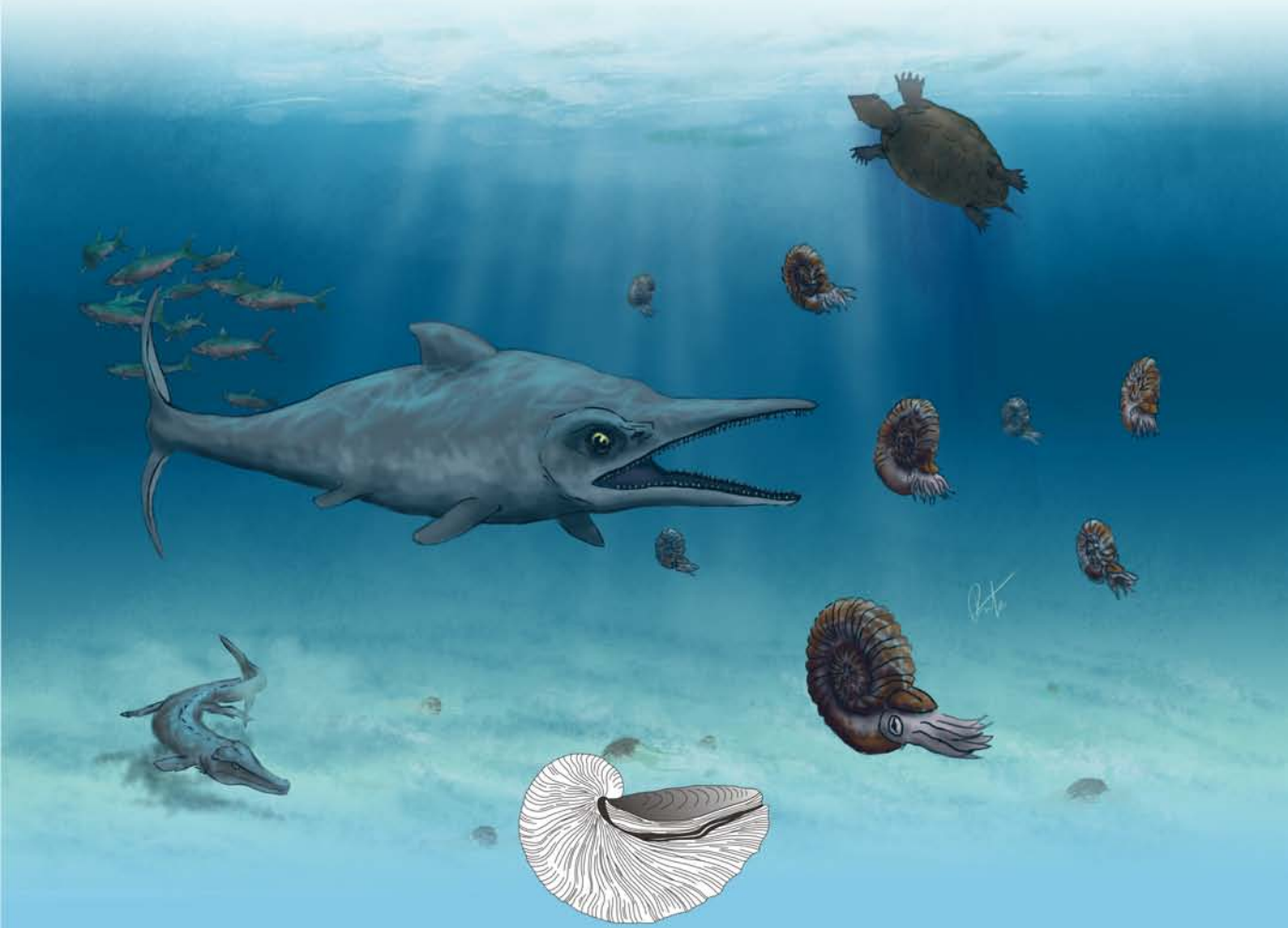
# XII$^{th}$ Jurassica Conference

# 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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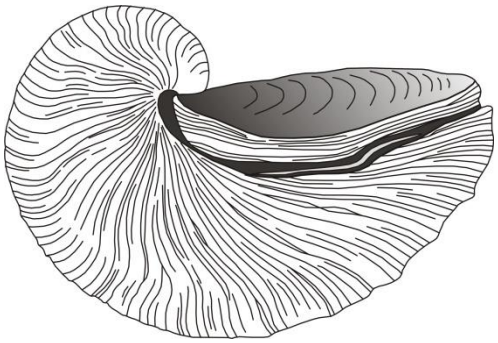

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# Infrazonal ammonite biostratigraphy of the Upper Kimmeridgian of Polish Lowland (preliminary results) and Late Kimmeridgian events

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*Ammonite biostratigraphy*

Upper Kimmeridgian deposits are widely distributed in the Polish Lowland, where they are penetrated by numerous deep boreholes, and only in the southern and northern periphery of this region (in the Peri-Carpathian area and northern Pomerania) they lies near to the Earth's surface and accessible through studies of shallow wells and / or quarries. Although general information about Upper Kimmeridgian ammonite distribution of the Polish Lowland has been published in many papers (mainly in the "Profile Głębokich Otworów" series), before the last decades only few ammonites were figured or described (Krantz, 1908; Pachucki, 1965; Malinowska, 1976, 1999, 2001). Detailed information on ammonites distribution accompanied by description and figuration of nearly all ammonoid taxa occurred through boreholes was published recently by Kutek and Zeiss (1997), but their study has been devoted to small area near Tomaszov Mazovecki, and only few ammonites from strata older than Autissiodorensis Zone were recorded. It should be noted, however, that recent advances in study of the Upper Kimmeridgian ammonite succession of the Middle Volga area by the author has revealed possibilities for further subdivision of the Polish uppermost Kimmeridgian, as ammonite succession of the Autissiodorensis Zone of the both these areas are nearly identical.

Detailed study of core stored in the Polish Geological Institute and Warsaw University accompanied by photographying and determination of ammonites as well as by counting of relative abundance of different ammonite taxa provides background for the proposed infrazonal subdivision of Kimmeridgian presented herein (fig. 1).

Mutabilis Zone

There are few ammonites from the Mutabilis Zone s.str. of the studied area were figured till now. For the further subdivision of this zone most important is Kcynia I borehole, which is containing the following succession of faunas: *kappfi* horizon (this immigrational horizon partially is belonging to the Askepta Subzone; it is also recognized in NE Poland by data published in Wierzbowski et al., 2015) with *Amoebites kapffi* (Oppel), *Aulacostephanoides* cf. *desmonotus* (Opp.), *Discosphinctoides* sp. (574,1-580,4 m); *salfeldi* horizon with *Aulacostephanoides* sp., *Glochiceras* sp., *Amoebites salfeldi* (Spath), *Taramelliceras* sp.(568,4-574,1 m); *Sarygulia* cf. *pishmae* (Khud.) (566,1-566,7 m); *Aulacostephanoides circumplicatus* (Quenst.), *A. desmonotus* (Opp.), *Glochiceras* sp. (564,1-566,1 m). Presence of the Lallierianum Subzone is proven for Kcynia IV well, in which *Orthaspidoc-*

*eras* cf. *lallierianum* (d'Orb.) has been found at 190,75-191,75 m.

Eudoxus Zone

Distribution of aulacostephanid and aspidoceratid macroconchs, which are used for subdivision of the Subboreal Eudoxus Zone (cf. Hantzpergue, 1989) in the Polish Lowland is poorly known due to rarity of these ammonites in cores. Only upper part of the zone (*yo* horizon) could be tentatively recognized by presence of the index species (*Aulacostephanus* cf. *yo* – see Wilczynski, 1962, pl. IV, fig. 1; pl. V; Matyja,Wierzbowski, 1998, pl. IV, fig. 2) as well as assemblage with *Aspidoceras* cf. *quercynum* (Kutek, Zeiss, 1997, pl. 1, fig. 1-2), *Discosphinctoides* ex gr. *roubyanus* (loc.cit., pl. 1, fig. 7-8), and *Sutneria* cf. *eumela* (loc.cit., pl. 1, fig. 3-5), which are typical for the upper Eudoxus Zone of the Russian Platform. However, cardioceratids are locally abundant and permits to recognize here some horizon known from Arctic succession. *Sokolovi* (formerly *kochi*) horizon could be traced by occurrences of the index species *Euprionoceras sokolovi* (Bod.) in the Borów K36 well (596,5 m). Overlying *anglicum* horizon is remarkable of mass occurrences of dwarf cardioceratid ammonites, belonging to *Nannocardioceras anglicum* (Salf.) and closely related species, which are typical for black shale facies. This horizon is recognized at Kcynia I (457,65-490,4 m), Nidzica IG 1 (1087,6-1101,4 m), Borów K36 (435,2-462,8 m) boreholes. Other ammonites, including small-sized *Neochetoceras* and *Aulacostephanus*, are uncommon.

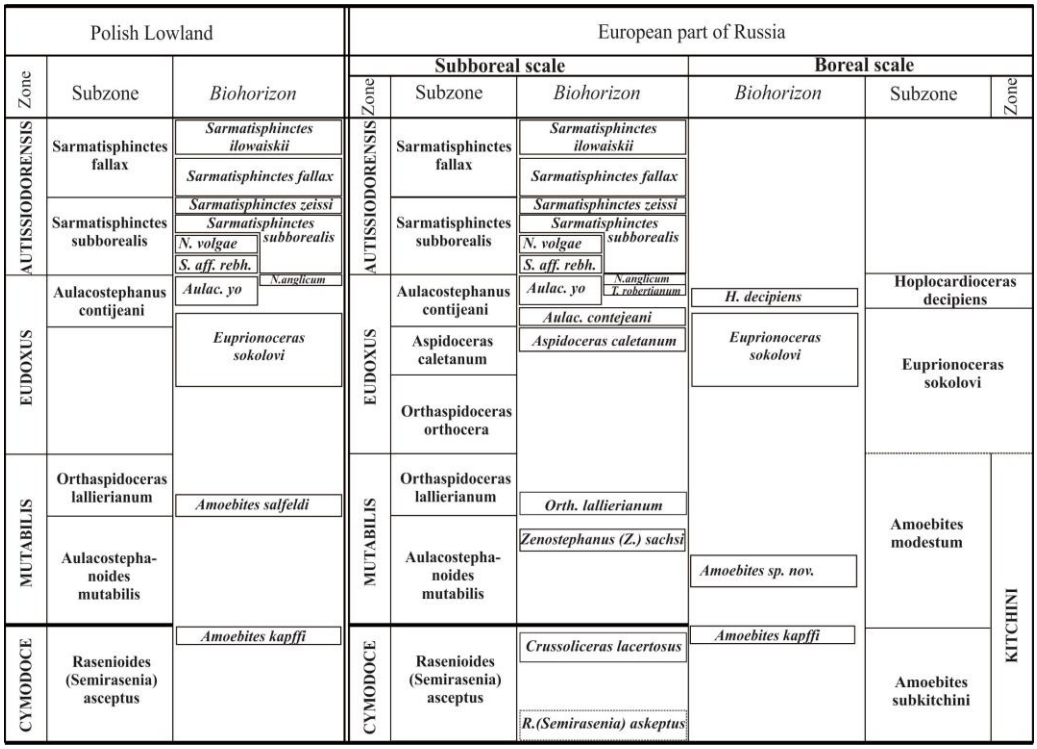


Fig. 1. Infrazonal subdivision of the Upper Kimmeridgian of Polish Lowland and the European Russia by ammonites.

Autissiodorensis Zone

Ammonte faunas of the Autissiodorensis Zone of Polish Lowland are nearly identical to those of the Middle Volga area (Rogov, 2010), and the same succession of biohorizon is recognized in the both studied areas.

Subborealis Subzone

Basal biohorizon of the Autissiodorensis Zone (aff. *rebholzi*) is marked by nearly equal

occurrences of ammonites with different biogeographic affinities.

Tiny *Sutneria* aff. *rebholzi* Berckh, as well as macroconchs *Schaireria* sp. are very typical for this unit along with *Nannocardioceras krausei* (Salf.), first virgatitids (*Sarmatisphinctes subborealis* (Kutek & Zeiss) and aulacostephanids (*Aulacostephanus volgensis* (Vischn.), *A. (A.) kirghisensis* (d'Orb.), *A. (A.) subundorae* (Pavl.), *A. autissiodorensis* (Cott.)). This horizon is recognized in many wells (Kcynia IG 1, Nidzica IG 1, Płońsk 8, Gostynin IG 4) along with historical occurrences in Northern Poland (Krause, 1908). Overlying *volgae* horizon marked by mass occurrences of the last cardioceratid ammonite ever known, *Nannocardioceras volgae* (Pavl.), while other ammonites (*Sarmatisphinctes subborealis* (Kutek & Zeiss) and *Aulacostephanus* sp.) are rare here. Throughout the Subboreal Realm (including also the Middle Volga and Pechora areas as well England) thickness of this horizon is very small suggesting that duration of the *volgae* hemera was very short comparing with other hemerae of the Late Kimmeridgian. Along with two event horizons mentioned above the single "evolutionary" horizon *subborealis* could be recognized in the lower part of the Subborealis Subzone by occurrence of the earliest *Sarmatisphinctes.* At the upper part of range of this species *Neochetoceras*-rich level is occurred ("Subnudatum level" in Kutek, Zeiss, 1997). Uppermost horizon of the Subborealis zone (*zeissi* horizon) is dominated by the index species and as well as in the Russian Platform it is lacking any ammonites with Submediterranean affinities.

Fallax Subzone

Two biohorizons recognized in this subzone are based on the lineage of the last members of genus *Sarmatisphinctes* (Rogov, 2010). Other ammonites (belonging to the genus *Aulacostephanus*) are rarely occurring in the Fallax Subzone. As well as in the other Subboreal succession there are gradually became more and more rare upwards and totally disappeared in the top of the Autissiodorensis Zone.

*Late Kimmeridgian events and ammonoid immigration*

Changes in Upper Kimmeridgian ammonite assemblages are very close to those recognized in the central part of the Russian Platform and (at least for the topmost Eudoxus and Autissiodorensis Zone) for England. It should be noted that not only successions of ammonite taxa are very similar in all these Subboreal regions, but even relative abundance of certain ammonite species and genera seems to be very close throughout the realm.

Beginning of the Late Kimmeridgian is marked by mass occurrence of *Amoebites kappfi* (Opp.) in Central and Northern Poland, and at the same level this species has been found in the Middle Volga area. The next interval of strong dominance of Boreal ammonites, which could be connected with cooling event, is recognized at the latest Eudoxus Chron (*anglicum* hemera). Throughout the Subboreal Realm this interval is represented by black shales, which are crowded by dwarfish *Nannocardioceras*. However, lowermost assemblage of the Autissiodorensis Zone is showing quite different ammonite assemblage of the mixing character, in which aspidoceratids are relatively common (above they are disappeared in the Subboreal areas). Above it is again replaced by cardioceratid-dominated assemblage, which is recognized across the huge area. Such strong changes in ammonite association could be caused by climatic oscillations. Above the *volgae* horizon one more remarkable event is traced in the both Polish Lowland and the Volga area ("Subnudatum level" by Kutek and Zeiss, 1997), while above ammonite assemblages of these areas are characterized by differences in distribution of thermophylic ammonites, which are absent in Poland above the *subborealis* horizon but persisted in the Volga area till the end of the Kimmeridgian.

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# A Tithonian *Chitinoidella* horizon and "Volgian" and "Portlandian" ammonites in the Owadów-Brzezinki section (central Poland) – a clue for Upper Jurassic interregional correlations

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Youngest Late Jurassic deposits in the epicratonic area of Poland crop out only at Sławno, in the Owadów-Brzezinki quarry near Tomaszów Mazowiecki. These Tithonian deposits are developed as the limestones of the Kcynia Fm., and they succeed the well-known marly deposits of the Pałuki Fm. corresponding to the "Lower" and a lower part of the "Middle Volgian" – well dated by ammonites and described in many papers in the past from the Tomaszów Mazowiecki (Brzostówka) sections (Lewiński, 1923; Kutek, 1994; Kutek and Zeiss, 1974, 1997; and earlier papers cited therein).

The deposits studied (uppermost part of the Pałuki Fm., and the Kcynia Fm.) have yielded abundant ammonites (more than one hundred specimens). A preliminary investigation of the collection shows the presence of two different systematic groups of ammonites: the subfamily Virgatitinae Spath, 1923 and of the subfamily Pavloviinae Spath, 1931. The