of two parts. During the morning sessions, lectures will document and discuss all species in this group. In the afternoon, selected species will be illustrated using light microscopy and material from type slides and other populations from Europe.

- 9.00 – 10.00 Lecture 1
- 10.00 – 10.30 Break
- 10.30 – 12.00 Lecture 2
- 12.00 – 13.00 Break
- 13.00 – 15.00 Microscope session

The last millenium of natural and anthropogenic disturbances on a remote island on the edge of Europe: a diatom-based paleolimnological approach

**Catarina Ritter¹, Pedro M. Raposeiro¹, Sergi Pla-Rabes², Erik J. de Boer³
Armand Hernández³, Alberto Sáez⁴, Nora Richter⁵, Linda Amaral-Zettler^{5,6,7}
Mario Benavente-Marín³, Ricardo Trigo⁸, Roberto Bao⁹, Santiago Giralt³
Vítor Gonçalves¹**

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Spanish National Research Council (CSIC), Barcelona, Spain

⁴Department of Earth and Ocean Dynamics, Universitat de Barcelona, Barcelona, Spain

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Brown University Providence, USA

⁶Department of Marine Microbiology and Biogeochemistry
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⁷Department of Freshwater and Marine Ecology
Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, Amsterdam
The Netherlands

⁸Instituto Dom Luiz (IDL), Faculty of Sciences, University of Lisboa, Lisbon, Portugal

⁹Centro de Investigacións Científicas Avanzadas (CICA) - Facultade de Ciencias
Universidade da Coruña, A Coruña, Spain

Previous studies show that climate variability and volcanism along with the arrival of humans played a significant role in the recent evolution of insular Azorean ecosystems. However, the timing and rate of anthropogenic impacts are poorly understood. Paleolimnological research allows us to reconstruct ecological conditions prior to and after human settlement on oceanic islands, to understand how species and island ecosystems responded to both natural and anthropogenic disturbances. Here, we present the first high-resolution reconstruction of ecological changes in Lake Funda (Flores Island, Azores) over the last millennium based on diatom analysis from a 993 cm-long sediment core retrieved in June 2017. The chronology of the reconstructed paleoenvironmental events has been established with a preliminary radiocarbon-based age model.

The three main ecological periods were mostly related to human disturbance. (1) During the pre-human arrival period (AD 950 to 1330), the sediment record has a diverse benthic and

tychoplanktonic diatom assemblage dominated by *Staurosirella pinnata* and *Pseudostaurosira elliptica*, representing the baseline conditions of Lake Funda. (2) Upon human arrival in Flores, around AD 1330, human disturbances in the catchment area (e.g., livestock release and gradual forest clearance) and climate fluctuations led to changes in the diatom assemblage. Several climate fluctuations from AD 1330 to 1560 and the onset of human-driven deforestation (ca. 1380 AD) led to an abrupt drop in diatom diversity and the dominance of eutrophic *Aulacoseira* spp.. (3) Finally, the most recent period (AD 1560 to 2008) corresponds to the well-established Portuguese settlement in Flores Island. Complete forest clearance led to a second ecological perturbation characterized by a highly productive lake with an anoxic hypolimnion and enhanced in-lake nutrient recycling. From 1980, changes in diatom assemblages suggest prolonged periods of summer stratification and increase in extreme climatic events, which could be associated with recent climate change. The synergistic influence of multiple environmental stressors (climate and anthropogenic) may have resulted in major shifts in the diatom assemblages of Lake Funda. This study increases our understanding of how the interplay between climate and anthropogenic factors results in drastic shifts in lake ecosystems. The present paleolimnological approach has important implications for long-term ecosystems conservation management in remote volcanic oceanic islands.

This research is funded by DISCOVERAZORES (PTDC/CTA-AMB/28511/2017; DL57/2016/ ICETA/EEC2018/25) and through the funded research project PaleoModes (CGL2016-75281-C2) and the Luso-American Foundation's "Crossing the Atlantic" program.