Archaeological Surveys in Lower Sindh - Preliminary Results of the 2009 Season

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ABSTRACT

In January-February 2009 archaeological surveys were conducted in three different regions of Lower Sindh, from Ranikot, in the north, to the Makli Hills, in the south. They resulted in the discovery of many sites and flint spots within a territory the archaeology of which was previously poorly known. This paper is aimed at the description of these finds, their cultural attribution and, whenever possible, absolute chronology. Particular attention has been paid to the radiocarbon chronology of the sites located on the rocky outcrops that rise from the alluvial plain of the Indus delta, a few of which indicate that seafaring along the northern shores of the Arabian Sea was already active at least since the very beginning of the seventh millennium uncal BP.

1. PREFACE

This paper is a preliminary report of the surveys carried out in January and February 2009 in Lower Sindh, between Ranikot, in the north, and the Makli Hills, in the south. The scope of the surveys, which were part of a joint venture by Ca' Foscari University, Venice (I) and Sindh University, Jamshoro (PK), was to discover new archaeological sites in a territory insufficiently explored, and define their cultural attribution and absolute chronology by radiocarbon dating. Although some parts of the above region had already been surveyed by other authors (see, for instance, MAJUMDAR, 1934; COUSENS, 1998; FRANKE-VOGT, 1999; FLAM, 2006), our attention focused mainly on territories never accurately investigated before. The surveys were conducted by systematic walking in the three main, well-defined areas described in the following chapters (fig. 1).

2. THE REGION AROUND RANIKOT

2.1. RANIKOT

Along the main road from Sann to Ranikot Fort, a few gravel terraces were

systematically surveyed. Flint and other chippable rocks were collected from two different areas 1) 19 km from the fort (25°58'40.114N – 68°03'29.643E), from which comes also one probable blade-like flake (fig. 2, n. 1), and 2) 12 km from Ranikot (25°56'10.258N – 68°01'36.262E), where small flint nodules of several colours were recovered (fig. 2, n. 2). More pebbles of good quality flint of a very dark grey colour (7.5YR3/1) were collected also inside the fortification walls at 25°53'08.687N – 67°54'41.984E. These data reinforce the impression that all the area inside and around Ranikot is favourable to prehistoric settlement due to the abundance of good quality flint from the Ranikot formations (see also ABRO, 1996).

Another brief survey was conducted around the eastern entrance of Ranikot Fort (HASAN, 2006). *Acacia* sp. charcoal fragments were identified from an exposed surface of the collapsed pillar at Sann (Eastern) Gate (fig. 2, n. 3), from which one specimen was radiocarbon-dated to 160±30 uncal BP (GrA-44671). This result indicates that this part of the fort was constructed (or restored) in historical times, most probably during the Talpurs rule (BIAGI and NISBET, 2009) (fig. 3).

2.2. ARZI GOTH

Further discoveries were made near the Baloch village of Arzi Goth, along the eastern side of the main road from Jamshoro to Amri and Dadu. On the top of a hillock two cairns were recorded at 25°46'01.111N – 68°17'21.779E and 25°46'01.409N – 68°17'20.935E respectively (fig. 4).

A heavily patinated *Levallois* flint flakelet of yellowish brown colour (10YR5/4) with a facetted platform (fig. 22, n. 6) comes from the top of the same hillock (25°45'59.213N – 68°17'15.452E). Along its northern slope, an exhausted, tiny subconical hypermicrobladelet core, obtained from a very small flint pebble of black colour (7.5YR2.5/1), was collected at 25°46'03.545N – 68°17'18.854E (fig. 22, n. 5).

3. THE REGION AROUND JHIRAK

3.1. KOT RAJA MANJERA (KAFFIR KOTE OR KAFIR KOT)

W. Cole, Deputy Collector of Karachi, was the first to visit Kot Raja Manjera, most probably in 1852. "*In a letter addressed to the Secretary of the Bombay Branch of the Royal Asiatic Society*", written in 1853, he

describes the ruins of a Buddhist site and a *stupa*. More precisely "*two and a half to three miles south of this again* (Jhirak), *and between the Jarak-Thathah road and the river, is a low flat-topped hill upon which are the remains of a Buddhist stupa*" (COUSENS, 1998: 87). According to his description "*the flat top of the hill, which is of a small area, appears to have been formerly surrounded by a wall of large stones, the remains of which are in places still traceable*" (fig. 5).

The site was later revisited by D. ROSS (1882: 27) who wrote "*three miles below Jhirak there is a low hill covered with ruins, called by the natives, Kafir Kot, or Infidel Fort, and supposed to have been erected by Raja Manjhira. Hindu and Buddhist remains have been found here, with very curious inscriptions in old Indian characters*". This information is reported also by M.H. PATHAN (1978: 364), who identifies this site with the city of Manjabari.

The site, called Kaffir Kote by W. Cole, and still nowadays locally believed to be an ancient residence of the infidel king Munjera, was surveyed by Professor A.R. Khan of Karachi University in the early 1970s (KHAN, 1979a: 6). On the top of the terrace he discovered a prehistoric site, which he attributed to the Amri Culture thanks to the presence of typical red-slipped wares and potsherds with painted geometric patterns (KHAN, 1979b: 71), and a rich chipped stone assemblage, including flint micro-drills for beads making. According to his field observations, A.R. KHAN (1979a: 6) ascribed the "*stone wall up to 6 feet thick*" that surrounds the hilltop, to the Chalcolithic period, and, on the basis of this structure, he considered Kot Raja Manjera a fortified settlement of the Amri Culture.

The site is located on a flat-topped limestone terrace (fig. 6), roughly east-west oriented, along the south-western bank of an ancient meander of the Indus, which at present flows some 5 km to the east, where it forms a semicircular bend, that in prehistoric times lapped the limestone formation on which the village of Lakho Pir is situated. The site's location seems to have been accurately chosen because of its unique geographic position and, possibly, its strategic importance. According to the field notes by A.R. KHAN (1979a: 7) the site yielded archaeological finds, which he attributed to both Amri Culture and Buddhist period (5th century AD).

A short visit paid to the site in the spring of 2004 confirmed Professor A.R. Khan's observations. Chipped stone artefacts, among which are 1 bullet core of variegated greyish brown flint (10YR5/2) and laminar

products were collected from the north-western part of the terrace (fig. 7)[1].

A systematic survey was carried out on January 21st, 2009, aimed at the definition of the area covered by the Amri Culture settlement. During the survey, 14 main scatters of chipped stone artefacts, ca. 4 m in diameter each, were recorded as well as a few potsherds and very few fragments of marine and mangrove shells, one of which was collected for radiocarbon dating. Their distribution map is shown in fig. 8, while the main characteristics of the assemblages are listed in table 1.

Most of the flint spots were discovered along the central-western part of the northern edge of the terrace, even inside a squared structure described by COUSENS (1998: fig. 17) as "*rubble*". Only one spot (number 8) was recorded along the westernmost edge, and two along the southern one (numbers 9 and 10). Chipped stone artefacts were not recorded from the central part of the mesa, where a rectangular stone structure, some 270 m long and 40 wide, is still clearly visible, and along its eastern edge, where Mr. Cole excavated the remains of a *stupa*. The richest assemblages come from spots KRM13 and KRM14. No traces of fireplaces or charcoal/ash concentrations were recorded during the 2009 survey. The general impression is that the Amri Culture site was located in the central-western part of the terrace, and that it was heavily damaged by the buildings erected on the hill by a Buddhist community, most probably in the 5th century AD.

3.1.1. The chipped stone assemblages

Fourteen distinct spots were recorded by three people who worked at each scatter for some 20 minutes. All together 732 chipped stone artefacts were collected (table 1), mainly obtained from two different types of flint of 1) fine-textured grey colour (7.5YR6/1) and 2) slightly rough-surfaced brown colour (7.5YR4/2) with very small blackish inclusions. The first was mainly employed for the manufacture of small-sized tools among which are drills on microbladelet blanks, the second for the production of blades of a larger size. The precise location of the raw material sources exploited for their manufacture is at present unknown, although the recent discovery of

[1] The 2004 assemblage consists of 1 bullet core (fig. 7, n. 1), 1 straight truncation on a bladelet (fig. 7, n. 2), 1 backed bladelet with deep, alternate retouch (fig. 7, n. 5), 1 backed bladelet with marginal, direct retouch (fig. 7, n. 4), 2 fragmented blades with simple retouch and a sinuous edge (fig. 7, nn. 6 and 7), 1 fragmented crested bladelet (fig. 7, n. 3), 105 flakes and microflakes, 29 of which are complete and 76 broken, 8 bladelets and 1 broken blade. Many artefacts are burnt.

sources of good quality flint of light grey colour (7.5YR7/1), and traces of mining activity on two different terraces, south-west of Jhimpir, some 20 km to the west-south-west of the site (BIAGI and NISBET, 2010), might indicate that Jhimpir is one of the outcrops exploited by Kot Raja Manjera inhabitants.

The length/width diagram of the complete, unretouched artefacts shows a predominance of flake debitage (table 2); this result is partly due to the very fragmentary state of the products. Nevertheless 178 unretouched blade(let) fragments were collected, most of which are between 7 and 13 mm wide (fig. 9). Bladelets represent the commonest blanks exploited for making tools. A detailed description of the chipped stone assemblages from the fourteen spots is provided in table 3.

3.1.1.1. Discussion

The chipped stone assemblage from Kot Raja Manjera is represented by a noticeable variety of tools among which the most important, from a typological point of view, are abrupt-retouched implements, drills and borers. The tools have been obtained mainly from blades, bladelets and microbladelets, as also suggested by the presence of bullet type subconical cores (fig. 7, n. 1; 12, n. 15; 13, n. 7). They were at least partly produced within the site, as indicated by a few crested blades (fig. 7, n. 3; 10, nn. 17 and 24; 12, nn. 16 and 17) and a great number of waste flakes and flakelets.

Except for one borer (fig. 11, n. 2), the drills are of a microbladelet dimension (fig. 10, nn. 2-5, 9 and 14; 12, nn. 2 and 3; 13, nn. 1-4). According to the traceological analysis, a few of them were employed for drilling (fig. 10, nn. 9 and 14; 12, n. 2; 13, nn. 1, 2 and 4), as it is also possibly supported by the recovery of carnelian bead fragments from spots KRM1, KRM13 and KRM14. This indicates that beads were manufactured within the settlement area. It is important to point out that two of the micro-drills had been utilised as armatures or projectile points, given the presence of impact fractures at their pointed, distal edge (fig. 10, nn. 2 and 4 and perhaps fig. 12, n. 3).

The abrupt-retouched tools are represented mainly by backed blades and bladelets and truncation (fig. 10, nn. 6 and 10) and convergent backed blades and bladelets with a complementary retouch along the opposite side (fig. 10, nn. 7, 8, 11 and 21; 11, n. 8; 12, nn. 5-9).

The use wear analysis has shown that, apart from drilling (bead manufacturing) and spearing (hunting?), the tools had been used in a variety of (specialised) activities among which are woodworking (fig. 10, n. 10 and

20; fig. 11, n. 7), cut medium hard material (fig. 10, nn. 22 and 23), and cut vegetables (fig. 10, n. 16). Only one implement has sickle gloss wear patterns (fig. 10, n. 19); 4 had been hafted (fig. 10, nn. 10, 19, 22 and 23).

3.2. LAKHO PIR

The area that surrounds the village of Lakho Pir, on the western limestone terrace that delimits an old bend of the Indus, north-west of Kot Raja Manjera (fig. 14, n. 3), was surveyed on January 25th, 2009. Eight spots of archaeological material were recorded from this region (fig. 15).

LP1 (25°02'02.902N – 68°11'56.984E). Three flint hypermicroflakelets one of which splintered and another very weathered, with a percussion bulb, of a dark greyish brown colour (10YR4/2)

LP2 (25°01'59.523N – 68°11'55.320E). From this point comes a typical Amri Culture scalene triangle of, light grey flint (10YR7/2), hafted, with cut wood utilisation traces (fig. 22, n. 4).

LP3 (25°01'59.113N – 68°11'53.847E). One flint microflakelet and 3 natural pieces of flint.

LP4 (25°02'09.749N – 68°11'54.949E). Two brown-patinated flint microflakelets.

LP5 (25°02'11.441N – 68°11'55.898E). One flint microflake with a bulb of percussion.

LP6 (25°02'08.450N – 68°11'57.720E). One patinated blade-like flakelet, the original colour of which was very dark grey (2.5Y3/1).

LP7 (25°02'04.567N – 68°12'13.415E). Two brown-patinated, broken microflakelets.

LP8 (25°01'59.342N – 68°12'17.162E). One microflakelet, 2 small flakes and 2 flakes slightly patinated and corticated. Their original colour was pale brown (10YR6/3).

3.3. TERRACES NORTH OF JHIRAK

The terraces west of the main road, some 3 km north of Jhirak were surveyed on February 3rd.

Five distinct points yielded archaeological chipped stone artefacts (fig. 14, n. 2). They are:

JHK1 (25°04'09.476N – 68°14'05.339E). Two microflakelets of silicized limestone.

JHK2 (25°03'56.335N – 68°13'59.155E). Proximal fragment of a flint microbladelet.

JHK3 (25°03'42.753N – 68°13'55.935E). One flakelet, 1 microflakelet and 1 fragmented long end-scraper of very dark grey flint (10YR3/1) with utilisation traces (fig. 22, n. 3)
JHK4 (25°03'51.602N – 68°13'27.337E). One small pebble of natural, weathered flint.
JHK5 (25°04'00.443N – 68°13'29.701E). One flint bladelet proximal fragment and one fragment of microbladelet.

3.4. AJI ABDUL REIM

Is located along the lake shore, east of the road from Jamshoro at 25°06'42.911N – 68°13'33.466E (fig. 14, n. 1). From the above point come a few natural flint pieces and 1 transversal scraper on a corticated, thick flake (fig. 13, n. 8).

4. THE REGION SOUTH AND SOUTH-WEST OF THATTA

This region is of unique importance for the study of 1) the variations of the northern coastline of the Arabian Sea in both prehistoric and historic times, and 2) the complex processes that led to the formation of the alluvial plain of the Indus delta (WILHELMY, 1968; HARVEY and SCHUMM, 1999; GIOSAN *et al*., 2006; INAM *et al*., 2007). According to several authors, at the time of the Greek invasion (327 AD) "*the sea extended upto Gujo area*" (PANHWAR, 1964: 100), a boundary generally accepted by both geologists (BENDER, 1995: fig. 10.18) and historians (EGGERMONT, 1975: map 2). The Indus coastal landscape of the 1st century AD is accurately described in the Periplus (SCHOFF, 1974: 37): "*the river has seven mouths, very shallow and marshy, so that they are not navigable, except the one in the middle; at which by the shore, is the market town, Barbaricum. Before it lies a small island, and inland behind it is the metropolis of Scythia, Minnagara*".

The above market town is mentioned also by M.R. HAIG (1894: 30-31) who describes the port of Barbarikon (Barbaricum), along the western coast of the Indus delta "*on the middle mouth of the river, having a small island in front of it*", which "*would be one of the numerous tracts of land in the Delta which are isolated by minor branch channels*".

The complexity of the problem, which is strictly connected with the movements of the prehistoric and historic courses of the Indus, and their flow into the Arabian Sea in relation with the coastline advance, has been taken into consideration also by L. FLAM (1984; 1987). W.T. BLANDFORD (1880: 154), in his geological study of Thatta and its surroundings, pointed out that "*to the west of Makli Hill there are several small scattered rises in*

the alluvium; all, except one, which is Khirtar, composed of Nari beds. Farther west, and again to the south-west, there are some detached rocky rises of peculiar formation, ascribed to the Gáj group". "*A third range of high ground occurs close to Tatta, and is 18 miles long from north to south and 4 from east to west. In all these cases portions are detached and separated by alluvium from the main range, and there are some other small and unimportant patches, none of which are of any size, near the edge of the alluvial area*" (BLANDFORD, 1880: 24).

Most of the authors agree with the idea that the above "*rocky rises*" were in effect islands or islets during Alexander's times, as they were also before the Hellenistic period. In this respect H.T. LAMBRICK (1986: 118-119) described "*the island of Bibakta which I should suppose to be one of the small rocky elevations which occur hereabouts, perhaps that called Tharri Gujo. This, in my view, was the position of "Alexander harbour". The alluvial plain about here is only slightly elevated above sea level, and we may reasonably suppose it to have been formed within the last twenty-two centuries*". This interpretation has been supported also by M. KEVRAN (1995: 295) and A. IBRAHIM (2000-2001), although with different arguments. Of quite a contrasting opinion is P.H.L. EGGERMONT (1975: 37) who identifies Alexander's harbour with Barbarikon (Barbaricum), some 130 km east-north-east of Tharro, at the mouth of the only navigable central branch of the river (see also SCHOFF, 1974: 37). The above different interpretations of the original Greek sources (MCCRINDLE, 1979; 2000) are most probably due also to the variable measure attributed to the *stadion* according to the different authors (GULBENKIAN, 1987).

S. PIGGOTT (1950: 77) and A.R. KHAN (1979: 5), believed that the Tharro Hills were an island rather close to the northern rocky coastline in Chalcolithic times, when Amri Culture peoples established a settlement along their eastern edge (BIAGI, 2005), as it is supported by a radiocarbon date from Ostreidae marine shells collected from the central part of the site (GrN-27053: 5240±40 uncal BP). They were undoubtedly surrounded by Arabian Sea waters during the Neolithic, as it is confirmed by a small scatter of Ostreidae from point THR2 (24°43'27.13N - 67°44'44.78E) radiocarbon-dated to 6910±60 uncal BP (GrN-32119) (BIAGI and FRANCO, 2008: fig. 7) (fig. 16).

The 2009 surveys led to the discovery of archaeological remains on five of the above-mentioned rocky outcrops that rise from the Indus alluvial plain; they are listed below.

4.1. BERI

The site of Beri[2] is located on a small, boat-shaped, flat-topped limestone terrace that raises in a northeast-southwest direction from the Indus alluvial plain some 1.6 km south-east of the Tharro Hills (figs. 16 and 17). Its surface is covered with fragments of marine and mangrove shells, flint artefacts and a few ceramic potsherds. An Islamic cemetery, mentioned also by M. KEVRAN (1995: 297), is still clearly visible at its northeast edge. A sample of *Terebralia palustris* mangrove gastropods from point 24°43'00.037N - 67°45'09.485E has been radiocarbon-dated to 5960±50 uncal BP (GrN-32166).

4.1.1. The chipped stone assemblage

The chipped stone assemblage from Beri consists of 35 unretouched artefacts, 19 of which are complete and 11 broken (11 burnt), 1 core (fig. 18, n. 1), 1 platform rejuvenation flakelet (fig. 18, n. 10), and 9 instruments (fig. 18, nn. 2-9 and 11). Four of the complete, unretouched specimens are corticated, obtained from at least 2 small nodules of a strong brown colour flint (7.5YR4/6), 9 are bladelet fragments. The assemblage includes a great variety of flint types, mainly of a dark brown colour, with lighter striations (7.5YR3/2), and dark reddish grey (10R3/1). Some unique specimens include 1 silicified limestone blade, 20 mm wide, of a light grey colour (1 for Gley 7), 1 grey (10YR5/1), and 1 black flake (10YR2/1) with brown spots (10YR5/3). A unique type of flint is represented by a thin blade of reddish grey colour (2.5YR5/1) (43x17x3 mm) in a very "fresh" state of preservation. Many of the unretouched artefacts show a light grey or white patina, most probably caused by the exposure, and slightly rounded, bright surfaces due to eolization.

The retouched tools (9) are represented by 2 straight borers (fig. 18, nn. 2 and 3), 2 truncations with complementary retouches along the edges (fig. 18, nn. 4 and 6), 1 fragmented scalene triangle (fig. 18, n. 5), 2 fragmented backed tools, probably 1 backed blade (fig. 18, n. 8) and 1 point (fig. 18, n. 7), 1 fragment of a retouched parallel-sided blade, which had been hafted and used for cutting soft wood (fig. 18, n. 9), and 1 lateral side scraper (fig. 18, n. 11). Their main characteristics are shown in table 4. It is important to point out that, although the number of tools is very small, most of them are obtained with a (semi)abrupt retouch on blade or bladelet blanks with straight sides. The recovery of 1 scalene triangle on a bladelet is of major importance.

[2] Beri means boat in Sindhi.

4.2. JABAL SHAH HUSEIN

This hillock, ca. 850 m long and 350 wide, elongates in a northeast-southwest direction some 12 km south of the Tharro Hills, and 1 km west of the limestone terrace of the Makli Hills, south of Thatta (fig. 19), which is "*18 miles long from north to south and 4 from east to west*" (BLANDFORD, 1880: 24).

A shrine, from which the hill takes its name, is built on its top, and a monumental graveyard has been erected in the central part of the western slope, crossed by a footpath that takes to the shrine. Mangrove and marine shells, mainly Ostreidae, were recovered from several points during the brief survey conducted on January 24th, 2009, which revealed at least seven spots of potential archaeological interest, mainly in the north-eastern part of the hill (fig. 20). They are:

JSH1 (24°42'26.007N - 67°48'38.327E). From its surface (fig. 21) comes a trapezoidal transversal arrowhead, with abraded cutting edge, obtained from a blade of light grey flint (10YR7/2) (fig. 22, n. 1), and a medium fragment of a parallel-sided bladelet of pinkish grey colour (5YR6/2) (fig. 22, n. 2; see also table 5). The area yielded also marine shells and fragments of *Terebralia palustris* gastropods. A single specimen of Ostreidae shell was radiocarbon-dated to 5325±40 uncal BP (GrA-45180);

JSH2 (24°42'26.392N - 67°48'39.029E), close to JHS 1, the surface here is rich in marine shells and mangrove gastropods, among which are specimens of *Telescopium telescopium*, one of which yielded the radiocarbon result of 4245±40 uncal BP (GrA-45181);

JSH3 (24°42'25.073N - 67°48'37.593E), It yielded a patinated microflakelet of light grey colour (10YR7/2);

JSH4 (24°42'21.658N - 67°48'35.519E) from which comes a patinated and corticated small blade-like flakelet, the original colour of which was light brownish grey (10YR6/2);

JSH5 (24°42'24.420N - 67°48'36.318E). From this point come a few fragments of marine shells and 2 small flint flakelets with a light grey patina;

JSH6 (24°42'22.549N - 67°48'34.910E). It yielded one triangular, rough-surfaced flakelet of yellowish brown flint (10YR5/4);

JSH7 (24°42'13.063N - 67°48'27.491E). Two small, corticated flint nodules with a brown patina. Also this area is covered with oyster marine shells.

4.3. UNNAMED ROCK NORTH-EAST OF JABAL SHAH HUSEIN

It is located at 24°42'45.440N – 67°48'54.508E, north-east of Jabal Shah Husein (fig. 19, n. 4). Linear, quadrangular and chessboard patterns of rock engravings were discovered at its southern edge (fig. 23).

4.4. OTHER UNNAMED ROCK ALONG THE NATIONAL ROAD WEST OF THATTA

From the surface of an unnamed rocky outcrop, located south of the road from Gujo to Thatta (24°44'26.264N – 67°48'41.635E) (fig. 19, n. 3), comes a fragment of a heavily patinated flint microflakelet of greyish brown colour (10YR5/2) with *écaillée* detachments (?).

4.5. THE MAKLI HILLS

Only the northernmost part of the Makli Hills, south of Thatta, was systematically surveyed on January 29th, 2009. Chipped stone artefacts were recorded 1) close to Aqel Pir, where a white-patinated flint microflakelet with percussion bulb was collected from the surface, close to a water spring, at 24°41'16.672N - 67°49'29.259E (fig. 19, n. 6), and 2) in the proximity of the Military Public School (MPS: 24°41'04.048N - 67°51'19.673E), which yielded 2 flint flakelets, 1 broken and 1 with bulb of percussion (fig. 19, n. 7). A visit was paid also to the XVI century AD city of Kalan Kot, on the surface of which fragments of both *Terebralia palustris* and marine shells were collected, and the promontory north of the city, on the top of which lie the ruins of several historical structures (fig. 19, n. 8).

5. DISCUSSION

The surveys carried out in Lower Sindh in January-February 2009 have undoubtedly improved our knowledge on some aspects of the prehistory of the region mainly as concerns a few topics of major interest. They are:

1) The absolute chronology of the prehistoric settlement of the Indus delta. The radiocarbon dating of marine (Ostreidae) and mangrove shell samples (*Terebralia palustris* and *Telescopium telescopium*) from the Tharro Hills (fig. 16), Beri (fig. 17) and Jabal Shah Husein (fig. 20) shows that the first human activity in the area took place at least from the beginning of the seventh millennium uncal BP (THR2: GrN-32119). The THR2 radiocarbon result confirms that some of the above islands had already been (sporadically or seasonally?) settled in that period. This assay fits well within the general framework of the earliest anthropisation of both the coasts of the Arabian Sea and the Gulf, which is supposed to have occurred from the middle of the eighth millennium uncal BP onwards (VITA-

FINZI and COPELAND, 1980; CLEUZIOU, 2004; BIAGI, 2008); it also poses the question of the (models of) coastal navigation in this part of the Arabian Sea during the Middle Holocene, when the first shell-middens began to be settled in well-defined environmental landscapes (BIAGI, 2004; BERGER *et al*., 2005; SANLAVILLE and DALONGEVILLE, 2005; UERPMANN *et al*., 2009).

2) The characteristics of the flint assemblages from the ancient islets, at present rocky outcrops, in the above region. Apart from the chipped stone assemblage from the Tharro Hills, which has been attributed to the Amri Culture (BIAGI, 2005), a fragmented Amri triangle comes from Beri (fig. 18, n. 5). Nevertheless the cultural attribution of the chipped stone assemblage from this site is problematic for the following reasons: 1) it has been manufactured from flint from several different sources, many of which are at present unknown, 2) it is rather poor and fragmented, 3) a single *Terebralia palustris* mangrove shell from its surface yielded the radiocarbon result of 5960±50 uncal BP (GrN-32166). It is unclear whether the above assemblage is homogeneous or it represents a few different occupations, all chronologically attributable to periods preceding the beginning of the Bronze Age. A transversal arrowhead of a well-defined type, already known from the Mesolithic sites of Mulri Hills, south of Karachi University Campus, Kadegji Gorge and Buda Ran Pethani (BIAGI, 2003-2004: figs. 10 and 17) comes from the surface of Jabal Shah Husein (JSH1: fig. 21). One single oyster specimen from the surface of this site was radiocarbon-dated to 5325±40 uncal BP (GrA-45180), even though the radiocarbon date and the tools are not necessarily contemporaneous and might indicate subsequent occupations.
3) The characteristics of the flint assemblages from Kot Raja Manjera and the region that surrounds this site. Kot Raja Manjera is so far a unique Amri Culture Chalcolithic settlement, although heavily disturbed by subsequent historical occupations and weathering. From a typological point of view, the chipped stone assemblage from the site shows many Amri characteristics, although some of these characteristics are known also from lithic assemblages of the same millennium in Balochistan (LECHEVALLIER, 2003). Among these is the abundance of abrupt-retouched tools with an opposed complementary retouch, a few of which are most probably

fragments of scalene Amri triangles (LECHEVALLIER, 1979; BIAGI, 2005). The recovery of one isolated specimen of these typical implements from the surface of the limestone terraces of Lakho Pir (LP2), in front of Kot Raja Manjera, is particularly relevant, given also the definition of its function thanks to the presence of traces of wear along its sides (fig. 22, n. 4);

4) The recovery of a few characteristic tools and small scatters of flints from several investigated areas between Ranikot Fort, in the north, and Jhirak, in the south. These finds show that good quality flint was undoubtedly available from several outcrops of Lower Sindh, from deposits belonging to the Ranikot Formation (BLANDFORD, 1880) and others further to the south (FAIRSERVIS, 1982: 111; CLELAND, 1987: 103). The recurrence of isolated, surface finds, among which are flint cores and retouched implements attributable to several cultural aspects and ages, shows that people moved across the study region in different prehistoric periods according to models that are at present unknown. Of great interest is also the recovery of a Middle Palaeolithic *Levallois* flakelet from the surface of a hillock at Arzi Goth (fig. 22, n. 6), which indicates that finds of this period can be recorded also from so far unsuspected landscapes.

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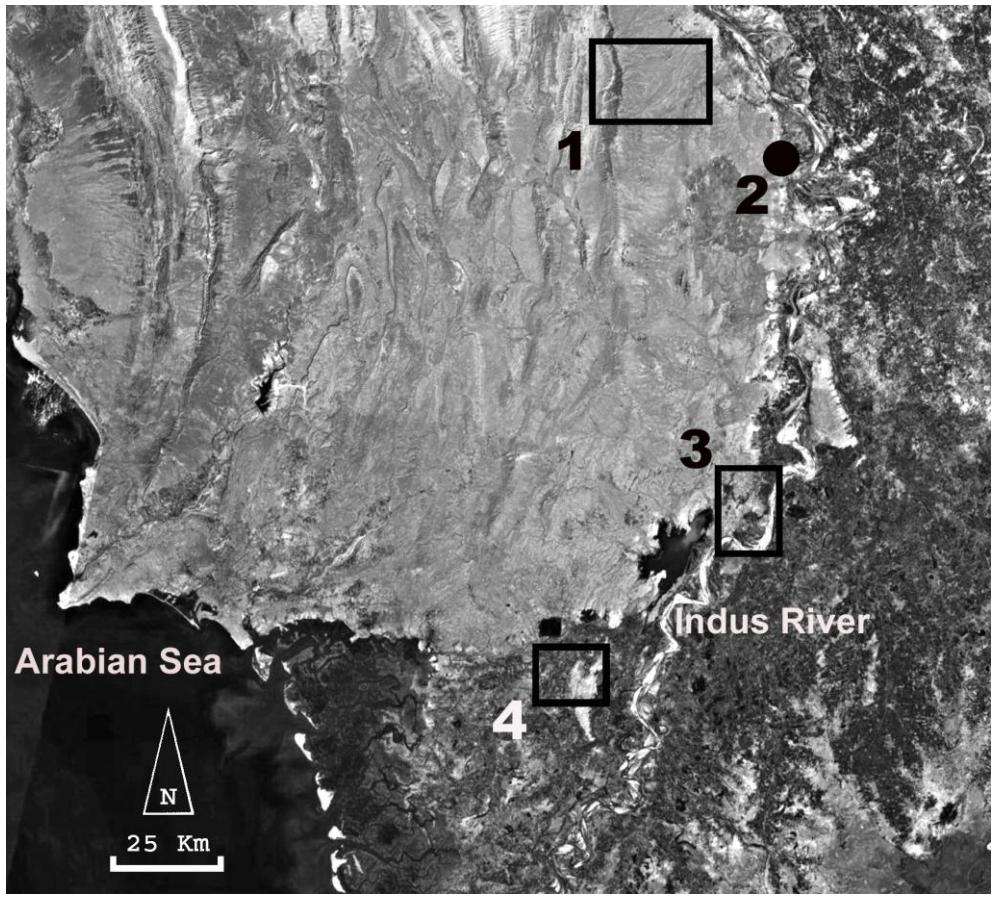

Fig. 1 - Lower Sindh: distribution map of the three areas surveyed in January-February 2009: Ranikot (1), Arzi (2), region around Jhirak (3), and south of Thatta (4).

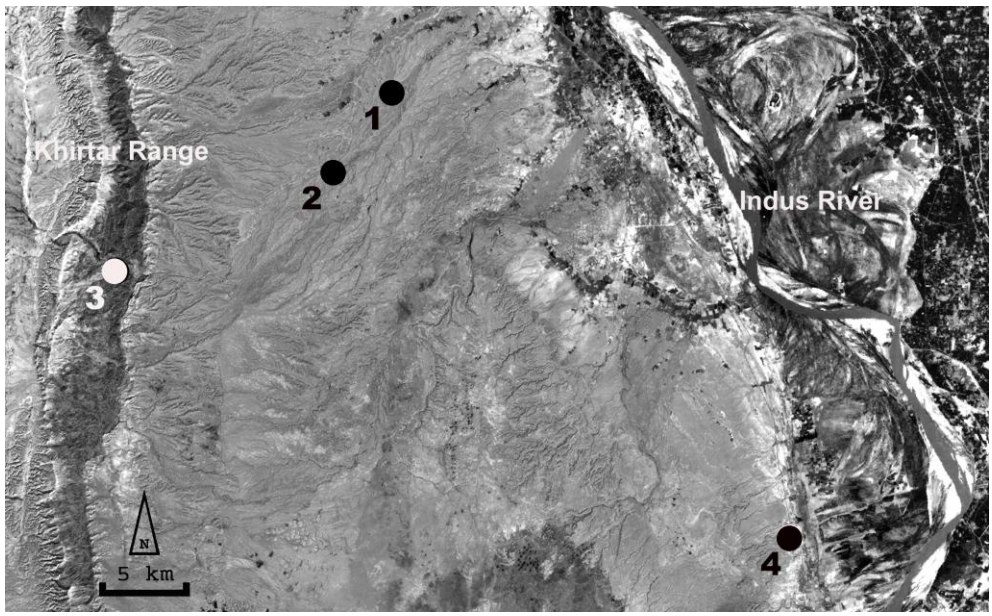

Fig. 2 - Ranikot area: 19 km from Ranikot (1), 12 km from Ranikot (2), Ranikot (3), Arzi (4).

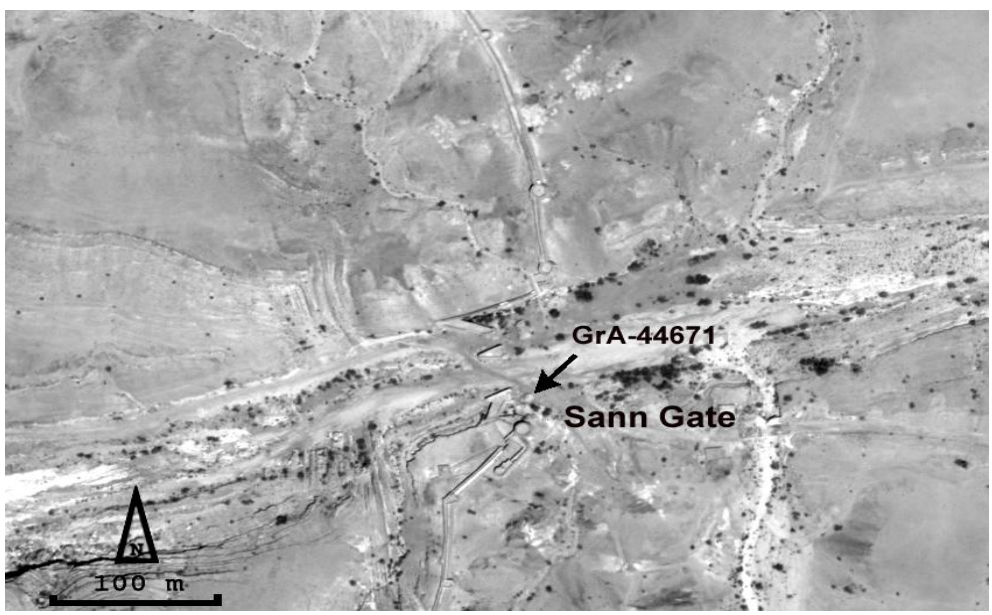

Fig. 3 - Ranikot Fort: Sann (Eastern) Gate (arrow) from which comes the radiocarbon dated charcoal sample GrA-44671.

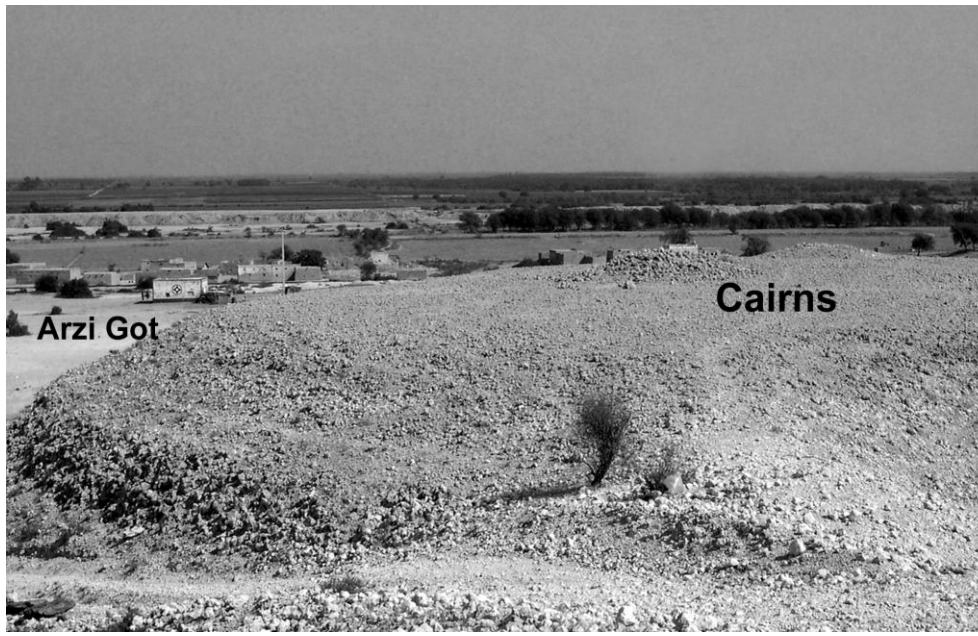

Fig. 4 - Arzi Goth: location of the two cairns on a hillock close to the Baloch village (*photograph by the author*).

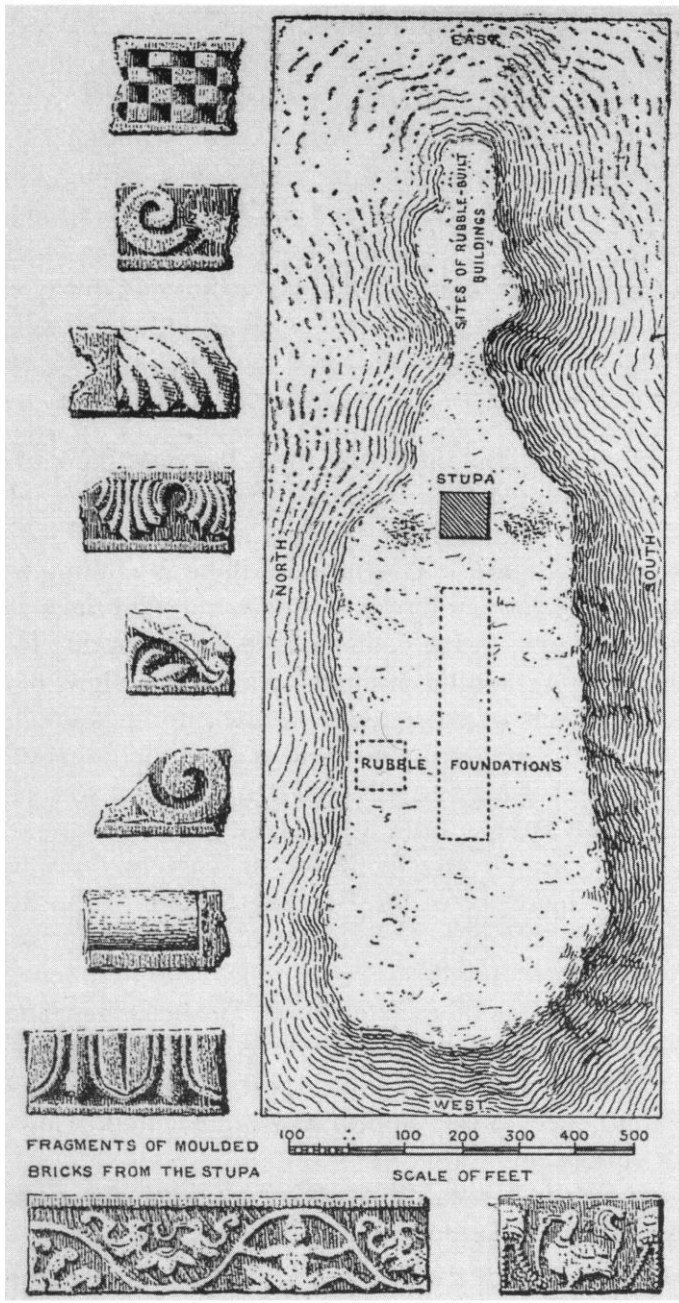

Fig. 5 - Kot Raja Manjera: the Buddhist structures on the top of the terrace (from COUSENS, 1998: Fig. 17).

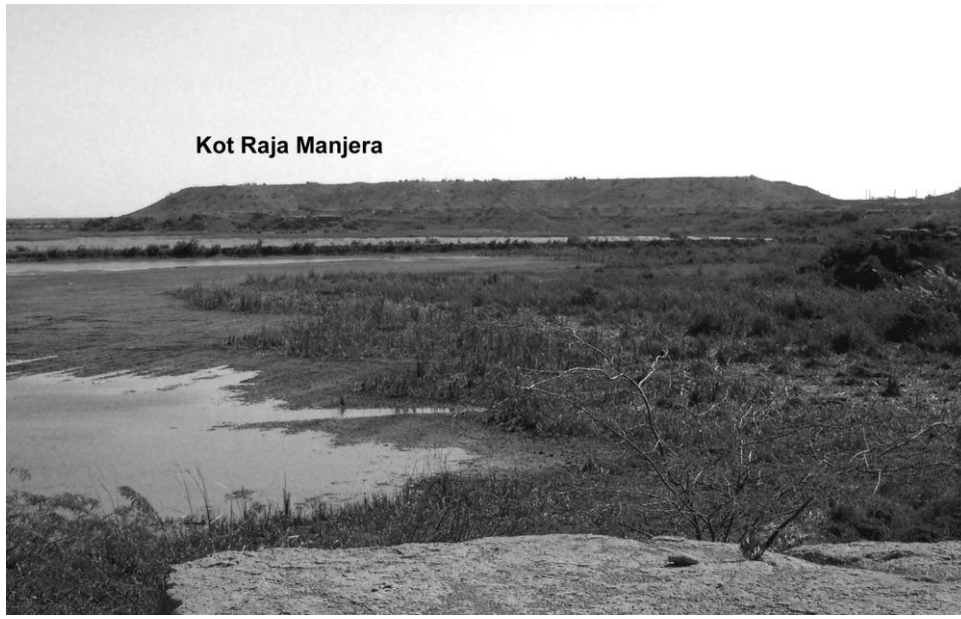

Fig. 6 - Kot Raja Manjera: the limestone terrace on which the site is located from Lakho Pir (*photograph by the author*).

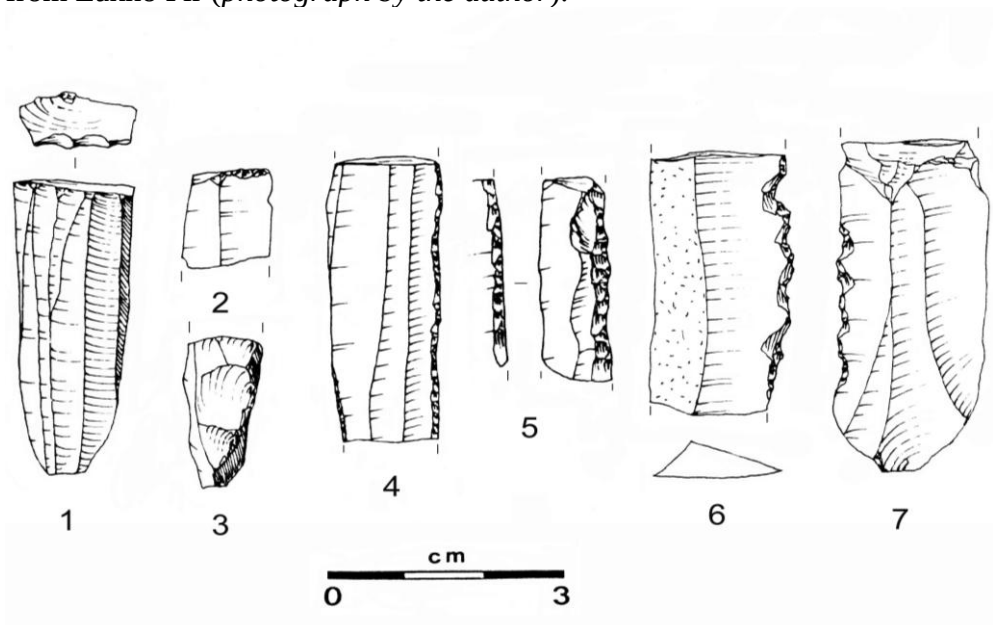

Fig. 7 - Kot Raja Manjera: chipped stone assemblage collected in 2004 (*drawings by P. Biagi, inking by G. Almerigogna*).

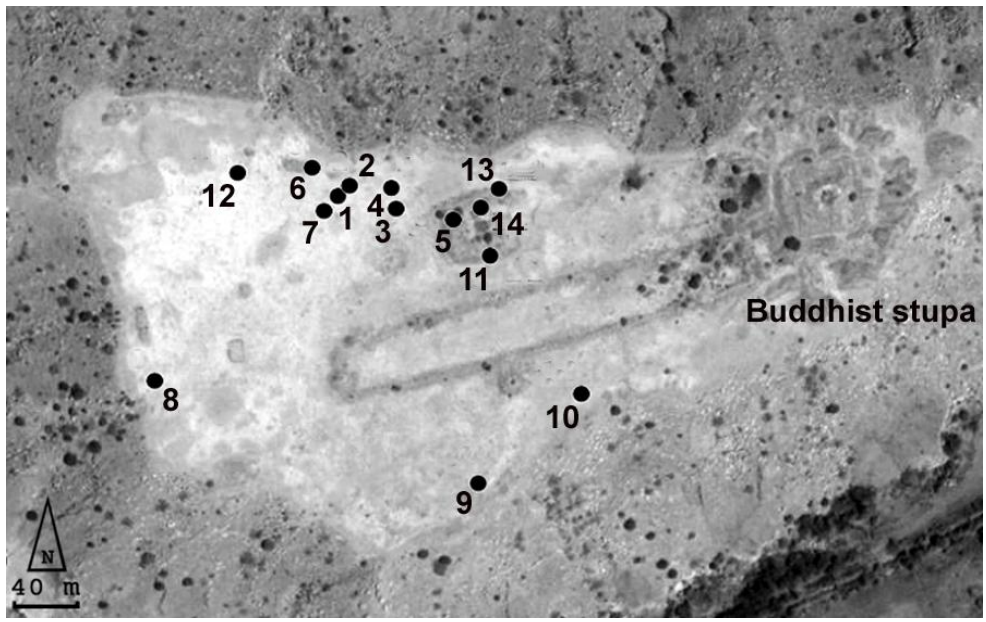

Fig. 8 - Kot Raja Manjera: distribution map of the 14 main scatters of chipped stone artefacts recorded in 2009.

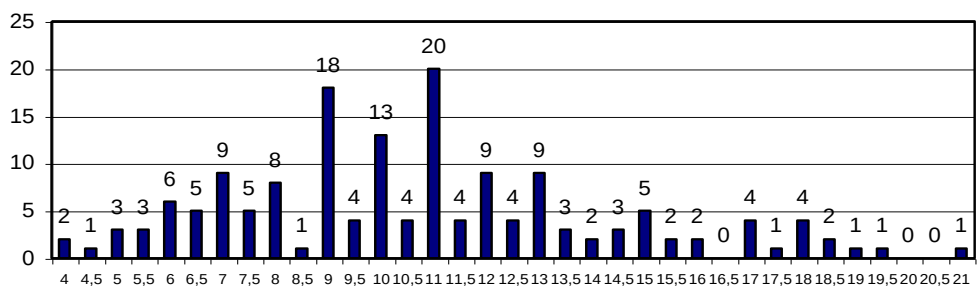

Fig. 9 - Kot Raja Manjera: number and width of the fragmented blades and bladelets from the 14 scatters.

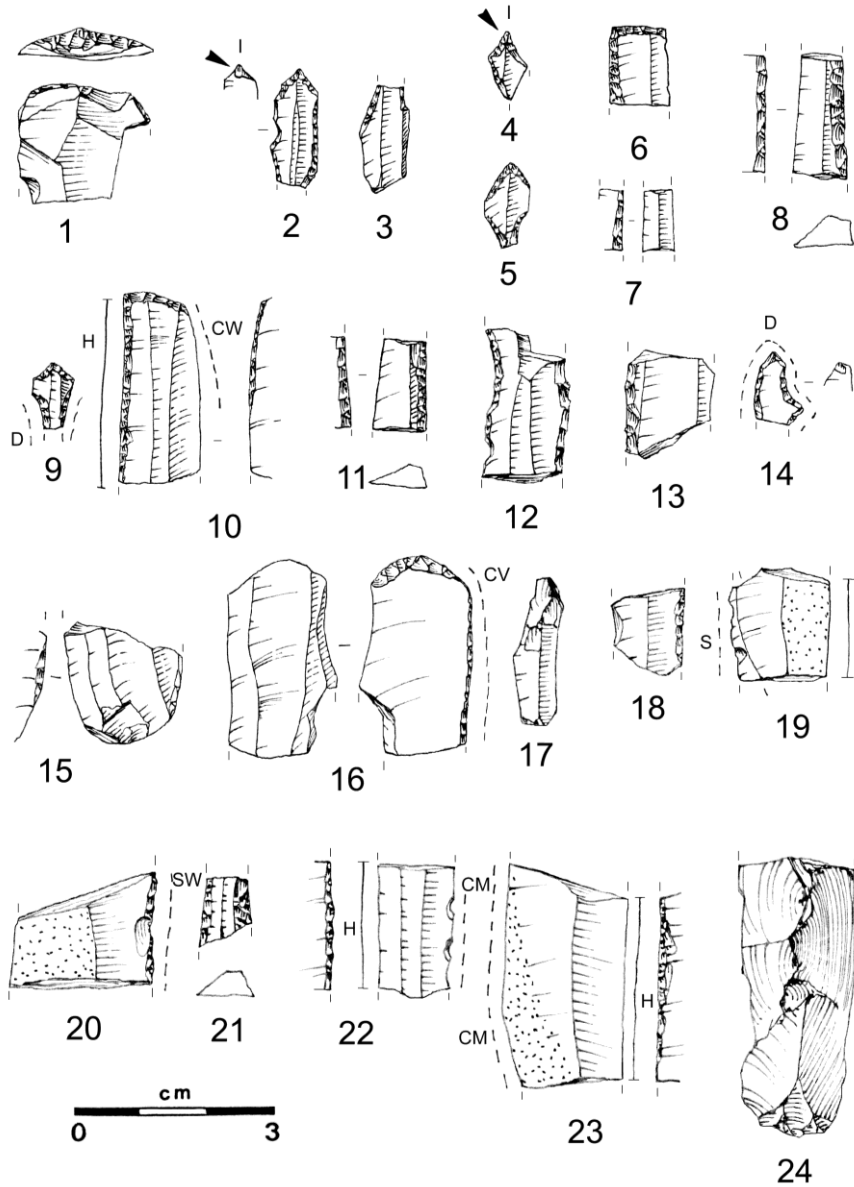

Fig. 10 - Kot Raja Manjera: chipped stone tools from KRM1 (nn. 1-8), KRM 2 (nn. 9-13), KRM4 (n. 14), KRM6 (nn. 15 and 16), KRM7 (nn. 17-20), and KRM8 (nn. 21-24). Symbols: arrow: impact fracture; small circle: bulb of percussion; D: drill; H: haft; S: sickle; CW: cut wood; CSW: cut soft wood; CV: cut vegetables; CM: cut medium; SH: scrape hard; A: abrasion; AR: armature? (*drawings by P. Biagi, inking by G. Almerigogna*).

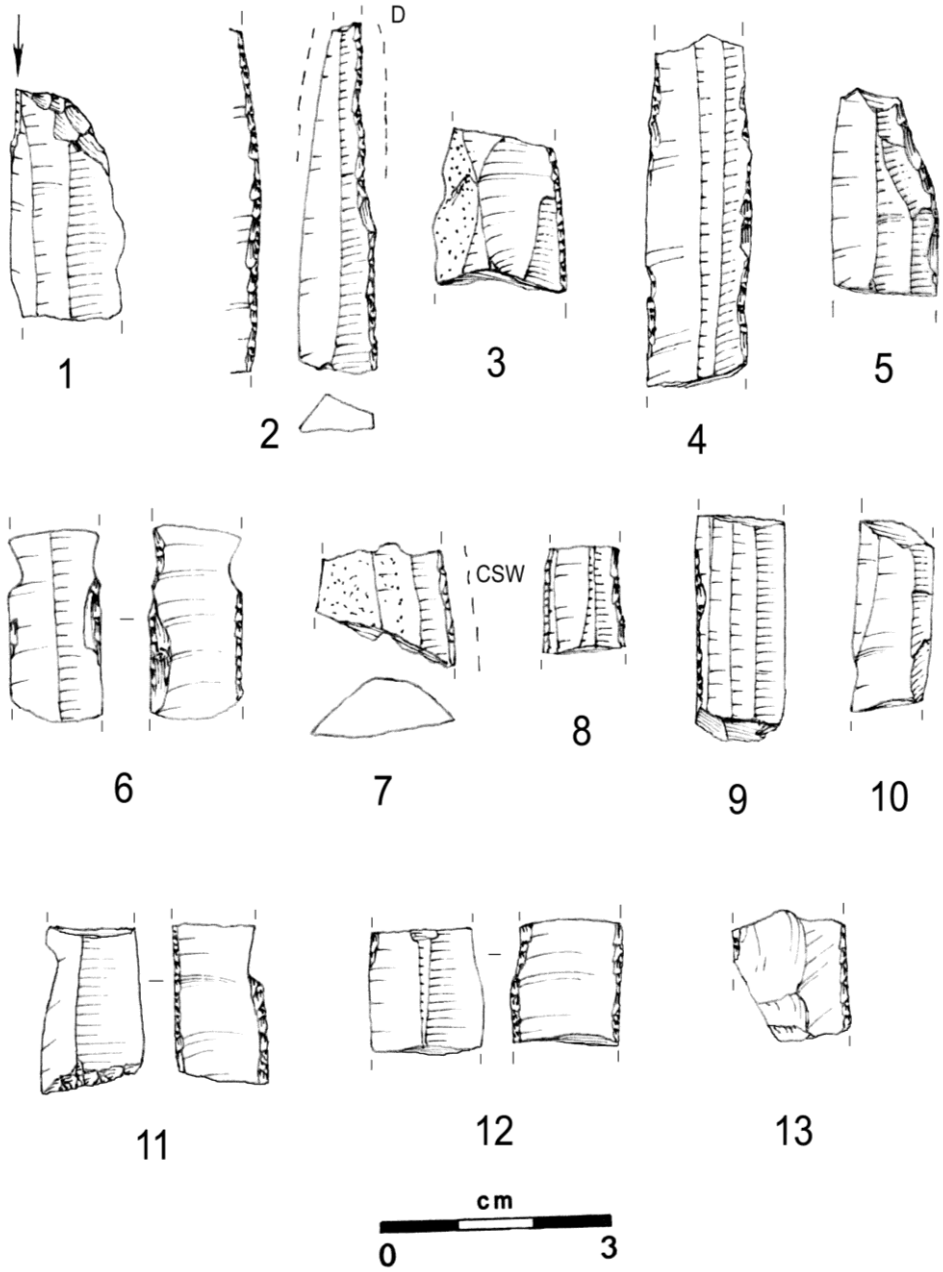

Fig. 11 - Kot Raja Manjera: chipped stone tools from KRM9 (nn. 1-6), KRM10 (n. 7), KRM11 (nn. 8-10), and KRM12 (nn. 11-13) (*drawings by P. Biagi, inking by G. Almerigogna*).

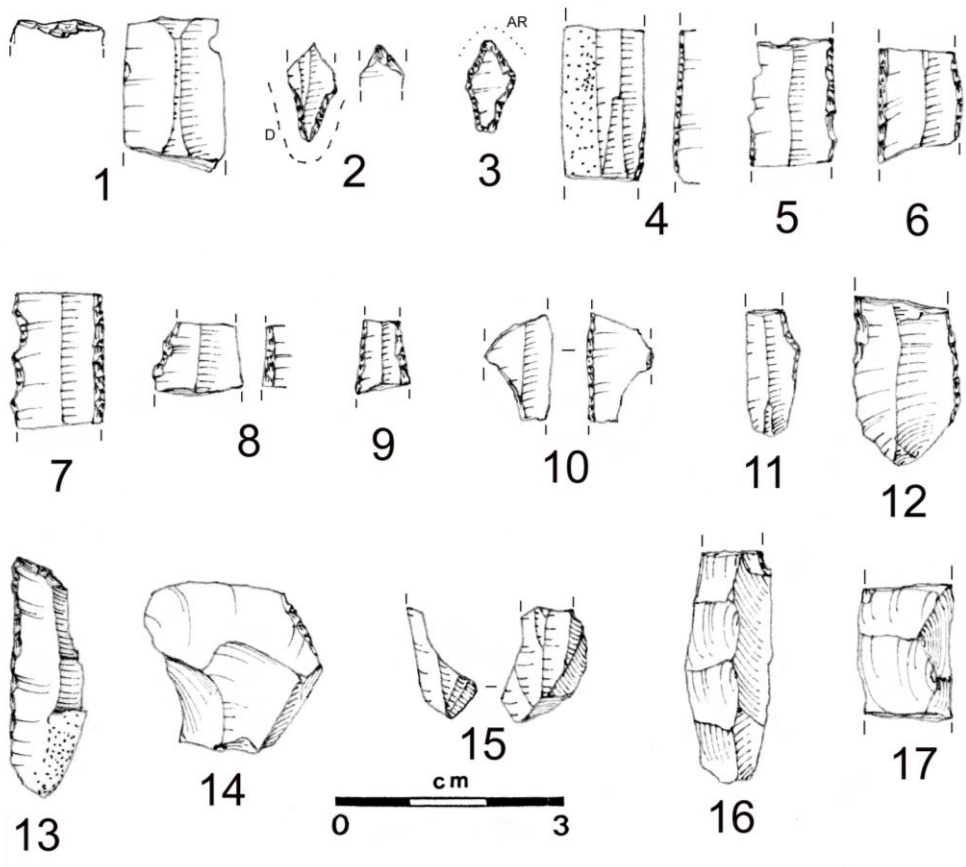

Fig. 12 - Kot Raja Manjera: chipped stone tools from KRM13 (nn. 1-17) (*drawings by P. Biagi, inking by G. Almerigogna*).

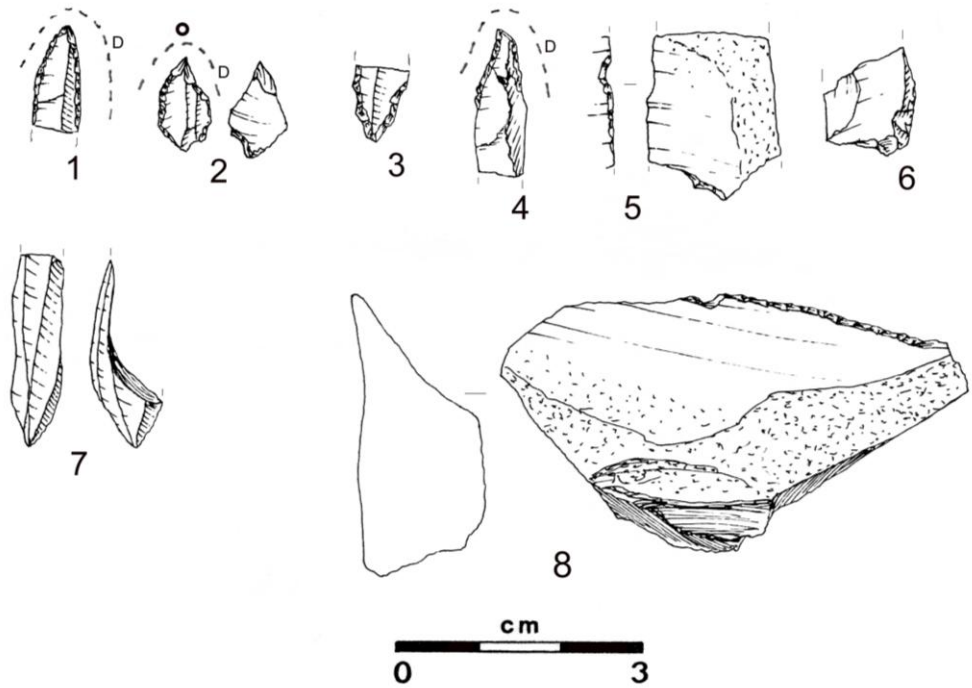

Fig. 13 - Kot Raja Manjera: chipped stone tools from KRM14 (nn. 1-7), and Aji Abdul Reim (n. 8) (*drawings by P. Biagi, inking by G. Almerigogna*).

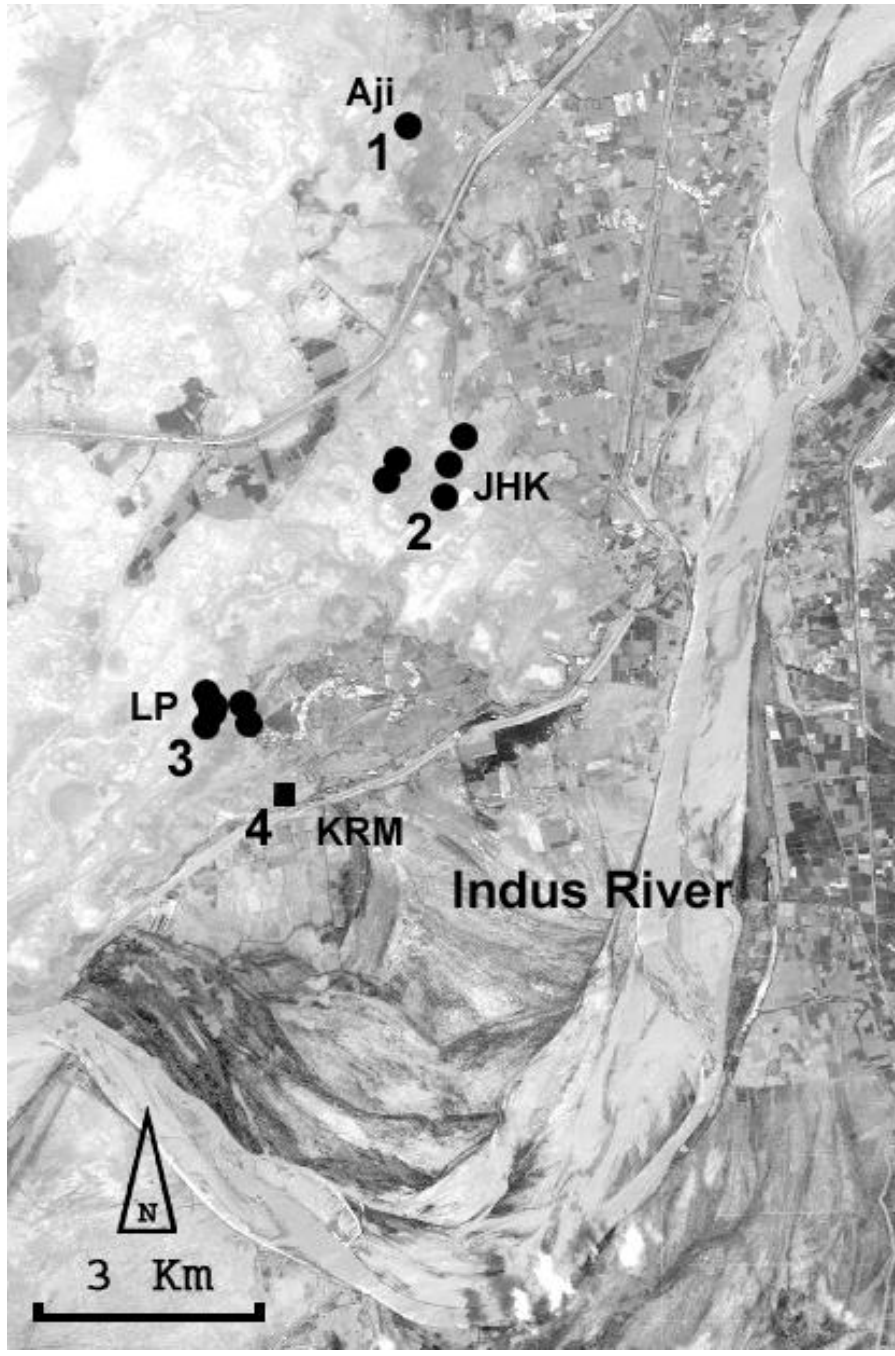

Fig. 14 - Location of the sites of Aji Abdul Reim (1), Jhirak (2), Lakho Pir (3) and Kot Raja Manjera (4).

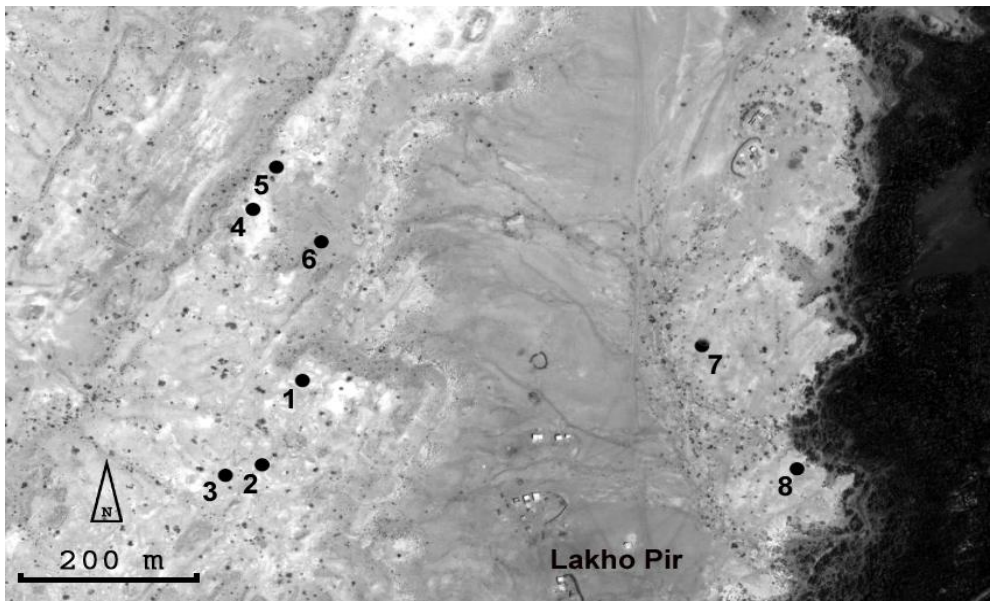

Fig. 15 - Lakho Pir: distribution map of the finds spots.

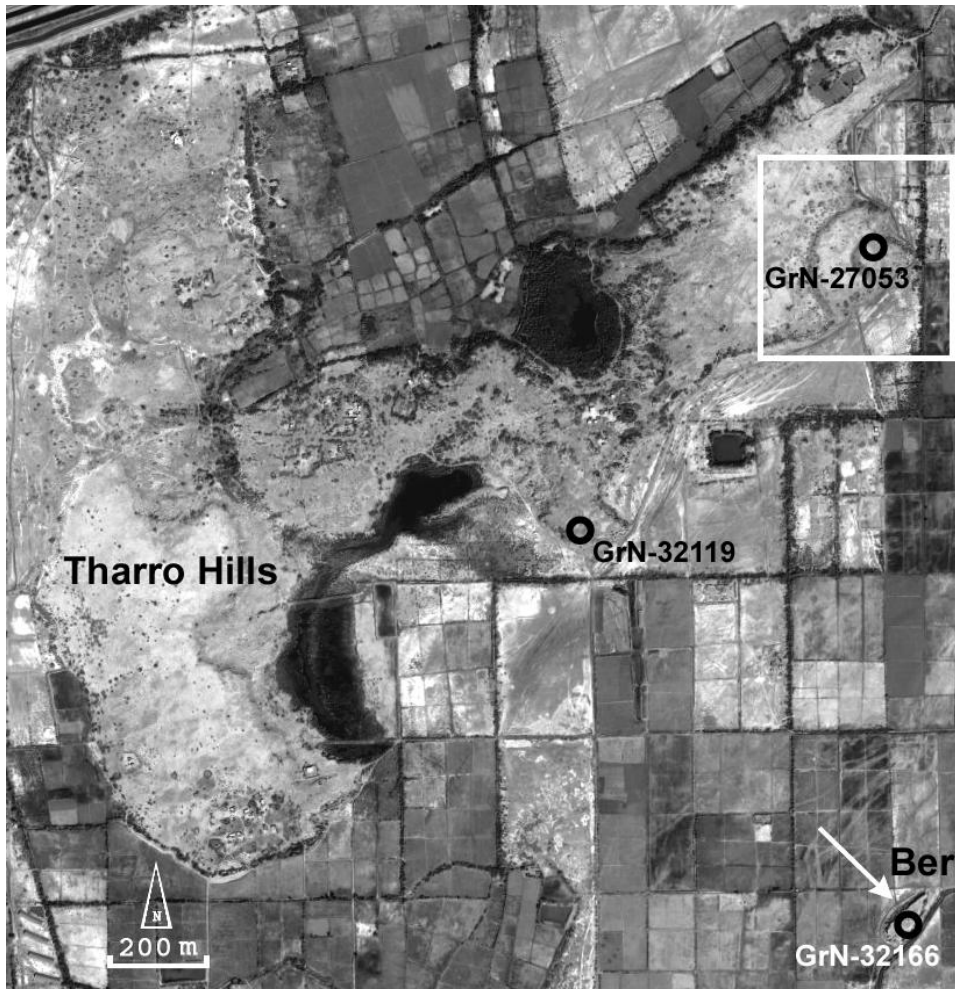

Fig. 16 - Tharro Hills and Beri: location of the three radiocarbon-dated shell samples.

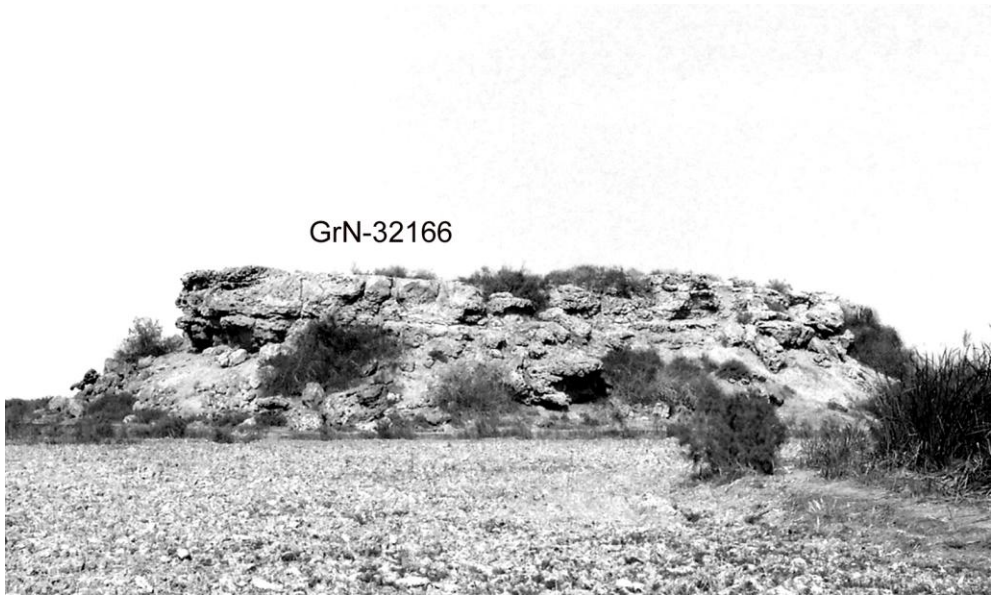

Fig. 17 - Beri: the limestone terrace on which the prehistoric site is located, from the south (*photograph by the author*).

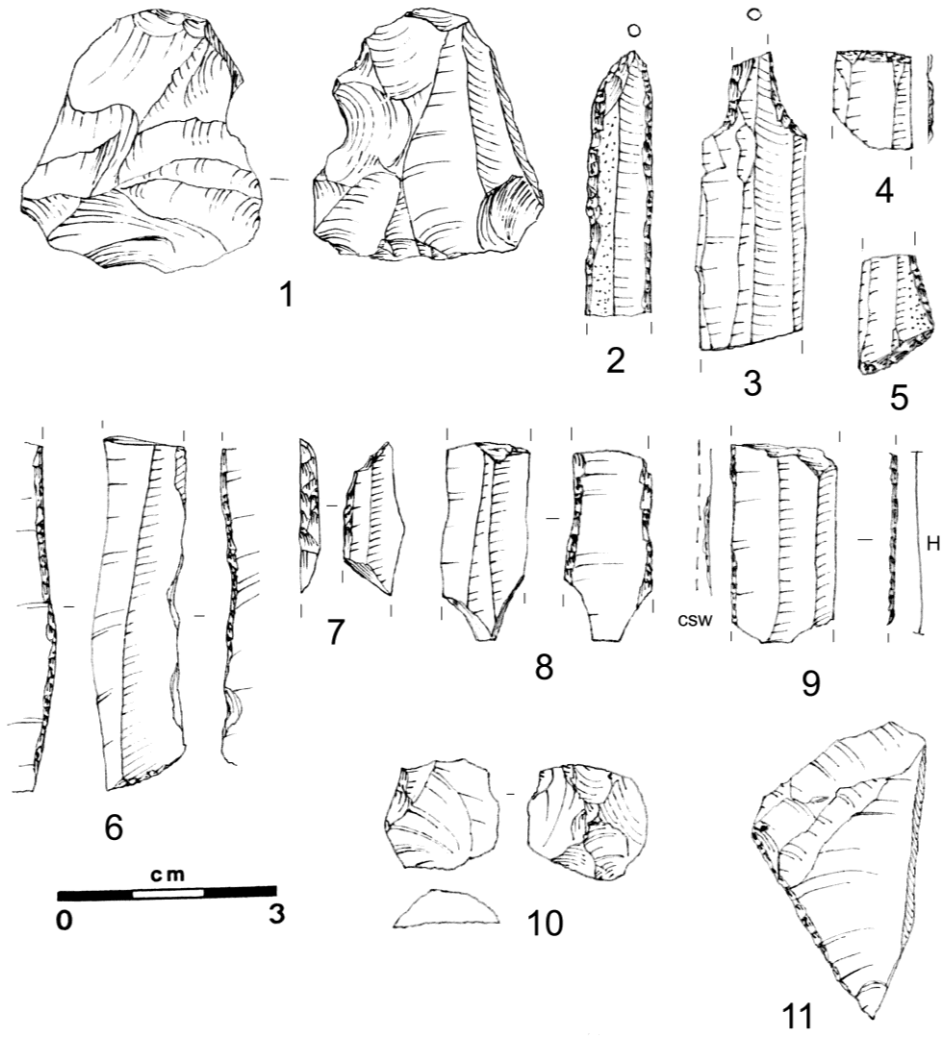

Fig. 18 - Beri: chipped stone artefacts (*drawings by P. Biagi, inking by G. Almerigogna*).

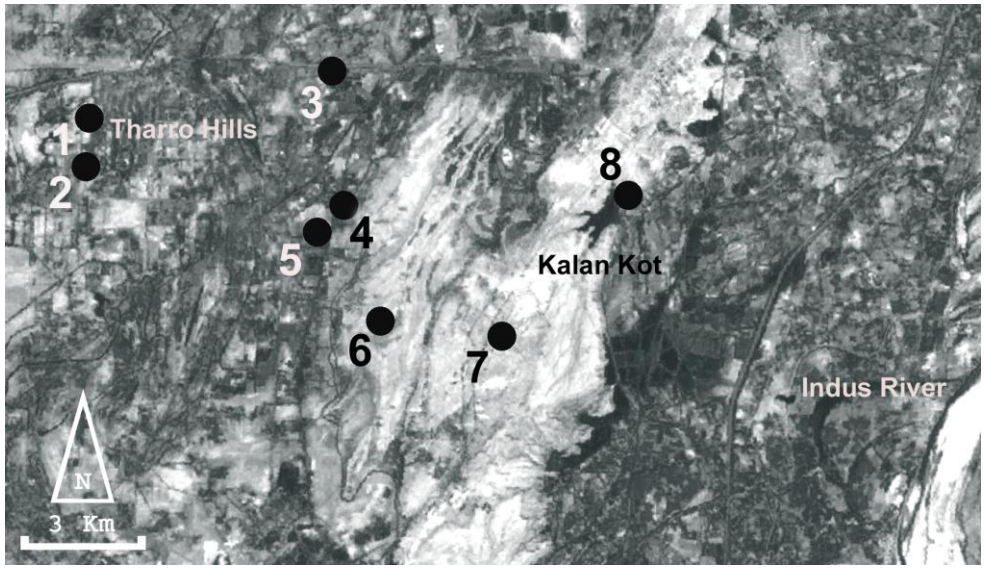

Fig. 19 - Location of the sites of Tharro Hills (1), Beri (2), unnamed rock west of Thatta (3), Jabal Shah Husein (5), other unnamed rock (4), Akel Pir (6), MPS (7), historical site north of Kalan Kot (8).

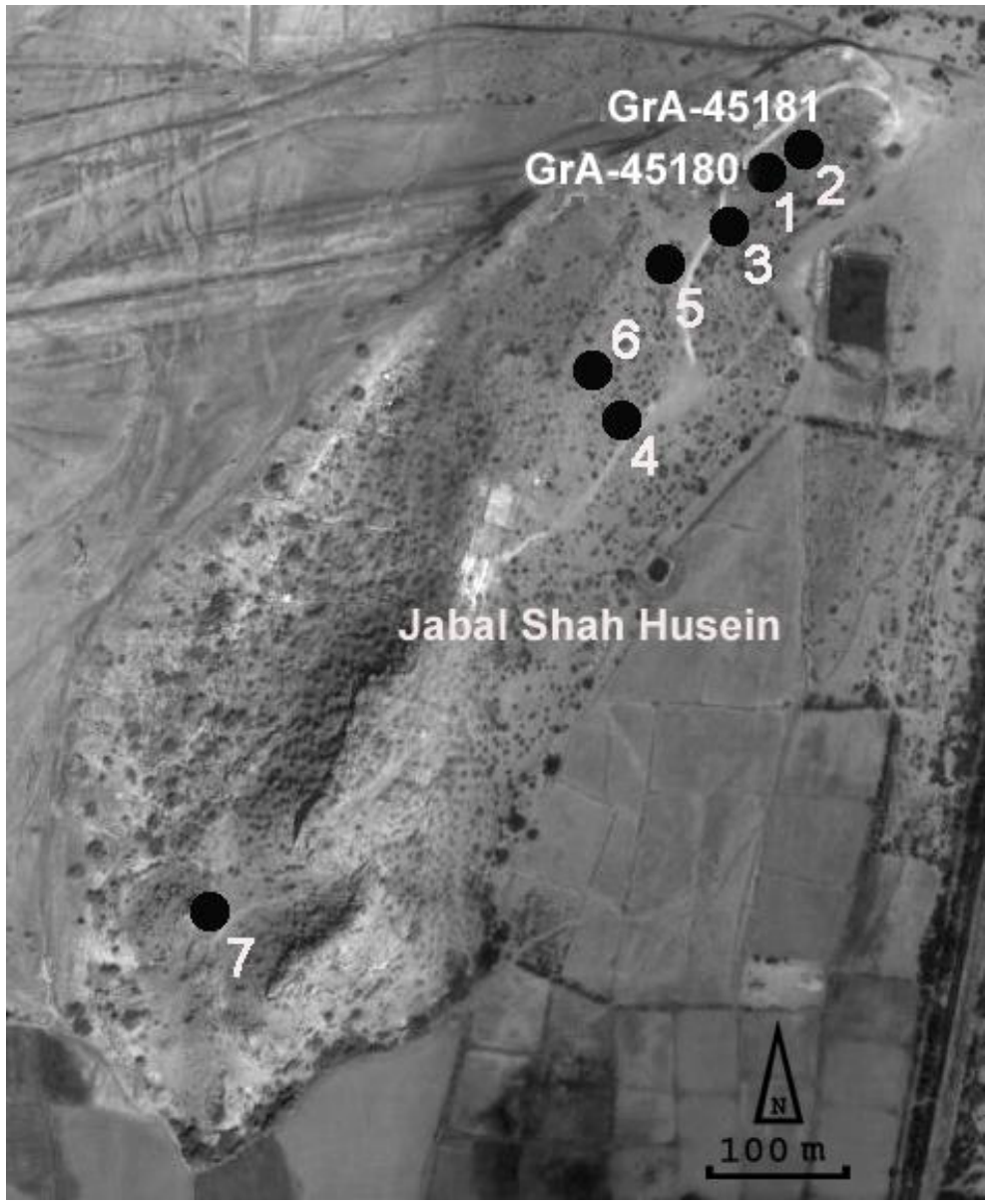

Fig. 20 - Jabal Shah Husein: location of the different find spots and radiocarbon-dated samples.

Fig. 21 - Jabal Shah Husein: site JSH1 from the south (*photograph by the author*).

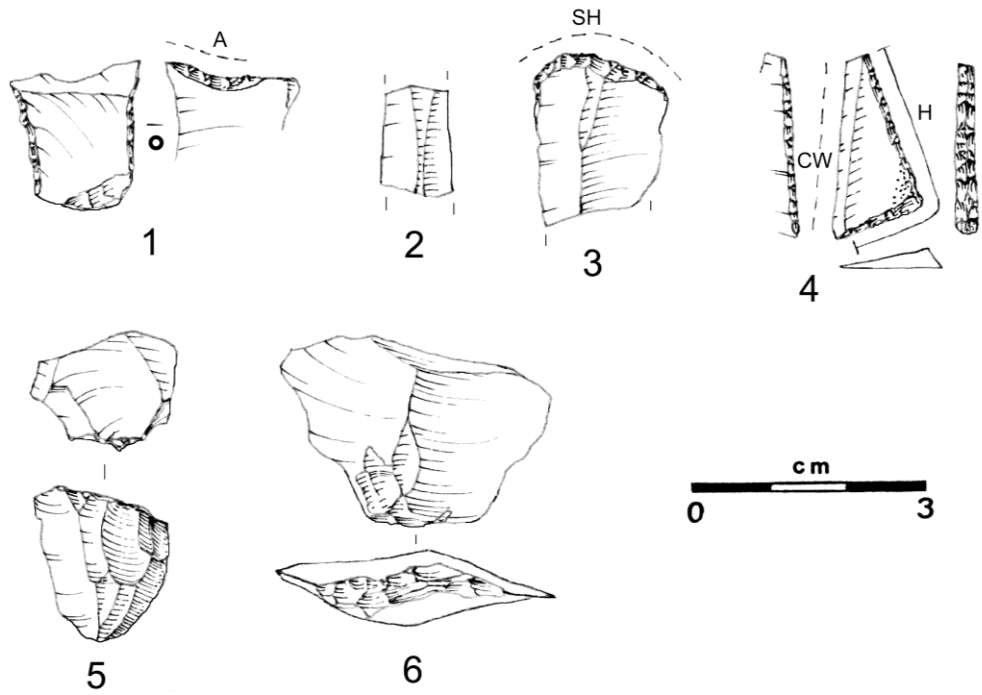

Fig. 22 - Chipped stone artefacts from JSH1 (1 and 2), JHK3 (3), LP2 (4), and Arzi Goth (5 and 6) (*drawings by P. Biagi, inking by G. Almerigogna*).

Fig. 23 - Unnamed rock north-east of Jabal Shah Husein: rock engraved limestone surfaces (*photograph by the author*).

Spot nr.	Coordinates	Artefacts	Tools	Cores	Complete measured	Fragments	Corticated	Burnt	Blades width	Crested blades	Others
KRM 1	25°01'20.485N – 68°12'34.391E	64	8	0	10	46	7	14	16	0	3 Cornelians, *Dentalium*
KRM 2	25°01'20.622N – 68°12'34.558E	72	5	0	24	43	16	34	7	0	
KRM 3	25°01'20.323N – 68°12'35.223E	23	0	0	4	19	6	22	4	0	
KRM 4	25°01'20.593N – 68°12'35.155E	19	1	0	0	18	2	8	0	0	
KRM 5	25°01'20.181N – 68°12'36.039E	16	0	0	2	14	2	2	2	0	
KRM 6	25°01'20.857N – 68°12'34.018E	18	2	1	1	14	10	2	2	0	
KRM 7	25°01'20.292N – 68°12'34.190E	12	1	1	0	9	4	3	2	1?	
KRM 8	25°01'18.079N – 68°12'31.769E	18	3	0	3	11	3	7	4	1	
KRM 9	25°01'16.745N – 68°12'36.397E	35	2	0	10	23	9	8	4	0	
KRM 10	25°01'17.909N – 68°12'37.873E	1	1	0	0	0	1	0	0	0	Large pot (historical?)
KRM 11	25°01'19.709N – 68°12'36.568E	44	1	0	10	32	4	27	12	1	
KRM 12	25°01'20.789N – 68°12'32.956E	21	3	0	3	15	3	9	5	0	
KRM 13	25°01'20.582N – 68°12'36.695E	228	15	1	70	141	36	15	68	1	1 Cornelian
KRM 14	25°01'20.338N – 68°12'36.434E	162	6	1	57	95	41	41	35	1	1 Cornelian
Totals		**732**	**48**	**4**	**194**	**480**	**144**	**179**	**161**	**5**	

Table 1 - Kot Raja Manjera: location and main characteristics of the chipped stone assemblages from the different spots.

Category	Limits (cm)	Number	%
Elongation Indexes			
Very narrow blades	<6	0	0.00
Narrow blades	6-3	1	0.51
Blades	3-2	11	5.67
Blade-like flakes	2-3/2	29	14.95
Flakes	3/2-1	69	35.57
Wide flakes	1-3/4	54	27.83
Very wide flakes	3/4-1/2	30	15.46
Extremely wide flakes	>1/2	0	0.00
Dimension indexes			
Hypermicroliths	<2	26	13.40
Microliths	2-4	158	81.45
Normoliths	4-6	9	4.64
Macroliths	>6-8	1	0.51

Table 2 - Kot Raja Manjera: elongation and dimension indexes of the unretouched chipped stone artefacts.

Spot number	Tool type	Typology (Laplace, 1964)	Measures (mm)	Munsell Colour	Condition	Cortication	Burnt	Patina	Wear traces	Figure	Other details
KRM 1	End-scraper	G2 dist	(17)x20x5	10YR3/4, dark yellowish brown	Distal fr	25%	No	No	No	10, n. 1	
KRM 1	Perforator (drill)	Bc2 dist [Apd+Apd]	17x7x2.5	10YR4/3, brown	Complete	No	No	No	Impact fracture	10, n. 2	
KRM 1	Perforator (drill)	Bc2 dist [Apd+Apd]	(15)x6.5x2	7.5YR6/1, grey	Proximal fr.	No	No	No	No	10, n. 3	
KRM 1	Perforator (drill)	Bc2 dist [Apd+Apd]/-Apd sen	9x5x2	7.5YR6/1, grey	Complete	No	No	No	Impact fracture	10, n. 4	
KRM 1	Perforator (drill)	Bc2 dist [Apd+Apd]/-tang	12x6x2	7.5YR6/1, grey	Complete	No	No	No	No	10, n. 5	
KRM 1	Truncation	T2 norm rect/-Apd sen	(12)x8x2	2.5Y4/3, olive brown	Proximal fr.	No	No	No	No	10, n. 6	
KRM 1	Backed blade	LD2 [Apd dext]	(18)x8x4.5	10YR6/4, light yellowish brown	Mesial fr.	No	No	No	No	10, n. 7	
KRM 1	Backed blade	LD2 [Api sen]	(8.5)x4.5x2	Unknown	Mesial fr.	No	Yes	No	No	10, n. 8	
KRM 2	Perforator (drill)	Bc2 prox [Apd+Apd]/.Apd.Apd	(9.5)x6x2	10YR6/1, grey	Distal fr.	No	No	No	Drill	10, n. 9	
KRM 2	Truncation	T2 norm conv/-Spd sen	(28.5)x12.2.5	7.5YR5/3, brown	Distal fr.	No	No	No	Cut wood - Haft	10, n. 10	
KRM 2	Backed blade	LD2 [Apd dext]/.Spi sen	(14)x8x3	10YR6/4, light yellowish brown	Mesial fr.	No	No	No	No	10, n. 11	
KRM 2	Retouched blade	L1 [Smd bil]	(22.5)x12x3	5YR4/1, dark grey	Mesial fr.	No	No	No	No	10, n. 12	
KRM 2	Retouched blade	L2 [Spd sen]	(16)x13x2.5	5YR4/1, dark grey	Mesial fr.	No	No	No	No	10, n. 13	
KRM 4	Perforator (drill)	Bc2 dist [Apd+Apd]	(10)x7x2	7.5YR6/1, grey	Distal fr.	No	No	No	Drill	10, n. 14	Ventral scar
KRM 6	Retouched blade	L1 [Smi alt]	(17.5)x17x4	1 for Gley 7, light grey	Proximal fr.	No	No	No	No	10, n. 15	Silicized limestone
KRM 6	Truncation (?)	T2 norm conv	(30)x15.5x4	10YR6/3, pale brown	Distal fr.	No	No	No	Cutting vegetation	10, n. 16	
KRM 6	Core	Bladelet core	(29)x(22)x(10)	Unknown	Fragment	No	Yes	No	No		
KRM 7	Crested blade	Bladelet	22x6x5	10YR6/2, light brownish grey	Complete	No	No	No	No	10, n. 17	Burin spall
KRM 7	Retouched blade	L1 [Smd dext]	(12.5)x10.5x3	Unknown	Mesial fr.	No	Yes	No	No	10, n. 18	
KRM 7	Unretouched blade	L0	(17)x15x3.5	10YR4/3, brown	Mesial fr.	50%	No	No	Sickle - Haft	10, n. 19	
KRM 7	Retouched blade	L1 [Smd dext]	(17)x22x5	10YR5/3, brown	Mesial fr.	50%	No	No	Scrape wood	10, n. 20	

KRM 8	Backed blade	LD2 [Apd dext]/.Amd sen	(10)x7x4	Unknown	Mesial fr.	No	Yes	No	No	10, n. 21	
KRM 8	Backed blade	LD2 [Api sen]	(20)x11x3	10YR4/2, dark greyish brown	Mesial fr.	No	No	No	Cut medium hide/skin - Haft	10, n. 22	
KRM 8	Backed blade	LD2 [Api dext]	(32)x18x4.5	10YR5/4, yellowish brown	Mesial fr.	25%	No	No	Cut medium - Haft	10, n. 23	
KRM 8	Crested blade	Blade	(41)x17x6	10YR6/3, pale brown	Proximal fr.	No	No	No	No	10, n. 24	
KRM 9	Burin ?	B6 [T2 conv]	(27)x15x4	10YR6/3, pale brown	Distal fr.	No	No	No	No	11, n. 1	
KRM 9	Perforator (borer)	Bc2 [Apd+Api]	(41)x10x5	10YR4/2, dark greyish brown	Distal fr.	No	No	Brown?	Drill/Bore	11, n. 2	
KRM 9	Backed blade	LD2 [Apd dext]	(18)x17x3.5	10YR5/3, brown	Mesial fr.	25%	No	No	No	11, n. 3	
KRM 9	Unretouched blade	L0/L1	(40)x14x4	10YR6/3, pale brown	Mesial fr.	No	No	No	Wear traces right side?	11, n. 4	
KRM 9	Retouched blade	L1 [Smd dext]	(23.5)x14x3	10YR6/3, pale brown	Distal fr	No	No	No	No	11, n. 5	
KRM 9	Backed blade	LD1 [Ami bil]	(22)x13x3.5	10YR6/3, pale brown	Mesial fr.	No	No	No	No	11, n. 6	
KRM 10	Retouched blade	L1 [Smd dext]	(16)x18x6.5	10YR5/3, brown	Mesial fr.	50%	No	No	Cut soft wood	11, n. 7	
KRM 11	Retouched blade	L1 [Smd sen]	(26)x12x4	10YR7/2, light grey	Mesial fr.	No	No	Light?	No	11, n. 8	Striped flint?
KRM 11	Crested blade	L0	(22)x9.5x4	Unknown	Mesial fr.	No	Yes	No	No	11, n. 9	
KRM 11	Retouched blade	L1 [Smd bil]	(12)x10.5x2.5	Unknown	Mesial fr.	No	Yes	No	No	11, n. 10	
KRM 12	Truncation	T2 prox norm rect [Apd]	(19)x14x4	Unknown	Proximal fr.	No	No	White	No	11, n. 11	
KRM 12	Backed blade	LD2 [Api bil]	(14)x15x4.5	10YR6/3, pale brown	Mesial fr.	No	No	No	No	11, n. 12	
KRM 12	Retouched blade	L1 [Smd bil]	(14)x15x4	Unknown	Mesial fr.	No	Yes	No	No	11, n. 13	
KRM 13	Truncation ?	T2 rect [Api]	(20)x13.5x3.5	7.5YR4/3, brown	Distal fr.	No	No	No	No	12, n. 1	
KRM 13	Perforator (drill)	Bc2 prox [Apd+Apd]	(12.5)x6x2.5	10YR5/2, greyish brown	Proximal fr.	No	No	No	Drill	12, n. 2	
KRM 13	Perforator (drill)	Bc2 dist [[Apd+Apd]	12x7x2	10YR5/3, brown	Complete	No	No	No	Armature?	12, n. 3	
KRM 13	Retouched blade	L1 [Smi dext]	(20)x11x4	Unknown	Mesial fr.	No	Yes	No	No	12, n. 4	
KRM 13	Backed blade	LD1 [Amd dext]	(16.5)x11x3.5	10YR5/3, brown	Mesial fr.	No	No	No	No	12, n. 5	
KRM 13	Backed blade	LD1 [Amd dext]	(15)x11x3.5	2.5YR5/3, light olive brown	Mesial fr.	No	No	No	No	12, n.6	
KRM 13	Backed blade	LD2 [Apd dext]	(18)x12x3	7.5YR4/3, brown	Mesial fr.	No	No	No	No	12, n. 7	
KRM 13	Retouched blade	L1 [Smi dext]	(10)x(11.5)x3	Unknown	Mesial fr.	No	Yes	No	No	12, n. 8	
KRM 13	Backed blade	LD1 [Amd bil]	(9.5)x7x2	Unknown	Mesial fr.	No	Yes	No	No	12, n. 9	
KRM 13	Backed blade	LD1 [Ami dext]	(13.5)x9x2.5	10YR5/4, yellowish brown	Mesial fr.	No	No	No	No	12, n 10	
KRM 13	Backed blade	LD1 [Amd dext]	(16)x7x2	7.5YR4/1, dark grey	Proximal fr.	No	No	No	No	12, n 11	
KRM 13	Retouched blade	L1 [Smd bil]	(21.5)x14x4	7.5YR4/2, brown	Proximal fr.	No	No	No	No	12, n 12	
KRM 13	Retouched blade	L1 [Smd sen]	32x10.5x4	10YR4/3, brown	Complete	25%	No	No	No	12, n.13	
KRM 13	Side scraper	R1 [Smd lat]	22.5x24x5.5	Unknown	Complete	No	No	Whitish	No	12, n.14	
KRM 13	Core	Bladelet core	(15)x(13)x(7)	10YR4/2, dark greyish brown	Fragment	No	No	No	No	12, n. 15	Bullet core ?
KRM 13	Crested blade	L0	(30)x12x4	10YR4/3, brown	Proximal fr.	No	No	No	No	12, n 16	
KRM 13	Crested blade	L0	(16.5)x13.5x5.5	7.5YR4/2, brown	Mesial fr.	No	No	No	No	12, n. 17	
KRM 14	Perforator (drill)	Bc2 dist [Apd+Apd]	(13)x6x1.5	7.5YR4/1, dark grey	Distal fr	No	No	No	Drill	13, n. 1	
KRM 14	Perforator (drill)	Bc2 prox [Apd+Apd]/.Ami.Ami	11.5x6x2	7.5YR4/1, dark grey	Complete	No	No	No	Drill	13, n. 2	
KRM 14	Perforator ?	Bc2 prox [Apd+Apd]	(9)x6.5x2	7.5YR4/1, dark grey	Proximal fr.	No	No	No	No	13, n. 3	
KRM 14	Perforator (drill)	Bc2 dist [Apd+Apd]	(12)x6x3.5	7.5YR4/1, dark grey	Distal fr.	No	No	No	Drill	13, n. 4	Crested bladelet
KRM 14	Side scraper	R1 [Smi tra]	20x21x9	7.5YR4/2, brown	Complete	50%	No	No	No	13, n. 5	
KRM 14	Retouched blade	L1 [Smd dext]	(13)x12x4	10YR5/2, greyish brown	Proximal fr.	No	No	No	No	13, n. 6	
KRM 14	Core	Bladelet core	(23)x(11)x(7)	10YR5/2, greyish brown	Fragment	No	No	No	No	13, n. 7	Bullet core ?

Table 3 - Kot Raja Manjera: main characteristics of the retouched tools and cores from the different spots.

Site name	Tool type	Typology (Laplace, 1964)	Measures (mm)	Munsell Colour	Condition	Cortex	Burnt	Patina	Wear traces	Figure
Beri	Discoidal core	Centripetal flakelets	36x33x20	10YR4/3, brown	Complete	25%	No	Yes	No	18, n. 1
Beri	Perforator (borer)	Bc2 prox [Apd bil]	(35)x8.5x5	10YR5/3, brown	Proximal fr.	25%	No	Yes	No	18, n. 2
Beri	Perforator (borer)	Bc2 prox [Apd+Apd]	(19.5)x15x3	10YR5/2, greyish brown	Proximal fr.	No	No	No	No	18, n. 3
Beri	Truncation	T2 dist [Apd]/-Smi dext	(12.5)x11x2	Unknown	Distal fr.	No	Yes	No	No	18, n. 4
Beri	Truncation	T2 obl prox [Apd]/-Api bil	(48)x11x5	10YR3/6, dark yellowish brown	Proximal fr.	No	No	Yes	No	18, n. 6
Beri	Scalene triangle	Gm3 [T2 obl prox+Apd]	(15)x10x3	10YR4/2, dark greyish brown	Proximal fr.	25%	No	No	No	18, n. 5
Beri	Backed point	PD2 [Apd]	(21)x9x3	Unknown	Distal fr.	No	Yes	No	No	18, n. 7
Beri	Backed blade	LD2 bil [Api]	(26)x12x6	Unknown	Mesial fr.	No	No	Yes	No	18, n. 8
Beri	Retouched blade	L1 [Sma]	(27)x13.3x3.5	10YR4/2, dark greyish brown	Mesial fr.	No	No	No	Cut soft wood - Haft	18, n. 9
Beri	Core rejuvenation	Round tablet	15x15x6	10YR4/2, dark greyish brown	Complete	No	No	No	No	18, n. 10
Beri	Side scraper	R1 lat sen [Smd]	39x26x6.5	Unknown	Complete	No	No	Yes	No	18, n. 11

Table 4 - Beri: main characteristics of the retouched tools and cores.

Site name	Tool type	Typology (Laplace, 1964)	Measures (mm)	Munsell Colour	Condition	Cortication	Burnt	Patina	Wear traces	Figure	Notes
JSH 1	Trapeze	Gm6 [Apd+Apd]	17x20x2.5	10YR7/2, light grey	Complete	No	No	White	Abrasion	22, n. 1	
JHK 3	End-scraper	G1	22x18x5	10YR3/1, very dark grey	Complete	No	No	Yes	Scrape hard	22, n. 3	
LP 2	Triangle	Gm3 [T2 obl rect+Apb]/.Api	(24)x12x4	5YR5/1, grey	Fragment	5%	No	Yes	Cut wood - Haft	22, n. 4	
Arzi 1	Core	Subconical, microbladelet	16x17.5x19	7.5YR2.5/1, black	Complete	No	No	Yes	No	22, n. 5	Prepared platform
Arzi 2	Flake	*Levallois*	24x36.5x10	10YR5/4, yellowish brown	Complete	No	No	Yes	No	22, n. 6	
Aji Abdul	Side scraper	R1 tra [Smd]	34x59x19	7.5YR5/2, brown	Complete	50%	No	Yes	No	13, n. 7	

Table 5 - Other surveyed sites: main characteristics of the retouched tools and cores.