

## Pelitic rocks of the Kiroko greenstone mélange of the Atogura Nappe in the Yorii-Ogawa area, central Japan

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Atogura and Ryoke Nappes were formed at the final stages of large-scale Nappe tectonics that occurred around 70-50 Ma. The geological bodies of Atogura Nappe were distributed in the forearc region of the early Paleogene arc-trench system of central Japan. Here, we examine the Kiroko greenstone mélange distributed in the southern part of Atogura Nappe.

The Kiroko greenstone mélange is composed of Kiroko metamorphic rocks, tectonic blocks and serpentinite, and is presumed to have been distributed in the vicinity of the Sanbagawa metamorphic rocks at about 60Ma. The Kiroko metamorphic rocks are low-temperature metamorphic rocks mainly composed of greenstone, chert, mudstone (slate), sandstone and conglomerate. Greenstones contain various tectonic blocks. The tectonic blocks are geological bodies which were captured by the Kiroko metamorphic rocks and serpentinite.

The route map of Kiroko greenstone mélange and rock textures of mudstone and greenstone are shown in Figures. The route map is different from the one previously reported and it appears a geological map. In the Kiroko area, tonalite, serpentinite, mudstone, sandstone, chert and greenstone are exposed along a small stream (loc.a of the route map). The K-Ar whole rock age of the greenstone near the chert is 57.4 Ma. This greenstone is a fine-grained actinolite-chlorite schist, but it is a heterogeneous rock with small amounts of lenticular pelitic lenses (Figure loc.a, white arrow). The main constituent minerals of the pelitic lenses are very fine-grained muscovite, actinolite, chlorite, quartz and carbonaceous materials.

The K-Ar whole rock age of the mudstone near the 57.4 Ma greenstone is 117 Ma. Coarse detrital quartz and muscovite grains are the cause of the old age value. The pelitic rocks (mudstones and slate) of the Kiroko metamorphic rocks commonly contain coarse-grained quartz, feldspar and muscovite. Its occurrence is shown in Figures, Kiroko b & c. Some mudstones have many quartz veins. The foliation of mudstone is continuous inside the quartz vein (Kiroko, a).

At loc.Y, muddy mixed rocks are sandwiched between metagabbro. At loc.Z, serpentinite, mudstone, serpentinite conglomerate, slate, greenstone, sandstone, and conglomerate are exposed in this order from south to north. Conglomerates are mixed rocks composed of breccia of sandstone and mudstone, and are presumed to be slump deposits.

Mudstone, sandstone, conglomerate and chert are widely distributed in the southern part of the Iyo area of Higashi-Chichibu Village. Massive cherts are common, and red mudstone is exposed in one place (red circle). Sizes of quartz grains of the muddy chert to the south of loc.e are about 5  $\mu\text{m}$ , and muscovite has a feather-like morphology. For the mudstones at loc.d and loc.e, very fine-grained minerals are common and fine muscovite grains exhibit preferred orientation, but there are also large detrital particles of quartz and muscovite. The Tuff breccia in the Iyo area may be a tectonic block mainly composed of nearly amorphous tuff breccia.

The greenstones and mudstones examined here lack prehnite or prehnite veins.

As described above, detrital minerals are common in pelitic rocks of the Kiroko greenstone mélange. On the other hand, no detrital minerals remain in the pelitic schists of the Mikabu unit in the northeastern part of the Kanto Mountains. Mikabu unit is not distributed in the study area.

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