

Sr and Nd isotopic ratio of dust in an ice core drilled on Belkha Glacier in Altay Mountains

Naoko Nagatsuka^{1*}, Nozomu Takeuchi¹, Takanori Nakano², Jun Uetake³, Shuntarou Sera¹, Fumio Nakazawa³, Takayuki Miyake³, Sachiko Okamoto⁴, Koji Fujita⁴, Vladimir Aizen⁵

¹Chiba Univ., ²RIHN, ³National Institute of Polar Research, ⁴Nagoya Univ., ⁵University of Idaho

Eolian mineral dust from vast deserts can be transported globally by wind and effect various environments on the Earth. Dust deposited on glaciers in the past can be obtained by ice core drilling. The past variations in the eolian dust can be reconstructed by particle analysis of ice cores.

Stable isotopic ratios of Sr and Nd provide a means of identifying sources of substances. The means can use for the icecore dusts because it requires low samples for analysis. These isotopic ratios of the icecore dusts may show variation of amount, provenance and pathway of the dust. In this study, we analyzed Sr and Nd isotopic ratio of the icecore dusts drilled on Belkha glacier in Russian Altay Mountains.

The ice core was drilled at a snow plateau of 4100 m a.s.l. in 2003. The length is 171m and the age estimated 96 years for 48m. There were only two prominent dust layers in upper 100m of the ice core. The particle concentrations of the layers were approximately 10 folds of the mean concentration of the ice core. Sr and Nd isotopic ratios of the dust in one of the layers shows relatively higher Nd isotope and lower Sr isotope value compared with those of Asian desert sand. This suggests that the dust was not derived from Gobi or Taklimakan Deserts and deserts in southern Kazakhstan, but from deserts in the northern parts of China.

Keywords: Sr and Nd isotope ratio, Icecore, eolian dust