
**MÜNSTERSCHE FORSCHUNGEN
ZUR
GEOLOGIE UND PALÄONTOLOGIE**

Heft 110

**10th International Symposium
“Cephalopods – Present and Past”**

Fes · 26th March – 3rd April 2018

Program & Abstracts

**Ahmed El Hassani, Ralph Thomas Becker,
Sven Hartenfels & Felix Lüddecke (Eds.)**

Field Guidebook

**Sven Hartenfels, Ralph Thomas Becker,
Ahmed El Hassani & Felix Lüddecke (Eds.)**

Münster. Forsch. Geol. Paläont.	110	311 S.	219 Abb., 2 Tab.	Münster März 2018
--	------------	---------------	-----------------------------	------------------------------

Alle Rechte vorbehalten. Jegliche Vervielfältigung einschließlich photomechanischer Wiedergabe nur mit schriftlicher Genehmigung durch den Herausgeber der Reihe.

Mitarbeiter und Herausgeber der Zeitschrift erhalten kein Honorar. Die Herausgabe erfolgt ohne gewerblichen Zweck oder materiellen Gewinn, sondern dient ausschließlich der Förderung der Wissenschaft. Für den wissenschaftlichen Inhalt und die Form der Beiträge sind die Autoren allein verantwortlich.



Herausgeber der Reihe:	STUDIERENDE DER GEOWISSENSCHAFTEN IN MÜNSTER E.V. Institut für Geologie und Paläontologie und Geomuseum Westfälische Wilhelms-Universität Münster
Vorsitz:	Stephan Helling
Geschäftsführung:	Stephan Helling
Redaktion:	Felix Lüddecke
Layout und Computersatz:	Sven Hartenfels, Felix Lüddecke
Druckabwicklung:	Druckerei Joh. Burlage, Kieskampweg 2, 48157 Münster, Germany
Bestellungen an:	Münstersche Forschungen zur Geologie und Paläontologie Corrensstr. 24, 48149 Münster, Germany (muefogeo@uni-muenster.de)

Palaeogeography and marine connections of the Middle Russian Sea across the Middle Jurassic: cephalopod-based model [oral presentation]

A. P. Ippolitov¹ & D. B. Gulyaev²

¹ Geological Institute of RAS, 7 Pyzhevski lane, 119017 Moscow, Russia, ippolitov.ap@gmail.com; ² Commission on the Jurassic System of ISC of Russia, 25-7 Chekhov Street, 150054 Yaroslavl, Russia, dbgulyaev@gmail.com

The Middle Russian sea is a Mesozoic marine basin with changing outlines, which occupied most territory of the East European platform during the Jurassic-Cretaceous. Middle Jurassic epoch was the time of establishing the marine environment over the territory, and eustatic fluctuations superimposed by non-uniform tectonic development produced a basically complicated and quickly changing palaeogeographical picture. However, existing palaeogeographic models either generalize data up to stages (or even joining sequent stages – e.g. PALEOMAP project by C. R. SCOTSESE), or postulate nominally isolated time slices, but in fact providing some generalized pictures around the reference age (R. BLACKKEY reconstructions). Most detailed maps are available from the regional literature (SASONOVA & SASONOV 1967), but their stratigraphic and dataset backgrounds are clearly outdated now. All this leads to a paradox: any of the existing reconstructions, despite being substantiated by a huge massive of primary geological data, when taken for research purpose without proper critical analysis of primary data on a certain interval under consideration, can be essentially wrong as the generalized picture may deviate significantly from the reality.

Our study is based on the materials collected through extensive fieldworks of 2012-2017, covering most part of East European platform together with its southern framing (North Caucasus and Crimea). Together with literature data analysis, it allows to propose a holistic scenario of the paleogeographic evolution of the Middle Russian sea across the Aalenian-Early Callovian time as a series of paleogeographic maps, reconstructing principal marine connections of the Middle Russian Sea (schematic summary is on Fig. 1). The highlights, directly appealing to our own materials, are listed below.

1. Wide marine transgression from Tethys to the eastern part of Russian platform started in the Lower Bajocian (Discites?-Laeviuscula Chrons), not in the Late Bajocian (Garantiana Chron) as it was considered for ages. In 2016-2017 a diverse belemnite assemblage was discovered in the lower part of marine succession in the Lower Volga region, which allowed to re-date the sediments. This assemblage is of Euro-boreal type and is represented by diversified *Eocylindroteuthis* spp., typical for the Lower Bajocian in Central Europe, co-occurring with relict *Homaloteuthis* and *Hastites*, which are restricted to more ancient strata in Central Europe and thus indicate high level of provincialism for the studied territory.

2. An idea about an episode of marine connection of Tethys and Arctic across the Russian platform during the Humphriesianum Chronozone across the Russian platform was recently introduced (DZYUBA & DE LAGUSIE 2017). Originally it was based on a find of common belemnite species in Bulgaria and Siberia as well as on non-critical acceptance of data by NIKITIN (1977) who recorded a typical Tethyan Aalenian-Lower Bajocian genus *Holcobelus* in association with Boreal members of the family Cylindroteuthididae in the “Bathonian” of Central Ukraine. Restudy of both Nikitin’s localities and type materials clearly indicates that these “*Holcobelus*” spp. finds belong to ventrally eroded Cylindroteuthididae and are earliest Callovian (Elatmae Chron) in age. Finally, Humphriesianum Chron connection across Russian platform is not excluded, but currently it is not supported by any clear geological evidence from the studied territory.

3. In the Volga area, the basal horizon of marine Middle Jurassic have Late Bajocian age (?Garantiana and Parkinsoni Chrons). Up to end of the Bajocian, fully endemic assemblage on the territory existed both in ammonites and belemnites. Their strong provincialism supports the idea that in Late Bajocian the marine basin, despite occupying a large area, was almost fully isolated from the adjacent aquatories, and its marine character was supported only by the wide Tethyan connection at the South-eastern margin of the Russian platform. In turn, direct marine connection between Tethys and former Dnepr-Donetz sea, now integrated as a gulf inside the Middle Russian sea, seem to completely close by this time.

4. The Early Bathonian is a well-studied interval during recent years, however most studies are devoted to one locality only, so-called “Sokur quarry” (see review in MITTA et al. 2014). This time is of particular

interest, because it fixes the marine connection between Tethys and Arctic ocean via the Russian platform. In 2016 we discovered previously unknown locality revealing new details about this marine passage. Belemnite data shows that there was an early episode of Arctic connection, preceding the main one, well-characterized by data on immigration of different mollusk groups. In turn, finds of some belemnites in Europe indicate a probable short-living opening of Prip'yat strait during the later main episode, which was connected with the maximum of transgression.

5. Middle Bathonian time is characterized by non-marine sediments across the Russian platform, and Late Bathonian was a start of a new marine transgression, now coming from the north (Arctic area). Connection of Middle Russian sea with Tethys did not exist this time and was established only in the earliest Callovian, as indicated by the appearance of Tethyan taxa in the sections. Analysis of cephalopod distribution around the Bathonian/Callovian boundary in Crimea, Russian platform and Europe clearly indicates the opening of Prip'yat strait during the early Elatmae/Herveyi Chron. This connection as a stable paleogeographic character was established from the mid-Early Callovian time. The study has been supported by the RAS program no. 17 (project 0135-2018-0050) and RFBR project 18-05-01070.

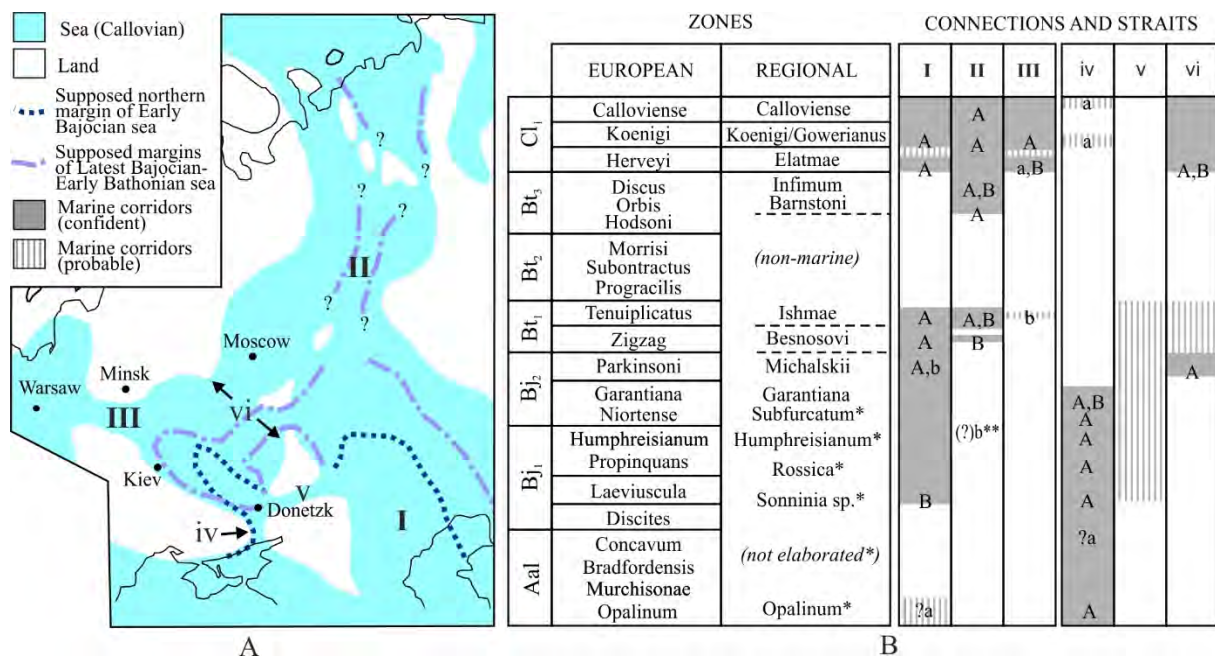


Fig. 1. A. General paleogeography of the Middle Russian Sea, showing principal (I-III) and secondary (iv-vi) marine corridors and connections (I – Tethyan connection, II – Northern connection, III – Prip'yat strait, iv – Orekhovo strait, v – Donetsk strait, vi – unnamed central connection), after SASONOVA & SASONOV (1967, modified). **B.** evolution of marine connections through time (abbreviations: A- ammonite-supported, confident; a – ammonite-supported, probable; B – belemnite-supported, confident; b – belemnite-supported, probable). Compiled from numerous sources and own data. * recognized only in Donetsk area. ** proposed by DZYUBA & DE LAGAUSIE (2017).

References

- DZYUBA, O. & DE LAGAUSIE, B. (2017): New belemnites (Megateuthididae, Cyliothrotheuthididae) from the Bajocian and Bathonian of the Yuryung-Tumus Peninsula, northern Siberia, Russia and their palaeobiogeographic implications. – *Paläontologische Zeitschrift*, in press, published online: 21 November 2017, DOI: 10.1007/s12542-017-0380-6.
- MITTA, V., KOSTYLEVA, V., DZYUBA, O., GLINSKIKH, L., SHURYGIN, B., SELTZER, V., IVANOV, A. & URMAN, O. (2014): Biostratigraphy and sedimentary settings of the Upper Bajocian–Lower Bathonian in the vicinity of Saratov (Central Russia). – *Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen*, **271**: 95-121.
- NIKITIN, I. I. (1977, in Russian): Additional notes on the Jurassic belemnites of the northern part of the Kanev dislocations region. – *Geological journal*, **37** (4): 89-97.
- SASONOVA, I. G. & SASONOV, N. T. (1967, in Russian): Paleogeography of the Russian platform in Jurassic and Early Cretaceous time. – 260 pp., 93 pls., Nedra (Leningrad).