

3rd Polar Marine Diatom Taxonomy and Ecology Workshop

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Diatoms are key organisms at the base of high-latitude communities throughout the late Paleogene and Neogene. Their fossil remains serve as a fundamental basis for age determination and paleoenvironmental reconstruction, and are key indicators of marine paleotemperatures, presence/absence of sea ice, and the advance and retreat of ice sheets and shelves - all important geological data that can feed into ice-sheet and climate models.

The workshop was attended by 27 diatomists from 11 countries and was hosted by Leanne Armand at the Department of Biological Sciences, Macquarie University. International participation (especially at the graduate student and post-doctoral level) was instrumental in the transfer of sound taxonomic skills and the exchange of knowledge relative to modern and fossil diatom records of the polar regions. These skills are key to understanding the ecologic and micropaleontologic records of the poles. This meeting was timely for the hands-on transfer of results from the successful Antarctic Drilling (ANDRILL) project (Ross Sea), several recent Integrated Ocean Drilling Program (IODP) Legs

(Wilkes Land, Campbell Plateau, and Berling Sea), and a suite of polar marine-based projects hosted at the national level (such as the US NSF-sponsored Larsen Ice Shelf System - Antarctica LARISSA project).

The two primary goals of the workshop were: (1) to provide the international community of polar diatom research with an opportunity to exchange data, discuss taxonomic issues toward standardization of terminology and identifications, and to explore new techniques and approaches, and (2) to allow students to receive training and advice from leaders in the field.

Mornings were devoted to taxonomic work at the microscope and based on participants' slide sets that highlighted particular genera and species. These sessions focused on identification of key extant and extinct paleoenvironmental indicators in both the Antarctic and Arctic regions, understanding the environmental implications of morphological variability within single species, and recognition of important biostratigraphic markers ranging back to the Eocene (ca. 56-34 Ma). In the afternoons, advances in the field were discussed. These included the application of biomarker and stable isotopic studies to

biosiliceous sediments, the role of dissolution in altering the diatom paleo-record, and lessons learned through studies of modern phytoplankton.

In addition, two keynote speakers shared their expert knowledge with participants: Diana Krawczyk (University of Szczecin, Poland) spoke about her paleoclimatic research off West Greenland, addressing the local implications of ocean-climate forcing and the expression of late Holocene climatic events (such as the Little Ice Age and the Medieval Climate Anomaly) in the marine diatom sedimentary record. Simon Wright (Australian Antarctic Division and Antarctic Climate and Ecosystems Cooperative Research Centre) provided a larger scale framework for diatom studies through his work on the responses of Southern Ocean phytoplankton to climate change.

One of the intended objectives of this workshop was to bring together students and early career researchers with the intention that the weeklong conversations and discussions would lead to future research collaborations. The next Polar Marine Diatom workshop is planned for 2013 and will be hosted by Jenny Pike (Cardiff

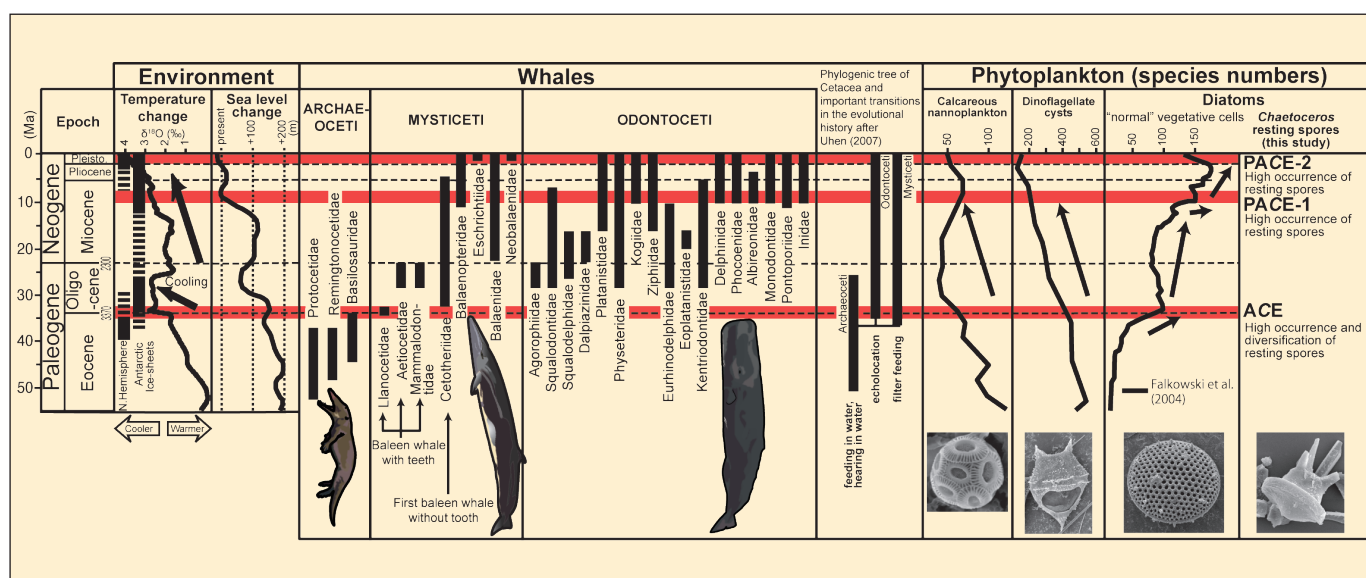


Figure 1: Comparison of marine phytoplankton species-richness curve indicated by Falkowski et al. (2004) with chronologic ranges of cetacean families worldwide by Uhen (2007), and sea-level change. Global deep-sea oxygen record and paleo-temperature change are by Zachos et al. (2001) and the presence data of sea ice and ice sheets were compiled by St. John (2008) and Stickley et al. (2009). The Atlantic Chaetoceros Explosion (ACE) event occurred across the E/O boundary in the North Atlantic, and is characterized by resting spore diversification that occurred as a consequence of upwelling activation following changes in thermohaline circulation through global cooling in early Oligocene. Pacific Chaetoceros Explosion events-1 and -2 (PACE-1 and PACE-2) are characterized by relatively higher occurrences of iron input following the Himalayan uplift and aridification at 8.5 Ma and ca. 2.5 Ma in the North Pacific regions. From Itsuki Suto, Nagoya University, Japan.

University, UK). Previous workshop accomplishments are reported by Armand (2006), Assmy (2008) and Leventer et al. (2007).

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Australian Marine Geoscience Office, Geoscience Australia, the Australian Biological Resources Study, Macquarie University, ATA Scientific and ANDRILL.

Selected references

Full reference list online under:

http://www.pages-igbp.org/products/newsletters/ref2012_1.pdf

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Climate change in the Carpathian-Balkan region during the Late Pleistocene and Holocene

1st International Workshop, Suceava, Romania, 9-12 June 2011

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The Carpathian Mountains are considered as one of Europe's last "wilderness" areas, but are nevertheless under heavy pressure from human activities. Examples range from large-scale activities (e.g. sulfur mines in Calimani), ecological disasters (e.g. tailing dam failures in the Toroiaga and Baia Mare areas) to cross-border pollution (e.g. Chernobyl nuclear accident). The current political thrust for development is accelerating the pace of industrial activities, exploitation of natural resources and tourism.

Romania has just recently been integrated into the European Union and many community-based projects were initiated to evaluate problems related to climatic and anthropogenic impacts. However, the Carpathian Mountains remain the least studied mountain range in Europe. This paucity of research projects in the region is reflected by the low number of well-dated and high-resolution paleo-records (e.g. Buczkó et al. 2009, Fig. 1). Rose et al. (2009) published a pollution history study from a lake in the Retezat Mountains at the western extremity of the Southern Carpathians, but no similar studies exist for the rest of the mountain range, despite the abundance of lakes (Akinyemi et al., in press).

The purpose of this workshop was to bring together an international group of scientists interested in the Carpathian-Balkan region to discuss research results and promote opportunities for interdisciplinary and international collaboration. The workshop was co-sponsored by the University of Suceava, the Applied Geography Association (GEOCONCEPT), the Mountain Research Institute (MRI) and PAGES.

The program centered on oral and poster presentations as well as open discussions on the climatic and environmental dynamics during the Pleistocene and Holocene in the Carpathian and Balkan mountains. The workshop featured 36 talks and 15 posters. The 70 participants were from Romania, Hungary, Germany, United Kingdom, Bulgaria, Slovenia, Ukraine,

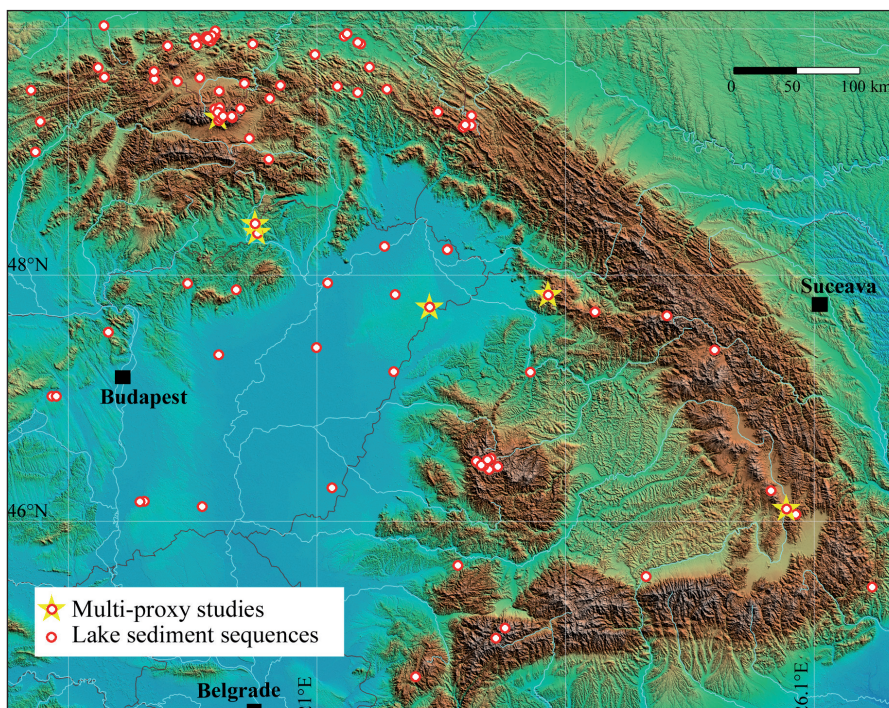


Figure 1: Map showing all sedimentary sequences identified in the Carpathian mountain range by Buczkó et al. (2009) in their review of dated Late Quaternary paleolimnological records. Despite the relative density of records listed in that study, the authors conclude that only very few records can be used for modern environment or climate studies, and that large areas of the Carpathian mountains remain under-investigated. Figure modified from Buczkó et al. (2009).

Poland, Switzerland, Czech Republic and Belgium. The entire workshop was webcast and it was educational for young researchers and students by providing them a platform to present their results to an international audience and discuss their research in a multidisciplinary community.

A post-symposium field trip was organized to the formerly glaciated alpine ranges of the Northern Romanian Carpathians (Rodna Mountains), as well as to several large peat-bog accumulations and wetland ecosystems (Iezer lake and Poiana Stampei peat bog).

The organizers of the workshop offered to lead publication of the more advanced workshop contributions in a special issue of the journal *Quaternary International* and 29 author groups committed themselves to contribute papers.

In order to promote follow-up activities in the region, the "Suceava working group" was created under the lead of Marcel Mindrescu, Angelica Feurdean, Enikő Magyari and Dan Veres. A group website is currently being set up (<http://atlas.usv.ro/www/climatechange/>) and grant proposals will be prepared. The group will also coordinate the organization of a second regional workshop in 2013 or 2014. Further activities, such as summer camps or meetings in the field will also be considered.

References

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