

Middle Triassic chert-basalt succession in the Chanthaburi area, Southeast Thailand

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Paleozoic and Mesozoic rocks distributed in Southeast Thailand fundamentally comprise the basements of the Indochina continental Block to the east and the Sibumasu Continental Block to the west. Those distributed between the two continental blocks contain Permian-Triassic island-arc facies and back-arc basin facies, and have been discussed their geological significance and boundary. In the Sa Kaeo-Chanthaburi zone, the Triassic Pong Nam Ron and Noen Po formations are distributed in the Chanthaburi area of southeastern Thailand. Although Middle-Late Triassic radiolarians were reported from them (e.g., Hada et al., 1999), the lithologic features and sedimentary environments of fine-clastic and siliceous sediments have not been documented in detail. With respect to the depositional setting of these formations, moreover, there are two contrasted interpretations proposed up to now; one is that they are infilling sediments of the Nan-Sa Kaeo back-arc basin (Ueno and Charoentitirat, 2012) and the other is that they are arc-originated sequences associated with submarine volcanisms of the Sukhotahi arc (Sone et al., 2012).

At Ao Tan Khu, about 50 km southeast of Chanthaburi, we found an interesting exposure belonging to the Noen Po Formation. Reddish chert accompanied by basaltic rocks crop out along a seacoast of this area. We extracted radiolarians from the chert for age determination and also preliminarily examined petrographic and geochemical features of the basalt to estimate its tectonic origin. Red and gray bedded chert and basaltic lava and tuff are exposed along coastal outcrops over the width of 250 m. The succession is divided into four parts as follows; basalt in the lower part, chert in the middle part, basaltic tuff in the upper part, and chert in the uppermost part in ascending order.

Chert in the middle part of this section is well bedded and recrystallized and is partly interbedded with tuffaceous shale layers, while in the uppermost part it is characterized by intercalations of black (manganese?) seams. Under the microscope, the chert in this section is free from volcanic fragments derived from the island-arc domain as well as coarse terrigenous grains, and contains a number of radiolarian tests within a cryptocrystalline quartz matrix. Poorly preserved but diagnostic Middle Triassic radiolarian species, *Triassocampe* sp., was obtained from a red-chert bed in the middle part of the section.

Basaltic rocks consist of lava showing pillow-like structure and alternations of thick lava and tuffaceous layer in the lower part of the section, and thick tuff and lava beds with minor intercalations of lens-shaped chert layers in the upper part. Under the microscope, the basalt shows an intersertal texture consisting of plagioclase and clinopyroxene phenocrysts within a fine-grained groundmass. We performed whole-rock geochemical analysis for two basaltic samples from the study section and plotted the result on some discrimination diagrams to estimate their tectonic origins. The plots mainly fall in the fields of tholeiitic basalt and MORB, suggesting that the basalt exposed at Ao Tan Khu should be derived from MORB.

Our stratigraphic observation revealed that the basalt and chert are essentially conformable, thus the radiolaria-bearing bedded chert was deposited directly on the Middle Triassic oceanic crust, forming a typical oceanic chert-basalt succession. Recently Sone et al. (2012) interpreted that the basalt in this locality originated in submarine arc volcanism, and the Noen Po Formation should belong to the Sukhothai Arc domain. However, our present data produce clear counterevidence to the explanation by Sone et al. (2012). The lithological features of chert and the occurrence of basalt with a geochemical signature of MORB both indicate that this basalt-chert sequence in the Noen Po Formation was formed in an oceanic area remote from the arc or continental domain rather than a basin where island-arc volcanism was active.