

## Co-Variation of Sr-Nd-Pb-Hf Isotope Chemistries of the Quaternary Lavas and the Basement Granitoids, Northeastern Japan arc

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Sr-Nd-Pb-Hf isotopic ratios were determined for the frontal-arc lavas and for the Cretaceous to Paleogene granitoids occurring in the Northeastern Japan arc in order to examine the genetic relationships between the young magmas and their basement rocks. Frontal-arc Nasu and rear-arc Chokai volcanic chains develop in response to the - 90 to -180 km depth contours of Wadati-Benioff zone of the Pacific Plate slab. Previous studies showed that the Sr-Nd isotopic compositions of the rear-arc lavas have a common depleted source, whereas the frontal-arc lavas have various enriched sources with increasing Sr and decreasing Nd isotope ratios from north to south. The isotopic variations of the frontal-arc lavas almost correlate with that in the basement granitoids, which also have increasingly radiogenic Sr from north to south. We newly present Sr-Nd-Pb-Hf isotope ratios for the representative frontal-arc lavas and the basement granitoids. Frontal-arc lavas examined were from Hakkoda, Akita-komagatake, Iwate volcanoes from the northern area, Zao and Azuma from the central area, and Nasu and Takahara from the southern area. Basement granitoids were analyzed for the Kitakami belt (north area), the Abukuma belt (central area), and the Ashio/Mino belt (south area). All the Sr-Nd-Pb-Hf isotope data confirmed increasingly enriched source from north to south for both the Quaternary lavas and the basement granitoids. Multi-isotope plots show discrete quasi-linear mixing arrays consisting of the lavas at each volcano suggesting mixing of endmember magmas from depleted and enriched sources. The depleted source is, the most likely, originated from a common Indian MORB mantle affected by the slab components from the Pacific Plate. In contrast, the enriched sources for the lavas vary and the source at each volcano appears to correlate with the underlying basement granitoids in terms of isotope geochemistry. This suggests either crustal assimilation of the upper crustal granitoids or deep assimilation of the lower crustal amphibolite which was the source of the basement granitoids. The isotopic evidence clarified that the Quaternary lavas in the Northeast Japan arc were fundamentally derived for a common mantle source but severely affected by the various crustal materials.