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The territory of abkhazia as a part of the eastern black sea route of hominide migration and settlement

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This article provides a general overview of the settlement of the territory of Abkhazia by ancient hominids. Special attention is paid to the chronology and routes of settlement by anatomically modern humans and their relationship with preceding populations. As a historical review, the article provides an extensive bibliography on the topic.

Key words: Anthropogenesis, Hominization, Sapientation, Paleolithic, Abkhazia

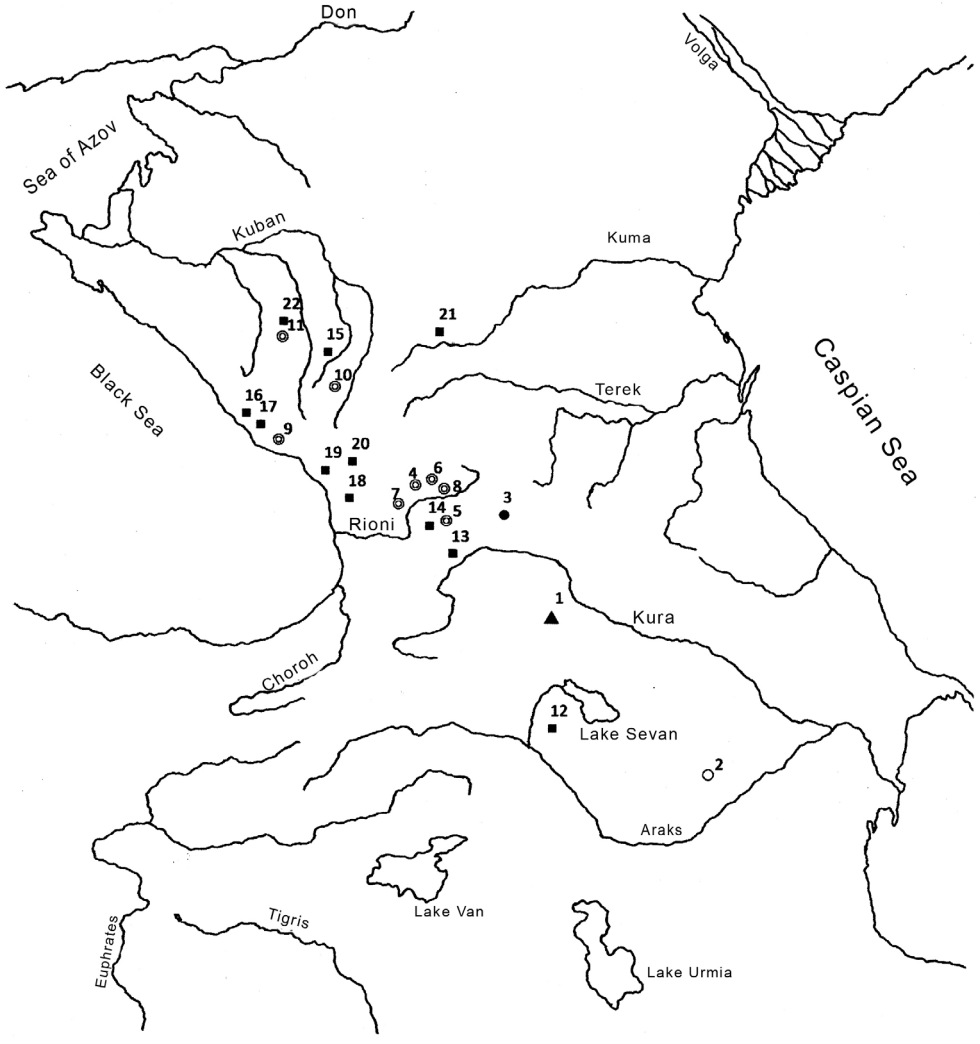
Introduction

Anthropogenesis is traditionally considered in two main aspects: hominization, which concerns the evolution of ancient primates into the *Homo* genus, and sapientation, which addresses the origin of anatomically modern humans, or *Homo sapiens* [58, 59].

The territory of Abkhazia, as an integral part of the Caucasian Black Sea region, has long served as a crossroads for cultural and historical contacts between neighboring regions, including Transcaucasia, the North Caucasus, Asia Minor, Western Asia, Crimea, and Eastern Europe. These connections emerged during the earliest stages of human societal development, as evidenced by the most ancient material culture sites in the former USSR. Sites in Abkhazia date back to the Acheulean era and include the first cave sites of the Mousterian era [39, 43]. Consequently, Abkhazia was a corridor for the movement of ancient hominids even before the final evolutionary formation of biologically modern humans. The region thus formed part of a Black Sea migration route for Paleolithic populations, with the Caspian route recently also being considered in light of new research (**Fig. 1**).

Although Stone Age archaeological sites are widely represented in Abkhazia, the region is notably lacking in paleoanthropological material from the Paleolithic era. Most hominid finds have been discovered outside its borders and are singular and fragmentary, making it difficult to form a complete picture of the morphological features of the local populations.

Map of Paleolithic human fossil finds in the Caucasus



Legend

▲ Dmanisi hominid
● **Homo erectus**
○ **Homo haidelbergensis**
◎ **Homo neanderthalensis**
■ **Homo sapiens**

1. Dmanisi
2. Azykh
3. Kudaro
4. Sakaziya
5. Dzhruchula
6. Bronze
7. Ortvala
8. Tsutskhvati
9. Machagua
10. Mezmayskaya
11. Barakayevskaya
12. Razdan
13. Devis-Khvreli
14. Bodi
15. Kasozhskaya
16. Akhshtyrskaya
17. Navalishenskaya
18. Okum I
19. Kuab-Chara
20. Kholodny Grotto
21. Podkumok
22. Satanay

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Fig. 1

The oldest and most significant find near Abkhazia comes from the Dmanisi site in Eastern Georgia. Dated to 1.75 million years ago and associated with Villafranchian fossil fauna, this is the oldest paleoanthropological find in Eurasia. The "Dmanisi man" shares morphological features with erectoid forms like *Homo ergaster*, as well as with *Homo habilis* and *Homo rudolfensis* [8, 9, 28, 69]. These distinct characteristics led anthropologists to assign a new taxonomic status, *Homo georgicus*, which is now widely recognized in the scientific community[1].

Remains from this period also include the so-called "Azokh anthrop" from Azokh Cave in Azerbaijan, represented by fragments of a lower jaw likely dating to the Pleistocene. These remains are attributed to either Archanthropines (*Homo erectus*) or pre-Neanderthals/Heidelberg man (*Homo heidelbergensis*) [15, 32, 66, 67].

Further evidence comes from Kudaro I Cave, where a human tooth was found in an Acheulean layer (Mindel-Riss). This tooth may belong to Archanthropines of the *Homo erectus* type or the Neanderthal taxon, though it is more closely related to erectoid forms. A permanent incisor and premolar were also found at the site; the incisor has a modern structure, while the premolar is characteristic of ancient forms [27, 8, 69].

In Sakazhia Cave, fragments of an upper jaw with four teeth were discovered in Mousterian level 3d, associated with Levallois-Mousterian tools. Additional teeth and skull fragments were found elsewhere in the same cave [52, 53, 54, 56, 57]. These remains exhibit features that suggest a Neanderthal similar to Palestinian forms, with some even approaching sapient characteristics, possibly indicating a hybrid population [13, 52, 14].

A Neanderthal first upper permanent molar was discovered in Mousterian layer II of Djruchula Cave, which is morphologically close to the finds from Sakazhia [64, 12, 41, 69]. Other Neanderthal dental remains have been found in Bronze Cave (Bronzovaya Peschera), Ortvala Cave [55], and Tstsukhvati Cave [50, 52].

Materials from the Upper Paleolithic and Mesolithic periods are also present. A skull from Western Georgia, dated to the Meso-Neolithic period, carries a proto-Australoid combination of features typically characteristic of the Upper Paleolithic era [16]. The lower jaw of a young sapient woman was found in the Aurignacian layer of Devis-Khvreli Cave [48, 1]. In 2012, a tooth belonging to *Homo sapiens* was discovered in Bondi Cave, Georgia, in a layer dated to 24-21 thousand years ago, providing crucial evidence for the timing of the first sapiens' appearance in the region [73].

Human remains have also been discovered within the Caucasian Black Sea region. Of particular interest are finds of anatomically modern human remains, albeit with archaic features, from Mousterian layers 3a and 3 of Akhshtyr Cave [10, 26, 11, 67]. However, these are represented only by minor fragments, including individual teeth and postcranial skeleton pieces. There is also a reported discovery of an anatomically modern human skull in Navalishenskaya Cave in the Khosta River gorge, which displays Euro-African traits [30].

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[1] The geographical naming convention is widespread in paleoanthropology, with examples including Neanderthal (Neander Valley, Germany), the Azokh anthrop (Azokh Cave, Azerbaijan), Peking Man (China), and Java Man (Indonesia).

In Abkhazia specifically, finds of individual teeth in the Mousterian layers of Machagua Cave may belong to either the Neanderthal taxon or modern humans, though a lack of detailed morphological data prevents a definitive taxonomic assignment [70]. Human remains were also found in the Upper Paleolithic layers of Okum I Cave [4]. Two lower jaws of *Homo sapiens* with archaic, pre-sapient features were recovered from the presumably Late Paleolithic or Early Mesolithic layers of Kuab-Chara Cave, likely belonging to late archaic sapiens or early anatomically modern humans [7].

The most intriguing finds from Abkhazia are the human remains from the Cold Grotto (Grot Khuapinipshakhua), represented by an accumulation of eight skulls, including two from adolescents. The skulls allegedly bear cut marks that may indicate dismemberment. Published sources suggest the skulls exhibit proto-Australoid or non-differentiated Euro-African characteristics, though a detailed paleoanthropological study of these materials is still lacking.

This accumulation of skulls suggests the practice of a specific religious rite. They resemble skull remains found in the Imeretian caves Devis-Khvreli and Sakazhia, as well as more distant sites like Ofnet, indicating shared ritual practices across a wide geographical area. This archaeological evidence curiously echoes the historical and ethnographic literature documenting a cult of the skull among the Abkhazians [61, 62, 63, 65, 31].

Data from the North Caucasus are also highly significant. For instance, the remains of a Neanderthal with sapient features were discovered in Mezmaiskaya Cave, displaying traits that align it with the Skhul type [68, 69]. Genetic studies by German researchers, who sequenced the genome of the Mezmaiskaya individual, further established its closer affinity to Western European forms [20, 54][2]. A child's lower jaw found in Barakayevskaya Cave exhibits features of a transitional type between Paleoanthropes and Neoanthropes [40]. However, several morphological characteristics suggest the Barakay individual is closer to Western European Neanderthals than to Western Asian types like those from Shanidar and Skhul [40, 67]. In the Satanay Grotto (Gubsky Shelter No. 7), a *Homo sapiens* female skull was discovered, bearing similarities to sapient skulls from Central and, to a lesser extent, Western Europe, particularly specimens from Kostenki XIV, Kostenki II, Oberkassel, and Dolní Věstonice III [19, 60]. Additional human remains, including a skull fragment, have been found near Podkumok, close to Pyatigorsk [21].

Our current knowledge is constrained by the limited and fragmentary nature of these fossil finds, which significantly complicates a comprehensive understanding of hominid settlement in Abkhazia. Several critical problems remain unresolved, including:

- The chronology of the initial penetration of ancient hominids into the region.
- Their specific evolutionary lineages.
- The correlation of particular hominid types with specific archaeological industries.

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[2] In recent years, the so-called archaeogenetic revolution has been underway, and there is a wealth of data on Neanderthal archeogenetics, including for the Caucasus Neanderthals. However, a review and synthesis of this literature could be the topic of a separate study [22].

• The ultimate fate of these ancient populations in Abkhazia.

A problem of equal importance is determining the timing and migration routes of *Homo sapiens* into the region.

The Caucasus has consistently served as a gateway to Eurasia for migrating hominids [68]. Current evidence suggests the first humans appeared here in the late Pliocene and early Pleistocene, most likely arriving via Eastern Anatolia and the Western Asian highlands from Africa. Around 2 to 1.5 million years ago, hominids of the species *Homo ergaster* emerged in Africa and began dispersing northward, reaching the Caucasus. Unfortunately, despite advances in Paleolithic archaeology in Abkhazia, sites from this early period remain undiscovered. Such early sites are rare but have been identified in Georgia, the Taman Peninsula, and Dagestan, attributed to *Homo georgicus* and *Homo ergaster*.

Some scholars argue that the absence of a continuous Oldowan and pre-Oldowan tradition in the Caucasus indicates that the bearers of these earliest industries did not undergo further evolutionary development in the region. Their presence may represent brief episodes of migration, following animal herds and seeking high-quality raw materials for tools. Conversely, other researchers posit that their appearance was part of the first global migration of hominids, with the Caucasian representatives being among the first humans on the Eurasian continent.

Abkhazia's role in this initial phase is unclear, as no finds chronologically associated with the Oldowan period (1.7-1.6 million years ago) have been found there. However, the nearby Bogatyri / Sinaya Balka site on the Taman Peninsula, with materials dating to 1.2-1.6 million years ago, and the slightly later site of Amiranic-Gora (c. 800,000 years ago), suggest that the earliest sites near Abkhazia fall within the 1.7-0.8 million years ago range. These sites represent the earliest, rare episodes of hominid presence in the Caucasus. The populations that left these traces likely did not establish a permanent presence and may have migrated southward, a theory supported by paleoclimatological data indicating a trend toward aridity and cooling around 1.75 million years ago. A subsequent thermal optimum may have facilitated a new wave of hominids, followed by a sharp cooling coinciding with the Günz glaciation (oxygen-isotope stage 22), which may have led to the departure or local extinction of *Homo georgicus* and *Homo ergaster* populations.

The next major settlement phase in the Caucasus and Abkhazia occurred during the Early Acheulean era[3]. The chronological gap between the Acheulean and the preceding industries is likely due to unfavorable climatic conditions. Critically, the Acheulean industries of the Caucasus show no direct technological continuity with the local Oldowan, indicating they were not the result of in-situ evolution but were introduced by a new wave of hominids from the south, likely late *Homo erectus*. The closest analogues to these Caucasian industries are found in the Levant.

The general chronological range for the Caucasian Acheulean is 600-300 thousand years ago, spanning from oxygen-isotope stage 15 to stage 9. Absolute dates from sites

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[3] Since the archaeological attribution of Paleolithic sites will be addressed in subsequent sections, the present analysis deliberately bypasses this aspect of the problem to focus exclusively on the paleoanthropological and migratory evidence.

near Abkhazia, such as Triangular Cave (583 ± 25 kya) and Kudaro III Cave (560 ± 112 kya), fall within this range. The appearance of Acheulean toolmakers coincides with warm interglacial stages, which created favorable conditions for northward migration from southern regions.

In Abkhazia, the Yashtukha site provides key evidence for this process, reflecting multiple settlement episodes during the Günz-Mindel and Mindel-Riss interglacials. The earliest settlers were likely *Homo erectus* during the Günz-Mindel interglacial, with later stages dated to 358-330 kya (Mindel-Riss). During these warm periods, hominids penetrated the Caucasus and Black Sea region, likely migrating along open foothill zones to avoid the swampy Colchis Lowland. The primary route probably ran from the Armenian Highlands through Eastern and Western Transcaucasia, then westward towards the Abkhazian Black Sea region and into the Trans-Kuban area [42]. This is supported by later sites in the Northern Black Sea region, which imply significant population infiltration from the south [5, 62]. Geological factors, such as lower elevation profiles of the Caucasus ridges (1-1.5 km lower than today) and asynchronous glaciation patterns compared to Europe, further facilitated these movements and led to periods of cultural isolation.

A later Acheulean stage in the Caucasus may be associated with *Homo heidelbergensis*, as suggested by the remains from Azokh Cave. This group likely penetrated the region around 300-350 kya (late Mindel-Riss interglacial), and the late Acheulean at Yashtukha may be attributed to them. Acheulean industries appear to have persisted until the end of the Riss glaciation, when the first Mousterian tools mark the beginning of the Middle Paleolithic.

Recent research indicates that the Middle Paleolithic (Mousterian) in the Caucasus did not evolve from local Acheulean traditions but was introduced from outside. The technological affinities of Caucasian Middle Paleolithic materials lie with sites in Western Asia (the Levant and Zagros). This suggests that bearers of these Mousterian technologies moved from the Zagros through the Western Asian highlands and from the Levant through Eastern Anatolia into the Western Caucasus, including Abkhazia.

The lack of genetic continuity between Acheulean and Mousterian industries supports the theory that these new technologies were brought by a new wave of hominids: *Homo neanderthalensis*. Fossil evidence confirms Neanderthals were the bearers of nearly all Mousterian sites in the Caucasus.

The timing of their appearance is linked to the earliest Mousterian sites. The oldest dated Mousterian layer in the Caucasus is at Myshtulagty-Lagat (North Ossetia), around 250 kya, with the latest layers dating to approximately 70 kya. Transcaucasian sites have slightly later dates; for example, Kudaro I Cave dates to 90-60 kya. In Abkhazia, a date from Apiancha Cave of around 38 kya reflects a much later Mousterian stage.

Two distinct stages of Neanderthal penetration into the Caucasus are identified, supported by technological disparities between early and late Mousterian industries. The first stage, around 250 kya (Riss-Würm interglacial), is derived from early Middle Paleolithic cultures of the Levant. The second stage occurred during a significant climatic deterioration in the “Mousterian Würm” (oxygen-isotope stage 4, 75-71 and 60-57 kya), which may have reduced or extirpated the “first wave” Neanderthals. In this second phase, settlement included populations from the south of the Russian Plain and Crimea, with North Caucasian sites showing Central and Western European affinities, while Transcaucasian sites gravitated towards Zagros cultures [39, 43].

The cultural differences observed in the Mousterian could result from different technological traditions, diverse genetic origins of populations, or even early ethnic formations [39]. Climatic fluctuations likely caused population movements between highland and lowland areas, leading to concentration, increased cultural contact, and the formation of distinct archaeological cultures like the Kudar, Tskhinvali, and Gub groups. The so-called Khosta culture and the somewhat isolated position of the Abkhazian Mousterian further highlight this regional diversity [34].

The subsequent Upper Paleolithic era in the Caucasus, while diverse, shares commonalities with cultures of the Near East, forming a distinct West Asian cultural region separate from North Africa, Central Asia, and the South Russian steppes. Within the Caucasus, the Imeretian and Gub cultures can be identified. Cultural differences became more pronounced by the end of the Upper Paleolithic, suggesting independent development after an initial common origin. A cultural divide between the North Caucasus and Transcaucasia is also evident, likely due to the glacial barriers presented by the Caucasian ridge. In contrast, sites on the Black Sea coast show evidence of constant movement and cultural connections.

The Imereti sites are closest to the Baradostian and Zarzian cultures of the Zagros and differ from those in the Levant [3], suggesting a possible ethnic unity within this interaction zone.

The origins of early *Homo sapiens* in the region should be sought in the Near East, as evidenced by the material culture similarities between Imereti, Zagros, and Luristan [3]. This indicates that *Homo sapiens* in the Caucasus are not of local autochthonous origin [8].

The timing of their arrival is discernible from the Upper Paleolithic archaeological record. It is well-established that Mousterian cultures are predominantly associated with Neanderthals, while Upper Paleolithic industries are genetically unrelated to the Mousterian. Any apparent connections likely reflect cultural contact between Neanderthals and sapiens, not local evolution.

The Caucasus was part of the vast Neanderthal range, which bordered the habitat of *Homo sapiens* in the southern regions of Western Asia. The Upper Paleolithic appeared in the Caucasus relatively late. The first traces of Upper Paleolithic industries, and thus the first representatives of *Homo sapiens*, appear during a period of relative warming at the onset of the powerful Würm II glaciation (oxygen-isotope stage 3), dated to 36-38 thousand years ago. This period marks the replacement of Neanderthals by anatomically modern humans in the Caucasus.[4]

Today, the processes of coexistence between different hominid lineages in the Caucasus remain elusive. It is even more challenging to determine whether the region, including Abkhazia, constituted a formative center for anatomically modern humans. A more plausible scenario is that the Caucasus lay on the periphery of a primary sapientation zone, receiving slow but successive waves of migrants at various evolutionary stages.

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[4] Given the scope of this article, we will bypass a detailed discussion of theories concerning the origin of anatomically modern humans, such as the monocentric (Out-of-Africa) and polycentric (Multiregional) hypotheses.

This interpretation is supported by the morphological evidence. Paleoanthropes from Georgian sites such as Sakazhia, Djruchula, and Tstsukhvati exhibit features that place them on a trajectory toward sapientation, sharing affinities with Western Asian finds of the Skhul type. This aligns with the scholarly consensus that the early Caucasian Mousterian originated from the Levant, the very region that produced the Skhul groups.

These migrations inevitably led to multiple cultural and genetic contacts between hominids of different evolutionary levels. For instance, the first paleoanthropes entering the Caucasus likely encountered residual groups of Acheulean culture bearers, possibly *Homo heidelbergensis*. Subsequently, during a second wave of paleoanthrope settlement, local groups may have mixed with migrants from the Zagros. Furthermore, when conditions allowed, populations from Crimea could have penetrated Transcaucasia via the Black Sea coast, introducing another demographic layer. This complex chronology means that earlier migrants, such as Skhul-type groups from the Levant, could have been more progressive than later arrivals, indicating that the process of sapientation, though perhaps attenuated, was already underway in the region.

Against this backdrop, it is conceivable that even during the Mousterian, there were early, episodic incursions of fully sapient groups. If so, the first modern humans arriving in the Caucasus may have encountered not "classical" Neanderthals but populations of paleoanthropes with intermediate morphological traits. This supports the hypothesis of the Caucasus as a zone of hybridization, fostering erectoid-Neanderthaloid and Neanderthaloid-sapient groups.

Consequently, the appearance of modern humans in Abkhazia and adjacent regions likely occurred through multiple mechanisms. On one hand, there may have been a degree of *in-situ* sapientation within local populations. On the other, there was undoubtedly migration of already fully formed anatomically modern humans.

The archaeological record confirms that migration pulses from the Near East northward into the Caucasus persisted throughout the Upper Paleolithic and continued into the Mesolithic. The significant presence of early *Homo sapiens* remains, morphologically represented by undifferentiated proto-Australoid and Euro-African types, suggests their penetration into the region long before the definitive onset of the Upper Paleolithic era. This evidence paints a picture of the Caucasus not as an isolated cul-de-sac, but as a dynamic periphery - a complex corridor of migration, interaction, and potential hybridization over millennia.

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