

Environment

Previous work by the Franco-Chadian Paleoanthropological Mission (MPFT) indicates that the environment of *Sahelanthropus tchadensis* was linked to the extension of wetlands (notably the Chad Palaeolake) in the northern Chad Basin, maintaining a patchwork of forest cover, palm groves and less forested, more grass-rich areas in what is now a desert. *Sahelanthropus tchadensis*, therefore, had resources from arboreal, terrestrial and aquatic environments at its disposal. The study of its postcranial material indicates that this species had the ability to take advantage of these different environments. Nevertheless, its exact habitat in this mixed landscape remains undetermined, and its bipedalism is not necessarily an adaptation to a drier and more open context.

Sahelanthropus tchadensis shared this landscape with a highly diverse vertebrate fauna, including many species known only from Toros-Menalla.

Age

The age of TM 266 was initially deduced from the study of its fauna, the evolutionary stage of which was compared with that observed in Eastern African sites dated by radiochronology to between 7.4 Ma (million years ago) and 6.5 Ma. The application of an absolute dating technique, based on beryllium isotopes, provided an age of between 7.43 Ma and 6.38 Ma, later refined to an interval of between 7.46 Ma and 6.96 Ma. According to these dates, *Sahelanthropus* predates *Orrorin* and *Ardipithecus kadabba* by four hundred thousand to one and a half million years, and *Ardipithecus ramidus* by two to three million years.

What is 'habitual bipedalism'?

Here, 'habitual' refers to the recurrent use of a particular behaviour that is consistently preferred in a given context. For example, in the case of habitual bipedalism, *Sahelanthropus* preferred to use bipedalism whenever it was on the ground.

Who did what?

The authors of this article were directly involved in the writing process. However, it is important to emphasise that this work is part of a much larger team effort, which would not have been possible without the contribution of many people, both in terms of science, field logistics and administrative management of the research. This research is based on the complementarity and exemplary collaboration between the Chadian and French (Poitiers) scientific teams.

Palaeoanthropologists Guillaume Daver (lecturer at the University of Poitiers) and Frank Guy (researcher at the CNRS) are both first authors on the article. They carried out the bulk of the analysis, wrote most of the paper, and managed the peer review process.

Jean-Renaud Boissarie (palaeontologist, research professor at the CNRS) wrote part of the paper, contributed to the peer review process, participated in the study of the TM 266 faunal context, and facilitated the study.

Laurent Pallas (palaeoprimatologist, postdoctoral fellow) contributed to the analyses and participated in the writing and evaluation process.

Hassane Taïso Mackaye (palaeontologist, CAMES lecturer, University of N'Djaména), Andossa Likius (palaeontologist, CAMES lecturer, University of N'Djaména) and Patrick Vignaud (palaeontologist, professor, University of Poitiers) all participated in drafting the paper, contributed to the study of the faunal and environmental context of TM 266, and took part in the 2001 fieldwork.

Abderamane Moussa (geologist, CAMES assistant professor, University of N'Djaména) participated in drafting the paper and contributed to the geological study of fossil sites in Chad.

Djetounako Nekoulngang Clarisse (palaeontologist, CAMES research fellow, deputy director of the CNRD, in charge of collections) participated in drafting the paper and supervises the management and conservation of the material.

Further information on the context of the discovery can be found in the article's supplementary material.

Why is Michel Brunet not a co-author on this article?

Michel Brunet (Honorary Professor at the Collège de France, Emeritus Professor at the University of Poitiers) has coordinated the MPFT since its creation, led the fieldwork that discovered the Toros-Menalla fossiliferous area, and initiated the study of the femur and *ulnae* in 2004 by performing the first observations and comparisons.

Although it is customary for the coordinator of a research programme to co-author an article describing material discovered by the programme – often in last position as a "senior" author – Michel Brunet preferred not to be included as a co-author in this article. We salute Michel Brunet's immense contribution to palaeontology in Chad, and are honoured by his confidence and by what constitutes a handover to the Chadian and French (Poitiers) teams that are the heart of the MPFT.

Context of the discovery

The July 2001 fieldwork that uncovered the cranium attributed to *Sahelanthropus* and two of the postcranial remains (the femur and an ulna) did not, unfortunately, establish precise spatial relationships between TM 266 specimens. The initially unidentified postcranial elements were subsequently only examined by a palaeoanthropologist in early 2004. Our article includes a history of the discovery of this material, keeping to the facts as they are known to us.

Why did it take so long to publish this material?

Analysis of this material began in 2004. The femur, in particular, was presented by Michel Brunet to various international specialists for advice and comparison. This research was then considerably slowed down for various reasons, including priority being given to the field research of other postcranial remains and other work, as well as the difficulty of analysing this fragmentary material requiring complementary expertise.

The study intensified in 2017; however, it took five years to complete all the required analyses, acquire adequate comparison material, and pass the various stages of a particularly stringent review process in the journal *Nature*, largely complicated by the global pandemic.

Why a preprint?

While preprints have become commonplace in various disciplines, notably in physics, they remain exceptional in palaeoanthropology. Preprints are not scientific publications in the formal sense, as they have not yet been peer-reviewed; however, they do allow us to announce a forthcoming study. After *Nature* proposed it, we felt it was important to document the submission of our manuscript. It has been considerably enriched since its initial version.

Who owns this material? Where is it kept? Can it be studied by other teams?

All the fossils discovered by the MPFT in Chad belong to the heritage of this country and are therefore the property of the Chadian State. The fossils are managed by the National Centre of Research for Development (CNRD) and the Department of Palaeontology at the University of N'Djaména. The three postcranial specimens described in this study have been on loan since 2004 to the PALEVOPRIM laboratory of the CNRS and the University of Poitiers for analysis, in accordance with the agreement between the University of Poitiers, the CNRD and the University of N'Djaména. They will be housed at PALEVOPRIM for another year, probably until next spring, when they will join the rest of the TM 266 material in N'Djaména. Once published, this material and the related data will be accessible to any researcher who requests it from the Chadian authorities.

Future work

The MPFT will continue its work on the fossil material from Chad, whether it be remains attributed to *Sahelanthropus tchadensis*, *Australopithecus bahrelghazali* or other vertebrates. Following the numerous missions carried out since 2001, the MPFT will continue its fieldwork with the support of the Chadian and French authorities.