

Cretaceous and Miocene geology and paleontology of the Tounai River region, Biratori, Hokkaido

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The Cretaceous rocks of the Yezo Group exposed in the Hobetsu district are richly fossiliferous containing marine mollusks (mainly inoceramids and ammonites), reptiles (mosasaurs, plesiosaurs and turtles) and echinoids and, therefore, many geological and paleontological works have been done so far. The Cretaceous rocks extend to the south, adjacent Biratori district, but works were less common there. We have carried out mapping to provide a revised geological map in the Tounai River area, Biratori Town, and analyzed molluscan and radiolarian fossils to estimate depositional ages. This is the first report of radiolarians from this area.

The Cretaceous Yezo Group in this area is subdivided into the Kashima and Hakobuchi Formations in ascending order and is cut by some faults. The Kashima Formation comprises fairly monotonous, hemipelagic mudstone intercalating with many acidic tuff beds. The Hakobuchi Formation is composed mainly of sandstone, conglomerate and sandy mudstone. Cross-bedded sandstone and minor coal beds suggest shallow-marine depositional environments for the Hakobuchi Formation. As a result, it has been recognized that the Kashima Formation distributes in the western part of the studied area and probably extends north to the neighboring region where the distribution of the Kashima Formation was discovered in 2015 by Negishi and coworkers. It is previously estimated that the Kashima Formation forms an anticlinal structure in the northern part of the Tounai River area. However, our investigation about facies and structures of tuff beds does not support such fold structure.

Fossils occurred throughout the Cretaceous sequence concerned here. Molluscan fossils, including *Inoceramus amakusensis*, *Inoceramus japonicus* and *Eupachydiscus haradai*, collected from the Kashima Formation of the studied section indicate ages of Santonian to Campanian. Radiolarian assemblages include *Amphipyndax stocki*, *Lithocampe manifesta* and *Spongotropus morenoensis*, suggesting ages of Coniacian to Maastrichtian for the Kashima Formation.

Miocene rocks distribute in the western margin of the studied area and are bounded from the Cretaceous rocks by a fault. The Miocene rocks subdivided into the Takinoue and Kawabata Formations in ascending order. The Takinoue Formation consists of mudstone and sandstone. Strata of the Kawabata Formation are dominated by interbedded mudstone and sandstone representing turbidite facies of deep-sea fans. In the studied area, the lower part of the Kawabata Formation crops out. Radiolarians were almost absent from the samples collected from these Miocene formations.

Keywords: Yezo Group, Ammonoid, Inoceramus, Radiolaria