# **Allohippus koobiforensis from NS zone**

****Cranium****
The specimen KNM ER 1484 was found inside the *Notochoerus scotti* Faunal Zone (NS), in the Area 130 just below the KBS tuff. This tuff is correlated with the H2 tuff in the Shungura Formation uncontroversially dated about 1.8 My (Cerling et al. 1979). Last datations of the KBS tuff found ages of 1.87 +/- 0.04 My (Gleadow 1980) and 1.89 +/- 0.01 (McDougall et al. 1980 ; McDougall 1981, 1985).

The cranium is very large (Basilar Length : 577mm), almost complete, and belonged to a young female (Fig. 1). When I studied it, I did not measure the cheek length nor the length of the naso-incisival notch. But they can easily be estimated on the photographed profiles. I corrected also here the cranium height behind the orbits (measure 28) which was obviously wrong.
Fig. 1
The Simpson’s ratio diagram shows that this specimen is larger than the average cranium of the *extant Equus grevyi* ; the shortness of the cheek (measure 32) relative to the length of the naso-incisival notch (measure 31) bears evidence to its belonging to the genus *Allohippus*. It is the type of *A. koobiforensis* (Eisenmann 1983).
Fig. 2
****Mandibles****
From NS zone, there is one incomplete ramus : KNM ER 5361 (left side, associated with an upper cheek series) collected in Area 100. It obviously belonged to an equid (see below) smaller than *A. koobiforensis* (Figure 3).
Fig. 3
****Upper Cheek Teeth****
The upper cheek teeth of A*llohippus koobiforensis* KNM ER 1484 are not very worn. The dP1 is present. The protocones are lingually concave, or indented, except on P2. The postprotoconal grooves are notably deep. Plis caballins are present, at least on premolars.

The premolar KNM ER 1129 from Area 129 and the molar KNM ER 2687 from Area 105 have the same pattern and size. Two other upper cheek teeth (premolar KNM ER 1265 and molar KNM ER 1267) were collected in the same Area 130. They are smaller. Protocones are bilobated and postprotoconal grooves are deep in both. A pli caballin is present on the premolar only.
Fig. 4
I refer them to *Allohippus koobiforensis* (Fig. 4) although the depth of the post-protoconal valley and the length and shape of the protocones are unusual for *Allohippus*.

****Lower Cheek teeth****
The size of the damaged series KNM ER 4051 (Fig. 5) fits well with the size of KNM ER 1484, the type of *A. koobiforensis*. 
Fig. 5
The enamel is plicated (Fig.6). A pli protostylid is present on the P2, the metaconid and metastylid are rounded and have the same size. The vestibular valley is shallow on the M2. The lower series of *Allohippus stenonis vireti* (QSV 536) of Saint-Vallier, France, has about the same size and a similar enamel pattern (Fig. 6). The presence of a pli protostylid on the P2 is, however, unusual except in Sussemiones and extant *E. grevyi*.
Fig. 6
I refer also to *A. koobiforensis* because of their size and their plicated enamel (Fig. 7) three teeth from Area 129 (KNM ER 3986, 4027, 4026), and one from Area 100 (KNM ER 4046). They differ by a pointed instead of rounded metastylid. One premolar (KNM ER 2655, Area 105) has a very elongated and bilobated metaconid as happens in some extant Hemiones and in Sussemiones (Eisenmann, 2006).
Fig. 7
Another (KNM ER 4015, Area 100) has also an elongated metaconid but a rounded metastylid.

****Size correlations of limb bones and cranial dimensions****
There are some correlations in the respective size of various bones and in particular between cranial basilar length and distal widths of metapodials. Figure 8 shows how basilar lengths and supra-articular MC widths relate in extant *Equus*, *A. stenonis vireti* of Saint-Vallier, *A. sanmeniensis* of Nihowan, and hypothetically, how the basilar length of *A. koobiforensis* would relate to the supra-articular width of MC of O75-197-1547 of Omo (Shungura Member G) and KNM ER 1276 (from under KBS tuff).
Fig. 8
Although it cannot be excluded that the MC KNM ER 1276 belonged to *A. koobiforensis*, it seems that a MC like O75-197-1547 from Shungura G would be a more probable fit.