

## Variations in Sr, Nd, Pb isotopic ratio of surface dust on Asian glaciers

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Snow and ice on glaciers contain various impurities, such as soluble ions, mineral particles, pollens, and microbes. These impurities can reduce surface albedo and affect melting of glaciers, and also can be used in ice core studies as an indicator of past environment. Thus, it is important to understand how these impurities were supplied on glaciers. Stable isotopic ratios of Sr, Nd, and Pb provide a means of identifying sources of substances and have been commonly used in loess or sediment studies. In this study, we analyzed Sr, Nd, and Pb isotopic ratio of the surface dust collected from four mountain glaciers that were located geographically different regions in Asia. The surface dusts were chemically separated into 5 substances with different acids (4 minerals and organic matter) and isotopic ratios of the each substance were measured. Variations in the isotopic ratios are discussed in terms of sources of each mineral and biological process on the glaciers.

Microscopic observation revealed that the surface dust consisted of mineral particles (eolian dust) and organic matters derived from glacial organisms. The Sr and Nd isotopic ratios in HCl-residual fractions of the surface dust varied among glaciers and were closed to the ratio that have been reported in loess, desert sand, or river sediments around each glacier. This suggests that the isotopic ratios reflect the sources of the mineral particles around glaciers. The Sr isotopic ratios of organic matter in the surface dust also varied among the glaciers, and are likely to reflect the minerals used by glacial microbes as nutrients.