

K-Ar ages of plutonic and metamorphic rocks of Massifs A, C and Minami-Yamato Nunataks in Yamato Mountains, East Antarctica

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The Yamato Mountains are located ~300 km southwest of Syowa Station in East Antarctica (71.3S - 72.1S, and 34.8E - 36.9E). The mountains extend for about 60 km north-south, and are made up of several small nunataks and Massifs A to G from south to north. The Minami-Yamato Nunataks are situated in the southernmost part of the Yamato Mountains, 40 km southwest of Massif A. The Yamato Mountains are composed of high-grade metamorphic rocks, syenitic rocks and granitic rocks.

To understand the timing of the metamorphic and plutonic activities that built the Yamato Mountains, various types of geochronological studies (K-Ar, Rb-Sr, CHIME, SHRIMP U-Pb methods) have been investigated (Yanai et al., 1982, Shibata et al., 1985, Shibata et al., 1986, Shiraishi et al., 1994, Motoyoshi et al., 1995, Asami et al., 1997) on rocks of Massifs A, C and E. K-Ar dating results of Massifs A and C were divided into two groups, gneiss rocks of Massif A with 470-480 Ma biotite ages (Shibata et al., 1985) and syenite rocks and a gneiss rock of Massif C with 360-400 Ma whole rock ages (Yanai et al., 1982). On the other hand, no geochronological study has been carried out on the rocks from the Minami-Yamato Nunataks.

I measured the K-Ar mineral ages of rocks of Massif A (Mt. Nokogiri), Massif C (Tsuitate-Iwa) and the Minami-Yamato Nunataks (Nunatak C in Kuwagata Mt.) from the Yamato Mountains. These samples were collected while searching for Antarctic meteorites during the 41st Japanese Antarctic Research Expedition. Potassium content and the radiogenic ^{40}Ar abundance in the samples were measured at Yamagata University.

K-Ar dating results are as follows. (1) K-Ar ages of a granitic gneiss rock (~450Ma) and a hornblende-biotite gneiss rock (~490Ma) of the Minami-Yamato Nunataks resemble those of the gneiss rocks of Massif A (470-480Ma, Shibata et al., 1985). (2) A syenite rock from Massif A yielded a younger K-Ar age (~350Ma) than those of the gneiss rocks from Massif A (470-480Ma, Shibata et al., 1985). The temporal relationships between the gneiss and the syenite is consistent with that previously reported from field and petrographical observations (Shiraishi et al., 1982). (3) K-Ar ages of mineral separates from a syenite rock (~350Ma) and a metabasite rock (~390Ma) of Massif C are consistent with previous whole rock K-Ar dating results (350-400 Ma, Yanai et al., 1982). These results will be used to consider the genetic relationships of rocks from the Yamato Mountains.