

Sr and Nd isotopic ratio of dust in an ice core drilled on Grigoriev Ice Cap in Tien Shan Mountains

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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 Grigoriev glacier in Kyrgyzstan Tien Shan Mountains.

The ice core was drilled at a snow plateau of 4660 m a.s.l. in 2007. The length is 87.48m and the age estimated 12,000 years. There were prominent dust layers in more than 80m 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 several layers were lower than those of soil from the bottom of ice core. This suggests that the dust was not derived from soil around the ice cap but from Asian desert sand, which is most likely to be derived from Taklimakan Desert.

Keywords: Sr, Nd isotope ratio, Ice core, Dust provenance