

Whole-rock chemical compositions and rare earth element compositions of the Paleogene Tadami-gawa granitic rocks, northea

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The Paleogene Tadami-gawa granitic rocks are located at the border between Fukushima and Niigata prefectures, northeastern Japan. The granite is divided into two rock types, the Tadami-gawa granite and the Hinoemata-gawa granite. The Tadami-gawa granite is coarse-grained biotite granite and it is characterized by the phenocryst of K-feldspar. The Hinoemata-gawa granite is medium-grained biotite-hornblend granite, and it is intruded by the Tadami-gawa granite. In this study, we have analyzed whole-rock chemical compositions including REE of the Tadami-gawa granitic rocks, and discuss the petrogenesis of the pluton. 7 samples of the Hinoemata-gawa granite and 18 samples of the Tadami-gawa granite were analyzed for major-minor chemical compositions and REE compositions by XRF and ICP-MS, respectively. SiO₂ contents of the Hinoemata-gawa granite and the Tadami-gawa granite range from 59.6 to 69.4 wt.% and from 62.8 to 74.6 wt.%, respectively. The Tadami-gawa granite and the Hinoemata-gawa granite may be generated from the same magma origin because they show similar trend on the Harker's diagram. The Tadami-gawa granitic rocks are plotted within the field of non-alkaline rock on the graph of SiO₂-(Na₂O+K₂O)(Miyashiro, 1978). It is also assumed that the pluton belongs to calc-alkaline rock series because SiO₂ contents increase with increasing FeO/MgO ratio. Additionally, almost all samples were classified into VAG (Volcanic Arc Granite) on the Rb-(Nb+Y) diagram(Pearce et al., 1984). Therefore, the Tadami-gawa granitic rocks magma might be originated from the partial melting of the basaltic crust. REE abundance patterns of all samples normalized by chondrite show high-LREE pattern. Many samples show negative Eu anomaly, and the value of Eu anomaly increase with decreasing anorthite content calculated by CIPW norm. The value of Eu anomaly might be concerned with the crystallization differentiation of the original magma. The degree of Eu anomaly of the Tadami-gawa granite is higher than that of the Hinoemata-gawa granite. Whole-rock chemical composition analyses suggest that the Tadami-gawa granite is more differentiated than the Hinoemata-gawa granite.

References

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