

Stable isotopic compositions of river waters in the core area of the Shirakami Mountains, Japan

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The Shirakami Mountains is the general name given to an extensive mountainous region of 130,000 hectares ranging from the southwest of Aomori to the northwest of Akita prefecture. Within this area are 16,971 hectares of land, enclosing virgin beech forests in Japan, which were registered as a world heritage region in December 1993. However, environmental impact by acid rain at the Shirakami Mountains is becoming an issue these days. Acid rain deposits nitrates that can lead to increases in nitrogen in forests. So we continued research about the chemical and isotopic compositions of river and spring waters in the Shirakami Mountains area, to clarify origin and geochemical characteristics since 2011. However, little is known about stable isotopic composition of natural water in the core area. Therefore, we sampled natural water in a central area and analyzed chemical and isotopic compositions.

The result of the investigation was that $\delta^{18}\text{O}$ and $\delta^2\text{H}$ of the core area's water samples showed -9.1 to -9.9 per mil and -55.7 to -59.4 per mil, respectively. Stable isotope composition of the samples roughly resemble those of meteoric water ($\delta^2\text{H} = 8\delta^{18}\text{O} + 20$), thereby indicating that these are local meteoric water. In addition, the range of Deuterium excess (d-excess) of samples is from 16.9 to 19.9 per mil. These characteristics of isotopic composition are similar to result of SW-part of Shirakami area.

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