pXRF analysis of obsidian artifacts from Albania: Crossroads or cul-de-sac?

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1. Introduction

Archaeologists first identified obsidian artifacts in Albania in the early 20th century, but their numbers were small and the contexts insecure. Their source was never determined. Nor was it clear why, given the large numbers of obsidian artifacts recovered in regions to the south and north, in areas like central and southern Greece and Croatia, more obsidian artifacts were not found in Albania. In an attempt to address these problems in Albanian prehistoric archaeology, we analyzed eight obsidian artifacts from six sites – out of a total of only 16 known pieces from the entire country, many of which are now lost – using portable X-ray fluorescence spectroscopy (pXRF). One of these, from the Putanja site, is from Lipari, Italy. The other seven are from Melos, Greece. All eight appear to date from the Middle/Late Neolithic to Late Bronze Age (5500–1050/25 BCE). The absence of obsidian in Albania is not the result of poor archaeological sampling; several, recent intensive surface surveys and excavations in south and north Albania produced no obsidian. Rather, it may be that obsidian was not imported to prehistoric Albania due to the presence of abundant, accessible, very fine flint sources, located in particular in the southwest of the country. Consequently, the prehistoric inhabitants of Albanian were out of the loop or otherwise uninterested in obsidian during those periods of Mediterranean prehistory, specifically from the Late Neolithic to the Bronze Age, when it was traded most extensively.
2. Mediterranean obsidian sources

Most Eastern Mediterranean obsidian derives from four primary source zones in Italy, Greece, Turkey, and the Carpathians. Chemical sourcing of Mediterranean lithic materials began with research on Melian obsidian in the 1960’s by Cann and Renfrew (1964), acting as a catalyst for the analysis of other, known sources in other parts of the Mediterranean and Eastern Europe. Consequently, we now understand relatively well where and how Mediterranean obsidian was acquired and subsequently traded. In this section, we briefly describe each source zone in turn and then consider Albania’s position within and between the Mediterranean’s prehistoric obsidian distribution spheres (Fig. 1).

2.1. Greece

In Greece, there are two main island sources of obsidian, Giali in the Dodecanese and Melos in the Cyclades. Some exploitation may have also occurred on the island of Antiparos, but the material is considered to be of lower quality (Renfrew et al., 1965: 232; Williams-Thorpe, 1995: 231). Melos is the best-studied obsidian source in the Mediterranean, and has been exploited since early prehistoric times. Melian obsidian artifacts were recovered, for example, from Upper Paleolithic and Mesolithic levels at Franchthi Cave in the Argolid, demonstrating the existence of early marine exchange networks (Perlès, 1987, 1990; Perlès et al., 2011). Obsidian trade in the Aegean continued through the Neolithic and climaxed during the Bronze Age. Though the other sources were known and occasionally used, the majority of obsidian found at sites in Greece comes from Melos and access to the quarries might have been open, not restricted (Torrence, 1986).

On the island of Melos, two quarries are known: Demenegaki and Sta Nychia (the latter has also been referred to as Adhamas, Agia Nychia, or Bombarda) (Francaviglia, 1984; Renfrew et al., 1965; Torrence, 1986). They are located on opposite sides of the island and exploit flows formed by two different volcanic events (Acquafredda and Paglionico, 2004: 422; Fytikas et al., 1976; Fytikas et al., 1986). Though dating the flows using fission track analysis produced controversial results (Arias et al., 2006), compositional analysis of samples from the two quarries clearly demonstrates that they are chemically distinct (using INAA: Aspinall et al., 1972; Aspinall and Feather, 1978; Bigazzi et al., 1986; Williams-Thorpe, 1978; OES: Cann and Renfrew, 1964; and XRF: Frahm et al., 2014; Liritizis, 2008; Molloy et al., 2014; Riebe, 2018; Tykot, 2002). Seven of the obsidian artifacts we analyzed in Albania were from Melos and though we did not aim to identify subsources, most of them would appear to be from Demenegaki.

Melian obsidian artifacts are found throughout Greece, from Thrace and Greek Macedonia in the north to the Peloponnese and the Ionian islands in the south, and at many sites in western Anatolia (Kourtessi-Philippakis, 2014; Milić, 2014: 288, fig. 2; Sørenson, 2010: 158, fig. 1). Generally speaking, numbers fall off with distance (Sørenson, 2010: 171, table 1), however, and as recent field research (Middle Kalamas Archaeology Project in Thesprotia, Sidari excavations, etc.) has demonstrated, there is clearly less Melian obsidian in northwestern Greece and the Adriatic as compared to northern Greece and Asia Minor (Kourtessi-Philippakis, 2009a, 2009b). To the best of our knowledge, Melian obsidian has not been identified along the east Adriatic coast north of southern Albania and in Italy, with the exception of Grotta del Leone near Pisa (Tykot, 1996: 54). Melian obsidian accounts for approximately 10% of the total from the prehistoric site of Salamandria on the island of Palagruža, while the rest is from Lipari (Forenbaher, 2013: 94; Tykot, 2011, 2014).

Fig. 1. Map of the Eastern Mediterranean showing obsidian sources and distribution spheres. M. Galaty, based on Milić (2014: 286, fig. 1).
2.2. Italy

Italian obsidian comes from sources on four islands: Lipari, Palmarola, Pantelleria, and Sardinia. Of these four, Lipari obsidian is the most widely distributed, with substantial amounts found throughout Italy and in Croatia, near the coast in Istria and in central Dalmatia (e.g., Danilo, n = 54), and inland as well, at a few sites in north Croatia (Bass, 1998; Kaiser and Forenbaher, 1999; Tykot, 2011, 2014, 2017a; Tykot et al., 2013). Obsidian from the other Italian sources has not been identified in the Adriatic, with the exception of two pieces of Palmarola obsidian from Susac (versus 56 from Lipari; Tykot, 2014: 178), one each at two mainland sites in Croatia (Tykot, 2017b), and Sardinian obsidian at Brindisi in the heel of Italy (De Francesco et al., 2011). One Albanian obsidian artifact from the Putanja site is from Lipari.

2.3. Turkey

There are many sources of obsidian known in Turkey, primarily located inland in central Turkey (Carter, 2006; Carter and Shackley, 2007; Chataigner et al., 1998). Small numbers of central Anatolian obsidian artifacts are found in western Anatolia and in Crete and the Cyclades (Milić, 2014: 287, 288, fig. 2). No Anatolian obsidian has been identified in Albania.

2.4. The Carpathians

As is the case in the Mediterranean, Eastern Europe has a limited number of obsidian sources from which materials could be obtained in prehistoric times (Biro, 1984, 1998a, 1998b). The obsidian sources are located in several locations within the Tokaj-Eperjes Mountains in northwestern Hungary and in southeastern Slovakia. To date, relatively few compositional studies have been carried out on Eastern European obsidian materials (Biagi et al., 2007; Biagi and Starnini, 2013; Constantinescu et al., 2002; Riebe, 2016; Williams-Thorpe and Nandris, 1977; Williams-Thorpe, 1978; Williams-Thorpe et al., 1984). Small numbers of Carpathian obsidian artifacts are found as far south as Greek Macedonia, e.g., from the sites of Displio and Mandalo (Kilikoglou et al., 1996; Milić, 2014: 288, fig. 2), and in northern Italy (Kilikoglou et al., 1996: 347). Carpathian obsidian has been recovered from Neolithic archaeological sites in northern, continental Croatia and Bosnia (Tykot, 2011), as well as recently from the Dalmatian coast (D. Riebe, personal communication). No Carpathian obsidian has been identified in Albania, but there are several pieces from the site of Žitkovac, Kosovo (Tripković and Milić, 2008: 30 citing Chapman, 1981: 302–303, fig. 98).

2.5. Summary

When Mediterranean obsidian distribution spheres are mapped (as described by Robb and Farr, 2005: 37 and done by Milić, 2014: 286, fig.
1), Albania falls into a gap between them, even during the Late Neolithic-Bronze Age, when these spheres were at their largest and most active (Fig. 1). As discussed below, the lack of obsidian in Albania is not mainly a sampling problem; there must have been other factors at play.

With regard to the Neolithic Mediterranean obsidian trade, Broodbank (2013: 233) describes the existence of: “unusual specialist individuals or groups moving over much longer distances than most of their contemporaries.” Just what motivated these traveling specialists – and why they skipped Albania – remains unclear, but obsidian does not appear to have been circulated for utilitarian purposes only; rather there seems to have been deeper social needs driving early trade contacts. It may be that prehistoric inhabitants of Albania eschewed obsidian because they had access to excellent local flints. But another intriguing possibility is that, at least during the Bronze Age, the prehistoric inhabitants of Albania did not adopt the Aegean social practices that accompanied obsidian, such as scarification, the cutting and shaving of hair, and various mortuary rituals, and so did not acquire it (Broodbank, 2013: 231; Carter, 1994, 1997; Nakou, 1995: 22–23).

However, before addressing this hypothesis, we catalog and describe all of the obsidian artifacts found to date in Albania, followed by descriptions of methods and results.

3. Obsidian in Albania

The list of obsidian artifacts discovered in Albania is short and confined to twelve sites in southern Albania (Table 1): 16 total artifacts, of which eight are certainly obsidian (as determined by pXRF analysis), and six were probably obsidian (not visually inspected by the authors or subjected to pXRF analysis), but are now lost. One reported obsidian axe, now lost, was almost certainly not obsidian. Of the 16, six are blades or blade fragments, three are “scrapers,” three are flakes, and two are chips/chunks. Of the three flakes, one may indicate rejuvenation of a core, and of the blades, one preserves a secondary crest, indicating that prepared cores were occasionally imported to Albania. Of those artifacts that could be dated, by form and/or context, the majority date to the Neolithic-Bronze Age, with most of those probably dating from the Late Neolithic to Bronze Age (5500–1050/25 BCE).

3.1. Albanian obsidian artifacts not subjected to pXRF analysis

The first archaeologist to identify obsidian in Albania was Luigi Maria Ugolini, the head of the Italian archaeological mission to Albania. In the early 20th century, he published sporadic prehistoric finds that he claimed ranged in date from the Eneolithic through the Bronze Age (circa 4500–1050/25 BCE; Ugolini, 1932, II: 216–217). These were reported in the context of excavations undertaken in the classical city of Phoinike in southwest Albania, 1926–1927 (De Maria, 2002: 21–22).

The accounts describe several prehistoric artifacts, among them two fragments of polished stone hammers, flint tools, and a small obsidian knife, most of which were discovered in the central part of the Phoinike plateau close to the treasury (Ugolini, 1932, II: 139–142). That this knife was in fact obsidian has never been confirmed, and no other finds from these periods have been reported from more recent excavations (Budina, 1971a: 295–299, 1974: 235–244, 186: 113–121; Çondi, 1977: 343–344, 2004: 35–48; Nanaj, 1989: 272–273, 1990: 256–266; De Maria and Gjongecaj, 2002, 2003, 2005), but we may assume that the knife was prehistoric.

Ugolini also identified two pieces of obsidian from the acropolis of the classical city of Butrinti. From excavations beginning in 1928, he recovered a few prehistoric artifacts, of which two are identified as small obsidian scrapers. Ugolini indicated that these materials were of late prehistoric date (Ugolini, 2000: 115–116), while Mustilli was of the opinion that the lack of context made dating them (and those from Phoinike) impossible (Mustilli, 1943: 138). More obsidian was collected at the site in Ugolini’s excavation back dirt during a visit in 1937 by the Swedish archaeologist Natan Valmin (1939: 77). In fact, unlike Phoinike, later work at Butrinti has revealed possible Late Neolithic and mostly Late Bronze Age and Early Iron Age finds in the area of the acropolis (Budina, 1988: 25–27, 30–31, 34–37; Hashim, 1998: 223–224, 227–228; Lima, 2013: 32; Nanaj, 1985: 306, 311, 1986: 255; Prendi, 2008), suggesting that Ugolini’s obsidian scrapers perhaps did date to late prehistory.

One more obsidian chunk was discovered as a surface find at Dhiapori in the vicinity of Butrinti during survey work in 1999. The piece has not been published and lacks any obvious association with other finds (I. Gjipali, personal communication). We could not confirm that it was in fact obsidian.

An obsidian blade fragment was discovered during the 1993 excavations at Konispoli Cave in the far south of Albania near the ancient city of Butrinti. Based on visual inspection of the piece, the authors of a preliminary report of the 1992–1994 excavations suggested a Melian origin (Korkuti et al., 1996: 183, 192, 216; see also Petruso et al., 1994). Unfortunately, the piece could not be relocated in the store rooms of the Institute of Archaeology in Tirana for pXRF analysis. Nevertheless, given that the excavators are experienced Mediterranean archaeologists, the piece seems almost certainly to have been of Melian origin, as originally identified. According to the report, it was recovered from a Middle-Late Neolithic stratigraphic context in Trench XXI, unit 23 (Korkuti et al., 1996; K. Petruso, personal communication).

Another stray surface find—a grey obsidian pierced axe, 12 cm long, broken longitudinally—was recovered during the 1962 excavation campaign at the IVth century BC hilltop fortification of Ripësi in the Finiqi district of southern Albania (Budina, 1971b: 69, 79). Despite efforts to relocate the object, its whereabouts remain unknown. However, based on the information provided in the publication and given the axe’s form, we can infer an approximate date in the Albanian Late Neolithic to Middle Bronze Age. Given that there are no other comparable or existing examples of polished obsidian axes from the Mediterranean basin of which we are aware, this particular object was probably misidentified and was most likely a polished stone axe, not obsidian.

An attested obsidian find comes from the classical Corinthian colony of Apollonia in the Fier district, but it also could not be relocated. It was discovered during the 1951 excavations in the area delimited by the temenos wall and the site’s deposit of sacred amphorae, between the gate of the temenos wall and the odeon. The author of the excavation report maintains that even though the obsidian piece was found in a historic stratum it was of prehistoric date, and would have been imported from either Hungary or Melos in Greece (Ceka, 1951: 3–4; we consider the latter a much more likely point of origin). While Anamali (1956: 8) points to a possible Neolithic date for the obsidian, artifacts of Bronze and Iron Age date have been found occasionally both within the city and in its necropolis (Anamali, 1956, 8; Bejko and Aliu, 2010, 1–2, 23–24), which could indicate that the piece was a late prehistoric, rather than Neolithic, import.

3.2. Albanian obsidian artifacts subjected to pXRF analysis

Recently, an obsidian piece from Maliq was identified in the Institute of Archaeology store rooms in Tirana (Fig. 2). The site is located in the Korça basin in southeast Albania, on the north side of the current bed of the Devolli River, in close proximity to the town of Maliqi. The settlement, discovered in 1948 during drainage work at Maliq Lake (Ceka and Adam, 1949: 95), was excavated from 1961 to 1966 and 1973 to 1974 (Andrea, 1983–1984: 114, 1991–1992: 84–85; Prendi, 1966, 1974), revealing Late Neolithic, Eneolithic, Bronze Age, and Iron Age phases. The piece was originally excavated in 1966, bears the inventory number 5869, square K13, spit 20, and is described as a blade fragment, bilaterally retouched on black flint belonging chronologically to the Late Neolithic. PXR analysis of the artifact indicated instead that it is Melian obsidian.
Two purported obsidian artifacts were found at the large (8 ha) Middle (5400–5200 BCE)–Late Neolithic (4800–4500 BCE) lakeside settlement of Kallamas, located on the northern shore of Greater Prespa Lake in the Korça district of southeast Albania. The site represents a particularly large specialized workshop for the production of polished stone implements. It was first identified by an Albanian-French team in 2007. Systematic test excavations followed (2008–2011) in order to determine the extent and the chronology of the site. Each season surface finds were collected, producing a relatively large sample of lithic artifacts, including two possible obsidian pieces (Lera and Touchais, 2008, 897–900; Lera et al., 2009; Mulliez, 2009, 969–970; Lera et al., 2010, 618–626, 647; Lera et al., 2011, 661–675; Lera et al., 2012; Oberweiler et al., 2014, 83–89). The first is a blade fragment found in 2009 (“Rapport Sur La Campagne de 2009”, 2009: 8, 10, 37). It was analyzed by pXRF and is made from black flint, not obsidian. The other is a small chip found in 2011. The pXRF analysis indicated a Melian origin.

Another obsidian find derives from the site of Bisti i Pallez, discovered during survey and rescue excavations from 2002 to 2005 at Archaios sanctuaries in the territory of the ancient Corinthian colony of Epidamnos. The site is situated north of the modern city of Durrës, on the southern part of the Bisti i Pallez peninsula, and is being eroded by wave abrasion. Initially, the very large number of lithics made exclusively from honey-brown flint suggested a Paleolithic or Mesolithic age (Gjipali, 2006: 37). But later work, including trial excavations in 2007, revealed at least two major chronological phases: the Late Neolithic and Early Bronze Age. Unfortunately, the sea water level did not allow for additional deeper excavations at what once might have been an island, leaving room for further interpretation as regards date and site function (Pojani et al., 2013: 133–134; Gjipali, 2012: 231, 2014: 61; Ruka et al., 2014: 103). Mixed in with the particularly large quantities of surface-collected honey-brown flint finds was a single obsidian flake, possibly a core tablet. The piece is rather worn due to wave action but remnants of flake scars can still be detected on the dorsal side, which might suggest the presence of at least one obsidian core, the platform of which was maintained by detaching core tablets. The flake was analyzed by pXRF and it is from Melos, the northernmost example of Melian obsidian discovered to date along the eastern Adriatic coast.

The sites of Putanja and Dalani i Vogël were discovered in 2010 by local amateur lithic collectors and are situated north of the city of Vlora, on the bay, at the far southern end of the eastern Adriatic coast (Ruka et al., 2014). Each produced one obsidian artifact. Putanja and Dalani i Vogël are two of several prehistoric archaeological sites located close to the southern extent of a sandstone and sandy hill-range molasse that extends for ca. 4.6 km northwest-southeast between the sea and Narta Lagoon. The important late prehistoric and Classical site of Treponti is also situated nearby, but until recently the overall archaeological potential of the wider region, for early prehistory in particular, had not been fully realized. The hill range is comprised of a series of depressions and peaks that are being continuously eroded by the sea on the southwest. Like Putanja and Dalani i Vogël, the rest of the sites are situated in depressions that are relatively flat. The many recently-identified open-air sites along the range contain mostly different early prehistoric components at each of the various locations.

In the assemblage of Putanja, one obsidian medial blade fragment with very regular parallel ridges and lateral margins was identified and recovered during a brief visit to the site in 2012 (Fig. 3). The pXRF analysis indicated that the obsidian is from Lipari, Italy. Given its form and the lack of pottery at the site, we initially dated the piece to the Mesolithic. However, Lipari’s obsidian sources were not formed until the late Mesolithic and exploited prior to the Neolithic period (Tykot, 2017a). They generally were not exported outside Italy after about 3000 BCE, so the artifact may well date to the Neolithic (Freund, 2017: 5–6).

The second obsidian artifact derives from the site of Dalani i Vogël and is a core bladelet fragment. The site includes finds that range from the Middle Paleolithic to perhaps the Bronze Age, with one of the most significant components being the Early Neolithic (Andoni et al., 2016: 121–123, 125; Ruka et al., 2014). The obsidian originated from Melos and the artifact is probably of Middle/Late Neolithic-Bronze Age date, given that most Melian obsidian artifacts found in the nearby Ionian Islands date to this period.

Three obsidian artifacts were discovered at the Late Neolithic-Eneolithic site of Kamnik, a hilltop settlement situated in the Kolonja district of southeast Albania. The site was first identified in 1967 and was excavated from 1968 to 1970 by a local archaeologist, Skënder Aliu.
(caption on next page)
In collaboration with Bep Jubani (Aliu and Jubani (1969)) and Frano Prendi (Prendi (1971) and Prendi and Aliu (1971)). The pieces were recently relocated in the store rooms at the Institute of Archaeology in Tirana and identified as obsidian. All three were excavated during the 1969 campaign from Late Neolithic contexts, with two bearing the inventory numbers 7495/5 and 7499/15, and the third without a number. Of particular interest is 7499/5, a blade which preserves a secondary crest. The other two pieces are a blade and an accidental flake fragment.

Finally, a recent systematic survey conducted in the vicinity of Apollonia, the Mallakastra Regional Archaeological Project (MRAP; additional discussion below), recovered numerous early prehistoric artifacts, including a single, small obsidian piece, a rectangular microolith, from the site of Kryegjata B (Runnels et al., 2004: 13–17). Our pXRF analysis of the artifact indicates that it is not obsidian, rather it is made from black flint.

4. pXRF analysis of obsidian: materials and methods

A Bruker Tracer III-V portable X-ray fluorescence spectrometer, owned by the Department of Anthropology and Middle Eastern Cultures at Mississippi State University, was used to analyze Albanian obsidian artifacts. Over the last decade the use of pXRF has become widespread in archaeological obsidian studies due to its low-destructive while providing quantitative measurements of many of the same trace elements used in obsidian sourcing studies by ED-XRF, INAA, and LA-ICP-MS. The pXRF model used is equipped with a high resolution, Peltier cooled, Silicon PIN diode detector. The instrument was set to 40 kV and 33 μA and each sample was analyzed for 300 s. A filter (76 μm Cu, 25 μm Ti, 305 μm Al) was used to reduce the background and increase the precision for the K-alpha peaks for elements in the Mn to Nb range, with detection limits for the trace elements in single-digit parts per million (ppm). With the exception of the obsidian artifact from Kallamas (a very small, thin chip), thick, flat clean faces that covered the detector completely were analyzed.

The raw data produced were calibrated using Bruker software which incorporates many obviant standards developed at MURR (Missouri University Research Reactor). Carpathian, Mediterranean, and Anatolian obsidian sources have been analyzed extensively with several analytical techniques including pXRF, thereby allowing direct comparison with the archaeological sample data and providing a fairly straightforward assignment to specific sources (Milić, 2014; Tykot, 2017b). For small samples, the use of element ratios resolves any issues arising due to low values in the raw data.

5. Results

Ten elements were measured by pXRF: Mn, Fe, Zn, Ga, Th, Rb, Sr, Y, Zr, and Nb (Table 1). Of these, Fe and the trace elements Rb, Sr, Y, and Zr were most useful in determining the origins of the Albanian obsidian artifacts, while all were used to confirm matches with specific obsidian sources. This is quite normal given that most obsidian provenance studies regardless of geographic location rely on six elements or less, including Fe, Rb, Sr, Y, Zr, and Nb (Ferguson, 2012: 408). The unique combination and proportion of these elements enables researchers to accurately identify the geological source for any given archaeological artifact. For the use of pXRF in the particular region of our study, Milić (2014: fig. 3) has shown that the elements Zr, Rb, and Sr are sufficient to distinguish each of the Aegean sources from Carpathian and Anatolian sources, while for more than a decade Tykot (2017b: figs. 3, 5, 6) has used Rb, Sr, and Nb to distinguish not only between each of the four Italian island, Carpathian, and Aegean island sources, but also to distinguish four subsources on Sardinia, three on Lipari, and both Deme- negaki and Sta Nychia on Melos. In this study, when Carpathian, Melian, and Lipari geological samples are plotted with the other eight Albanian artifacts, the Putanja fragment is clearly not from Melos (Fig. 4a, b, c). It is much too high in Fe, Rb, and Zr to be from either of the Melian sources and is, in fact, from Lipari, which has low Sr. The other seven Albanian artifacts are all from Melos.

6. Discussion

The obsidian artifact compositionally identified as Lipari may have arrived in Albania at the Putanja site as early as the Early Neolithic. The form of the blade and the lack of associated pottery at the open air site suggested a pre-Neolithic date, but the Lipari sources were not exploited until the end of the 7th or the beginning of the 6th millennium BC, that is prior during the Neolithic (Freund, 2017; Tykot, 1996, 2004, 2017a). A similar case can be made for another piece of obsidian, identified from the site of Tsarlambas along the Epirote coast in the area of Preveza. The authors of the publication suggest based on macroscopic observations that it might originate from Lipari and could perhaps date to the Mesolithic (Runnels and van Andel, 2003: 118, 121, 131, 134). The uncertainty regarding the origin and the age of this piece, however, makes the Putanja obsidian artifact the southernmost, securely-identified piece of Lipari obsidian along the eastern Adriatic-Lonian coast. The other group of Lipari finds from the eastern Adriatic is concentrated on the route connecting the islands of Palagruza, Sušac, and Korcula to various points along the middle Dalmatian coast (Tykot, 2004: 32, 2011, 2017a). Given the distances between this area of the Dalmatian coast and the area of Vlora, and the proximity of the latter to southern Italy, we can suggest direct contact between Vlora and Apulia. In which case, a number of candidate sites from the eastern coastal areas of Apulia could have served as intermediaries linking Putanja to the opposite coast and Lipari during the 6th–4th millennium BC (Freund, 2017: Supplemental Table B).

By contrast, the obsidian artifacts compositionally identified as Melian appear to have arrived in Albania beginning in the Middle/Late Neolithic and, perhaps, in the Bronze Age. It is interesting that during the Late Neolithic, when Lipari’s obsidian trade network was at its height (referred to by Freund, 2017 as Lipari’s “Golden Age”), reaching both interior and coastal sites in Croatia and Bosnia, Albanian sites acquired small amounts of Melian obsidian instead. The inland Albanian sites of Maliq, Kaminik, and Kallamas, located in Korça in southeast Albania, probably interacted with large Neolithic settlements in Macedonia, such as Dispolilji, that procured relatively large amounts of Melian obsidian (Milić, 2014: 288). Obsidian may have arrived in the Korça basin from Macedonia via down-the-line trade up the Haliakmon River from the Theraic Gulf. The Macedonian settlements also received small amounts of Carpathian obsidian (Milić, 2014: 288–289), but it appears to have arrived via routes that accessed Kosovo and bypassed Albania, probably down the Danube and Vardar rivers from the very important tell settlement of Vinča, located in Serbia near Belgrade (Kilikoglou et al., 1996; Tripković and Milić, 2008). By comparison, coastal Albanian sites, such as Dalani i Vogël, Bishiti i Pallès, and, perhaps, Konispoli, Dhiapori, Butrinti, Phoinike, and Apollonia would have acquired obsidian through coastal trade routes that ran up the eastern Adriatic shore from southwestern Greece and the Ionian Islands, largely bypassing northwest Greece and Corfu. This trade may have been facilitated by secondary distribution nodes situated at the far northern edge of the Melian distribution sphere, such as Late-Neolithic Pangali near Patras, from which 276 pieces of obsidian were
excavated (Sorensen, 2010). Traders operating out of depots, like Pangal and others in the Ionian Islands, may have sought partners at lithic-dense Albanian sites like Dalani i Vogël and Bishità i Pallès, but were rebuffed. The nearest, concentrated assemblages of artifacts of purported Melian origin are from the Ionian islands of Lefkada, Kefalonia, Ithaka, and Zakynthos, are dated to the Late Neolithic and the various different chronological sub-periods of the Bronze Age, and are thought to have been transported via sea routes (Souryoudzoglu-Haywood, 1999: 7, 17, 25, 30, 34, 39, 45, 47, 96–97, 100, 121–122).

The question, then, is why, at the end of the Neolithic and during the Bronze Age, when Melian obsidian was becoming available in large quantities throughout Greece and adjacent areas, was Albania not pulled into the Melian obsidian exchange interaction sphere?

One explanation we can discount is sampling bias. Since 1991, when Albania’s period of isolation ended, modern recovery methods have been introduced, including fine screening and intensive surface survey, producing 1000s of lithic artifacts without a net increase in the number of obsidian artifacts recovered. For example, the Mallakastra Regional Archaeological Project (MRAP) conducted six seasons of intensive surface survey in the vicinity of Apollonia, in central Albania, and excavations at the nearby site of Kryegjata B, recovering 1593 and 1190 lithics respectively (Runnels et al., 2004, 2009). Of these, only one was perhaps obsidian, now disproved by pXRF analysis (see above). Likewise, the Projekt Arkeologjik i Shkodrës (PASH) conducted five seasons of intensive survey in north Albania, recovering more than 1533 lithics; none were obsidian (Ruka, in preparation-a).

What is now abundantly clear is that in all periods of prehistory, the occupants of Albania had access to excellent flint in large amounts, so much so that much later one of the world’s primary producers of gun flints was located near Vlora in south Albania (Evans, 1887; Ruka, in preparation-b). Beginning as early as the early 20th century, several authors pointed to Albania as a possible source of flint raw materials, which might have been imported to Greece during late prehistory (Perlès 2004: 158, 2012: 542; Parkinson and Cherry, 2010: 4–5; Ruka et al., 2014: 102; Tsundas, 1908: 328; Wace and Thompson, 1912: 71). More recently, work focused in northern Albania indicates that honey-brown flint, which may originate from the Vjosë River valley in the southwest of the country, was exported to the site of Blazi Cave starting at least as early as the Late Upper Paleolithic period or 18,000 cal. BP (Hauck et al., 2017c: 155–156). Similar trends have also been observed for the Mesolithic period at the nearby Neziri Cave (Hauck et al., 2016: 156; Hauck et al., 2017a: 19–20; Hauck et al., 2017b: 164, 166). The practice of collecting and transporting large amounts of honey-brown flint reached its zenith at the site of Bishità i Pallès during the Late Neolithic and Early Bronze Age, where many thousands of honey-brown flint artifacts have been recovered (Pojani et al., 2013: 133–134). In short, it may be that obsidian was not imported to Albania in significant amounts simply because it was not needed. Lithic specialists there, operating out of workshops along the coast, may have embargoed obsidian because its importation was not an economic necessity and did not positively impact their livelihood.

We would, however, like to suggest an additional possible explanation: that prehistoric inhabitants of Albania fell into gaps between obsidian distribution spheres not for purely geographic or utilitarian economic reasons, but because the social practices that underpinned the Mediterranean obsidian trade did not appeal to some Balkan peoples, those in the west-central Balkans in particular. The obsidian “embargo” appears to have applied to both coastal and interior Albania, including Korça, the length and breadth of the country, despite the fact that other exotic goods reached Albania during the Middle/Late Neolithic, pottery in particular (Korkuti, 2001: 264, Table 3). In fact, the presence of Neolithic pottery imported to Albania from Greece strongly indicates that the volume and weight of particular goods did not dissuade inhabitants from transporting them over long distances. Moreover, the embargo held through the whole of the Bronze Age, when obsidian from Melos was traded most extensively.

Carter (1994, 1996) has argued that obsidian blades were used by Early Bronze Age Aegean individuals for depilation and/or scarification and were commonly deposited in burials (circa 3100–2000 BCE). West Balkan peoples apparently did not practice these forms of body modification and certainly did not include obsidian blades in burials. And yet, they must have been relatively well aware of Aegean Early Bronze Age burial practices, generally speaking, since so-called violin figurines were made out of clay in imitation of Aegean violin figurines were often interred in Albanian Early Bronze Age graves (Govedarica, 2016).

Interestingly, Melian obsidian artifacts appear to co-occur spatially with forms of burial practiced to the south in mainland Greece and the Aegean islands, including Crete, often associated with large corporate tombs, such as chamber and tholos tombs, that could be reopened and closed as needed, allowing various performative mortuary rituals, such as the cleaning and secondary reburial of corpses. Prehistoric Albanians practiced burial in tumuli (mounds) beginning in the Early Bronze Age and well into the historic period, much longer than in most other parts of Europe. At least 156 tumuli have been excavated to date in Albania (Bejko, 2014), and whereas lithics (and other artifacts, such as pottery sherds and daub) that range in date from the Middle Paleolithic to the Neolithic are commonly discovered in abundance in the mound and grave fill (Aprile, 2014), none of those reported lithic finds have been obsidian. In fact, primary burial in mounds did not encourage the kinds of mortuary rituals practiced to the south, including secondary reburial. The northernmost tholos tomb in western Greece is located just outside of Preveza in Epirus (Tartaron, 2004). It is perhaps no coincidence that beyond Epirus, the numbers of Melian obsidian artifacts drops to almost zero, and none are found in tombs. Rather, large numbers of exotic goods such as pottery, metal objects, including weapons, amber, and carnelian beads were imported to Albania, in particular during the Late Bronze Age, and these have been recovered almost exclusively from mortuary contexts (e.g., Bejko, 1993; Touchais, 2002; Kuri, 2012; Kurti, 2017). Obsidian is completely absent.

7. Conclusion

To close, the analysis by pXRF of Albanian obsidian artifacts points to Melian origins for the majority, both from coastal and inland Albania. Albania’s coast presents the easternmost securely identified extent, albeit sporadic, of Lipari obsidian distribution, and the northernmost extent of Melian obsidian distribution, which is marked by distance decay and considerable fall off. We conclude that sampling bias does not explain the general absence of obsidian from Albania; rather, prehistoric Albanians chose not to participate in the various Mediterranean obsidian interaction spheres that surrounded them through the Neolithic and into the Bronze Age. This could be due to the presence of abundant, excellent flint sources in Albania, but there may be a social explanation as well. Bronze Age inhabitants of Albania were culturally distinct from their southern neighbors. They espoused different mortuary beliefs and practices that did not require obsidian, and so it was not imported. It remained an exotic curiosity, nothing more, found occasionally in settlements, never in any quantity. Connections between the prehistoric inhabitants of Albania and adjacent regions were forged in other ways, with other materials, metal in particular.

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