

Review of fossil chelonioid sea turtles (Class Reptilia: Order Testudines: Chelonioida) from Japan

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Chelonioida is the group of marine turtles appeared in the Early Cretaceous, about 110 m.y.a. Their limbs are modified as paddles for swimming, and lachrymal glands are enlarged for excluding salt. Diversified chelonioids from Japan are allocated into three families, Cheloniidae, Dermochelyidae and extinct Protostegidae.

Upper Cretaceous Yezo Supergroup of Hokkaido Prefecture, northern Japan, including Middle and Yezo Groups, and Hakobuchi Group, has been yielding more than 100 specimens of chelonioid sea turtles. Most specimens are fragmentary and contained in the calcareous concretions weathered out from sediments, although they are well preserved uncrushed bones after acid preparation. *Desmatochelys lowii* is a protostegid from the Middle Turonian of Yubari, including skull, lower jaw, and limb bones of one individual as estimated with 1 m long carapace. This represents the oldest known chelonioid in Japan. Partial shells of the genus *Protostega*, advanced large protostegid, are found from the Coniacian of Yubari and the Santonian of Mikasa. *Mesodermochelys* sp., a primitive dermochelyid with carapace less than 1 m long, is the most dominant sea turtles in the Santonian of Hokkaido Prefecture. Scute was already lost in *Mesodermochelys* sp. Undescribed small protostegid with about 60 cm long carapace is also known from the Santonian, characterized by keeled neurals and retention of scute. *Mesodermochelys undulatus* was an almost exclusive chelonioid species from the Campanian to the Early Maastrichtian of Japan. *M. undulatus* has more massive peripherals and pelvic girdle, and its carapace is reaching up to 1.5 m long. This species is particularly abundant in the Maastrichtian Hakobuchi Group of Hobetsu area of Mukawa-cho of Hokkaido Prefecture. *M. undulatus* is also known from the Late Campanian to Early Maastrichtian Izumi Group of Hyogo and Kagawa Prefectures, western Japan. An isolated humerus is about 50 cm long, suggesting an individual with almost 2 m long carapace.

The Late Cretaceous chelonioids of Japan show the following history:

- 1: Protostegids were dominant during the Turonian and Coniacian.
- 2: Primitive dermochelyid, *Mesodermochelys* sp., appeared and became dominant in the Santonian.
- 3: Larger dermochelyid, *M. undulatus*, was almost exclusive sea turtles during the Campanian and Maastrichtian. Several turtle egg shells have been collected from the Turonian to Santonian marine deposits of Hokkaido Prefecture. They might be derived from protostegids based on temporal distribution of turtles.

Dermochelyid dominant assemblage of Japan was unique, different from those of North America and Western Europe with Cheloniidae dominant assemblage. Such provincialism among chelonioids are quite distinct from the cosmopolitan geographical distribution of marine turtles after K-T boundary. Such difference might be related with changing pattern of marine currents affected by the continental drift.

Early Oligocene undescribed cheloniids with 30 cm long carapace from Saga Prefecture, western Japan, are the earliest occurrence of Cenozoic chelonioids in Japan. *Syllomus aegyptiacus*, an aberrant cheloniid with about 50 cm long carapace, is the most abundant Neogene chelonioids; more than 60 specimens, including skulls, have been collected from the Miocene sediments of Toyama, Gunma, Saitama, and Chiba Prefectures. This species was cosmopolitan in geographical distribution, known from Egypt, USA, and Italy. *Procolpochelys susaensis*, another cheloniid, from the early Middle Miocene of Yamaguchi Prefecture, western Japan, is characterized by fifth vertebral overlying the seventh costals and neural. Right scapula of dermochelyid *Psephophorus* is known from the Pliocene of Hokkaido Prefecture.

Fossil sea turtles of Japan would be important materials for understanding paleobiogeography and paleoenvironments of marine ecosystem.

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