

## Study on the origin of hot spring water using the deep part of Inubohsaki Onsen's core.

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Inubohsaki Onsen in Choshi, Chiba is a Na-Cl type hot spring sourced from groundwater at a depth of 1000 m or more. In previous studies, we have reported that Inubohsaki Onsen is derived from 10,000 to 20,000 years old seawater, and has a different chemical composition from current seawater due to geological effects. In this report, the purpose of this study is to obtain information on the origin of the source of Inubozaki Onsen from the relation between the composition of rocks in the Atagoyama Group, which is considered to be the core of the source well and the hot spring water dissolved components. Hot spring water was collected from the source well of Inubosaki Onsen "Kuroshio-no-yu" and the amount of ions was determined by ion chromatography. The components and crystal phases of a 1280-1290 m deep drilling core and Atagoyama rock were measured by X-ray fluorescence and X-ray diffraction measurements, respectively. The component concentrations of hot spring water tended to be higher for  $\text{Cl}^-$  and  $\text{Ca}^{2+}$  and lower for  $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Mg}^{2+}$  than current seawater. The contents of core and rock main components were in the order of  $\text{Si} \gg \text{F} > \text{Al} > \text{Ca} > \text{K}$ . These contained quartz, Mg-calcite, albite and chlorite. These results indicate that the presence of the calcite that elutes  $\text{Ca}^{2+}$  and the ion-exchangeable silicate minerals that take up  $\text{Na}^+$ ,  $\text{K}^+$  and  $\text{Mg}^{2+}$  in seawater and release  $\text{Cl}^-$  and  $\text{Ca}^{2+}$  to hot spring water relate to the origin of the source.

Keywords: Hot spring, Clay, Coae, Chemical composition