

## Geology and structural development of the Asahi area, Okayama Prefecture

# Masashi Aoyama[1], Shigeru Otoh[2]

[1] Earth Sci., Toyama Univ, [2] Dept. Earth Sci., Fac. Sci., Toyama Univ.

The Inner Zone of Southwest Japan consists of several pre-Tertiary geologic units, and various ideas of their division and structural interpretation have been presented. This study aims to redefine the structural division of the Asahi area, Okayama Prefecture, on the basis of the protolith assemblage of metamorphic rocks, and to clarify the structural development of the area. The pre-Cretaceous rocks of the Asahi area were so far collectively called the Sangun metamorphic rocks of the Chizu Terrane.

The metamorphic rocks in the Asahi area are divided from the protolith assemblage into the Maniwa Group and the Asahi Group. The former consists of bedded chert and mudstone with blocks of bedded chert, whereas the latter consists of felsic tuff and mudstone. The Asahi Group has rested upon the Maniwa Group by a S-dipping ductile thrust zone.

The Maniwa Group crops out in the central part of the study area. The lower part is composed mainly of metamorphosed chert, whereas the upper part consists of mudstone with blocks of bedded chert. All of the rocks in this group have intensely been sheared and have a WNW-trending and S-dipping foliation with N-trending mineral and/or stretching lineation that lying on the foliation. The deformation tends to become stronger toward the ductile thrust zone. The rocks of the Maniwa Group have metamorphic minerals such as actinolite, sericite, epidote and chromite. Some of these metamorphic minerals have cut and overgrown deformation microstructures.

The Asahi Group occurs in the northeastern and southwestern parts of the study area. This group is composed of felsic tuff and mudstone that have WNW-trending and S-dipping foliation with N-trending mineral and/or stretching lineation lying on the foliation. The rocks of this group have metamorphic minerals such as epidote, sericite, chromite and pumpellyite with very small amounts of tourmaline. The foliation of the rocks is defined by preferred orientation of platy or acicular metamorphic minerals caused by deformation and rotation during metamorphism. The deformation intensity of the rocks becomes stronger toward the ductile thrust fault. Asymmetric microstructures of metamorphic minerals clearly indicate the top-to-the-north sense of shear.

The Maniwa Group is correlated with the rocks of the Chizu Belt in the type locality on the basis of lithology and spacial distribution. The Asahi Group, on the other hand, is lithologically correlated with the Maizuru Group in the Maizuru Belt, which is assumed to be of continental shelf deposits. Moreover the Maniwa Group in the Asahi area is similar in lithologic association to the Type I suite of the Tamba Belt. In this way, the Chizu Belt is redefined as a geologic belt beneath the Maizuru Belt that is characterized by high-P/T type regional metamorphic rocks originated from an accretionary complex.

The Maniwa Group and the Asahi Group have Rb-Sr metamorphic ages of 180 Ma and 195 Ma, respectively (Shibata and Nishimura, 1989; Nishimura and Shibata, 1989). The age of deformation -the ductile thrusting- of the Asahi area lies between the metamorphic peaks of the two groups, i.e. between 195 Ma and 180 Ma, based on the relationship between metamorphic minerals and deformation. In other words, the Asahi Group was thrust over the Maniwa Group to the north after the metamorphic peak of the Asahi Group and during the growth of metamorphic minerals of the Maniwa Group. Further study is needed of the metamorphism of the Asahi Group during and after the ductile overthrusting.