



Hominoids' Mixed Locomotion in the Late Miocene Necessarily through Adaptation

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Introduction

When judging in particular all the Apes in connection with Upper Miocene, both osteological and anatomical results paleoanthropologists discern is **bipedalism** and whether the finding is **hominid** in the context of this special movement.

Beginning with thereabouts between 7.5 and 6.5 million years ago, there was a very first ape like hominid *Sahelanthropus tchadensis*, nicknamed Toumai and meaning 'Hope of Life' in the local language. Hitherto she was examined only by a virtually complete cranium (TM 266-01-060-1) along with the 4 jaw fragments and a few teeth identified among thousands of other vertebrate fossils uncovered in the Djurab Desert, Chad-**Toros-Menalla** fossiliferous-in 2001 Wilson [1]. Before 2001, early hominins had only been found in the Rift Valley in East Africa, so the discovery of *S. tchadensis* suggests it is a new specialised genus, taking into account the geographical difference and the time together.

The Late Miocene, also known as Upper Miocene, and the hominin fossils related to this sub-epoch is extremely vital for **Human** evolution. *Sahelanthropus tchadensis* existed in the time when the ancestors of human and chimpanzee split from one another and therefore her cranium clearly demonstrates distinct morphological features between the great apes and later hominins such as Kenyanthropus and Homo Brunet et al., [2]. Having relatively smaller canines coupled with the quite flat face are the ones of the *Hominin* lineage and continuous brow ridges above the orbits and highly low cranial capacity are the ones of the chimpanzees.

In paleoanthropological term, to be able to make a determination for a *Hominid*, it is necessary to analyse the postcranial ske-

leton, especially the extremity femur. As stated in the most recent researches associated with the partial left femur (TM 266-01-063) and ulnae of *Sahelanthropus tchadensis*, when taking into account the angle the femur makes with the pelvis, she was not habitually bipedal Macchiarelli et al., [3]. Overall assessments - computed tomography scans and 3D models - undertaken by also University of Poitiers conclude that the essential locomotion she applied was **bipedalism** and she only sometimes would have climbed the trees according to the notably rough surface at the top of the femur Guy et al., [4]. By virtue of all these statements, we think she was not morphologically bipedal, however she was using a mixed locomotion type, half walking on two and half walking on four as a consequence of adaptation.

In the process of considering comparative femur anatomy in early hominins, it is indispensable to examine the *Orrorin tugenensis*' comprehensively. Upper part of the femur shaft has very dense cortex and on the proximal point, very human like femoral head along with the neck and greater trochanter's orientation towards the hip clearly shows she is bipedal Pickford et al., [5].

Conclusion

Savannah Habitat and Woodland Vegetation Hypotheses

When thoroughly considering evolutionary mechanisms, we know that some anatomical features in the species become advantageous based on substantial environment changes through adaptation just by coincidence. The subject of how climate had been like in the *Late Miocene* -right in the middle of the time, when the common ancestors of *Homo sapiens* and *Pan* evolutionary lineages

diverged - still remains controversial, however, according to new researches about carbon-isotope data in soils, it may be that the frequency of open grasslands made of almost %60 of the flora over the past 6 million years Cerling et al., [6].

Another view upon extreme climate variability between woodland and grassland over short timescales may have led to the morphological flexibility of hominins and it caused mixed locomotion anatomy to cope in different environments Maslin and Trauth., [7]. We think Late Miocene hominins had to survive in rapidly changing environmental conditions and *bipedalism* evolved through adaptation, however, a lot more hominin fossils in association with Late Miocene needs to be unearthed for comprehending how hominins evolutionarily appeared.

Acknowledgment

None.

Conflict of Interest

No conflict of interest.

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