

## Reconstruction of pelagic reef biota of the Carboniferous Omi Limestone, Niigata Prefecture, central Japan

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Reefs are most biodiversified ecosystems of the modern ocean and their intricate three-dimensional landscapes promote elaborate adaptations of marine animals and complex interactions of them. However, the reefs are the most threatened ecosystems in the world, and the transitions of the reefs from geological time up to the present are one of the major interests of reef studies. Paleozoic pelagic reefs are distributed as reef carbonates in Japanese Islands. We study the Carboniferous Omi Limestone belonging to the Akiyoshi Terrane as one representative here. The Omi Limestone occupies the eastern end of the Akiyoshi Terrane is located in the Itoigawa City, Niigata Prefecture, central Japan. Due to containing rich fossils, the Omi Limestone has been subject to paleontological studies since in the early 1900's and the limestone is a historic place of the Japanese paleontology. The oldest work conducted in 1918 by Hayasaka reported some Carboniferous brachiopod fossils and revealed the presence of the Carboniferous strata in Japan for the first time. This limestone possesses abundant easily-recognizable fossils, but remnants in fossil biota are less distinctive. For that reason, the primary reports themselves of microfossils are few except for ones with biostratigraphical importances such as smaller foraminifers and fusulinaceans. This study aims to reveal the microfossil fauna and reconstruction of the Carboniferous pelagic reef ecosystem based on the integration of micro and known macrofossils. Obtained microfossil fauna is composed of following taxa: conodonts, ostracods, actinopterygians and chondrichthyans, mollusks, echinoids, holothuroids, ophiuroids, sponge spicules and chitinozoas. Classes Ostracoda, Actinopterygii, Chondrichthys, Echinoidea, Holothuroidea, Ophiuroidea and Chitinozoa are first report from the limestone. Based on obtained conodonts, four middle Carboniferous conodont biozones are established. We reconstruct the paleoecosystem of the middle Carboniferous Omi Limestone from the perspectives of paleoecology of fossil taxa. We also investigate the paleogeography of the middle Carboniferous Omi Limestone based on the regional and international correlations of benthic faunas such as holothuroid sclerites and ostaracods.

Keywords: Microfossil, Akiyoshi Terrane, Omi Limestone, Paleozoic Era, Carboniferous