Palaeoenvironmental reconstruction and climate change in South Eastern Europe (Neogene Karlovo lignites, central Bulgaria)

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Neogene Karlovo Basin, Central Bulgaria was comparatively studied with other Bulgarian lignites for palaeoenvironment assessment. Petrographic and chemical methods were used. The data allowed floral reconstruction at the region and assumption for the climate during the corresponding geological time. The data of geochemical and petrographic studies gave proves for the long-term evolution of the Late Neogene on the South Eastern Europe connected with the decrease in palaeotropical elements and increase in arctotertiary taxa. Conifers remained main coal-forming vegetation predominantly represented by *Pinaceae*. Biomarker assemblage assumed insignificant *Cupressaceae*/*Taxodiaceae* contribution. Monoaromatic angiosperm-derived triterpenoids with ursane/oleanane skeleton proved the presence of dicotyledonous angiosperm-derived organic matter in the palaeoplant taxa as well. Palaeoenvironmental conditions within the forest swamp should be determined as limnic, with varying water table and seasonal drying.

New evidence for impacts of the AD365 tsunami along the North African Coast

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Inspired by a fascinating report of the 4th c. AD writer Ammianus Marcellinus, a destructive, earthquake-generated tsunami is inferred to have seriously affect Alexandia in Egypt in 21 July AD365. This earthquake is traditionally associated with tectonic processes along the Aegean Arc, and more recently with the up to 9.5m uplift of West Crete and with seismic destruction in coastal Libya, in Cyprus and Sicily among other areas. In addition, models of the causative fault and of the tsunami propagation have been proposed, while it has been presented evidence that the overall process involved at least three major seismic events near Cyprus, SW of Crete (M>8.5) and possibly between Libya and Sicily.

A recent systematic interdisciplinary study permitted to refine the fault-model at Crete and to re-evaluate the tsunami effects along the North African Coast.

No clear evidence for destruction of the main city of Alexandria by a tsunami exists, at least as far as the history of its famous Library suggests, while a report for a miracle of St Athanasius who saved the city from the tsunami was identified. Tsunami denudation must have been important in the Nile Delta east of Alexandria, but on the contrary, there is no evidence for tsunami damage in Cyprus and the major coastal towns of Libya, the first to have been affected by a Cretan event; some reports for tsunami deposits in southern Greece mainland or of tsunami propagation as far as Croatia seem also at least questionable.

The most likely explanation is that the report of Ammianus is not genuine and precise, as several authors have noticed on the grounds of history and tsunami propagation modeling, and inundation of the coast east of Alexandria was probably associated with an earthquake south of Cyprus, not an unusual event, indeed, or of its secondary effects. The possibility of a second tsunami which affected southern Italy and possibly the western Greek coast cannot be discarded, since there is evidence for coastal uplift in this last area during the critical period, consistent with the hypothesis that the historical reports for a "universal" earthquake in AD365 reflect an amalgamation of several major seismic events which occurred in a rather short time interval.