



Carbon isotope signature in carbonate zone of Palaeoproterozoic weathering profile (C.Karelia, Fennoscandinavian shield)

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Reasons for changing C isotope ratio in sediments, especially in Precambrian, are still not clear. Consequently every new data concerning this theme can be significant. In this article we represent new $\delta^{13}\text{CPDB}$ and $\delta^{18}\text{Osmow}$ data for Palaeoproterozoic weathering profile and overlaying carbonate sediments.

Samples were collected from palaeo-weathering profile on granite-gneisses with pristine carbonates (Sochava, Shuleshko, 1975) and marine Jatuli dolomites from Chapanshary island (Segozero lake, C.Karelia, Fennoscandinavian shield).

$\delta^{13}\text{CPDB}$ for overlying dolomites varies from +5.4 to +3.5‰ for weathering profile carbonates from -0.1 to -2.2‰ (average value = -1.2‰). $\delta^{18}\text{Osmow}$ is 14.3 ‰ (average of 5 samples) for dolomites, and 14.0 ‰ (average of 10 samples) in weathering profile (samples with a light carbon isotope composition). Negligible differences in oxygen isotope ratio suppose nonmetamorphic origin of carbon isotope signature in investigated continental and marine carbonates.

Obtained data for dolomites are in significance with stratigraphic data for these rocks (Sochava, Shuleshko, 1975). In local stratigraphic scale dolomites belong to lower Jatuli level. Received positive carbon isotope data matches values world-known Lomagundi-Jatuli carbon positive excursion for that stratigraphic level.

Thus, weathering profile, located on granite-gneisses under dolomite sediments have to be older, than dolomites, proved to be Jatuli. $\delta^{13}\text{CPDB}$ for 2.5-2.2 Ga carbonate sediments from Fennoscandinavian shield varies from -1.8 to -2.5 ‰ with average value = -2.13‰ (Akhmedov et al., 1996). That data exceeds average value for carbonates from weathering profile (-1.2 ‰) almost twice.

SEM shows various evidences of biota proliferation in samples from hypergene crust (biofilms, glycocalyx and some bacteria). Thus, the difference between carbon isotopic signature in marine carbonates 2.5-2.2 Ga and in carbonates from weathering profile of the same age might be explained by biological processes in continental environment in Palaeoproterozoic.