

## Greenstone melange of the Atogura Nappe in the Iyou district, Saitama Prefecture, central Japan

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The Atogura Nappe in the northeastern margin of the Kanto Mountains consists of various kinds of geological units. The Kiroko greenstone melange is a geological unit distributed in the southern part of the Atogura Nappe. It is composed of the Kiroko metamorphic rocks, serpentinites and various kinds of tectonic blocks. The Kiroko metamorphic rocks mainly consist of weakly metamorphosed slate, sandstone, mixed rock, chert, greenstone and actinolite rocks. These rocks are usually exposed separately. However, slate, psammitic rock, mixed rocks, chert, greenstone and conglomerate of serpentinites are conformably piled up at locations *a* and *f* of Figure-Kiroko. Hornblendite, amphibolite, epidote amphibolite, psammitic metamorphic rocks, meta-tonalite and acidic tuff are representative tectonic blocks. The Kiroko metamorphic rocks and tectonic blocks were intruded by serpentinites.

The important geological data obtained to date for the Kiroko greenstone melange are as follows. 1) The K-Ar whole rock age of a greenstone at loc.*a* is 57.4Ma. Thin pelitic lenses mainly consisting of fine-grained actinolite, chlorite, white mica, carbonaceous material and quartz exist in the studied greenstone. The dating result suggests that the Kiroko metamorphic rock is a member of the Sanbagawa metamorphic rock. 2) The K-Ar hornblende age of a small amphibolite block included in an actinolite rock is 402Ma. 3) A thin layer of muscovite-biotite-garnet schist was found in a psammitic metamorphic rock exposed in the Iyou area, Higashi-chichibu village. The K-Ar age of white mica from the muscovite-garnet schist is 109Ma (Figure-Iyo). The metamorphic rocks are considered to be members of the Higo- Abukuma metamorphic belt [1,2].

The following facts are revealed by a recent geological study of the Iyou area (Figure- Iyo). (a) Psammitic metamorphic rocks and thin aplitic granites are distributed in the northern part of the Kiroko greenstone melange. The metamorphic and granitic rocks show no evidence for suffering from the Kiroko metamorphism. (b) Similar metamorphic and granitic rocks occur as a small block of approximately 30m long and 12m wide to the south of the above mentioned psammitic metamorphic rocks. (c) A tectonic block of meta-tonalites was found to the southwest of the small psammitic metamorphic block. Plagioclases of the meta-tonalites are replaced by fine zoisite grains. Some meta-tonalites show mylonitic textures, but others show weak schistosity. In the latter case, most of plagioclase grains have many tension cracks which are filled with quartz and plagioclase. Chlorite-rich veins and pools are not rare. Edges of large amphibole crystals are replaced by colorless amphiboles. The K content of a whole rock sample is less than 0.05% by weight. (d) Floatstones of psammitic metamorphic rocks are found near the western part of the meta-tonalite.

The present study has revealed the existence of melange structures in the Iyou area. Allochthonous blocks were captured during the exhumation of the Kiroko metamorphic rock before the intrusion of serpentinite. The finding of tectonic blocks of mid-Cretaceous metamorphic and granitic rocks suggests that the intrusion of serpentinite and the exhumation of the Kiroko metamorphic rocks took place in the eastern marginal portion of the early Paleogene forearc region where Higo-Abukuma metamorphic and granitic rocks are distributed in the upper crust [1,2]. The shift of the Higo-Abukuma belt toward the late Cretaceous trench was caused by nappe tectonics.

[1] A. Ono, 2011, Abs. Geol. Soc. Japan, Meeting, R9-P-9, p. 196.

[2] A. Ono, 2013, Abs. Japan Geosci. Union Meeting, SMP43-P16.

Keywords: Atogura Nappe, Greenstone melange, Tectonic blocks, Higo-Abukuma Belt, Serpentinite

SGL40-P12

Room:Convention Hall

Time:May 27 18:15-19:30

