

## Chemosynthesis-based ecosystem discovered on a Cretaceous sea turtles from Japan

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One of the basic types of chemosynthetic ecosystems is known to develop on vertebrate carcasses. Within the framework of efforts to trace the evolution of chemosynthetic animals thriving in the modern vents and seeps, it has been hypothesized that these chemosynthetic animals adapted to the vent and seep environments via the transient environment formed by the decomposition of bones of vertebrate animals (e.g. Distel et al., 2000). Thus a study of the geological record of chemosynthetic ecosystems on vertebrate carcasses became of increasing importance in understanding the evolution of chemosynthetic animals. However, such studies were not fully assessed so far. Kaim et al. (2008) reported the existence of chemosynthetic ecosystems on plesiosaurid carcasses, marine reptiles which flourished in the Cretaceous oceans. However, we still were uncertain whether any other marine reptile carcasses could support chemosynthetic ecosystems. Here we document the first chemosynthetic community found on carcasses of the Cretaceous sea turtles.

The fossil sea turtle (*Mesodermochelys* sp.) has been collected from the Upper Cretaceous Campanian deposits cropping out along the Nio River, Nakagawa Town, Hokkaido. Sediments surrounding the turtle yielded provannid gastropods and thyasirid bivalves, both known to be members of chemosynthetic communities. Those chemosynthetic molluscan fossils have also been found in Cretaceous hydrocarbon seeps and on plesiosaurid carcasses (Kaim et al., 2008; 2009; Kiel et al., 2008).

This finding indicates that the chemosynthetic communities were supported not only by plesiosaurid carcasses but also by decomposing sea turtles. The sea turtles are a rare example of Cretaceous marine reptiles surviving the Cretaceous/Paleocene extinction event. Thus, it is reasonable to assume that sea turtle carcasses could continuously support chemosynthetic ecosystems linking the Mesozoic reptile fall communities with Cenozoic and modern whale fall communities, the latter occurring in the fossil record not earlier than Eocene.