



Late Vendian-Early Cambrian riftogenic hanging-wall sedimentary basin and Early Cambrian ocean problem: western and southern periphery of the Siberian Platform

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Introduction

Late Vendian-Early Cambrian coarse-grained deposits extend almost as continuous belt from Igarka region to Aldan shield and form of the same type sedimentological sandstone successions with conglomerates at the base and gradual transition upward to the terrigene-carbonate and carbonate complexes including anhydrite and salt. Marker sedimentological and petrographic features of these formations are used for tracing the boundary of the Lower Cambrian [1], the Vendian [2,3] or last Upper Vendian straton [4] subject to idea. This conglomerate-sandstone complex considered to be the basal part of regional Irkutskiy stratigraphic [1] or Enisei-Gissayanian petrographic horizon [5]. Conglomeratic-sandstone deposits of Graviyskaya, Uglovskaya, Redkolesnaya, Ust-tagul'skaya, Shamanskaya, Ushakovskaya, and upper part of Zherbinskaya formations regarded as final association of Late Vendian collisional molasse [4]. The analysis of more broad data led to conclusion that Vendian-Cambrian boundary is the time of tectonic epochs change in the Siberian Craton namely from transpression to transtension regimes and it is intercontinental significance [6].

Sedimentology of Enisei-Gissayanian petrographic horizon

Stratigraphic level of conglomerate-sandstone complex was proved of its position just below the findings of SSF in the Nemakit-Daldyn stage and well-known negative excursion of $\delta^{13}\text{C}$ isotopic curve [7]. The glacial deposits horizon in the base of Oselkovaya, Chap'skaya and Baikalskaya series and $\delta^{13}\text{C}$ isotopic curve character in carbon-

ate members have most importance which display its correlation with Early Varangian glaciation and Lower Vendian [8]. By all data the Enisei-Gissayanian conglomerate-sandstone complex is conformed to base of Nemakit-Daldynian stage of the Late Vendian in Russian stratigraphic scale or most early Pretommotian subdivision of Lower Cambrian in International stratigraphic scale [9].

Environments of conglomerate-sandstone complex were in detail reconstructed with facies analysis in the South-Enisei, Gis-Sayanian and Gis-Baikalian foredeeps and in the Irkutsk Upland also. At the Ust-Tagulskaya and Shamanskaya formations the similar succession of depositional systems was established: (1) fluvial with gravelly and sandy braided and alternation bars rivers, (2) shoreface and shallow marine with sand-waves and dunes, (3) coastal with barrier and lagoons. Close interrelation between the continental and marine complexes display simultaneous transgression with orogenesis when the sea has being redistributed huge mass of sand and gravel. The sea influence to sedimentation it was established well by tidal traces on sand waves and tidal flats and facies alteration to north and north-east with carbonates.

Current directions by river sand bars demonstrate some peculiarities. All rivers had the sources to west and south in the outer zone of Siberian Craton. The number of separate rivers formed alluvial and strand plane conformable to south-western Siberian Craton contour and epicontinental sea was connected with ocean to north and north-east. The orogene poor of clay rocks were the sources of clastics and presented the marginal supracrustal complexes of uplifted basement blocks. Quartz and arkose sandstone composition is similar to provenances of inner craton localities and uplifted basement blocks [10]. This quick and simultaneous rise of Siberian margins extending to more than 3000 km is considered to have been by forming of dome uplifts and rifting onset in relation with mantle plums [6].

The thermal subsidence followed the rifting was leading to quick orogene reduction, but this common process wasn't the single one. The regional transgression stage in the base of coastal complex marked by geophysical reper M_2 relate probably to spreading and the new ocean opening. Clastic sedimentary wedge was originated in the rising stage in the domes sides and named the hanging-wall basin.

Hanging-wall sedimentary basin preceded to cardinal reorganization of the subsidence plane in the Siberian Craton at the Lower-Middle Cambrian. In this time the carbonate platforms and central field of more intensive subsidence were formed that was the first cause of evaporite sedimentation in hot climate zone.

Conclusions

Hanging-wall sedimentary basin in the Siberian Platform was formed at the span

Precambrian-Cambrian transition. This was the beginning of the tectonic separation epoch of the supercontinent created in Late Vendian. This time was marked by reorganization of the lithospheric plates kinematics, cratons transtension and appearance of new oceans, global sea level rise and changing water circulation. Hanging-wall basin is to display riftogenic phases of these global events.

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