



Geochemical anomalies around Lange Ranch eustatic event and impact event in the Batyrbay Stage of the Upper Cambrian (Malyi Karatau, South Kazakhstan)

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The Batyrbay section is located on the northeastern slope of the Malyi Karatau Range in south Kazakhstan. This section ranging from the Upper Cambrian to the Lower Ordovician is considered as one of the most stratigraphically complete and well investigated sections in Russia as well as in countries of Central Asia and Kazakhstan. The section is a stratotype of the Uppermost Cambrian Batyrbay Stage officially used in Russia, Kazakhstan and adjacent areas. The detail conodont zonal scale is elaborated on the base of the section study (Dubinina, 2000). It is a reference scale for the Upper Cambrian and Lower Ordovician of Kazakhstan and adjacent areas. In the Batyrbay section the Cambrian-Ordovician boundary deposits are represented by a variety of carbonate rocks. These are predominantly clastic limestones, i.e., calcirudites, calcarenites, calcisiltites. Earlier, the global short-term eustatic sea-level changes in the Late Cambrian were established and called the Lange Ranch eustatic event by J. Miller (1992). In the Batyrbay section the regressive - transgressive couplet of this event has been traced in the upper part of the *Cordylodus primitivus* Zone of the conodont scale, i.e., in the interval of 104-109 m of the section (Dubinina, 1993). Later, microspherules and particles of iron have been found at the level of 104 m of the section in deep-water black calcisiltites with micrograded bedding that are considered to be the evidence about falling of a meteorite on Earth (Batyrbay impact event) (Korchagin et al., 2007). It is possible, that the Batyrbay impact event corresponds to one

of two iridium anomalies in the Upper Cambrian of China (Xu Dao-yi et al., 1989). In this work the results of geochemical sampling in the above-mentioned interval of the Batyrbay section, where we can fix the Lange Ranch eustatic event and falling of a meteorite, are considered.

Results. (1) The generated geochemical calculations have shown practically complete absence of a terrigenous component in deposits of a considered interval of the section. This fact can testify to geographical remoteness of the Malyi Karatau from areas of continental transportation of sediments in the Late Cambrian. (2) In this case the allocation of geochemical anomalies should be connected not with variations of terrigenous material entering in the basin of sedimentation, but with variations in an atmosphere, with hydrothermal activity and geochemical features of water-masses. (3) Three intervals with distinct geochemical anomalies are established. The level of 103 m is characterized by anomalously high concentrations of Ti, Fe, Si, Se. The specific features of 104 m - 105 m interval of the section are anomalously high contents of Pb, Cr, Cu, Rb, Th, Sc. The level of 107 m is characterized by high concentrations of As, V, Zn, Ba, Sr. Above, at the level of 110 m of the section the anomaly of Zn is clearly manifested.

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