Taphonomie und Paläoökologie

Computer Tomography controlled decomposition process of a dormouse as a tool for reconstructing the taphonomy of the apatemyid *Heterohyus nanus* from Messel

Michael Wuttke[1] & Achim Schwermann[2]

In vertebrate fossils out of aquatic fossil lagerstätten, the position of bones represents the composite of different taphonomic processes like gravity, gases of putrefaction, currents and scavenging. So the skeleton does not seem to give information on the decompositional process of the former soft and connective tissues of the skeleton.
To understand the maintenance of the post-dispositional movement of bones in the fossil record, it is necessary to understand the former different and deferred processes of soft tissue decomposition by autolysis and putrefaction; and the order of disarticulation or disintegration of connective tissue between bones.
Contemporary research on decomposition processes of vertebrates in an aquatic environment, made by forensics and palaeontologists, mainly describe observations which are visible by the naked eye from the outside of the corpse. Internal decomposition processes which control the disarticulation, for example, of joints within the corpse are rarely documented in 2-D by X-rays by Wuttke (1983), Richter (1994) and Heng et al. (2008, 2009).
To reconstruct the taphonomy of the apatemyid, information is needed in 3-D about the potential amplitude and deferred movement of skeletal elements within the corpse of an arboricol dormouse when the integument is intact, depending on gravity and putrefaction gases and possible hydrodynamics in the environment. The micro-CT analysis is an important tool for the study, because it is a non-destructive possibility, to document the inner-disarticulation inside the integument.
Acknowledgements: We thank Thomas Martin and Julia Schultz for their supportive advice.

[1] Generaldirektion Kulturelles Erbe, Große Langgasse 29, D-55116 Mainz, Germany, michael.wuttke@gdke.rlp.de

[2] Steinmann-Institut, University of Bonn, Nussallee 8, D-53115 Bonn, Germany, ahschwer@uni-bonn.de

Paläobotanik und Palynologie

Kurzzeitiges Auftreten tropischer Florenelemente im Paläogen von Mittel- und Westeuropa

Reinhard Zetter[1], Christa-Ch. Hofmann[1] & Fridgeir Grimsson[1]

Günstige klimatische Bedingungen, die während der unterschiedlichen thermischen Maxima im Paläogen (58–40 Ma) herrschten, erlaubten es verschiedenen megathermalen Pflanzen weit in nördliche und südliche Breiten vorzudringen. Das wohl bekannteste Beispiel dafür ist das der Mangrovenpalme *Nypa* (*Spinizonocolpites* Pollen und *Nypa* Früchte). Die routinemäßige Anwendung der Kombination von LM- und SEM-Untersuchungen an Mikrofloren zeigen aber, dass es weitere Beispiele für megathermale Elemente gibt, die diesem Verbreitungs-muster folgen. Paläozäne bis Mitteleozäne europäische Mikrofloren enthalten unter anderem sehr auffällige Pollenkörner der Gattung *Malvacipollis* Harris (*Aristogeitonia*-Gruppe, Picrodendraceae) und *Lanagiopollis* Morley (*Alangium villosum*-Typ, Alangiaceae). Diese Pflanzentaxa haben heute ihre Verbreitung in den Tropen. Die Picrodendraceae, insbesondere der *Aristogeitonia*-Typ, sind pantropisch verbreitet und die Alangiaceae treten nur in den Paläotropen und angrenzenden klimatischen Bereichen auf. *Alangium villosum* ist heute nur von NO-Australien bis zu den Fidschi Inseln und dem Indonesischen Archipel verbreitet. Mit der beginnenden Abkühlung ab Ende des Mitteleozäns verschwinden beide Elemente aus Europa.

[1] Universität Wien, Institut für Paläontologie, Althanstr. 14, 1090 Wien

Taphonomie und Paläoökologie

Palaeocommunity dynamics at different hierarchical levels

Martin Zuschin[1], Mathias Harzhauser[2] & Oleg Mandic[2]

A species-abundance data set (10 localities, 213 bulk samples, > 49.000 shells) from Burdigalian, Langhian

and Serravallian benthic marine molluscan assemblages of the Central Paratethys allows us to evaluate the influence of taxonomic and abundance level on palaeoecological patterns. The studied assemblages are from nearshore (including the intertidal and very shallow subtidal) and sublittoral environments, represent four biozones and four 3rd order depositional sequences over more than three million years, and are developed along the same depth-related environmental gradient. Nearshore assemblages have lower evenness than those from nearshore environments. At the species level and using abundance data, most localities differ significantly from each other. These differences are stronger among sublittoral assemblages and between nearshore- and sublittoral assemblages, but are less pronounced among nearshore assemblages. Decreasing the taxonomic resolution from species- to genus level strongly emphasizes similarities between nearshore assemblages but has only minor impact on differences between sublittoral assemblages. A further taxonomic decrease from genus- to family level has an overall much lower impact on differences between palaeocommunities, but is somewhat more pronounced among sublittoral than among nearshore assemblages. In nearshore assemblages the use of presence / absence data increases differences between localities at all taxonomic levels, but most so at the species level. In contrast, a decrease from abundance to presence-absence data decreases differences between sublittoral assemblages somewhat and is strongest at the family level. As most important result the decrease in taxonomic and quantitative resolution still retains a primary palaeoecological signal, but the impact of such changes depends strongly on environments and is much more severe in nearshore than in sublittoral assemblages.

[1)] Department of Palaeontology, University of Vienna, Althanstraße 14, A-1090 Vienna, e-mail: martin.zuschin@univie.ac.at

[2)] Natural History Museum Vienna, Burgring 7, A-1010 Vienna