

# New advance on *Platybelodon* from the Linxia Basin of China

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*Platybelodon grangeri* from the Linxia Basin of China. A, male cranium; B, female cranium; C, male mandible; D, female mandible. Credit: Wang Shiqi

(Phys.org) —*Platybelodon* is a group of extinct Proboscidea. They extended from the early Miocene to middle Miocene of Eurasia. Evident also shows that some of them reached North America in the late Miocene. These strange animals were first reported by Borissiak in 1927 from the middle Miocene of the Kuban Region, Caucasus Area. Sequentially, much material has been discovered by the Asia Expedition Team of US from the middle Miocene of the Tunggur Area, Inner Mongolia. When Osborn reported these specimens in 1936, he juxtaposed an elongated and flattened mandibular symphysis of *Platybelodon* with a huge shovel. "Shovel-tusked" elephant was then well known by people.

During recent 20 years, researchers from Institute of [Vertebrate Paleontology](#) and Paleoanthropology, [Chinese Academy of Sciences](#) (IVPP) and Hezheng Paleozoological Museum (HPM) found much material of *Platybelodon*. The quantity and completeness of the specimens surpass those from the Tunggur Area, including more than 60 nearly complete skulls and mandibles, hundreds of isolated teeth, and a number of post-cranial bones. All of these specimens are housed in the HPM. Recently, Wang ShiQi from IVPP and co-authors from HPM studied the material and published on the *Acta Palaeontologica Polonica* (Vol. 58, No. 2).

Most of the fossils were discovered from two sites of late middle Miocene Hujialiang Fm., Zengjia and Laogou. The material resembles the type and other material of *Platybelodon grangeri* from the Zone I of the Tunggur Area in: the portion of the length to width of the mandibular symphysis, the loph(id) number of the cheek teeth, the complexity of the crown pattern, and the heaviness of cementum. Thus the material from Zengjia and Laogou were attributed to the same species as *P. grangeri*. The [skulls](#) from the Zengjia site show strong sexual dimorph. Adult males, except having stronger upper tusks, generally possess higher arched neurocranium and more posteriorly positioned nasal bones than adult females. The adult mandibles are also able to divide into two types: one with relatively narrow and long symphysis and the other with short and broad one. They are determined as male and female, respectively. It seems that the characters of males are more derived than that of females, and the juveniles is more similar to females than males. Furthermore, cheek teeth from the Laogou site is slightly more derived than that from the Zengjia site. Additionally, besides from the late middle Miocene Hujialiang Fm., *Platybelodon* were also discovered from the early middle Miocene Dongxiang Fm. The teeth is relatively simple, and the transverse symphyseal ledged is absent on the madibular symphysis. The morphology resembles to the type species *Platybelodon danovi* from the Kuban Region, Caucasus Area, and thus be attributed to this species.

The evolutionary relationships of known *Platybelodon* were also discussed. The earliest *Platybelodon* is *P. dangheensis* from the early Miocene of Danghe, China, following by middle Miocene *P. danovi* from Caucasus, then by *P. danovi* from the Linxia Basin, by *P. danovi* from Tongxin, by *P. grangeri* from the Junggar Basin, by *P. grangeri* from the Zone I from Tunggur, by *P. grangeri* from the Zengjia site of the Linxia Basin, by *P. grangeri* from Zhongning, by *P. grangeri* from the Laogou site of the Linxia Basin, and finally by *P. grangeri* from the Zone II from Tunggur. They constitute a continuously evolutionary series in principle. In this sequence, the loph(id) number of m3 and M3 increased and some individuals from the Zone II from Tunggur even had tetralophodont m2 and M2. The complexity of crown pattern and the heaviness of the cementum of the cheek teeth rose. However, by the end of the middle Miocene, the thrived group was suddenly extinct in Eurasia, possibly due to the aridification of the climate and competition from more derived group (such as true tetralophodont taxa "*Mastodon grandincisivus*").

Provided by Institute of Vertebrate Paleontology and Paleoanthropology

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