Finding of late Cretaceous-early Paleogene metamorphic rocks formed in the north of the Sanbagawa Belt in central Japan

Akira Ono[1]

[1] none

Recent studies on Yoshimi metamorphic rocks, actinolite schists of the Atokura Nappe and Awasawa metamorphic rocks showed the existence of late Cretaceous - early Paleogene metamorphic rocks in the axial part of Southwest Japan. The tectonic upheavals of Yoshimi metamorphic rocks and actinolite schists occurred in the missing land located between the Sanbagawa and Ryoke Belts before the formations of the Paleogene Atokura Nappe.

Actinolite schists are common in the greenstone merange of the Atokura Nappe. The K-Ar bulk rock age of actinolite schist from the Kiroko area is 57.4Ma. The rock is mainly composed of actinolite and chlorite, and it is not suffered from secondary recrystallization.

Awasawa metamorphic rocks are exposed near the Median Tectonic Line (MTL) of the Hase-Ichinose district of Ina city. They are usually suffered from intense alteration. However, a few amphibolite was found to be free from intense alternation. The K-Ar age of hornblende from biotite-garnet amphibolite is 55.7Ma, which suggests that Awasawa metamorphic rocks were crystallized after the formations of Ryoke metamorphic rocks and Kashio mylonites.

Figure 1 shows the late Paleogene central Japan. The illustration is useful for geological considerations on the root zone of the Atokura Nappe and the initial location of the Awasawa metamorphic rocks. Figure 1 was illustrated by following procedures on the basis of several assumptions: (1) Central Japan was separated into 5 units, the inner zone of the Chubu district, the Chichibu-Sanbagawa Belt of the Chubu district, the Chichibu-Sanbagawa Belt of the Kanto district, Ashio-Yamizo region of Miocene Northeast Japan, and the Abukuma Belt and its surrounding regions. (2) Mid-Miocene tectonics of the inner zone of the Chubu district was similar with those of the Shikoku and Kinki districts. (3) Miocene deformations are not remarkable in the inner zones of the Chubu and the Ashio-Yamizo regions. (4) The Chichibu-Sanbagawa Belts in all the districts were linearly distributed in early Miocene. (5) The Abukuma Belt and the Ashio-Yamizo Belt were located in the northeast of the Chichibu-Sanbagawa Belt of the Kanto district. (6) Tsukuba metamorphic rocks were exposed in the easternmost part of the Ryoke Belt.

Figure 1 exhibits the existence of a large missing land which belongs to the inner zone of Southwest Japan. Hence, the existence of the MTL in the late Paleogene Kanto region is not evident. However, Ryoke Nappe on the Sanbagawa Belt suggests the existence of MTL in late Paleogene times. Before or during the formation of the Paleogene MTL, nappe tectonics took place and all the early Paleogene metamorphic rocks which do not belong to the Ryoke and Sanbagawa Belts were superposed on the Sanbagawa metamorphic rocks.