Geology of the Atokura Nappe of the Yorii-Ogawa district in the Kanto Mountains

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[1] none

The Atokura Nappe was studied in the Yorii-Ogawa area. The geological map based on the present study is shown in Figure1, and main results are listed below.

(1) Small tectonic blocks were found at 21 localities.

(2) The Atokura Nappe is composed of various kinds of tectonic blocks which belonged to various geological belts. Thin tectonic blocks occur between larger tectonic blocks. Small tectonic blocks are often distributed more than 3 km along larger tectonic blocks.

(3) Small tectonic blocks of Kinshozan quartz diorite were found in the northernmost and southernmost parts of the Atokura Nappe. Kinshozan quartz diorite and Mid-Cretaceous metamorphic and granitic rocks are distributed in almost all parts of the Atokura Nappe.

(4) The K-Ar bulk rock age of the actinolite schist from Kiroko is 57.4Ma. The result suggests the formation and cooling of the actinolite schist in early Paleogene or late Cretaceous.

(5) Low-angle faults are very rare within the Atokura Nappe. An example is located at a quarry in the southeast of Mt. Kuruma-yama where massive granite is superposed on schistose biotite granite.

(6) Faults between Sanbagawa metamorphic rocks and the Atokura Nappe are usually high-angle normal faults. The Atokura thrust was displaced in many localities by the high-angle faults. The displacements occurred in relation to the tectonic upheavals in the northern part of the Kanto Mountains. After the significant erosion of the surveyed area, Sanbagawa metamorphic rocks were selectively exposed in highly raised regions.

(7) The Kannokura fault located between the Chichibu Belt and the Atokura Nappe was active even after the sedimentation of middle Miocene mudstones. In Ogawa town, middle Miocene mudstones are exposed in southernmost parts of the Atokura Nappe. Their lack in the Chichibu Belt is attributed to the erosion accompanied by vertical upheavals of the Chichibu Belt along the Kannokura fault.

The present study has revealed the complex geological structure of the Atokura Nappe and the presence of many high-angle faults. The Atokura thrust was cut by many high-angle faults which were formed by accompanying with tectonic upheavals after middle Miocene. Similar upheavals occurred in the north of the Kanto Mountains. Almost vertical faults were observed between lower Miocene conglomerates and Mikabu greenstone at Mure, Yorii town. Many high-angle faults are supposed between the Ryoke Nappe of the Hiki Hills and the surrounding Miocene sediments. It is impossible to find the thrust of the Ryoke Nappe in the northernmost part of the Kanto Mountains because of the widespread occurrence of high-angle faults.