

## Lithological and Geochemical Features of Carbonate Rocks in the Sedimentary Cover of the Gargan Terrain, Southeastern East Sayan

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In recent years carbonate rocks have become increasingly more important in paleogeodynamic reconstructions of fold belts, serving as indicators of sedimentation conditions, because they are of autochthonous origin. The carbonate rocks of the Irkut Formation being part of the Riphean sedimentary cover of Gargan terrain of the Paleosian ocean was investigated (Belichenko et al., 1999). The basement of this terrain is composed of Early Precambrian gneisses and gneiss granites. The carbonate rocks of the Irkut Formation overlap the basement rocks in the form of a small gently dipping cover within the block and in the band framing its southern part and intruded by granites of Sumsunur complex with age 790 Ma (Kuzmichev, 2000).

Our diagnosis of depositional conditions is based on studies of the distribution of trace elements. Studies of the distribution of major typomorphic elements for carbonate rocks (Ti, Zr, Mn, Sr and Ba) make it possible to restore physicochemical and tectonic conditions of sedimentogenesis and, on the basis of distribution of impurity elements (Cr, Ni, Co, V, Cu, Pb, Sn, Zn, Be and Y), to elucidate the petrogenic character of the noncarbonate part of rock and the distance between the source land and the accumulation basin.

According to their lithologic-geochemical characteristics, the carbonate rocks of the Irkut Formation belong to subplatform facies of a shelf zone. Sedimentation of these rocks took place in shallow open seas in the vicinity of the land both in the oxidising medium in active water regime and off the shore in a more passive regime and under weakly reducing conditions. During the formation of the carbonate series of this suite, the Gargan block was a stable area of the Earth's crust within the ocean.

Lithological and geochemical studies of the Irkut Formation rocks allowed three shelf microfacies to be recognised. They include: (1) shallow littoral-marine facies represented by

dolomites and dolomitic limestones with high concentrations of Ti, Zr, Mn, (2) deep-water facies of shelf zone represented by limestones and dolomitic limestones with low concentrations of terrigenous sediments and (3) deepest microfacies represented by fine-grained limestones with high concentrations of Mn, Cr, Ni. On the basis of studies of patterns of trace and scattered elements, typical of the source of sediment ablation of ultrabasic, basic, and acid compositions, we can conclude that the major source of sediment ablation for terrigenous and clayey components of carbonate rocks of all microfacies was gneisses and gneiss granites of the Gargan block. Throughout the sedimentation of carbonate rocks of the Irkut series there were typomorphic elements of rocks of acid and intermediate composition (Pb, Zn, Sn, Be and Y). The investigation of the aerial distribution of elements characterising the rocks of ultrabasic and acid specialisation in microfacies suggests severe tectonic activity and vast volcanic activity in the contiguous territories of the southeastern part of the Gargan block during the formation of the carbonate series of the Irkut Formation, which agrees well with the data on volcanism this area (Gladkochub and Sklyarov, 1996).

Thus, Gargan terrain represented the detached continental block within Paleosian ocean in Riphean. It was not a part of any supercontinents in this time interval.

### References

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## Geological Significance of the Neoproterozoic Granitoid Belt in the Northern Margin of the Qaidam Basin, Northwest China

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Rodinia the earliest well-documented supercontinent, has been one of the major research projects in orogeny research field since the early 1990's (McMenamin and McMenamin, 1990; Moores, 1991; Dalziel, 1991; Hoffman, 1991). Many researchers worked on the reconstruction of Rodinia supercontinent bringing out different configurations (e.g., Hoffman, 1991; Li et al., 1996;

Condie, 2001). However, the positions of the major ancient continental blocks of China, the North China, Huanan (Yangtze and Cathaysia) and Tarim blocks, in the Rodinia configurations are disputed. Hoffman (1991) did not provide assured positions for the major ancient blocks of China in his Rodinia reconstruction. The Huanan, North China and the Tarim blocks