大雪山高層湿原泥炭中の鉱物ダスト量の見積もりとその完新世における変動

Quantification of mineral dust in peat from high moor on the Mt. Daisetsu and its variation during Holocene

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Mt. Daisetsuzan, Hokkaido, Japan is located just below the northern route of Asian dust transport and receives a significant amount of dust which dies snow surface brown in spring time every year. This area is also characterized by well-developed high moors on the mountains covering the last 4000 - 7500 yrs, which would continuously record the history of climate change during the middle to late Holocene. Peat collected from these high moor could be also a suitable material for a precise age determination using the radio carbon, and its inorganic fraction might consist of aeolian dust of continental origin and volcanic materials of the local origin which could be easily distinguished from each other.

Asian dust transported to the northern Japan may have a different source from those transported to the southwestern Japan. In spite of this, many of previous dust studies for Asian dust deposition in Japan have been conducted for the paleo-archives collected from the southern area. Therefore, it is necessary to reconstruct the composition and flux of Asian dust transported to the northern Japan in order to understand the spatio-temporal variability of westerly that could have significant influence on the climate in east Asia.

We collected peat cores from the high moor in Mt. Daisetsuzan area, and measured the mineral composition contained in peat. After heat treatment of peat samples, we conducted X-ray diffraction (XRD) analysis on the ash fraction and semi-quantified the minerals. Quartz, illite, and chlorite showed positive correlation among others, while various feldspars showed another positive correlation among others independent from quartz. Amorphous materials exhibited a variability different from quartz or feldspars. High ash content was associated with high feldspars or amorphous. Comparing these mineral compositions with those of aeolian dust deposited in this area and the local riverbed materials, we judged that the inorganic fraction could be explained by mixtures of aeolian dust and two kinds (crystalline and amorphous) of local volcanic materials.

We will try to statistically unmix these mineral assemblage using PARAFAC algorithm on XRD profiles. Quantification of subcomponents such as Asian dust and local volcanic materials will enable us to estimate the variation of dust flux to this northern region for the last 5000 years. We will also compare our results with previous works for dust depositional history in southwestern region around Japan.

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