

InterRad 15 in Japan (22-17 October, 2017) and outreach items for radiolarians

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InterRad is the international association of radiolarists. The 15th InterRad meeting will be held in Japan during 22-27 October in 2017. The InterRad is returning to Japan after 23 years since the InterRad 7 was held in Osaka in October, 1994. On the occasion of this international meeting, we are planning to do something in enhancing a degree of recognition of radiolarians. It is essential for any academic associations to introduce relevant topics into society. Several items are being newly produced in relation to the InterRad 15. They include enlarged models of radiolarian shell, play cards using scanning electron microscope images of radiolarian shell, and T-shirts with radiolarian printed on. The T-shirt is produced in collaboration with an artist Mr. Moria.

Keywords: InterRad, Radiolaria, Outreach item, Enlarged model, Card game, T-shirt

High precision X-ray CT morphometry of microfossils for scientific validations

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Recent three dimensional (3D) morphometrics bring tremendous contributions for natural sciences. In the field of earth sciences, the acquisition of 3D morphometrics is rapidly increasing for the purpose of precise analysis of morphology of geological materials, especially for microfossils. In this study, we are trying to acquire the high resolution microtomography of microfossils by using the Microfocus X-ray Computed Tomography (MXCT). The combination of MXCT technique and high-precision X-ray detectors realize submicron-scaled morphology of microfossils without destruction on both the outer and the inner structures, therefore it is useful for classification, evolutions and functional morphology on microfossils.

The materials used in this study were microfossils from deep-sea sediments collected by the Deep Sea Drilling Project (DSDP) and Ocean Drilling Project (ODP) and other materials in modern ocean. So far, we already achieved the 3D microtomography for some species on foraminifers, radiolarians, diatoms and pteropods from each geological ages. In this presentation, we will show the reconstructed 3D images of the above specimens and discuss about the essentials for scientific validation on micropaleontological studies. In addition, we will discuss about 3D printing models by using the above 3D data for educational purposes.

Keywords: Microfossils, Microfocus X-ray CT, 3D morphometry, Three dimensional models

Preliminary report on Permian radiolarians from the Ashio terrane in Hachioji Hills, eastern Gunma prefecture, central Japan

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The Ashio terrane, a Jurassic accretionary complex, is distributed over the Ashio Mountains in the North Kanto region, central Japan. Hachioji Hills in eastern Gunma Prefecture is located at the southwest end of the Ashio Mountains, and the Ashio terrane is exposed at the hills. However, there is a few studies that focus on the Ashio terrane in Hachioji Hills. I have surveyed the Ashio terrane in the Ashio Mountains, including that in Hachioji Hills, since 2016.

I discovered Permian radiolarian assemblages from red bedded cherts of the Ashio terrane in Hachioji Hills. Previously, Middle Jurassic radiolarians occurred in the mudstones of Ashio terrane in Hachioji Hills; however, Permian radiolarian occurrences have never been reported from Hachioji Hills.

The assemblages contain *Pseudoalbaillella sakmarensis* Kozur. This species occurred in the *Pseudoalbaillella lomentaria* Assemblage Zone and *Albaillella sinuata* Range Zone of the middle Cisuralian, lower Permian.

The Ashio terrane in Hachioji Hills has been considered to be extension of the Kiryu-Kurohone Unit distributed over the Kiryu and Kurohone areas. However, the Kiryu-Kurohone Unit contain no Permian cherts according to the previous studies. Our result suggests that the Ashio terrane in Hachioji Hills belongs to other unit in the Ashio Mountains.

Keywords: Permian radiolaria, Ashio terrane, Jurassic accretionary complex, Hachioji Hills, Gunma Prefecture

Lithology and age of Middle Paleozoic siliceous-clastic strata related to the opening of the Paleo-Tethys in the Klaeng area, Rayong Province, southeastern Thailand

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The Devonian continental-margin to deep-water facies in Thailand provides important information about the marine environmental change during the opening of the Paleo-Tethys (Hara et al., 2010). In the present study, Devonian siliceous and clastic rocks, exposed at Laem Krabang Phet, approximately 20 km southwest of Klaeng, Rayong Province, southeastern Thailand (Kamata et al., 2015), were examined in terms of lithostratigraphy and geologic age. The strata of the study section are subdivided into the following three rock-facies: black carbonaceous mudstone, sandstone, and chert (Unit I), felsic tuff, tuffaceous sandstone, tuffaceous chert, and chert (Unit II), and siliceous mudstone associated with various lithologies (chert, black carbonaceous mudstone, sandstone) (Unit III).

From near the locality where we studied, Kamata et al. (2015) reported *P. cladophorum* and some entactiniid species such as *S. cf. pusilla*. They concluded that this fauna is probably referable to the Middle-Late Devonian. We collected over 50 samples including black carbonaceous mudstone, chert, tuffaceous chert, felsic tuff and siliceous mudstone from the study section, with the aim of determining detailed biostratigraphic age. As a result, we recovered moderately well-preserved radiolarians from gray to dark gray chert of Unit II and black siliceous mudstone of Unit III. The radiolarian fauna from both samples has similar species composition, including *T. minax*, *T. vetusta*, *T. davidi*, *T. elegans*, and *T. echinata*. *Trilonche minax* and other *Trilonche* species are the representative species of the *T. minax* assemblage (Aitchison et al., 1999). Based on the age calibration by Aitchison et al. (1999), the fauna of our samples can be assigned to latest Givetian to early Frasnian (latest Middle Devonian to early Late Devonian).

Kamata et al. (2015) suggested that the lithological assemblage in the study section is dissimilar to that of the Devonian part of the Fang chert (Chiang Dao area of northern Thailand), which is related to the opening of the Paleo-Tethys (Hara et al., 2010). However, the result of the present study shows that the stratigraphy consisting of black carbonaceous mudstone of Unit I and overlying fine-grained siliceous and tuffaceous rocks (Unit II) is similar to that of black shale and overlying siliceous shale and tuffaceous chert in the Chiang Dao area of Hara et al. (2010).

Keywords: Paleo-Tethys, Devonian, Radiolaria