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Coastal upwelling near the western margin of the Siberia in the late Cryogenian: phosphatic stromatolite, marine loess and correlation of transitional Cryogenian-Ediacaran strata

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The late Cryogenian deposits relating to coastal upwelling belong the Ipsit Formation of the Karagassy Group. Ipsit Formation overlap the Tagul Formation of the Karagassy Group and underlie of the Marnya Formation tillite of the Marinoan epoch glaciation immediately. A more ancient glaciation in an enigmatic epoch about 650-635 Ma has caused a sea level fall up to 100 m and cropped out a late Cryogenian Tagul carbonate platform to expose for an aeolian abrasion. The top of the carbonate platform have carved by wind and the yardangs and bottomless grooves have originated (*Figure 1*). These abrasion depressions and carbonate plateau have been filled and overlapped by clastic dust has been bringing by wind from continent interior [1]. The siliceous-chlorite-phosphate beds were been formed at the onset of flooding and sea level maximum. The greenish-gray phosphate siltstones, deep-water phosphate low-arcuate stromatolite bioherms and laminate aphanite phosphorite are typical sediments of the outer shelf [2]. After sedimentation of basal phosphorite the nutrients have been arrived by upwelling to lower shoreface and made use of bacterial communities to form thin incrustation crusts on the silty tempestites tops. The storm-influenced deposits in the middle part of Ipsit Formation are composed of aeolian dust in whole has been derived from dry intracontinental cold desert and might be named marine loess. Impact of the aeolian silt became weaker to the end of the Ipsit age and red silty stromatolite dolomite made up the coastal and inner shelf reefs. This succession of events has been in the late Cryogenian at the other continents and therefore the Ipsit Formation would be has genetic analogues. These genetic and stratigraphic analogues at the South Australia are silty shales of the Cryogenian Enorama Formation below and red silty stromatolite dolomite of the Trezona Formation above. Ipsit sequence has many similarities to the fine-grained sandy tempestites and red silty stromatolite dolomite with of the Cryogenian Bonahaven Formation in the Scotland. There is on the other part the similarity in stratigraphic position of Ipsit basal phosphate unit and phosphorite layers of the Doushantuo Formation in the South China.



Figure 1: Cryogenian aeolian relief, Foothills of the East Sayan Ridge, Siberia

References:

- [1] Sovetov et al. (2013) In: *Proceedings of VII All-Russian lithological conference*: IPGG SB RAS Publisher, 125-128
- [2] Sovetov et al. (2015) In: *Proceedings of VIII All-Russian lithological conference*: RGU Publisher, 160-164

