

Palynology of Triassic/Jurassic boundary key sections of the NW Tethyan Realm (Hungary and Slovakia)

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Abstract

Late Rhaetian/Hettangian microfloras of three depositional environments of the NW Tethyan realm have been studied: platform to basinal limestones of the Csóvár section (N Hungary), shallow marine limestones and marls of the Tatra Mountains (N Slovakia) and terrestrial coal deposits of the Mecsek Mountains (S Hungary). The analysis of the palynological assemblages and palynofacies patterns builds the base for interpretation and comparison of the different depositional environments. Additionally, the sporomorph distribution and diversity are investigated with respect to environmental and climatic change within the Triassic/Jurassic boundary interval and the processes that may have caused these changes. A striking spore spike was detected in all depositional areas studied. Palynological investigations were accompanied by geochemical (stable isotope) and clay mineral analyses. The results of this integrated analysis point to a relatively sudden climatic change most probably caused by the volcanic activity of the Central Atlantic Magmatic Province (CAMP) associated with the onset of rifting of Pangaea during early Mesozoic times. The data obtained in the course of this thesis strongly support this interpretation and depositional series of Hungary and Slovakia proved to be key sections of the NW Tethyan realm.

Kurzfassung

Palynomorphen-Assoziationen und die Zusammensetzung der sedimentären organischen Substanz der Trias/Jura-Grenze wurden in Profilen Ungarns und der Slowakei untersucht, welche drei unterschiedliche Ablagerungsräume der NW Tethys-Schelfregion darstellen: distale Plattform-Beckenablagerungen (Csóvár), proximale Flachwasserablagerungen (Tatra) und fluviatil-lakustrine Kohleablagerungen (Mecsek). Schwerpunkt der Arbeit war die Dokumentation der Palynomorphen und der Palynofazies anhand kompletter Profile von marinen und kontinentalen Ablagerungsserien. Stratigraphische und laterale Variationen in der Zusammensetzung der Palynofazies wurden hinsichtlich eines klimatischen Wechsels innerhalb dieser Zeitscheibe analysiert. Ein charakteristisches Sporen-Signal konnte in allen Regionen nachgewiesen werden. Darüber hinaus zielten die Untersuchungen darauf ab, Veränderungen des Paläoenvirments anhand der unterschiedlichen Palynomorphen-Assoziationen nachzuweisen. Dazu dienten ebenfalls Isotopen- und Tonmineralanalysen. Die Ergebnisse dieser Untersuchungen liefern einen wesentlichen Beitrag zur Klärung der Umweltveränderungen an der Trias/Jura-Grenze, deren Ursache und den globalen Zusammenhängen. Der Einfluss der relativ kurzzeitigen, starken vulkanischen Aktivität der mittelatlantischen Magmen-Provinz (CAMP) im

Zusammenhang mit den plattentektonischen Ereignissen (Pangäa-Rifting) wird als Hauptursache für die Umweltveränderungen im frühen Mesozoikum angesehen. Die neu gewonnenen Daten aus dieser Arbeit liefern dazu wichtige Belege und die untersuchten Ablagerungsserien Ungarns und der Slowakei haben sich als Schlüsselprofile der NW Tethys-Schelfregion erwiesen.