

The trionychian turtles from the Middle Miocene to Lower Pleistocene in Myanmar and its paleobiogeographic implications

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The Irrawaddy Group, the latest Middle Miocene to Early Pleistocene fluvial sediments widely distributed in central Myanmar, yields a number of terrestrial vertebrate fossils such as mammals and turtles. A nearly complete carapace of large Trionychidae and three peripherals of Carettochelyidae were newly discovered from the Gwebin and Magwe areas.

The nearly complete carapace of the Trionychidae is 60cm long and wide, suggesting its total shell length as about 90cm long when living. Trionychid synapomorphies such as losses of scute sulcus, peripherals, pygal and suprapygal, and well-developed pocked mark sculptures on the dorsal surface, are observable. The nuchal is much wider than long, with a nearly straight anterior margin. Its distal ends bend toward latero-posteriorly, nearly attaching to the distal parts of the first costals. The first neural is elongated and hexagonal, with curved anterior border with nuchal. The first and second costals have distinct rib ridges on the proximal ventral surface. Ventral surfaces of the first to third thoracic vertebrae are flat, without median ridges. These characters are shared by the genus *Chitra*, and are quite similar to *Chitra chitra* that is distributed in Thailand and Malaysia. However, this specimen has a few unique characters such as a sinuous margin at the distal end of the second costals and the well developed eighth costal.

The left first, second and the right ninth peripherals can be determined as a turtle of the family Carettochelyidae based on the distinct sculpture on their surfaces, consisting of fine tubercles. There is no sulcus on their surfaces. Carapace is estimated as about 70cm long at maximum. These specimens are the first record of carettochelyids from the Neogene in Asia. Carettochelyids first appeared during Albian in Asia, and extended its geographical distribution to North America, Europe and Africa during Paleogene. However, their fossil records are very sparse in Neogene. Only two peripherals are known from the Miocene sediments of Germany and Zaire.

All specimens except for the left second peripheral have yielded from the upper Pliocene in the Gwebin area. The Pliocene carettochelyid from Myanmar are the latest known record of this family except for a living species (*Carettochelys insculpta*) in New Guinea and Northern Australia. They seem extinct during Pleistocene as well as pleurodilan turtles such as *Shweboemys pilgrimii*. Fossil turtles from Myanmar should be important to make a contribution to the paleobiogeographic history of tropical Asia.

Keywords: Myanmar, Cenozoic, Irrawaddy Group, Fossil turtles, Trionychia