Comparison of Metoposaurus-bearing localities – how can paleohistology help us to understand fossil ecosystems

Conference Paper · October 2018

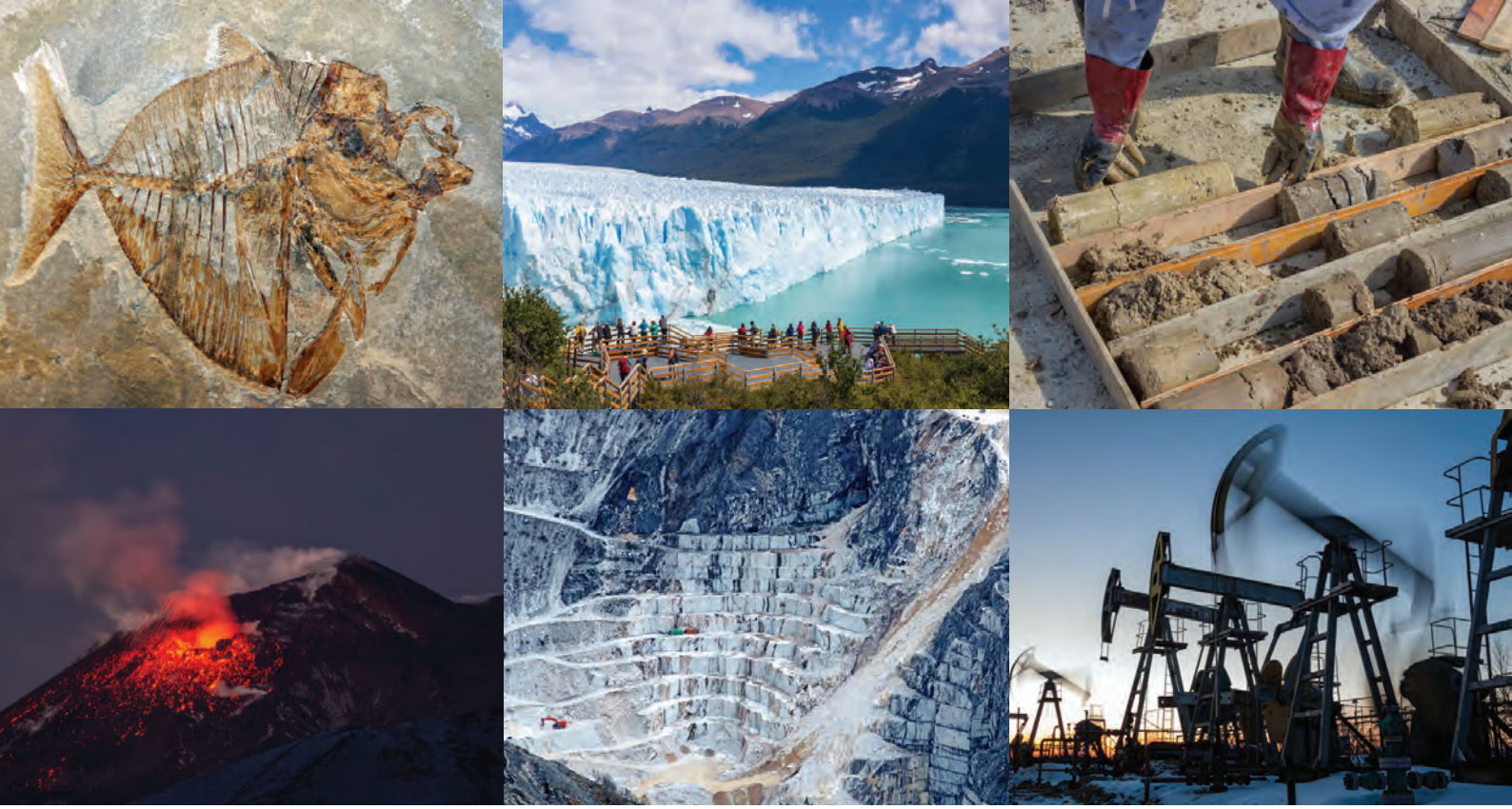
CITATIONS
0

READ
1

2 authors:

Elzbieta M. Teschner
Opole University
16 PUBLICATIONS **7** CITATIONS
SEE PROFILE

Dorota Konietzko-Meier
Opole University
34 PUBLICATIONS **152** CITATIONS
SEE PROFILE

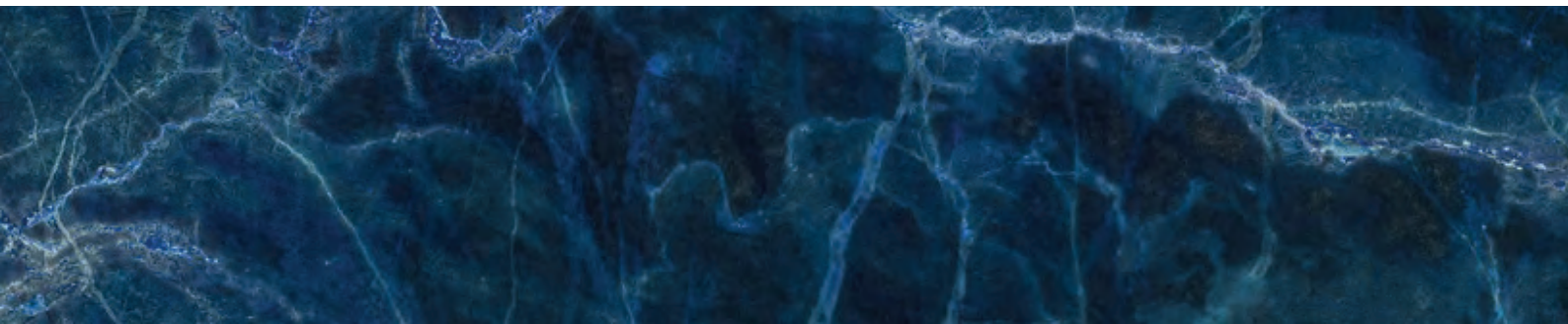


GEOBONN 2018

2–6 September 2018 | Bonn | Germany

Living Earth

Abstracts



the sediments containing the fossils. Skin preservation is not uncommon in the iguanodons, and apart from distortion by crushing, the preservation of the bones is exquisite. Unfortunately, these natural treasures are threatened by decay of the pyrite which is ubiquitously present in the skeletons. Therefore continued action is needed to preserve them. Here I present results on the bone histology and geochemistryof the Bernissart iguanodons. Core samples were taken from16 individuals and processed into thin sections. The analytical approach most notably involved polarized light microscopy, μXRF and nano-infrared spectroscopy, to demonstrate the morphological preservation of the bony tissues, and presence of metal sulfides and silicates in the medullary cavity. Pyrite did thus not affect the bony tissues themselves, which allowed assessment of the growth of this iconic taxon.

Talk

Comparison of Metoposaurus-bearing localities – how can paleohistology help us to understand fossil ecosystems

Elzbieta Maria Teschner[1,2], **Dorota Konietzko-Meier**[1,3]

[1]Opole University, Department of Biosystematics, Poland; [2]European Centre of Palaeontology, Opole University, Poland; [3]Steinmann-Institut, Universität Bonn, Germany

Metoposaurids are included in the group of Stereospondyli, an extinct clade of temnospondyl amphibians. Their occurrence is limited to the Late Triassic and they are distributed worldwide. The most commonly used method in paleontology to gain information about the mode of life and the living environment is so far the morphological description and the link with the geological setting. Paleohistology however, is a modern method which –based on inner structure of the fossilized (bone) tissue– enables gaining new information about the animals' biology. Up to date, the best histologically studied taxon is *Metoposaurus krasiejowensis* from the Norian locality in Krasiejów, SE Poland. Humeri are the most solely examined bones and they show a variation in growth pattern (histotypes) even though, they resemble in one morphotype. It is highly probable, that the histological variation reflects the variation of the local environmental conditions. To test this a comparison within the Metoposauridae family is necessary. There, bones of *Metoposaurus maleriensis (India), Dutuitosaurus ouazzoui (Morocco), M. diagnosticus (Germany)* and *M. algarvensis* (Portugal) have been studied. The first results show, that on the histological level (organization of matrix) all taxa represent the same scheme and the common presence of parallel-fibred bone mixed with lamellar bone as well as similar organization of the vascular canals seems to be typical for all taxa independent of the locality and individual age. Between bones also the clear differences resulting from the individual age is observed as i.e. degree of remodeling or secondary originated porosity increase. However, the most important differences are visible on the level of growth pattern and origination of the growth marks. The most important factors are thickness of the zones and annuli and the presence of the Line of Arrested Growth (LAG). In *Metoposaurus krasiejowensis* two growth patterns has been observed (H1 represents an alternating growth; H2 represents a rapid growth) which are not connected to the bone size. The typical LAGs are not observed there either. *Dutuitosaurus* shows only one growth pattern with thick zones, thin annuli and annual LAGs occurrence. *Metoposaurus maleriensis* is the most interesting so far as it seems to represents both histotypes observed in *M. krasiejowensis* as an age-dependent system (small bones represent rapid growth, larger bones alternating growth). It comes out that for better understanding the intraspecific variation and especially a possible population diversification – other methods, e.g. geochemistry, need to be applied.