



## **NECLIME working group on taxonomy of Neogene palynomorphs**

4<sup>th</sup> NECLIME workshop on taxonomy of the Neogene palynomorphs

Faculty of Natural Sciences, Comenius University in Bratislava

Bratislava, Slovak Republic, June 11-13, 2013

*[organized by Marianna Kováčová]*

### ***Report [Torsten Utescher and Andrea K. Kern]***

The 4<sup>th</sup> NECLIME workshop on taxonomy of the Neogene palynomorphs, hosted by Marianna Kováčová, was held at the Faculty of Natural Sciences, Comenius University in Bratislava. 11 colleagues participated in the workshop. The program included 11 talks presented on Wednesday, June 12, and a round table discussion in the morning of Thursday, June 13. As usual, the participants exchanged research results and discussed specific taxonomical questions, including also the work on microscope.

#### Core topics presented on Wednesday

- Palynomorph records (Paratethys and Eastern Mediterranean)

Presentations focused on palynomorph records of the Paratethys and the Eastern Mediterranean. The reports on the Paratethys included the presentation of new results on the Early Badenian parastratotype Židlochovice (Nela Doláková), a detail study on late Miocene palynomorphs from South Bulgaria including the combined TLM/SEM technique for a better identification of the botanical affinity (Viktoria Hristova and Dimiter Ivanov), as well as a report on new evidence for the presence of mangrove vegetation in the early late Miocene of the Euxinian Basin (Dimiter Ivanov et al.).

The palynology of haline deposits and implications on palaeoclimate were outlined using examples from the Turkish Neogene record (Serkan Akkiraz).



- Methodology

Contributions of methodological importance comprise the use of plant phylogeny to improve NLR concepts and thus the climatic resolution of palynomorph based reconstruction. This was exemplified by studies on pollination mechanisms and pollen morphology of *Ephedra*, presented by Kristina Bolinder in respect of its evolution (molecular data). The Andrea Kern discussed the problems and potential of high-resolution records and compared these with a new method to reconstruct CA-based climatic data (Utescher et al.). Preliminary results of this statistical tool show a slight improvement, however, more experience is needed to refine this method.

- Palynomorph systematics and taxonomy

The detail reports given by Elżbieta Worobiec and Barbara Słodkowska focused on the holotypes of the “Atlas of Pollen and Spores of the Polish Neogene” and on the representation of pollen belonging to the families Adoxaceae, Oleaceae and Vitaceae in the 4<sup>th</sup> volume of the atlas, and on problematic records of *Staphylea* and their taxonomical treatment.

#### Core topics of the round table discussion on Thursday

- Status and updating of the Palaeoflora database

The Atlas of Pollen and Spores of the Polish Neogene will be used as standard for the Neogene palynomorph record of Europe. Especially taxa described in the 4<sup>th</sup> volume will be included in the database within the next year (Torsten Utescher). For pollen of the families Pinaceae and “Taxodiaceae” and the subfamily Tilioideae, their Nearest Living Relative concepts for the use in quantitative palaeoclimate and vegetation reconstruction is presented (see below).

Tables for additional families will be made available at the NECLIME website. These will include the European pollen record of Altingiaceae, Betulaceae, Buxaceae, Chenopodiaceae, Ephedraceae, Juglandaceae, Malvaceae, Myricaceae, Olacaceae, Polygonaceae, Ranunculaceae, Restionaceae, Rubiaceae, Sparganiaceae/Typhaceae, and Ulmaceae.



- Reference collections of modern / fossil pollen and spores

The working group aims to extend the list of reference collections provided at the NECLIME website (see data base, reference collections) and to add other useful resources regarding the identification of palynomorphs.

Reference collections compiled so far:

- Institute of Botany, Polish Academy of Sciences, Cracow (Poland) (Elżbieta Worobiec, e.worobiec"at"botany.pl)
  - Institute of Botany, Bulgarian Academy of Sciences, Sofia (Bulgaria) (Dimitar Ivanov, dimitar"at"iph.bio.bas.bg)
  - Department of Geology and Paleontology, Comenius University, Bratislava (Slovakia) (Marianna Kováčová)
- Palynomorph taxa critical with respect to taxonomy, botanical affinity and climatic evaluation

The problem of palynomorph taxa critical with respect to taxonomy, botanical affinity and climatic evaluation, exemplified at the meeting with the ambiguous record of *Staphylea* is identified as crucial when performing quantitative reconstructions (climate and vegetation). The importance of close interactions between macro- and micro-palaeobotany was pointed out.

- Re-evaluation of Neogene palynomorph records

The re-evaluation of regional palynomorph spectra using TLM/SEM in combination is currently pursued by various member of the working group, the actual focus is on material from the Central and Eastern Paratethys. Related studies on Turkish Neogene materials are prospected (Serkan Akkiraz). The intended studies explicitly include modern reference pollen for the fossil taxa.



- Summary and appointments for the next meeting.

The next meeting of the working group will be in Kuthaya, Turkey, in October 2014. Serkan Akkiraz kindly agreed to organize a workshop including field trip to nearby open cast mines exposing impressive Neogene successions in continental facies. The exact dates will be communicated.



Pinaceae

Palynomorph taxon	NLRs used in climate and vegetation reconstruction	remarks
<i>Abiespollenites</i>	<i>Abies</i>	Species listed in the atlas indicate the pollen type and are not used in climate reconstruction
<i>Pinuspollenites</i> <i>P. alatus, microalatus</i>	<i>Pinus</i> Pinaceae	
<i>Pinus haploxylon</i>	<i>Cathaya</i> (mainly; use climate data of Pinaceae)	
<i>Cathayapollis</i> , diverse species	<i>Cathaya</i> (use climate data of Pinaceae)	
<i>Podocarpidites eocaenicus, nageiaformis, podocarpoides, verruculatus</i> <i>Pinipollenites libellus</i>	<i>Podocarpus, ? Cathaya</i>	
<i>Zonalapollenites</i>	<i>Tsuga</i>	
<i>Pityosporites</i>	Synonym	



Taxodiaceae

Palynomorph taxon	NLRs used in climate and vegetation reconstruction	remarks
<i>Inaperturopollenites</i> <i>I. concedipites, dubius, verrupapillatus</i>	<i>Taxodium, Glyptostrobus</i>	
<i>I. hiatus</i>	Synonym (partly <i>concedipites, dubius, verrupapillatus</i> )	
<i>Sequoiapollenites</i> <i>S. gracilis, major</i>	<i>Sequoia, Metasequoia, Sequoiadendron, Cryptomeria</i>	Use climate data of Taxodioideae due to relic character of genera
<i>S. largus</i>	<i>Cryptomeria</i>	
<i>S. megaligulus</i>	<i>Sequoiadendron</i>	
<i>S. sculpturius</i>	<i>Metasequoia</i>	
<i>S. polyformosus, rugulus, undulatus, rotundus</i>	<i>Sequoia, Metasequoia, Sequoiadendron</i>	



Malvaceae – Tilioideae

<b>Palynomorph taxon</b>	<b>NLRs used in climate and vegetation reconstruction</b>	<b>remarks</b>
<i>Intratropollenites instructus</i>	Tilioideae	<i>Banisteriaecarpum giganteum</i> (Göppert) Kräusel complex (Kvacek)
<i>Intratropollenites insculptus</i>	<i>Craigia</i>	<i>Craigia brononii</i> Unger complex (G. Worobiec and Kvacek)
<i>Intratropollenites cordataeformis</i>	<i>Tilia</i>	