

# Two Miocene Hipparion species identified from Shihuiba locality of Lufeng, Yunnan, China

May 31 2013

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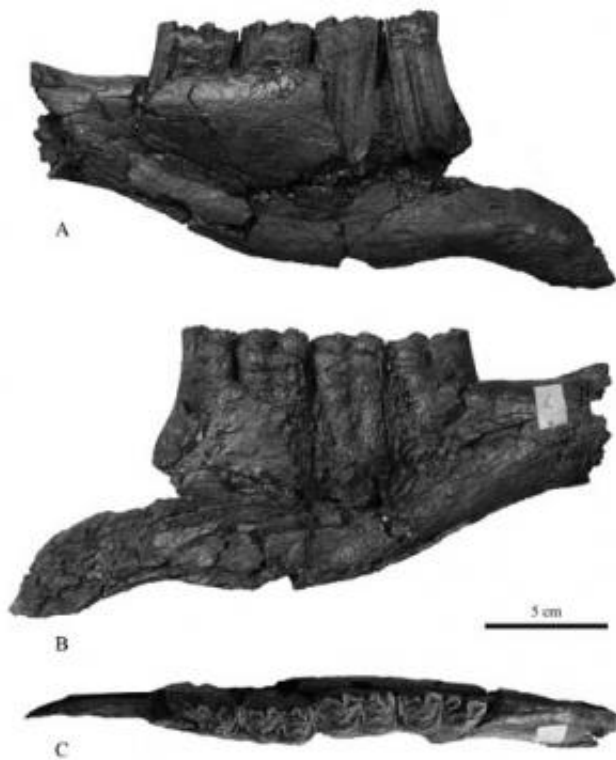


Fig.1 Broken right mandible of *Hipparion theobaldi* (IVPP V 18497.1), A. lingual view, B. labial view, C. occlusal view. Credit: SUN Boyang)

The Shihuiba locality (Lufengpithecus site) at Lufeng, Yunnan is one of the most important Miocene mammal fauna sites in China. The *Hipparion* (three-toed horse) fossils collected from this locality from

1975 to 1983 were identified as *Hipparion* sp. 1 and *Hipparion* sp. 2. Recently, SUN Boyang, a graduate student paleontologist of Institute of Vertebrate Paleontology and Paleoanthropology (IVPP), Chinese Academy of Sciences, re-examined these specimens and found they represent two species, *Hipparion theobaldi* (Lydekker, 1877) and *Hipparion* (*Hipparion*) *lufengense* sp. nov. The study published in the latest issue of *Vertebrata Palasiatica* 2013(2) indicated that both species immigrated from the Siwaliks to Yunnan when climate and environment changed, providing new data for studies on paleobiogeography.

*Hipparion theobaldi* is a common hipparionine species in [South Asia](#). It is a very large-sized hipparionine horse. Protocones of the Shihuiba specimens are small and rounded, different from those of the Siwaliks specimens, which are elongated with a flattened lingual side. The specimens of *H. theobaldi* in Yuanmou, Yunnan and the Irrawaddy Group of Myanmar are similar to the Lufeng specimens in protocones. The ages of the Yuanmou and Lufeng [mammals](#) are later than those of Siwaliks. So *H. theobaldi* in Yunnan might come from the Siwaliks. *H. theobaldi* in Yunnan and Myanmar might become a population within a species which is different from *H. theobaldi* in the Siwaliks.

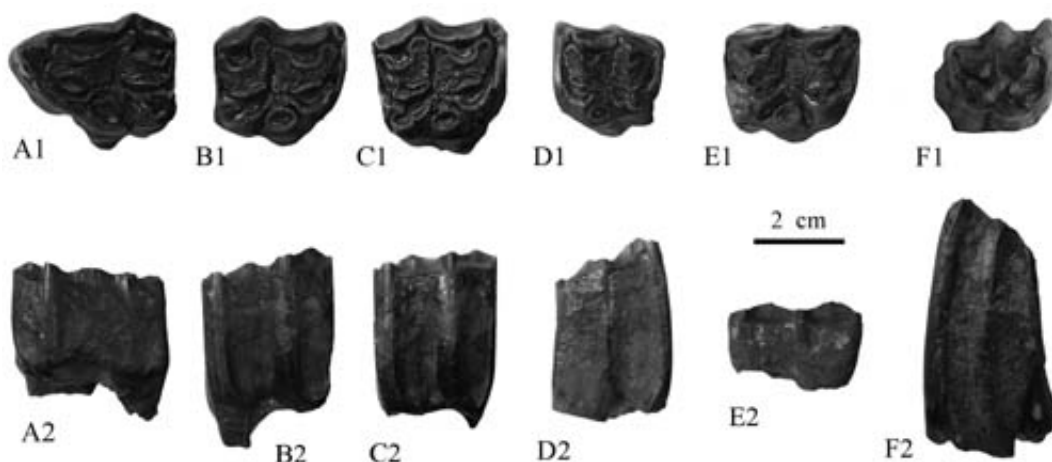


Fig.2 Upper cheek teeth of *Hipparion theobaldi*. Credit: SUN Boyang

The height of cheek tooth crown of *H. theobaldi* in the Siwaliks was increasing from the Lower to Upper Dhok Pathan Formation. The crown height of *H. theobaldi* in Middle Dhok Pathan is similar to those in Yuanmou and Lufeng. The age of Middle Dhok Pathan Formation was about 8-6 Ma. The age of the Yuanmou locality is 8.2-7.2 Ma. The age of the Lufeng locality is 6.8-6.2 Ma. The environment of the Siwaliks changed and [grassland](#) was dominant at 7.37-6.76 Ma, while forests were dominant at Lufeng at that age. It is probable that *H. theobaldi* in the Siwaliks evolved to hypsodont to adapt to coarse food and meanwhile tried to seek a comfortable habitat where grass was soft.

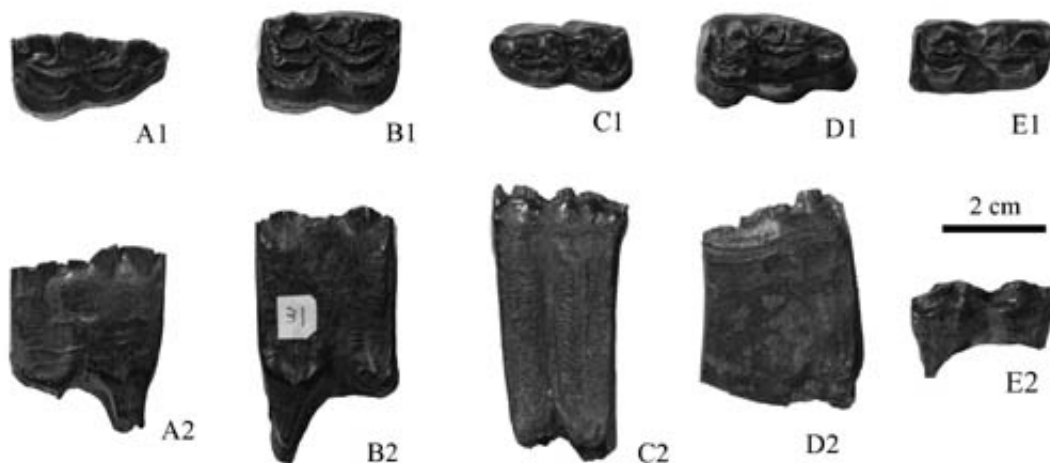


Fig.3 Lower cheek teeth of *Hipparion theobaldi*. Credit: SUN Boyang

*Hipparion (Hipparion) lufengense* sp. nov. is a small-sized hipparionine horse. Its characters are quite different from those of the Old World and Africa. Most of the Old World *Hipparion* are medium-sized to large-sized, and the small-sized species have no similarity with the Lufeng specimens in cheek teeth. The North American hipparionine horses have

four genera, and each of them has very special characters, which are completely different from the Lufeng specimens. Among all Hipparion specimens, the Siwaliks specimen (AMNH 19492) is the most similar one to the Lufeng [specimens](#). Both of them are small-sized and have very complex plications on cheek teeth. So Siwaliks specimen (AMNH 19492) should be assigned to H. (H.) lufengense.

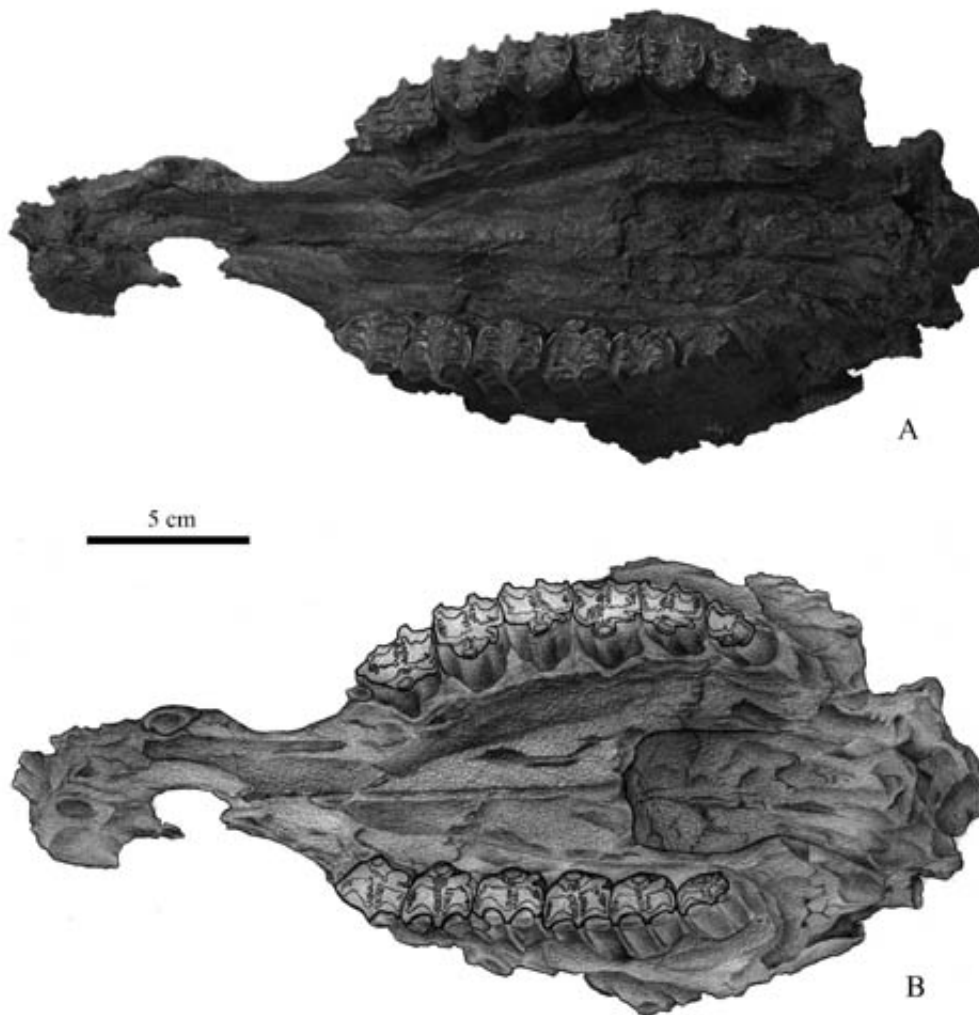


Fig.4 Photo (A) and sketch (B) of *Hipparion (Hipparion) lufengense* sp. nov., holotype, IVPP V 18531, in ventral view. Credit: SUN Boyang

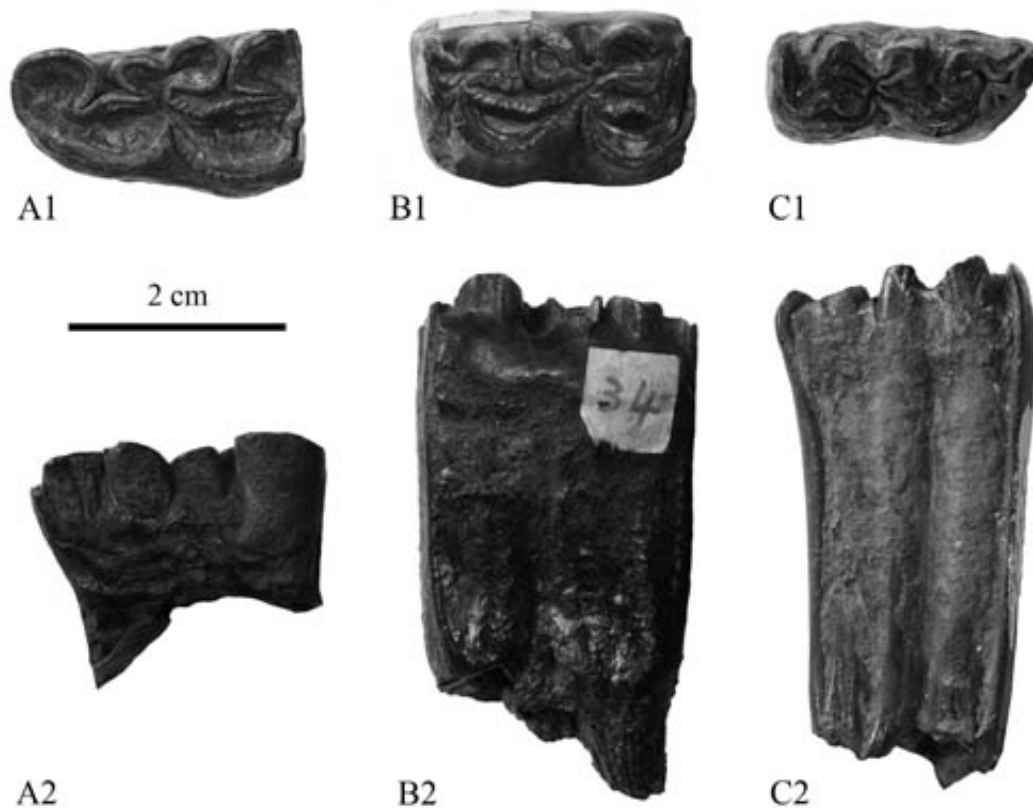


Fig.5 Lower cheek teeth of *Hipparion (Hipparion) lufengense* sp. nov. Credit: SUN Boyang

The plications of *H. (H.) lufengense* are relatively straight, and have very thick enamel. These characters might adapt to coarse food. But in the habitat of *H. (H.) lufengense*, the forests were dominant. This situation seemed to be a paradox. *H. (H.) lufengense* evolved to complication in cheek teeth to adapt to coarse food when the environment of Siwaliks changed greatly, and meanwhile tried to seek a more comfortable habitat where grass was soft. So it is reasonable that *H. (H.) lufengense* in the Siwaliks immigrated to Yunnan when climate and environment changed.

**More information:** [www.ivpp.cas.cn/cbw/gjzdwxb/xb ...](http://www.ivpp.cas.cn/cbw/gjzdwxb/xb...)

[0507383338265913.pdf](#)

Provided by Institute of Vertebrate Paleontology and Paleoanthropology

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