The "German Albanian Palaeolithic" Programme (GAP): A status report.

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Abstract

Since 2009 the German Albanian Palaeolithic project (GAP) examines two open-air and three cave sites in different parts of Albania. The data obtained allow a first assessment of the potentials as well as challenges posed by these archives. While evidence for human occupation in the postglacial period and subsequent Holocene is plentiful, older traces are still scanty. Multiple factors are responsible for this bias of which to mention above all is climatic impact and postglacial landscape modification. Two cave sequences in the northern part of Albania show a reworking or erosion of MIS 3 and older deposits. Disturbance of open-air sites in the coastal lowlands is principally caused by weathering and sediment aggradation. While such observations are important for future research strategies, the preserved Palaeolithic sequences already provide the basis for a robust Palaeolithic database. It bears a rich and well-preserved record of Late Upper Palaeolithic and Mesolithic occupations. Our investigations give a first insight into human land-use shortly after the Last Glacial Maximum. We thereby add important data to the growing record of Epigravettian and Mesolithic sites in the wider scope of the Eastern Adriatic.

Introduction

Albania is still largely unexplored in terms of its Palaeolithic record. Nevertheless, after decades of political and scientific isolation, an enormous scientific effort has been done on the Albanian side in all archaeological disciplines (e.g. Korkuti 2003; Gjipali 2006, 2012; and see references in Përzhita *et al.* 2014). In Palaeolithic archaeology, the joint Albanian-German fieldwork project in the framework of the Collaborative Research Centre 806 "Our Way to Europe" (CRC806, University of Cologne, Germany) runs since 2009.

Palaeoenvironmental studies suggest that part of the Balkans acted as glacial refuge areas and provided favourable environments for Palaeolithic hunter-gatherers (e.g. Miracle 2007; Fouache *et al.*, 2010; Panagiotopoulos *et al.* 2014). The Adriatic coastal area was significantly larger during glacial periods due to a lowering of the sea-level of as much as -120m (Shackleton *et al.*, 1984; Fleming *et al.*, 1998; Flemming *et al.*, 2014; Sakellariou and Galanidou 2016). Pronounced relief and diversity of local substrates favoured the existence of multiple microhabitats that probably attracted early modern humans on their dispersal into Europe some 40'000 years ago. The expansion of Homo sapiens sapiens was paralleled by the spread of the earliest Upper Palaeolithic along distinct geographical trajectories (e.g. Bar Yosef 2002; Mellars 2006; Richter *et al.* 2012). As the territory of Albania lies within the supposed coastal dispersal trajectory, the search for early Upper Palaeolithic traces is of special interest for the CRC806 investigations. Another research topic addresses cultural dynamics and demographic processes during and after the Last Glacial Maximum (LGM) (e.g. Djindjian 2016; Maier *et al.* 2016). Human populations likely sustained in glacial refugia of which the Eastern Adriatic was certainly an important one (e.g. Cancellieri 2015). Therefore, Palaeolithic research in Albania also entails the quest for LGM deposits that bear evidence of human adaptation strategies vis a vis the harsh glacial conditions.

Research within the GAP project centres on three different regions in Albania: the Mat river catchment in northern Albania and the bay of Orikum and the Butrint lagoon in southern Albania. Adding to this is palaeoenvironmental research in the CRC806 framework based on lake sediment cores from Lake Ohrid and Prespa (Wagner *et al.* 2009, 2010; Panagiotopoulos *et al.* 2014). Test excavations were done in three cave sites and two open-air localities. Part of the data presented in this paper is already published elsewhere (Richter *et al.* 2014; Hauck *et al.* 2016; Hauck *et al.* in press). In this paper, we present unpublished results from the most recent excavations. Furthermore, a sequence model for the Albanian Palaeolithic record is discussed and set into a broader framework.

The Palaeolithic sites

Five different sites were subject of fieldwork in the GAP project. Their location is shown in Fig. 1. Depending on their nature and archaeological potential, excavations were of variable extent. While test excavations reached bedrock in only one instance, all other excavated sequences are still to be explored in further depth.

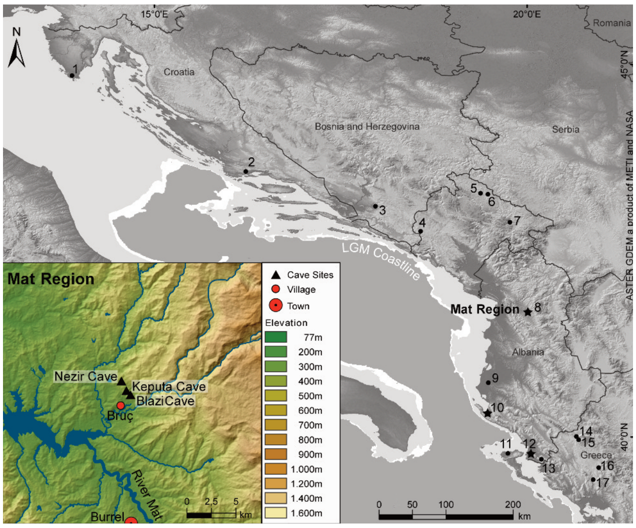

Figure 1: Map of the East Adriatic coast area with major Palaeolithic and Mesolithic sites referred to in the text. The sites investigated in the GA poject are marked as stars. The modelled LGM coastlines are set at -130m (white) and -120m (light grey), according to the data provided by Fleming et al. *1998 and Flemming* et al. *2014. The smaller map on the lower left shows the Mat region north of the town Burrel with the location the three cave sites that are currently under investigation. The lake to the west of the caves is a recently built barrier lake. Major sites: No.1: Sandalja; No.2: Mujina pećina, No.3: Badanj; No.4: Crvena Stijena; No.5: Malisina Stijena; No.6: Medena Stijena; No.7: Trebakić krs; No.8: Mat region cave sites: Blazi Cave, Keputa Cave, Nezir Cave; No.9: Kryegjata; No.10: Kanalit; No.11: Sidari; No.12: Shën Mitri; No.13: Konispol: No. 14: Boïla; No.15: Klithi; No.16: Kastritsa; No.17: Asprochaliko.*

Three caves in the Mat region in northern Albania were subject of three fieldwork seasons (Fig. 1). They are located in active karst in the small Val tributary gorge that runs into the larger Mat river catchment. Situated at 300 m.a.s.l. and oriented southwest, the cavities offer favourable settlement parameters. Their strategic position enables a wide ranging overview and control over the surrounding alluvial plain. This advantageous setting explains the richness of human occupation remains, ranging from the Communist period down to the Palaeolithic. In search for Neolithic, Bronze Age and Iron Age remains, the caves deposits were repeatedly tested and excavated from the end of the 1970s and during the 1980s (e.g. Prendi and Andrea 1981). Fieldwork in the GAP project focusses on the Pleistocene deposits that were left untouched by these earlier excavations.

Blazi Cave

This cave is the first that becomes visible when entering into the limestone gorge from the Mat alluvial plain. It holds an impressive Neolithic and Bronze Age record which was subject of large-scale excavations in 1978 and 1979 (Prendi and Andrea 1981). In the course of these investigations, the front gallery was excavated in many parts down to bedrock. As a consequence, Pleistocene deposits are left only in a few parts of the cave in shallow depressions. We investigated the remaining sequences in five test trenches. Fieldwork methods and results are described in detail by Hauck *et al.* 2016 and Hauck *et al.* in press. The most important points for Blazi Cave is the richness of in situ Epigravettian remains as well as indications of earlier visits to the cave before the LGM.

Keputa Cave

The cave and rock-shelter of Keputa are only 200m away from Blazi Cave and belong to the same cave system. The connection between the two is blocked by roof collapse in its inner part. Keputa Cave is archaeologically interesting because of two main aspects. Firstly, several undisturbed or partly disturbed ceramic, ash and stone tool concentrations occur on the cave floor, some of them far away from the entrance. Secondly, the rock-shelter at the cave entrance bears a long Holocene sequence with a succession of hearths from different periods. Parallel to the test excavations at the entrance area, we conduct a 3D documentation programme inside the cave for a detailed recording of all surface concentrations. The data that are discussed in this paper come from Trench 1 at Keputa rock-shelter.

Nezir Cave

This is the largest of the three caves. It is situated slightly higher than Blazi and Keputa Cave and belongs to a different karst level (Fig. 2). The large entrance opens into a front hall from which the main gallery continues to the north. After about 60m further access into the main gallery is blocked by sediment infill. Like in Blazi Cave, large-scale excavations (1978-1985) were carried out in the 4 m thick Holocene sequence of the front hall. As these excavations stopped at the Holocene-Pleistocene transition, we re-opened part of the backfilled area for the investigation of pre-Holocene deposits (Fig. 2). Trenches 1 and 2 cover the first 1,5 m of Pleistocene sediment. Judging from the sediment volume and the low weathering degree of limestone gravel, rate of sedimentation was probably higher in Nezir compared to the two other caves. This likely explains why Palaeolithic layers are not yet found in both trenches. Nevertheless, part of a well preserved Mesolithic occupation was discovered in Trench 2 some 20 cm below the earliest Neolithic hearths.

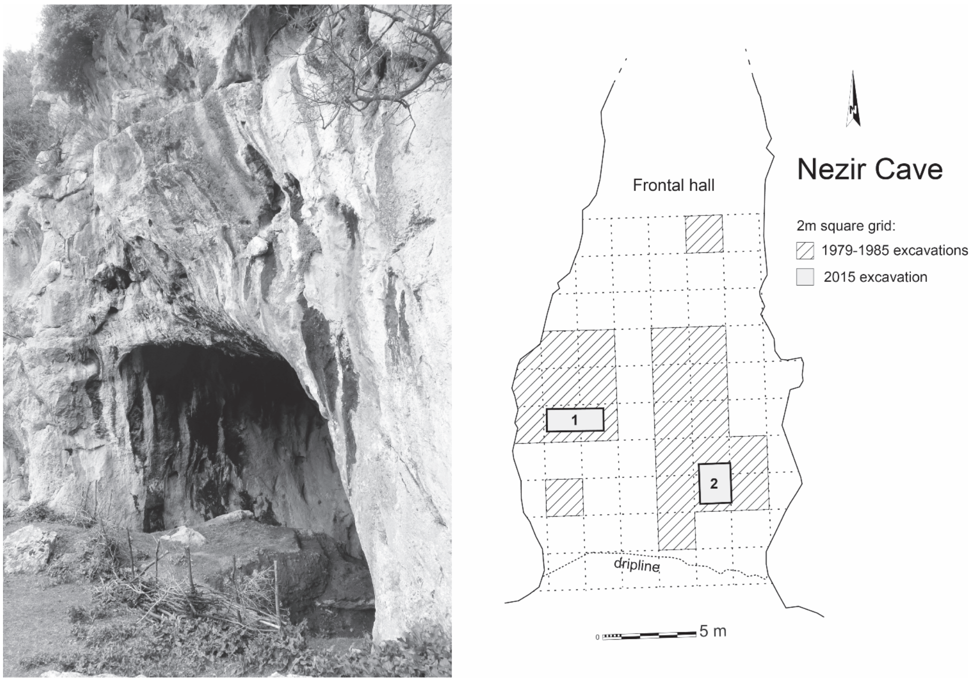

Figure 2: *Nezir Cave (Mat region, northern Albania). The map shows the position of excavated sections in the accessible part of the frontal hall.*

Kanali

This rock-shelter is located at the base of an east-west stretching Cretaceous limestone ridge at the southern border of Orikum bay. The shelter is the remnant of an extended cave system that collapsed completely prior to the Holocene. The discovery of backed bladelets on the slope in front of the shelter gave the impetus to open a test trench (Richter *et al.* 2014; Hauck *et al.* 2016). Lithic artefacts were exclusively found in the top soil, the lower part of the sequence turned out to be sterile. It consists of reworked and unconsolidated cave sediment that is difficult to excavate. Moreover, as the archaeological potential of the Kanali site is considered to be low, fieldwork stopped in 2014.

Shën Mitri

The hill of Shen Mitri is located in the lagoon of Butrint in the south of Albania. It is 60 m high and consists of Neogene clay deposits that belong to the massive infill of the Butrint Graben system (Moisiu and Durmishi 2015). After the discovery of lithic artefact concentrations on the surface, we opened three test trenches in the mid part of the hill and three geological cuts at other parts (Richter *et al.* 2014; Hauck *et al.* 2016). The latter went parallel with a geo-electric sonding project that aims to determine the composition of the Shen Mitri site and its archaeological potential (Hamacher 2016). Archaeological material of different periods is found in a 2 m thick colluvium that makes up the upper part of the Shën Mitri sequence. A series of radiocarbon dates is of Holocene age and does not provide an age model for the Palaeolithic and/or Mesolithic artefact sample (Hauck *et al.* 2016). The stratigraphy mirrors a complex taphonomic history that includes repeated and intensive modifications of the site during the Holocene. Evident traces of recent earthwork is a paving of limestone slabs and pits. These features were cut into a 2 m thick multiphase colluvium that consists of Neogene clay, eolian sands and anthropogenic material. Lithic artefacts, faunal remains and ceramics are found loosely dispersed within the colluvium.

The Palaeolithic record

A combination of sedimentological and archaeological evidence allows for a first draft of a sequence model that includes the most important Albanian Palaeolithic sites and sets them into the larger Eastern Adriatic context (Fig. 3). The sequence model combines the cultural sequence and absolute dating results. Current age models for the Albanian Palaeolithic and Mesolithic are based on new AMS ^{14}C dates that are given in table 1.

The Middle Palaeolithic

Remnants of Middle Palaeolithic occupations were discovered at three locations: Blazi Cave, Keputa Cave and Kanalit. At all of these sites they occur in secondary position as a result of erosion and weathering processes. At Kanalit, a few lithic artefacts were found on the surface at various parts

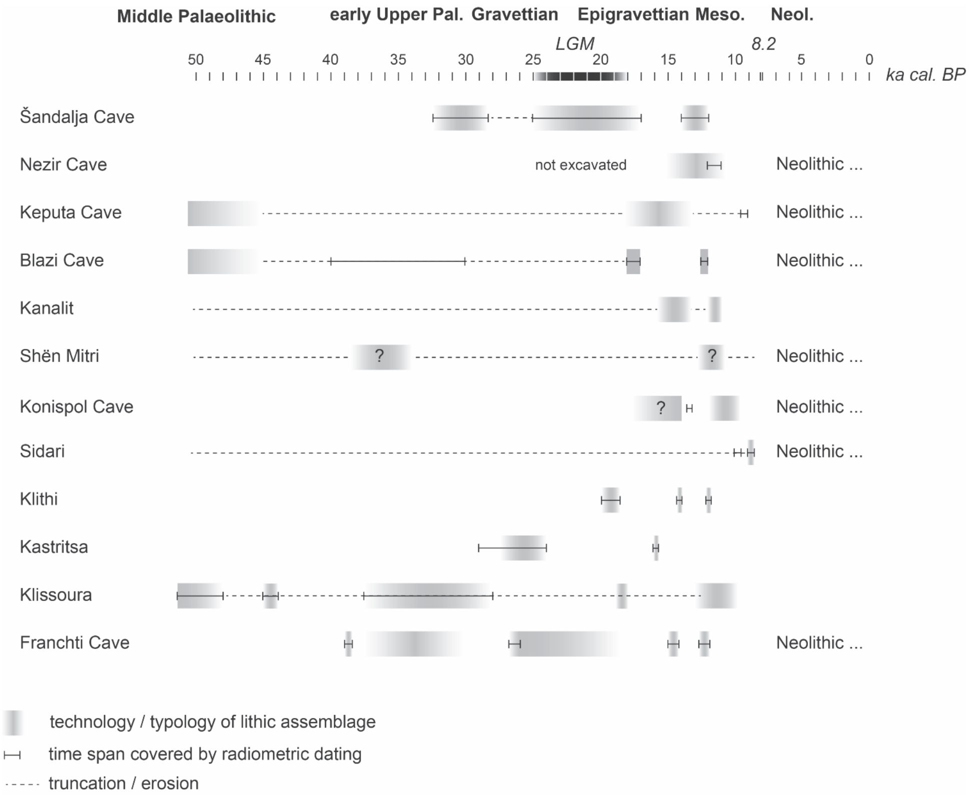

Figure 3: *Sequence model for major Palaeolithic and Mesolithic sites in the Eastern Adriatic; data taken from: Bailey and Gamble 1990; Petruso* et al. *1994; Gowlett* et al. *1997; Schuldenrein 1998; Galanidou* et al. *2000; Koumouzelis* et al. *2001; Karavanić 2003; Berger and Guilaine 2009; Karkanas 2010; Kuhn* et al. *2010; Douka* et al. *2011; Karavanić* et al. *2013.*

on the slope and in Keputa Cave only one centripetal Levallois core appeared at the base of Trench 1. In Blazi Cave, a larger sample (N=70) was excavated in Trench 2 on the terrace beyond the drip line. Here, the sediment is composed of reddish clay and limestone gravel and inclines sharply towards the talus. Lithic artefacts and a few bones were found in the red clay. All lithic artefacts are made of radiolarite that occurs locally as river gravel or in primary outcrops a few kilometres away from the cave. Not much is to say about technology and typology as the sample is small, probably mixed and many artefacts display edge damage. Suffice it to say that Levallois blanks, various side scraper types and one broken unifacial tool are diagnostic elements.

The Blazi Cave assemblage belongs to the growing record of Middle Palaeolithic sites in Albania. However, this record is made up of surface material that was collected during surveys in the coastal region (Harrold *et al.* 1999; Runnels *et al.* 2009; Ruka *et al.* 2014). For this reason, we are far away from understanding the chronology and cultural dynamics of the Albanian Middle Palaeolithic so far. What we do see, however, is that the multitude of open-air find spots points at a systematic frequentation of raw material rich areas by Middle Palaeolithic humans in the coastal parts of southern Albania. In addition, prominent landmarks, such as caves, equally attracted these hunter-gatherers in the more rugged hinterland, even in areas where the raw material situation is less attractive.

Despite the richness of Middle Palaeolithic find spots along the Eastern Adriatic coastal zone, only few sites hold stratified archaeological layers. To mention here is the Late Middle Palaeolithic sequence of Mujina Pećina in the Dalmatian coast (Karavanić *et al.* 2008), Asprochaliko rock-shelter in the Epirus (Bailey *et al.* 1992) and the important sequence of Klissoura Cave on the eastern Peloponnese (Koumouzelis *et al.* 2001; Sitlivy *et al.* 2007). The Blazi Cave Mousterian assemblage is not comparable to any of these sites as doubts pertain to its integrity. The lack of dated and undisturbed Middle Palaeolithic sites in the Eastern Adriatic leaves us in the dark about Neanderthal settlement dynamics and the dynamics of culture change at the Middle to Upper Palaeolithic transition. The Middle-Upper Palaeolithic interface is not preserved in any of the investigated archives in Albania. This is not surprising given the fact that the Uluzzian, a technocomplex that hallmarks this time period in southeast Europe, is missing in the Eastern Adriatic, except for layer V in Klissoura Cave (Koumouzelis *et al.* 2001; Douka *et al.* 2014). Moreover, the search for

Site	Area	Spit / Layer	Lab. No.	^{14}C age (yrs BP)	(1 σ)	^{14}C age cal. BP	sd	Associated material
Nezir Cave	Trench 2	4	Beta-426502	9170	30	10323	53	Mesolithic
Nezir Cave	Trench 2	4	BETA-426505	9310	30	10515	49	Mesolithic
Nezir Cave	Trench 2	6	BETA-426507	9020	30	10206	22	Mesolithic
Keputa Cave	Trench A	5cm	COL3012.1.1	8263	41	9251	85	None
Keputa Cave	Trench A	5cm	COL3013.1.1	8579	42	9546	34	None
Blazi Cave	Trench 5	15	Beta-426506	14440	50	17605	98	Epigravettian
Blazi Cave	Trench 5	18	Beta-426508	11100	40	12967	67	Epigravettian
Blazi Cave	Trench 5	25	Beta-426501	15360	50	18637	66	Epigravettian
Blazi Cave	Trench 5	25	Beta-426504	15140	50	18404	84	Epigravettian
Blazi Cave	Trench 1	Layer 2	COL1959.1.1	15727	85	18984	106	Epigravettian
Blazi Cave	Trench 1	Layer 2B	COL1957.1.1	29287	254	33462	274	Indeterminate
Blazi Cave	Trench 1	Layer 2B	COL1956.1.1	39648	722	43516	606	Indeterminate
Blazi Cave	Trench 1	Layer 2B	COL1958.1.1	40713	827	44347	737	Indeterminate

Table 1: *Radiocarbon dates for excavated Palaeolithic sections in the caves of Blazi, Keputa and Nezir (Mat Region, Albania). Conventional ages calibrated in OxCal (Bronk Ramsey 2009) using the IntCal13/Marine13 curve (Reimer* et al. *2013).*

the Campanian Ignimbrite (Y5 tephra), that separates the Uluzzian from the Protoaurignacian in Klisoura failed in the Blazi Cave section (D. White, personal communication).

The Early Upper Palaeolithic

Archaeological cornerstones of the dispersal route of early modern humans along the Adriatic coast are Klissoura Cave (Koumouzelis *et al.* 2001; Kozlowski and Stiner 2010) and Franchthi Cave (Perlès 1987; Douka *et al.* 2011) in the extreme south and ćandalja Cave on the Dalmatian coast in the north (Karavanić 2003). Between these geographic poles, the Eastern Adriatic record is largely devoid of early Upper Palaeolithic traces. The Albanian sequences exhibit either reworked MIS 3 deposits or a stratigraphic gap due to sediment run-off (Hauck *et al.* 2016). Nevertheless, traces of an Aurignacian occupation exist at Blazi Cave, and we therefore argue that it is only a matter of time until an intact and datable Aurignacian site comes to light in Albania. Moreover, provided that the Shën Mitri open-air site contains an Aurignacian assemblage, this site is the first of its kind in the Eastern Adriatic (Hauck *et al.* 2016).

The earliest proof for early modern humans in Albania is given by either radiocarbon dates or lithic tools of Aurignacian type. Unfortunately, the combination of both is still lacking. Age determination of three charcoal samples taken at the bottom of Trench 1 in Blazi Cave indicates that early Upper Palaeolithic humans visited the cave between 40’000 and 30’000 years ago (Tab. 1). Aside from the radiocarbon dates, any unequivocal proof for the Aurignacian is lacking in the Blazi Cave sequence. The few lithic artefacts (N=8) that were found in association with the dated charcoal in Layer 3 and 4 are severely edge damaged and undiagnostic in terms of cultural affiliation. This implies that weathering and sediment run-off likely affected the early Upper Palaeolithic sequence in this cave (Hauck *et al.* 2016). Presence of the Aurignacian is however corroborated by diagnostic lithic artefacts that were found on the slope in front of the cave. To mention here are carinated bladelet cores and thick end scrapers.

In the open-air sit of Shën Mitri, a large artefact sample was recovered after two years of excavation. Based on the presence of several nosed and carinated endscrapers, we tentatively attributed the assemblage to the Aurignacian but did not rule out a possible Mesolithic age (Fig. 4); Hauck *et al.* 2016). Ongoing excavation and extension of the lithic sample further complicated the matter as the Aurignacian tool types now occur alongside Late Upper Palaeolithic tool types (e.g. thumbnail endscraper) and tempered pieces. An in situ find layer in a palaeosoil that underlies the colluvium was discovered at the very end of last year’s excavation with no time left for further exploration. Based on the stratigraphy and geo-electric resistivity data, the current hypothesis on site formation is as follows: an original Palaeolithic occupation of unknown age was successively covered by slope wash deposits that contain archaeological material. Any attempt to locate the origin of this material failed. Consequently, there is a big question mark concerning the integrity of the Shën Mitri site and its Palaeolithic age.

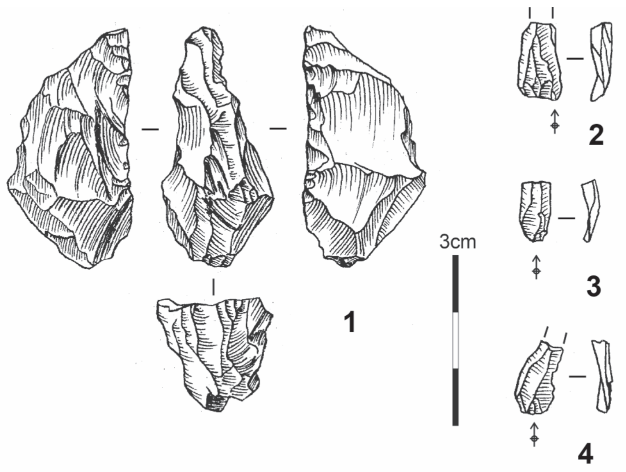

Figure 4: *Aurignacian-type lithic artefacts from the open-air site of Shën Mitri: No.1: carinated endscraper; No.2-4: bladelets.*

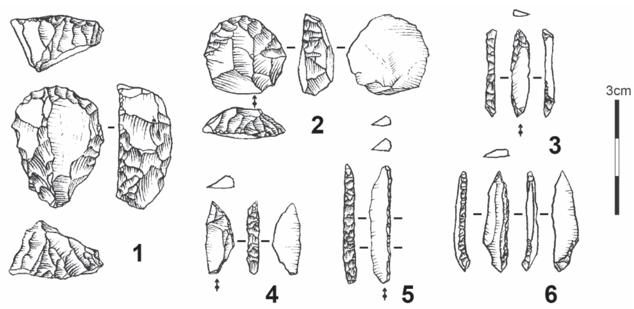

Figure 5: *Selected Epigravettian tools from Trench 1 in Blazi Cave. No. 1: double endscraper; No. 2: thumbnail endscraper; No. 3: microgravette; No.4: segment; No. 5: backed bladelet; No. 6: shouldered point.*

The Late Upper Palaeolithic

As concerns the time frame between 30'000 and 18'000 years BP, there is no Gravettian site known yet in Albania. After this gap, the Palaeolithic record sets on shortly after the Last Glacial Maximum. The three investigated caves in the Mat region of northern Albania each hold evidence for Epigravettian occupations. While only a few backed bladelets were discovered randomly in the excavated sections at Nezir Cave and Keputa Cave, a rich Epigravettian find layer is still present in remaining deposits at the entrance area of Blazi Cave (Hauck *et al.* 2016; Hauck *et al.* in press). Charcoal samples taken from Trench 1 and 5 date the Late Upper Palaeolithic occupation to around 18'000 cal. BP. Later Neolithic settlement activity truncated the Epigravettian sequence, and therefore, a significant part of the post-glacial record of Blazi Cave is missing.

More than 10'000 lithic artefacts and an equal number of well-preserved faunal remains allow for a determination of site function and seasonality of occupation in Blazi Cave. Lithic analysis shows that re-tooling was the main purpose of artefact production. To this end, small radiolarite pebbles and larger flakes were transported to the cave for further reduction. On-site production focussed on bladelets and micro-blades many of which were subsequently truncated and retouched to replace the worn inserts of composite hunting weapons. Backed bladelets, backed microblades, microgravettes and a few Gravette points are typical tool types in this respect (Fig. 5). Parallel to the replacement of hunting weapons, endscrapers and a few burins were made on larger blades or on flakes, such as fan-shaped types or thumbnail endscrapers.

Raw material determination has yet to be done for the Blazi Cave assemblage to provide information about the foraging radius of Epigravettian hunter-gatherers and possible exchange networks. While the radiolarite is of local origin, some imported cores, blanks and tools of exotic flint can be informative. We assume that this personal gear is made of flint varieties that stem from southern Albania.

Faunal analysis reveals that the majority of determinable bones from Blazi Cave belong to Capra ibex (about 90% of NISP; Hauck *et al.* in press). Other mammal species, such as red deer and wild boar, occur in much smaller number. This shows that Blazi Cave served as an important station for the hunt for ibex in the rugged limestone terrain around the site. As neonate individuals are missing in the bone assemblage, the summer period is the most likely season of occupation. The remaining spectrum of animal species points at a diversified landscape around the cave with wood covered alluvial plains, fissured karst and open habitats in higher elevations. Therefore, Blazi Cave holds a strategic position in the late LGM landscape of the intermediate zone between coastal lowlands and higher mountainous region of Albania.

A second Epigravettian assemblage is known from the southern coastal zone of Albania at Kanali (Hauck *et al.* 2016). Here, artefacts of Late Epigravettian type appeared within the topsoil that overlies a collapsed and buried cave system. Unfortunately, the Kanali assemblage is deprived of its original sedimentary context. However, the position of the site close to the coast at the base of an east-west stretching limestone ridge is interesting. The position of Blazi Cave in the hinterland in mind, Kanali likely belonged to sites at the intersection between the foothill zone and the extended LGM steppe.

Like in Albania, the record for the Gravettian is scanty in the entire Eastern Adriatic. Except for

Kastritsa rock-shelter and Asprochaliko Cave in Epirus (Adam 2007), the majority of Eastern Adriatic sequences lack any sign of human occupation shortly before and during the LGM. In the current state of research, it seems that human settlement activity intensified only after the last glacial peak. This is proven by the density of Epigravettian sites from the northern end of the Eastern Adriatic coast down to southern Greece that appeared after 20 ka cal. BP (Fig. 1). Some common features, such as the lack of geometric microliths and the presence of shouldered points, attribute the Blazi Cave assemblage to the pool of early Epigravettian sites. To mention here are Klithi and Kastritsa rock-shelter in northwest Greece (Adam 1989; Bailey 1997b), Crvena Stijena and Medena Stijena in Montenegro as well as Badanj in Bosnia and Herzegovina (Whallon, 1999; Mihailović, 1999, 2009). Further to the north, a number of Epigravettian sites are known in the Croatian karst (Vukosavljević *et al.*, 2011; Karavani? *et al.* 2013). However, these sites belong to the later phase of the Epigravettian.

A conspicuous Epigravettian site cluster that likely coincides with a regional-scale network or territory is given by sites in northwest Greece and Albania. In the Epirus, several rock-shelter sites and open-air localities allow for a modelling of human settlement dynamics and mobility on a seasonal basis (Bailey 1997a, 1997b; 1999). Like today, the postglacial landscapes offered a mosaic of microhabitats many of which acted as LGM refugia for many animal and plant species (Miracle *et al.* 2010; Phoca-Cosmetatu and Rabett 2014; Whallon 2007). Regular macro-moves between the open coastal lowlands and rugged mountainous hinterland guaranteed access to a wide spectrum of foraging grounds. This transhumance strategy targeted on ibex and chamois in higher elevations during the warmer summer months and ungulates adapted to more wooded environments, such as bovids and red deer, in lower elevations during longer periods of the year (Sturdy *et al.* 1997; Miracle 1995, 2007). Rock-shelters and caves in rugged limestone environments attest for repeated hunting trips to exploit ibex and chamois (Gamble 1997). Blazi Cave belongs to this group of hinterland sites the archaeological record of which shows only a seasonal facet of Epigravettian settlement dynamics (Hauck *et al.*, in press). This implies that cultural complexity should vary alongside this seasonal gradient and occupation length with diversified and high-density records in sites located at the intersection of major ecozones versus task-specific assemblages in less diversified environments. The density of archaeological remains and the diversity of lithic and faunal assemblages a various sites seem to support this Epigravettian land-use model (Fig. 6). The caves with long archaeological sequences, such as ?andalja, Franchthi or Klissoura, are situated at the intersection between the open coastal lowlands and the more closed mountainous hinterland. Their strategic position favoured long-term occupations, and hence, a wide array of activities is reflected in their archaeological record. These sites were central foci in the Epigravettian landscape from which task-related moves into the mountainous region or coastal forest steppe were organized. It is important to bear this land-use pattern in mind when dealing with technological variability in the Epigravettian. The model however faces the problem of post-glacial sea-level rise that lead to the submersion of coastal lowlands which were formerly exposed during the Epigravettian period (Del Bianco *et al.*, 2015; Sakellarou and Galanidou, 2016).

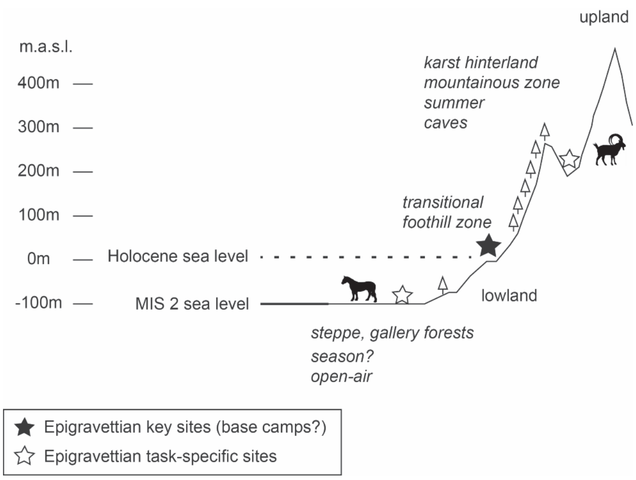

Figure 6: *Epigravettian land-use model for the Eastern Adriatic. The sharp relief along the Eastern Adriatic implied a vertical organization of technology according to season. Note that winter-term task localities in the steppe lowlands can only be assumed as respective evidence is potentially submerged by Holocene sea-level.*

The Mesolithic

Before 2009, the Mesolithic in Albania was known from three sites: Konispol Cave in the extreme south, Kanali rock-shelter and Kryegata B (Petruso *et al.* 1996; Harrold *et al.* 1999; Runnels *et al.* 2004, 2009). In Konispol Cave, the Mesolithic assemblage is rich but remains undated. Based on stratigraphic observations, it seems to be younger than 11'400 BP and directly underlies the earliest Neolithic levels (Schuldenrein 1998).

We are now able to add important data to this corpus of early Holocene sites. The first indication of visits by Mesolithic people to one of the caves in the Mat region was given by two radiocarbon dates of 9252 ± 85 and 9540 ± 34 cal. BP (Tab. 1). The charcoal samples were taken from an ash concentration on the cave floor deep inside the main gallery of Keputa Cave. Unfortunately, the charcoal scatter is without lithic artefacts or faunal remains.

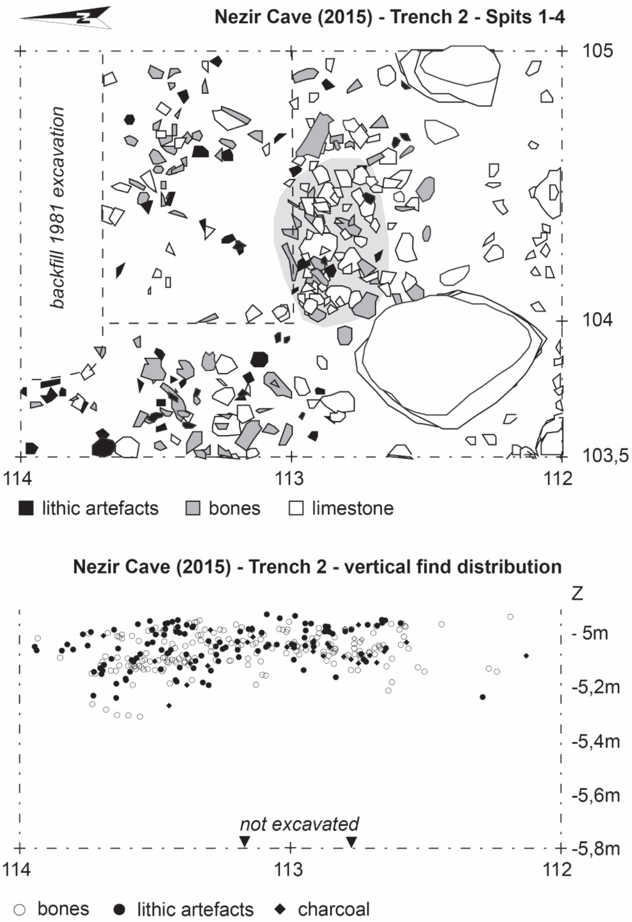

Figure 7: *Superposition of spits 1 to 4 (eight centimetres depth) in Trench 2 in Nezir Cave and vertical find distribution of the Mesolithic layer; depth is measured below datum. The fireplace is marked in grey shading. Note that the upper part of square 113/104 was partly truncated by the 1981 excavation.*

Secure evidence for a Mesolithic occupation was recently discovered in nearby Nezir Cave. Separated from the Neolithic horizons by a 20cm thick sterile deposit, the Mesolithic find layer appeared in Trench 2 within a reddish clay that contains a low density of limestone debris. Lithic artefacts, faunal remains and charcoal are found in a 30cm thick concentration the highest density of which is in the upper 20cm (Fig. 7). Trench 2 probably hit the periphery of the original occupation zone as find density is conspicuously lower in the southernmost part of Trench 2. Apart from this spatial concentration, the objects' horizontal embedding and the fact that some faunal elements were unearthed in anatomical connection shows that the Mesolithic layer is in situ. A small fireplace can be identified in the centre of the excavation surface (Fig. 7). It shows a high density of charcoal and heat-cracked metamorphic rocks that are of non-local origin. Three charcoal samples were taken for AMS 14C dating and date the Mesolithic occupation between 10'000 and 10'500 cal. BP (Tab. 1).

The lithic artefact sample comprises 131 items of which about 40% are chunks and small debris. Simple flakes (N=51) dominate the group of diagnostic implements, followed by blades (N=17), cores (N=8), bladelets (N=3) and one microblade. Almost all pieces were struck from radiolarite pebbles, only 5 objects are made of non-local flint. This pattern resembles the raw material provisioning strategy that was observed for the Epigravettian at Blazi Cave.

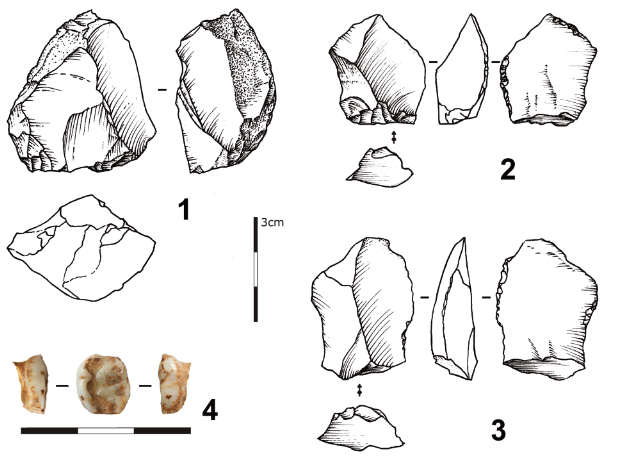

Figure 8: *Selected finds from the Mesolithic layer in Nezir Cave. No.1: flake core; No.2-3: flakes; No.4: human molar (m1).*

Surprisingly, the lithic assemblage contains no typical Mesolithic tool type. In fact, putting one backed bladelet, one microgravette and two endscrapers aside, the assemblage does not even look like an Upper Palaeolithic one. To the contrary, it is the dominance of simple flakes that were struck with a hard hammer from Levallois-like cores that marks the Mesolithic of Nezir Cave (Fig. 8). The flakes are short and thick and show an unprepared striking platform . The scar pattern on the cores and flakes shows that the flaking surface was prepared with unidirectional convergent removals.

More than 800 faunal remains were excavated. Although chemical weathering affected some of them, preservation is sufficient to allow for a rough determination of animal species. Due to the high degree of fragmentation, only 21,3% (N=187) are attributable to genus and only 6,4% (N=56) to species. Among the latter, wild boar (Sus scrofa) is the most frequent, followed by red deer (Cervus elaphus), bovids (Bovidae), brown hare (Lepus europaeus), roe deer (Capreolus capreolus), ibex (Capra ibex) and red fox (Vulpes vulpes).

Although the faunal sample is too small to allow for a meaningful reconstruction of settlement activity and palaeoenvironment, two basic considerations can nevertheless be made. Firstly, the animal species distribution points at a temperate woodland in the surrounding of the cave. This is corroborated by the fact that all three dated charcoal samples belong to oak trees (Quercus). Secondly, the dominance of wild boar and red deer over ibex stands in contrast to the pattern seen at Blazi Cave and may serve as a hint that the cave was occupied during the winter months.

Two finds give a first indication of whom actually went to the cave and from where. The first evidence is a cockle shell fragment that belongs to the group of bivalves. We take it as a sign for connections with the Mediterranean coast. Shells like this were found as middens in the Mesolithic site of Sidari on Corfu Island (Sordinas 2003). The second discovery is a human tooth. It is a first molar (m1) from the left side of the mandible of an adult person (Fig. 8). The root is missing and the surface is extremely worn down.

In the current state of analysis, we interpret the Mesolithic assemblage of Nezir Cave as the left-over of one or a few very brief occupations which likely served for the processing of hunting prey. Some of the larger bone fragments exhibit cut marks and a future taphonomic study will provide further insight into Mesolithic settlement activity in Nezir Cave. Among other things, these activities required fresh and sharp-edged flakes for which it sufficed to reduce radiolarite pebbles in an expedient manner. This type of assemblage exemplifies how variable technological solutions can be. This in turn poses problems to the visibility of Mesolithic sites on the basis of lithic assemblages alone (see Galanidou 2011 for a comparable issue with Greek Mesolithic sites).

In the wider region of the Eastern Adriatic, the transition from the Late Upper Palaeolithic to the Mesolithic is all but clear. Despite the growing number of sites, Mesolithic cultural evolution and the tendency for regionalisation of cultural groups, are still difficult to grasp (Galanidou and Perlès 2003; Kyparissi-Apostolika 2003; Galanidou 2011)). The idiosyncratic flaking method described for the Nezir Cave assemblage in Albania is likely paralleled by flake based assemblages discovered in Early Mesolithic sites in Greece. Moreover, the microlithic tool component is equally low in the early phase of the Greek Mesolithic (Perlès 2003; Sordinas 2003). We have to await a more detailed analysis of the Nezir lithic assemblage for a better comparison of this Albanian cave site with other Early Mesolithic sites. In the present state of research, the flaking technology seen at Nezir resembles the expedient flake production observed in the Mesolithic assemblage of Theopetra Cave (Adam 1999) and the lower Mesolithic levels of Franchthi Cave (Perlès 1990). It is interesting to note that it is exactly these two sites that also delivered human remains in the context of burials (Stravopodi *et al.* 1999; Perlès 2003).

Runnels and colleagues propose a shift in land-use strategies from the Late Upper Palaeolithic to the Mesolithic (Runnels and Van Andel 2003; Runnels *et al.* 2009; but see Galanidou 2011). In the Mesolithic, many sites are clustered at the coast with very few localities being found in inland regions. This phenomenon likely coincides with a growing interest in maritime resources (Sordinas 2003). Provided that Shën Mitri in southern Albania holds a flake-based Mesolithic component, this open-air site then nicely fits into the observed Mesolithic site distribution pattern.

Concluding remarks

After five years of survey and test excavations done by the German-Albanian Palaeolithic project (GAP), the Palaeolithic record of Albania is enriched by well-preserved Late Upper Palaeolithic and Mesolithic sites. Their solid dating and meaningful integration into seasonally triggered land-use patterns reveals the flexibility and reliability of human technology used in the postglacial period, around 18'000 years ago. The mosaic arrangement of different ecozones in the Eastern Adriatic caused a complex organization of Epigravettian and Mesolithic technology. This in turn is manifest in the dissimilitude of sites and artefact assemblages. The use of neatly tied typological catalogues for the definition of Late Upper Palaeolithic and Mesolithic phases disregards the dynamics of technological solutions. This is especially problematic for the understanding of culture change in the postglacial period, a time when a rapidly changing environment and population growth demanded a wide array of technological experiments and innovations.

Finally, we will briefly address the stratigraphic gaps that appear in almost all Late Quaternary sequences in the Eastern Adriatic (Fig. 5). All Albanian sites that were investigated in the GAP programme lack undisturbed MIS 3 and older deposits (Hauck *et al.* 2016). If present, Middle and early Upper Palaeolithic occupation remains always occur in reworked sediments. A comparable hiatus is seen in many rock-shelter sequences in the Epirus region (Kotjapopoulou *et al.* 1999; Bailey 1999). Another major gap occurs between the Mesolithic and the early Neolithic. This is the case in Nezir cave where a 20cm thick sterile layer separates the two. A similar hiatus is observed at Konispol Cave and Sidari for example (Schuldenrein 2001; Berger and Guilaine 2009). The most likely factors that are responsible for this fragmentation of most Adriatic sequences are the following:

1. Climatic impact: Severe pleniglacial conditions resulted in a lag of (re-)occupation of higher latitudes in mountainous areas; therefore, human populations were restricted to more temperate areas in the coastal lowlands during cold episodes, such as the LGM (Bailey and Gamble 1990; Bailey 1999; Sturdy *et al.* 1997). Furthermore, erosion is enhanced due to the absence of tree cover and freeze-thaw cycles. The hiatus between the Mesolithic and Neolithic is likely caused by the 8,2 ka cal. BP event during which cooler and wetter conditions lead to frequent sediment run-off (Mlekuć *et al.* 2008; Berger and Guilaine 2009).
2. Archaeological visibility: Post-glacial sea-level transgression lead to the submersion of a considerable land mass that was previously part of human foraging ranges along the Adriatic coast (Del Bianco *et al.* 2015; Sakellariou and Galanidou 2016). The submersion of archaeological sites is further enhanced by tectonic activity that continuously modified the coastal landscapes (Miccadei *et al.* 2011; Flemming *et al.* 2014). Furthermore, aggradation in the coastal lowlands caused a submersion of sites with thick alluvial deposits. All this implies that a significant number of Palaeolithic sites are nowadays out of reach for archaeological investigation.
3. Human impact: Increased opening of the coastal area for touristic and industrial purpose is a potential threat to the preservation of archaeological sites.
4. Lack of research: Survey activity is commencing in Albania and will do so in adjoining countries, such as Montenegro or Bosnia and Herzegovina. Until today, however, large surfaces are still unexamined.

Due to the limited visibility of sites, the currently visible Palaeolithic landscape in Albania and the Eastern Adriatic as a whole is merely a small facet of past reality. The above mentioned factors have important methodological implications for archaeological model building and future survey strategies.

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