

## First record of Late Jurassic radiolarians from eastern Heilongjiang Province, NE China

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The early study of the Nadanhada geology began in 1930s by Japanese geologists (Yabe and Ohki, 1957). In 1957 Chinese and Russian scientists made joint geological research in the Ussuri River region, and confirmed the occurrence of Upper Triassic, Lower and Middle Jurassic rocks on the basis of fossil evidence (Wang, 1959), and they came to the conclusion that the Mesozoic mobile belt developed from a geosyncline in the northeastern continental margin of East Asia.

Based on fossil records of Late Palaeozoic fusulinids the Nadanhada Range was considered as a Palaeozoic geosyncline which extends from the northeast Sikhote-Alin region (Li et al., 1979). But the sporadic and irregular distribution of rock formations with various age fossils (Carboniferous and Permian fusulinids in limestone, Triassic conodonts in bedded chert, Triassic, Early and Middle Jurassic radiolarians in bedded chert and siliceous shale and Late Jurassic to Early Cretaceous bivalves, a *Buchia* fauna), strongly suggest the melange characters of the Nadanhada geology. It together with the Mino and Western Sikhote-Alin terranes formed a single superterrane before the opening of the Japan Sea (Kojima, 1989).

Recent studies showed that the Dajiashan Formation, cropping out in the Zhenbaodao-Dajiashan area, southern Nadanhada Terrane, yields a middle-late Early Cretaceous *Aucellina* Fauna (Wang et al., 1995). Furthermore, the purported Early Jurassic ammonites of the Dajiashan Formation (Li, 1996) are also similar to those of the *Pseudohoplaceras* ammonite fauna from the Lower Cretaceous Longzhaogou Group. All these sparked an interest in restudying the palaeontology and biostratigraphy of the Dajiashan Formation and its underlying deposits.

Well preserved Middle-Late Jurassic radiolarian faunas are encountered in four samples from the black mudstone of the Dalingqiao Formation, which was originally dated to Late Triassic-Early Jurassic by the Geological Survey of Heilongjiang Province of China. These radiolarian faunas consist of 45 species and subspecies in 28 genera and are assigned to two radiolarian zones, i.e. the Middle Jurassic (late Bathonian to early Callovian) *Striatojaponocapsa conexa* Zone and the Late Jurassic (Kimmeridgian) *Hsuum maxwelli* Zone. The new fossil record of Late Jurassic radiolarians makes it possible to reconstruct the geological history of the Nadanhada Range in northeastern China.

Keywords: radiolarians, biostratigraphy, Middle Jurassic, Late Jurassic, Eastern Heilongjiang Province, China