

Geology of the Atokura Nappe in the Yorii-Ogawa district, central Japan

Akira Ono^{1*}

¹None

The Atokura Nappe is distributed in the northeastern margin of the Kanto Mountains. The Atokura Nappe in the Yorii-Ogawa district consists with various kinds of geological bodies (Figure 1). Typical geological bodies are late Permian granitic bodies, mid-Cretaceous granitic and metamorphic rocks and early Paleogene high-pressure metamorphic rocks.

Geological structures of the Atokura Nappe are complex, but important facts are the following three points. (1) Various geological bodies are in contact with each other by high-angle faults. Low-angle faults have not been found anywhere. (2) Both of very small geological bodies and large geological bodies are widely distributed. Small elongated geological bodies are arranged along the boundaries of larger geological bodies. (3) The Atokura thrust, a low-angle fault between the Mikabo Greenstones and the Atokura Nappe, has been found at the locations of a, b, c, d and e.

The small geological bodies of the Atokura Nappe are tectonic blocks which were formed when larger geological bodies integrated in the root zone of the Atokura Nappe. With respect to the formations of the small geological bodies, it is very important to understand geologies of the Tochiya and Yatsu regions.

In the Tochiya region, rocks of small elongated Kiroko greenstone melange are sandwiched between sandstones and conglomerates of the Atokura Formation. As the Atokura thrust exists below the Atokura Formation, the same Atokura thrust is also assumed below the small elongated geologic body which is mainly composed of serpentinite. The small elongated Kiroko greenstone melange was formed in the root zone of the Atokura Nappe.

On the other hand, it is possible to consider that the small elongated greenstone melange was formed in the Sanbagawa belt. In this tectonic model the Kiroko greenstone melange which was situated far above the Atokura Formation fell down and was sandwiched between the rocks of the Atokura Formation. In this tectonic process geological bodies which were situated below the Kiroko greenstone melange were also significantly depressed. Nevertheless, the assumed geological structure is highly unnatural. Hence, the assumed tectonic model appears to be a mistake.

In the Yatsu region, the late Cretaceous Atokura Formation is distributed close to sandstones and conglomerates of the early Paleogene Yorii Formation. A small tectonic block of chert and mudstone is exposed in the west of the Yatsu region, but the Atokura Formation is directly in fault contact with the Yorii Formation in the east (Figure 1). As the Atokura thrust exists below the Yorii and Atokura Formations, the Mikabo greenstones also exist below the chert block. It is unreasonable to consider that the Atokura thrust below the chert has fallen into the deep.

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