

Characteristics of stable isotopes in monthly precipitation at Oshino village and northern slope of Mt. Fuji from Dec. 2016 to Mar. 2020

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Monthly precipitation has been sampled at 11 sites, whose altitude is from 953 m to 2296 m, in Oshino village and northern slope of Mt. Fuji since December 2016 for using to estimate the recharge area of springs and groundwater in Oshino village. Temporal variation of isotope ratios ($\delta^{18}\text{O}$ and $\delta^2\text{H}$) in monthly precipitation at 11 sites indicates almost same tendency. Isotope ratios are relatively low on June and December-January, because of rainy season and snow event. The d-excess values show a seasonal variation clearly, that is low in the warm period (from April to September) and high in the cold period (from October to March). The $\delta^{18}\text{O}$ - $\delta^2\text{H}$ regression line (LMWL) is $\delta^2\text{H} = 7.7 \delta^{18}\text{O} + 10.2$ ($r^2=0.921$), and almost all data in monthly precipitation are plotted along the LMWL. For dividing into the warm period (Apr.-Sep.) and cold period (Oct.-Mar.), regression line is $\delta^2\text{H} = 7.9 \delta^{18}\text{O} + 9.0$ ($r^2=0.975$) and $\delta^2\text{H} = 7.8 \delta^{18}\text{O} + 15.5$ ($r^2=0.945$), respectively. As a result of comparison between monthly precipitation amount and isotope ratios, the relation is not clearly, nevertheless, in the case when using the average values of all observed data, negative correlation is recognized clearly. Relation between air temperature and isotope ratios using the average values of all observed data also show strong positive correlation. From these results, thus it can be said that there is an amount effect and temperature effect when long-term data is used. On the other hand, isotope ratios of monthly precipitation decrease with increasing the altitude, therefore altitude effect is recognized. The altitude effect is $-0.18 \text{‰}/100 \text{ m}$ for $\delta^{18}\text{O}$ and $-1.43 \text{‰}/100 \text{ m}$ for $\delta^2\text{H}$, respectively.

In future, we will attempt to estimate the recharge area of Oshino-Hakkai springs and shallow and deep groundwater in Oshino village by using these observed isotope ratios of precipitation.

Keywords: Mt. Fuji, Oshino Village, precipitation, oxygen and hydrogen stable isotopes, altitude effect