

Events Stratigraphy

Size variation of conodonts during the Smithian-Spathian (Early Triassic) global warming event

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The Early Triassic Smithian/Spathian Boundary (SSB) crisis coincides with an episode of extreme warmth. A high resolution stratigraphic framework comprising six conodont zones is provided in Jiarong section, Nanpanjiang Basin, South China. Detailed size measurements of 441 conodont elements of the closely related genera *Neospathodus*, *Triassospathodus* and *Novispathodus* show for the first time that this clade suffered a temporary, but significant, size reduction during the SSB crisis. Size reduction of conodonts was probably caused by an episode of global warming.

Keywords: Conodont; size variation; Early Triassic; extinction; South China.

Latest Bajocian bio-events of ammonite immigration and colonization in the Tarapaca Basin (northern Chile): palaeoenvironmental implications in sequence stratigraphy

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Uppermost strata of the Torcasas Formation from Quebrada San Pedro and Caracoles outcrops, Comuna Sierra Gorda, Region de Antofagasta (Chilean Precordillera), along 20 km, have yielded latest Bajocian ammonite fossil-assemblages characterized by the dominance of juvenile individuals belonging to endemic or pandemic taxa. Also occur very scarce pre-adult, individuals of dimorphic taxa previously unknown in circum-Pacific basins but relatively common in West Tethyan areas, such as the morphoceratids *Dimorphinites* [Macroconch] - *Vigoriceras* [microconch] and the strigoceratids *Strigoceras* [M] – *Cadomoceras* [m]. This report presents the main taphonomic, palaeoecological and palaeobiogeographical observations related to these recent palaeontological findings and their implications in sequence stratigraphy. The maximum deepening, relative sea-level rise and oceanic accessibility of a Bajocian-Bathonian, second-order, transgressive/regressive facies cycle in the marine, back-arc Tarapaca Basin were reached during the latest Bajocian Parkinsoni Biochron.

Keywords: Palaeobiogeography, Sequence stratigraphy, Torcasas Formation, Antofagasta, Middle Jurassic.

Dinocyst stratigraphy and paleoenvironmental interpretation of the Cretaceous/Paleogene boundary at Stevns Klint, Denmark

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There has been some doubt cast upon the results of dinoflagellate cyst studies previously undertaken at Stevns Klint, Denmark, one of the classic outcrops of the Cretaceous/Paleogene (K-Pg) boundary. A re-examination of the uppermost Maastrichtian chalks and an expanded section of the Fish Clay (Fiskeler Member) has identified significant differences between our findings and this earlier work. Thirty-one samples were collected through the K-Pg boundary succession, processed and analysed for their dinoflagellate cyst content. The white coccolith chalk of the uppermost Maastrichtian (Sigerslev Member) is placed in the *Palynodinium grallator* Zone. The overlying 'Grey Chalk' (Højerup Member) represents a shallower-water marine succession that is characterised by a series of dune-like structures. The last occurrence of *P. grallator* is within the Højerup Member, confirming a Danian age for the Fish Clay (Fiskeler Member) and a latest Maastrichtian age for the *P. grallator* Zone. Within the Fiskeler Member key biostratigraphical markers are only intermittently present, and may be used to generate a potential zonation. The highest samples in the Fiskeler Member indicate a progressive transition towards more proximal environments, with no dinoflagellate cysts recorded, having been replaced in the samples by pollen grains.

Keywords: Dinocyst stratigraphy, Cretaceous/Paleogene, Stevns Klint, Denmark.

Cretaceous–Paleogene boundary events in Texas: new sections, revised micropalaeontological interpretations and clarification of the stratigraphy

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Recent fieldwork (2009–2012) in the Brazos River area, Falls County, Texas, has resulted in the discovery of a number of new exposures that have allowed a re-interpretation of the Cretaceous/Paleogene boundary events. Our data indicate that there was a single impact event with the seismic shock and resulting tsunami eroding the uppermost Maastrichtian surface, prior to the deposition of a number of storm-generated sandstones, the lower of which contains altered spherules, shell fragments, ichthyolith debris and re-worked microfossils. The overlying Lower Paleocene succession of mudstones and siltstones was deposited in a mid-shelf setting that is quite similar to that of the preceding uppermost Maastrichtian. The Lower Paleocene appears to record a Milanković cyclicity and, potentially, the Dan-C2 hyperthermal event.

Keywords: Texas, Chicxulub impact, Tsunami, Paleocene, Foraminifera.

Bio- and litho-stratigraphic markers of the Mid-Pennsylvanian event - application for detailed stratigraphy and correlation (East-European Platform)

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The substantial biotic changes in the Moscovian-Kasimovian interval were studied based on the study on several sections of the Oka-Tsna uplift and a general overview of the taxonomic changes in eastern and northern Laurussia. The interval corresponds to the interglacial episode between Glacial II and Glacial III events (GROSSMANN *et al.* 2008). The event is indicated by a diversity drop and partial extinction of massive colonial corals, the fusulinid genus *Fusulina*, and species of *Fusulinella* and taxonomical changes in conodonts shown by data from measured sections. A few levels of disconformities, subaerial exposure and paleosoils are observed. The cyclic sedimentation is generally displayed by replacement of grainstone to dolostone or secondary micritized mudstones, which allows subdividing the elementary cycles bounded by submerged or exposure unconformities. The paleosol profile with development of *Microcodium* was found at the top of the Domodedovo Formation in the Kasimov quarry. The frequency of erosion surfaces increased into the Upper Domodedovo Formation and Peski Formation. The change of sedimentation is marked by an input of siliciclastic material, which allows tracing the lower boundary of the Voskresensk Formation by the red clay deposit. The biostratigraphy of the recently measured Kasimov and Maleevo sections is based on conodonts which enable us to recognize some zones from the southern part of the Moscow Basin, utilizing fusulinids and rugose corals. The isotope data shows a positive trend of $\delta^{18}\text{O}$ and a negative trend of $\delta^{13}\text{C}$ at the base of the Peski Formation (Upper Moscovian) coinciding with a paleosol with *Microcodium* occurrence.

Keywords: Moscovian, Kasimovian, event, Kasimov quarry, bio- and lithostratigraphy, stable isotopes data.

Impact of the Boda Event (Upper Ordovician) on high-latitude peri-Gondwanan faunas: an echinoderm perspective

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In late Katian times, high-latitude peri-Gondwanan regions of the Mediterranean Province display a dramatic faunal turnover, closely associated with a major shift from siliciclastic to carbonate-dominated sedimentation. In most Mediterranean regions, echinoderm assemblages show patterns of faunal replacement comparable to those already described in other groups of marine invertebrates (brachiopods, bryozoans, trilobites). During the late Katian time interval, typical soft substrates-adapted echinoderm communities were suddenly replaced by new communities associated with harder substrates (bryozoan mud-mounds). However, late Katian soft-substrate echinoderm communities persisted both in deep environments of the Prague Basin (Bohemia), and in the largest part of the Anti-Atlas (Morocco).

Keywords: Echinodermata, Climate, Gondwana, Ordovician, Palaeobiogeography.