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# 大分県大野川流域土壌および河口堆積物の鉱物組成変動
# Temporal variation of mineral composition in the drainage area of the Ohno River, Ohita, Japan

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The Ono River is located in the northeast Kyushu Island, which has the head water region at the Mt. Kuju and Mt. Aso, flows eastward combining some tributaries from the south, and then flows northward to the Beppu Bay. Surface geology of the drainage area is roughly divided into two as andosol in the northeast and brown forest soil in the south. Such contrasting detrital provenances could provide a variety of grain composition to the marine sediments deposited in the Beppu Bay. The No. 5 boring core was drilled at a landfill site on the mouth of the Ono River. The core continuously recovers 97 m length and consists of Holocene marine sediments. The variety of the sediment facies would give us a good opportunity to reconstruct the terrestrial environment of hinterland (the Ono River Basin) through the detailed analysis of the detrital mineral composition.

Detrtal fraction contained in marine sediments can be generally used as climate proxies because variations in provenance and mineralogy could be affected by the precipitation distribution and weathering intensity. Change in the surface soil composition could be observed if a well-preserved depositional soil sequence was found. In order to detect the change in provenances and interpret the terrestrial environment using detrital proxies in the marine sediments, it is necessary to know the variability or range of the mineral composition of a particular provenance during the targeted time periods. Fortunately, we found a suitable soil sequence on the foot of the Mt. Kuju at 850 m altitude, which covers the similar time interval as the No.5. The soil sequence consists of brown loam overlain by the alternation of tephra and andosol. We tried to compare the variations in mineral compositions both for this soil sequence and the No.5 core since about 8,000 yrs age.

We conducted a powder X-ray diffraction analysis (XRD) and color (visible light reflectance) measurement to determine the major mineral composition. Used samples were extraction residues by organic solvent, which were dried and powdered before XRD and color measurement. Major minerals were identified and evaluated semi-quantitatively using the height of their diagnostic peaks. The sediment color was examined through L$*$, a$*$, and b$*$ indices.

The No. 5 core mainly consists of smectite, illite, chlorite (or kaolinite), amphiboles, quartz, feldspars, and amorphous materials with minor calcite. Amorphous material is supposed to mainly consists biogenic opal. Amorphous material is higher during 7000 to 3500 yrs BP which suggests the decrease in detrital input due to the Jomon transgression. All the detrital minerals show opposite variation. The detrital mineral composition such as quartz / feldspars ratio is higher during 0 ? 2000 yrs BP and before 7000 yrs BP which suggests a change in terrestrial condition. On the other hand, The Mt. Kuju soil sequence (KSS) mainly consists of smectite, illite, chlorite (or kaolinite), amphiboles, quartz, felspars, and amorphous materials assoiated with gibbsite. Amorphous material is supposed to mainly consists volcanic glass. Crystalline minerals such as smectite, illite, chlorite, and quartz are higher in loam (up to 7000 yrs BP), and quartz increases at the top andosol of the KSS (after 3000 yrs BP). Volcanic glass began to increase just before quartz decreased at about 7000 yrs BP when feldspars increased alternatively. Quartz / feldspars ratio both in terrestrial soil and marine sediment, which show lower value between 3000 and 7000 yrs BP, suggests that the change in surface soil composition could affect the mineral composition of the marine sediments.

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