

## RUSSIAN PLATE AS A KEY REGION FOR THE VOLGIAN/TITHONIAN CORRELATION: REVIEW OF THE MEDITERRANEAN FAUNAL ELEMENTS IN THE VOLGIAN STAGE

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Since the 70es of the XX century records of some Mediterranean ammonites, such as Oppeliidae, Haploceratidae, Aspidoceratidae etc., from the uppermost Kimmeridgian to the lowermost Middle Volgian of the Russian Plate have been known (Mesezhnikov et al., 1977). Unfortunately, these data are practically not used for the Boreal-Tethyan correlation.

In the uppermost Kimmeridgian of the Russian Plate (*Autissiodorensis* Zone) we can recognize a succession of Oppeliidae (the same in SW Germany). In the lower part of *Autissiodorensis* Subzone there appears *Metahaploceras subnudatum*, the upper part of those marked by the apparition of *Metahaploceras cf. zlatarskii* sensu Schweigert, 1998. In the uppermost *Fallax* Subzone *Metahaploceras rebouletianum fridingense* (-*Neochetoceras rebouletianum*: Schweigert, 2000, pi. 2, fig.5) is common. Unfigured *Metahaploceras cf. rebouletianum* was also cited from the Upper Kimmeridgian of the North Subcaspien region (Bogdanov, 1934). Following these data, we can correlate the base of Tithonian with the base of Volgian (Fig.1). In the lower *Klimovi* Zone (beds with *Neochetoceras steraspis* and *Glochiceras (Lingulaticeras) solenoides*} *N. steraspis* and *G. (L) solenoides* are very common, as well as in the *riedlingense* horizon of SW Germany. The following lithographicum *Efimovi* horizon contains numerous *Glochiceras (Paralingulaticeras) spp.*, and more rare *Neochetoceras spp.*, *Taramelliceras prolithographicum*, *Gravesia cf. gravesiana*. This horizon can perhaps be correlated with the lower part of Mornsheimer Schichten in Franconia. Its dawn may be corresponding to the base of *Lithographicum* Subzone in Franconia. After Mesezhnikov et al. (1977), so rare *Glochiceras (Paralingulaticeras)* occurs in the lowermost part of the *Sokolovi* Zone. Representatives of this subgenus indicative of the Mediterranean *Hybonotum* Zone, therefore the uppermost *Hybonotum* Zone can be compared to the lowermost *Sokolovi* Zone (Fig.1). In the *Neoburgensis* horizon (*Pseudoscythica* Zone) *Anaspidoceras neoburgensis* are very common, same in the *Semiforme* Zone and the *Ciliata* Zone (Rogov, 2002). The following *Puschi* horizon contains rare specimens of *Pseudovirgatites puschi* and can be compared with *Tenuicostata* Zone in Poland. In the Middle Volgian *Panderi* Zone there sometimes are *Glochiceras (?Lingulaticeras) blaschkei*, as well as in the *Fallauxi* Zone (*Richteri* Subzone) of Ardeche (Rogov, 2002). Moreover, after Mesezhnikov et al. (1977), in this level there occur some other Submediterranean/Mediterranean ammonites, such as *Sutneria* and *Haploceras*. Probably, the lower part of the *Panderi* Zone corresponds with the Mediterranean *Richteri* Subzone, but the upper *Panderi* Zone belongs to the Late Tithonian age (Kutek, Zeiss, 1997) (Fig.1).

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| Submediterranean Province (after Geysant, 1997; Schweigert, 1999; Schweigert et al., 1996). Middle Tithonian ammonite zones correlated by the author. |      |         |         | Subboreal Province (ammonite succession of the Russian Plate) |      |          |  | Range chart of some ammonites with Mediterranean and Submediterranean affinity from the Kimmeridgian and Volgian of the Russian Plate  |
|---|------|---------|---------|---|------|----------|--|--|
| SUBSTAGE  | ZONE | SUBZONE | HORIZON | HORIZON OR FAUNAL ASSOC.                                      | ZONE | SUBSTAGE |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | MID. TITHONIAN  |      |          |  |  |
| BECKERI   |      |         |         | SEMIFORME/FALLAUXI  |      |          |  |  |
| Subeumela (part)  |      |         |         | PONTI   |      |          |  |  |
| Setatum   |      |         |         | PALMA-TUS   |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| minutum   |      |         |         | ?   |      |          |  |  |
| supinum   |      |         |         | ?   |      |          |  |  |
| ornatum   |      |         |         | CILIATA   |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| uracensis   |      |         |         | ?   |      |          |  |  |
| siliceus  |      |         |         | ?   |      |          |  |  |
| zio-wepferi α   |      |         |         | MUCRO-NATUM   |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| hoelderi  |      |         |         | VIMI-NEUS   |      |          |  |  |
| rebouletianum   |      |         |         | PALA-TINUS  |      |          |  |  |
| STILL IS NOT DETAILED   |      |         |         | LOWER TITHONIAN   |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| Autissiodorensis  |      |         |         | HYBONOTUM   |      |          |  |  |
| Fallax  |      |         |         | Moernsheimensis   |      |          |  |  |
| AUTISSIODORENSIS  |      |         |         | Ruepellianus  |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| UPPER KIMMERIDGIAN  |      |         |         | Riedense  |      |          |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | eigeltिंगense   |      |          |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | KLI MOVI  |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| UPPER KIMMERIDGIAN  |      |         |         | SOKOLOVI  |      |          |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | PSEUDO-SCYTHICA   |      |          |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | PANDERI (part)  |      |          |  | <p>— <i>Anaspidoceras neoburgensis</i></p> <p>— <i>Metahaploceras ex gr. subnudatum</i></p> <p>— <i>Sireblakites cf. zlatarskii</i> sensu Schweigert, 1998</p> <p>— <i>Metahaploceras rebouletianum fridingense</i></p> <p>— <i>Glochiceras (Paralingulaticeras) spp.</i></p> <p>— <i>Glochiceras solenoides</i></p> <p>— <i>Neochetoceras spp.</i></p> <p>— <i>Pseudovirgatites puschi</i></p> <p>— <i>Glochiceras blaschkei</i></p> <p>— <i>Pseudolissoceras sp.</i></p> |
| UPPER KIMMERIDGIAN  |      |         |         | MID. VOLGIAN  |      |          |  |  |
| UPPER KIMMERIDGIAN  |      |         |         | MID. VOLGIAN  |      |          |  |  |

Fig. 1. Correlation between Submediterranean uppermost Kimmeridgian to lowermost Upper Tithonian with Subboreal (Russian Plate) succession.