

## Reexamination of the Ultra-Tamba Terrane in the Hirone area, Osaka and Hyogo prefectures, SW Japan

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The Yamashita Formation and the Nagaoyama Formation distribute in the southeastern part of Hyogo Prefecture and the northwestern part of Osaka Prefecture. These formations are considered to be the components of the Ultra-Tamba Terrane (Matsuura et al., 1995). According to Matsuura et al. (1995) the Yamashita Formation consists mainly of mudstone and a small amount of sandstone. Kusunoki et al. (1997) reported Middle to Late Permian radiolarians from felsic tuff and Late Permian radiolarians from mudstone of the Yamashita Formation. The Nagaoyama Formation is tectonically overlain by the Yamashita Formation, is subdivided into the Lower Member composed mainly of mudstone and the Upper Member composed mainly of sandstone (Matsuura et al., 1995). This formation is thought to be Mesozoic formation, because *Nassellaria* was reported from mudstone (Matsuura et al., 1995). The Nagaoyama Formation is correlated with the Takatsuki Formation located the Kyoto Nishiyama area, eastward of the study area (Matsuura et al., 1995; Miyachi et al., 2005). But, late Wujiapingian to Changhsingian (Late Permian) radiolarians are extracted from felsic tuff and Permian radiolarians from mudstone of the Takatsuki Formation (Sugamori, 2004, 2005). Thus there is a problem about the correlation between the Nagaoyama and Takatsuki formations.

The author extracted Late Permian radiolarians from mudstone of the Nagaoyama Formation. Broken beds of sandstone and mudstone exposes on the locality, lat 34deg. 54m. 20s. N. and long 135deg. 25m. 1s. E. Mudstone of matrix in the broken beds of sandstone and mudstone has yielded Late Permian radiolarians. This mudstone includes clastic grains and clay minerals.

Radiolarians extracted from mudstone are *Albaillella protolevis* Kuwahara, *Neoalbaillella* sp., *Ishigaum trifustis* De Wever and *Caridroit* and so on. Based on the occurrence of *A. protolevis*, this mudstone corresponds to the *Neoalbaillella ornithoformis* Assemblage Zone to the lower part of the *Neoalbaillella optima* Assemblage Zone of the Upper Permian.

The author tried to extract radiolarians from mudstone on the locality that Matsuura et al. (1995) reported *Nassellaria*. Only a few ill-preserved spherical radiolarians were yielded from it and there is no evidence showing Mesozoic. It is unknown whether the depositional age of the Nagaoyama Formation reaches Mesozoic or not.

Depositional age of clastic rock of the Nagaoyama Formation is the same as to the Yamashita Formation based on radiolarians. Although the Nagaoyama Formation is different from the Yamashita Formation in the lithological features (Matsuura et al., 1995), its difference is not so critical on the basis of the author's survey. Therefore, it is difficult to distinguish the Yamashita Formation from the Nagaoyama Formation by their depositional age and lithological characteristic. Also, the Nagaoyama Formation contains greenstone and the Yamashita and Nagaoyama formations include broken beds of sandstone and mudstone. These features suggest that both formations are an accretionary complex and should be unified as the Inagawa Complex.

The Inagawa Complex is capable of being correlated with the Takatsuki Formation based on the tectonic and geographic position, and depositional age of clastic. This suggests the Takatsuki Formation is an accretionary complex.