JK2018

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FOREWORD

The **JK2018** International Symposium focuses on a ca. 20 My interval of time spanning the Tithonian – Berriasian / Volgian – Ryazanian / – Valanginian interval (eventually overlapping slightly its lower and upper boundaries) in the Tethys area, as well as in the Panthalassa, Boreal and Austral regions.

This meeting is intended to bring together people with interests in the transition period spanning the latest Jurassic to the earliest Cretaceous times and to feature disciplines covering the many aspects of stratigraphy (litho-, bio-, magneto-, chemo-, cyclo-, sequence), as well as sedimentology, paleontology, paleogeography and global tectonics, at all scales, from the SEM – Scanning Electron Microscopy – to basin analyses.

The meeting is hosted by the **Muséum d'Histoire naturelle de Genève** and I take this opportunity to acknowledge the support provided by Jacques Ayer (Director of the Museum), Dr Nadir Alvarez (Head of the 'Research and Collections' Unit), Dr Lionel Cavin (Curator, Editor-in-Chief of *Revue de Paléobiologie*), their staff and colleagues, among whom are Dr Christian Meister, Dr André Piuz, and Dr Éric Monteil. The organizing committee, which also includes Prof. Rossana Martini, Prof. Jean J. Charollais, and Prof. Andreas Strasser, thanks the 15 national and international organizations that agreed to be our scientific partners.

This abstract volume comprises 59 contributions, which is already an achievement. More than 70 participants representing at least 25 nationalities are attending and we wish you will all enjoy contributing to this stimulating meeting and to the debates.

Bruno Granier
President of JK2018

<u>Note</u>: In order to have fair, unbiased, and open discussions on the system boundary during the **JK2018** meeting and to give all sides the possibility to defend their views, it was suggested that, in both abstracts and figures, the author(s) should refrain as much as possible from using "JK system boundary", and should preferably refer to stage boundaries instead. We did not censor any abstract. Accordingly, you will find some abstracts stating that the system boundary equates to the Tithonian-Berriasian boundary (more specifically the base of the acme /abundance/ zone of *Calpionella alpina*), which was not the conclusion of the meeting.

51. Middle-late Volgian regression as it expressed in different depositional environments of Central Russian Sea

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Upper Jurassic deposits of the Russian Platform accumulated in an extensive shallow epeiric sea covering a tectonically stable old craton and subjected to slow subsidence and low terrigenous supply. As a result, the depositional record is characterized by low thickness and high fragmentation due to numerous episodes of non-deposition and submarine erosion. The Russian sea basin was strongly "shoaled" by the end of Volgian stage (Tithonian to earliest Berriasian). The well-known middle Volgian Oil Shale, corresponding to the Panderi ammonite Zone and covering large areas of the Russian Platform, could be assigned as a record of the latest widespread late Jurassic transgression. The overlying uppermost Jurassic sediments contained a low portion of clay component and accumulated in a wide range of shallow-marine environments.

Middle-upper Volgian deposits were investigated in the Rybinsk, Moscow and Ul'yanovsk-Syzran regions, traditionally considered key localities for Russian Platform biostratigraphy. The results were obtained by detailed sedimentological and biostratigraphical examinations of well-known and newly found exposures, and was supplemented by measurement of new comprehensive core material, acquired from technical drilling in Moscow. Biostratigraphic control was based on the ammonite zonation, which has significantly improved in recent years. The main objective was to create elements of a lateral transect (about 800 km in length), passing through the main sites of stable late Jurassic marine sedimentation from the Moscow syneclise in the north-west, to the Ul'yanovsk-Saratov trough in the south-east, and target it for reconstruction of depositional systems and their evolution under external and internal controls.

Three general types of depositional environment were distinguished in the studied regions and their main evolutional trends were recognized (Fig. 1).

In the Rybynsk region the middle-late Jurassic sediments (about 30-40 m thick) were accumulated within a storm- and wave-dominated shoreface that progressively prograding basinward. The studied interval is represented by a coarsening upward succession of medium- to coarse-grained sandbodies, separated by discontinuity surfaces, that are marked by phosphoritic conglomerates. From the bottom to top of the succession, sandstones exhibit sediment structures that reflect a progressive increasing of wave energy. The lowest, yellow bioturbated sandstone (about 6 m, of which 1-1.5 m could be observed) corresponds to the Virgatus ammonite Zone. It is overlain by red sandstone of Nikitini, Fulgens and Catenulatum Zones (about 6-7 m of which could be observed), which is moderately bioturbated (Neoeione, Rosselia) and characterized by preserved fragments of large (about 1 m in length) gently sloping swaley cross stratification. The uppermost unit is represented by red sandstone (about 12 m) with distinct

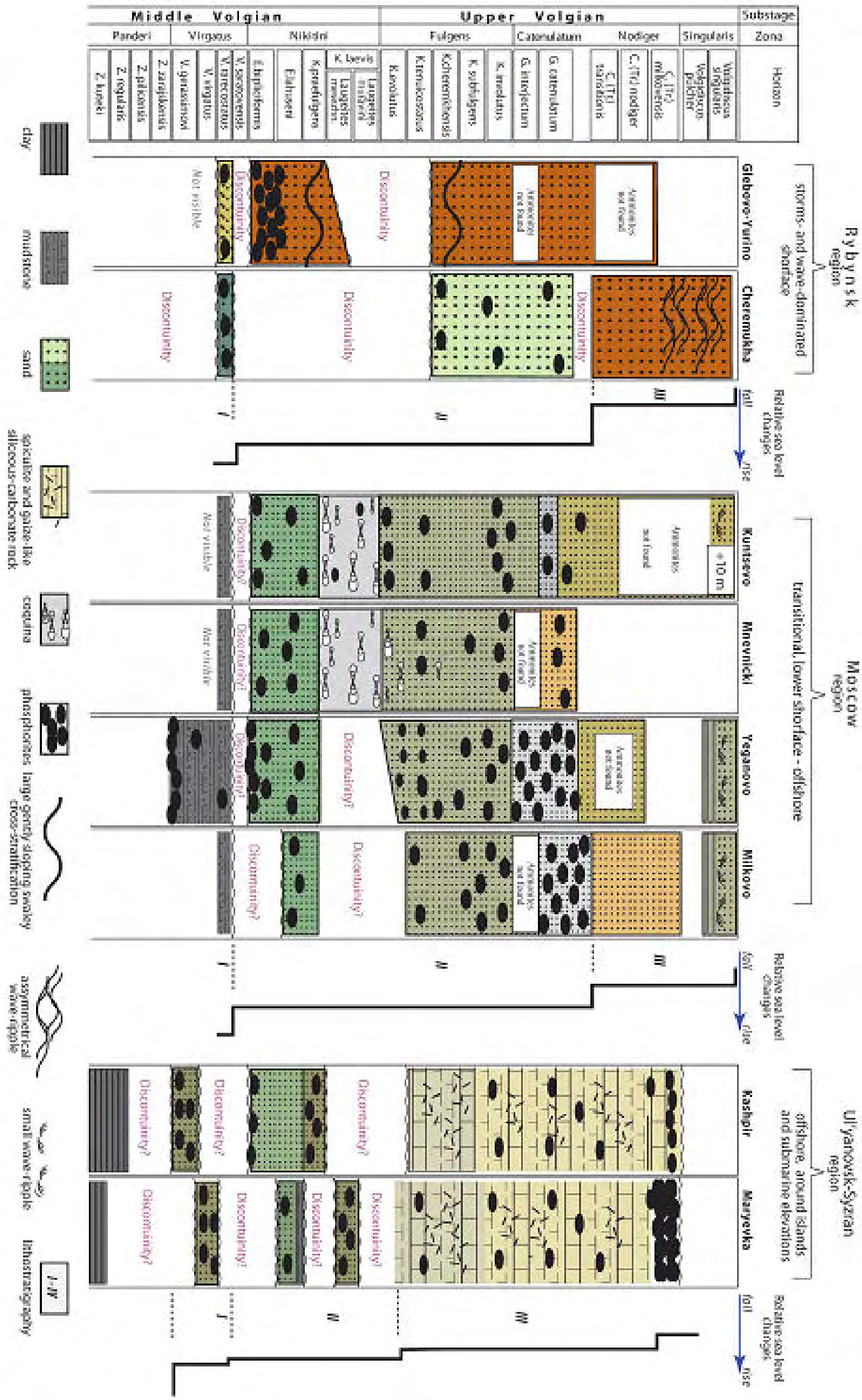

Figure 1: Middle-late Volgian depositional sequences, accumulated in different facies belts of Central Russian Sea.

wave ripple cross-stratification, and identified as belonging to Nodiger Zone and topmost Jurassic Singularis Zone. It passes up-section into Ryazanian coarse-grained gravely sandstones with wave-ripple and trough-like cross-stratification.

In the Moscow region the studied interval (20-40 m thick) is composed of fine-grained and muddier siliciclastic material, and seems to have accumulated in a low-energy and more offshore environment, subjected to only weak storm activity, but progressively approaching a fair-weather wave base. It is composed of interbedded fine-grained sandstones and dark grey micaceous and green mudstones. Glauconitic pellets, mollusks shells and reworked phosphorites are abundant in the lower part of the succession, corresponding to basal beds of the Virgatus Zone (1-2 to ~30 m) and to the interval of the Nikitini, Fulgens and Catenulatum Zones (2.5-4.5 m). The upper part of the sequence is thicker (9-13 m) due to increased terrigenous supply and shows elimination of autochthonous basinal sedimentary components, decreased burrowing and the occurrence of numerous dm- scale intervals with well preserved wave ripple cross-bedding. In this thick interval ammonites of the Nodiger Zone were found only near the base, while its uppermost part could be correlated to the uppermost red sandstone of the Nodiger and Singularis Zones in the Rybynsk region.

In the Ul'yanovsk-Syzran region the studied sequence is substantially reduced in thickness (5-6 m) due to the effects of sediment starvation and multiple "renewals" and amalgamation of omission surfaces, and demonstrates negligible signs of reworking by waves. The sediments are composed of very-fine sandy, silty and muddy material, with a high proportion (to 25-50 % and more) of autochthonous basinal biogenic and autogenous components, such as a glauconite, carbonate shells, scelets and detritus, siliceous sponge spicules, and pristine and reworked phosphorites. Numerous levels of enrichment in phosphorites, belemnites and shells are typical for the sequence

The suggested depositional environment is nearshore to offshore shallow-shelf, around Islands or submarine elevations that could provide a calm hydrodynamic, low siliciclastic influx and high nutrient availability. The sequence is subdivided into lithostratigraphical units. The lower one corresponds to the middle Volgian Virgatus and Nikitini Zones, represented by strongly condensed (from tens cm to ~1.5 m in thickness) subsequences, built of very fine- to fine-grained sandstones with a high (50 % and more) concentration of glauconite and with numerous levels enriched in phosphorites, belemnites and shells. They are overlain by ~3.5 m thick interbeds of spiculites and "guaize"-like, very fine-grained sandstones, enriched in silica spicules and carbonate shell detritus, which correspond biostratigraphically to the upper Volgian.

Thus, the general trend of regression is manifested by depositional sequences, accumulated in different facies belts of the Central Russian Sea since the end of middle Volgian to Ryzanyan time period. The trend shows similar stepwise evolutional dynamics in different depositional environments that are expressed in sub-synchronous impulses of progradation and intervening «delays». The later seems to be recorded within transitional intervals of the Virgatus-Nikitini Zones, the Nikitini Zone, and probably the Catenulatum-Nodiger Zones.

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52. The Jurassic-Cretaceous boundary interval in the Jura Mountains and the Vocontian Basin: Sedimentological aspects

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During the latest Jurassic and earliest Cretaceous, the paleogeographic realm of the Jura was a topographic high between the Tethys Ocean and the Paris Basin, on which a shallow carbonate platform developed. Hiatuses are abundant and biostratigraphically relevant fossils are rare. In the Vocontian Basin, lowstand sediments predominated, precluding an undisturbed stratigraphic record.

In the Swiss Jura, the Tithonian strata are represented by the Twannbach Formation where dolomitization and features implying subaerial emergence are common. It is overlain by the early Berriasian Goldberg Formation, which corresponds to the «Purbeck facies». Periods of subaerial exposure are indicated by black pebbles and calcretes.

Overlying the Goldberg Formation, the Pierre-Châtel Formation developed in fully marine, shallow-lagoonal conditions. The climate was semi-arid. Its base, dated to the Subalpina subzone of the middle Berriasian Occitanica zone (CLAVEL *et al.*, 1986), represents a first transgressive surface that can be correlated over the entire Jura platform. The overlying Vions Formation records a more humid climate, indicated by terrigenous input of clays and quartz, iron-staining, root traces, and coal layers. The Chambotte Formation displays bioclastic and oolitic limestones, again implying fully marine conditions in a more arid climate. This is the result of a second transgressive pulse, dated to the base of the Otopeta subzone of the late Berriasian Boissieri zone (CHAROLLAIS *et al.*, 2008). A tectonic tilt of the Jura platform resulted in non-deposition and/or erosion of parts of the Vions and Chambotte formations.

The early Valanginian is represented by the reddish limestones («calcaires roux») of the Vuache Formation (STRASSER *et al.*, 2016). Locally, the base of the formation contains a marly interval («Marnes d'Arzier»). The limestone beds display hummocky and swaley cross-stratification implying storm activity. The facies are bioclastic and oolitic packstones to grainstones rich in echinoderm and bryozoan fragments. The depositional environment was that of an open shelf. Ammonites and dinocysts assign the main body of the Vuache Formation to the Pertransiens and Neocomiensiformis ammonite zones, while the Inostranzewi and Verrucosum zones are condensed at its top (MONTEIL, 1993; CHAROLLAIS *et al.*, 2008).

In the Vocontian Basin, the Tithonian commonly displays thickly bedded hemipelagic limestones («barre tithonique»). Facies and sedimentary structures imply deposition mainly as mudflows, grainflows, debris flows, and occasional turbidites. The early Berriasian is dominated by slumps and debris flows. Starting within the Privasensis subzone (Occitanica zone), cyclic hemipelagic sedimentation resulted in a more expanded stratigraphic record. The sections are