

R004-11

C会場：11/6 AM2 (10:45-12:30)

11:45~12:00

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## Forensic research of beach sand collected from Aomori in Japan: an application of rock magnetic and chemical analyses

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When concealments and smugglings have occurred on beaches, it is essential to physically and chemically investigate beach sediments to lead a successful criminal conviction. Previous studies indicate that the microtextural analysis of quartz is useful for characterizing beach sediments (Itamiya et al., 2019; 2020; 2022). In order to suggest a new method to characterize the particle of beach sediments, we applied chemical and magnetic analyses to the samples collected at nine sites (from 1M-1 to 1M-9) from Shimokita peninsula in Aomori, the northernmost part of the main island in Japan. Sites 1M-1, 1M-2, 1M-3, 1M-4, 1M-5, and 1M-6 are located at the eastern coast of the peninsula, the Pacific Ocean side. While the other sites 1M-7, 1M-8, and 1M-9 are located in the western coast, which faces Mutsu Bay. The sedimentary rocks which were formed from Pleistocene to Holocene are distributed, while Osore (andesitic) and Towada (basaltic) volcanoes are located near the sampling sites. Rock magnetic and chemical analyses of the samples were performed. The results indicate that the beach sediments vary depending on the lithology. Concentration-dependent magnetic parameters increase southward. The direction of the coastal drift is from the south to the north, suggesting that basaltic ash of Towada volcano rich in magnetic minerals was supplied to the sampling sites. The sample collected at 1M-4 where is near Sabishiro Mine indicates the maximum value of anhysteresis remanent magnetization among the samples. Magnetic grain size parameters, Mrs/Ms and Hcr/Hc, values are also reflected to the result of grain size analysis. High temperature magnetometry results suggest that goethite ( $\alpha$  FeOOH), magnetite (Fe<sub>3</sub>O<sub>4</sub>), and (titano) maghemite (rFe<sub>2</sub>O<sub>3</sub>) are common in the samples at the Pacific side sites. Low temperature magnetometry indicates the drastic decrease from 5 K to 30 K in Pacific side samples which contain Na, Ca, and Al. The microtextural analysis of quartz also shows that the ratio of “silica precipitation” and “oriented etch pits” types were relatively high values (Itamiya et al., 2020). The results of magnetic properties and chemical analyses of the beach sediments indicate that the origin of sand particles can be characterized as andesite and/or basalt. We can suggest these approaches as useful methods for forensic investigations.