

## More about the Hominid Mandible KNM-BK 8518 (Baringo, Kenya)

Données complémentaires sur la mandibule KNM-BK 8518 (Baringo, Kenya)

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### Abstract

In 1982 a fairly complete hominid mandible, KNM-BK 8518, was found in the Kapthurin Formation (Baringo, Kenya). The mandible belongs to an adult specimen with heavily and asymmetrically worn teeth. Preliminary results point in the direction that this specimen, together with some other specimens from East Africa (as KNM-ER 992, OH 13 and KNM-ER 1805) and Java (as Sangiran 1b and Sangiran 9), probably belongs to early *Homo erectus* (or late *Homo habilis*). Multivariate statistical techniques on the complete data set will be applied in order to prove or disprove this hypothesis.

### Résumé

Une mandibule relativement complète d'Hominidé, KNM-BK 8518, a été découverte en 1982 dans la formation de Kapthurin (Baringo, Kenya). Elle appartient à un sujet adulte dont les dents sont fortement et asymétriquement usées. Les analyses préliminaires indiquent que le fossile, comme d'ailleurs d'autres mandibules d'Afrique de l'Est (comme KNM-ER 992, OH 13 et KNM-ER 1805) et de Java (Sangiran 1b et Sangiran 9), relève probablement d'*Homo erectus* (ou d'une forme tardive d'*Homo habilis*). Des analyses multivariées utilisant un vaste fichier de données seront réalisées pour tester cette hypothèse.

Key words : Kenya, Mandible, KNM-BK 8518, *Homo erectus*

Mots clés : Kenya, mandibule, KNM-BK 8518, *Homo erectus*

## Introduction

Since 1980 an interdisciplinary team under the general direction of F. Van Noten (Koninklijk Museum voor Midden-Afrika, Tervuren, Belgium) has been excavating in the Kapthurin Formation. The area of the Kapthurin Formation is situated at the West of Lake Baringo, some 300 kilometres north of Nairobi (fig. 1). The Kapthurin Formation consists of a  $\pm 100$  metres thick series of alluvial and lacustrine

deposits, in which three tuff layers (Bedded Tuff, Pumice Tuff and Grey Tuff) can be distinguished.

In 1982, a hominid mandible, KNM-BK 8518, was found in a gravel layer  $\pm 3$  metres beneath the Grey Tuff. This means that the mandible must be over 820,000 years old - the first dating for the Grey Tuff (Wood and Van Noten, 1986) - although it should be mentioned

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that more recent dating points to an later date of  $\pm 600,000$  years of age (Cornelissen *et al.*, 1990).

Later, in 1984, a hominid incisor (KAP-LS 1325) was found in the same gravel layer but at another site of the Kapthurin Formation. Although the last mentioned site has been extensively excavated unfortunately no more hominid remains have been found.

The object of this paper is to report some preliminary results concerning the hominid mandible KNM-BK 8518, based upon comparisons with other *Homo habilis* and *Homo erectus* mandibles.

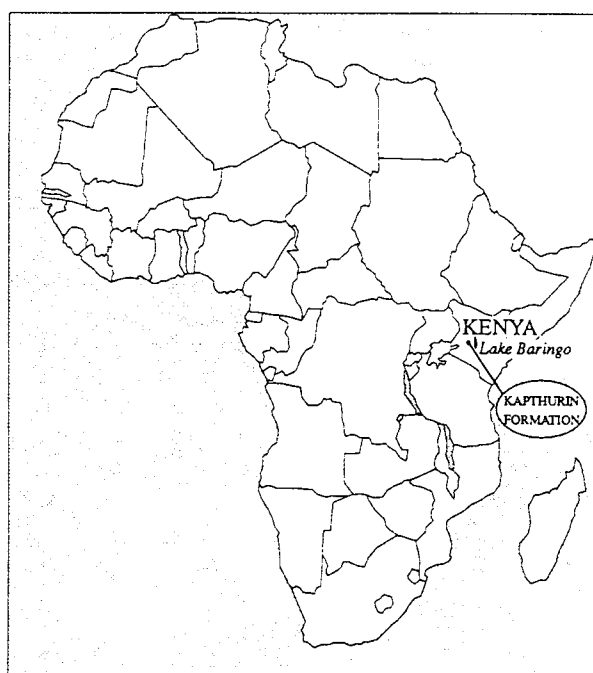


Fig. 1 Map of Kenya showing the location of the Kapthurin Formation.

## Material and Methods

Figure 2 shows a picture of the mandible KNM-BK 8518 before cleaning. A lot of matrix, especially around the incisors and the left third molar, can be distinguished. The mandible belongs to an adult specimen. After cleaning (fig. 3) it became clear that the dental arcade had been distorted *post mortem* and that the teeth were heavily and asymmetrically worn. It can

also be seen that the hominid mandible was found in four pieces : the body, part of the left ramus and two separate teeth, possibly remains of the left P4 and the right canine.

Wood and Van Noten (1986) assign the specimen to *Homo* sp. indet (aff. *erectus*) showing similarities with the hominid mandible KNM-BK 67, found in 1966 (Leakey *et al.*, 1969).

A large number of metrical as well as non-metrical characteristics have been scored. A first basic analysis of the mandible lead to the conclusion that this mandible shows characteristics that could be attributed to *Homo habilis* as well as to *Homo erectus*. This is the reason why the same characteristics have been scored on all original *Homo habilis* - and *Homo erectus* specimens (mandibles) from Kenya, Tanzania, South Africa and Java. It is also my intention to measure and study the specimens from China, as e.g. the mandible from Lantian, which shows many similarities with KNM-BK 8518.

The methods that will be used in order to analyse these data are essentially multivariate techniques, such as Discriminant Analysis, Maximum Likelihood, Cluster Analysis, etc. (van Vark, 1970; Uytterschaut, 1983). However, at the moment only univariate analyses based on only one part of the data (the most completely scoring characteristics for the mandibles of Kenya, Tanzania and Java) has been applied until now. Therefore, the following results have to be considered as preliminary. It is quite possible that including the whole data set, enlarging the number of considered mandibles and applying multivariate statistics, the results will have to be reconsidered.

## Preliminary Results

With regard to the mandibles found in Kenya and Tanzania, the mandible KNM-BK 8518 shows the greatest similarities with KNM-ER 992, OH 13 and KNM-ER 1805, all specimens that were attributed (according to several authors) to a primitive *Homo erectus* (or late *Homo*

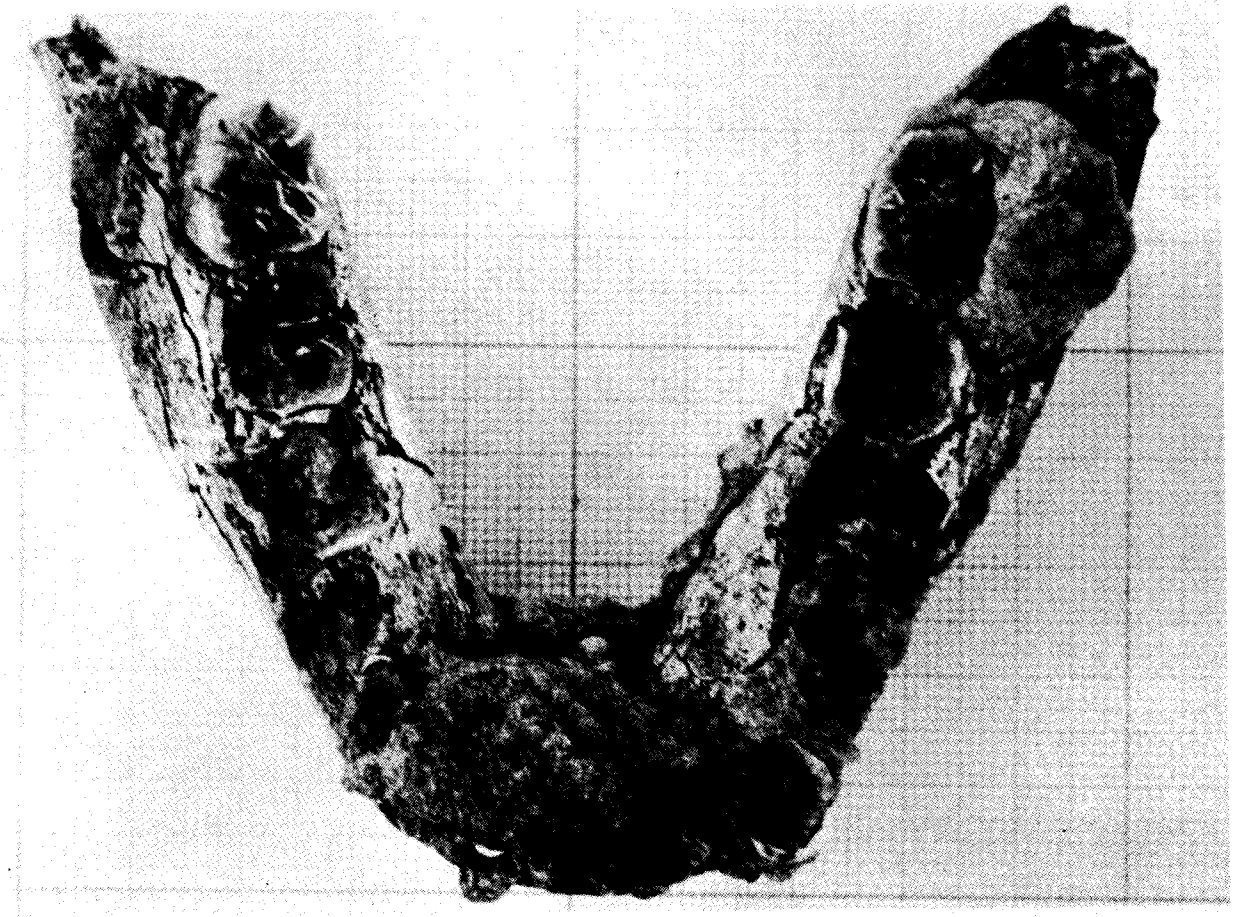


Fig. 2 Mandible KNM-BK 8518 before cleaning.

*habilis*). Examples of characteristics that point in that direction are the height of the corpus at M2, the symphysis width at M2, length of the premolar and molar tooth row, mesiodistal and buccolingual dimensions of M2 and M3, width of the *extramolar sulcus* and steepness of the *planum alveolare*.

With regard to the mandibles found in Java, KNM-BK 8518 shows the best similarities with Sangiran 1b "Mandible B" (*Pithecanthropus B*) and Sangiran 9 (*Pithecanthropus C*). Characteristics pointing in that direction are especially size measurements but also non-metrical characteristics such as the position of the mental foramen, the markedness of the lateral prominence, etc. A more detailed study of some old and new Pleistocene discoveries from Java (Uytterschaut, 1991) leads to the conclusion that Sangiran 1b as well as Sangiran 9 probably belong to an early *Homo erectus*.

## Conclusions and Discussion

Since these results are only preliminary and the analysis has not yet been completed, the conclusions are preliminary as well.

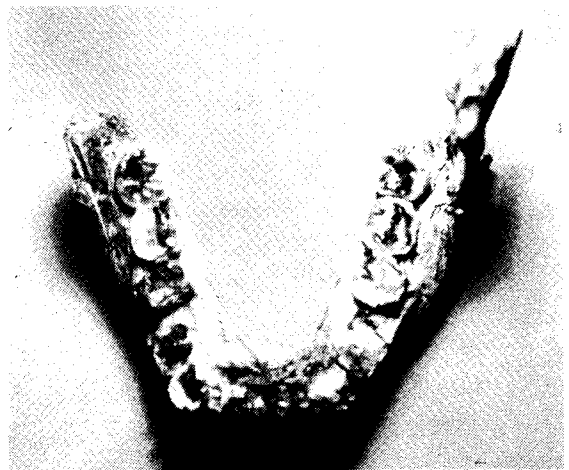


Fig. 3 Mandible KNM-BK 8518 (body + ramus) after cleaning.

According to the results, based on univariate statistics and comparative anatomy, the mandible KNM-BK 8518 seems to show similarities with the East African specimens: KNM-ER 992, OH 13, KNM-ER 1805 and with the South-East Asiatic specimens Sangiran 1b and Sangiran 9. All of these specimens probably belong to early *Homo erectus* (or late *Homo habilis*).

Multivariate statistical techniques on the complete data set will be used to prove or disprove this hypothesis. Moreover, the same techniques will be used in order to find a set of characteristics

that are clearly different between *Homo habilis*, *Homo erectus* and an eventually transitional form. Once this set of characteristics has been found, it will be easier to assign the mandible BK 8518 to one of these groups. Up to now there is no clear set of morphological characteristics that allow us to distinguish *Homo erectus* mandibles (especially the primitive form) from *Homo habilis* mandibles with some degree of certainty. With respect to the amount of evolution taking place within the *erectus* grade, Howells (1966) mentions that there is probably a good deal of accident of discovery involved in defining *Homo erectus*.

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