XII[th] Jurassica Conference

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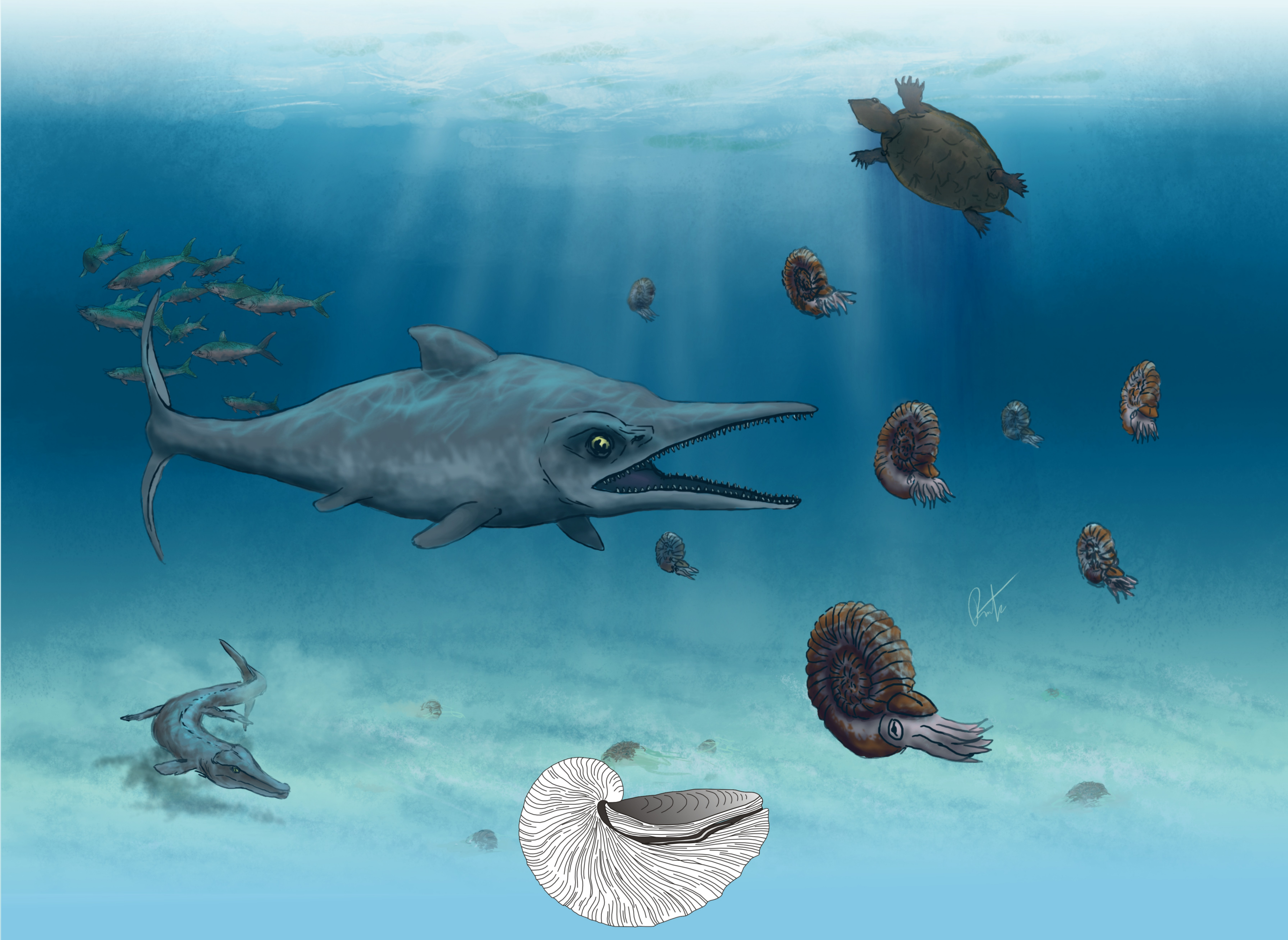
Field Trip Guide and Abstracts Book



Smolenice, Slovakia, April 19–23, 2016

Earth Science Institute, Slovak Academy of Sciences
Bratislava
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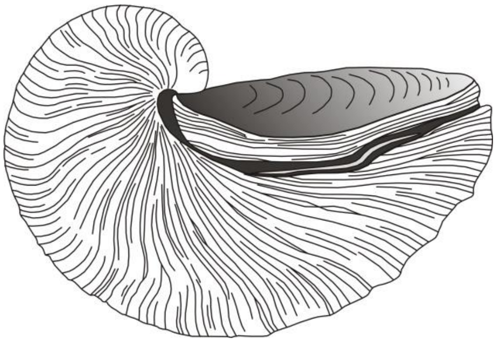

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Berriasian-Valanginian boundary in the Crimean Mountains

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At present, stratigraphic ranges of some late Berriasian ammonite genera and species are defined not very precisely because of three reasons. First, complete Berriasian–Valanginian sections are absent in many regions, second, the same taxa are controversially identified, and third, they are inadequately studied. Accordingly, position of the Berriasian–Valanginian boundary in the Mediterranean is disputable. Hoedemaeker (1982) who studied complete Berriasian–Valanginian sections in Spain distinguished above the upper Berriasian Picteti Subzone an interval, characteristic of which are representatives of genera *Tirnovella* (*T. alpillensis* included), *Kilianella, Sarasinella, Neocomites*, and *Olcostephanus.* This interval termed the Tirnovella alpillensis Subzone was included into the Thurmanniceras (Kilianella) retrocostatum Zone of the lower Valanginian and supplemented by remark that *alpillensis* forms with abundance maximum in synonymous subzone commenced their evolution in the Picteti Subzone of the upper Berriasian. Later on, Company (1987) established presence of *T. alpillensis* in the Otopeta Zone and occurrence of *F. boissieri* in the lower part of the Valanginian Pertransiens Zone in Spain. In preliminary ammonoid zonation suggested for the Mediterranean region (Hoedemaeker, Bulot, 1990), there was an interval of "unnamed association" above the Picteti Subzone, which was included into the Boissieri Zone and corresponded to the Alpillensis Subzone in the earlier ammonoid zonation suggested by Hoedemaeker (1982). Expecting a more complete investigation and description of fauna, experts on the problem recommended including this interval into the Berriasian. Later on, it was decided to consider the interval as the upper Tirnovella alpillensis Subzone of the Boissieri Zone (Hoedemaeker et al., 1993). Despite the opposition of Hoedemaeker, that decision was authorized in resolutions of the International Ammonite Working Group (Rawson et al., 1999; Hoedemaeker, Rawson, 2000). New information about distribution of *T. alpillensis* and *F. boissieri* in Mediterranean sections appeared in recent years. In Morocco, *alpillensis* forms have been detected in the Otopeta Zone (Aguado et al., 2000), while *boissieri* specimen was described from the Otopeta Subzone ranked accordingly as the upper Subzone of the Boissieri Zone (Wippich, 2003). In the mentioned region, *F. boissieri* is found in association with *Subthurmannia latecostata, T. alpillensis*, and *Thurmanniceras thurmanni.* At the Stramberk locality (Czechia), species *Subthurmannia* cf. *boissieri* is associated with Valanginian ammonites *Thurmanniceras pertransiens, T. thurmanni, K. roubaudiana*, and *K. clavicostata*, which are characteristic of the Pertransiens Zone (Houša, Vašiček, 2004). As is noted in the cited work, however, the species in question is confined in the Stramberk locality to the base of lower Valanginian deposits above deeply eroded Berriasian sediments (a greater part of the Boissieri Zone is missing), and shells of this taxon are redeposited most likely. Taking all this into consideration by positioning the Berriasian–Valanginian boundary in Mediterranean region, the "Kilian Group" decided to transfer the Otopeta Zone into the Berriasian and ranked it as upper subzone of the Boissieri Zone (Hoedemaeker et al., 2003). This decision is consistent with recommendation of the Brussels Symposium (Bulot, 1996) to define the Berriasian–Valanginian boundary at the first occurrence level of *Calpionellites darderi* at base of Zone E. More exactly, this level corresponds to the appearance datum of the typical Valanginian species *T. pertransiens.*

Valanginian ammonites are scarce in the Crimean Mountains, and it is difficult to establish here the relevant zonation (Zones of the Cretaceous..., 1989). None of the sections with the Berriasian–Valanginian transition proved by paleontological materials is known here. The Valanginian sediments transgressively overlap as a rule either the Berriasian and Upper Jurassic deposits, or the Tavricheskaya Group. In the Varnautskaya and Baidarskaya depressions of the southwestern Crimea, the deeply eroded Tithonian and Berriasian deposits are overlain by clays containing ammonites *N. neocomiensis, K. roubaudiana*, and *T. thurmanni* of the lower Valanginian (Eristavi, 1957; Lysenko, 1964). The only place, where E.Yu. Baraboshkin established based on ammonites the lower Valanginian Pertransiens Zone (Atlas of the Cretaceous…, 1997; Arkadiev et al., 2002), is section of the Bel'bek Valley in the southwestern Crimea. Even here, nevertheless, the Berriasian–Valanginian boundary cannot be defined precisely, because the Euthymiceras–Neocosmoceras Beds correlated with the Boissieri Zone and beds with ammonites of the Pertransiens Zone are separated by carbonate and quartz conglomerate strata barren of ammonites and conventionally attributed to the Berriasian. Deposits with ammonites of the Otopeta Zone are established in the Kacha and Bodrak river basins of the southwestern Crimea (Baraboshkin and Mikhailova, 2000), where they discordantly overlie the Tavricheskaya Group, and concrete position of the Berriasian–Valanginian boundary is problematic here as well. In the Crimean Mountains, species *T. alpillensis* and *F. boissieri* have not been found as yet in association with ammonites of the lower Valanginian Otopeta or Pertransiens Zones (Baraboshkin, Mikhailova, 2000), and it would be motiveless therefore to support or disprove reasonably the resolutions of the "Kilian Group".

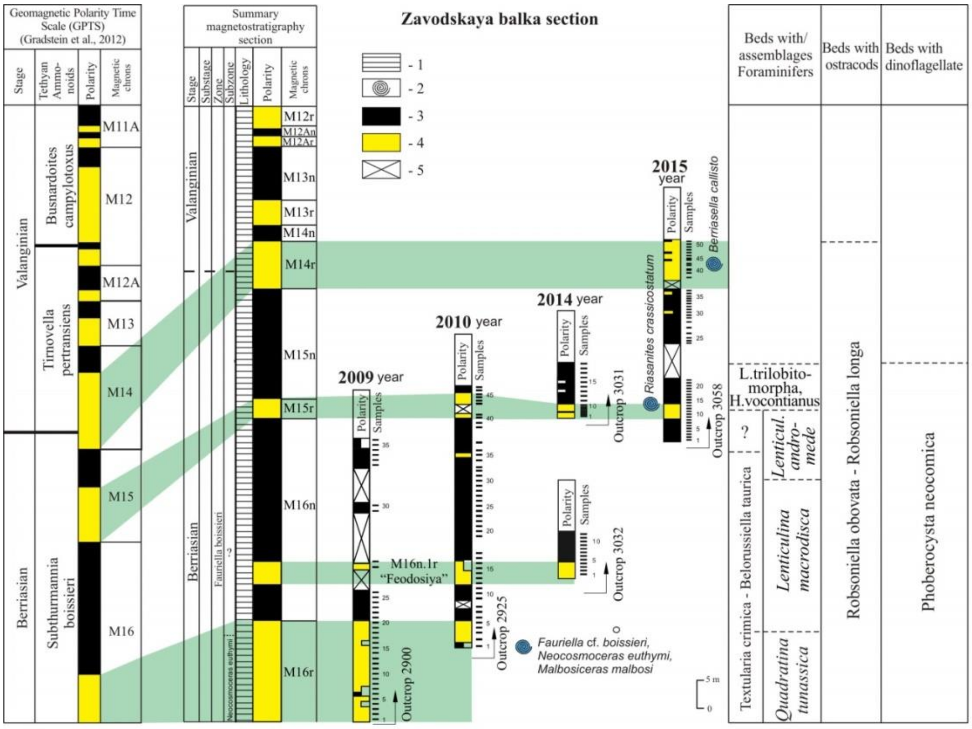

Fig. . Composite section of Berriasian - Valanginian of Zavodskaya balka (1 - clays; 2 - ammonites; 3- normal, 4 - reverse; 5 - missing data.)

In 2009-2015 years the authors studied the Upper Berriasian "Zavodskaya Balka" section (Feodosiya, Crimea) (fig. 1) (Arkadiev et al., 2010, 2015; Guzhikov, Bagaeva, Arkadiev, 2014). Among results of these studies, there was a discovery of ammonites *Neo-*

cosmoceras euthymi, *Fauriella* cf. *boissieri*, *Malbosiceras malbosi* in the upper part of the succession. This assemblage is characteristic for Neocosmoceras euthymi Subzone of the Mountaineous Crimea (Arkadiev et al., 2012) corresponding to standard Tethyan Malbosiceras paramimounum Subzone of the Boissieri Zone (Reboulet, 2014). Ammonites classified as *Riasanites crassicostatum* were discovered in 2014 in the upper part of the section, 40 m above the *Neocosmoceras euthymi* finds. In 2015, ammonites *Berriasella callisto* were founded above *Riasanites crassicostatum* finds. In this way, based on ammonites first substantiated the presence of a single sequence all previously proposed for the Crimean Mountains Upper Berriasian biostratons, including Crassicostatum Subzone and Beds with Jabronella cf. paquieri and Berriasella callisto (Arkadiev et al., 2012). Species *Berriasella callisto* may indicate the presence of Otopeta Subzone, because in Spain sections it known from this stratigraphic interval (Tavera, 1985). By biostratigraphic correlation, based on foraminifers, ostracods and dinocysts, the studied section is an age analogue to upper Berriasian — lower Valanginian of standard Tethyan scale. The palaeomagnetic column presents an alternating polarity. The magnetic chrons analogous to the M15 and M14 are identified in it. By magnetostratigraphic correlation, the studied section there is an age analogue of the Berriasian—Valnginian boundary (Otopeta Subzone and Pertransiens Zone). The existence of the M16n.lr subchron (“Feodosiya”) is confirmed.

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3-D geological model of Jurassic deposits from the Lublin Basin, E Poland

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The 3D geological model of Jurassic deposits from the Lublin Basin is a part of the 3-D model of the region comprising the geological profile from Ediakarian to Quaternary. The model has been recently constructed in the Polish Geological Institute – NRI as a part of the program of sedimentary basins modeling by a team consisting of regional geologists, geophysicists and experts in modeling. Mapped regional structure covers the area of 260x80 km located between Warsaw and Polish-Ukrainian border, along NW–SE-trending margin of the East European Craton. Within the basin, the Paleozoic beds with coalbearing Carboniferous and older formations containing hydrocarbons and unconventional prospects are covered unconformably by Permo-Mesozoic and younger rocks. Vertical extent of the regional model is set from topographic surface to -6000 m ssl and at the bottom includes some Proterozoic crystalline formations of the craton. The project focuses on internal consistency of the models in different scales – from basin (small) scaleto field-scale (large-scale). The models, nested in the common structural framework, are being built with regional geological knowledge, ensuring smooth transition in the 3D model resolution and amount of geological detail.

Modeled Jurassic strata reaches 700 m of thickness in the western part of area. Overmost of the area, they overlie the Palaeozoic (Carboniferous, Devonian) and are covered by the Upper Cretaceous.The first stage of the modelling process was a data integration and an update of the database with geological information derived from boreholes and geophysical interpretation. Structural modelling of top and base of Jurassic was based on 2D seismic interpretation and data from 420 wells. Inter-