CAPO MANNU PROJECT 2011 - LITHIC INDUSTRY

AUTHORS

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CATEGORY

Report

LANGUAGE

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ABSTRACT

The authors present the first results of the analysis carried out on the prehistoric lithic industry, collected during the systematic survey campaign of September 2011, in the coastal area of Capo Mannu, central western Sardinia, and coming from old collections from the same area.

Various issues are addressed: study methodologies, quantitative analysis of data, typological description of a lithic sample, an introduction to lithic supply strategies and choices regarding raw material usage, and a short final discussion.

INTRODUCTION

In this preliminary contribution, the first results of the analysis carried out on the prehistoric lithic industry, collected during the systematic survey campaign of September 2011, in the area of Capo Mannu, will be presented. In addition, other objects from the same area, but related to sporadic findings and brought to light during previous excavation and survey campaigns, were examined.

Various issues are addressed: study methodologies, analysis of the quantitative data, typological description of a lithic sample, an introduction to lithic supply strategies and choices regarding raw material usage, and a short final discussion.

METHODOLOGY

For the general methodological considerations regarding the collection of artefacts and the project's database-building, see Castangia, G. in this volume. Obsidian tools, flint tools and those made of different raw materials (trachytic phonolite, basalt and shist) were counted separately inside each bag.

Subsequently the knapped tools were separated from the processing waste, which was counted separately. Grinders, mills, pestles and hammers are excluded from this analysis and will be published in future contributions.

Analytical recording forms, containing information about morphological, tipometric, technological and typological data, were specifically created along with the rest of the database. The retouch was also analysed when present. The database used for this study includes the following entries:

* Bag ID number: indicates the content of a single collection (see Castangia in this volume)
* Territorial Unit ID number: indicates the territorial unit in which the material was collected
* GPS point: GPS position of the object on the map (specifically used for the high instrument concentrations)
* Raw material: the raw material used for the object
* Type of instrument: typological definition of the object (bifacial, axe, blade, core, etc.)
* Type of fragment: indicates whether it is a whole object or it preserves only the proximal, mesial or distal part.
* Colour: entry used in particular for flint, in order to enable future comparisons and studies on the supplying points
* Type of borders: indicates types of edges present on an object (straight, concave, convex, irregular)
* Cortex: the percentage of the object's surface covered by cortex
* Type of bulb: indicates the presence and typology of bulb present on the object (smooth, flat, flat thrown prominent, absent)
* Definition of retouch: indicates which type of retouch can be observed on the object (flat, covering, direct)
* Type of heel: indicates the presence and typology of heel on the object
* Object sections: indicates the morphology of the cross-section of the object (lenticular, trapezoidal, triangular, rectangular)
* Extension of retouch: indicates the presence and type of retouch on this object
* Length: indicates the maximum length of the object
* Width: indicates the maximum width of the object
* Thickness: indicates the maximum thickness of the object
* Type of flake blank: indicates whether it is a laminar blank or a flake blank
* Presence of patination: indicates whether any patination can be observed on the surface of the object
* Surface alteration: indicates whether the object is affected by any alteration caused by washing away or floating

QUANTITATIVE AND DISTRIBUTIONAL DATA

During the September 2011 survey campaign, a total of 1576 lithic finds were collected, among which 39 pieces came from the collection gathered in Porto Alabe (see Castangia in this volume, Tab. 1 and Fig. 1). Furthermore, lithic tools coming from recoveries made in the site of Monte Benei in 2004 (survey - unpublished), of Sa Rocca Tunda in 1981 (excavation – Stiglitz 1984) and Su Pallosu in 2007 (excavation – Castangia 2011), for a total of 1598 units, were included (Tab. 2).

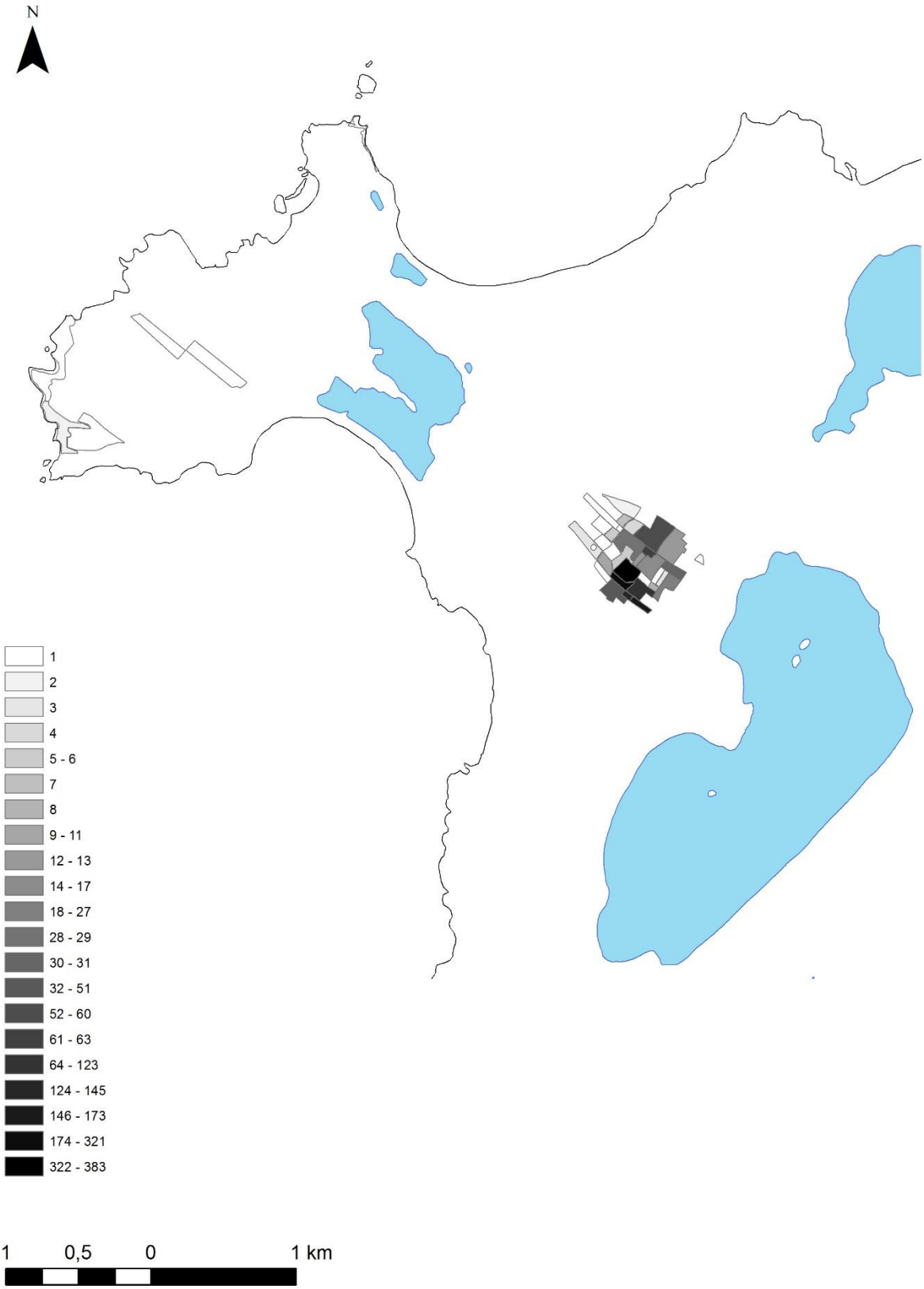

Fig. 1 - Density map showing the number of lithic findings per Territorial Units over the area of the project.

Table 1

TU	O	F	OTHER	TOT PER TU
238	0	1	0	1
246	137	22	14	173
256	112	25	8	145
258	0	0	13	13
278	7	0	1	8
285	0	0	2	2
288	58	21	44	123
299	25	2	0	27
302	220	49	52	321
305	0	0	3	3
308	38	7	6	51
315	25	3	3	31
319	236	47	100	383
332	0	0	1	1
333	6	8	3	17
339	4	0	9	13
343	11	0	0	11
352	41	17	5	63
359	2	1	3	6
369	0	0	1	1
375	13	4	12	29
376	5	1	7	13
377	5	1	0	6
387	0	1	2	3
391	1	1	2	4
393	0	0	1	1
394	22	0	38	60
398	4	2	1	7
428	5	0	4	9
430	1	1	0	2
433	0	0	1	1
655	0	0	2	2
720	0	0	1	1
821	0	0	1	1
873	0	1	0	1
956	1	0	0	1
1291	0	0	1	1
1306	1	0	0	1
1308	1	0	0	1
totale	946	213	341	1537

TU - territorial unit
O - obsidian
F - flint

Table 2

TU	O	TU	F	TU	OTHER	
288	56	302	46	246	8	
375	7	375	2	302	50	
302	216	299	2	246	3	
394	22	246	10	376	6	
299	25	246	12	258	13	
246	86	873	1	655	2	
246	44	376	1	278	1	
256	112	256	24	821	1	
376	1	315	3	302	1	
278	7	359	1	256	8	
288	2	308	7	315	3	
956	1	377	1	359	3	
315	25	319	47	369	1	
359	2	288	21	305	3	
319	236	398	2	302	1	
428	5	391	1	428	4	
398	4	352	17	398	1	
391	1	387	1	387	1	
352	41	302	1	391	2	
308	38	430	1	308	6	
377	5	375	2	352	5	
1308	1	333	8	1291	1	
376	4	302	1	387	1	
430	1	256	1	433	1	
375	6	302	1	332	1	
1306	1	238	1	393	1	
343	11	Su Pallosu (2007, sample 009)	1	720	1	
333	6	Monte Benei (Usai)	1	246	3	
339	4	Porto Alabe	35	375	12	
302	1	Monte Benei (2004)	1	288	44	
302	1			333	3	
302	1			376	1	
302	1			339	9	
246	1			319	100	
246	6			394	38	
Monte Benei (2004)	8			285	2	
Sa Rocca tunda (1981)	1			Su Pallosu (2007, E7-US4)	1	
				Sa Rocca Tunda (1981)	1	
				Sa Rocca Tunda (1981)	1	
				Monte Benei (2004)	1	
				Su Pallosu (2007, sample 008)	1	
				Porto Alabe	4	
				Sa Rocca Tunda (1981)	3	
				Monte Benei (2004)	1	
				Monte Benei (2004)	1	
TOTAL	990		253		355	1598

TU - Territorial Unit
O - obsidian
F - flint

A majority of the lithic samples, 93% of the total sample, came from the site of Monte Benei (UT 246, 256, 278, 288, 299, 302, 305, 308, 315, 319, 332, 333, 339, 343, 352 , 359, 369, 375, 377, 387, 391, 393, 394, 398, 430, 433, 1306, 1308 - for a total of 1492 pieces – Fig. 2).

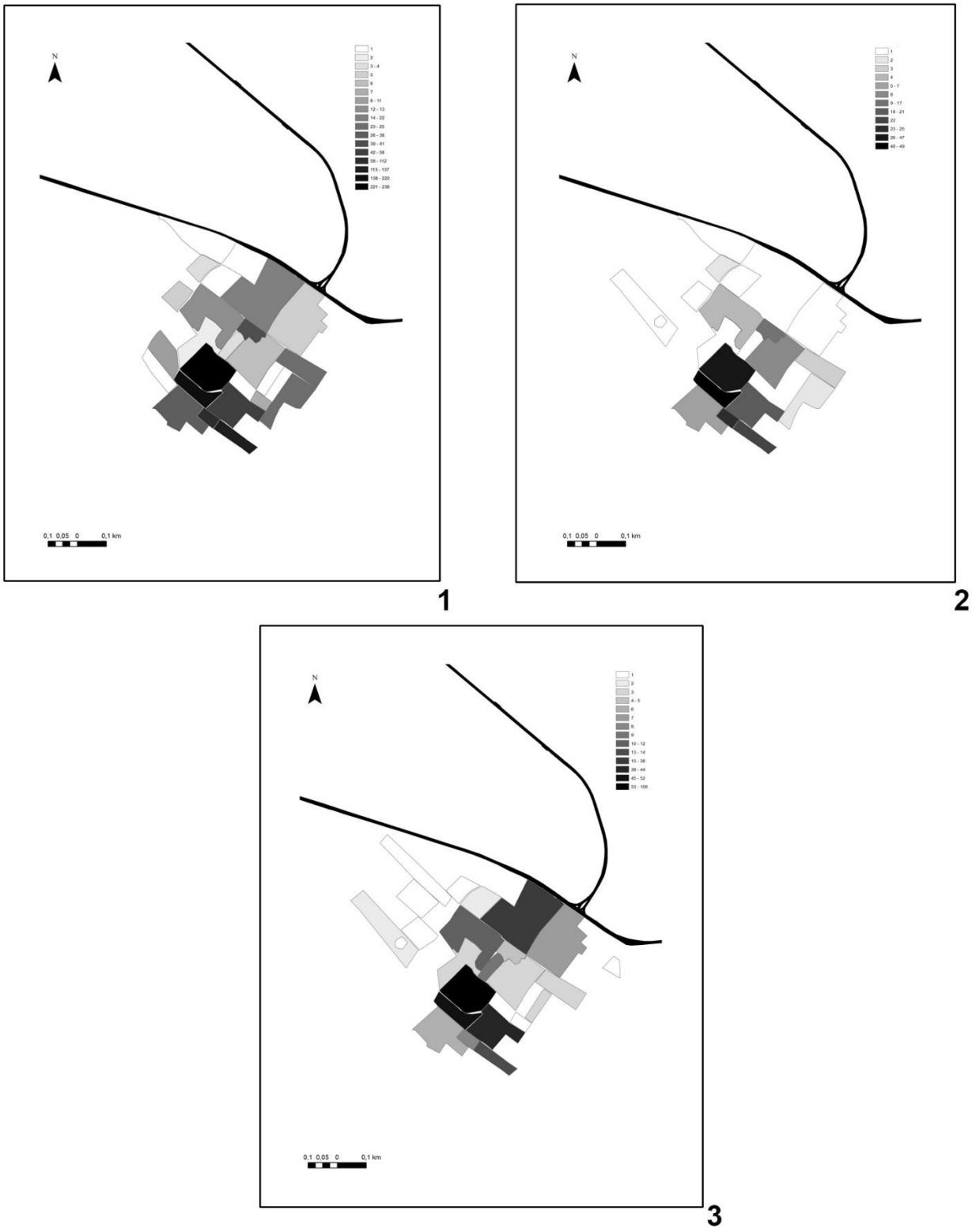

Fig. 2 - Density map showing the number of lithic findings by raw material over the area of Monte Benei: 1 – obsidian; 2 – flint; 3 - other.

The most frequent raw material, without considering heavy stone (grinders, mills, pestles, whetstones and smoothers), was obsidian (984 pieces) followed by flint (251 pieces), trachytic phonolite (13 pieces), and vesicular basalt (12 pieces). Within the sample, objects in schist and greenstone were

also present (Fig. 3). Overall, the tools selected for the specific analysis were 61 (Table 2, Plates 1, 2, 3a, 3b, 4a, 4b, 5, 6).

Table 3 - http://www.archaeologicaltraces.org/images/stories/TIT/2/Carusoetalii/Table3_EN.pdf

Plate 1 - Arrowheads.

Plate 2 - Blade and bladelets.

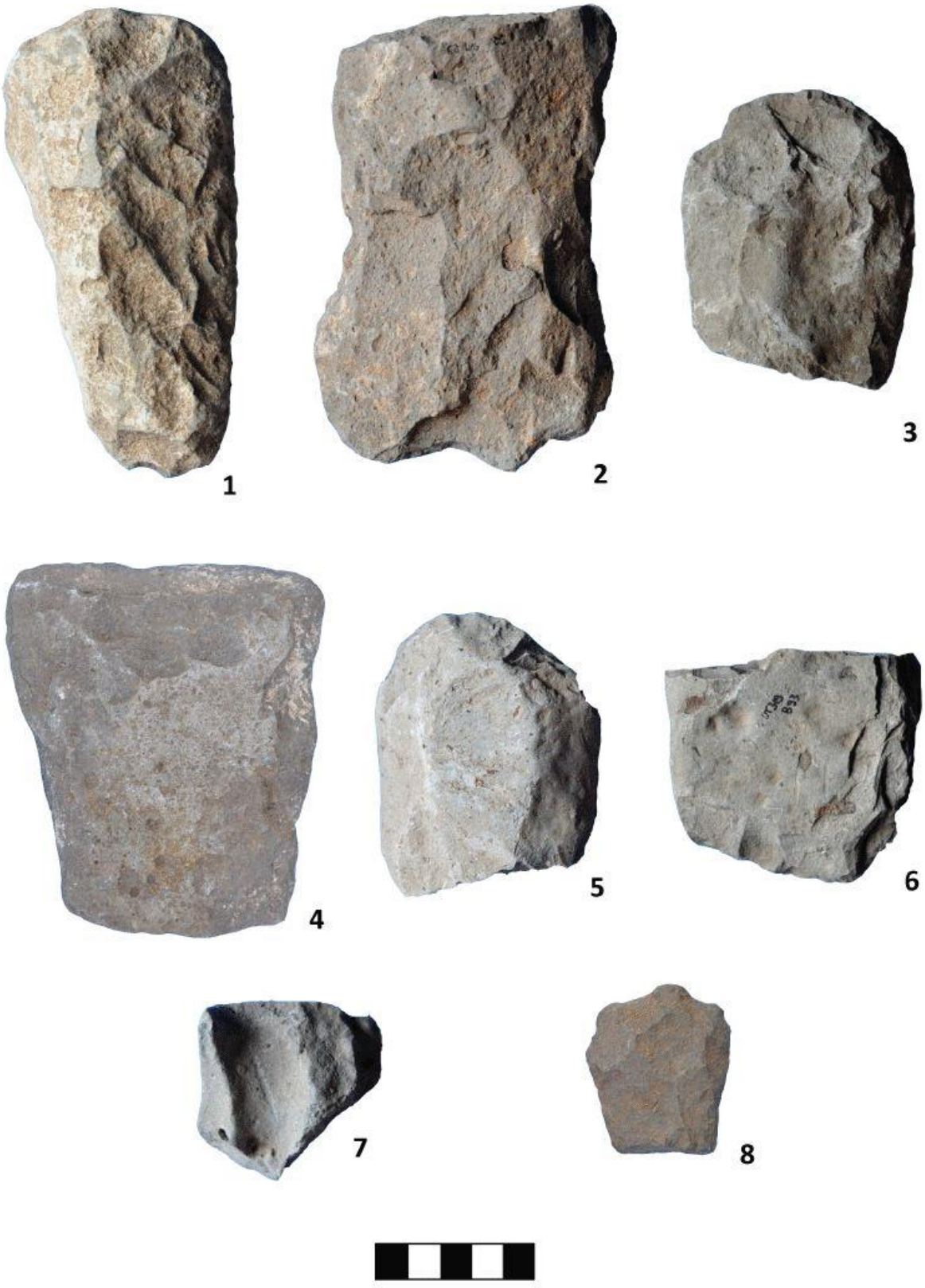

Plate 3a - Axes 1 of 2.

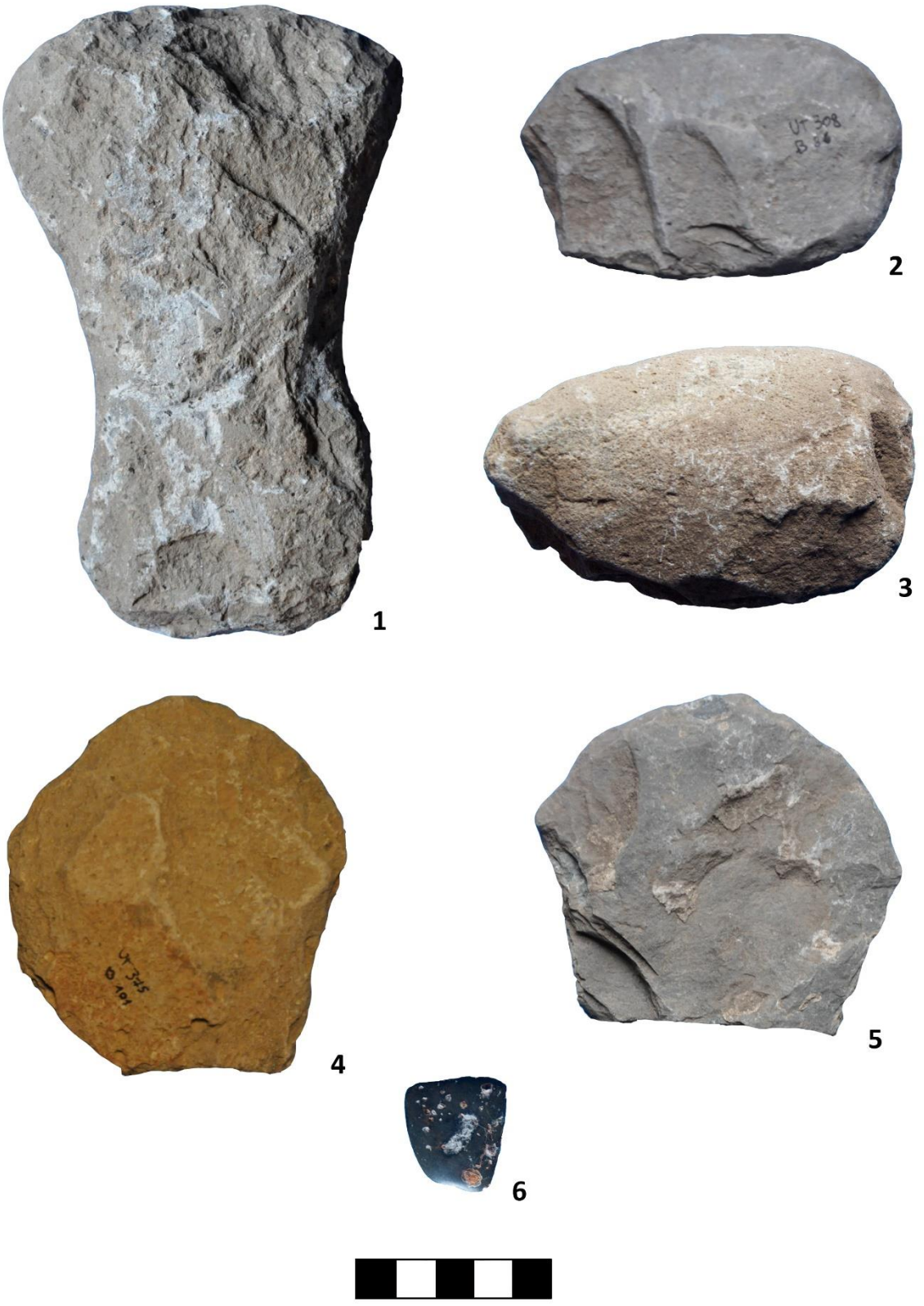

Plate 3b - Axes 2 of 2.

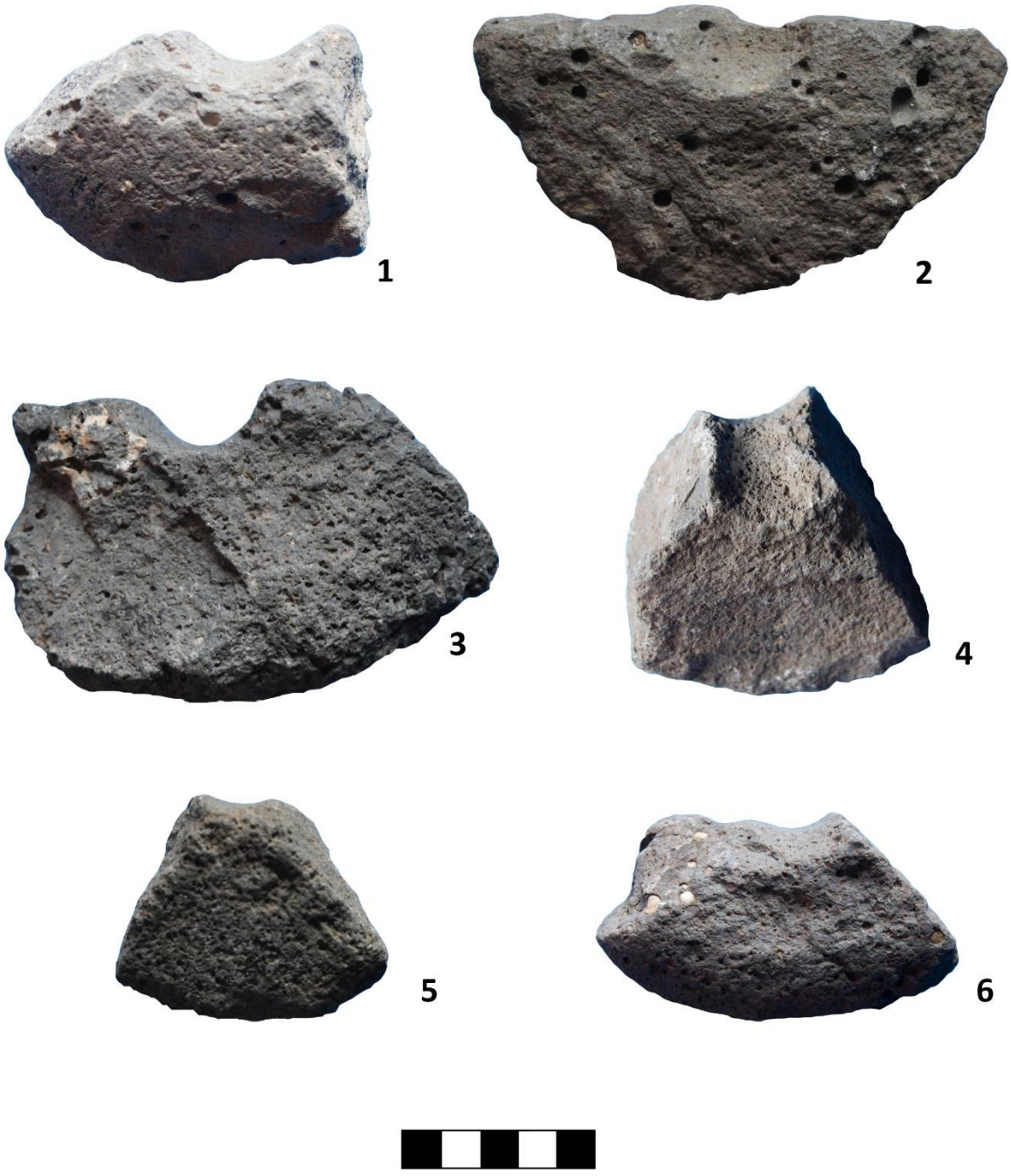

Plate 4a - Mace heads 1 of 2.

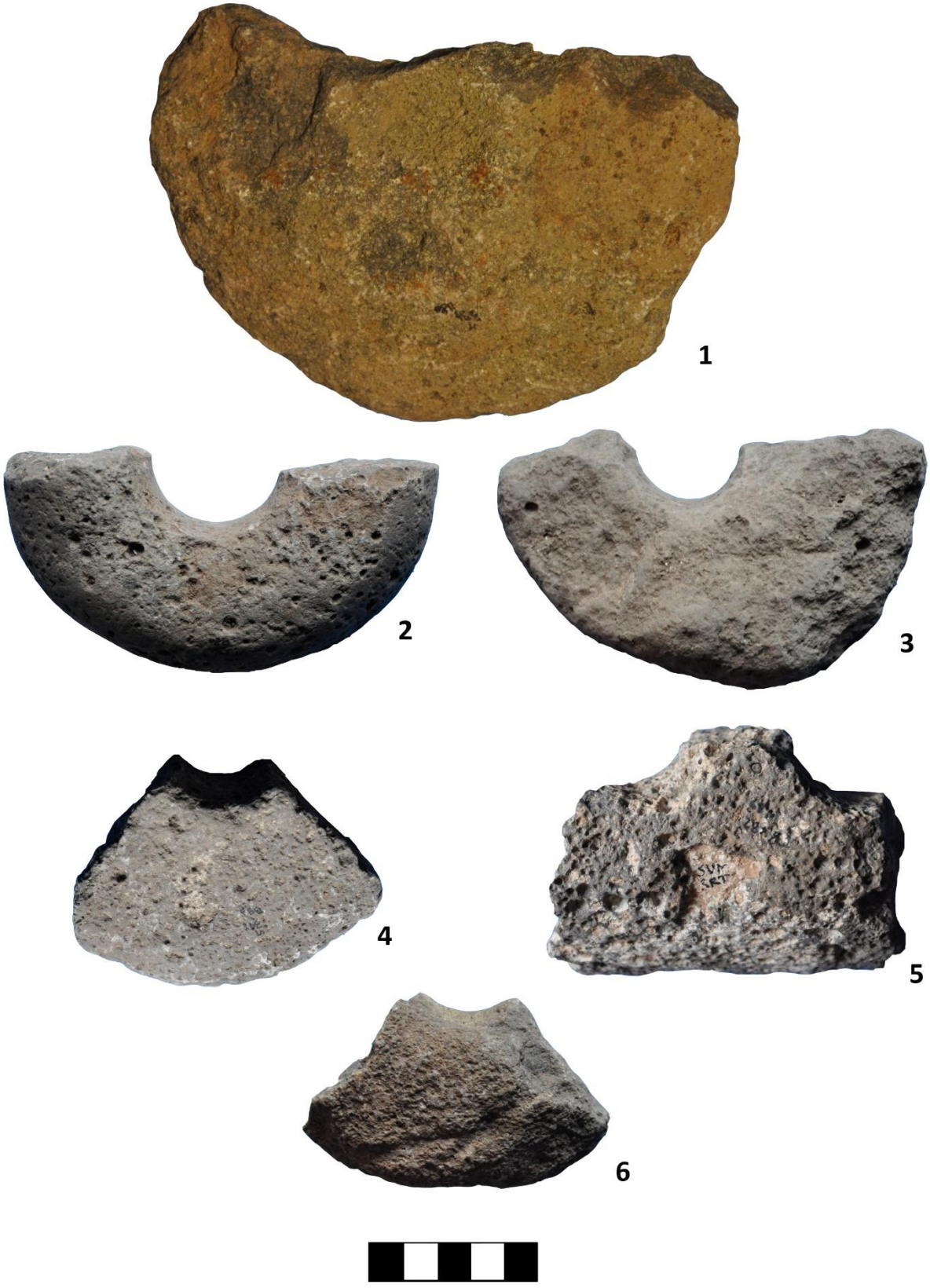

Plate 4b - Mace heads 2 of 2.

Plate 5 - Sidescarpers and flakes.

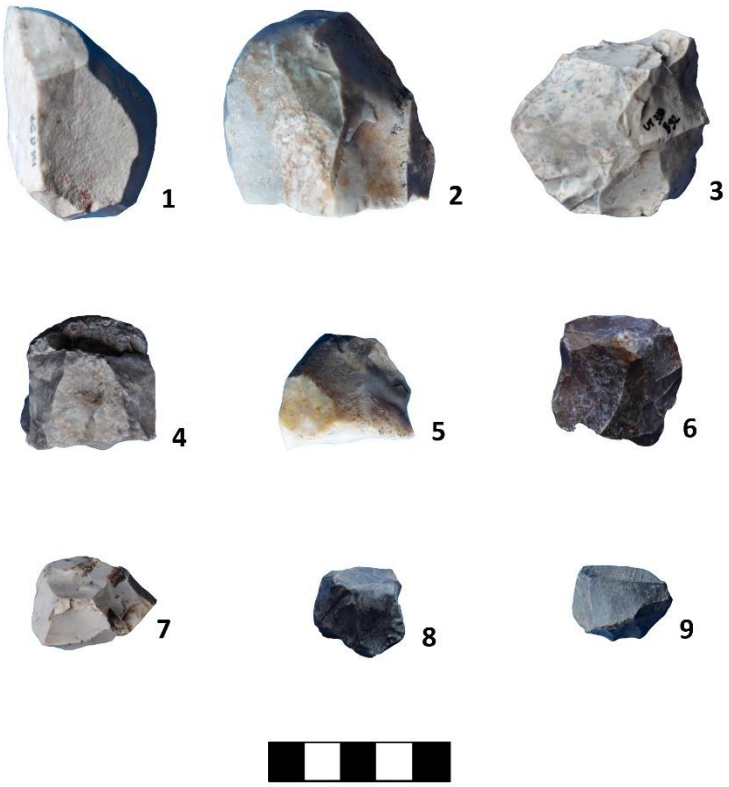

Plate 6 - Cores.

FLINT AND OBSIDIAN CORES AND TOOLS

In the samples under study, 34 items were in chipped stone, 17 of which were manufactured from flint while the remaining 17 were from obsidian.

Regarding flint, the presence of 3 pyramidal cores was observed (n.21 - pl.6 item 2, n.23 – pl.6 item 5 and n.56 – pl.6 item 4), with a length between 2.7 cm and 4.8 cm and a thickness between 3 cm and 3.5 cm. Some of these cores came from the area of Porto Alabe (n.21 – pl.6 item 2) and Monte Benei (n.23 – pl.6 item 5). Furthermore, 3 prismatic cores (n.22 pl.6 item 1, n.55 – pl.6 item 6, n.57 – pl.6 item 7) with an average thickness and length of 3.9 and 2.6 cm respectively, were also certified.

Another core, this time multidirectional (n.60 – pl.6 item 3) presented a length equal to 5.7 cm and a thickness of 5.1 cm. Other finds were: a pedunculate leaf arrowhead (n.2 – pl.1 item 7), 2 blades on truncated flakes (n.3 – pl.2 item 2 and n.4 – pl.2 item 3), a scraper with an indentation (n.52 – pl.5 item 5), a truncated cortical blade (n.7 – pl.2 item 4), a truncated blade (n.53 – pl.2 item 9) and a flake (n.54 – pl.5 item 7). The sample also included a blade from Porto Alabe (n.20 – pl.2 item 5), a mesial fragment of a blade (n.59 – pl. 2 item 6) from Monte Benei and a flake of triangular section (n.24 – pl.5 item 6).

Regarding obsidian tools, 3 leafed bifacials with a flat covering retouch, one of which was intact (n.1 – pl.1 item 1) while the other two preserved only the distal part (n.10 – pl.1 item 2 and n.11 – pl.1 item 3), were identified. Two cores, both prismatic and worn-out (n.25 – pl.6 item 8 and n.26 – pl.6 item 9), with a length between 2.3 and 2.4 cm and a thickness between 2.3 and 1.9 cm, were found. Four scrapers were also identified, n.16 (pl.5 item 1) had a sided covering retouch, while n.8 (pl.5 item 2) showed an indentation on the left edge and a covering flat bifacial retouch; n.9 (pl.5 item 3) presented a flat bulb and lenticular section, while n.27 (pl.5 item 4) had a chipped flat bulb and a rectangular section. Two pedunculate and winged arrowheads (n.12 – pl.1 item 4 and n.13 – pl.1 item 6), which had the same width (1cm) and thickness (0.2 cm) but slightly different length, were catalogued. In the sample a fragment of a mesial pedunculate and winged arrowhead (n.5 – pl.1 item 5), was also identified. Lastly 2 blades (n.6 – pl.2 item 7 and n.17 – pl.2 item 8), a bladelet (n.14 – pl.2 item 10), a truncated bladelet (n.15 – pl.2 item 11) and a flake with triangular section (n.58 – pl.5 item 8), which came from the 1981 excavation of Sa Rocca Tunda, were included in the analysed sample.

TOOLS MADE USING OTHER RAW MATERIALS

Within the examined sample, 27 tools were made of materials other than flint and obsidian. Among them, 12 specimens, typologically classified as mace heads, were made of basalt, 13 items, traditionally classified as axes, were made of trachytic phonolite. A little polished axe in green stone (n.9 – pl.3b item 6) and a schist point (n.18 – pl.2 item 1) were also present.

As for the so-called axes, two main tool categories were identified: roughly-knapped axes and eyed axes. Two types of the first category were represented: necked (n.33 – pl.3a item 1, n.35 – pl.3a item 2, n.41 – pl.3a item 3, n.46 – pl.3b item 1, n.50 – pl.3a item 8 and n.61 – pl.3b item 5), in which the hafting was achieved by using a narrowing in the body, and simple-based (n.45 – pl.3b item 3, n.49 – pl.3a item 4 and n.51 – pl.3b item 2), while the assignment of n.29 (pl.3a item 5), n.44 (pl.3a item 6) and n.48 (pl.3b item 4) remains uncertain. The average length was 8.9 cm, but it was possible to isolate a group (n.33 - pl.3a item, n.35 – pl.3a item 2, n.45 – pl.3b item 3, n.46 – pl.3b item 1 and n.49 – pl.3a item 4) which had lengths comprised between 10.5 cm and 14.8 cm. The average width was 6.9 cm, while the average thickness was circa 2.8 cm, without any particular clusters as was the

case in the length. The category of eyed-axes was represented by only one piece, n.36 (pl.3a item 7), which was, moreover extremely fragmented and difficult to interpret.

Regarding the mace heads group, in 9 out of 12 cases they were fragmented objects (n.30 – pl.4a item 7, n.31 – pl.4a item 3, n.32 – pl.4a item 5, n.34 – pl.4a item 6, n.37 – pl.4a item 4, n.38 – pl.4b item 6, n.39 – pl.4b item 4, n.43 – pl.4b item 2, n.47 – pl.4b item 3) whilst 2 objects in preparation phase were present (n.28 – pl.4a item 2 and n.42 – pl.4b item 1). The artefact n.40 (pl.4b item 5 - stone element with two holes) was inserted within this group, even if the typological characteristics presented did not allow a certain attribution. The average length was 10.2 cm, from which only the two axes in preparation phase (n.28 – pl.4a item 2 and n.42 – pl.4b item 1) diverged with a length equal to, respectively, 13 cm and 15.4 cm. The average width was 6.6 cm with a single divergent case (n.42 – pl.4b item 1) which presented a width of 11.2 cm. The average thickness was 4.2 cm. Artefact n.41 (pl.3a item 3) was very different in form and processing techniques, and its characteristics suggested a possible attribution to the Roman period.

As for the isolated findings, the polished green stone hatchet (n.19 – pl.3b item 6) had dimensions that fell within the standards for this kind of artefact - length 3 cm, width 2.6 cm, and thickness 0.5 cm. Finally, the schist point (n.18 – pl.2 item 1) from the Su Pallosu excavation, presented the following dimensions: length 8.3 cm, width 3.5 cm and thickness 1.1 cm.

COMPARISONS AND CHRONOLOGICAL ATTRIBUTION

The necked roughly-knapped axes (n.46 – pl.3b item 1, n.50 – pl.3a item 8 and n.61 pl.3b item 5) showed features that allow the comparison with those already known from the open-air settlements in the Oristanese area and attributed to the Late Neolithic Ozieri, Eneolithic Sub-Ozieri and Monte Claro phases (Lugliè 1999:223-28; Sebis personal communication). The same comparisons are valid for the simple-based axes n.49 (pl.3a item 4) and n.51 (pl.3b item 2 - Lugliè 1999:229).

The obsidian leafed bifacial (n.1 – pl.1 item 1) had broad comparisons within the Ozieri cultural tradition. From the village of Cuccuru Is Arrius (Cabras) - whose cultural framework may be limited to Ozieri and Sub-Ozieri phases (Lugliè and Sebis 2004:239-240) - many published specimens can be cited. Those from the Neolithic settlement Puisteris Mogoro (Cicilloni and Usai 2004:222) ascribed to the Late Neolithic Ozieri period are also similar to the obsidian leafed bifacial under study. Similar materials, yet unpublished, come from areas adjacent to the Capo Mannu peninsula, particularly from surface collections made in the settlements of Perda Lada - San Vero Milis and Conca Illonis - Cabras (Castangia, Stiglitz and Sebis personal communication).

The blade on a truncated flake n.3 (pl.2 item 2) - probably hafted and used as a sickle - and the flint arrowhead n.2 (pl.1 item 7) had similarities with elements associated with the Ozieri tradition in the north of the island, particularly in Anglona, in the area of Perfugas, Contraguda (Pitzalis 1989:79) and Concas (Pitzalis 1989:81).

The green stone small axe n.19 (pl. 3b n. 6) is comparable with a Late Neolithic specimen from Serra Linta of Sedilo (Tanda e De Palmas 1997:303), and to another one found in the settlement of Cuccuru Ambudu of Serramanna, datable to the same phase (Melis 1997:331). Mace heads (pl. 4a and 4b), although similar to Bronze and Early Iron Age published specimens from nuragic villages, where they are very common, are more likely to be neolithic or datable to the Roman phase. As a matter of fact, they come from the area of Monte Benei where only a Neolithic and a Roman-phase settlement were identified so far on the base of the pottery. Unfortunately, publications on and of mace heads are quite rare in Sardinia, especially for periods different than Bronze and Early Iron Age, so we have not enough elements for useful comparisons.

SUPPLYING AND CIRCULATION OF RAW MATERIALS

Within the analysed lithic sample, six raw material types were identified: basalt, trachytic phonolite, obsidian, green stone, flint and schist (see Fig. 3).

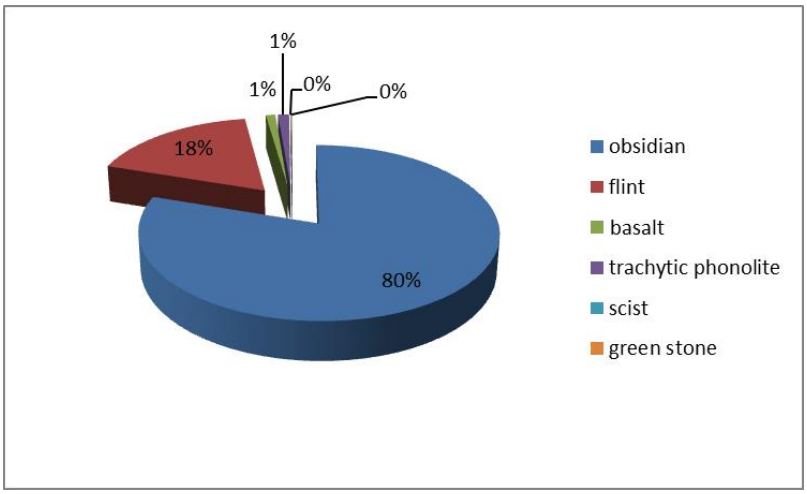

Fig. 3 - Pie showing the percentages of the raw materials within the lithic sample.

The so-called mace heads, round tools with either an eye shaped hafting hole or perforated round head, of which 12 specimens have been catalogued, were made with vesicular basalt. This type of stone is fairly widespread throughout the island, but its provenance from Montiferru is highly plausible, given the close proximity to this site.

The trachytic phonolite was associated with the morpho-functional category of roughly-knapped axes (Lugliè 1999:197-229), of which 13 tools were catalogued. At a macroscopic examination, these objects appeared to have been all made of phonolites, trachytes and trachyphonolites from the western slope of Montiferru (Fig. 4). The same lithic raw material is also present in the Monte Arci area further south, and a certain amount of it may have travelled together with obsidian to the Capo Mannu peninsula. Within the Copper Age tradition of the island this tool category was also produced on different raw material supports (andesites, andesitic basalts, and lati-andesitites), which have not yet been identified among the materials from the site of Capo Mannu and could not be attributed to a certain provenance area, because of their wide regional distribution (Marchi et al. 2004: 406-414). Petrographic and geochemical analyses on the analysed tools are scheduled, in order to determine the exact chemical and physical composition.

A unique specimen of polished green stone hatchet was present among the analysed assemblage. It was gathered in the Su Pallosu site area (TU 1291). In Italy lithotypes such as serpentinites, eclogites, jadeites and onfacitites (Chiari et al. 1996: 35-53) can be found. The provenance of green stone, cannot be identified with certainty, because of the wide distribution of this raw material, which extends from the Alps (Piemonte) to southern Italy, until petrographic and geochemical provenance analyses are executed (Barfield 1996:57 -65).

The flint source area used in the Capo Mannu area, and in particular in Monte Benei, was identified during the surveys on a hill area behind the hamlet of Porto Alabe, in the commune of Tresnuraghes (Fig. 4). The area was reported to the survey team as a likely area of raw material provenance by geologist Dr. Salvatore Carboni. The outcrop, considerably wide, contains various different types of flint, regarding colour, inclusions and translucency, in the form of lists or nodules. The same features

were also found in the analysed archaeological material, especially regarding the great variability in colour from opaque white to translucent red-orange, transparent (a type that recalls rock crystal), yellow, brown, grey, burgundy, and many other shades.

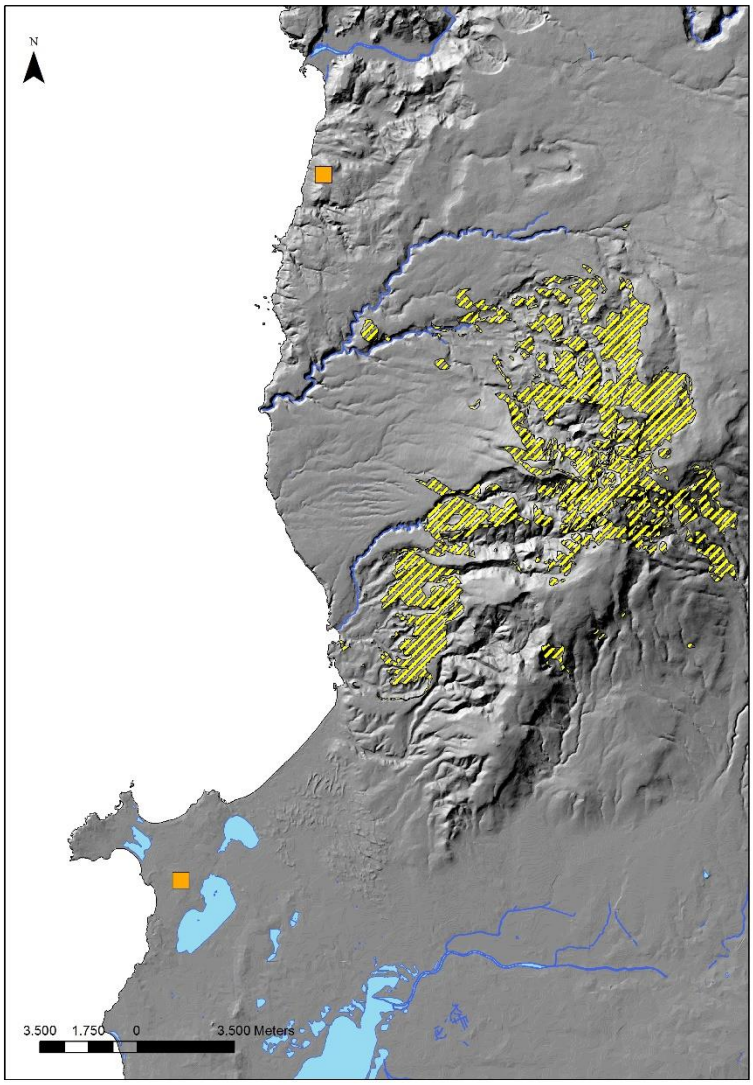

Fig. 4 - Raw material supply map. The yellow area delimits the trachytic phenolite supply area on Montiferru slopes. The top orange square marks the flint supply site of Porto Alabe, whereas the bottom orange square incates the location of Monte Benei site.

The flint had an average-to-high quality, reaching excellence in the case of the transparent-white specimen, which had a very low number of inclusions, in some cases completely absent. It can be reasonably assumed that this flint was inserted within a sailing by sight sea route: in front of the site of Porto Alabe there is indeed a small bay, characterized by the presence of a wide stretch of beach that can serve as an easy landing for small cabotage boats.

Obsidian, the widely prevalent raw material, of which 17 tools were made – 3 leafed bifacials, 3 pedunculate winged tips, 4 side scrapers, 4 blades, a flake and 2 worn-out cores – originated in Monte Arci. It can be found in primary depositions, but especially displaced by erosive processes, both along the western and southern slopes (compositional variety respectively, SB1, SB2 and SA) and along the eastern one (SC variety; Lugliè 2004:47-60). The intense erosion has caused the dismantling of the alluvial fans that extend towards Marrubiu and Uras, causing a much wider

dispersion of raw material: well floated obsidian nodules, with diameters up to 25 cm and evolved cortical areas, appear in the river sections even at a depth of 1 meter and are present in the skeleton of ancient alluvial terraces carved by the palaeo-riverbeds of Rio Mogoro and Riu Mannu (Lugliè 2004:47-60). The 'obsidian route' from Monte Arci to Capo Mannu was essentially a land route that crossed the northern portion of the Campidano plain and through which raw material came in the form of half-processed cores.

CONCLUSIONS

The distributional analysis of lithic materials confirms the ceramic evidences from the Monte Benei hill and strongly supports the presence of an Ozieri-culture Neolithic settlement in the area, from which the vast majority of lithic materials come (93% of the total assemblage).

The typological analysis of the studied finds and the similarities noticed with materials found in other sites of the investigated area, allow the attribution of the analysed sample mainly to the Ozieri culture and partly to the Sub Ozieri one. For the general chronological attribution, both the “necked” and “simple based” axes and the obsidian bifacial (n.1) proved to be particularly important. Regarding the mace heads, most of the published comparisons are related to materials attributable to the Nuragic phase, between Middle Bronze Age and Early Iron Age. Nevertheless, their attribution to Neo-Eneolithic phases cannot be excluded.

Some of the raw materials used for tool production, such as flint and trachytic phonolite, come from areas relatively close to Capo Mannu. The phonolite is uniformly distributed in the northern part of Montiferru, whilst it is almost entirely absent in the southern part, except for an appendix on the south-western slope, 10.5 km away from Capo Mannu as the crow flies. The easy retrieval of this raw material by the prehistoric communities of Capo Mannu can be related to the almost exclusive use of this raw material for the production of roughly-knapped axes (found during the 80s and 90s excavations and surveys - Maffezzoli in prep.).

Regarding flint, the distance between the outcrop located on the hills behind the village of Porto Alabe and the area of Capo Mannu, approximately 25 km, is comparatively shorter if crossed by sea, also considering the convenient landing in the proximity of the outcrop. The overland route is made more difficult by the Planargia geomorphological characteristics. It could be hypothesized that the circulation of this Planargia flint fits into the sea routes of Monte Arci’s obsidian (Tykot 2004:118-32).

Lastly, the distance between Monti Arci and the area of Capo Mannu, approximately 18 km, would suggest the land transport of obsidian, made easier by the relatively simple morphology of the territory and by the presence of numerous sheets of water exploitable as communication routes throughout the year (Stagno di Cabras).

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