

Nitrogen and oxygen isotope composition of nitrate in river and spring waters of the Shirakami Mountains

MIURA, Takuya^{1*}, AMITA, Kazuhiro¹, HAYASHI, Takeshi¹

¹Akita University

Introduction

In recent years, volume of nitrogen load has been increasing in mountainous area because of acid rain. The concentration of NO₃⁻ keeps increasing in the water of Subari Lake in Shirakami Mountains at Akita Prefecture. To elucidate of nitrogen cycle in forest is importance problem in view of effects of ecosystem in Shirakami Mountains. Then, in this study, to verify the loaded nitrate source in investigation basin and spatial distribution of nitrogen isotope values originated from forest, thirty river and spring water samples from Shirakami Mountains southern region were analyzed for nitrate concentration and nitrate-nitrogen (d¹⁵N-NO₃⁻) and oxygen (d¹⁸O- NO₃⁻) isotope values.

Method

So far the investigation and water sampling has been carried out on November 2011 in the Shirakami Mountain southern region at Akita Prefecture. The main water sampling points were in the river, stream, spring, lake and wetlands. Physicochemical parameters (pH, ORP, DO, Temperature) were measured in the field investigation. Water samples were determined NO₃⁻ concentration and major water chemistry.

Results

The results showed that NO₃⁻ concentration was in the range of 0.5mg/L to 3.1mg/L. In each basin of the western study area (Tokiwa River Basin, Hanawa River Basin, Mizusawa River Basin), there was a more than 2.5mg/L concentration of NO₃⁻. By contrast, at each point in the inland area (The upper stream of Subari Lake, Fujikoto River Basin), NO₃⁻ concentration was less than 1mg/L.

Keywords: shirakami mountains, nitrate, nitrate-nitrogen and oxygen isotope ratio, acid rain

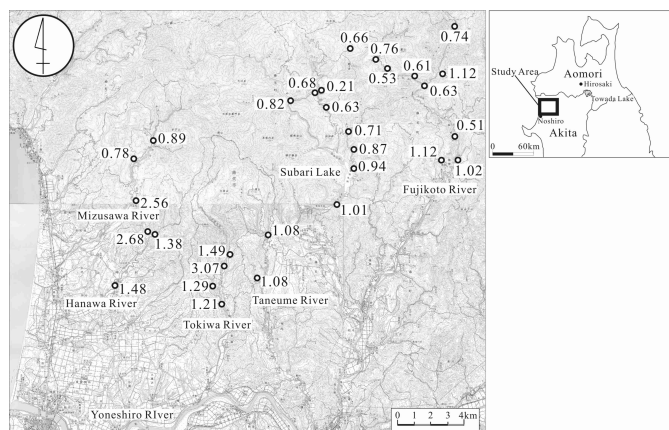


Fig. Distribution of NO₃⁻ concentration in the water sampling point. Figure shows NO₃⁻ concentration(mg/L)