Role of subducted sediment in Sr-Nd-Pb-Hf isotopic evolution for Early Cretaceous to Paleogene granitic rocks from northeast Japan

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The Japanese Islands represent a segment of a 500 Ma old subduction related orogen developed along the western Pacific convergent margin (e.g., Maruyama, 1997; Isozaki et al., 2010). Here We investigate Sr-Nd-Pb-Hf isotopic evolution for Lower Cretaceous to Paleogene granitic rocks in northeast Japan. Kagami et al. (1999) described that the northeast Japan arc can be divided into three groups based on their Sr-Nd isotope characteristics: the Kitakami, North (Abukuma belt), and South (Ashio/Mino belts) Zones. Among these zones, the Kitakami zone is characterized by the occurrence of adakitic rocks probably related to Lower Cretaceous ridge subduction. Sr-Nd-Pb-Hf isotopic study are made for granitic rocks from the Kitakami belts (Kitakami Mountains), the Abukuma belts (Shirakami Mountains, Obonai area, Taihei Mountain, Sekiryo Mountains, and Abukuma Mountains), and the Ashio/Mino belts (Okutone area, Tadami area, Okutadami area, Taisyaku Mountains, and Ashio Mountains). Multi-isotope plots of these rocks indicate that the trend in variation could result from the mixing of depleted and enriched components. The depleted components are likely to originate from subducted oceanic crust and subarc mantle, which shows temporal variation related to the Early Cretaceous ridge subduction to younger normal subduction. On the other hand, the enriched components probably originate from subducted sediment including oceanic and continental components. The latter component probably originate from the old continental fragments rich in detrital zircon from proto-Japan arc initially developed along the southeastern margin of the South China Block.