Geophysical Research Abstracts
Vol. 14, EGU2012-284, 2012
EGU General Assembly 2012

The Orthoceltites beds – a case study on a Triassic mass-occurrence (Carnian, Taurus, Turkey)

A. Lukeneder and S. Lukeneder
Natural History Museum Vienna, Geology and Paleontology, Vienna, Austria (alexander.lukeneder@nhm-wien.ac.at)

Mass-occurrences in the palaeontological record can act as proxy for the environmental activities and biotic crisis through time. It has to be noted that the ultimate causes are often unknown and not well understood and are still under comprehensive discussion.
The formation of the ammonite beds (e.g. Orthoceltites) is either autochthonous or allochthonous (transported). Expected 3D modelling results will be essential to reach geodynamic, palaeooceanographic and palaeobiological conclusions. 3D reconstructed faunas, representing environmental changes as displayed by the sea-level and climate can become more obvious and the 'motor' behind the demise better understood.
While the Carnian, an ammonite mass-occurrence (Anatolia, Turkey) was deposited within an intrashelf area on the western end of the Cimmerian System, with intermediate connection to both, the Neo-Tethys and the Palaeo-Thetys Oceans. The mass-occurrence can be observed over several square kilometers around Aşağiyaylabel and Karapinar. This ammonite mass occurrence (Orthoceltites sp.) is now located at the boundary from the Kartoz and the Kasimlar Formation. The ceratitid ammonite Orthoceltites dominated the ammonite fauna (approx. 99.9%; n > 1 000 000) and is accompanied by rare individuals of Klipsteina and Sirenites.
Statistical analysis of the orientation and relative position of the ammonite shells hint to current or transport directions. 3D modelling of ammonites will lead to a geometrical reconstruction and shed light on the biostratinomic and additional diagentic processes. The proposed research integrates well established 3D visualisation and geometrical modelling techniques in an exciting palaeontological task of reconstructing the distribution and alignment of ammonite in a Triassic mass-occurrence from Turkey. Computed tomography and laser surface-scans of ammonites and computed tomography provide additional information on shape and internal structures, which will in a further step be analysed by morphometric comparisons using landmark supported visualising-applications (e.g. Amira, EVAN Toolbox or Landmarks).
Preliminary studies suggest that the ammonites mass-occurrence was deposited during unstable (e.g., tectonics and sea-level fluctuations) environmental conditions on the mid to outer ramp of the Early Carnian Kasimlar Formation. Phases of normal sedimentation, comprising only few specimens of Orthoceltites, are interrupted by pulses of bottom water currents, marked by interbeds of Orthoceltites mass-occurrences (e.g., n > 1 000 000). The latter beds are characterized by imbrication of ammonite shells and erosional surfaces. The ammonite beds are assumed to display a mixture of autochthonous and allochthonous elements.