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وزارة الثقافة

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المركز الوطني للبحوث في عصور
ما قبل التاريخ علم الإنسان والتاريخ
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PRESS RELEASE

“1.9 million and 2.4 million-year-old artefacts and stone tool cutmarked bones from Ain Boucherit, Algeria”

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***Prepared by Professor Mohamed Sahnouni
Director of the Ain Hanech Paleoanthropological Research Project***

- National Research Center for Human Evolution (CENIEH), Paseo de Atapuerca 3, 09002 Burgos, Spain;
- *Centre National de Recherches Préhistoriques, Anthropologiques et Historiques*, 3 rue FranklinRoosevelt, 16000 Alger, Algeria ;
- Stone Age Institute & Anthropology Department, Indiana University, Bloomington, IN, USA;

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Up until this publication, the earliest archaeological evidence for the Oldowan and associated fossil bones with evidence of butchery is known from the 2.6 million-year deposits at Gona (Ethiopia). Until recently, most paleoanthropologists believed that early hominins dispersed into Northern Africa much later. Continued research at Ain Hanech (Sétif, Algeria) over the past two decades has expanded the geographic range of early hominin settlement in North Africa, also pushing back the evidence for ancestral hominin fashioning of stone tools and carnivory to 2.4 million years ago (Ma). During the previous decade, we have documented stone artefacts and stone tool cutmarked bones at Ain Hanech dated to circa 1.8 Ma, proving the potential of this area for yielding even much older archaeological materials.

Scientists; from CENIEH (Spain), CNRPAH (Algeria), IPHES, CSIC/MNCN (Spain), Griffith University (Australia), University of Sétif 2 and University of Algiers 2 (Algeria), and IPH-MNHN (France); conducting field excavations at the older nearby Ain Boucherit deposits (within the Ain Hanech study area) have discovered the oldest artefacts and stone tool cutmarked bones currently known in North Africa. The stone tools and associated fossil bones were excavated from two distinct archaeological levels at Ain Boucherit: The lower

level (AB-Lw) and upper level (AB-Up) situated in a sedimentary outcrop exposed by a deep ravine. The archaeological materials were excavated at two levels within the Ain Hanech geological formation and are estimated to ~2.4 Ma and to ~1.9 (Ma), respectively. Dr. M. Sahnouni, Archaeologist and leader of the Ain Hanech Project, discovered the first archaeological materials in the lower level in 2006, and in the upper level in 2008, both during the course of archaeological and stratigraphic studies. Subsequent excavations conducted from 2009-2016 yielded a large number of lithic artefacts and cutmarked bones. The age of the sites was constrained based on magnetostratigraphy, Electron Spin Resonance (ESR) dating, and biochronology of large mammals excavated together with the archaeological materials. Unlike East Africa where volcanic ashes amenable for absolute dating ($^{40}\text{Ar}/^{39}\text{Ar}$) are available, animal fossils such as pigs, horses, and elephants, known from other well-dated sites were used by Dr. Jan van der Made (project paleontologist and co-author) to corroborate the age derived from paleomagnetism obtained by geochronologist and co-author Dr. Josep Parés.

The Ain Boucherit stone tools were made of locally available limestone and flint and include chopping tools, subspheroids, and sharp-edged cutting tools used for processing animal carcasses. The hominins collected the rocks used for making the stone tools from nearby ancient stream beds, which are still accessible from these ancient channels. The artefacts are typical of the Oldowan stone technology known from 2.6-1.9 million-year-old sites in East Africa, although those from Ain Boucherit show subtle variations. Dr. M. Sahnouni, the lead author and director of the Ain Hanech project, said:

“the Ain Boucherit archaeology, which is technologically similar to the Gona Oldowan, shows that our ancestors ventured into all corners of Africa, not just East Africa. The evidence from Algeria has changed earlier view regarding East Africa being the cradle of humankind. Actually, the entire Africa was the cradle of humankind”.

In addition to the ubiquitous cores and sharp-edged stone flakes, the Ain Boucherit materials also include faceted subspheroids/spheroids, whose functions are still obscure. Remarkably, such types of tools are abundant in North Africa, but least known in East Africa. The observed variability in the stone tool assemblages between East Africa and North Africa may be a result of subtle differences related to the flaking qualities of the various raw materials used during the Oldowan.

The fossilized bones associated with the archaeological materials include a variety of savanna type animals such as mastodons, elephants, horses, rhinos, hippos, wild antelopes, pigs, hyenas, crocodiles, etc. Currently such animals occupy a relatively open savanna type habitats with permanent body of water nearby. The fossilized bones preserving stone tool cutmarks are primarily composed of small and medium-sized bovids and equids, which are anatomically represented by upper and lower limbs, followed by cranial and axial elements. Evidence of cutmarked and hammerstone-percussed bones is abundant in both assemblages recovered from the upper and lower levels. Cutmarks are isolated or grouped and mainly characterized by narrow V-shaped cross-sections and with clear internal micro striation and hertzian cones. Such hominin induced marks were located primarily on limb bones, on ribs, and on cranial remains, suggesting skinning, evisceration, and defleshing activities. Hominin induced percussion marks were identified with evidence of pits, cortical extractions, impact notches, implying marrow extractions. Ain Boucherit is among the very few archaeological sites in Africa that has produced evidence of cutmarked and hammerstone percussed bones associated with *in situ* stone tools. Moreover, Ain Boucherit has produced a larger sample of excavated materials

known from a single site, allowing stronger inferences to be made on how hominins butchered animal carcasses. The evidence from Ain Boucherit unambiguously shows that ancestral hominins exploited meat and marrow from all animal size categories and skeletal parts involving skinning, evisceration, and defleshing of upper and intermediate limbs. Dr. Isabel Caceres, the project taphonomist, commented that:

“the effective use of sharp-edged knife-like cutting stone tools at Ain Boucherit suggests that our ancestors were not mere scavengers. Not clear at this time whether or not they hunted, but the evidence clearly showed that they were successfully competing with carnivores for meat and enjoyed first access to animal carcasses”.

Significance of the Ain Boucherit discovery

For a long time, East Africa has been considered the place of origin of the earliest hominins and lithic technology. East Africa became the focus of attention in paleoanthropology over 50 years ago with the stone tools and hominin discoveries made by M. Leakey at Olduvai (Tanzania) dated to ~1.8 Ma.

Following M. Leakey, more discoveries appeared from Ethiopia and Kenya in East Africa, with the most famous skeleton known as ‘Lucy’ from the Afar, Ethiopia. Further work in South Africa brought about a number of hominin and archaeological discoveries, leaving North Africa a backwater in the quest for fossil remains of the earliest hominins and cultural remains.

Very little was known regarding early hominin occupation and their activities in North Africa prior to the multidisciplinary international expedition launched by Dr. M. Sahnouni. The archaeological and faunal materials known previously were vaguely estimated to be around ~0.6 Ma. Two decades of field and laboratory research directed by Dr. M. Sahnouni has shown that ancestral hominins actually made stone tools in North Africa that are near contemporary with the earliest known stone tools in East Africa dated to 2.6 Ma. At this moment, the most important question is who made the stone tools discovered in North Africa. Currently, no hominin remains were found in North Africa that are contemporary with the earliest stone tools. As a matter of fact, no hominins have been documented in direct association with the earliest known stone tools from East Africa. However, a recent discovery from Ethiopia has shown the presence of early *Homo* dated to ~2.8 Ma, most likely the best candidate also for the materials from East and North Africa. Scientists for a long time believed that hominins and their material culture originated in the East African Rift. Surprisingly, the earliest known hominin dated to ~7.0 Ma, and the 3.3 Ma *Australopithecus bahrelghazali* have been discovered in Chad located in the Sahara 3000 km away from the East African Rift. Dr. Sileshi Semaw, who is also co-author, stated that:

“obviously, hominins that are contemporary to ‘Lucy’ (dated to ~3.2 Ma) probably were roaming across the Sahara, and their descendants may have been responsible to leave the archaeological signatures now discovered in Algeria, dated to ~2.4 Ma, that are near contemporary with East Africa”.

It can be argued that North Africa and the Sahara are a repository of troves of fossil and archaeological materials, but the inhospitable nature of this vast area has hindered systematic and intensive investigations. Despite its considerable geographical distance from East Africa, the evidence from Ain Boucherit clearly argues for rapid expansion of

stone tool manufacture from East Africa or for possible multiple origin scenario of stone tool manufacture in both East and North Africa. Based on the potential of Ain Boucherit and the adjacent sedimentary basins, it can be suggested that hominin fossils and Oldowan artifacts as old as those documented in East Africa could be discovered in North Africa.

“Future research will focus on searching hominin fossils in the nearby Miocene and Plio-Pleistocene deposits searching for the tool-makers and even older stone tools”. Dr. M. Sahnouni concluded.