

The Jurassic-Cretaceous Boundary Problem and the Myth on J/K Boundary Extinction

M.A. Rogov¹, V.A. Zakharov¹, B.L. Nikitenko²

1. Geological Institute of RAS, Moscow, Russia (E-mail: russianjurassic@gmail.com)
 2. Trofimuk institute of Petroleum Geology and Geophysics SB RAS, Novosibirsk, Russia

Jurassic-Cretaceous boundary is the last system boundary within the Phanerozoic which is not fixed by GSSP. Moreover, key events as well as possible GSSP candidates still remain under discussion (Wimbledon, 2008; Zakharov, et al., 2009). Among the most important problems in the delimitation of this important boundary are the Tethyan-Boreal correlation controversies, absence of remarkable changes in fossil assemblages and poor corresponding of changes in assemblages belonging to the different fossil groups.

The latter reasons are strictly contradict with suggestion on J/K boundary extinction, postulating by many researchers since pioneering works by Raup & Sepkoski (1984 and later articles). Our analysis of changes in ammonite, bivalve and foraminiferal faunas (which thought to be most well-studied and widely ranged among marine faunas) through this boundary in the both Boreal and Tethyan areas has indicates absence of changes in extinction rate during the Tithonian and Berriasian (or Volgian and Ryazanian). From the other hand, Jurassic-Cretaceous transition is chara-

cterized by remarkable increase of faunal provinciality and oscillation in positions of province boundaries as well as high speciation rate, especially in non-leiostracan ammonoids. There are no remarkable changes at the J/K boundary in Tethyan section, while its analogues in the Panboreal Superrealm traced by means of paleomagnetism cannot be traced biostratigraphically, because it don't marked by any biostratigraphical event. As could be shown on example of Boreal ammonite ranges through J/K boundary (fig. 1), small decrease of the diversity fixed through the Late Volgian, when Panboreal Superrealm lack connection with Tethys-Pantalassa Superrealm, while within Panboreal Superrealm provinciality decreased. Changes in the bivalve assemblages through the J/K boundary were much smaller. As has been shown by Zakharov and Yanine (1975), in the both Boreal and Tethyan bivalve faunas J/K transition marked by minor changes. Among the 61 Tithonian bivalve genera 59 are also known from the Berriasian.

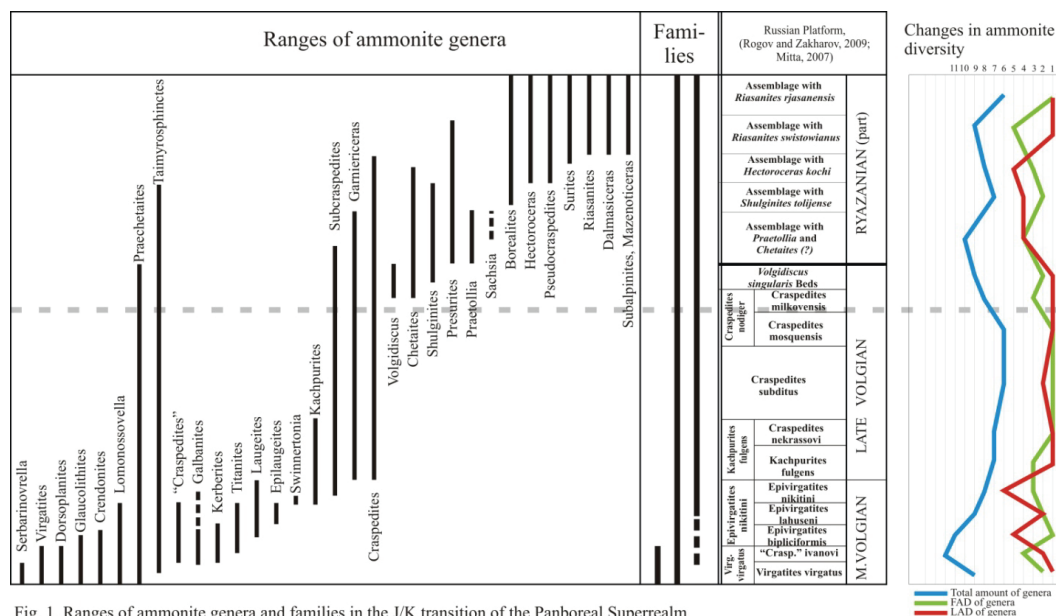


Fig. 1. Ranges of ammonite genera and families in the J/K transition of the Panboreal Superrealm

Major sources for initial errors in determination of character of extinction rate through the J/K boundary were, in our opinion, the following:

Faunas of the interval under discussion (especially Boreal ones) were poorly known until recent time, especially in those time than Treatise, using as major

source of data, were published.

Summaries of datasets from the whole stages/substages and all regions showed increase of speciation rate and/or provinciality.

Wide development of regressive/terrestrial/freshwater facies around the J/K boundary in Europe, the



most intensively studied region provides the bulk of data used.

Acknowledgements: This study has been supported by RFBR grants no.09-05-00456, 10-05-00276 and Program of the Presidium of RAS no.24.

Key words: J/K boundary; Mass extinction

References:

- Mitta V.V. Ammonite assemblages from basal layers of the Ryazanian Stage (Lower Cretaceous) of Central Russia. *Stratigraphy and Geological Correlation*, 2007, 15 (2): 193-205.
- Raup D.M., Sepkoski J.J., Jr. Periodicity of extinctions in the geologic past. *Proceedings of the National Academy of Sciences. USA*, 1984, 81: 801-805.
- Rogov M., Zakharov V. Ammonite- and bivalve-based biostratigraphy and Panboreal correlation of the Volgian Stage. *Science in China, Series D, Earth Sciences*, 2009, 52: 1890-1909.
- Wimbledon W.A.P. The Jurassic-Cretaceous boundary: An age-old correlative enigma. *Episodes*, 2008, 31 (4): 423-428.
- Zakharov V.A., Rogov M.A., Nikitenko B.L., et al. Key events around the J/K boundary of the Panboreal Superrealm, their correlative potential and relation with the base of the Berriasian. In: Hart M.B. (ed). *8th International Symposium on the Cretaceous System*, University of Plymouth, September 5-12, 2009, Abstracts volume: 40-41.
- Zakharov V.A., Yanine B.T. Les bivalves à la fin du Jurassique et au début du Crétacé. *Mém. B.R.G.M.*, 1975, 86: 221-228.