

Geology of the Chichibu Belt in the Tomochi and Shiibamura district in central Kyushu

Makoto Saito[1], Seiichi Toshimitsu[2]

[1] G.S.J., AIST, [2] G.S.J., AIST

<http://www.gsj.go.jp/>

The authors have revealed the detailed geology of the Chichibu Belt in the Tomochi-Shiibamura district of central Kyushu. This result has made clear that pre-Cretaceous shallow marine sediments and Paleozoic igneous rocks overlaid the Jurassic accretionary complex. Furthermore, the detailed age of Jurassic to Early Cretaceous accretionary complexes has made it possible to be compared with the Mino terrane of Inner Zone.

[Outline of geology]

Chichibu Belt in this area is bordered on the south by Butsuzo Tectonic Line, and is bordered on the north by Usuki-Yatsushiro Tectonic Line. The Chichibu Belt in this area is divided into two belts; southern belt is Southern Chichibu Belt occupied by Jurassic to Cretaceous accretionary complex, and northern belt is Kurosegawa Belt occupied by Jurassic accretionary complex with Silurian to Cretaceous shallow marine sediments, Permian accretionary complex, Jurassic schist, and serpentinite melange with Paleozoic igneous and metamorphic rocks (about 400Ma). In the Kurosegawa Belt, there are two types of Lower Cretaceous; one unconformably covers an accretionary complex (Hirodaira Unit; age unknown), another overlies the Upper Jurassic formation, and each has different molluscan fauna (e.g. Tanaka et al., 1998).

Jurassic accretionary complexes are distinguished definitely from other rock bodies by faults (often associated with serpentinite) in the Kurosegawa Belt. Therefore all lithologic units of the Chichibu Belt except of Cretaceous shallow marine sediments, are divided into Jurassic to Early Cretaceous accretionary complex and pre-Cretaceous normal sediments and Paleozoic members.

As Silurian to Cretaceous shallow marine sediments and Paleozoic members overlie the Jurassic accretionary complex, they are exposed near the syncline in the Kurosegawa Belt

[Jurassic to Early Cretaceous accretionary complex]

The Jurassic accretionary complex in the Southern Chichibu Belt is divided by thrust into four units; Omae Unit of Early Cretaceous melange, Momigi Unit of Middle Jurassic coherent facies, Nitao Unit of late Early to early Middle Jurassic coherent facies, and Hagi Unit of Early Jurassic melange in ascending order, south to north. In the south wing of syncline in Kurosegawa Belt, the Takadake Unit of Early Jurassic coherent facies is thrust over the Hashirimizu Unit of Early Jurassic melange, whereas accretionary complexes in north wing are Shimodeke Unit of Early Jurassic melange and Hirodaira Unit of melange (age unknown). The Hirodaira Unit might belong to Permian accretionary complex.

In southwestern extension of the Jurassic metamorphic rocks in southern margin of the Kurosegawa Belt, pre-Cretaceous shallow marine sediments expose widely, and have syncline. Therefore the Hashirimizu Unit in the Kurosegawa Belt will be originally same as the Hagi Unit in the Southern Chichibu Belt, and the base side of main syncline in the Kurosegawa Belt (Hashirimizu and Shimodake Units) will be also originally same. Then the Jurassic accretionary complexes except of the Hirodaira Unit are composed of Early Cretaceous melange (Omae U.), late Early to Middle Jurassic coherent facies (Momigi and Nitao Units), Early Jurassic Melange (Hagi, Hashirimizu and Shimodake Units) and Early Jurassic coherent facies (Takadake U.), in ascending order.

This stratigraphy is similar to that of the Mino terrane in Inner Zone. The Jurassic accretionary complexes of the Mino terrane are piled up by thrust fault; earliest Cretaceous melange, Middle to early Late Jurassic coherent facies, Middle Jurassic melange and Middle Jurassic coherent facies, in ascending order. Although the start of accretion of the Mino terrane is later than that in Chichibu Belt, the lithologic order and the end of accretion of Mino terrane are similar to those in Chichibu Belt. These correlations are very important to estimate the formation process of Jurassic accretionary complexes in Southwest Japan Arc.

Geologic map of the Tomochi - Shiibamura district

