NECLIME working group on taxonomy of Neogene palynomorphs

Second Workshop, Cracow, Poland, June 14-15, 2011

Report

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Topic: Joint meeting with the macro group in Sofia, 2012

The idea of a joint meeting with the macro group was appreciated. D. Ivanov kindly offered to organize a workshop in Sofia, to take place end of September 2012. Apart from specific topics related to the activities of both working groups, **Eastern Paratethys including Black Sea area and Turkish lacustrine basins** will be in the focus. Preparations are ongoing to invite related talks. Details will be communicated at the annual NECLIME meeting in Bucharest.

Topic: Precipitation reconstructions using palynomorphs – drought indicators

Promising candidates:

- Asteraceae; Artemisia type, Ambrosia type
    - Specify/check climate data for both types

Topic: Ecology of non-pollen palynomorphs

The potential of non-pollen palynomorphs in palaeoecological reconstruction was outlined

- E.g. zygospores of Mougeotia, Zygnema and Spirogyra, colonial green algae, fungal spores (e.g. ascospores) and conidia, parts of fungal hyphen etc.
- Fructifications of epiphyllous fungi (e.g. Microthyriales) can be indicative for very high annual rainfall rates when abundant and highly diverse (cf. Worobiec E. 2003, currently studied by G. Worobiec)

Topic: Taxa complexes

- Search for in situ materials, intensified co-operation with the macro group of Neclime
- Analysis of macro and micro materials from the same sample (ongoing studies by e.g. M. Kovacova, E. Worobiec, G. Worobiec)

Topic: Palynomorph reference collections

- The importance of reference collection in taxonomical work is emphasized. We gratefully acknowledge the facilities and support provided by the Szafer Institute.
- Contacts with Chinese colleagues (e.g. Neclime meeting in Nanjing 2012) could be used to organize exchange between collections

Topic: Improving pollen/spore identification; re-evalutation of Neogene palynomorph records using TLM/SEM

Recommended resources

- J.I. Raine, D.C. Mildenhall, E.M. Kennedy (2008). New Zealand fossil spores and pollen: an illustrated catalogue. 3rd edition. GNS Science miscellaneous series no. 4. http://www.gns.cri.nz/what/earthhist/fossils/spore_pollen/catalog/index.htm.
- Jansonius and Hill Catalogue: Genera file of fossil spores and pollen
- Recent pollen: PalDat, PhotoPal, ANU

The importance of a combined use of the TLM/SEM technique in identification was demonstrated based on Badenian palynomorphs from the Paratethys (Kovacova et al.) and late Miocene materials from the Sofia Basin (Hristova, thesis). Also intraspecific variability of morphology of recent pollen was exemplified.

Topic: Updating the NECLIME data base – changes in taxonomy and NLR interpretations

Based on volumes I-III of the "Atlas of pollen and spores of the Polish Neogene (Stuchlik, ed.)" taxonomy and NLR interpretation of key taxa were discussed in detail, particularly with regard to practical applications such as quantitative vegetation reconstruction and Coexistence Approach (CA).

The working group makes the following suggestions

Pinaceae

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

Taxodiaceae

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

Malvaceae – Tilioideae

Palynomorph taxon	**NLRs used in climate and vegetation reconstruction**	**remarks**
Intratriporopollenites instructus	Tilioideae	*Banisteriaecarpum giganteum* (Göppert) Kräusel complex (Kvacek)
Intratriporopollenites insculptus	*Craigia*	*Craigia bronnii* Unger complex (G. Worobiec and Kvacek)
Intratriporopollenites cordataeformis	*Tilia*	

other angiosperm families

Palynomorph taxon	NLRs used in climate and vegetation reconstruction	remarks
Momipites *M. triangulus, punctatus*	*Engelhardia, Oreomunnea, Alfaroa*	
M. quietus, gracilis	*Engelhardia*	
Engelhardioipollenites	synonym	
Ostryoipollenites rhenanus	*Ostrya, Ostryopsis*	
Periporopollenites stigmosus	*Liquidambar styraciflua*	
Periporopollenites orientaliformis	*Liquidambar orientalis, Altingia*	
Polyatriopollenites stellatus, rotundiformis, mecsekensis	*Pterocarya*	Species listed in the atlas indicate the pollen type and are not used in climate reconstruction
Pterocaryapollenites	synonym	
Castanoideaepollenites pusillus, oviformis	*Castanea, Castanopsis, Lithocarpus*	
T. cingulum	synonym	

Key taxa that are going to be published in the 4th volume of the "Atlas" and implications on NECLIME typical quantitative techniques will be discussed in detail at the next meeting.