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Terminal Pleistocene subsistence strategies and aquatic resource use in southern Greece

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ABSTRACT

In many parts of the Mediterranean Basin, the Late Glacial was a dramatic time in terms of demographic, cultural, and technological change. One region that illustrates this especially well is southern Greece, where Upper Paleolithic lifeways transitioned to the Mesolithic with the onset of the Holocene. Previous archaeological research in this area has documented an intensification of meat resources as foragers widened their diet breadth to include more low-return prey animals, eventually shifting their focus to the Mediterranean Sea. In this paper, we synthesize and expand on these previous analyses by combining new data from Kephalaria Cave with two other published sites in the Argolid (Peloponnese), Franchthi Cave and Klissoura Cave 1. These three sites provide an ideal case study for examining changes in meat procurement strategies because they have overlapping Upper Paleolithic and Mesolithic chronologies and are located within about 45 km of one another. We consider each of the sites within their local environmental contexts, including the contraction of the coastal plain and moving shorelines after the Last Glacial Maximum. Changes in the composition of ungulate prey track local environmental and ecological conditions. The use of low-return species supports an overall picture of resource intensification in the region over time. At Klissoura, the most inland of the three sites, small terrestrial prey increases over the course of the Upper Paleolithic, particularly in the Late Glacial, and until the site was abandoned in the Mesolithic. At both Franchthi and Kephalaria, small game are abundant in all Upper Paleolithic layers, but there is no overall trend. However, fishing appears in the Upper Paleolithic (most likely the Gravettoid phase) of Kephalaria and during the Epigravettian at Franchthi. Fishing increases dramatically in later layers at both sites. At Franchthi, this trend culminates in open-water fishing of large-bodied tunny in the Upper Mesolithic. Interestingly, the use of Klissoura declined at about the time that fishing became a critical part of the economy at Franchthi, and possibly Kephalaria. These subsistence shifts reflect a combination of factors, including growing human populations on a regional level and local responses that included changes in mobility patterns and site use, and more diverse toolkits, as well as changes in Pleistocene shorelines that brought an additional ecosystem closer to two of the sites. These internal and external factors allowed foragers in southern Greece to successfully move into a new ecological niche at the end of the Pleistocene.

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1. Introduction

The Late Glacial (ca. 15,000–11,000 cal BP) is an important period in human evolutionary history in many parts of Eurasia. This

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phase immediately precedes the Pleistocene/Holocene boundary, and marks a change in human adaptations from the Upper Paleolithic to the Mesolithic or Epipaleolithic. Though we know that many threads of population growth, resource intensification, and technological change appear much earlier in the Upper Paleolithic or even the Middle Paleolithic (Atici, 2009; Aura Tortosa et al., 2002; Cochard et al., 2012; Hockett and Haws, 2009; Kuhn et al., 2009; Langlais et al., 2012; Munro, 2004, 1999; Shea, 2009; Shea and Sisk, 2010; Stiner, 2005; Stiner et al., 2000), a continuation of

these trends into the Late Glacial set the stage for the adoption and spread of agriculture, particularly in Southwest Asia and the Eastern Mediterranean.

In some parts of the Mediterranean Basin, foragers increasingly relied on aquatic resources during the Late Glacial (e.g., Colonese et al., 2011; Pluciennik, 2008). There are earlier documented cases of marine resource exploitation, particularly of gatherable mollusks (Finlayson et al., 2006; Stiner, 1994; Stiner et al., 2000), seal hunting (Stringer et al., 2008), and fishing (Brown et al., 2011; Hardy and Moncel, 2011), but there is currently no evidence indicating that the exploitation of aquatic vertebrates began in earnest until the Upper Paleolithic. In many parts of Greece marine resources increase in importance during the Late Glacial (Runnels et al., 2005; but see Galanidou, 2011 on the diversity in this phase). This is evidenced by more fish and marine mollusks in faunal assemblages, as well as Mesolithic sites located on Greek islands, such as Sidari (Sordinas, 2003, 1969), the Cave of Cyclope (Sampson, 1998), and Maroulas (Sampson et al., 2010, 2002). The sequence at Franchthi Cave in Peloponnese (Fig. 1) is well known for documenting a shift to marine resources during the Late Glacial (Jacobsen, 1981; Perlès, 1987), and in many ways has driven the narrative on Mesolithic lifeways in Greece. Fish first appear in significant numbers in the Epigravettian, then fishing intensified during the Mesolithic. By the Upper Mesolithic, foragers had a full suite of technology that allowed them to fish the open waters of the Mediterranean for large-bodied taxa such as tunny (Payne, 1975; Rose, 1995; Stiner and Munro, 2011). Archaeologists document exotic obsidian from the island of Melos at Franchthi starting after 11,000 cal BP (Perlès, 1999, 1987), which suggests that fishing was part of a larger maritime strategy by this phase.

The archaeological record of at least one inland Greek site, Klissoura Cave 1 (Fig. 1; hereafter Klissoura) (Koumouzelis et al., 2001a, 2001b, 1996), contrasts with Franchthi with regard to occupation intensity. While the site was occupied throughout the Middle Paleolithic, and fairly intensively in the Aurignacian and subsequent “Gravettoid” phases, site occupation intensity declines in the Late Glacial Epigravettian and Mesolithic periods up to the abandonment of the site (Karkanas, 2010; Stiner et al., 2010). This decline follows the intensification of small game use, particularly of hares (Starkovich, 2017, 2014, 2012a). Other sites in the Klissoura Gorge contain Mesolithic components, but they are ephemeral and do not reflect a large-scale occupation of the gorge at this time (Koumouzelis et al., 1996). Ongoing faunal analyses of the rich Late Glacial layers at Kephalaria Cave (Fig. 1) (Felsch, 1973; Reisch, 1982, 1976) suggest that the situation was similar to Franchthi in terms of fish exploitation and more intensive occupation in later periods.

Although some local geographic features probably drove the availability and exploitation of large-bodied prey (e.g., Starkovich and Ntinou, 2017), the site is located next to a large spring only a few kilometers from the Mediterranean shore, so it provides an interesting comparison to the Franchthi and Klissoura records in terms of terminal Pleistocene subsistence strategies.

In this paper, we compare the faunal records of Franchthi, Kephalaria, and Klissoura caves, specifically in terms of species composition and diversity through time. Because of the large amount of data available for the three sites and our interest in regional trends, we focus on broad comparisons of taxonomic abundance and diversity. Each of these sites contains earlier Upper Paleolithic deposits (e.g., Aurignacian, Gravettoid), which we use to provide context for the later assemblages. Franchthi and Klissoura are also home to substantial Neolithic and Middle Paleolithic deposits, respectively, but we exclude these from our discussion (see Munro and Stiner, 2015; Starkovich, 2017, 2012a for more information on these phases). We consider these sites within their local and regional environmental and geographic contexts, especially their proximity to the sea.

2. Background

2.1. Excavation history and site stratigraphy

Franchthi, Kephalaria, and Klissoura preserve some of the most significant Upper Paleolithic deposits found to date in Greece. The sites are located within 45 km of one another in the Argolid region of Peloponnese in Southern Greece (Fig. 1). Kephalaria was the first of the three sites to be excavated, yet is probably the least well known. Kephalaria was excavated in 1972 by Ranier Felsch, then in 1975 and 1976 by Ludwig Reisch of the German Archaeological Institute at Athens (Felsch, 1973; Reisch, 1980, 1976). The excavation area was small, particularly in the Paleolithic layers (approximately $2 \times 3 \text{ m}^2$). The recovery techniques were exceptional even by modern standards; the excavators wet- and dry-screened through nested 5 mm and 1 mm meshes (Reisch, 1980). This led to the recovery of small lithic debitage, microfaunal remains and charcoal, in addition to larger materials.

Kephalaria preserves rich Upper Paleolithic layers, as well as a disturbed Neolithic and small Middle Paleolithic component. The deposits include a Middle to Upper Paleolithic transitional industry, which was cited by Hahn (1984) as Uluzzian (confirmed by Gilbert Marshall, who is currently re-analyzing the lithics, personal communication to BMS, Nov. 3, 2014). The site also contains a thin Aurignacian component, and rich Mediterranean Gravettian or

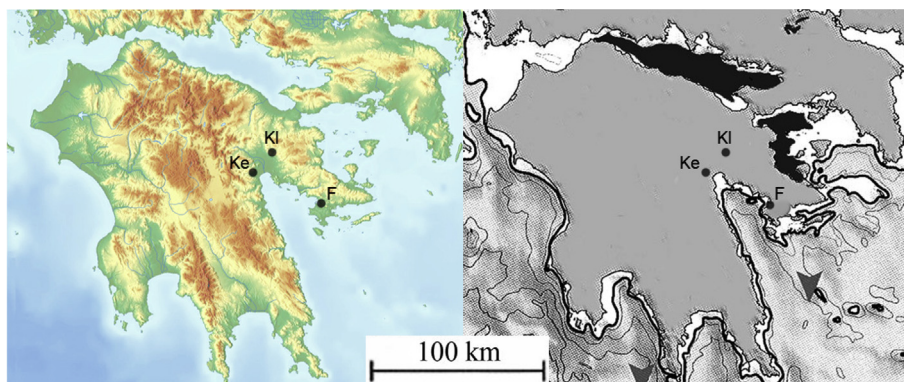


Fig. 1. (Left) Topographic map of Peloponnese with the sites mentioned in the text. Klissoura (KI) is 15 km from Kephalaria (Ke) and 44 km from Franchthi (F). Kephalaria and Franchthi are 41 km apart. (Right) Shoreline reconstructions from the Last Glacial Maximum (LGM). Solid gray area represents modern land mass, dark outline depicts LGM shorelines, black areas indicate inland paleolakes. Adapted from Stiner and Munro (2011) and Petit-Maire et al. (2005).

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