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**THE AMRI CHALCOLITHIC PHASE IN SINDH (PAKISTAN):
WHAT WE KNOW AND WHAT WE SHOULD KNOW**

ABSTRACT

The problem of the origin of the Indus Civilisation has attracted attention of many colleagues working on the archaeology of the Indian Subcontinent and the Indus Valley in particular. What is the role played by the cultural processes preceding the origin and spread of one of the most important Bronze Age civilisations of the ancient world? This paper examines some aspects of the Amri Phase, which flourished in Sindh during the 4th millennium BC. Our knowledge in this area is very poor. It relies almost exclusively on the ceramic assemblages retrieved during excavations carried out in the type site in the 1960s. Research currently underway in Lower Sindh has led to the discovery of more sites relevant for this problem. Many of them are located close to the ancient Arabian Sea coastline or on limestone terraces which used to be islands in the Chalcolithic times. They consist of shell middens, whose surface has yielded characteristic Amri Culture knapped stone assemblages.

Keywords: Sindh, Amri Phase, Chalcolithic, chronology, assemblages

Introduction

Our knowledge of the archaeology of the Greater Indus Valley in the centuries that preceded the origin and spread of the Bronze Age Indus Civilisation is still poor due to lack of research.¹ What we knew of the Chalcolithic in Sindh before the beginning of the 2000s was based almost exclusively on the results of surveys performed by N.C. Majumdar between the end of the 1920s and the beginning of the 1930s,² the excavations carried out by the French Archaeological Mission at Amri in 1959–1962,³ the results of the Sindh Archaeological Project and the excavation of Ghazi

¹ Petrie *et al.* 2010a.

² Majumdar 1934.

³ Casal 1964.

Shah in Kohistan,⁴ and the geoarchaeological surveys conducted by A.R. Khan around Karachi in the late 1970s.⁵ Our knowledge has slightly improved during the last 20 years, but many questions pertaining to the relationships between the Chalcolithic and the beginning of the Bronze Age remained unsolved. Similarly, the current perspective on the way these relationships may have contributed to the formation of the Indus Civilisation is still just as speculative as it was in 2000.⁶

The present paper analyses the Chalcolithic Amri Phase,⁷ its distribution in Sindh,⁸ the characteristics of the sites, their material cultural assemblages and radiocarbon chronology, and the way it can be related to other Chalcolithic phases of Balochistan to the west (Nal),⁹ and Punjab to the north (Hakra).¹⁰

The presence of several Amri sites in the Dadu district of Western Sindh is well known since the 1930s.¹¹ Their number varies according to different authors. Unfortunately, in many cases the distribution and quantity of Amri and Nal sites have been presented together, despite the differences between the two aspects.¹² Amri is the only systematically excavated and published stratified mound of this phase.¹³ Its chronology is based on the stratigraphic position of the Amri Phase sequence below the Indus Civilisation horizon and two charcoal radiocarbon dates which were obtained more than fifty years ago.¹⁴

Materials and methods: the sites

Amri and its sequence

Amri is located in the Dadu district of Western Sindh, some 300 metres to the west of the right (western) bank of the River Indus, ca. 28 kilometres to the south-east of the shore of the Manchar Lake, at an altitude of ca. 35 metres above the sea level. Amri was visited for the first time by A. Burnes before the middle of the nineteenth century.¹⁵ The site is situated in an area of ecological tension, but rich in water supplies. Eastwards of the site, there extends the fertile alluvial plain of the Indus, while the easternmost fringes of the Lakhi Range rise to the west of it (Fig. 1).

Amri consists of four mounds, only two of which, ca. 100 metres apart, were partly excavated. The eastern and largest one was called Mound A by Casal (Mound 1 by Majumdar) and

⁴ Flam 1993a; Flam 2006.

⁵ Khan 1979a; 1979b.

⁶ Shaffer, Lichtenstein 1989, 123; Possehl 2000-2001.

⁷ Shaffer 1992, 444.

⁸ See Flam 1976.

⁹ Shudai *et al.* 2009; Cortesi 2015; Franke 2015.

¹⁰ Mughal 1997; Ghauri 2018.

¹¹ Deva, McCown 1949, Fig. 1.

¹² Flam 1987, Fig. 2; Possehl 2000-2001, 232.

¹³ Casal 1964.

¹⁴ Agrawal *et al.* 1971; Shaffer, Thapar 1992.

¹⁵ Burnes 1834.

the western Mound B by Casal (Mound 2 by Majumdar). The first excavations were carried out in 1929 by N.C. Majumdar, who opened three trenches along the edges of Mound B.¹⁶ From Trench I, he reported the presence of two distinct archaeological horizons, the lower of which, ca. 1.80 to 2.15 metres (6 to 7 feet) deep, yielded a ceramic assemblage which he dubbed “Amri pottery” *“representing an earlier phase of the Chalcolithic civilization than that represented by Harappa and Mohenjo-daro”*¹⁷. According to the excavator, the pottery of this period was wheel-made, thin and porous with a buff, cream or pink paste. Many vessels have a reddish-brown band at the neck, and their body is sometimes decorated with a *“row of lozenges, either solid or filled in by hatches, chevron, rectangles within rectangles, the row of sigmas, and so on”*.¹⁸

The French Archaeological Mission excavated several trenches in the mounds A and B. The Amri horizon was discovered in Mound A at ca. 3.50 metres of depth. The Chalcolithic sequence, ca. 2.00 metres thick, was subdivided into four layers from IA to ID.¹⁹ Rectangular or square mudbrick rooms, probably dwellings, and fireplaces were unearthed in layers IB, IC and ID. According to Casal’s report, the vessel shapes and decorations varied between layers. The general characteristics of the pottery are those reported by Majumdar in 1934, although the vessels of Layer ID are characterised by an increase in zoomorphic and naturalistic painted motifs. Unfortunately, the excavators did not provide much information about the lithic assemblages, knapped stones in particular.²⁰

Two radiocarbon dates were obtained from unidentified charcoals sampled from Mound A, eastern Trench, Level 28c (Layer IB: 4710±110 BP, TF-864) and Level 19 (Layer ID: 4485 ±110 BP (TF-863)).²¹ The results give an idea of the probable duration of the Chalcolithic settlement (Tab. 1).

The Tharro Hill

The Tharro Hill is a limestone terrace ca. 1.5 kilometre long and 0.5 kilometre wide, which rises from the alluvial plain of the River Indus some 2.0 kilometres to the south-west of the small town of Gujo in Lower Sindh. The hill extends in the south-west/north-east direction ca. 10–15 metres above the present sea-level. The Chalcolithic Amri settlement is located in the south-eastern part of the terrace, delimited by two parallel, semi-circular stonewalls.²² Many small mounds and

¹⁶ Majumdar 1934, 25-27; see also Casal 1964, Volume II, Fig. 3.

¹⁷ Majumdar 1934, 27.

¹⁸ Majumdar 1934, 27; Fairservis 1975, Fig. 48.

¹⁹ Casal 1964, Volume II, Fig. 8.

²⁰ Casal 1964, Volume I, 147-148.

²¹ Agrawal *et al.* 1971, 84.

²² Carter 1932, 88, note 13.

tombs are scattered over an area of ca. 4.000 square metres, inside and outside the two walls (Fig. 2).²³

The site has never been studied in detail, although it has been summarily described by several authors. Some of them stressed its island character, which is supported by the presence of spots of marine and mangrove shells on some of its surface and the inner stonewall rubble.²⁴ Majumdar reports the presence of an impressive quantity of knapped stone artefacts, which led some authors to think that Tharro was “*merely a centre of flint-knapping industry, and not a regular dwelling site*”.²⁵

Marine and mangrove shells have been sampled for radiocarbon dating from a point close to the southern edge of the inner stonewall.²⁶ The results show that this part of the site was settled during the first half of the 4th millennium cal BC. In 1928, N.C. Majumdar excavated three rectangular mounds, which yielded red-slipped potsherds and ceramic items with geometric painted patterns. He also illustrated two vessels of undefined cultural attribution.²⁷ More accurate surveys were conducted in 2008 and 2013.²⁸

The chrono-cultural attribution of the finds has sometimes been misinterpreted or incorrectly reported,²⁹ despite the presence of typical red-slipped and geometrically painted potsherds (Fig. 3) and a rich knapped stone assemblage with prismatic cores, blades, and semi-abrupt retouched artefacts (Fig. 4), which are characteristic features of the Chalcolithic Amri Culture.³⁰

Kot Raja Manjera

Kot Raja Manjera (Kafir Kot) is a famous Buddhist site with ruins of a stupa which are still visible in the eastern part of the terrace³¹ that extends for ca. 300 metres to the east-west (40 m a.s.l.). The site is located at the south-western edge of an ancient bend of the River Indus, some 5.5 kilometres to the south-west of the town of Jerrack (Jhirk) and 8.0 kilometres eastwards of the north-eastern shore of the Keenjar Lake (Fig. 5: top). The Chalcolithic artefacts were scattered over the mesa, which was delimited by a low stone wall attributed to this period. The site was visited by Professor A.R. Khan of the Karachi University in the 1970s. This author collected many knapped stone artefacts, among which are microdrills and straight perforators obtained from

²³ Majumdar 1934, 21.

²⁴ Fairservis 1921, 175; Carter 1932, 88; Khan 1979b, 5.

²⁵ Majumdar 1934, 21.

²⁶ Biagi 2017, 262.

²⁷ Majumdar 1934, 21, Table XVI, 24 and 25.

²⁸ Biagi *et al.* 2018, 12.

²⁹ Fairservis 1921, 175; Piggott 1950, 197; Allchin 1985, 132; Possehl 1999, 398.

³⁰ Cleland 1987; Biagi 2005.

³¹ Majumdar 1934; Cousens 1998, Fig. 17.

microbladelets,³² most probably showing the presence of a bead manufacturing area, and ceramic potsherds, which he attributed to the Amri Phase.³³

A more systematic survey was performed in 2009. Several lithic and ceramic spots were recorded mainly along the north-western part of the terrace, which confirmed Professor Khan's attribution of the prehistoric site to the Amri Phase.³⁴ A few small red-slipped potsherds and a few others with painted zig-zag patterns showed strong similarities to those of the Amri IB or IC ceramic assemblages from the type site described by Casal.³⁵ One *Terebralia palustris* fragment recovered from this part of the terrace yielded a date of 4635±35 BP (GrA-47083). Although the result is a few centuries more recent than expected, nevertheless it is important because it shows that around the beginning of the Bronze Age a mangrove was flourishing not far from the site,³⁶ which reinforces some views regarding the location of the Arabian Sea coastline during this period.³⁷

Ghazi Shah and Sindh Kohistan

A concentration of Amri sites has been known for many years along the fringes of the Lakhri Range in the Dadu District of Sindh Kohistan.³⁸ The site of Ghazi Shah is located in the alluvial plain of the Naing Nai stream, ca. 4.0 kilometres eastwards of a perennial spring originating from the Bhit Range, which has been reported by several researchers (Fig. 5: bottom).³⁹ The mound was excavated for the first time by N.C. Majumdar who opened six trial-trenches in the southern part of the site.⁴⁰ They showed that Ghazi Shah was settled during both the Amri and Indus periods. The sequence has been confirmed by the excavations carried out by L. Flam in the 1980s, during which three radiocarbon dates were obtained from the Chalcolithic and Bronze Age layers.⁴¹ Unfortunately, most of the assemblages from this site are still unpublished.

Kalan Kot and the shell middens of Lower Sind

Several shell middens and shell clusters mainly represented by fragments of mangrove shells, were discovered during the surveys conducted in Lower Sindh in the last decade.⁴² Most of

³² Khan 1979a, 72.

³³ Khan 1979b, 6.

³⁴ Biagi 2010.

³⁵ Casal 1964, Volume II, Fig.51, 57, Plate XVII.

³⁶ Biagi 2011, Table 1.

³⁷ Flam 1993a, Fig. 14.5b.

³⁸ Deva K., McCown 1949, Fig. 1; Flam 1987, Fig. 2.

³⁹ Blanford 1880, 112.

⁴⁰ Majumdar 1934, Plate XLIV.

⁴¹ Flam 1993b.

⁴² Biagi *et al.*, 2018.

the sites were found on the limestone terraces that rise from the alluvial plain of the Indus, the so-called “*rocky outcrops*” described by W.T. Blanford more than a century ago.⁴³ Although several of them have already been published, more discoveries were made in 2021 and 2022, and more sites have been radiocarbon dated from mangrove shell samples.⁴⁴

The area around the ancient town of Kalan Kot, in the Makli Hills to the south of Thatta, is of unique importance. Six shell middens consisting of *Telescopium telescopium* fragments have been recorded around the southern walls of Kalan Kot (Fig. 6). Three of them have been dated to the first half of the 4th millennium BC (KKT-3, 4 and 5) (Fig. 7). They have been attributed to the Amri Phase, thanks to the presence of characteristic Amri type chert artefacts,⁴⁵ despite the absence of other material culture and archaeozoological remains.

The site of KKT-4 is a thin shell midden which covers an elliptical surface of at least 100 square metres, inside which different shell clusters have been observed. Most probably, it formed due to prolonged exploitation of *T. telescopium* by Amri shellfish gatherers who operated in the mangrove ecosystem flourishing along the Arabian Sea shore a few hundred metres to the east of the site. The Kalan Kot and Tharro Hill discoveries pose important questions regarding the role played by mangroves in the subsistence economy of the Chalcolithic 4th millennium BC Amri communities settled along the northern coast of the Arabian Sea.

Discussion

The distribution of the Amri sites in Sindh is determined by the course of the River Indus in the east, the Arabian Sea in the south, and a part of the Kirthar Range in the west. Professor A.R. Khan reports the presence of just a single fortified settlement along the left bank of the Hab River (Mai Ghari), whose attribution to the Amri Phase is nevertheless uncertain.⁴⁶ The northern limit is represented by the Dadu district, north of which Amri sites have never been discovered (Fig. 8). The detailed chronology of this phase is poorly-known due to the scarcity of excavated sites and absolute dates. The radiocarbon chronology developed in the last two decades suggests that it flourished throughout the entire 4th millennium BC, despite some differences between the charcoal and shell radiocarbon dates. The charcoal dates from Amri and Ghazi Shah fall into the second half of the 4th millennium BC, while the majority of the shell middens have been dated to the first half of the same millennium, with some overlaps between the two groups around the middle of the millennium (Tab. 1 and Fig. 9).

⁴³ Blanford 1880, 154.

⁴⁴ Biagi *et al.* 2022.

⁴⁵ Biagi 2023, Fig. 5.

⁴⁶ Khan 1979b, 6.

All the shell dates have yielded a negative $\delta^{13}\text{C}$ value (from -0.64 to -7.03), showing that all the samples came from a mangrove environment and not from open sea waters. This data is important for defining the characteristics of the environment around the islands and along the Arabian Sea coast exploited by the Amri communities.

Another important point regards the chronology of the phase because Amri and Ghazi Shah are provided the only radiocarbon-dated sequences available up to date. Casal presented important information about the characteristics and distribution of the Chalcolithic structures discovered during the Amri excavations (which he subdivided into four subsequent periods) and the pottery with painted patterns which varied from purely geometric to geometric and zoomorphic around the end of the Chalcolithic sequence. Unfortunately, Amri is the only site which yielded such evidence. Some more data are available from Ghazi Shah and the Tharro Hill, although the latter seems to have been inhabited for a shorter period, at least its central part.

The Amri Phase knapped stone industry is characterised by pressure-made artefacts represented by prismatic blades and bladelets with parallel sides and semi-abrupt retouched tools. The most important assemblage of this phase comes from the Tharro Hill where a detailed collection was gathered in 2008 (Fig. 2). The cores are polyhedral, with one (Fig. 4: 7) or two (Fig. 4: 8) opposed prepared platforms and parallel straight blade detachments on one face. The semi-abrupt technique is systematically employed to make retouched blades with a trapezoidal cross-section (Fig. 4: 1), truncations, other types of retouched and denticulated bladelets (Fig. 4: 5–6) and characteristic triangular tools, otherwise called “Amri triangles”⁴⁷ (Fig. 4: 3–4). These artefacts are typical of the Amri Phase and were not produced during the following Bronze Age Kot Diji Period “*which can be firmly dated to the early third millennium BC*”, at least in north-western India.⁴⁸

Conclusion

Our knowledge of the period preceding the emergence and quick development⁴⁹ of the Mature Indus Civilisation is rather unsatisfactory. More results have been achieved during the surveys and excavations carried out in some regions of Punjab as well as along the terraces delimiting the ancient course of the Hakra River in the Bahawalpur district⁵⁰ and neighbouring India.⁵¹ In particular, the surveys conducted by R. Mughal in the Cholistan Desert yielded a few Hakra knapped stone assemblages.⁵²

⁴⁷ Biagi 2005.

⁴⁸ Uesugi 2012, 2.

⁴⁹ Shaffer, Lichtenstein 1989, 133.

⁵⁰ Mughal 1995.

⁵¹ Uesugi 2012; Ghauri 2018.

⁵² Mughal 1997, Plate 43.

From a chronological point of view, many of the charcoal dates from the Amri, Nal, and Hakra sites have yielded comparable results (see Tab. 1 and Fig. 9). Until a few years ago our knowledge of the Chalcolithic Period was based almost exclusively on pottery seriations and typological comparisons between vessel shapes and decorations from different sites and local/regional complexes,⁵³ which nevertheless have yielded useful results.⁵⁴ However, some progress has been made during the last decades which help clarify the complex situation.⁵⁵ Apart from radiocarbon dating, the research underway has stressed the importance of the techno-typological characteristics of the lithic assemblages and the provenance and circulation of the knappable raw material.

As reported above, the Amri assemblages are easy to recognise because of their uniqueness,⁵⁶ although their manufacturing method and function need to be more precisely defined. This observation can be extended to all the Early and Middle Holocene industries of Sindh, and the entire Greater Indus Valley in general. This is a seriously underrated problem, considered and discussed in detail by few archaeologists.⁵⁷

Regarding Balochistan, the Chalcolithic settlement of Mehrgarh III has yielded a laminar knapped stone assemblage whose techno-typological characteristics can be compared with those from the Tharro Hill discussed in this paper.⁵⁸ Unfortunately, the important Mehrgarh Period is not radiocarbon dated. It can be attributed most likely to the 4th millennium BC because it precedes Period IV, from which only a single charcoal sample is available, obtained from the overlying Horizon IV (Ly-1528: 4190±140 BP).⁵⁹ Some chronological and typological data are available from the Quetta Valley, where the lowermost layers of the mound of Damb Sadaat have yielded a Chalcolithic complex with pottery similar to that from Amri,⁶⁰ from which we have a few charcoal radiocarbon dates which fall into the 4th millennium BC⁶¹. The same can be said of the Nal horizon dates from Sohr Damb, which yielded comparable, homogeneous results.⁶²

At present, we do not have any useful information about the lithic assemblages of the Nal and the Chalcolithic “Balakotian” levels of Balakot,⁶³ from which we have two 4th millennium BC

⁵³ de Cardi 1983, 7-9.

⁵⁴ Shudai *et al.* 2013.

⁵⁵ Possehl 2000-2001.

⁵⁶ Biagi 2005.

⁵⁷ Hoffman, Cleland 1977; Cleland 1987; Pelegrin 1994; Lechevallier 2003.

⁵⁸ Lechevallier 2003, 93-117.,

⁵⁹ Jarrige *et al.* 1995, 556.

⁶⁰ Fairservis 1952, Fig. 2.

⁶¹ Shaffer 1986, Table I.

⁶² Görsdorf 2003; 2004; 2005; 2006.

⁶³ Dales 1979, 254.

dates.⁶⁴ Additional data are available from the Lake Siranda: Chalcolithic shell middens of Las Bela region which have yielded knapped stones strictly comparable with those of the Amri Phase.⁶⁵

Interestingly, also the Chalcolithic horizons of the well-dated site of Sheri Khan Tarakai in the Bannu district⁶⁶ have yielded a pressure-made, laminar lithic industry with cores, prismatic bladelets and retouched tools whose techno-typological characteristics are very similar to those discussed in the present paper.⁶⁷

To conclude: more work is necessary to understand the Chalcolithic Period of the Greater Indus Valley and the role it may have played in the formation of the Indus Civilisation. Our present knowledge is too limited and we are unable to suggest any conclusion. One of the interesting points advanced here concerns the knapped stone assemblages. They show very similar common traits in manufacturing technique, type of retouch and tool types, regardless of their geographic location, which are nevertheless different from those of the following Bronze Age. This is remarkable, because the subdivisions into phases has been established based on pottery analysis, while lithics have not been considered, at least in most cases. However, the situation seems to have slightly improved, especially in regard to the definition of the Amri Phase, thanks to the results of the surveys underway in Lower Sindh, a new set of radiocarbon dates, and the systematic study of the lithic and pottery assemblages from the Tharro Hill.

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⁶⁴ Shaffer 1986, Table I.

⁶⁵ Biagi, Nisbet 2023, Fig. 14.

⁶⁶ Petrie *et al.* 2010b.

⁶⁷ Inizan *et al.* 1994.

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Illustrations:



Fig. 1. Amri: Location of the archaeological site within its surrounding landscape (drawing by P. Biagi).

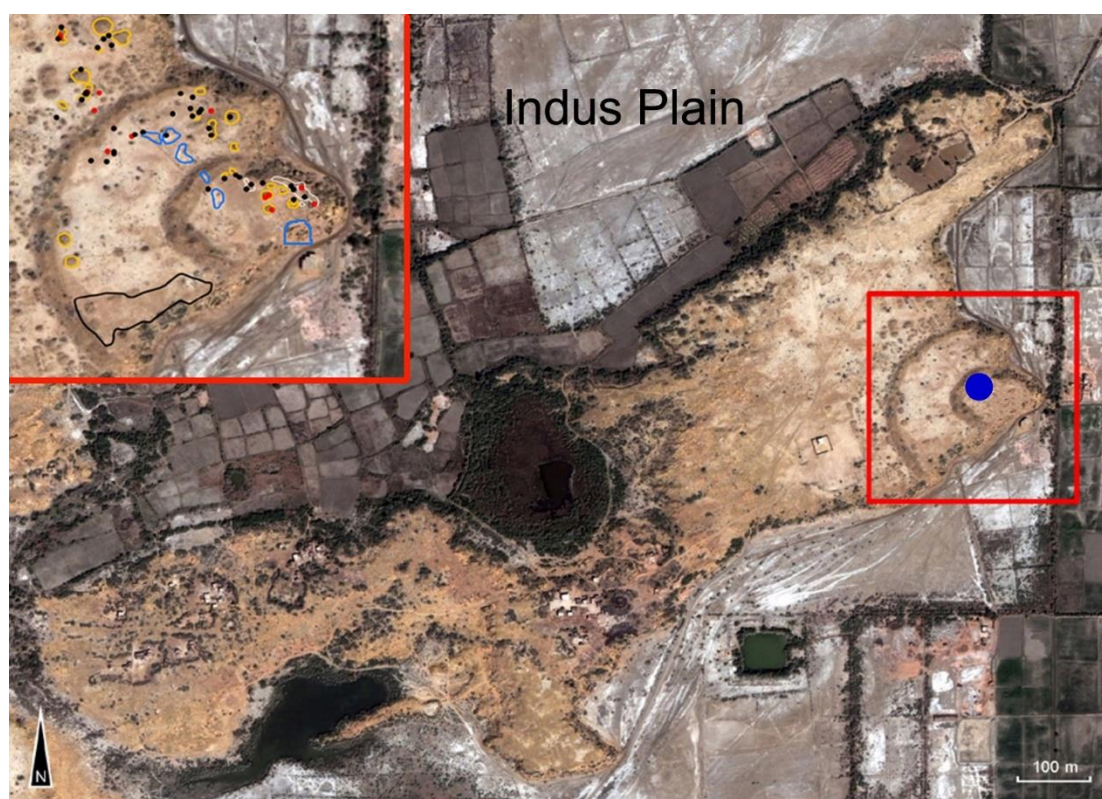


Fig. 2. The Tharro Hill terrace with the location of the Amri archaeological site (blue square). Radiocarbon dated samples (blue dot), spots of knapped stone artefacts (black dots), painted potsherds (red dots), limits of the shell scatters (blue lines), limits of ash concentrations (white line), main mounds (yellow circles), limit of a lithic scatter (black line) (drawing by C. Franco).

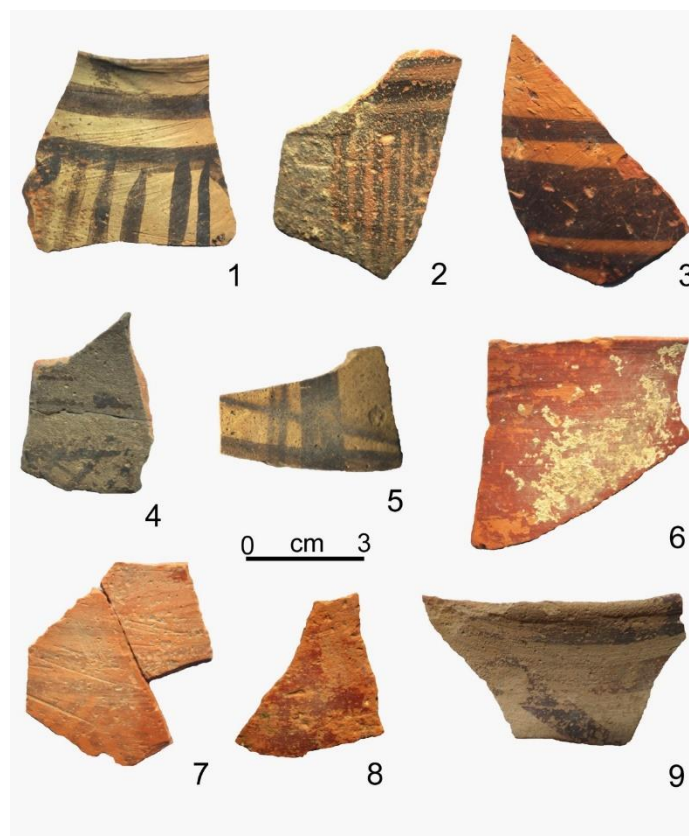


Fig. 3. Tharro Hill: Amri phase painted potsherds with geometric motifs (nos 1-5, 7, 9) and with a red slip (nos 6, 8) (photographs by P. Biagi).

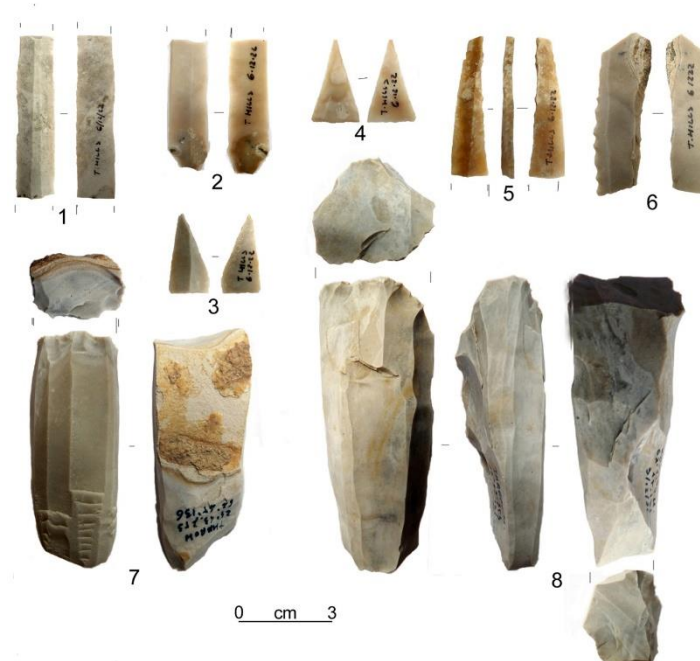


Fig. 4. Tharro Hill: characteristic Amri phase knapped chert artefacts: retouched and unretouched bladelets (nos 1 and 2), Amri Triangles (nos 3 and 4), semi-abrupt-retouched bladelet (n. 5), denticulated bladelet (n. 6), prismatic cores (nos 7 and 8) (photographs by E. Starnini).

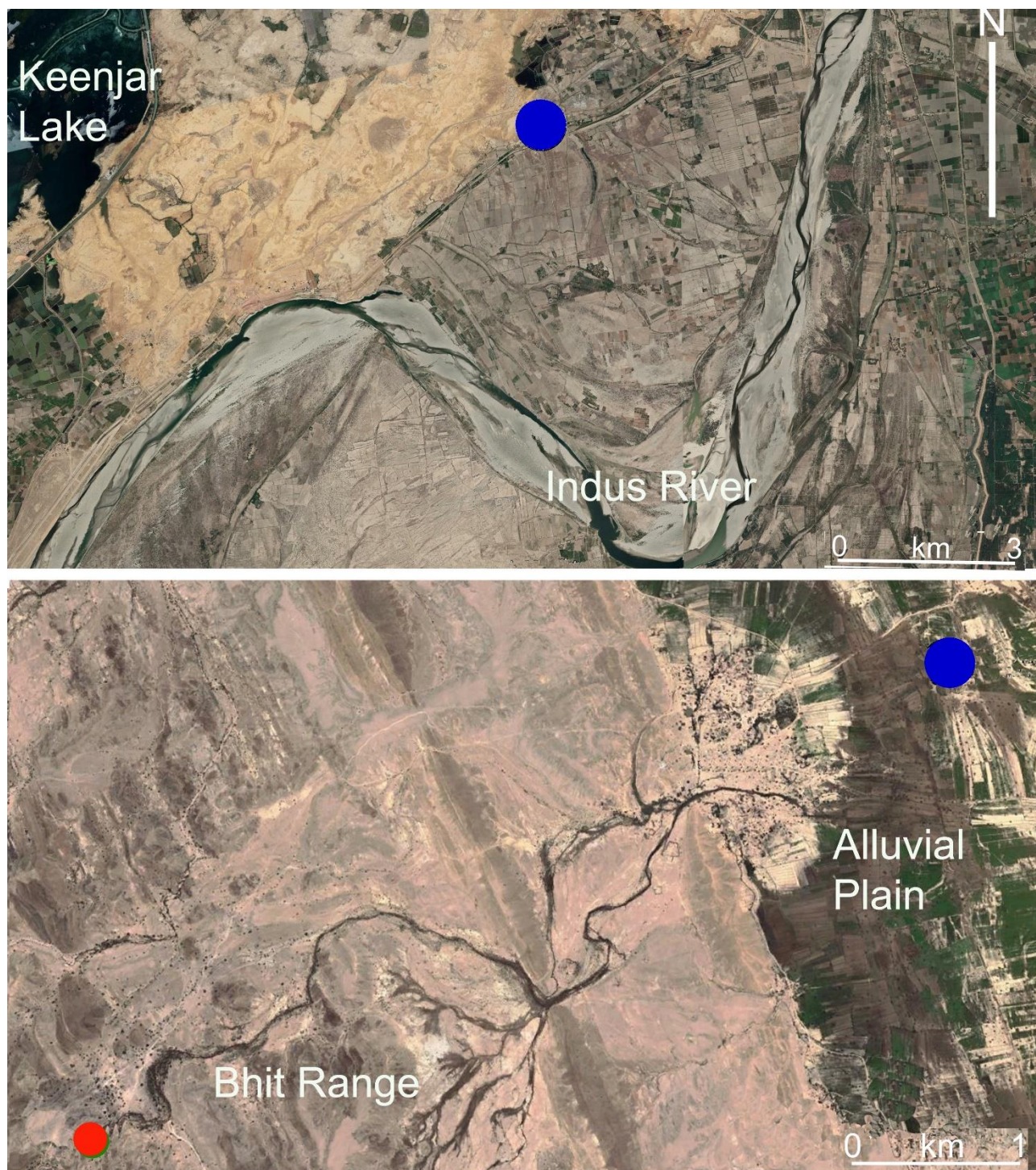


Fig. 5. Kot Raja Manjera: Location of the archaeological site within its surrounding landscape (top); Ghazi Shah: Location of the archaeological site within its surrounding landscape (bottom): Ghazi Shah mound (blue dot), spring (red dot) (drawing by P. Biagi).

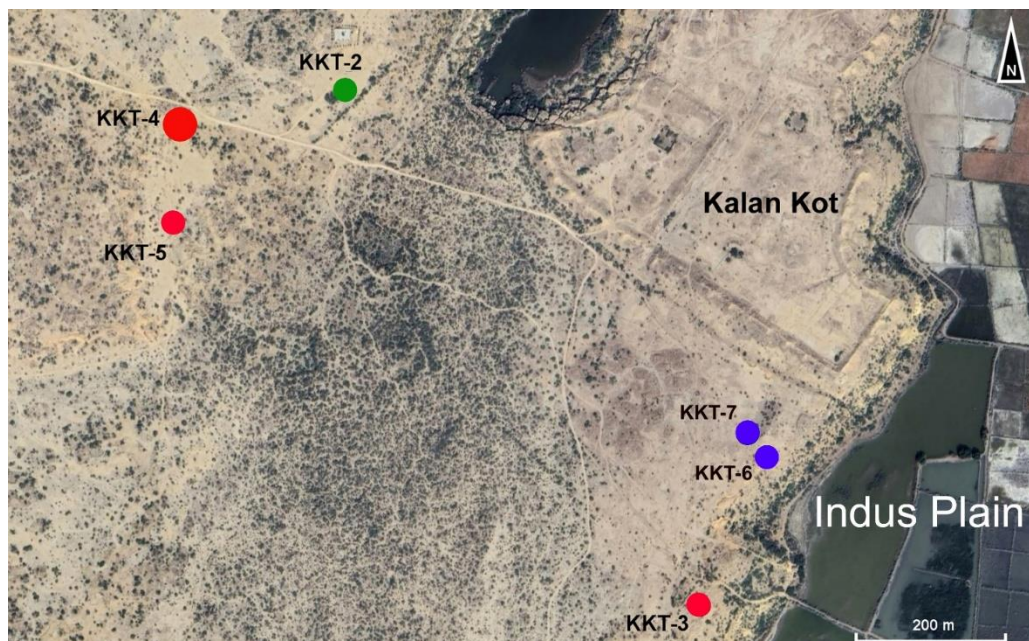


Fig. 6. Kalan Kot: Location of the shell middens within their surrounding landscape: Neolithic radiocarbon dated site (green), Chalcolithic radiocarbon dated sites (red), undated sites (blue) (drawing by P. Biagi).



Fig. 7. Kalan Kot: Shell middens KKT-4 (above) and KKT-5 (below) (photographs by P Biagi, 2022).

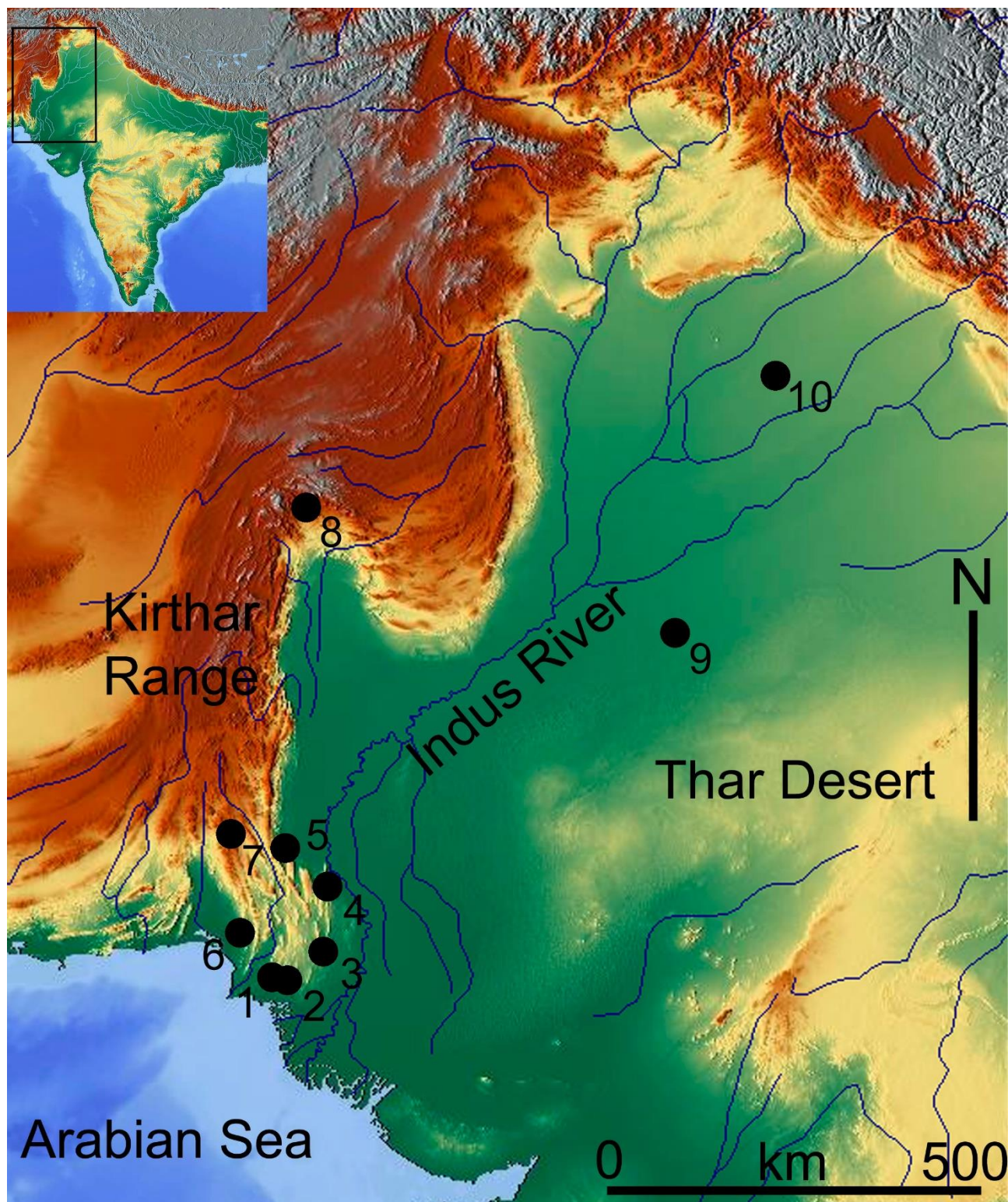


Fig. 8. Approximate location of the sites mentioned in the text: Tharro Hill (1), Kalan Kot (2), Kot Raja Manjera (3), Amri (4), Ghazi Shah (5), Balakot (6), Sohr Damb (7), Mehrgarh (8), Derawar Hakra sites (9), Jaranwala Hakra sites (10) (drawing by P. Biagi).

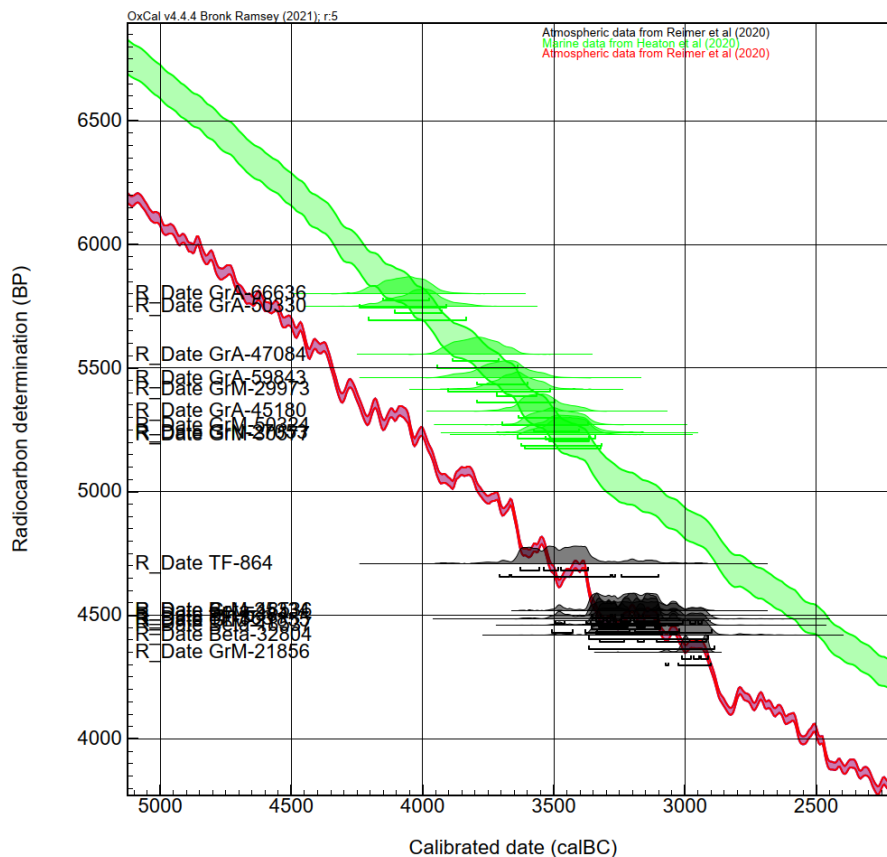


Fig. 9. Plots of the calibrated dates from charcoal from the Chalcolithic sites of Amri (Sindh: Amri phase), Ghazi Shah (Sindh: Amri phase), Sohr Damb (Balochistan: Nal phase), Mallomand (Punjab: Hakra phase), Hassokay (Punjab: Hakra phase), and Rajanpur (Punjab: Hakra phase) (grey), and the mangrove and marine shell dates from the Chalcolithic shell middens and scatters of the Tharro Hill, Gharo, Shah Husain, Makli Hills and Kalan Kot in Lower Sindh (green) (data from Tab. 1) (Plot by T. Fantuzzi, 2023).

1	Site name	Sample Location	Province	Coordinates	Alt. (m a.s.l.)	Material	Lab. n°	δ ¹³ C	Uncal BP	Cal BC/AD 2σ	Phase	Reference
2	Amri	Mound B, Level 19	Sindh	26°10'27.1"N-68°00'58.5"E	35	Unid. charcoal	TF-863	n.a.	4485±110	3507-2900	Amri	Agrawal et al. 1971, 81
3	Amri	Mound B, Level 28c	Sindh	26°10'27.1"N-68°00'58.5"E	35	Unid. charcoal	TF-864	n.a.	4710±110	3708-3102	Amri	Agrawal et al. 1971, 81
4	Ghazi Shah	Area 2, Locus VIII, Unit 2	Sindh	26°27'17.5"N-67°27'51.1"E	50	Unid. charcoal	Beta-32804	n.a.	4420±100	3366-2887	Amri	Flam 1993, 142
5	Ghazi Shah	Area 3, bead workshop	Sindh	26°27'17.5"N-67°27'51.1"E	50	Unid. charcoal	Beta-18537	n.a.	4460±90	3366-2911	Amri	Flam 1993, 146
6	Ghazi Shah	Area 3, bead workshop	Sindh	26°27'17.5"N-67°27'51.1"E	50	Unid. charcoal	Beta-18536	n.a.	4520±70	3494-2935	Amri	Flam 1993, 146
7	Sohr Damb	S181	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5680	-24.1	4311±29	3011-2886	Nal	Görsdorf 2005, 467
8	Sohr Damb	SD02/S-1	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5518	-24.7	4358±37	3092-2898	Nal	Görsdorf 2006, 388
9	Sohr Damb	S036	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5753A	-24.2	4392±37	3313-2906	Nal	Görsdorf 2004, 406
10	Sohr Damb	S182	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5679	-24.6	4403±36	3319-2911	Nal	Görsdorf 2005, 467
11	Sohr Damb	S071	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5758	-25.1	4417±35	3326-2917	Nal	Görsdorf 2006, 388
12	Sohr Damb	S070	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5757	-25.0	4435±39	3331-2925	Nal	Görsdorf 2006, 388
13	Sohr Damb	S073	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5759	n.d.	4494±89	3491-2916	Nal	Görsdorf 2006, 388
14	Sohr Damb	S075	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5760	-24.6	4499±39	3357-3035	Nal	Görsdorf 2006, 388
15	Sohr Damb	SD01/S66-B25	Balochistan	27°41'21.2"N-66°18'27.0"E	1234	Unid. charcoal	Bln-5384	-25.3	4501±32	3356-3093	Nal	Görsdorf 2003, 363
16	Mallomand	MLM-1, 80 cm depth	Punjab	31°15'28.7"N-73°29'54.3"E	189	Acacia charcoal	GrM-21856	-27.51	4352±26	3075-2902	Hakra	ul Ain 2021, 151
17	Hassokay	SSK-1, 20 cm depth	Punjab	31°08'01.8"N-73°21'38.1"E	180	Unid. charcoal	GrM-21855	-25.79	4479±26	3340-3032	Hakra	ul Ain 2021, 143
18	Rajanpur	RJP-1, 20 cm depth	Punjab	31°09'07.4"N-73°22'52.7"E	182	Acacia charcoal	GrM-25334	-27.51	4520±30	3360-3101	Hakra	ul Ain 2021, 145
19												
20	Tharro Hill, Gujo	THR-3	Sindh	24°43'45.3"N-67°45'07.6"E	13	<i>T. palustris</i>	GrA-47084	-5.15	5555±35	3964-3639	Amri	Biagi 2011
21	Tharro Hill, Gujo	THR-1	Sindh	24°43'45.3"N-67°45'07.6"E	13	Ostreidae	GrN-27053	-0.64	5240±40	3624-3320	Amri	Biagi et al. 2018
22	Gharo, Bhanbore	Gar-8	Sindh	24°45'35.9"N-67°33'18.6"E	26	<i>T. telescopium</i>	GrM-30577	-2.50	5230±30	3612-3320	Amri?	This paper
23	Shah Hussain, Thatta	JSH-1bis	Sindh	24°42'26.0"N-67°48'38.3"E	12	<i>T. telescopium</i>	GrA-66636	-4.79	5800±40	4242-3911	Amri?	This paper
24	Shah Hussain, Thatta	JSH-1	Sindh	24°42'26.0"N-67°48'38.3"E	12	Ostreidae	GrA-45180	-2.34	5325±40	3697-3372	Amri?	Biagi et al. 2018
25	Makli Hills, Thatta	MKL-1	Sindh	24°36'52.5"N-67°51'36.5"E	22	<i>T. palustris</i>	GrA-50330	-3.929	5750±40	4206-3835	Amri	Biagi et al. 2018
26	Kalan Kot, Thatta	KKT-4	Sindh	24°42'15.3"N-67°52'15.2"E	26	<i>T. telescopium</i>	GrA-59843	-7.03	5460±60	3903-3514	Amri?	Biagi et al. 2018
27	Kalan Kot, Thatta	KKT-5	Sindh	24°42'11.4"N-67°52'15.2"E	26	<i>T. telescopium</i>	GrM-29973	-5.02	5415±27	3794-3496	Amri	Biagi et al. 2022
28	Kalan Kot, Thatta	KKT-3	Sindh	24°41'55.9"N-67°52'40.6"E	22	<i>T. telescopium</i>	GrA-50324	-5.01	5270±40	3637-3341	Amri	Biagi et al. 2018

Tab 1. List of the Chalcolithic sites sampled for radiocarbon dating, from which results have been obtained and discussed in this paper. Charcoal (above) and mangrove/marine shell dates (below).