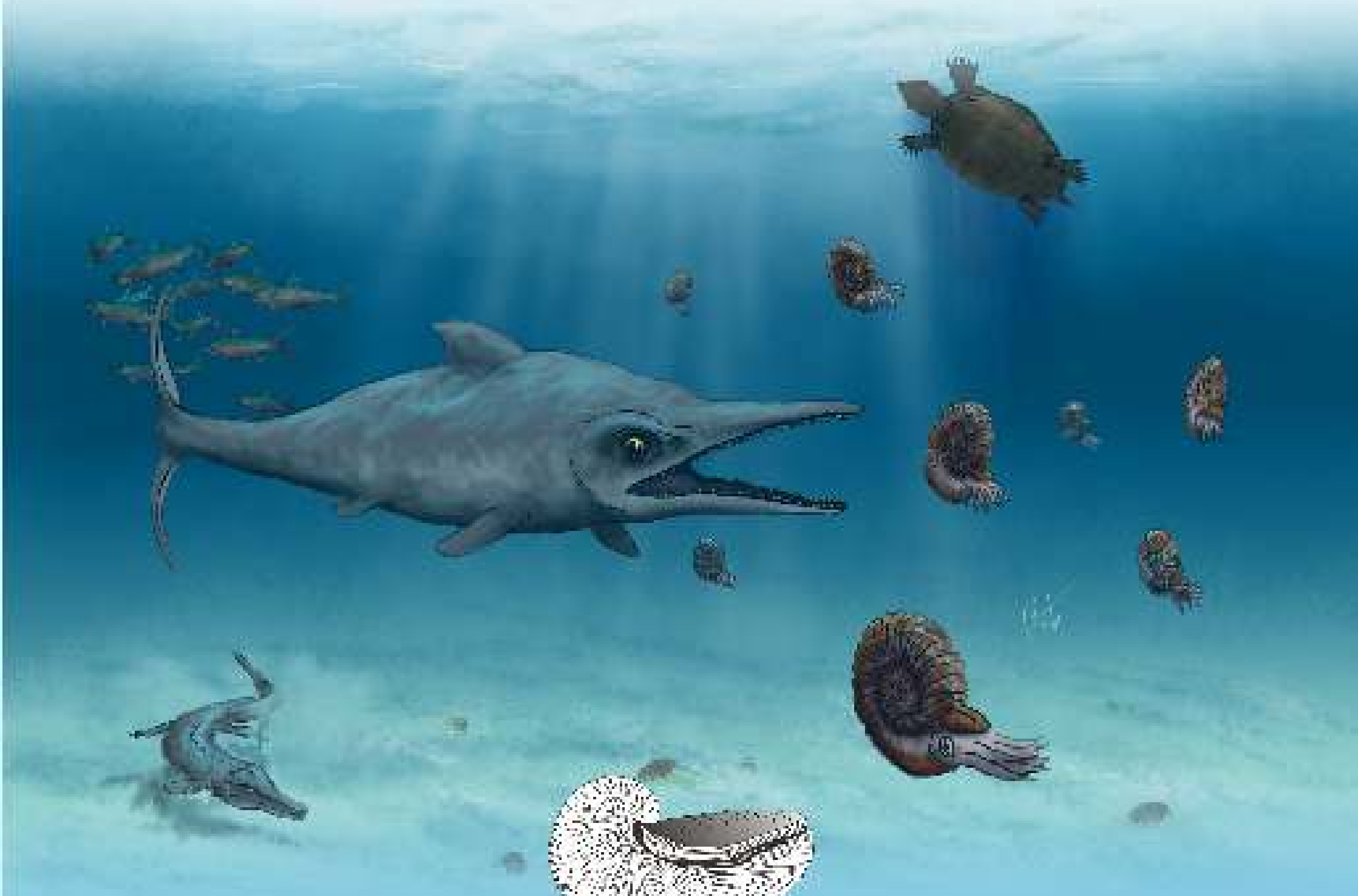
XIIth Jurassica Conference

Workshop of the ICS Berriasian Group and IGCP 632

Field Trip Guide and Abstracts Book



Smolenice, Slovakia, April 19–23, 2016

Earth Science Institute, Slovak Academy of Sciences
Bratislava
2016

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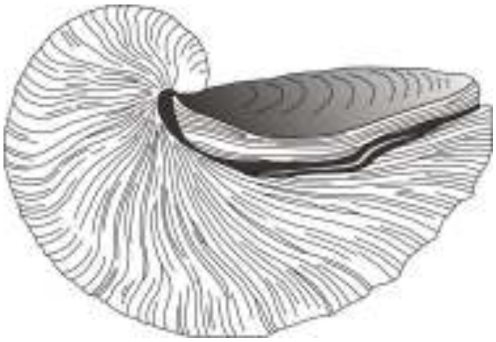

Field Trip Guide and Abstracts Book

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Earth Science Institute, Slovak Academy of Sciences
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SLOVAK RESEARCH AND DEVELOPMENT AGENCY

The editors are grateful for the financial support: Slovak Research and Development Agency, SRDA (project No. 14-0118).

ISBN 978-80-85754-36-0

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kerogen as a dominant organic matter. However, the lowermost 50–60 metres (Aalenian) is organically much richer, with TOC up to 13%. The measured thermal maturity indicates the oil window with vitrinite reflectance values up to 1.1% (Grotek, 2008; 2012 a and b).

The marly shale of Pałuki Formation has very good and excellent generative potential, revealing the TOC values of around 3% on average, with some peaks reaching even 11%. The organic matter is composed mainly of the type-II kerogen. All analysed samples reflect the thermal maturity at the level of early oil window (0.55–0.65% Ro). Thickness of the net pay zone within the Pałuki Formation is estimated at 70–150 m.

This needs to be emphasized that all analysed wells were drilled on the structural heights surrounding the significantly deeper (500 m) part of the regional syncline. Hence, the considered source intervals likely reached much higher level of maturation in that deeper section. Thermal maturity modelling suggests that both the Middle Jurassic and the Upper Jurassic source rocks entered the gas window (1.3–1.4%Ro) and oil window (0.9–1.1% Ro), respectively. The effective oil generation could have occurred at the depth of 3000 m, while generation of dry gas started around 500 m deeper.

Considering the presented results, the quality of analysed source rocks is clearly enough to generate and expel hydrocarbons. Despite the lack of conventional discoveries, there is a quite high potential for exploration of unconventional petroleum systems (shale gas and shale oil). Moreover, oil and gas accumulations in traps related to salt domes still cannot be excluded.

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Posters:

J/K boundary interval in Siberia: Litho-, bio-, magneto-, and chemostratigraphy

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To find the optimum solution concerning the Berriasian GSSP, it would be good way to define the most preferable level or, at least, interval for determination of the GSSP in each region where the J/K boundary deposits have been recorded.

The J/K boundary beds are observed in a huge territory of Siberia; they are dominated by terrigenous rocks of marine and continental geneses, which are of very different lithologic compositions and belong to the upper part of the regional Bazhenovo Horizon. With any of the accepted markers which are under examination of Berriasian Working Group, the J/K boundary in Siberian sections will be within the Bazhenovo Horizon.

The J/K boundary interval in Siberian sections is now well described by a system of parallel (independent) zonal scales based on different fossil groups (ammonites, belemnites, bivalves, microfauna, and microphytofossils). However, there are no biostratigraphic markers here which permit a direct correlation between Boreal and Tethyan sections. If the Berriasian GSSP will be determined in Mediterranean sections, the identification of this level in Siberian sections will be possible only based on a combination of data obtained by palaeontological and nonpalaeontological methods of stratigraphy (bio-, chemo-, magnetostratigraphy). Unlike the Tithonian–Berriasian boundary, only the Volgian–Ryazanian boundary in Boreal sections has reliable bioevent markers. In Siberia it was assigned to the base of the *Chetaites sibiricus* or *Praetollia maynci* ammonite zones.

The J/K boundary traditionally defined at the base of the Jacobi Zone is positioned in Siberia above or below or at the point of connection with the base of the *Craspedites taimyrensis* ammonite Zone according to magnetostratigraphic data (Houša et al., 2007; Bragin et al., 2013) and the most recent models of correlation between Siberian and Western Mediterranean sections (Rogov et al., 2015; Schnabl et al., 2015; Shurygin & Dzyuba, 2015). The so-called traditional basal Berriasian interval (between the bases of the Jacobi and Grandis subzones) corresponds in Siberia to the interval including the relevant magnetostratigraphic units, and the base of the *Arctoteuthis tehamaensis* belemnite Zone (Fig. 1). Additionally, a positive $\delta^{13}C$ excursion was identified here in the marine carbonate (belemnites) carbon records from the beds corresponding to the upper part of the basal Berriasian interval (Dzyuba et al., 2013). This excursion is comparable to analogous excursions detected in Europe, and we consider it an important marker for interregional correlation of the J/K boundary deposits. The composite Tethyan $\delta^{13}C$ curve that is based on bulk carbonate analyses is relatively smooth as the result of the mixing of different biogenic components, which may also be of different age (the averaging effect).

The best integrated stratigraphic study of the J/K boundary interval in Siberia was performed for the Nordvik section located in northern East Siberia (see Rogov et al. in the present Abstract Volume). In Western Siberia, the most stratigraphically-complete section spanning the both Tithonian–Berriasian and Volgian–Ryazanian boundaries is located in the foothills of the Northern Urals on the Maurynya River. Ammonite-based and belemnite-based biostratigraphy, and high-resolution C- and O-isotope stratigraphy have been clarified for the Maurynya section (Dzyuba et al., 2013). Additionally, the first Sr isotope data from this section were recently reported (Izokh et al., 2015).

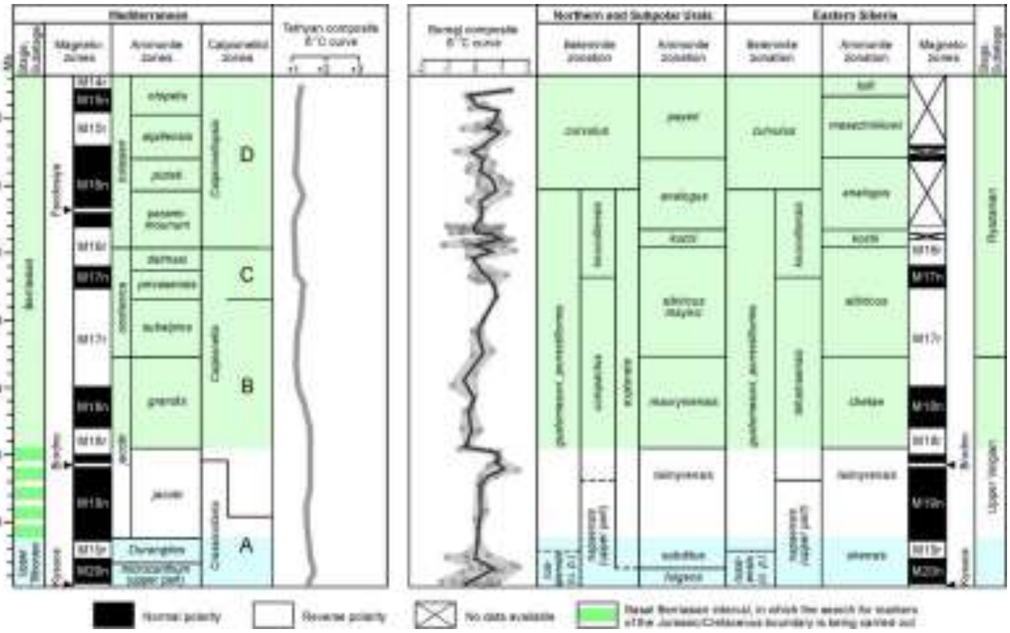

Fig. 1. Boreal (Siberian) bio-, magneto- and chemostratigraphy, compared with the Tethyan (Mediterranean) successions (after Dzyuba et al., 2013 and Shurygin & Dzyuba, 2015).

If a set of parallel biostratigraphic scales is applied with regard to palaeomagnetic and isotopic events, this can ensure quite a narrow uncertainty interval for the position of the J/K boundary in Siberian sections (Shurygin & Dzyuba, 2015). The least interval of the uncertainty of the position of this boundary in Siberian sections will be ensured by the selection of one of two markers: biostratigraphic (base of the Grandis Subzone) or magnetostratigraphic (base of the M18r magnetozone). This is a contribution to the IGCP608 and programs 30 and 43 of the Presidium of the RAS.

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