

Terrestrial Mesozoic Stratigraphy

The karstic habitat of spelaegriphacean from Las Hoyas fossil site (Upper Barremian, Serranía de Cuenca, Spain)

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Fossil remains of spelaegriphacean (Family Acadiocardiidae) are common in Las Hoyas *Konservat-Lagerstätte* (Upper Barremian, La Huérguina Fm., Southwestern Iberian Basin) although they belong to an extremely rare group in the fossil record. They have been interpreted to inhabit karstic environments as their contemporaneous equivalents do, however this interpretation has not been clearly proven. On the basis of tectonic, sedimentological, geochemical and paleontological data, the aim of this work is to explore the evidence of active karst processes contemporaneous to Barremian sedimentation in order to support the paleoecological hypothesis, and shed further light on the reconstruction of the paleogeographical evolution of the basin.

Keywords: Paleokarst, Las Hoyas Fossil Site, Spelaegriphacean, Lower Cretaceous, Iberian Ranges.

Palaeogeographical significance in the Western Tethys of the Early Triassic fluvial-aeolian interaction in the Catalan Ranges, NE Spain

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The Early Triassic was still marked by the general perturbations related to the drastic palaeoenvironmental changes produced around the Permian-Triassic transition. These perturbations affected both marine and continental environments and were caused by events such as massive volcanism from the Siberian Traps and its consequent general geochemical anomalies that caused a widespread mass mortality episode of global dimensions. When compared with the marine record, studies in the continental rocks are scarce due to decimated fossil record and important hiatuses. Some of these studies are located in Central Europe series and isolated areas of Antarctica, Urals and South Africa. During the late Early Triassic (Spathian), Central Europe was dominated by important dry conditions that allowed aeolian dune fields development. Southwards of this vast area, conditions were transitionally changing towards the more humid conditions that affected Northern Africa.

This paper is focused in the Catalan Ranges, NE Spain, where exceptional outcrops of continental rocks of Early-Middle Triassic age allow detailed sedimentary and palaeoenvironmental studies that offer new information about the palaeogeography of the western Tethys area, the climatic variations southwards of Central Europe, and the first steps of life recovery in this area after the Permian-Triassic boundary crisis. Data in this paper present a sedimentological interpretation of the Early Triassic sediments of the Catalan Ranges, where aeolian deposits are more important than previous works admitted; also, a new palaeogeography of NE Iberian Peninsula is presented, showing that fluvial deposits were dominant in the Iberian Ranges, but in the Ebro and Catalan Basin, aeolian deposits predominated in depressions among topographic highs of Paleozoic rocks, receiving far less fluvial input

and probably of local origin. This arrangement of facies is well known in Early Triassic basins of Western and Central Europe, but has been overlooked up to now in the Iberian Peninsula.

Keywords: Catalan Ranges, life recovery, Triassic climate, Spathian, Anisian, Western Tethys palaeogeography.

Albian–Paleocene Flora of the North Pacific: Phytostratigraphy and Palaeofloristics

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Stratigraphic settings, age, systematic composition and periodisation of development of the Albian – Paleocene floras in the Anadyr-Koryak (AKSR) and Northern Alaska (NASR) subregions of the North Pacific are discussed. The high-resolution Upper Albian–Paleocene phytostratigraphic schemes of these subregions are based on perceived phases of their floral evolution. In the AKSR the scheme includes seven subdivisions of subregional extent: the Early Ginter (upper Albian), Grebenka (upper Albian–Cenomanian–lower Turonian), Penzhina (upper Turonian), Kaivayam (Coniacian), Barykov (Santonian–lower to ?middle Campanian), Gornorechenian (?upper Campanian–lower Maastrichtian), and Koryak (lower to upper Maastrichtian–?Danian) phytostratigraphic horizons. The phytostratigraphic scheme of the NASR includes three subregional phytostratigraphic horizons and five plant-bearing beds. These are the Kukpowruk (?lower to middle–?upper Albian), Niakogon (upper Albian–Cenomanian), Kaolak (Turonian) horizons and beds with the Tuluvak (Coniacian), Early Kogosukruk (upper Santonian–Campanian), Late Kogosukruk (Campanian–Maastrichtian), Early Sagwon (Danian–Selandian), and Late Sagwon (Selandian–Thanetian) floras. The comparative analysis of coeval floras distinguished in the AKSR and NASR shows that they are either similar to each other (floras of the early Ginter and Kukpowruk, Grebenka and Niakogon, Penzhina and Kaolak, Koryak and Early Sagwon phases) or different in composition (floras of the Kaivayam and Tuluvak, Gornorechenian and Late Kogosukruk phases). Similarities between the floras implies that plant assemblages of two subregions evolved under comparable climatic conditions and freely intercommunicated via the Bering Land Bridge during the Albian–Turonian and terminal Maastrichtian–Paleocene. Floras of the AKSR and NASR, which are of different composition, existed in particular intervals of geological history when trans-Beringian plant migrations were limited or even ceased because of palaeoclimatic difference between the subregions. Floras of the AKSR and NASR survived crisis at the Cretaceous–Paleogene boundary without essential evolutionary consequence. Phytostratigraphy and floral evolution in the Albian – Paleocene of the North Pacific are discussed. A primary driver of Albian–Late Cretaceous florogenesis was the gradual invasion by novel angiosperm-rich plant communities into the Asiatic continental interiors and a replacement of pre-existing vegetation dominated by ancient ferns and gymnosperms.

Keywords: palaeofloristics, phytostratigraphy, North Pacific, Albian–Paleocene.

Paleoenvironmental interpretation of paleosols and palustrine carbonates of the Lower Cretaceous earliest terrestrial ecosystems in the Serranía de Cuenca, Iberian Ranges, Spain

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The bauxitic materials resedimentated on top of the karstified Jurassic carbonates in the Serranía de Cuenca, Iberian Ranges, display paleosols and palustrine carbonates that were coeval with the sedimentation of the

Rambla de las Cruces I Sequence (Upper Barremian; La Huérguina Fm.). This sequence holds rich micro- and macrovertebrate assemblages in the Buenache and Las Hoyas Basins, to the south of the study area. Different paleodrainage and paleotopographic locations are responsible for the different types of paleosols, some of them preserving vertebrate remains. This study allows clarifying some paleoenvironmental aspects of the sedimentation of La Huérguina Fm. and evaluates Upper Barremian terrestrial settings as potential fossil sites.

Keywords: Paleosols, Karstic Bauxites, Oxisols, Palustrine; Las Hoyas, Barremian, Iberian Ranges.

Palynological successions of the Late Jurassic and Early Cretaceous in the Qinghai-Xizang plateau, China

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Two palynological successions of Late Jurassic- Early Cretaceous in age are briefly introduced in this short paper from the Qinghai-Xizang Plateau, China. The northern one from the Tanggula Mountains area consists of three assemblage zones while the southern comprises two zones. Both of them are from marine sequences with diverse dinoflagellate cysts occurred in association. The positions of J/K boundary are discussed and evaluated by comparison to the dinocyst stratigraphy. It shows that the first occurrences of *Aequitriradites spinulosus* and *Cicatricosisporites* sp. may be the best markers for the boundary from a miospore point of view. The peak occurrence of *Dicheiropollis* in the equatorial Tethys region might be significant for this boundary.

Keywords: palynostratigraphy, J/K boundary, the Qinghai-Xizang Plateau, Tethys.

Triassic macrostratigraphy of the western United States

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The Triassic is an extraordinary time interval that experienced a Phanerozoic low in sedimentary packages, a major shift from carbonate to siliciclastics deposition, biotic recovery, the origination of the modern fauna, the peak of Pangean accretion (and its initial break-up), and the end-Triassic extinction. However, quantification of the sedimentary record is necessary to more fully interrogate the nature of Triassic deposition. In order to better understand the factors that influenced the formation and preservation of the sedimentary record, this study describes the spatiotemporal distribution of sedimentary packages (and their properties) in the western US; this region preserves the most complete Triassic record in North America.

Results demonstrate a significant climatic control on Early Triassic sediment accumulation, which is up to 4.5 times greater than that seen in the more tectonically controlled accumulation of Late Triassic sediment. It is demonstrated that global perturbations in $\delta^{13}\text{C}_{\text{carb}}$ closely match variability in the Early Triassic sedimentation rates, volume, and lithology. It is also during this interval that the highest turnover rate of sedimentary packages occurs. In contrast, the Late Triassic has much lower rates of sediment accumulation but greater lithologic heterogeneity, including several coarse-grained intervals linked to the initiation of Andean-type subduction along the Cordilleran margin. Further results show the distribution of sedimentary package duration throughout the Triassic interval is nearly identical to that reported for the entire Phanerozoic. This suggests tectonic processes that govern package longevity are similar in the Triassic of the western US to those that govern larger scale patterns across the continent. Quantification of the spatiotemporal distributions of Triassic sediments has provided a framework for comparing the structure of the sedimentary record across this dynamic interval. It is

anticipated that this study will be the starting point for further investigations of attributes integral to the Triassic system, including improved studies of mass balance, interrogations of the Middle Triassic problem, and the preservation and distribution of body and trace fossils essential to understanding biotic recovery and the origins of the modern fauna.

Keywords: macrostratigraphy, Triassic, modern fauna.

Dating of the uppermost part of the Cabullona Group in Esqueda (Sonora, Mexico)

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Esqueda locality is well-known for the quarries that provide shales used for decorative purposes and construction and the presence of dinosaur ichnites. This study determines the age of this deposit. A late Campanian age is suggested for the uppermost part of the Cabullona Group for all the Esqueda section, based on palynological assemblages and U/Pb geochronology.

Keywords: Late Cretaceous, Cabullona Group, Sonora, Mexico.