A Late Palaeolithic site at Ouriakos (Limnos, Greece) in the north-eastern Aegean

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The site

The Late Palaeolithic site of Ouriakos is located on the south-eastern coast of the island of Limnos in the northern Aegean. It was discovered in 2006 during the construction of a car park close to the beach which removed part of a sand dune (Figure 1, no. 1). The site is partly located on a Pleistocene calcarenite marine terrace, some 10m above present sea level, delimited by two seasonal streams (Figure 2). A profile along the right bank of the southern stream shows a buried dark clayey palaeosoil that developed above the calcarenite (Figure 3), containing chipped stone artefacts at its top, and which was sealed by a sand dune.

Surface collections made in 2008–2010 on the exposed archaeological surface (Figure 4), and the excavations that followed in 2009–2012, revealed that the site extends for some 1500m². The excavations were initially conducted on the area affected by the car park construction. Here the chipped stone assemblage was contained in a sandy layer, some 10–20cm thick, lying on the calcarenite terrace (Figure 5). The lower part of this deposit yielded a few unidentifiable bone fragments, a burnt sample of which was AMS-dated to 10 390±45 uncal BP/10 564–10 124 cal BC at 2σ (GrA-53229), suggesting that the site was settled during an advanced period of the Younger Dryas cold oscillation (*c.* 11 000–10 000 uncal BP; Lowe *et al.* 2001: tab. 3). In 2012, a test trench opened in an undisturbed area of the terrace, close to the edge of the southern stream bank, led to the discovery of an intact layer buried by a Holocene sand dune, at the top of the above-mentioned palaeosoil, from which *in situ* chipped stone artefacts were recovered (Figure 6).

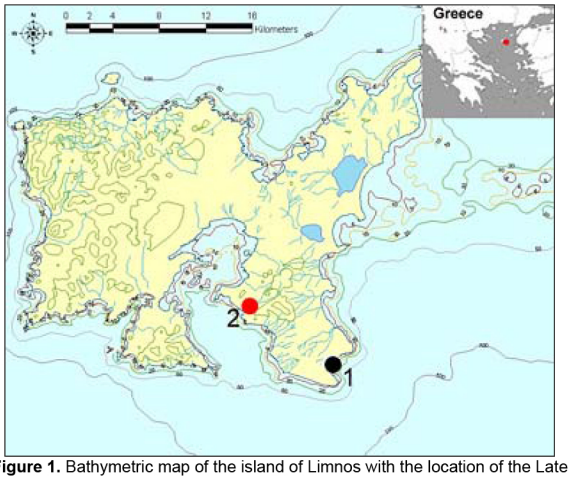

Figure 1. Bathymetric map of the island of Limnos with the location of the Late Palaeolithic site of Ouriakos (1), and Kavouli lithic sources (2).
Click to enlarge.

Figure 2. The site in the centre of the image, taken from the north-west (photograph P. Biagi).
Click to enlarge.

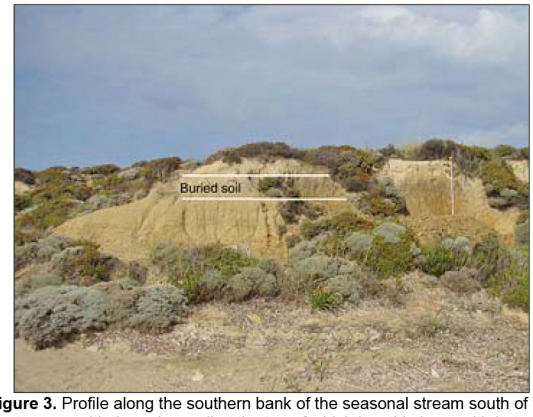

Figure 3. Profile along the southern bank of the seasonal stream south of the terrace, with the palaeosoil at the top of which is a thin layer with Late Palaeolithic chipped stone artefacts, buried by a sand dune (photograph P. Biagi).
Click to enlarge.

Figure 4. The calcarenite terrace on which part of the site is located, and a particular detail of the site surface (photographs E. Starnini).
Click to enlarge.

Figure 5. Excavations underway in the central part of the terrace in 2009 (photograph G. Syridis).
Click to enlarge.

The chipped stone assemblage

The chipped stone assemblage from Ouriakos is manufactured mostly from limnic/hydroquartzite-calcedony-opal and varicoloured jasper pebbles. Systematic surveys have shown that the closest sources of these raw materials are located in the lower Kavouli valley (Figure 7), some 7km north-west of the site (Figure 1, no. 2), where conglomerates containing jasper pebbles outcrop from the river terraces; a rich deposit with limnic/hydroquartzite-calcedony-opal of various colours outcrops from the volcanic formations along the south-eastern slope of Kalogiros, in the upper part of the same valley (Figure 7).

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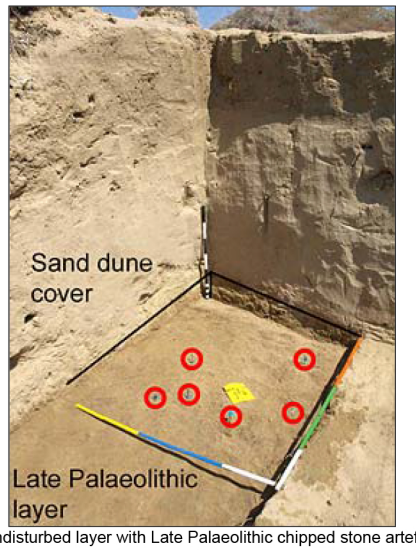

Figure 6. Undisturbed layer with Late Palaeolithic chipped stone artefacts *in situ* (red circles) buried by a Holocene sand dune, discovered in 2012 (photograph N. Efstratiou).
Click to enlarge.

A sample of some 8000 chipped stone artefacts has been analysed in two study seasons. Although both raw materials were utilised, it was observed that jasper artefacts are better preserved, whilst those manufactured from hydrothermal rocks are strongly weathered and patinated due to post-depositional processes in a salty environment that affects silica preservation (Sheppard & Pavlish 1992). Many lithic artefacts and bone fragments show contact with fire, despite the fact that no *in situ* fireplace has yet been found.

The

Figure 7. Limnoquartzite outcrop along the eastern slope of Kalogiros, in the upper Kavouli valley (photographs P. Biagi and E. Starnini).
Click to enlarge.

large numbers of cores, debitage and waste flakes, crested blades, and by-products derived from core preparation and successive production stages suggest that the tools were produced on site. Apart from cores (Figure 8, nos. 20–26), the most characteristic implements are microlithic lunates (Figure 8, nos. 12–18) and end-scrapers (Figure 8, nos. 2–9). Other tools consist of a few oblique truncations, backed bladelets (Figure 8, nos. 10–11), burins (Figure 8, no. 1) and notched bladelets (Figure 8, no. 19). The Ouriakos lunates are distinctive tools of standardised dimensions. They are obtained using abrupt, bipolar retouch (Figure 9 top) without microburin technology, from microbladelets of scalene triangular cross-section detached by indirect percussion from small cores with one or more prepared platforms. The end-scrapers are represented by atypical long and short specimens of different size and thickness (Figure 9 bottom), obtained from varying types of blanks. The Ouriakos industry can be compared with material from layers Ia1–Ia2 of Öküzini Cave, north of Antalya (south-west Anatolia). These layers yielded lithic assemblages with bipolar lunates, and a great variety of end-scrapers (Kartal 2002), radiocarbon-dated using charcoal to the Younger Dryas (OxA-5213: 10 150±90 and RT-1441: 10 440±115 uncal BP) (López Bayón *et al.* 2002: tab. 1). The lithic complex from Ouriakos suggests that hunting was the main activity practised at the site, as inferred from the presence of many microlithic lunates, most probably hafted as spearpoints, as well as end-scrapers for hide processing.

Figure 8. Chipped stone tools from the site surface: burin (1), end-scrapers (2–9), backed microbladelets (10–11), microlithic lunates (12–18), notched bladelet (19), microbladelet cores (20–26) (drawings P. Biagi, inking G. Almerigogna).
Click to enlarge.

Figure 9. Ouriakos: Microlithic lunate obtained by abrupt, bipolar retouch (top), and worn end-scraper front (photographs E. Starnini).
Click to enlarge.

Discussion

The absence of other sites of Late Palaeolithic, Younger Dryas date in the north-eastern Aegean (Kozlowski 2005, 2007; Sampson *et al.* 2005, 2009, 2010) makes the discovery of the Ouriakos site on the south-eastern coast of Limnos important for understanding the events that took place in this region at the end of the Pleistocene.

At Ouriakos the abundance of lithic artefacts, including cores and debitage flakes indicates the specialised production of specific types of microlithic lunates for the tipping of hunting weapons. Given that excavations have been conducted mainly in that part of the site affected by erosion, the absence of fireplaces or activity areas is unsurprising. The test trench opened below the sand dune on the other side of the stream, however, shows that this protected part of the site is most probably still intact.

According to the typological characteristics of the chipped stone assemblage, it is possible to attribute Ouriakos to the north-westernmost part of a Levantine Final Pleistocene cultural complex, whose spread and distribution along the southern and western coasts of Anatolia can now be traced potentially from Direkli Cave near Kahramanmaras (Erek 2010), and other caves in the surroundings of Batman (Kartal *pers. comm.* 2010), through to Öküzini and other caves in the Gulf of Antalya (Harmankaya & Tanindi 1996).

The discovery of the site of Ouriakos and the fieldwork that followed in 2008–2012 have established beyond doubt its importance in the wider Aegean context at the end of

Pleistocene and the beginning of the Holocene. This is a period for which very little is known either from the Aegean islands or the adjacent regions of north-west Anatolia, the Black Sea and the southern Balkans (Kozlowski 2005). For this reason, the coast of the island of Limnos is worthy of further intensive fieldwork during the coming years.

Acknowledgements

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