The central Levantine corridor: The Paleolithic of Lebanon

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The central Levantine corridor: The Paleolithic of Lebanon

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ABSTRACT

Throughout history and prehistory, the Levant has played the role of a land-bridge connecting continents and human populations and cultures. This role began with the early expansions of hominins out of Africa during the Lower Pleistocene and continued through the Middle and Upper Pleistocene when the region was occupied alternatingly (and possibly at times simultaneously) by Neandertals and anatomically modern humans dispersing from Europe and Africa respectively. At the end of the Pleistocene, the Levant formed a corridor through which modern humans crossed into Europe. Yet, even though the Levant is an extremely important region for paleoanthropological research, major gaps in such research in this region remain. Unlike its southern part, the Paleolithic record of an important area of its central part, i.e., Lebanon, remains virtually unexplored, with the exception of a handful of surveys and small number of excavated sites. In spite of their relative paucity, these surveys have identified hundreds of potential sites spanning all periods of the Paleolithic. Moreover, the few excavations illustrate the importance of Lebanese sites in enhancing our understanding of later human evolution. The site of Ksar Akil, for example, holds evidence for some of the earliest associations of modern human fossils with early -and possibly also Initial- Upper Paleolithic assemblages. This paper presents a summary of the Lebanese Paleolithic record.

1. Introduction

Lebanon is situated in the heart of the Levant, a strategic region which connects Africa, Europe, and Asia. Over the course of more than a million years, the Levant formed a vital land-bridge for hominin migrations and dispersals across these continents. Levantine sites have documented the early migrations of hominins out of Africa (Hours, 1976; Vandermeersch, 1981; Jelinek, 1982), the dispersals of Neandertals into western Asia (Garrod and Bate, 1937; Bar-Yosef et al., 1992; Kimbel et al., 1995; Akazawa et al., 1999), and the eventual expansion of modern humans out of Africa (Stringer and Bergman, 1989; Hershkovitz et al., 2015). Thus, this region has the potential to provide valuable information on various milestones of later hominin evolution. Despite this potential, and despite the various attempts made to explore the Paleolithic record of Lebanon during the first half of the 20th century, relatively little is known about the early prehistoric occupation of this country. This paper provides a short overview of the geography and geology of Lebanon and summarizes the available information on the Lebanese Paleolithic.

2. The geography of Lebanon

Lebanon is a small country with a surface area of 10,452 km^2 located on the eastern edge of the Mediterranean Sea. The Lebanese landscape can be divided into four NNE-SSW aligned zones. Moving eastward, these zones are: 1) the coastal strip, 2) Mount Lebanon, 3) the Bekaa Valley, and 4) the Anti-Lebanon Mountain Range (Fig. 1). The Lebanese coastal strip runs parallel to the sea with a coast line of 225 km (Walley, 1998). This strip is narrow with widths generally extending between a few hundred meters to a maximum of 5 km in the northernmost part. Lebanon has a very narrow continental shelf which has a maximum width of 10 km and then drops abruptly to depths of over 1500 m (Walley, 1997). The second zone is that of Mount Lebanon, a mountain range with elevations mostly between 1000 and 2000 m, but reaching up to 3088 m at Qornet es Saouda, its highest peak (Walley, 1997). To the east of Mount Lebanon is the Bekaa Valley. This interior plain is 8–10 km wide with an altitude above 850 m almost everywhere (Walley, 1997). The Bekaa is often considered to be a continuation of the East African Rift Valley; yet, this remains controversial. It seems

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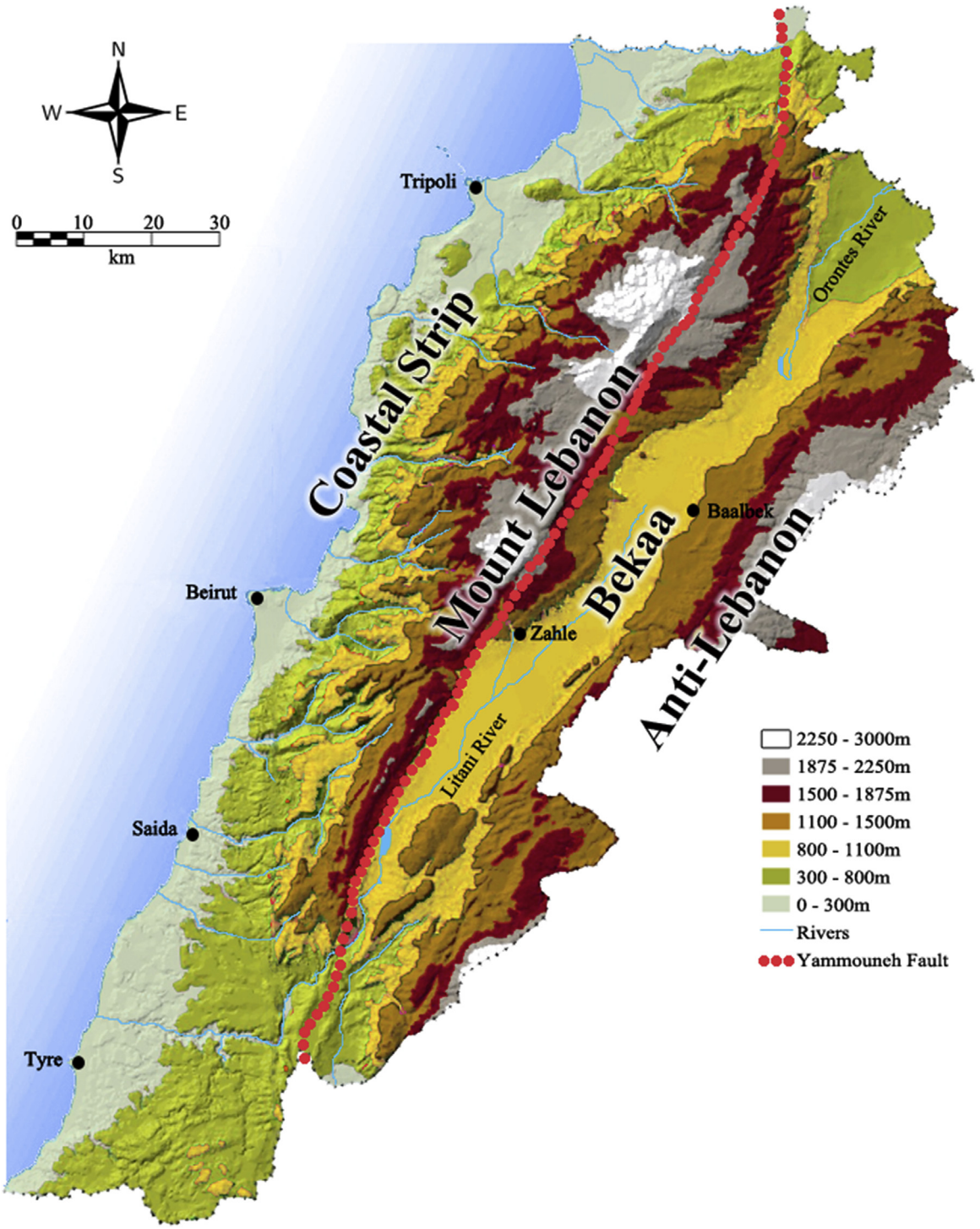

Fig. 1. Geography of Lebanon.

that in Lebanon, the Dead Sea Fault, i.e., the northernmost part of the Great Rift, is divided into several branches, with the main branch being the Yammouneh Fault which runs along the western margin of the Bekaa (Daëron et al., 2004). Thus, even though the Bekaa Valley has not really been formed by faults like a true rift, it has been greatly modified by faulting and represents a strike-slip valley. The fourth and easternmost zone is the Anti-Lebanon Mountain chain which forms the nation's natural and political boarder with Syria. Mount Hermon is this chain's highest peak reaching 2814 m (Walley, 1997).

Another important geographical feature of Lebanon that should be mentioned is its numerous springs and rivers which give the country its abundant forests. The rivers of Lebanon can be divided into two groups. The first consists of the rivers in the Bekaa, the biggest rivers of Lebanon. These are the Litani River, which flows south and eventually cuts through to the Mediterranean Sea close to the city of Tyre; and the Orontes (Al Assi) River which flows northwards into Syria (Fig. 1). The second group consists of the

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many east-west flowing rivers that drain Mount Lebanon from rainfall (which averages over a meter per year) and the melting snow. Most of these rivers cut into steep gorges. This river water flow has helped carve numerous caves in the predominantly limestone rocks of the Lebanese mountains. Many of these caves were occupied in antiquity as well as in modern times. It should be mentioned that these rivers also play an important role in redepositing lithic raw material from the high mountains which would have made it more widespread and easily accessible for hominin populations.

3. The geology of Lebanon

The vast majority of rocks in Lebanon are sedimentary and more specifically limestone with limited typological variability (Walley, 1997). The oldest surface rocks in Lebanon date back to the Lower Jurassic. These are very thick marine limestone deposits reaching up to 2–2.5 km and occurring in three main locations, two in Mount Lebanon, in Metn and Kesrouane and in the Chouf and Barouk areas, and one in the Anti-Lebanon range, in its central southern region (Walley, 1997) (Fig. 2). But, by far, the most abundant rocks in Lebanon are the second oldest Lower-Middle Cretaceous marine limestones which generally overly fluvio-deltaic sandstone deposits from the same time period (Walley, 1997) (Fig. 2). The Late Cretaceous Period in Lebanon saw very high sea levels and the deposition of sequences of pale fine limestone and chalks (Walley, 1998). These deposits contain the world-famous fossil “fish beds”. This time period also witnessed the first uplifting of the Lebanese mountain ranges, Mount Lebanon and Anti-Lebanon, as a result of the compressional effects caused by the Eurasian and African-Arabian plates starting to come close together (Walley, 1998). This uplifting continued, but became more substantial in the Late Eocene and Oligocene Epochs. Another major uplift event began around 10 million years ago (Ma) with the movement along the Dead Sea Fault system. The Miocene dated deposits in Lebanon are restricted to a few isolated localities of limestone on the coast and to “a sequence of clastics with calcareous breccias and conglomerates, sandy silty marls, lignites, limestones and lacustrine marls” in the Bekaa (Walley, 1997) (Fig. 2). The lacustrine and fluvial deposits appear to have persisted in the Bekaa into the Holocene (Walley, 1997). During the Pleistocene, the climatic fluctuations in Lebanon followed the general pattern of glacial/interglacial fluctuations with cold conditions prevailing during glacial times and warm conditions prevailing during interglacial times (Gasse et al., 2011). Yet, at the beginning of the Pleistocene, global climatic changes led to the prevalence of generally wetter conditions in Lebanon with a drying trend taking place during marine isotope stages (MIS) 4–2 (Gasse et al., 2011). Lake deposits in the southern part of Bekaa indicate that a large lake sporadically covered parts of the area during that time. Glacial and periglacial deposits occur at high altitudes suggesting that glaciers covered at least the tops of the highest peaks during the glacial episodes of the Ice Age, especially during the Last Glacial Maximum (Walley, 1997; Gasse et al., 2011). Yet, the extent of these glaciers remains uncertain (Walley, 1997). Coastal deposits of soils and sand dunes dating to the Quaternary Period are present on the coast (Sanlaville, 1977).

Aside from sedimentary rock, Lebanon has few areas with igneous rocks, namely basalt. These occur in a few restricted locations in Mount Lebanon as well as in two other regions, in the extreme north (Akkar) and extreme southeast (around Mount Hermon) of the country (Walley, 1998) (Fig. 2). The Mount Lebanon basalts were deposited by volcanic vents that developed during the Jurassic and Cretaceous periods as a result of tectonic activity in the area (Mouty et al., 1992; Walley, 1998). The basalts of the Akkar and Mount Hermon areas were deposited within the last 10 Ma by volcanic activity in Homs and the Jebel ad-Druze and Golan areas of Syria; with the latter two persisting into the Holocene (Mouty et al., 1992).

Unfortunately, there are no proper studies on chert sources in Lebanon although it is believed that the best sources of raw material are concentrated in the areas of Ras Beirut and Jub Jannine in the south (Yazbeck, 2004, 2007).

4. History of Paleolithic research in Lebanon

The earliest records of prehistoric discoveries in Lebanon date back to the mid-1800s. These records were kept by several travelers and diplomats who visited the country during that time, such as the French scientist Paul-Émile Botta (1833), the French geologist and paleontologist Louis Lartet (1865), and the Duke of Luynes Charles Honoré d'Albert (Haïdar-Boustani, 2009). Towards the end of the 19th century, prehistoric research in Lebanon really took off with the Jesuit priests who were starting to establish their presence in the country then and who were well aware of the prehistoric discoveries taking place in France and other European countries at the time (Haïdar-Boustani, 2009). The first of these priests, Father Godefroy Zumoffen (1848–1928), is considered to be the founder of Lebanese prehistory. Father Zumoffen came to Lebanon in 1889 and was a professor at the Faculty of Medicine at the University of Saint Joseph (Haïdar-Boustani, 2009). His interest in prehistory led him to conduct many surveys and excavations in different areas of Lebanon. Zumoffen's work did not only focus on the location of sites, but he also collected, described, and classified flint tools and prehistoric animal remains (Haïdar-Boustani, 2009). Additionally, as a result of his interest in geology, he noted the potential raw material sources for the lithics. He is also credited with the first discovery of prehistoric human remains [now believed to date to the early Holocene (Vallois, 1957)] in Lebanon at the cave of Antelias (Zumoffen, 1893b). In 1900, Zumoffen published the first book on the prehistory of Lebanon, *La Phénicie avant les Phéniciens*. Two other Jesuit priests worked at this early stage of Lebanese prehistoric research, Paul Bovier-Lapierre (1873–1950), whose contribution was limited to a few surveys, and Raoul Desribes (1856–1940), who worked on several sites but is most famous for his excavations at the site of Minet El Dalieh - Ras Beirut (Haïdar-Boustani, 2009).

These early investigations into the prehistory of Lebanon were limited by low funding, difficulties in transportation, and the challenging working conditions under the Ottoman Empire and during World War I. After World War I, the Jesuit priests continued to take the lead in exploring Lebanese sites. Father Auguste Bergy (1873–1955) discovered many sites in Beirut and the Bekaa. Yet, with two priests in particular, Henri Fleisch (1904–1985) and Francis Hours (1921–1987), Lebanese prehistoric research opened-up to other disciplines and foreign researchers and saw many methodological advancements. Fleisch explored many different areas in Lebanon, the north (region of Batroun and Mazraat Kfardibian), the coast (Beirut and Naame), the south (region of Ain Ibil), and the southern Bekaa (Haïdar-Boustani, 2009). He applied geological techniques in the study of stone tools of Ras Beirut. Fleisch had particular interest in the coastal habitats and, through his work with the geomorphologist Paul Sanlaville, he provided the first stratigraphic correlation between lithic tools from coastal sites and the Quaternary geologic formations seen in these sites (e.g., Fleisch and Sanlaville, 1967, 1974). As for Francis Hours, he introduced more scientific methodology as well as the use of information technology to prehistoric research in Lebanon. His collaborations with the different international researchers gave prehistoric research in Lebanon a multidisciplinary aspect (Haïdar-

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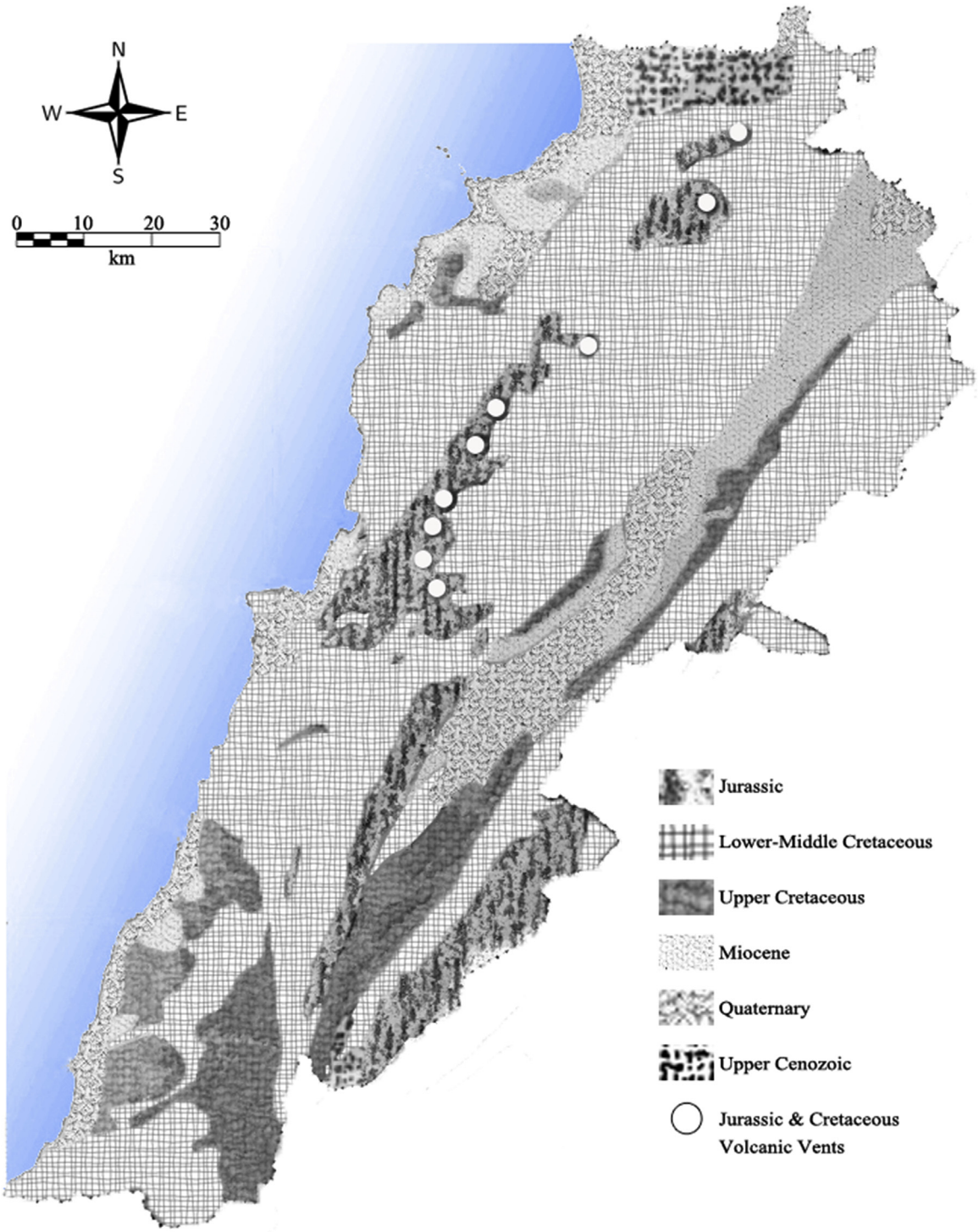

Fig. 2. Surface rock of Lebanon. Jurrasic: thick shelf limestone. Lower-Middle Cretaceous: fluvio-deltaic sandstones overlain by thick marine limestones. Upper Cretaceous: chalks and limestone. Miocene: limestone coasts, conglomerates and lake deposits in Bekaa. Quaternary: dunes and lake deposits. Upper Cenozoic: basaltic volcanics. Jurassic and Cretaceous: basalt vents. Modified from Fig. 1, Walley (1997) and Dubertret (1955).

Boustani, 2009). His work with geomorphologists in the Bekaa in particular opened new multidisciplinary perspectives (e.g., Besançon and Hours, 1970, 1971). Both Fleisch and Hours published extensively on Lebanese prehistory and participated in international meetings and conferences which introduced the prehistory of Lebanon to the world (see Haïdar-Boustani, 2009 for a complete list of Fleisch's and Hours' publications).

Aside from the Lebanon-based Jesuit priests, other foreign researchers also worked on the Paleolithic occupation of the country. All of this international work took place after World War II, with two notable exceptions. The first being the American Jesuits' Boston College expedition headed by Joseph G. Doherty, then a doctoral student at Cambridge University. Doherty, later accompanied by J. Franklin Ewing, also a doctoral student at the time, excavated at the

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famous site of Ksar Akil in 1937–1938 (Bergman et al., 2012). The second exception was the several surveys, as well as excavations (at the sites of Abu Halka in 1932–1933 and 1942–1943 and Ras Lados in 1945), conducted by the Swiss geologist Jean Haller during World War II (Copeland and Wescombe, 1965, 1966). After World War II, Ewing resumed excavations in Ksar Akil (1947–1948) (Ewing, 1947). Around the same time he also conducted excavations in Antelias Cave and Abri Bergy (Copeland and Wescombe, 1965). By the 1950s and 1960s, word about Lebanese prehistory had spread internationally. Dorothy Garrod spent some time in Lebanon and excavated in Ras el Kelb I in 1958, and along with British archaeologist Diana Kirkbride, resumed excavations in the caves of Adlun (Mugharet el Bezez and Abri Zumoffen) in 1958 and 1963 (Garrod and Henri-Martin, 1961; Garrod and Kirkbride, 1961; Garrod, 1962). American archaeologist Ralph Solecki and his Columbia University team conducted one season of excavation in El Masloukh in 1969 (which was directed by J. Skinner) (Solecki, 1982) and three seasons in Nahr Ibrahim I in the years 1969, 1970, and 1973 (Solecki, 1982). Between 1969 and 1975, excavations at Ksar Akil were reopened once again by French archaeologist Jacques Tixier (Tixier and Inizan, 1981). In addition to these different excavation campaigns, in the 1960s two major survey projects were conducted. The first was led by Lorraine Copeland (Copeland and Wescombe, 1965, 1966) and the second by a team from Tokyo University (Suzuki and Kobori, 1970). These surveys documented hundreds of sites, both new and previously known, all over the country with the hopes of future excavations.

Yet, these hopes were shattered by the Lebanese civil war which broke out in 1975 and lasted until 1990. During these 15 years, all Paleolithic fieldwork in Lebanon came to an end. Some researchers used this time to publish the results of their previous work in the country. Since then, Paleolithic research in Lebanon has been slowly recovering from this blow. The archaeological excavations that accompanied the rebuilding of the Beirut Central District in the 1990s included excavations of two Paleolithic sites: Beirut XIV (Place Debbas) in 1995 (Heinz and Bartl, 1997) and Beirut IX (Martyr's Square) in 1997 (Curvers and Stuart, 1997). In 2001, the Northern Anti-Lebanon highlands were the target of a new project initiated by A. Wasse (Council for British Research in the Levant) with the collaboration of the Lebanese Prehistory Museum at Saint Joseph's University (USJ) (Garrard et al., 2003). In 2002, Lorraine Copeland and Lebanese prehistoric archaeologist Corine Yazbeck published an update of the inventory of Stone Age sites in Lebanon, adding the new sites that were discovered and new information that was available on previously known sites since the publication of Copeland and Wescombe's inventory in 1965–1966 (Copeland and Yazbeck, 2002). Finally, between the years 2003–2008 the Qadisha Valley Project was conducted by a team from the University College London in collaboration with Corine Yazbeck (Garrard and Yazbeck, 2003, 2004, 2008). This project included surveys and excavations, and, even though most of the discovered prehistoric sites date to the Epipaleolithic and Neolithic periods, the surveys did reveal some artifacts dating to the different periods of the Paleolithic (Garrard and Yazbeck, 2008).

5. Lebanese Paleolithic record

The various researchers who had worked on the Paleolithic of Lebanon identified in total more than 200 Paleolithic sites. In spite of this large number, our understanding of the Lebanese Paleolithic remains limited. This is due to several reasons. First, only 19 sites have actually been excavated, and all these sites, with three exceptions, are located on the coast (see Appendix). Second, excavations in all of these 19 sites, with the exception of the two sites in Beirut excavated in the 1990s, were conducted before 1975 (with the majority before 1960) and were thus subjected to the methodologies of that time period which focused mostly on the collection and analyses of lithic assemblages. Aside from lithics, faunal and botanical remains were rarely collected and therefore information which is usually provided from such remains, e.g., on human subsistence, on paleoenvironment, etc, are basically nonexistent. Finally, there are very few radiometric dates available for the Lebanese sites. The sites are generally relatively dated through lithic assemblages' comparisons. However, geomorphological studies of the Lebanese coast and shorelines resulted in the establishment of a relative chronological framework that through the few available radiometric dates was linked to the marine isotope stages (Sanlaville, 1977, 1998, 2000).

5.1. Lower Paleolithic

A total of 46 sites with industries whose attribution to the Lower Paleolithic is almost certain have been located in Lebanon (Fig. 3). Sixteen more sites with possible, but not certain, Lower Paleolithic material have also been identified (Fig. 3). With two exceptions, the caves of Masloukh and Adlun II, all the identified sites from this period are open air sites located through surveys and surface collections. In addition, all these sites remain unexcavated with the exception of these two latter caves and the open air site of Jub Jannine II. Overall, information on the Lebanese Lower Paleolithic is fragmentary and incomprehensive and is almost exclusively available from the analyses of previously collected lithic assemblages (Yazbeck, 2004). Only very few, and thus not very informative, faunal and/or pollen samples have been recovered from the Lower Paleolithic levels of Adlun (Garrard, 1983), Masloukh (Gautier, 1970; Skinner, 1970), and Ras el Kelb IV (Copeland and Yazbeck, 2002). In addition, there are no absolute dates for this period. All chronologies are relative and are based either on associations of lithic industries or on the geomorphological studies conducted on the Lebanese coast (Sanlaville, 1977).

The oldest Paleolithic site known to date in Lebanon is Borj Qinnarit where a total of seventeen artifacts were discovered on a raised beach at 95 m above sea level (asl) (Hours and Sanlaville, 1972). These artifacts included "rolled, crude pebble-tools, flakes, choppers and cores", but no bifaces (Hours and Sanlaville, 1972; Copeland and Yazbeck, 2002). This assemblage is associated with the last phase of the Zaqrounian II transgression, which is dated to MIS 17 or 16 (Hours and Sanlaville, 1972; Sanlaville, 1977; Copeland and Yazbeck, 2002). Aside from Borj Qinnarit, three other sites in Lebanon are believed to have yielded non-bifacial industries: Ras Beirut II-*Cordon Littoral* (Copeland, 2003b), Bahsas (Wetzel and Haller, 1945; Copeland, 2003b), and possibly also the base of level C of Adlun II-Bezez Cave (Copeland, 1983, 2003b). These sites, however, are younger than Borj Qinnarit. The first two are raised beaches at 45 m asl and are correlated with the Jbailian II Transgression which has been dated to MIS 11 or MIS 9 (Sanlaville, 1977, 1998, 2000). The base of level C at Adlun II is located at around 16 m asl which coincides with the end of Jbailian II Transgression dated to MIS 8 (Sanlaville, 1977, 1998). The industry at these three sites is described as Tayacian (Copeland, 2003b). Aside from these sites, the bulk of the identified Lower Paleolithic sites in Lebanon have yielded Acheulean industries. The end of this period is marked by the Acheuleo-Yabrudian complex (Yazbeck, 2004).

5.2. Middle Paleolithic

Compared to the Lower Paleolithic, the Middle Paleolithic of Lebanon has received much more attention. Many more sites (a total of 131) with Middle Paleolithic industries have been identified (Fig. 4). In addition to these, 17 more might also contain Middle

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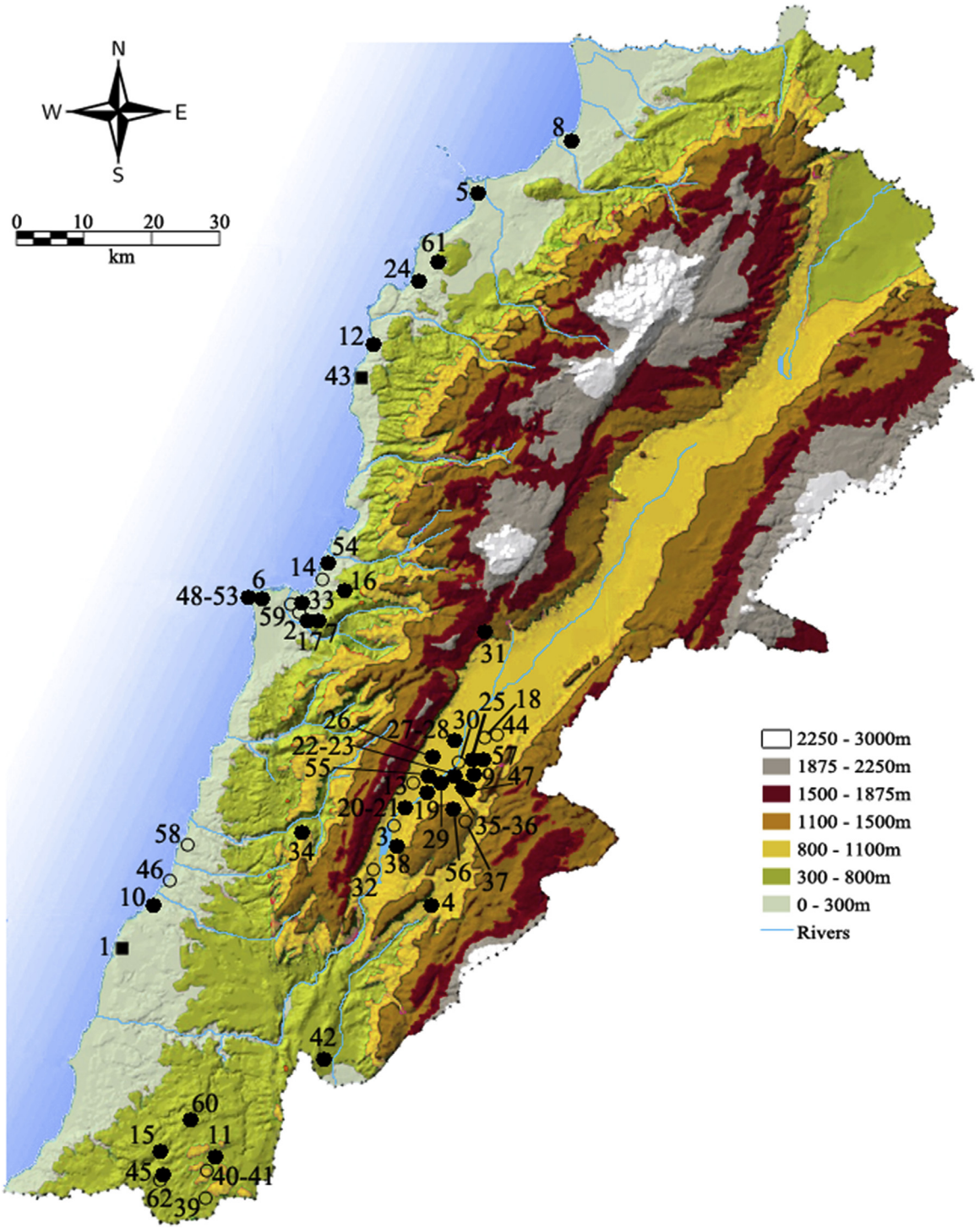

Fig. 3. Lower Paleolithic sites in Lebanon. Circles: open air sites. Squares: caves/rockshelters. Filled symbols: certain attribution. Unfilled symbols: uncertain attribution. Sites: 1. Adlun II (Bezez Cave)*, 2. Ain Cheikh, 3. Amlaq el Qatih, 4. Ard Saouda, 5. Bahsas, 6. Beirut IV (Furn Esh-Shebbak), 7. Beit Meri I, 8. Bibnin, 9. Birket Harizi, 10. Borj Qinnarit, 11. Chalaboun, 12. Dahr Ech-Chqif, 13. Dahr El Hassaneh, 14. Dbaye II, 15. Debel, 16. Dik El Mehdi I, 17. Dikwene I, 18. Ech-Cheberqa, 19. El Birke, 20–21. El Hamrat I, II 22–23. El Khaliye North and South, 24. El Marrouj, 25. Es-Slaiaa, 26. Es-Souan, 27–28. Ez-Zanbout I, II, 29. Hajjar Et-Tawil, 30. Haql al Mansoura, 31. Jebel Baniya, 32. Jebel Saad I, 33. Jedeideh I, 34. Jezzine, 35–36. Jub Jannine I, II*, 37. Kamed el Loz I, 38. Karaoun III (Ain el Barde), 39. Khallet El Hamra, 40–41. Khallet El Michte I, II, 42. Ma'ayan Baruck North, 43. Masloukh*†, 44. Mejdel Anjar, 45. Mseel El Hadd, 46. Nahr Zahrani, 47. Qataa Eliassi (Jebel Er-Ras), 48–53. Ras Beirut Ia (Ras Beirut I Slope Breccia), Ib (52 m Beach), II (Cordon Littoral), III (Depot A&B), III (Depot C), IV (Bergy's Trench) 54. Ras el Kelb IV, 55. Sahm Ech-Chaouk, 56. Sahm El Baidar, 57. Sahm El Baz, 58. Sidon II, 59. Sin el Fil, 60. Tibnine I, 61. Wadi Aabet, 62. Wadi Koura. (*) indicate excavated sites. (†) indicate that the site yielded hominin remains.

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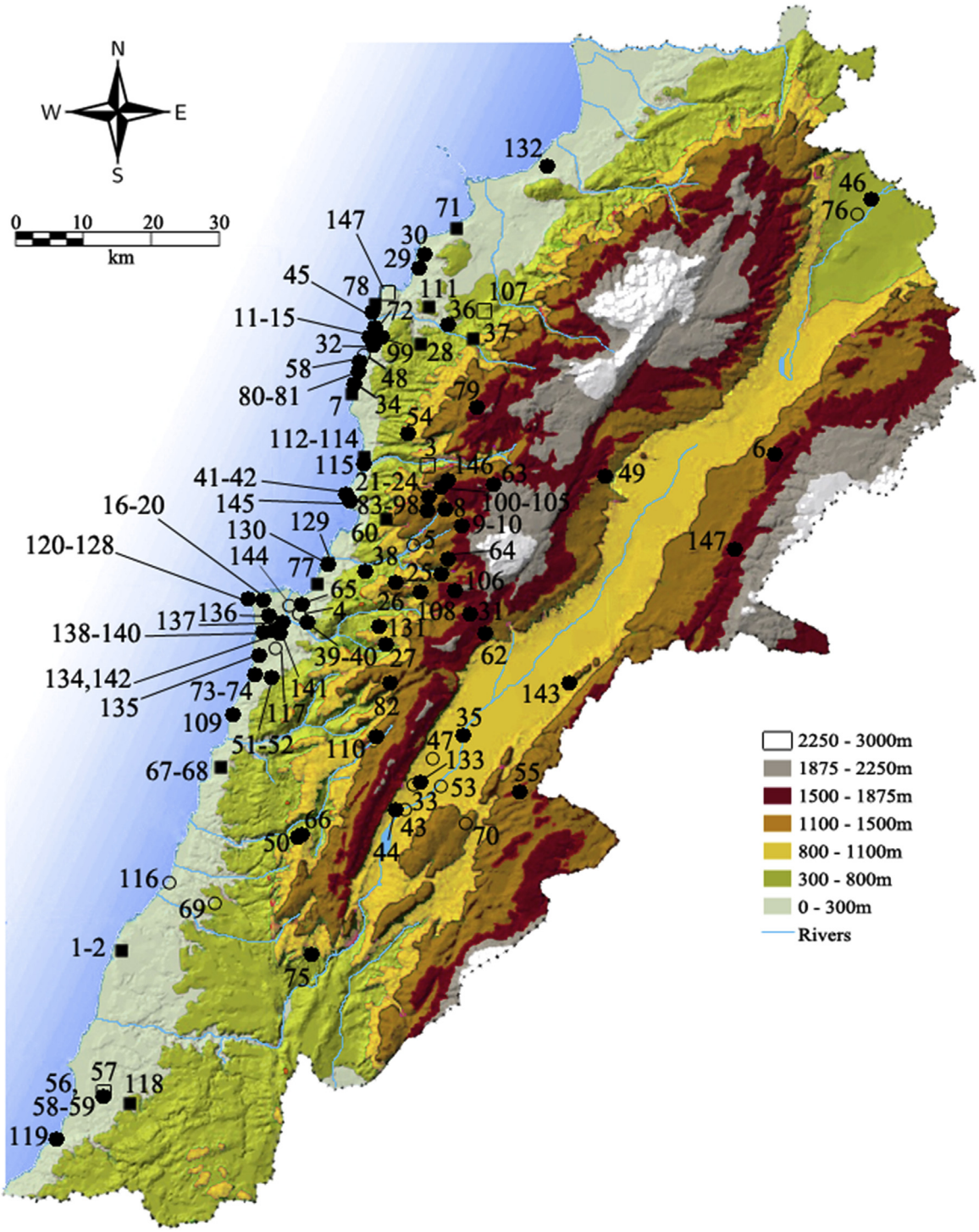

Fig. 4. Middle Paleolithic sites in Lebanon. Circles: open air sites. Squares: caves/rockshelters. Filled symbols: certain attribution. Unfilled symbols: uncertain attribution. Sites: 1–2. Adlun I (Abri Zumoffen)*, II (Bezez Cave)*, 3. Adonis Achtrout, 4. Ain Cheikh, 5. Ain El Kabou, 6. Ain Tinta, 7. Amchit (Mugharet Saleh), 8. Baatouta, 9–10. Baskinta I, II, 11–15. Batroun II, V, VI, VII, IX, 16–20. Beirut I (Minet el Hosn), IV (Furn Esh-Shebbak), V (Nahr Beirut), IX*, XIV*, 21–24. Beit el Mehdi I, II, III, IV, 25. Beit Qdiha, 26. Bikfaya I (Naas, Ghabie, Baharsaf), 27. Bmariam, 28. Boqsmaia, 29. Chekka Cement Works (Raz Chekka Henri, Chekka), 30. Chekka Jedeide, 31. Col of Zahle, 32. Dahr Ech-Chqif, 33. Dahr el Hassaneh, 34. Dahr el Mabour, 35. Dakoue, 36. Dar Baachtar, 37. Deir Billa, 38. Dik El Mehdi III, 39–40. Dikwene I, II, 41–42. Dqarine, Dqarine West, 43. El Hamrat I, 44. El Masqouaa I, 45. El Qareb, 46. El Quseir, 47. Es-Souan, 48. Fadeous, 49. Fleywe, 50. Ghour Ramle (Dahr el Ramle), 51–52. Habarjer I, II (Jouret Belloute), 53. Hajjar Et Tawil, 54. Hajoula, 55. Hammara, 56–59. Hannawiyeh I-IV, 60. Harajel I (Grotte de Nebaa al Mghara), 61. Harf El Mosri, 62. Jebel Baniya, 63. Jebel Mazloum, 64. Jebel Michmiche, 65. Jedeideh I, 66. Jezzine, 67–68. Jiye III, V (Souass Shelter), 69. Kafer Melki, 70. Kamed El Loz I, 71. Keoue Cave*, 72. Kfar Khollos, 73–74. Khalde III (Makhfar Ain Samake), IV (Naame North), 75. Khallet el Khazen I (Roueissat el Khalle or Ain Alaq), 76. Khibet Buseibis West, 77. Ksar Akil*, 78. Kubbah II, 79. Laklouk I, 80–81. Madfoun I, II, 82. Mansa'a El Hayate, 83–98. Mazraat Kafrdebbian I (Jebel Aassi), II (Ain Nosrani), III (Qanater), IV, V, VI (Jebel Hachem), VII (es-Souaki), VIII (Qalaat Fakhra), IX (Ain Gaoubeh), X, XI, XII, XIII, XIV, XV, XVI, 99. Mazraat Kamel, 100–105. Meyrouba I-VI, 106. Michmiche, 107. Moghr El Ahwal, 108. Mrouje, 109. Naame*, 110. Nabaa El Barouk, 111. Nahr El Joz (Keftoun), 112–115. Nahr Ibrahim I (Mugharet el Asfouriyeh)*, II, III, IV, 116. Nahr Zahrani, 117. Ourrouar III, 118. Qana, 119. Ras Al Biyada, 120–128. Ras Beirut Va (Bergy's plus 8), Vb (South Creek Trench), VI (North or Minel-ed-Dhalia), VII (South Creek), VIII (Bay of Pigeon Rock), IX (Depot facing cote 34), X (Bain Militaire), XIII (Field South of Pigeon Rock), XIV (AUB), 129–130. Ras El Kelb I*†, V, 131. Ras El Meten, 132. Ras Lados*, 133. Sahm El Jaras, 134–142. Sands of Beirut 1 (Bir Hassan), 3 (Khan Khalde), 4 (Mar Elias), 5 (Nahr Ghedir), 9 (Site 5, South of Shell Station), 10 (Site 6, East of Shell Station), 13 (Site 10, Tell aux Haches), 14 (Site 11, Haret Hraik), 15 (Site 12, East of Zone Militaire), 143. Serain, 144. Sin El Fil, 145. Tabarja, 146. Tannour, 147. Wadi Aarab Caves, 148. Wadi Jraibane (Nebi Sbat). (*) indicate excavated sites. (†) indicate that the site yielded hominin remains.

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Paleolithic material, but their attribution to this period remains uncertain (Fig. 4). Most of the identified Middle Paleolithic sites are open-air sites, with only a few caves and rock-shelters. And, just like the case for the Lower Paleolithic, most of these sites were identified through surveys and surface collections of lithic material and only 10 have been excavated (Fig. 4).

The analyses of Middle Paleolithic lithic assemblages, mostly from the excavated sites, show that the vast majority of Middle Paleolithic Lebanese lithics were made using Levallois technology (Yazbeck, 2004). The Tabun cultural chronology continues to be used as a reference for Middle Paleolithic sites in Lebanon. However, it is widely accepted that this chronology is inappropriate for Lebanon because it does not apply completely in the central and northern Levant and because no single Lebanese site has provided a succession of phases similar to that observed in Tabun (Yazbeck, 2004). Generally speaking, almost all of the Middle Paleolithic sites of Lebanon are dated through typology of the material culture and geomorphological associations. Very few absolute dates are available for this period. Two Mousterian levels, XXVIB and XXXII, at Ksar Akil have been dated respectively to 47,000 BP and 51,000–49,000 BP using U/Th dating (Mellars and Tixier, 1989) and another Mousterian level, level XXVII, has been radiocarbon dated to around 44,000–43,000 uncalibrated BP (Vogel and Waterblock, 1963). More recent radiocarbon dating of marine shells from the Mousterian level XXVIII of Ksar Akil provides an age of around 39,500 BP (around 43,000 cal BP) for this level (Douka et al., 2013). One ^{14}C date available from a charred bone recovered from the Levalloiso-Mousterian layer of the site of Ras el-Kelb gave an age >52,000 uncalibrated years BP (Vogel and Waterblock, 1964). Layer 4 of the basal levels of Nahr Ibrahim (Central Gallery) which have yielded a Tabun Type C lithic industry has been dated by ESR dating on burned flint to between 92,000 and 80,000 years BP (Porat and Schwarcz, 1991). And three U/Th dates place the *Strombus* and *Vermetes* shells layer underlying the Levalloiso-Mousterian layer of the site of Naame in MIS 5 and more specifically between 93,000 and 90,000 years BP (Stearns, 1970; Leroi-Gourhan, 1980).

Information from other lines of analyses aside from lithic material is scarce and not very informative. Faunal remains have been collected and studied from relatively few sites, mostly those that have undergone excavations, including: Adlun (Garrard, 1983), Ksar Akil (Hooijer, 1961), Ras el Kelb (Garrard, 1998), Naame (Fleisch, 1970a), Nahr Ibrahim (Solecki, 1975), and Keoue (Watanabe, 1971). Analyses of the faunal material recovered from these sites remain mostly preliminary. The macro-faunal species represented at all of these sites, with the exception of Keoue, are what is expected for Mediterranean coastal and low elevation mountain sites during the Pleistocene with the dominance of deer, and abundance of wild goat, gazelle, and *Bos/Bison* (Yazbeck, 2004). The fauna recovered from Keoue shows that *Bos/Bison* and not deer is the dominant animal in the assemblage (Yazbeck, 2004).

Micromammal, insectivore, and bird remains have only been collected and studied from the site of Ksar Akil (Kersten, 1991, 1992). Such remains generally provide both paleoecological information and information on hominin behavior. The species represented in the Middle Paleolithic layers of Ksar Akil reflect an environmental mosaic with forests/woodlands, open vegetation, and water sources around the site during the Middle Paleolithic (Kersten, 1991, 1992). Yet, the available samples are too small to provide more meaningful interpretations. For purposes of paleoecological reconstruction, pollen samples have also been collected but only from a handful of sites: Adlun, Naame, Ras el Kelb, Nahr Ibrahim, and Batroun (Leroi-Gourhan, 1971, 1973, 1980). Even though these pollen analyses give some glimpses of regional vegetation cover during some periods, they remain largely uninformative due to the lack of absolute dates of the layers the samples were taken from and also due to the lack of correlations between these layers across the different sites. Thus, these isolated samples are by no means sufficient to provide a general picture of paleovegetation cover of Lebanon during the Middle Paleolithic.

An interesting cluster of sites attributed to the Middle Paleolithic in Lebanon is the so called Meyroubian sites (Copeland and Wescombe, 1965). These are around 38 (possibly more, see Fig. 5) sites or localities (Copeland and Yazbeck, 2002) that provided assemblages that consist of up to 80% Middle Paleolithic (points and side-scrapers on Levallois flakes) and up to 20% Upper Paleolithic (end and steep scrapers and burins) tool forms (Copeland and Wescombe, 1965). These sites are restricted to the region of Mount Lebanon and to an elevation above 1000 m asl in the areas of Kesrouan, Metn, and Chouf, with the exception of one (Habarjer) coastal site (at 100 m asl) which was found to have similar yet not identical industry (Copeland and Wescombe, 1965; Copeland and Yazbeck, 2002). Even though the lithics from these sites were all collected from the surface (Copeland and Wescombe, 1965; Copeland and Yazbeck, 2002), it does not seem that these assemblages were a result of mixing because 1) typical Upper Paleolithic and typical older Middle Paleolithic artifacts are absent from these assemblages and 2) the Upper Paleolithic forms are made mostly on Levallois blanks with a flaking system that is clearly Levallois and are often atypical (Prüfer and Baldwin, 1957; Copeland and Wescombe, 1965; Fleisch, 1966; Hours, 1966, 1973b; Copeland, 2000; Copeland and Yazbeck, 2002; Leder, 2014). These sites are classified as belonging to the Late Middle Paleolithic Period.

Recent more detailed analyses of some of the Meyroubian lithic assemblages are showing that not all of these assemblages are uniform and almost identical as was previously thought (Leder, 2014). Upon the reassessment of material from several lithic collections traditionally considered to be Meyrobian, Leder (2014) notes that there is a good level of variation among the various sites and proposes to reclassify some assemblages. He notes close similarities between the lithics collected from the different sites in Baskinta and Mazraat Kafrdabbian and argues that this material is sufficiently distinct from other allegedly Meyroubian assemblages that he proposes to assign them to a new industry which he terms Baskintian. According to Leder (2014), Baskintian is a distinct local Late Middle Paleolithic industry that shows more development towards transitional industries than other so-called Meyroubian assemblages. Overall, Leder's (2014) work highlights the need for further more in-depth studies of all the collections classified as Meyroubian.

5.3. Upper Paleolithic

The Upper Paleolithic is represented in Lebanon by a total of 47 sites (Fig. 6). Of these sites, 34 have yielded material culture that can easily be attributed to the Upper Paleolithic, whereas the attribution of the finds from 13 sites to this period remains uncertain (Fig. 6).

Most of the attention on this period has been given to what is known as the “transitional” industries and what is now more commonly referred to as the Initial Upper Paleolithic (Copeland, 2003a; Kuhn, 2003). This type of industry is identified in Lebanon at three key sites: Ksar Akil (levels XXV-XX), Antelias (levels VII-V), and Abu Halka (levels IVf-IVe) (Haller, 1946; Copeland, 1970; Azoury, 1986; Ohnuma, 1988). The lithic industries of the transitional levels are characterized by the presence of Emireh points and chamfered pieces and by the production of Upper Paleolithic type tools, like scrapers and burins, using the levallois debitage technique (Copeland, 1975, 2000; Azoury, 1986; Ohnuma, 1988). The Upper Paleolithic proper in Lebanon starts with the Ahmarian tradition and is followed by the Aurignacian (Gilead, 1981; Marks,

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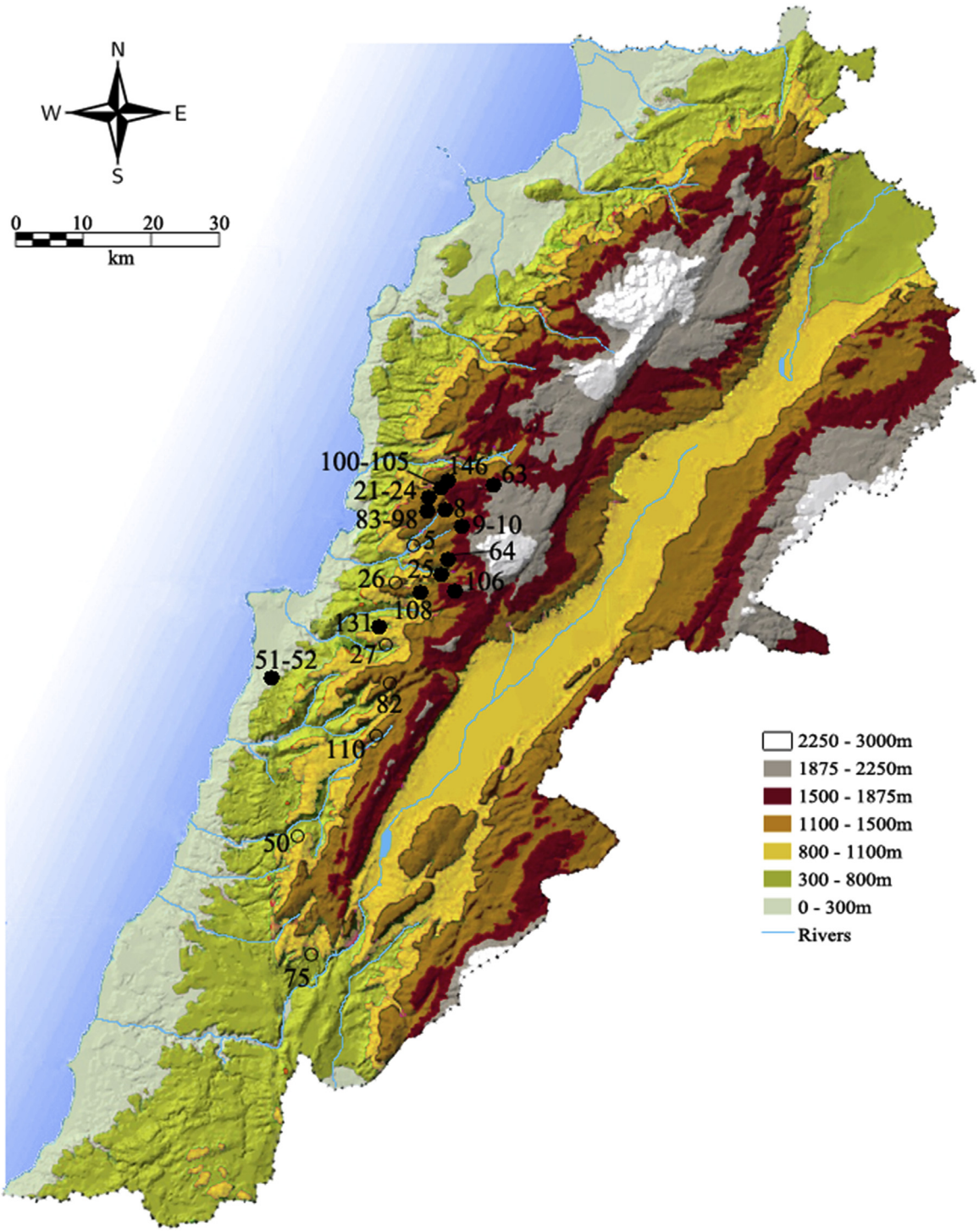

Fig. 5. Meyroubian sites in Lebanon. Circles: open air sites. Squares: caves/rockshelters. Filled symbols: certain attribution. Unfilled symbols: uncertain attribution. Sites (Site numbers are maintained from Fig. 4): 5. Ain El Kabou, 8. Baatouta, 9–10. Baskinta I, II, 21–24. Beit el Mehdi I, II, III, IV, 25. Beit Qdiha, 26. Bikfaya I (Naas, Ghabie, Baharsaf), 27. Bmariam, 50. Ghour Ramle (Dahr el Ramle), 51–52. Habarjer I, II (Jouret Belloute), 63. Jebel Mazloum, 64. Jebel Michmiche, 75. Khallet el Khazen I (Roueissat el Khalle or Ain Alaq), 82. Mansa'a El Hayate, 83–98. Mazraat Kafrdebbian I (Jebel Aassi), II (Ain Nosrani), III (Qanater), IV, V, VI (Jebel Hachem), VII (es-Souaki), VIII (Qalaat Fakhra), IX (Ain Gaoubeh), X, XI, XII, XIII, XIV, XV, XVI, 100–105. Meyrouba I-VI, 106. Michmiche, 108. Mrouje, 110. Nabaa El Barouk, 131. Ras El Meten, 146. Tannour.

1983; Bergman, 1987). Most of the information we have on this period is from the same three sites that have also provided Initial Upper Paleolithic industries: Ksar Akil, Antelias, and Abu Halka (Yazbeck, 2004). Two more sites, Saaide and Abri Bergy, should be added to these especially because they provide information on the end of the Upper Paleolithic Period (Yazbeck, 2004).

The site of Ksar Akil is the Levantine site which offers the longest sequence of Upper Paleolithic layers and is considered the reference site for this period in Lebanon and the Near East. In addition to the long succession of the Upper Paleolithic layers at Ksar Akil, several dates are available for the different levels thus providing a chronological framework for this period (Mellars and Tixier, 1989;

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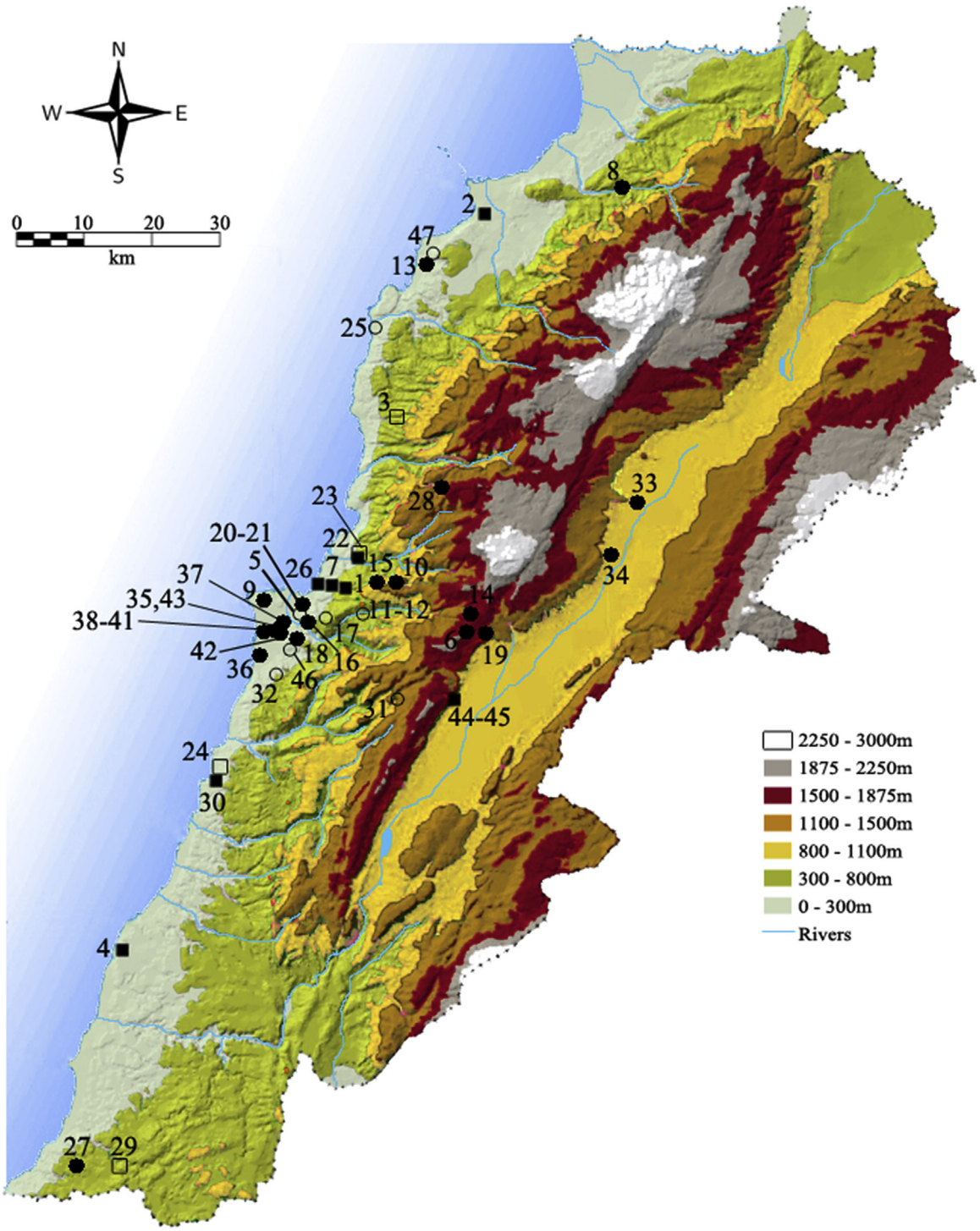

Fig. 6. Upper Paleolithic sites in Lebanon. Circles: open air sites. Squares: caves/rockshelters. Filled symbols: certain attribution. Unfilled symbols: uncertain attribution. Sites: 1. Abri Bergy*, 2. Abu Halka*, 3. Abu Saheb, 4. Adlun II (Bezez Cave)*, 5. Ain Cheikh, 6. Ain Hazir, 7. Antelias*†, 8. Ash-Ash, 9. Beirut XIV*, 10. Bikfaya I (Naas, Ghabie, Baharsaf), 11–12. Brumana I, II, 13. Chekka Cement Work, 14. Col of Zahle, 15. Dhour Choueir, 16. Dikwene II, 17. Fanar, 18. Fayadiyeh, 19. Jebel Baniya, 20–21. Jedeideh I, II, 22–23. Jeita II*, IV, 24. Jiye IV, 25. Kfar Khollos, 26. Ksar Akil*†, 27. Mchaich, 28. Meyrouba VI, 29. Mugharet El Abed, 30. Mugharet el Hammam, 31. Neba'a Safa, 32. Nesraniyeh, 33. Saaide I (Cistern)*, 34. Saayideh, 35–43. Sands of Beirut 1 (Bir Hassan), 3 (Khan Khalde), 5 (Nahr Ghedir), 9 (Site 5, South of Shell Station), 10 (Site 6, East of Shell Station), 11 (Site 7, North East of Shell Station), 13 (Site 10, Tell aux Haches), 14 (Site 11, Haret Hraik), 15 (Site 12, East of Zone Militaire), 44–45. Wadi Daher I, II, 46. Yarze I, 47. Zakroun. (*) indicate excavated sites. (†) indicate that the site yielded hominin remains.

Douka, 2013; Douka et al., 2013; Bosch et al., 2015a). Recent AMS radiocarbon dating of marine shells recovered from the different Upper Paleolithic levels of Ksar Akil provide an age range between 37,400 and 34,300 BP (around 42,000 to 38,000 cal BP) for the Initial Upper Paleolithic, an age range of between 35,000 and 33,000 BP (40,000–37,000 cal BP) for the Early Ahmarian or Early Upper Paleolithic, and an age range of between 35,500 and 30,600 BP (41,000 to 34,500 cal BP) for the Upper Paleolithic proper

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levels (Douka, 2013; Douka et al., 2013). More recent radiocarbon dating on shells from the same site agree with the dates provided by Douka et al. (2013) for the upper part of the Ksar Akil sequence but provide significantly older date ranges for the Initial Upper Paleolithic and the Early Upper Paleolithic layers (Bosch et al., 2015a). Bosch et al. (2015a) date the middle of the Initial Upper Paleolithic sequence (Level XXII) to 44,400–43,100 cal BP, the Early Ahmarian or Early Upper Paleolithic to between 44,000 and 37,200 cal BP, and the Upper Paleolithic proper to between 40,700 and 37,700 cal BP. This disagreement in the resulting dates of the Initial and Early Upper Paleolithic layers between the two studies led to different interpretations of the role of the Levant as a dispersal route for Upper Paleolithic humans from Africa into Europe. Whereas Douka et al. (2013) questions the Levantine corridor hypothesis claiming that their relatively late dates for the Initial and Early Upper Paleolithic layers in Ksar Akil provide evidence that the makers of the Upper Paleolithic industries were present in Europe before the Levant, Bosch et al. (2015a, b) insist that their relatively older dates fit well within the established chronologies for other Levantine sites and thus support the Levantine corridor hypothesis. Due to the discrepancies in dates, Douka et al. (2015) rejects Bosch et al. (2015a) results criticizing the latter's application of the Bayesian statistics and their understanding of the stratigraphy of Ksar Akil. Yet, Bosch et al. (2015b) maintained their conclusions even after making some adjustments to their statistical model in response to Douka et al. (2015) criticism. It should be noted that in some instances the date ranges offered by both Douka et al. (2013) and Bosch et al. (2015a) do not match the stratigraphic locations of the layers from which the dating samples were taken (i.e., dates obtained for some layers are older than those obtained for the stratigraphically lower ones). These mismatches are acknowledged by the researchers and attributed to diagenetic alteration of the shell samples, to the use of artificial excavation units, and/or to the mixing of material during or post excavation (Douka et al., 2013; Bosch et al., 2015a).

Macrofaunal assemblages from Ksar Akil Upper Paleolithic levels show a dominance of fallow deer (Hooijer, 1961; Bosch et al., 2015a). Other represented animals are wild goat, wild boar, aurochs, red deer, ibex, and gazelle. Moreover, going higher through the sequence, there appears to be a shift to more even representation of these latter animal species (Bosch et al., 2015a). However, it should be mentioned that surface modification marks, whether caused by animals or humans, are very rare on these remains (Bosch et al., 2015a). In addition, marine and freshwater shells recovered from the Early Ahmarian levels of Ksar Akil are believed to have been exploited for human consumption during this period (van Regteren Altena, 1962; Bosch et al., 2015a). Some shell species from this period were also used as ornaments (Kuhn et al., 2001) and in the later periods (i.e., during the Upper Paleolithic proper) as tools (Douka, 2011). Micromammal and insectivore remains from the Upper Paleolithic levels of Ksar Akil are virtually non-existent (Kersten, 1992). The Upper Paleolithic bird remains show a mosaic of environments (Kersten, 1991). Faunal remains were also collected from Abri Bergy and Antelias Cave and also show the dominance of fallow deer. However, remains from these two sites are very few and thus provide little information (Hooijer, 1961).

5.4. Epipaleolithic

Epipaleolithic industries have been found at 22 Lebanese sites. Material recovered from five additional sites might also be attributed to this period (Fig. 7).

The Epipaleolithic industries of Lebanon can be divided into four phases (Hours, 1976, 1992). The Proto-Kebaran is the earliest of these phases. It is best seen in Ksar Akil levels IV-II and in Jeita II levels 4–3. The beginning of the Proto-Kebaran (Level V) of Ksar Akil has been recently dated to between 30,400 and 29,500 cal BP (Bosch et al., 2015a). This date is somewhat older than expected for this industrial phase (Bosch et al., 2015a). This phase is characterized by the presence of Dhour Choueir bladelets (Hours, 1976, 1992). The second phase is the Classic Kebaran. This industry is similar to that found at the type site, Kebara (B), and is found at many of the Lebanese Epipaleolithic sites. It is best characterized by the presence of Kebara and Jeita points. Geometric Kebaran is the third phase. This industry is also widespread in Lebanon. The presence of Falita points among other microlithic types is a common feature of this industry (Hours, 1976, 1992). The Natufian represents the final phase of the Epipaleolithic in Lebanon. This industry is best known from two sites, Ain Chaub and Nachcharini Cave.

Just like all the Paleolithic periods, faunal and floral samples from Epipaleolithic layers have been collected from very few sites. Fauna from Ksar Akil Epipaleolithic levels show a dominance of deer followed by wild goat (Hooijer, 1961; Kersten, 1989). Preliminary results of the analyses of faunal remains recovered from Jeita II show a dominance of wild goat (Hours, 1973a; Melki, 1996). Pollen samples have been also been collected from Ksar Akil and Jeita II Proto-Kebaran layers (Melki, 1996). These samples are limited and basically uninformative.

5.5. Fossil hominins

Relative to the large number of identified sites in Lebanon, Paleolithic human remains are rare. This is probably due to the fact that most of the identified sites were never excavated. In terms of hominin fossils, there is an upper second molar from the Acheuleo-Yabrudian levels of Masloukh Cave. This tooth has been attributed to a Neandertal but only based on its stratigraphic location and not on its morphology (Copeland, 1975). There are also four teeth from Ras el Kelb (Bourke, 1998). Two were recovered from level K band 3, one was never studied (Bourke, 1998) and the second, an upper left third premolar, was studied by Vallois (1962) and attributed to Neandertals. These two teeth are currently lost. Two additional teeth, both upper left second molars, one permanent and one deciduous, were found among the faunal remains from the site (Bourke, 1998). These probably belong to Neandertals, yet their preservation does not allow secure taxonomic assignment (Bourke, 1998).

The site of Ksar Akil has yielded several human remains. From level XXV (Stone Complex 3 - a red clay deposit which might represent a hiatus right below the appearance of the Initial Upper Paleolithic industry or might represent the first of the Initial Upper Paleolithic levels), a partial maxilla with no teeth (Ksar Akil 2) belonging to a young adult and nicknamed Ethelruda was found. The date of this specimen was estimated to be somewhere between 42,400–41,550 cal BP (Douka et al., 2013) and, more recently, older than 45,900 cal BP (Bosch et al., 2015a). It was first classified as a Neandertaloid female based on metric comparisons with Tabun I, Skhul IV and V, Gibraltar, and La Chapelle-aux-Saints (Ewing, 1963). But, recent reassessments including modern human maxillae measurements show that it falls well within the modern human range of variation and, thus, is now believed to belong to an anatomically modern human (Metni, 1999; Yazbeck, 2004). More detailed examination of this fossil is planned (Yazbeck, 2004). This examination will hopefully finalize the taxonomic status of this fossil and will help shed light on who the makers of the Initial Upper Paleolithic in Ksar Akil (and the Levant) were. Aside from Ksar Akil 2, the Early Ahmarian level of XVII yielded fossils of two children. One was represented by a maxilla and a few ribs, but was

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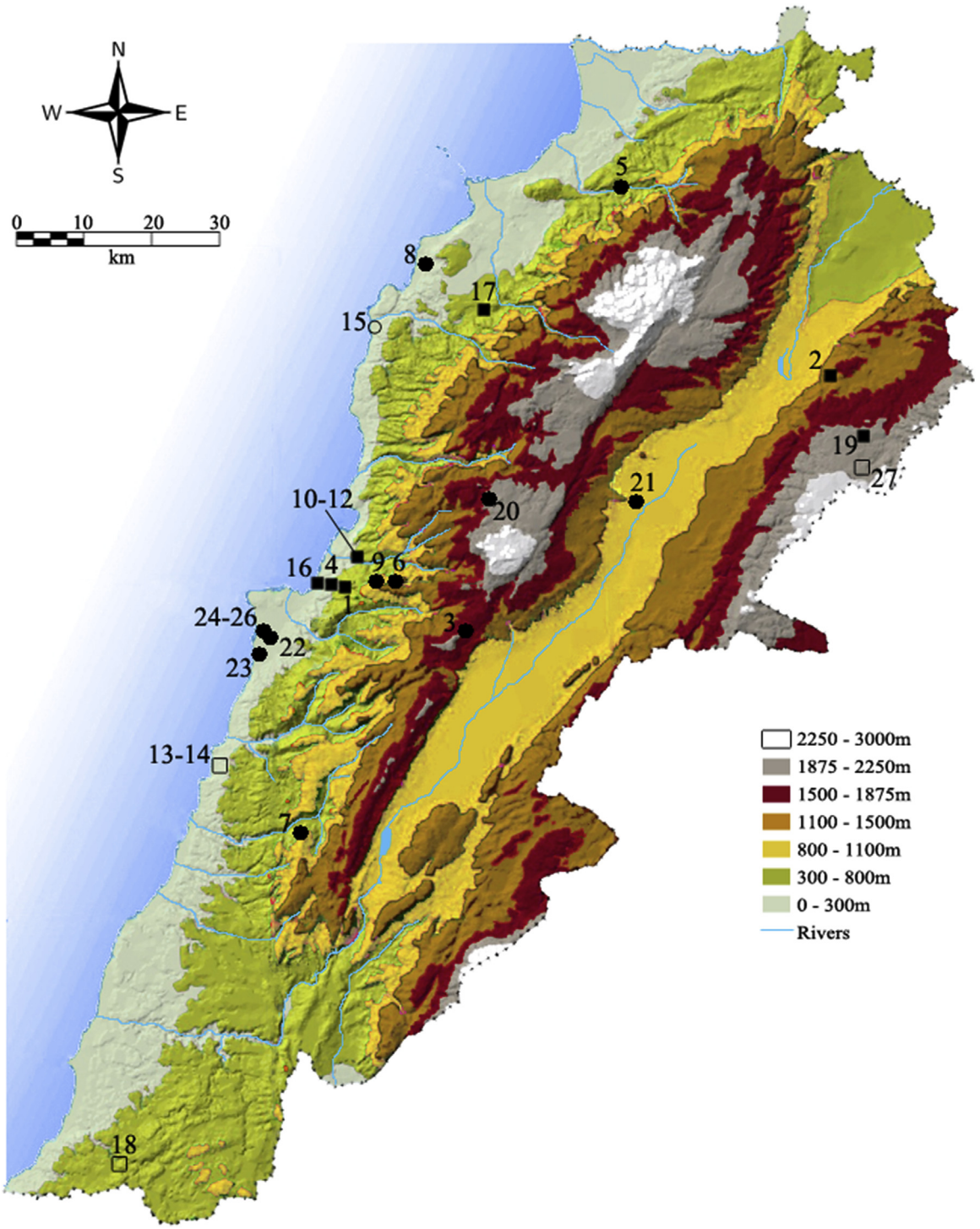

Fig. 7. Epialeolithic sites in Lebanon. Circles: open air sites. Squares: caves/rockshelters. Filled symbols: certain attribution. Unfilled symbols: uncertain attribution. Sites: 1. Abri Bergy*†, 2. Ain Chaub, 3. Ain Hazir, 4. Antelias*†, 5. Ash-Ash, 6. Bikfaya III, 7. Bkasin, 8. Chekka Cement Works (Raz Chekka Henri, Chekka) †, 9. Dhour Choueir, 10–12. Jeita II*, II East, III, 13–14. Jiye I, IV, 15. Kfar Khollos, 16. Ksar Akil*, 17. Moghr el Ahwal†, 18. Mugharet El Abed, 19. Nachcharini Cave*, 20. Neba'a El Mghara, 21. Saaide II*†, 22–26. Sands of Beirut 2 (Borj Barajne), 9 (Site 5, S of Shell Station), 12 (Site 8, NNE of Shell Station), 13 (Site 10, Tel aux Haches), 27. Wadi Al-Ithnayn. (*) indicate excavated sites. (†) indicate that the site yielded hominin remains.

probably never excavated or recovered (Ewing, 1947). The second, is the famous Egbert, i.e., Ksar Akil 1, whose skull only was extracted (Ewing, 1947). This skull is now lost but is known from old photographs as well as casts. This child was probably 7–9 years old at the time of death and had fully modern human traits (Stringer and Bergman, 1989). Recent date estimates for Egbert fall between 41,000–39,000 cal BP (Douka et al., 2013) and 43,200–42,900 cal BP (Bosch et al., 2015a). Finally, three meters above Ksar Akil 1, in the Aurignacian level XI or XII (phase VI of Tixier's excavation) dated to around 29,000 BP [although more recent dating of levels XI and XII give older ages of around 34,000 and 36,000 uncalibrated BP (38,000 and 40,000 cal BP) respectively

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(Douka et al., 2013; Bosch et al., 2015a)], an isolated upper right deciduous molar (Ksar Akil 3) was found belonging to a child approximately 10 years old. This child is also fully modern (Tixier and Tillier, 1991).

The bones of a fetus have been recovered from Upper Paleolithic layers of Antelias Cave (Zumoffen, 1893a, b; Vallois, 1957; Copeland and Hours, 1971). But, it is possible that the bones themselves date to a later period, maybe Epipaleolithic or Neolithic (Vallois, 1957). Some adult long bone fragments and a mandibular fragment were also found at Antelias Cave (Zumoffen, 1893b, a). These have not been studied but probably represent at least three individuals (Haïdar-Boustani, 2015).

From the Epipaleolithic Period several human remains were found. The Kebaran layers of the site of Moghr el Ahwal yielded few human bone fragments probably belonging to an adult male (Garrard and Yazbeck, 2003). Two skeletons were recovered from the Geometric Kebaran levels of Abri Bergy (Zumoffen, 1900; Ewing, 1953). One very fragmentary and incomplete skeleton was recovered from the Natufian layers of Saaide II (Soliveres, 1976–77; Schroeder, 1991). This probably belongs to a middle aged female. One bone of this skeleton was radiocarbon dated to 9980 ± 110 BP (Churcher, 1994). Finally some human remains were found at the site of Chekka Cement Works that probably come from Epipaleolithic context (Copeland and Wescombe, 1965).

6. Conclusion

The Paleolithic record of Lebanon might seem exhaustive at face value. Yet, in reality, this record is mostly restricted to site identification and location and vast collections of lithic material (mostly from surface finds) with very few excavations, in depth analyses of the lithic assemblages, collections of other kinds of archaeological material (e.g., faunal, botanical, etc), and absolute dates. Therefore, the available information on the Lebanese Paleolithic is too scarce to allow a comprehensive understanding of hominin occupation of this area and of hominin behavior during that time. Moreover, the available information is too limited to allow comparisons with other regions of the Levant. Yet, what is clear is that Lebanon has a very rich Paleolithic record which offers a great potential for enhancing our knowledge of later hominin evolution, and which deserves further study, and, especially, the application of modern, interdisciplinary approaches. Thus, a continuation of where the previous researchers have left off before the Lebanese civil war is necessary. This continuation is long overdue especially as rapid urbanization in Lebanon has led to the destruction of many of the identified sites. As early as 1970, Fleisch (1970b) expressed his frustration with the destruction of sites in Lebanon. He conducted some rescue excavations, namely in several sites in Naame, to retrieve as much information as he could from sites threatened by development (Fleisch, 1970a, 1980). During the civil war and the years that followed, urbanization became mostly uncontrolled and the lack of a strict policy to protect prehistoric sites resulted in further destruction of previously identified Paleolithic sites. Survey records show that around 50 of the known sites have already been completely or partially destroyed (Copeland and Wescombe, 1965, 1966; Copeland and Yazbeck, 2002). The fate of many more remains unknown. This situation warrants attention and action. Until the initiation of new prehistoric archaeological projects, Lebanon will still form a gap in our knowledge of the Paleolithic which remains to be filled.

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