

Freies Thema

Badenian planktonic foraminifera as climate proxies at the southern margin of the Central Paratethys (Ugljevik, Bosnia and Herzegovina)Dörte Theobalt^{1,2)} & Oleg Mandic²⁾

Badenian transgression is well exposed in the open coal pit Bogutovo Selo near Ugljevik in NE Bosnia and Herzegovina, located at the southern margin of the Pannonian Basin. Middle Miocene marine sediments superpose Oligocene lignite bearing lacustrine deposits. The measured succession is about 60 m thick and includes the uppermost part of the lake deposits, comprising clays, sands and coal seams, followed by marine sediments. These consist mainly of gray marls, which show some intercalations of thin, dark clay layers, volcanic ash layers and fossiliferous beds as well as few carbonate bodies of different thicknesses. The presence of *Orbulina suturalis* allows a biostratigraphic correlation of the marine transgression horizon with the upper part of the Lower Badenian.

A quantitative analysis has been carried out on planktonic foraminifera to evaluate the climate conditions and their change during initial marine flooding by the Paratethys Sea. 17 planktonic foraminiferal species were grouped in cool (*Globigerina praebulloides*, *Globigerina bulloides*, *Globigerina diplostoma*, *Globigerina concinna*, *Globigerina falconensis*, *Globigerina tarchanensis*, *Turborotalita quinqueloba*), temperate (*Globorotalia transsylvanica*, *Globorotalia bykova*, *Globoturborotalita woodi*, *Globoturborotalita druryi*), warm-temperate (*Tenuitellinata angustiumbilicata*, *Globigerinella regularis*) and warm indices (*Globigerinoides trilobatus*, *Globigerinoides quadrilobatus*, *Orbulina suturalis*, *Globoquadrina cf. altispira*). The preliminary results indicating changes in composition of planktonic foraminiferal fauna along the succession make it possible to recognize a climatic change from cooler conditions at the very base of the section over following warmer conditions in its lower part and middle part towards cooler conditions at the top again. Alternatively the changes in faunal composition could also reflect the sea-level change during initial Badenian marine flooding pulse.

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Palaeo-wildfires in the Late Jurassic (Kimmeridgian) of Western and Central Europe – Taphonomy and palaeoenvironmental significanceDieter Uhl^{1,2)}, André Jasper³⁾ & Günter Schweigert⁴⁾

Although fossil charcoal, as direct evidence of palaeo-wildfires, occurs in the fossil record at least since the Late Silurian it is not equally distributed in sedimentary rocks from different ages. As the occurrence of wildfires is indeed not only controlled by climatic and environmental parameters, but also by the concentration of atmospheric oxygen, it has been argued by various authors that the fossil record of charcoal must also be influenced by (long term) variations in atmospheric oxygen concentrations. Geochemical models reconstructed low oxygen concentrations during almost the entire Jurassic, resulting, at least theoretically, in very low fire frequencies during this period.

Here we describe new discoveries of fossil charcoals from two Late Jurassic (Kimmeridgian) localities in Western (Boulonnais area in N-France) and Central Europe (Nusplingen limestone Fossil-Lagerstätte in SW-Germany). Combining our new data with the so far known, rather scarce data about the occurrence of charcoals during this particular interval of time demonstrates that all of these occurrences lie either within a Late Jurassic winter-wet climate belt, characterised by a marked seasonality, or within the assumedly drier part of a temperate climate belt, near the boundaries to the winter-wet climate belt. This is somewhat surprising as the preservational potential of charcoal is generally considered to be rather low under comparable climatic conditions, although charcoal production is usually high under seasonally dry climatic conditions. As almost all Kimmeridgian charcoals discovered so far come from marine sediments it seems likely that taphonomic factors may have favoured the preservation of charcoal in such environments.

Considering all data and interpretations it seems possible that on a global scale fire frequencies were low during the Kimmeridgian due to relatively low atmospheric oxygen conditions during this period. Only in areas with a pronounced seasonality (i.e. under a winter-wet climate) fires occurred frequently enough to produce a certain amount of charcoal and this charcoal has only been preserved under favourable conditions in marine sediments or in peat bogs with relatively high fire frequencies.