

BPT026-02

Room:201B

Time:May 24 14:30-14:45

Carnivorous mammal faunas in the Paleogene of East Asia: chronological changes and geographical differences

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East Asia is known to have provided rich fossil evidences for Paleogene mammals. However, a large portion of the fossil remains has come from the northern East Asia, such as Mongolia and Inner Mongolia of China. During the past decade or so, intensive paleontological expeditions on Eocene localities in Southeast Asian countries such as Myanmar and Thailand have improved terrestrial mammalian fossil records from low latitude East Asia. In addition, reexamination on carnivorous mammals from the late Eocene of Mongolia revealed presence of species that are new taxa or that are previously unknown taxa to the area. In this study, using updated information on the carnivorous mammal fossil records in the Paleogene of East Asia, we attempted to evaluate chronological changes and geographical (latitudinal) differences among carnivorous mammal faunas.

Carnivorous mammals of our comparison consist of three orders: Carnivora (or Carnivoramorph), Creodonta, and Mesonychia. In East Asia, mesonychians were more dominant than other carnivorous mammals at first, and carnivorans became dominant during the later part of the Paleogene. Carnivorans appeared since the Paleocene, represented by the Viverravidae, then by the Miacidae. Southern East Asian faunas differ from the northern traditional Asian faunas in some points. First, mesonychians were dominant until the late Eocene in the northern area, while they became decreased during the middle Eocene in the southern area. Second, hyaenodontid creodonts in the northern faunas are *Hyaenodon* and its relatives and survived until the end of the Oligocene, while hyaenodontids in the southern faunas are proviverrines of Indian affinities and a hyaenaelurine and became extinct during the late Eocene. Third, carnivorans were rare or absent before the late Eocene in the northern area, while they became common elements of the fauna since the middle Eocene in the southern area.

Although there is a general trend of faunal turnover from mesonychians to carnivorans in the Paleogene of East Asia, the timings of first and last appearances of the carnivorous mammal groups differ among areas, suggesting that the turnover started earlier in the lower latitude faunas. Hyaenodontid creodonts in particular suggest that the faunas contain elements of geographically different origins: hyaenodontids from the southern faunas have relatives in India and Africa, while those from the northern faunas are genera known from North America and Europe. In East Asia, latitudinal differences in composition of terrestrial carnivorous mammalian faunas are present at least since the middle Eocene well before the formation of present-day biogeographical regions.