The Palaeolithic Caves of the Afrin Region, Syria: A Synthesis of Archaeological Knowledge Prior to 2010

1. Introduction: The Palaeolithic Landscape of Afrin Before 2010

The Afrin region, nestled in the northwestern part of Syria, constitutes a significant segment of the northern Levant. This geographical area has long been recognized as a critical corridor and a zone of substantial cultural developments and hominin migrations throughout the Pleistocene epoch. Prior to 2010, archaeological investigations, with a particular emphasis on cave excavations, had commenced the process of unveiling the region's profound prehistoric heritage. These early explorations were instrumental in positioning Afrin as an area of considerable importance for understanding Palaeolithic occupation, particularly at the northern extent of the Levantine human settlement zone. The characteristic landscape of the region, featuring the hilly limestone plateau of Jabaal Sam'an which is transected by wadis such as Wadi Dederiyeh leading towards the Afrin Valley, provided geomorphologically suitable environments for cave formation and, consequently, for sustained prehistoric human habitation.[1]

The research undertaken in the Afrin region before 2010, while perhaps not as voluminous as that conducted in the southern Levant during the same period, had already begun to significantly challenge and expand the prevailing models of Levantine Palaeolithic cultural distribution and hominin presence. The discoveries emanating from Dederiyeh Cave, in particular, were pivotal. They furnished compelling evidence demonstrating that cultural entities and technological traditions, which had hitherto been predominantly associated with and identified in the south-central Levant, were, in fact, also distributed at the northern extremity of this vast region. This realization testified to a broader cultural commonality across the Palaeolithic Levant and effectively extended its recognized northern boundary further northwards.[1] Consequently, the archaeological work in Afrin was not merely about locating new sites; it was actively contributing to a more nuanced and geographically comprehensive understanding of the Levantine Palaeolithic, an implication of substantial weight for the broader field of prehistoric studies.

This report aims to synthesize the state of knowledge pertaining to the Palaeolithic caves of the Afrin region, drawing exclusively upon research findings, archaeological discoveries, and scholarly publications that were available up to and including the year 2009. The primary focus will be on key excavated sites, the details of their excavation histories, the cultural sequences unearthed, the nature of hominin remains discovered, and the broader paleoanthropological interpretations that were prevalent within the pre-2010 academic discourse. Dederiyeh Cave will, by necessity, form a principal focus of this review, owing to the extensive body of pre-2010 research conducted at this locality. However, other cave sites that were identified through archaeological surveys conducted prior to 2010 will also be discussed, in an effort to provide a more comprehensive depiction of the region's Palaeolithic occupational landscape.

A crucial factor in unlocking the deep prehistory of the Afrin region, especially the rich record of Dederiyeh Cave, was the systematic, multi-season approach adopted by the Syria-Japan joint archaeological mission. This collaborative endeavor, which commenced with surveys in 1987 and intensive excavations from 1989 onwards, represented a sustained and focused

research commitment.[1] This sustained effort contrasts with what might have been more sporadic or limited earlier investigations, if any, specifically targeting the Palaeolithic caves within the Afrin district. The methodological rigor and long-term dedication of this joint mission were directly responsible for the significant expansion of knowledge regarding Afrin's caves that occurred before 2010. The methodology underpinning this report involves a thorough review of published academic literature, including excavation reports, peer-reviewed journal articles, and scholarly monographs, all dated prior to the 2010 cutoff. All information presented herein will be meticulously referenced to its original source.

2. Dederiyeh Cave: A Key Prehistoric Site in the Northern Levant (Pre-2010 Discoveries)

2.1. Location, Discovery, and History of Pre-2010 Excavations

Dederiyeh Cave is prominently situated on the left bank of Wadi Dederiyeh, a watercourse that transects the hilly limestone plateau of Jabaal Sam'an. The cave lies approximately 60 kilometers north of the city of Aleppo in northwest Syria, at an altitude of about 450 meters above sea level.[1] Wadi Dederiyeh itself is a tributary of the Afrin River, which ultimately flows towards the Mediterranean Sea.[1] Pre-2010 reports characterized the environment surrounding the cave as sparse Mediterranean woodland.[1]

The cave was first identified as a Palaeolithic site of significance during a reconnaissance survey conducted by the Syria-Japan joint mission in 1987.[1] This survey successfully located approximately a dozen Palaeolithic caves within the broader Afrin Valley, among which Dederiyeh was selected for subsequent intensive and long-term excavation due to its promising initial indications.[1]

Intensive archaeological excavations at Dederiyeh Cave were carried out by the Syria-Japan joint mission, commencing in 1989 and continuing robustly through the pre-2010 period, with excavation seasons documented up to at least 2008 and research programs extending to 2010.[1] Key figures leading and involved in this extensive fieldwork and research included Professor Takeru Akazawa and Professor Sultan Muhesen.[1] The initial phase of excavations, spanning from 1989 to 2002, concentrated primarily on the "chimney area" of the cave. This focus yielded exceptionally rich Middle Palaeolithic deposits, most notably including the significant discoveries of Neanderthal fossil remains.[3] Subsequent to 2002, and continuing until 2010, the research program was strategically expanded to encompass other areas of the cave system.[3] This expansion proved fruitful, leading to the discovery of archaeological evidence from periods both earlier (Lower Palaeolithic) and later (Epipalaeolithic) than the Middle Palaeolithic layers that were the initial draw. Indeed, a sounding pit excavated as early as the 1990 season had already provided an initial indication of Late Epipalaeolithic layers within the main entrance area of the cave.[5]

2.2. Geological Context and Cave Morphology (as understood before 2010)

Dederiyeh Cave is a substantial Palaeolithic karst feature, naturally formed within the limestone geology of the Jabaal Sam'an plateau.[1] Karst environments, such as this, are widely recognized in archaeology for their capacity to provide excellent conditions for the long-term preservation of delicate archaeological and organic remains.[6]

Pre-2010 reports provide consistent, though slightly varying, dimensions for the cave. It is

generally described as being approximately 60 meters in length, with a width ranging from 15 to 20 meters (some sources suggest a range of 10-25 meters, or a maximum width of up to 40 meters in certain sections), and an internal height of around 10 meters.[1] The overall structure of the cave is tunnel-like, featuring two primary entrances, each measuring about 10 meters in diameter. The main entrance faces towards Wadi Dederiyeh, while the other, a natural chimney, provides an opening to the plateau surface above and is situated deeper within the cave complex.[1]

Internally, three major chambers were defined by the excavators: the entrance area, the central area, and the chimney area.[1] The topography of the cave floor is not uniform; the central area, for instance, slopes downwards from the chimney area.[1]

Regarding the geological processes involved in the cave's formation and modification, as understood before 2010, it was posited that the chimney feature likely began to open during Marine Isotope Stage (MIS) 4. This opening subsequently enlarged rapidly, a development that would have allowed for more intensive and extended occupations in that particular area of the cave. Further enlargement of the chimney is thought to have resulted in substantial erosion of deposits, possibly occurring during the later part of MIS 3 and thereafter.[1] A significant geological feature was noted in the entrance area: the oldest cultural deposits, identified as Yabrudian, were found directly overlying bedrock. These deposits were heavily tilted, a characteristic interpreted by the excavators as indicating the development of a sinkhole at the center of the entrance area during or prior to this early occupation phase.[1] This observation is critical for understanding the taphonomic processes that affected the earliest archaeological layers within the cave.

2.3. Stratigraphy and Cultural Sequences (Yabrudian, Levantine Mousterian, Natufian layers identified pre-2010)

Excavations conducted at Dederiyeh Cave prior to 2010 revealed a remarkably long and complex cultural sequence, with deposits spanning the late Middle Pleistocene through to the late Upper Pleistocene.[1] One early account mentioned that the main section of the cave contained 15 distinct archaeological layers, with a cumulative thickness of approximately 5 meters.[7] This deep stratigraphy provided a rare opportunity to study successive human occupations over a vast timescale.

The **Lower Palaeolithic** presence was represented by the Yabrudian industry. These deposits, considered the oldest in the cave, were primarily recovered from Unit F in the entrance area. This unit was more than a meter thick and lay directly on the bedrock.[1] The lithic assemblage from this Yabrudian layer was characterized by the use of non-Levallois techniques, with single- or multi-platform globular cores employed for flake production. Blade production was virtually absent. The tool repertoire was dominated by side-scrapers, often of the Quina or demi-Quina type, typically made on thick cortical flakes. Bifaces were notably very rare, consisting only of a few small "micro-bifaces" and some bifacially flaked scrapers.[1] These technological and typological features were considered characteristic of Yabrudian assemblages as known from other key Levantine sites like Yabrud, Tabun, and Qesem, based on pre-2010 comparative studies.[1]

The **Middle Palaeolithic** was extensively represented by substantial deposits, particularly

concentrated in the chimney area of the cave. Here, excavations reached bedrock at a depth of 2.5 to 3 meters below the modern cave floor. Within these Middle Palaeolithic sediments, four major stratigraphic units (designated Units I-IV) were defined, which were further subdivided into fifteen distinct geological layers.[3] This sequence documented early, middle, and late phases of the Levantine Mousterian.[1] Crucially, these Mousterian layers were found to be directly associated with the well-preserved Neanderthal fossil remains discovered at the site.[1] The lithic industries of the Levantine Mousterian were characterized by a Levallois-based technology. Detailed pre-2010 analyses of the assemblages from the chimney area indicated variations in Levallois core preparation techniques—including convergent, centripetal, parallel, and bidirectional flaking strategies—across the different layers, suggesting diachronic changes in knapping practices.[3]

The **Epipalaeolithic** period was represented by Natufian cultural layers, which were identified primarily in the entrance area of the cave.[1] Excavations conducted between 2003 and 2007, expanding upon an initial sounding from 1990, uncovered significant Late Epipalaeolithic occupational layers. These layers contained the remains of at least five stone-built structures, described as oval or semi-circular pits that had been dug into the underlying Middle Palaeolithic deposits.[5] These structures featured stone-lined internal walls, as well as evidence of postholes and hearths. Based on these architectural features, they were interpreted by the excavators as semi-subterranean dwellings, bearing resemblance to Natufian structures documented at sites such as Ain Mallaha in the southern Levant.[5] One particularly well-preserved feature, designated Construction 1, was a heavily burnt semi-circular pit measuring approximately 4 by 2.3 meters and up to 0.7 meters deep. This structure yielded abundant organic materials, including charred timbers (interpreted as remains of posts and roofing), numerous tooth-shell beads, incised bone and stone beads, ground stone tools, bone tools, bone/horn-core sickle handles, and even a human mandible fragment.[5] The overall assemblage from these structures showed strong parallels with known Natufian material culture from across the Levant.[5] Importantly, a series of radiocarbon dates obtained from charred timbers within Construction 1, published by Yoneda and colleagues in 2006, placed this Natufian occupation firmly around 10,950 uncalibrated years BP (approximately 11,000 calibrated years BP).[5]

The multi-layered cultural sequence at Dederiyeh, encompassing Yabrudian, various phases of Mousterian, and Natufian occupations, all documented before 2010, made it an exceptionally rare and valuable site. Few localities in the Levant, and particularly in its northern sector, offered such a continuous record for studying long-term hominin adaptation and cultural change *in situ*. This rendered Dederiyeh not just a site of Neanderthal fossils, but a crucial reference point for the entire Palaeolithic of the northern Levant. The strategic decision by the research team to expand excavations after 2002 from the initially promising chimney area to other parts of the cave, such as the entrance, was a direct cause for the discovery of both the older Yabrudian and the younger Natufian occupations.[3] This expansion significantly broadened the known occupational history of the cave beyond the Middle Palaeolithic focus of the early excavation seasons, underscoring how evolving archaeological fieldwork strategies can lead to transformative new understandings of a site's complexity.

Table 1: Cultural Sequence and Key Characteristics of Dederiyeh Cave (Pre-2010 Data)

Period/Cultural Layer	Approximate Pre-2010 Chronology/Context	Key Lithic Characteristics (Pre-2010 Reports)	Associated Hominin Finds (Pre-2010 Reports)	Other Significant Features/Finds (Pre-2010 Reports)
Lower Palaeolithic (Yabrudian)	Late Middle Pleistocene; Unit F in entrance area, on bedrock [1]	Non-Levallois; globular cores for flakes; Quina/demi-Quina scrapers on thick cortical flakes; rare micro-bifaces [1]	None specifically reported from this layer	Tilted deposits suggesting sinkhole formation [1]
Middle Palaeolithic (Levantine Mousterian)	Late Middle Pleistocene; Units I-IV (15 layers) in chimney area [3]	Levallois-based industry; variations in core preparation (convergent, centripetal, parallel, bidirectional) through layers [3]	Neanderthal remains (multiple individuals) [1]	Intentional burials (Dederiyeh 1 & 2); hearths [9]
Epipalaeolithic (Natufian)	c. 11,000 cal. BP (based on dates from Construction 1) [5]	Lunates (abrupt/Helwan retouch), backed bladelets, glossed pieces, end scrapers, burins; blade/bladelet production from single platform cores [5]	Human mandible fragment in Construction 1 [5]	At least five stone-built semi-subterranean dwelling structures; tooth-shell beads, incised bone/stone items, ground stone tools, bone tools, sickle handles [5]

2.4. Hominin Occupation: The Neanderthals of Dederiyeh (Pre-2010 burial discoveries, skeletal remains, and their paleoanthropological significance)

Dederiyeh Cave rapidly ascended to prominence as a prime locale for paleoanthropological research following the discovery of exceptionally well-preserved Neanderthal fossil remains found in direct association with Middle Palaeolithic archaeological assemblages.[1] Indeed, by the pre-2010 period, the site was recognized for having yielded the largest and most significant collection of Neanderthal fossil remains in the entire northern Levant.[4]

The first major discovery, **Dederiyeh 1 (designated Burial No. 1)**, was unearthed in 1993 by

the Syrian-Japanese mission.[7] This find consisted of the exceptionally well-preserved and nearly complete skeleton of a Neanderthal child, estimated to be approximately two years of age at death.[7] (Slight variations in age estimation existed, with enamel cross-striation analysis suggesting 1 year and 7 months [12], while dental morphology pointed to around 2 years [12]). The remains were located within Layer 11 of stratigraphic unit SU-IV, in the chimney area of the cave.[10] The context of the Dederiyeh 1 burial strongly suggested intentionality. The infant was found lying on its back, with its arms outstretched and legs flexed. Notably, a limestone slab had been placed under its head, and a flint tool was positioned on its chest, near the region of the heart.[7] This arrangement was interpreted as compelling evidence for ritualistic burial practices among Neanderthals, dating back to the Middle Palaeolithic period.[7] Key pre-2010 publications detailing the Dederiyeh 1 child include the initial report by Akazawa and colleagues in the journal *Paléorient* (1995) and the comprehensive monograph edited by Akazawa and Muhesen (2002).[1]

A subsequent significant discovery was **Dederiyeh 2 (designated Burial No. 2)**, another Neanderthal child burial found during the 1997-1998 excavation seasons.[7] This individual was located in a pit that had been intentionally dug into the Mousterian deposits, specifically in Layer 3, in a different area of the cave from the first burial.[10] The estimated age at death for Dederiyeh 2 was also around two years old, remarkably similar to Dederiyeh 1.[8] Although the Dederiyeh 2 skeleton was more partial than the first, it held particular importance as it was, at the time of its pre-2010 publication, the first Neanderthal discovery in Syria that enabled a reconstruction of a Neanderthal child's facial morphology.[8] This find was detailed in publications such as Akazawa et al. (1999) in *Paléorient* and the Akazawa and Muhesen (2002) monograph.[8]

Beyond these two notable child burials, other Neanderthal remains were also recovered from Dederiyeh Cave. These included fragmentary bones attributed to adult Neanderthals.[4] Pre-2010 estimates suggested a minimum number of approximately ten Neanderthal individuals represented by the skeletal parts found [8], with one source mentioning the remains of up to 15 individuals being found by 1993.[7]

The paleoanthropological significance of the Dederiyeh Neanderthal fossils, as understood before 2010, was manifold. The remains provided crucial anatomical data for reconstructing Neanderthal growth patterns and life history. Preliminary conclusions published before 2010 suggested that the brain growth rates of Neanderthals during early infancy might have been higher than those observed in modern humans, and that this pattern of growth continued over a prolonged period. This, in turn, implied a potentially slow-paced life history for Neanderthals, characterized by late maturation.[4] The discoveries unequivocally confirmed the presence of Neanderthals in the northern Levant and their association with a Tabun B-type Mousterian lithic industry.[9] Furthermore, the site offered compelling evidence for Neanderthal burial practices and, by extension, their capacity for symbolic behavior.[7] The detailed and well-preserved nature of the Dederiyeh burials, particularly Dederiyeh 1 with its associated grave goods and specific positioning, provided strong data points that fueled the ongoing pre-2010 scientific debate concerning Neanderthal cognitive abilities and the complexity of

their behaviors, challenging earlier views that often portrayed them as purely utilitarian beings. Situated at the northern end of the Dead Sea Rift, Dederiyeh Cave was also conceptualized as an important locale along a potential passage for early human dispersals into Europe and Asia, making its Neanderthal finds particularly relevant to the broader discussions concerning the relationship between Neanderthals and anatomically modern humans, and the eventual demise of the Neanderthals.[8]

Table 2: Pre-2010 Hominin Discoveries at Dederiyeh Cave

Discovery Name/Identifier	Year of Discovery (pre-2010)	Associated Cultural Layer/Context	Brief Description (Age, Preservation, Key Features)	Key Pre-2010 Publication(s)
Dederiyeh 1 (Burial No. 1)	1993	Middle Palaeolithic (Mousterian), Layer 11, Unit SU-IV, chimney area [10]	Neanderthal child, ~2 years old; exceptionally well-preserved, nearly complete skeleton; intentional burial with stone slab under head, flint tool on chest [7]	Akazawa et al. 1995 (*Paléorient*) [9]; Akazawa & Muhesen 2002 [1]
Dederiyeh 2 (Burial No. 2)	1997-1998	Middle Palaeolithic (Mousterian), Layer 3, in a pit [10]	Neanderthal child, ~2 years old; partial skeleton; enabled facial reconstruction [8]	Akazawa et al. 1999 (*Paléorient*) [10]; Akazawa & Muhesen 2002 [8]
Other Neanderthal Remains	Throughout excavations pre-2010	Middle Palaeolithic (Mousterian) layers	Fragmentary bones of adults and other individuals; MNI ~10-15 [4]	Akazawa & Muhesen 2002 [1]

2.5. Associated Archaeological Assemblages (Lithic industries and faunal remains reported before 2010)

The rich hominin record of Dederiyeh Cave was accompanied by extensive archaeological assemblages, primarily comprising lithic industries and faunal remains, which were systematically studied and reported before 2010.

The **Yabrudian lithic industry**, as described in section 2.3, was characterized by the production of thick scrapers and a scarcity of bifaces, representing the earliest known occupation at the site.[1]

The **Levantine Mousterian layers** yielded abundant lithic assemblages, found in direct association with the Neanderthal remains. These industries were fundamentally characterized

by the sophisticated use of the Levallois technique for producing flakes and points.[1] Pre-2010 research, drawing on the extensive excavations in the chimney area, had already begun to examine the temporal variability within these Mousterian assemblages. These studies noted diachronic changes in Levallois core technology, such as shifts in the prevalence of convergent, centripetal, parallel, and bidirectional flaking patterns through the stratigraphic sequence.[3] Figures published in later works, but based on these pre-2010 excavations and analyses (e.g., Figures 5, 6, 8, 9, 12 in Nishiaki et al. 2012, which draws on earlier team research), illustrate these technological nuances. Raw material procurement studies conducted before 2010 involved surveys in the vicinity of Dederiyeh Cave, which located a number of small-scale flint outcrops, though none appeared to be associated with extensive Middle Palaeolithic quarrying activities.[15]

The **Natufian assemblages**, recovered from the entrance area of the cave, presented a distinct technological and typological profile. The toolkits included characteristic Natufian forms such as lunates (microlithic crescents, manufactured with both abrupt/semi-abrupt and Helwan retouch), triangles, and trapezes. Backed bladelets, glossed pieces (interpreted as sickle blades used for harvesting cereals or other plants), end scrapers, burins, and borers were also part of the assemblage.[5] Figures illustrating these tool types from Construction 1, based on pre-2010 excavations, were available in contemporary publications. The lithic raw materials utilized by the Natufian occupants included a commonly found dark brown flint, often referred to as "chocolate" flint, and a less common reddish-brown flint. Both were fine-grained, and pre-2010 analyses suggested they might be of non-local origin, with these materials being particularly favored for the manufacture of lunates.[5] The core reduction strategy during the Natufian occupation was clearly geared toward the systematic production of blades and bladelets, with single platform core types predominating in the assemblage.[11]

Faunal remains were consistently recovered from various cultural layers. Middle Palaeolithic faunal assemblages were found in association with both the Neanderthal remains and their lithic tools, providing context for their subsistence activities, although specific species lists and detailed taphonomic analyses from pre-2010 are not extensively detailed in the readily available synthesized sources.[1] The Natufian layers, particularly the deposits within structures like Construction 1, also contained faunal remains, indicating the exploitation of animal resources by these later occupants.[5]

Beyond lithics and fauna, the Natufian dwelling pits in the entrance area yielded a variety of **other artifacts**. These included numerous tooth-shell beads (indicative of personal adornment), incised bone and stone items (possibly also for adornment or symbolic purposes), ground stone tools (such as pestles and mortars, likely for processing plant foods), bone tools (awls, points), and distinctive bone or horn-core sickle handles, which would have held the chert sickle blades.[5]

2.6. Chronology: Pre-2010 Dating of Dederiyeh Cave

The chronological framework for the occupations at Dederiyeh Cave was progressively established through various dating methods applied to materials recovered before 2010.

For the **Middle Palaeolithic** sequence, Akazawa and colleagues, in a 2004 report, provided six preliminary radiocarbon dates for Layers 2 and 3. These layers are situated high in the

stratigraphic sequence of the Mousterian deposits in the chimney area. The dates obtained ranged from 48,100 ± 1200 to 53,600 ± 1800 years BP.[13] It was noted, however, that the specific layers where the Dederiyeh 1 child (Layer 11) and the Dederiyeh 2 child (Layer 3, but in a different area/context than the dated Layers 2-3) were found had not been absolutely dated by the time of this 2004 report. Nevertheless, a chronological link to the Mousterian levels of other significant Levantine sites, such as Kebara and Amud caves, was suggested based on strong similarities in the lithic industries.[13]

The **Epipalaeolithic (Natufian)** occupation in the entrance area received more precise chronological placement before 2010. Fourteen radiocarbon dates were obtained from different charred timber samples recovered from Construction 1, one of the Natufian dwelling structures. These dates, reported by Yoneda and colleagues in 2006 (and cited in subsequent pre-2010 publications, e.g.[5]), were remarkably consistent. They all fell within a narrow range, between 10,895 ± 60 and 11,060 ± 65 uncalibrated years BP. The weighted mean value for this series of dates was calculated as 10,950 uncalibrated years BP, which corresponds to approximately 11,000 calibrated years BP.[5] This suite of dates provided a firm and reliable chronological anchor for this particular phase of Natufian occupation at Dederiyeh.

For the **Lower Palaeolithic (Yabrudian)** layers, no specific absolute dates obtained directly from Dederiyeh Cave are provided in the pre-2010 synthesized sources available. However, their stratigraphic position, underlying the extensive Middle Palaeolithic (Mousterian) deposits, clearly indicates a greater antiquity. General chronologies for the Yabrudian culture in the Levant place it within the later part of the Middle Pleistocene. Some pre-2010 accounts mention the beginning of settlement at Dederiyeh as early as 400,000 years ago [2]; this figure likely refers to these early Yabrudian occupations, although the precise basis for this specific pre-2010 chronological estimate for Dederiyeh's Yabrudian is not detailed in the available snippets.

3. Other Palaeolithic Caves in the Afrin Region: Insights from Pre-2010 Surveys

While Dederiyeh Cave became the most extensively studied Palaeolithic site in the Afrin region prior to 2010, initial reconnaissance work had indicated a broader prehistoric landscape dotted with other potentially significant cave and open-air localities.

3.1. The 1987 Afrin Valley Reconnaissance Survey: Overview and Key Identifications

In 1987, a joint Syria-Japan archaeological mission undertook a reconnaissance survey specifically targeting the Afrin Valley to identify Palaeolithic sites.[1] This survey proved fruitful, locating what was described as "a dozen Palaeolithic caves" [1], thereby highlighting the rich potential of the area for prehistoric research. The results of this survey, including a map showing the distribution of some of these newly identified sites, were subsequently published, for instance, in an article by Akazawa and colleagues in the 1995 volume of *Paléorient*.[9] This map (Figure 1 in the 1995 *Paléorient* article) stands as a key pre-2010 source document for understanding the distribution of these other Palaeolithic sites in the Afrin region.

3.2. Qartal Cave

Qartal Cave was one of the sites identified during the 1987 survey.[9] Based on the surface collections and initial assessment at that time, its cultural attribution, as reported before 2010, was to the Levantine Mousterian period.[9] Beyond this identification and cultural assignation,

no further details regarding any subsequent excavation, specific artifact types, or features from Qartal Cave prior to 2010 are available in the synthesized research materials consulted for this report.[9]

3.3. Hammam Caves and Hammam Open-Air Site

The 1987 survey also identified several Palaeolithic sites associated with the name "Hammam" in the Afrin Valley.[9] These included:

- **Hammam Cave No. 1:** Attributed to the Upper Palaeolithic period based on pre-2010 survey data.[9]
- **Hammam Cave No. 2:** Attributed to the Levantine Mousterian period.[9]
- **Hammam Cave No. 3:** Also attributed to the Upper Palaeolithic period.[9]
- **Hammam Open-Air Site:** Identified as a Levantine Mousterian locality.[9] Similar to Qartal Cave, detailed information concerning excavations, specific artifact assemblages, or notable features for any of these Hammam sites, beyond their initial identification and cultural period attribution from the 1987 survey, was not readily available in the pre-2010 synthesized literature reviewed.[9]

3.4. Dederiyeh Cave No. I (as distinct from the main Dederiyeh Cave in some survey lists)

The 1987 survey map also listed a site designated as "Dederiyeh Cave No. I".[9] This site was culturally attributed to the Upper Palaeolithic period in pre-2010 reports.[9] This designation suggests either another, perhaps smaller, cave locality in the vicinity of the main Dederiyeh Cave, or a specific, distinct area within the larger Dederiyeh complex that yielded predominantly Upper Palaeolithic material, separate from the main excavation areas that focused on Middle Palaeolithic and later Natufian (Epipalaeolithic) deposits.

The 1987 survey, despite primarily paving the way for the intensive and long-term excavation of the main Dederiyeh Cave, was thus instrumental in revealing a broader Palaeolithic landscape within the Afrin Valley. The identification of sites like Qartal Cave and the various Hammam localities, with occupations attributed to both the Middle and Upper Palaeolithic, indicated that Dederiyeh was not an isolated prehistoric phenomenon. Instead, it was part of a wider regional settlement pattern used by hominin groups across different phases of the Palaeolithic.[9] This pre-2010 knowledge, even if based largely on surface surveys for these other sites, painted a picture of a valley that was repeatedly visited and inhabited.

However, the relative scarcity of detailed pre-2010 excavation reports or substantive findings from Qartal Cave and the Hammam sites, beyond their initial survey attributions, is notable when contrasted with the wealth of information emerging from Dederiyeh Cave during the same period.[9] This disparity suggests that, prior to 2010, Dederiyeh Cave had overwhelmingly become the central focus of Palaeolithic research efforts and resource allocation in the Afrin region. The significant early discoveries at Dederiyeh, particularly the Neanderthal remains, likely attracted the majority of subsequent research investment, potentially overshadowing other promising localities identified in the initial survey phase.

Table 3: Palaeolithic Cave and Open-Air Sites in the Afrin Valley Identified in Pre-2010 Surveys (Excluding Main Dederiyeh Cave Excavation Loci)

Site Name	Survey/Year Identified	Attributed Cultural Period(s) (Pre-2010)	Source of Information (e.g., Akazawa et al. 1995 map)
Qartal Cave	1987 Syria-Japan Mission Survey	Levantine Mousterian	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]
Hammam Cave No. 1	1987 Syria-Japan Mission Survey	Upper Palaeolithic	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]
Hammam Cave No. 2	1987 Syria-Japan Mission Survey	Levantine Mousterian	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]
Hammam Cave No. 3	1987 Syria-Japan Mission Survey	Upper Palaeolithic	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]
Hammam Open-Air Site	1987 Syria-Japan Mission Survey	Levantine Mousterian	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]
Dederiyeh Cave No. I	1987 Syria-Japan Mission Survey	Upper Palaeolithic	Akazawa et al. 1995, *Paléorient* (Fig. 1) [9]

4. Synthesis: The Caves of Afrin in the Broader Levantine Palaeolithic Context (Pre-2010 Perspectives)

The archaeological investigations conducted in the caves of the Afrin region, particularly at Dederiyeh Cave, provided substantial contributions to the broader understanding of the Levantine Palaeolithic from the perspective of pre-2010 scholarship.

The discovery of Neanderthal remains at Dederiyeh, especially the well-preserved child burials, significantly impacted the understanding of Neanderthal geographic range and behavior. These finds firmly extended the known presence of Neanderthals into the northern Levant, a region previously less understood in terms of Neanderthal occupation compared to the southern Levant.[1] Furthermore, the evidence for intentional burial practices at Dederiyeh, characterized by specific body positioning and the inclusion of items like a stone slab and a flint tool with the Dederiyeh 1 child [7], directly fueled pre-2010 discussions and debates regarding Neanderthal symbolic capacities and mortuary rituals. These findings resonated with, and added a crucial northern Levantine dimension to, similar evidence from other key Neanderthal sites in the Levant, such as Kebara and Amud, as well as numerous sites across Europe.

The cultural sequences unearthed at Dederiyeh Cave were instrumental in demonstrating a degree of cultural commonality across the wider Levantine Palaeolithic landscape. Discoveries indicated that specific cultural entities and technological traditions—such as the Yabrudian, particular facies of the Mousterian, and the Natufian—which had been previously well-documented and primarily associated with sites in the south-central Levant, were also clearly present at the northern end of the Levant, in the Afrin region.[1] This effectively testified to shared cultural traditions and potentially interconnected populations over a vast geographical expanse during different Palaeolithic periods. The pre-2010 research from Afrin's caves, spearheaded by the Dederiyeh excavations, was thus instrumental in solidifying the concept of the Levant as a continuous zone of hominin occupation and cultural interaction

during the Middle Palaeolithic, rather than a geographically fragmented landscape. These findings helped to connect the archaeological records of Anatolia to the north with those of the southern Levant.

Simultaneously, the data emerging from Dederiyeh before 2010 was also beginning to contribute to a more nuanced understanding of regional cultural variability within the Levantine Palaeolithic. The specific characteristics of the Dederiyeh assemblages were seen as potentially reflecting adaptations to the ecological settings of the northern Levant, which differ from those further south and lie closer to the Anatolian mountains.[1]

The geographical location of the Afrin region, and Dederiyeh Cave specifically, at the northern terminus of the Dead Sea Rift system, positioned it as a potential corridor, or perhaps a northernmost settled area, for hominin populations and cultural influences moving through or expanding within the Levant.[8] The pre-2010 findings strongly supported the view of the Afrin Valley as an integral and dynamic part of the wider Levantine zone of hominin occupation, adaptation, and interaction throughout the Palaeolithic. Moreover, the presence of well-developed Natufian settlements, featuring sophisticated semi-subterranean structures like those documented in the entrance area of Dederiyeh Cave and dated to around 11,000 calibrated years BP [5], significantly extended the known geographic range of these complex late Epipalaeolithic adaptations northward. This discovery challenged any prevailing notions that the core Natufian phenomenon, with its hallmarks of increasing sedentism and social complexity among hunter-gatherers, was strictly confined to the southern Levant. It suggested that the socio-economic transformations characteristic of the Natufian were more widespread, reaching into and adapting to the woodland environments of the northern Levant.

5. Conclusion: State of Knowledge on Afrin's Caves Prior to 2010

Prior to 2010, archaeological research focused on the caves of the Afrin region had substantially advanced the understanding of human prehistory in the northern Levant. The primary contributions stemmed overwhelmingly from the intensive, multi-season excavations at Dederiyeh Cave. This site yielded a remarkably long and detailed cultural sequence, spanning the Lower Palaeolithic (Yabrudian), multiple phases of the Middle Palaeolithic (Levantine Mousterian), and the Epipalaeolithic (Natufian). The discovery of significant Neanderthal remains, most notably the Dederiyeh 1 and Dederiyeh 2 child burials, provided invaluable insights into Neanderthal anatomy, growth patterns, mortuary practices, and symbolic behavior. These findings, all emerging from pre-2010 research, were pivotal in shaping contemporary discussions about Neanderthal capabilities and their place in human evolution. Beyond Dederiyeh, the 1987 reconnaissance survey had identified other Palaeolithic cave and open-air sites in the Afrin Valley, such as Qartal Cave and the Hammam sites. While these localities remained largely unexcavated or their findings unpublished in detail before 2010, their identification served to broaden the known prehistoric occupational landscape of the Afrin region.

From the perspective of pre-2010 scholarship, the caves of Afrin, with Dederiyeh at the forefront, had firmly established the region as a key area for Palaeolithic research. They provided crucial, tangible evidence for Neanderthal occupation, adaptation, and complex behaviors at the northern fringes of their known Levantine range. Dederiyeh, in particular,

offered a valuable long-term record of human presence, allowing for the study of cultural continuity and change from the Lower Palaeolithic through to the Epipalaeolithic within a single, well-stratified locality. The research conducted underscored the interconnectedness of the Levantine Palaeolithic cultural sphere, demonstrating shared traditions and technologies across considerable distances.

Despite these significant advancements, the state of knowledge as of 2009 also presented certain limitations and pointed towards future research directions. While Dederiyeh Cave had been the subject of extensive and fruitful study, many of the other Palaeolithic sites identified in the Afrin region awaited detailed investigation. The pre-2010 research, therefore, while groundbreaking in its focus on Dederiyeh, also highlighted a geographical concentration of intensive investigation. This disparity between the deep knowledge gained from one principal site and the survey-level understanding of other localities implicitly pointed towards a vast, largely untapped potential for future Palaeolithic research across the wider Afrin region. The "dozen Palaeolithic caves" noted in the 1987 survey hinted that many more chapters of Afrin's deep human history were awaiting discovery and elucidation. Continued research was anticipated to further refine chronologies for all periods, elaborate on subsistence strategies and paleoenvironments, and explore in greater detail the nuances of cultural interactions and hominin adaptations within this critical northern Levantine corridor.

6. Works Cited

- Abdul-Salam, A., Akazawa, T., & Muhesen, S. (1988). *Survey of Paleolithic Sites in the Afrin Region, Northern Syria: A Preliminary Report*. (Note: Specific publication venue for this 1988 survey report, cited by Akazawa & Nishiaki in *Quaternary of the Levant* [1], needs to be confirmed from primary sources if available, otherwise cited as per its mention in later works).
- Akazawa, T., & Muhesen, S. (Eds.). (2002). *The Neanderthal Burials: Excavations of the Dederiyeh Cave, Afrin, Syria*. Kyoto: International Research Center for Japanese Studies.
- Akazawa, T., Kanjo, Y., Nishiaki, Y., Kondo, O., Muhesen, S., & Ishida, H. (2009). The 2007–2008 seasons' excavations at Dederiyeh Cave, Afrin, Northwest Syria. *Chronique Archéologique en Syrie*, 4, 31–38.
- Akazawa, T., Muhesen, S., Dodo, Y., Kondo, O., Mizoguchi, Y., Abe, Y., Nishiaki, Y., Ohta, S., Oguchi, T., & Haydal, J. (1995). Neanderthal infant burial from the Dederiyeh Cave in Syria. *Paléorient*, 21(2), 77–86.
- Akazawa, T., Muhesen, S., Ishida, H., Kondo, O., & Griggo, C. (1999). New discovery of a Neanderthal child burial from the Dederiyeh Cave in Syria. *Paléorient*, 25(2), 129-142.
- Akazawa, T., Nishiaki, Y., & Aoki, K. (2004). (Report on Dederiyeh radiocarbon dates). (Note: This specific 2004 publication by Akazawa et al. concerning radiocarbon dates, referenced in Millard 2008 [13] and by extension in [13], requires full bibliographic details from primary sources if available. The snippets refer to its content rather than providing a full citation).
- Dederiyeh Cave. (n.d.). In *Wikipedia*. Retrieved. (Arabic Wikipedia page [7] citing Encyclopedia Arabica).
- Kondo, O., Ishida, H., Yoneda, M., Nishiaki, Y., Nakata, H., Aoki, M., & Akazawa, T. (2006).

Excavation of Dederiyeh cave in Syria: Its contribution to paleoanthropology in West Asia. In *Collected works for The 40th anniversary of Yuanmou Man discovery and the international conference on Palaeoanthropological studies* (pp. 261–268). Kunming: Yunnan Science & Technology Press.

- Nishiaki, Y., Kanjo, Y., Akazawa, T., & Muhesen, S. (2009). Newly discovered Late Epipalaeolithic lithic assemblages from Dederiyeh Cave, the northern Levant. In E. Healey, S. Campbell, & O. Maeda (Eds.), *The State of the Stone: Terminologies, Continuities and Contexts in Near Eastern Lithics. Studies in Early Near Eastern Production, Subsistence, and Environment 13* (pp. 119-128). Berlin: ex oriente. (This publication [5] itself cites earlier pre-2010 works by Nishiaki et al. 2005, 2006a, 2006b and Yoneda et al. 2006 for specific Natufian data).
- Oguchi, T., & Fujimoto, K. (2002). Geomorphological Setting and Sediments of Dederiyeh Cave. In T. Akazawa & S. Muhesen (Eds.), *The Neanderthal Burials: Excavations of the Dederiyeh Cave, Afrin, Syria* (pp. 19-30). Kyoto: International Research Center for Japanese Studies. (Cited in [1]).
- Sawada, J., Kondo, O., Nara, T., Dodo, Y., & Akazawa, T. (2004). Bone histomorphology of the Dederiyeh 1 Neanderthal child. *Anthropological Science*, 112(3), 247-261.
- Yoneda, M., Nishiaki, Y., Kondo, O., Akazawa, T., & Muhesen, S. (2006). Radiocarbon Dates from the Natufian Deposits of Dederiyeh Cave, Northwest Syria. (Note: This 2006 publication by Yoneda et al. is cited in Nishiaki et al. 2009 [5] for the Natufian dates. Full bibliographic details would be found in the Nishiaki et al. 2009 reference list).

Works cited

1. The Palaeolithic Cultural Sequence of Dederiyeh Cave, Syria ..., accessed May 11, 2025, https://www.cambridge.org/core/books/quaternary-of-the-levant/palaeolithic-cultural-sequence-of-dederiyeh-cave-syria/E12062D5E4545D598D5F958065150B5A
2. HISTORY OF ARCHAEOLOGICAL RESEARCHES IN SYRIA FOR PREHISTORIC SITES - Экономика и социум, accessed May 11, 2025, https://www.iupr.ru/_files/ugd/b06fdc_db4ff3f362044b469aa50e5941bc3cad.pdf?index=true
3. The plan of the Dederiyeh cave show ing the ex ca vated ar eas - ResearchGate, accessed May 11, 2025, https://www.researchgate.net/figure/The-plan-of-the-Dederiyeh-cave-show-ing-the-ex-ca-vated-ar-eas_fig1_285652519
4. G11 Dederiyeh Cave, a base camp of Neanderthals in the northern Levant, accessed May 11, 2025, https://www.um.u-tokyo.ac.jp/UMUTopenlab/en/library/g_11.html
5. (PDF) Newly discovered Late Epipalaeolithic lithic assemblages from Dederiyeh Cave, the northern Levant - ResearchGate, accessed May 11, 2025, https://www.researchgate.net/publication/293309831_Newly_discovered_Late_Epipalaeolithic_lithic_assemblages_from_Dederiyeh_Cave_the_northern_Levant

6. (PDF) Archaeology in karst areas - ResearchGate, accessed May 11, 2025, https://www.researchgate.net/publication/304908046_Archaeology_in_karst_areas
7. مغارة الديدرية - ويكيبيديا, accessed May 11, 2025, https://ar.wikipedia.org/wiki/%D9%85%D8%BA%D8%A7%D8%B1%D8%A9_%D8%A7%D9%84%D8%AF%D9%8A%D8%AF%D8%B1%D9%8A%D8%A9
8. The Dederiyeh Neanderthal, accessed May 11, 2025, http://www.kochi-tech.ac.jp/akazawa/english/1.html
9. Neanderthal infant burial from the Dederiyeh Cave in Syria - ResearchGate, accessed May 11, 2025, https://www.researchgate.net/publication/251028728_Neanderthal_infant_burial_from_the_Dederiyeh_Cave_in_Syria
10. New Discovery of a Neanderthal Child Burial from the Dederiyeh Cave in Syria, accessed May 11, 2025, https://www.researchgate.net/publication/251028760_New_Discovery_of_a_Neanderthal_Child_Burial_from_the_Dederiyeh_Cave_in_Syria
11. Cores from Construction 1 of the Dederiyeh cave. 1-2: Semi-flaked... - ResearchGate, accessed May 11, 2025, https://www.researchgate.net/figure/Cores-from-Construction-1-of-the-Dederiyeh-cave-1-2-Semi-flaked-single-platform-cores_fig2_293309831
12. Bone histomorphology of the Dederiyeh Neanderthal child - J-Stage, accessed May 11, 2025, https://www.jstage.jst.go.jp/article/ase/112/3/112_3_247/_html/-char/ja/
13. Neanderthal burials: Excavation of the dederiyeh cave, Syria ..., accessed May 11, 2025, https://www.researchgate.net/publication/292525267_Neanderthal_burials_Excavation_of_the_dederiyeh_cave_Syria
14. List of Neanderthal sites - Wikipedia, accessed May 11, 2025, https://en.wikipedia.org/wiki/List_of_Neanderthal_sites
15. (PDF) The temporal variability of Late Levantine Mousterian lithic ..., accessed May 11, 2025, https://www.researchgate.net/publication/285652519_The_temporal_variability_of_Late_Levantine_Mousterian_lithic_assemblages_from_Dederiyeh_Cave_Syria