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The characteristics of stable isotopes in precipitation at Japan

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Characteristics of Stable Isotopes in Precipitation over Japan
Spatial distribution and seasonal variabilities of stable isotopes in precipitation over Japan were considered.

The distribution of annual weighted average Oxygen-18 was considered. The Pacific Ocean side (Hachijo, Miyake, Tsukuba, Ryori) were recognized latitude effect. These of d-excess was also considered. D-excess of the Japanese sea side (Toyama, Tottori) were larger than those of Pacific sea side (Ryori, Kanto Plain, Kumamoto etc). This trend is same as previous studies. It is interesting that d-excess of Hachijo and Miyake (located in the Pacific Ocean) were almost same values in the Japanese sea side (Toyama, Tottori).

Seasonal variabilities of Oxygen-18 over Japan were recognized (increasing April and decreasing June). Seasonal variabilities of Oxygen-18 were classified into three types. The first type is summer type; high in summer (from July to August) and low in winter (from December to February). The distribution of summer type was in the Pacific Ocean side (Ryori, Kanto Plain, Kagoshima) and slope and intercept of Local Meteoric Water Line (LMWL) were less than 8 and less than 13, respectively. The second type is winter type; high in winter (from December to February) and low in summer (from June to August). The distribution of winter type was in the Japanese sea side (Toyama, Tottori). Slope and intercept of LMWL in winter type were more than 8, and more than 13, respectively. The third type is unclear seasonal variabilities. Seasonal variabilities of d-excess over Japan were recognized high in winter (from December to January), low in summer (from June to August).

Further study, the distribution of stable isotopes in precipitation will be compared with in shallow groundwater.

Keywords: stable isotopes in precipitation, seasonal variabilities, annual weighted average, LMWL