The Prehistory of Sindh and Las Bela (Balochistan): Thirty years of surveys and excavations (1985-2014)

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This paper is dedicated to the memory of The late Professor Harald Hauptmann
For his invaluable contribution to the archaeology Of the Aegean, Anatolia,
the Near East and the Indian Subcontinent

Abstract

During the last thirty years, our knowledge of the archaeology of Sindh and Las Bela in Balochistan (Pakistan) has greatly improved mainly thanks to the results of the research and excavations carried out by the Italian Archaeological Mission. Until the 1980s the prehistory of the two regions was centred upon the impressive urban remains of the Bronze Age Indus Civilization, and the Palaeolithic assemblages discovered at the top of the limestone terraces of the Rohri Hills in Upper Sindh and Ongar in Lower Sindh, while almost nothing was known of the Arabian Sea coastal zone despite the important work carried out in the region by Professor A.R. Khan of Karachi University in the late 1970s. Our knowledge has drastically improved thanks to the discoveries of a great number of sites in different territories of the two provinces, and the development of a radiocarbon sequence based on more than one hundred dates that help interpret the timing of the events that took place in the region from the middle Holocene period onwards.

Keywords: Prehistory, Sindh, Las Bela, Indus Delta, Arabian Sea, Mangroves, Radiocarbon chronology

Introduction

Sindh is the country that separates the uplands of Balochistan, in the west, from the Thar or Great Indian Desert, in the east. It is crossed from north to south by one of the most important waterways of south Asia, the Indus River. Thanks to its geographic location, its rich natural resources, and its varied environmental and ecological characteristics, the Indus Valley and Sindh have always played a unique role in the prehistoric and historic peopling of south Asia, and the Indian Subcontinent in particular (Flam 1973). Moreover, the River Indus is the natural route to follow to reach central Asia across the high mountain chains of the Himalaya and the Hindu Kush moving from Sindh and the Arabian Sea coast (Burton 1976; Curzon 2012).

The archaeology of Sindh became universally famous after the discovery of the impressive architectural remains unearthed by the excavations carried out at Mohenjo-daro, near Larkana, by J. Marshall (1931), E.J.H. Mackay (1937-1938), M. Wheeler (1976), and other British and Indian archaeologists during the last century (Lahiri 2005). The excavations brought to light the remains of an outstanding Bronze Age metropolis of the so-called Indus (or Harappan) Civilization, whose structures were built almost exclusively from bricks, organized into public and private quarters and craftsmen workshops and markets, from which just a few stone tools where recovered (Dikshit 1939) in contrast with a larger number of metal tools mainly distributed in the habitation area (Shaffer 1982: 196).

The first to carry out intensive surveys in Lower Sindh, and part of the Indus Delta, was the late N.C. Majumdar between 1927 and 1931 (Majumdar 1981). This author visited also the Tharro Hills, a unique Chalcolithic Amri Culture site (Piggott 1950: 79) that had been discovered by G.E.L. Carter just a few years before his visit (Cousens 1998: 38).

Therefore, until the end of the 1980s the archaeology of Sindh was almost exclusively known because of its Copper and Bronze Age antiquities. Soon they became the subject of many studies dealing mainly with the most important characteristics, origin, development, collapse, and chronology of the Indus Civilization (see Kenoyer 1991; 2015; Possehl 1997; 2002).

In the early 1980s the works of the joint IsMEO-Aachen-University Mission were underway in Mohenjo- Daro (Gnoli, Tosi 1984; Urban, Jansen 1984). During the same years the archaeological interests of the Italian Government, and the then IsMEO (Italian Institute for the Middle and Far East) in particular, looked at the newly established Khairpur University Campus, in those days a branch of Sindh University at Jamshoro, as a potential good partner to organise jointly archaeology PhD courses in an University of Sindh, whose location, not so far from the city of Mohenjo-Daro, was undoubtedly attractive. This is the key reason why the research in the Rohri Hills were conceived, as part of the suggested International Scientific Cooperation between Italy and Pakistan, and why one of the present authors (PB) was sent to Khairpur University Campus in April 1985 in order to have a first, preliminary idea of the archaeological potential of its surrounding region.

Therefore, after the first two visits paid in 1985 and 1986, and the revocation of the proposed cultural cooperation project between the two countries, independently from the IsMEO perspectives, though under the patronage and with the financial support of Ca' Foscari University of Venice, systematic surveys and excavations started to be organised by the Italo- Pakistani "Joint Rohri Hills Project" in Upper Sindh in the early 1990s. They continued in the following years, as Italian Archaeological Mission in Sindh and Las Bela (Balochistan), funded mainly by Ca' Foscari University and the Italian Ministry of Foreign Affairs (MAE).

2. The Italian Archaeological Expeditions in Sindh and Las Bela: aims and results

The works of the Italian Archaeological Mission in Sindh and Las Bela were conducted from time to time in collaboration with different Pakistani institutions. They are: the Department of Archaeology of Shah Abdul Latif University, Khairpur, the Departments of Geography and General History of Karachi University, The Institute of Sindhology of Sindh University at Jamshoro, the Department of Computer Sciences of the University of Balochistan at Quetta, and Las Bela University of Agriculture, Water and Marine Sciences at Uthal (Balochistan). These projects led to important changes, and greatly improved our knowledge of the prehistory of the two regions (Biagi 2011), thanks to the achievement of essential results during thirty years to fieldwork. The most noticeable are:

1) the development of a new cultural and typological time-scale for the Palaeolithic of Sindh, Acheulian Early Palaeolithic (Fig. 1) to the

end of the Late (Upper) Palaeolithic period. These results have been made possible thanks to the analysis of the lithic assemblages recovered from the Rohri Hills, Ongar and Jhimpir, and the study of the chipped stone industries collected by Professor A.R. Khan at Ongar and the surroundings of Karachi (Khan 1979a; Biagi et al. 1996; 1998-2000; Negrino, Kazi 1996; Biagi 2007a; 2008c). Among the latter are important Levallois Mousterian Middle Palaeolithic assemblages. They have been attributed to the presence of Neanderthal groups in Lower Sindh, who settled in the territory most probably during the OIS-5 period. They have been suggested to mark the south- easternmost spread of the Neanderthals in Eurasia, a probable limit of their territorial expansion very rarely taken into consideration before (Biagi, Starnini 2011; 2018a).

2) The discovery of many Mesolithic sites in the Thar Desert lake district of Upper Sindh (Fig. 2) (Biagi, Kazi 1995; Shar et al. 1997; Biagi, Veesar 1998-1999; Biagi 2003-2004; 2008b), and the study of the still unpublished Late (Upper) Palaeolithic and Mesolithic complexes of Lower Sindh discovered by Professor A.R. Khan in the late 1970s on the Mulri Hills (Fig. 3), in front of Karachi University campus (Zaidi et al. 1999), and within a radius of ca 40 miles east and west of Karachi (Khan 1979b; Biagi 2003-2004; 2004; 2017b; 2018), as well as the radiocarbon dating of one of the Kadeji River Valley sites (KDJ-1) (Biagi 2018). The aforementioned lithic assemblages show that Late (Upper) Palaeolithic and Mesolithic hunter-gatherers inhabited both Upper and Lower Sindh. In most cases their chronology cannot be defined in detail because of the absence of both stratified sites and datable organic material. At present their cultural attribution, and relative chronology, can be tentatively suggested comparing the techno-typological characteristics of the chipped stone artefacts. The implements consist mainly of various types of microlithic geometric tools among which are different types of lunates and trapezes, while other important characters are represented by the presence/absence of notched tools and end scrapers, the typology of the microbladelet cores and the high blade index of the richest assemblages.

3) A radiocarbon chronology for the Holocene shell middens and their related mangrove swamps along the north Arabian Sea coastal zone, a unique ecological environment at present disappeared in many areas of south Pakistan, close to which prehistoric communities established their seasonal camps mainly during the Neolithic and the Bronze Age to exploit the rich ecological niches. Samples of Terebralia palustris and Telescopium telescopium mangrove gastropods retrieved from at present extinct palaeoenvironments, often with traces of human exploitation, have been systematically radiocarbon- dated at Groningen University Isotope Laboratory to reach the goal. The scope of the project was to build up a reliable absolute time-scale of the human settling along the northern coast of the Arabian Sea, and interpret the environmental and morphological changes that took place all along the coastal zone of Lower Sindh and Las Bela from the beginning of the Holocene to the present (Blanford 1880; Lambrick 1986; Biagi 2010; 2017a). Moreover, the radiocarbon results would suggest that seafaring along the northern coasts of the Arabian Sea started to be practised at least around the beginning of the 7th millennium BP, if not a few centuries before (Biagi 2011). This is shown by the presence of scatters of fragmented marine and mangrove

shells, undoubtedly representing food refuses, on the top of the limestone terraces that punctuate the present-day Indus fan, which were systematically radiocarbon-dated. The new time-scale built up for Las Bela and Lower Sindh past landscapes and their environmental changes, shows synchronicity with that recently established for the western coast of the Arabian Sea in the Sultanate of Oman and, to a certain extent, also with that of the south-western shores of the Arabo-Persian Gulf in the United Arab Emirates (Cleuziou 2004; Biagi, Nisbet 2006; Biagi 2008a; Boivin, Fuller 2009; Berger et al. 2013; Biagi et al. 2017; 2018; submitted b).

Regarding the coast of Las Bela, 8th-to-5th millennium BP shell middens have been discovered along the coast of the small Bay of Daun (Biagi 2004; 2008a; 2013; Biagi, Franco 2008; Biagi et al. 2012) as well as on the Gadani and neighbouring Phuari headlands (Biagi et al. 2013).

Moreover, five fieldwork seasons were carried out between 2011 and 2014 to investigate the ancient shores of the so-called Lake Siranda (Las Bela, Balochistan), "a desert depression with no normal outlet to the sea" (Snead 1966: 58). The ancient depression, ca. 14 km long, 3 km wide, and only 0.30-0.45 m above the present sea level, is bordered by the Holocene mobile sand dunes of the Sonmiani Hills, in the west, and a Pleistocene sand plain, in the east (Snead, Frishman 1968). South of the "lake" the Kurkhera Plain is formed by the silting of the Winder River that seasonally flows from the mountains of the Pab Range (Pithawalla 1952: 33). The specific scope of the Siranda surveys was to verify the eventual occurrence of prehistoric shell middens, build up a detailed radiocarbon chronology of the sites (Fig. 4), and study the period and the reasons why the ancient lagoon started to dry. It is now well established that this event took place around the end of the of the 3rd millennium cal. BC, when a regional weakening of the summer monsoon led to a progressive lowering of the lake level and increasing salinity, more or less during the same period when the Indus Civilization finally collapsed due to a series of coincident environmental and climatic changes as well as cultural events (Dixit et al. 2014). Out of the 76 archaeological sites recorded so far around Siranda, mainly Neolithic and Bronze Age shell middens discovered during the surveys, 33 were AMS-dated by single, adult specimens of mangrove gastropod either T. palustris or T. telescopium (Biagi et al. 2017; 2018),

4) The definition of the unique, techno-typological characteristics of the Chalcolithic Amri Culture (Casal 1964) lithic assemblages (Lechevallier 1979; Cleland 1987). It was based on the analysis of the Tharro Hills chipped stone industries collected by Professor A.R. Khan in the 1970s, and the results of an intensive survey conducted at the same site in 2008 (Biagi 2005; 2010; Biagi, Franco 2008). The data retrieved from the survey, and the radiocarbon dating of three marine and mangrove shell samples, showed that the Tharro Hills were an island surrounded by Arabian Sea waters and mangrove swamps during the Neolithic and the Copper age (Fig. 5 and 6), and the landscape around them was still roughly the same at least up to the Hellenistic period (Biagi 2017a). According to the results obtained from the analysis of the chipped stone assemblages, the Amri culture industries are characterised by a strong laminar index due to the manufacture of blades and bladelets detached from only one surface of long subconical cores with prepared

platform. The tools are represented by unique types. They are characterized mainly by semi-abrupt retouched long, narrow blades and bladelets, though also truncated implements are present. The most typical tool is a long scalene, triangle of normolithic (and not microlithic) dimension with two or three retouched sides (the so-called "Amri triangle") (Fig. 7). According to the traceological analysis performed with a low-power approach (Biagi 2005) this tool was often, though not always used as a borer/perforator. These characteristic geometric implements recur also from other Pakistani sites, among which are the eponymous mound of Amri (Casal 1964) and the Chalcolithic layers of Mehrgarh, along the Bolan River course in Balochistan (Lechevallier 2003: Fig. 27). It is important to remark that even recently the Amri triangles have been confused with Mesolithic geometric microliths (Allchin 1985: 131) from which they definitely differ for dimension, typological characteristics, type of retouch and manufacture without the employment of the microburin technique (see Biagi 2003-2004: 195, note 1).

It is important to point out that the Chalcolithic Amri Culture flint knapping and retouching tradition does not find any parallel both in the preceding Neolithic technologies, and in the following Indus Bronze Age assemblages of Sindh and Balochistan. The problems related with origin, development and disappearance of the Amri Culture are still absolutely unknown because of absence of reliable data. In this respect, it is important to remind that the techno-typological traits of lithic production are one of the key elements to understand and define, thanks to proper investigations, the cultural components thanks to which the Indus Civilization developed.

5) The surveys and excavations carried out on the Rohri Hills were promoted by the Italo-Pakistani "Joint Rohri Hills Project", and launched by Ca' Foscari University of Venice and the Department of Archaeology, Shah Abdul Latif University of Khairpur between 1993 and 2002. The surveys led to the discovery of hundreds of archaeological sites, mainly chert mines and workshops, on the top of the Shadee Shaheed limestone terraces (Biagi, Shaikh 1994). The main scope of the project was to record the impressive evidence of Indus chert mines discovered in the central-western part of the Hills starting from 1986, to excavate a few sites and, whenever possible, radiocarbon date them (Fig. 8). Following the Rohri Hills experience, research was resumed at Ongar (formerly called Milestone 101: Allchin et al., 1978: 295-303) in collaboration with the Institute of Sindhology at Jamshoro. During the development of the Ongar project dozens of Bronze Age Indus Civilization chert mines were unexpectedly discovered and recorded on the limestone mesas of Ongar, Daphro and Bekhain, ca. 25 km south of Hyderabad and 8 km north of Jerruck (Biagi 2007b). The exploitation of the chert resources that took place in the area during the Indus period is testified by the presence of evident Bronze Age mining trenches that border the edges of the mesas, heaps of debitage flakes as well as typical Indus Civilization subconical blade cores (Biagi, Cremaschi 1991; Starnini, Biagi 2006; Biagi, Franco 2008; Biagi, Starnini 2008; 2018b). Other new chert mining complexes were later found also close to Jhimpir in Thatta taluka (Biagi, Nisbet 2010; Biagi et al. 2018).

6) The study of a Bronze Age fishermen village at Sonari, a few km north-east of Cape Monze (Ras Mauri), facing the Hab River mouth (Snead 1969: Fig. 15). Professor A.R. Khan

discovered Sonari in the late 1970s though, strangely, he never published or mentioned the existence of this important settlement in any of his papers. The site is well-sheltered inside a wide saddle that opens at ca. 30 m of altitude in the limestone Miocene Gaj formation that characterises the area (Biagi, Nisbet 2014). The settlement structures cover a roughly semi-circular area, ca. 30 m long and 35 m wide (Fig. 9). They consist of at least 6, rectangular, stone-walled features, measuring 2 by 3 m, arranged in north- south and east-west direction. In front of the settlement are located 4 small heaps of marine and mangrove shells that were all AMS-dated. The presence of beach pebble net-weights (Fig. 10) shows that fishing, and the collection of marine and mangrove shells, played a fundamental role in the subsistence economy of the small site that was settled during the first half of the 3rd millennium BC. Sonari is the only Bronze Age prehistoric fishermen village so far discovered all along the northern coast of the Arabian Sea.

7) The archaeometric studies regarded a) the investigation of ancient pottery production through the scientific analysis of the ceramic assemblages from a few Kot Diji, Mature Indus Civilization (Spataro 1998-1999; 2003; 2013; Biagi et al. submitted), and Buddhist sites (Biagi et al. 2002), following the experience acquired from the study of three contemporary pottery workshop villages in Lower Sindh (Spataro 2005), b) the archaeobotanical analysis of prehistoric (Castelletti et al. 1994) and historic (Biagi et al. 2002; Biagi, Nisbet 2009) macroremains and phytoliths (Madella 1997), the study of specific ethnographic structures of Sindh in relationship to the use of wood (Nisbet 2010), and soil micromorphological thin-section analyses of prehistoric and historic sites of Upper Sindh, among which are those sampled from Aror, the capital of Musicanus in Hellenistic times (Biagi, Cremaschi 1988; Biagi et al. 1995; 1998-2000; Ottomano 1995; Ottomano, Biagi 1997), and c) the radiocarbon dating of a few historical sites of Sindh, among which are the Buddhist city of Seeraj-ji-Takri (or Shiraz) in the Rohri Hills (Jafri 1980; Verardi 1987; Biagi et al. 2002; Biagi 2004) that was destroyed by industrial exploitation in the early 2000s, Aror (Ottomano, Biagi 1997) and Ranikot Fort (Hasan 2006; Biagi, Nisbet 2009). Moreover, three other Buddhist sites of Lower Sindh have been radiocarbon dated (unpublished results 2017). The new data are very important to improve our knowledge of the chronology of the Buddhist sites of Sindh, of which very little is known (Van Lohuizen-de Leeuw 1979), and the rate of spread of this religion across the country, as well to interpret the sequence of the events that followed the Arab conquest (Pathan 1978).

3. New achievements and new results

3.1. The Indus Civilization chert exploitation

Until the end of the 1980s very little attention had been paid to the lithic resources of the Indus Valley to ascertain the occurrence of siliceous rocks and knappable raw material sources in Sindh. It is well known that the presence of good-quality siliceous raw materials in a territory inevitably attracted human groups in various periods of prehistory in order to exploit them. Moreover, “a quarry site or lithic production workshop would seem the logical place to begin the study of a stone-tool-using culture” (Ericson 1984: 2). With the aim at mapping the available knappable stone resources of the region, and therefore recognise traces of prehistoric human exploitation, the Italian Archaeological Mission began a systematic exploration of some of the limestone formations that border the Indus River Valley (Starnini, Biagi 2006; Biagi, Starnini 2018b).

The surveys carried out by the "Joint Rohri Hills Project" in the Rohri Hills between 1993 and 2003, led to the discovery of an impressive number of chert mining complexes, whose scope was to exploit the rich, high-quality chert seams embedded in the limestone terraces of the hills (Biagi, Pessina 1994). Test trenches were opened at some of the sites discovered at the top of the mesas located just to the east of the shrine of the shrine of Shadee Shaheed (Biagi et al. 1997). They showed that most sites are undoubtedly attributable to the Bronze Age Mature Indus Civilization. This fact is confirmed also by a charcoal radiocarbon date obtained from the lowermost deposit of mine RH-862 (GrA-3235: 3870±70 BP: Biagi 1995).

Beside the chert mines, just few of the dozens of flint-knapping workshops recorded around the outcrops have been excavated (Biagi, Pessina 1994; Negrino, Starnini 1995; 1996; Biagi 1995; Starnini, Biagi 2006; Biagi, Starnini 2018b; Biagi et al. 2018). They showed that not only "precious" stones, among which are agate, lapis lazuli, carnelian, and steatites employed in bead manufacture in the craftsmen quarters of Mohenjo-daro (Tosi et al. 1984; Vidale 1992; 2000), but also the exploitation of chert, and chert blades mass production, played a very important role in the economy of the Indus Civilization (Fig. 11).

As recorded from many other prehistoric flint mines (Consuegra et al., 2018), also in the case of the Rohri Hills the raw material was obtained from the mining sites, and was processed on the spot. This fact resulted in a massive amount of lithic refuse, debitage and debris, found clustered in rounded-to- oval spots, in the proximity of the edges of the mining trenches. As documented through their excavation, the knapping workshops contain only waste products and by-products derived from core preparation, and laminar debitage (Negrino, Starnini 1995; Negrino et al., 1996). The techno-typological analyses, and the reconstruction of the operative chain, have shown that the goal to achieve was the production of thousands of regular laminar products, both macro- blades and micro-bladelets, to be exported elsewhere. However, further research is necessary to establish whether the two dimensionally different productions (macro-blades versus micro-bladelets), and their respective operative chains (starting either from sub- pyramidal cores or bullet cores) (Fig. 12), are contemporaneous, and aimed at the satisfaction of different demands, or represent two subsequent chert exploitation steps. The experimental reproduction of tiny micro-bladelets has shown that they have been detached from bullets cores by pressure, most probably employing copper-tipped punches (Briois et al., 2006).

The presence not only of chert blades, but also cores and debitage by- products is ascertained from most of the new Indus sites recently discovered in Upper Sindh (Mallah, Rajput 2016). However, a comprehensive and modern techno-functional study of the chert assemblages retrieved from the urban contexts is still missing. Therefore our knowledge of the role paid by chipped stone tools in various activities is still fragmentary and badly-defined.

In general, most archaeological narratives so far written on the Indus Civilization systematically underestimated the role played by chert exploitation in the economy, handicraft and, last but not least, social organization of the Indus Bronze Age (Jacobson 1987; Kenoyer 1991; 2015; Lahiri 1992; Ratnagar 2004; Wright 2010).

Mining entailed the need to perform other activities and tasks, among which are preparation and transport of water and food supply for the miners and mining tools to the Hills, as well as quantities of chert products down the Hills to the distribution and craftsmen centres of the Indus cities. It was an activity that undoubtedly needed logistic organization and social control, involving necessarily many people throughout its different steps and needs. Moreover, chert was a raw material exploited not only for the production of blades, but also for the manufacture of cubic weights of different size that were used as weighting systems during the Bronze Age, as is shown by many finds retrieved from several Indus urban centres (Wheeler 1968: 83; see also Rao 1985: Plate CCLVIIB).

The importance of this resource previously suggested. In the case of the Indus Valley Civilization, the exploitation of lithic resources would fall indeed in the "technological processes associated with the development of urbanism" (Cleland 1987: 99). In the Indus case, from the is indeed remarked not only by the evidence achieved from the Rohri Hills impressive exploitation, their siliceous but also by the presence of other chert mining localities discovered at Ongar and Jhimpir in Lower Sindh (Biagi, Starnini 2008; 2018b; 2018c). Moreover, the discovery of a dark red chert outcrop at Cape Gadani in Las Bela (Balochistan) (Biagi et al. 2013) with evidence of local exploitation add a new, though small potential source of siliceous rocks available in south- western Pakistan.

All the above new data underline once more the importance of the lithic factor in a Bronze Age urban society (Biagi et al. 2018). Its social and logistic organization that involved control, human energy, procurement strategy, labour investment, technology, workmanship, transport, local and long- distance well-planned exchange patterns (Ericson 1984; Spence et al. 1984), was undoubtedly more complex than Previously suggested In case of the Indus valley civilization the exploitation of the lithic sources would fall indeed in the "*technological processes associated with the development of urbanism*" (cleland 1987: 99). From the impressive evidence of their exploitation, siliceous rocks seem to have paid a roleas important as, or perhaps even more important than, metal during the 3rd mithiennium cal. BC.

3.2. The shell middens of Las Bela coast

In a broader geographic context, encompassing several thousand kilometres of coasts from Southern Oman and the Gulf, in the west, to the Indus Delta, in the east, the Makran and the Balochistan seaside in general, the aforementioned region is a scene of a common prehistoric cultural adaptation: the systematic human exploitation of mangroves, with their high nutritional content, in the frame of a nomadic gathering and hunting economy, starting as far as we know from the middle Holocene.

At least from the beginning of the Holocene the changing relationships between hydrology, climate, and neo- tectonic have strongly modelled the shape of the coasts, causing formation, development, and in some instances death of the mangroves, the typical “forests in the sea” which “seem to rise from the sea”, as were known to the ancient Greek historians (Arrian, Anabasis VI, 22.6).

Admitted changes in the South Asian monsoon from 9000 to 7200 BP (Staubwasser et al. 2002), together with eustatic sea-level changes during the very last phases of the Pleistocene, and the opening of the Strait of Hormuz, determined the final ingression of sea- waters into the Arabo-Persian Gulf between ca. 12,000 and 5500 BP when the sea reached approximately the present level (Lambeck 1996: 54-55;

Rose 2010: Fig. 5). The important effects on the changing landscape, the sudden formation of a new sea invading the ancient deltas of the Tigris and Euphrates played a major role in the human palaeo-geography along the coasts covering a wide region that extends from the Indus Delta to the shores of the Oman Peninsula.

Along the coast of Makran tectonic movements shaped the territory in a variety of forms and features, among which are huge mud volcanoes, faulting occurring in younger sediments, and river terraces, with strong earthquakes and a general coastal uplift with raised beaches up to ca. 15 m roughly during the past 5000 years (Snead, 1993a; 2010; Snead, Frishman 1968; Hughes-Buller 1996; Harms et al. 1984; Hosseini-Barzi, Talbot 2003; Shah-Hosseini et al. 2018).

One of the prehistoric key sites of Las Bela coast is Lake Siranda (Snead 1969: 34). As reported above, the intensive surveys carried out between 2011 and 2013 led to the discovery of 76 sites that show the exploitation of mangroves throughout a period of 3 ca. millennia, between the end of the 8th and the second half of the 5th millennium BP. The “lake” is in fact a sabkha-like depression, ca. 15 km long and 4 km wide, whose south-western edge lies 5 km from the Sonmiani Lagoon (Miāni Hor) and ca. 16 km from the open sea- shore. Formerly a shallow bay or a tidal lagoon of the Arabian Sea, it lost its openings with the ocean since the second half of the 5th millennium BP because of the aforementioned geomorphologic causes. Moreover, the deposition of blown sands along its western and southern sides led to the formation of coastal dunes 15 and more metres high (Fig. 13). Before these events, the “lake” provided an excellent physical and chemical environment for the growth of mangroves, because of the mixing of sea and freshwater seasonal stream sources (Snead 1966).

The specialised subsistence economy, mostly based on the collection of specific mangrove gastropods, namely Terebralia palustris and Telescopium telescopium, is documented by the occurrence of small scatters, medium and also large shell middens up to 100 m diameter (see f.i. SRN-29: Fig. 3). The 33 radiocarbon dates so far obtained from the area, mostly from T. palustris specimens, document the history of palaeo-mangrove environments (Fig. 14), whose latest presence is only three centuries more recent than that shown by a date obtained from the surface of the stratified Chalcolithic/Bronze Age mound of Balakot (Dales 1987) located ca. 10 km to the south-east of the lake (BLK-1, GrA-55828: 4660±40 BP, δ13C-3.77, on T. palustris). At present nothing survives of this ancient forest environment around Lake Siranda, and the depression is sometimes partly occupied by freshwaters mostly due to winter and summer monsoons (Snead 1966).

Some 48 to 68 km southeast Lake Siranda, between the Gadani rocky spur and the Hab River mouth, other similar shell middens have been discovered, among which are those of the Bay of Daun, ca. 10 km north of the Hab River (Fig. 15). They are represented mainly by heaps of T. palustris and T. telescopium mangrove shells inside which just a few material culture remains were recorded. These latter consist mainly of chipped stone artefacts and ground stone tools, while net-sinkers are very rare. From a chronological point of view the Daun sites are grouped into two main clusters, the first of which falls within the 7th millennium BP, and the second is of the entire 5th millennium BP (Biagi et al. 2012; submitted c).

Some 9.50 km north of Daun, the geology of Cape Gadani is unique for its complexity and richness. The headland belongs to the Bela Ophiolithes, a sequence of basaltic pillow-lavas, inter- flow sedimentary rocks (chert, argillite and limestone) mostly of Upper Cretaceous age emerging as the western part of Mor Range, and the Parh limestone formation (Upper Cretaceous) (Naseem et al., 1996-1997; Sarwar 1992). The archaeological interest of the cape is twofold: as a small mangrove site and a source of Gadani dark red chert, which was exploited for making artefacts and also geometric microliths (Biagi et al. 2013). As far as we know, the radius of exploitation of the Gadani red chert source is delimited by Lake Siranda shores, in the north, and Karachi, in the east. One radiocarbon date obtained from T. palustris shells is almost identical to that yielded from the neighbouring site of Cape Phuari, ca. 3.5 km to the south (GDN-0, GrN-26369: 4460±30 BP, δ13C -4.99, on T. palustris; PHR-11, GrA-55826: 4415±40 BP, δ13C-5.09, on T. palustris) (Biagi et al. 2013: 77). The results demonstrate the existence of at present disappeared mangroves in the area, flourishing just after the middle of the 3rd millennium cal. BC. They were located most probably at the mouth of a few small streams, around the middle of the 5th millennium BP, when Siranda palaeo- lagoon had already changed into a saline depression, fed only by monsoon rains and seasonal freshwater streams (Minchin 1907; Biagi et al. 2013).

3.3. The coastal sites between the Hab River and Karachi

The earliest fisher/gatherers village of the northern Arabian Sea coast of Pakistan was discovered by Professor A.R. Khan in the late 1970s on the limestone ridge that elongated southwest of the small fishermen harbour of Sonari, west the Hab River mouth (Biagi, Nisbet 2014; Biagi et al. submitted a). After a short Neolithic presence, AMS-dated to the middle of the 7th millennium BP (SNR-102: GrA-62253: 6340±40 BP, δ13C -4.01, on Meretrix), a small Bronze Age community of fishermen and shell gatherers (though also food producers as shown by the presence of querns) built a few rectangular stone structures during the 5th millennium BP. Spots of chipped Seventeen AMS dates have been obtained from mangrove and marine shells collected from the site and its surroundings. The oldest assay (SNR- 101: GrA-62252: 4690±35 BP, δ13C -4.2, on T. palustris) documents the presence of a mangrove at the river estuary by that period. The more recent result (SNR-2: GrA-59834: 670±50 BP, δ13C -5.1, on T. telescopium) would suggests that mangroves flourished until a few centuries ago at the Hab River mouth.

The Sonari Bronze Age fishermen used net sinkers similar to those recovered from many prehistoric sites excavated along the coast of the Peninsula of Oman and the Arabo- Persian Gulf. The raw material exploited for their manufacture consists of limestone, natural, flat, oval beach pebbles simply modified by knapping two opposed bifacial notches on the long sides, around which a string could be firmly tied (Biagi et al. submitted a; submitted b).

Some chipped stone artefacts, represented by one microbladelet core, one microbladelet point and a few microbladelet fragments, document the exploitation of the Gadani red chert outcrops. It is interesting to note the presence of one bladelet made from non- local chert, most probably coming from one of the outcrops located in Lower or Upper Sindh, namely Jhimpir, Ongar or the Rohri Hills (Biagi et al. 2018). These important siliceous raw material sources undoubtedly supplied the Indus Civilization sites located in the region close to Sonari, among which are Pir Shah Jurio (Biagi 2004) and Balakot (Dales 1974; Shaffer 1986; Cleland 1987).

The stretch of coast between Cape Monze and Karachi is almost unknown from an archaeological point of view (Snead 1969: 41). Time and personal security, topographic difficulties in the movement on the ground, inaccessible military areas made the surveys up to now impossible. However there are reasons to suggest the presence of other prehistoric sites along the ca 20 km of coastline, most probably lacking conditions of mangrove growths, though rich in coves and shores ideal for fishing.

Some 50 km east Cape Monze, at the eastern outskirts of Karachi and close to the high terraces of the Malir River course, the Mulri Hills were visited by shell gatherers even slightly earlier than Siranda Lake. The AMS date obtained from a T. palustris sample retrieved from site 15 by Professor A.R. Khan's (MH-15: GrA-63863: 7320±40 BP, δ13C -4.01, on T. palustris), is the oldest radiocarbon result at present available from mangrove gastropods showing the presence of disappeared mangal environments along the northern Arabian Sea coast of Pakistan. Earlier human presence along the terrace faults, and close to freshwater springs that open at the top of the terraces, is well documented by many Late (Upper) Palaeolithic and Mesolithic sites that covered their surface until the 1980s, when they were quickly destroyed by the rapid urbanization of the area.

However, the occurrence of mangroves ca. 1000 years before is suggested by another AMS date obtained from a fragment of a large marine bivalve collected from site KDJ-1, along the left bank of the Kadeji River, ca. 30 km north of the present sea-shore (Fig. 17). It shows that this marine shell was undoubtedly collected from a mangrove environment (KDJ-1: GrA-63862: 8275±40 BP, δ13C -4.44: Biagi 2018).

3.4. The Indus Delta country

The Indus Delta region is very important for the study of the rate of advance of the Indus fan, the formation of the river alluvial plain, and the changes that took place along the northern coast of the Arabian Sea during the Holocene (Wilhelmy 1968; Harvey, Schumm 1999; Giosan et al. 2006; Inam et al. 2007). At present we know that at the time of Alexander's invasion (327 BC) "the sea extended upto Gujo area" (Panhwar 1964: 100). This idea is generally accepted by both geologists (Bender 1995: fig. 10.18) and historians (Eggermont 1975: Map 2), within the general picture of the movements of the Indus River through the ages (Flam 1984; 1987; Jorgensen et al., 1993).

Most authors suggest that the "rocky rises" of the Indus Delta were in fact islands in Hellenistic times. This is the case for the Tharro Hills. The surveys carried out in the Delta region between 2009 and 2013 confirmed this view because of the discovery of archaeological finds, marine and mangrove shells from all the above outcrops from which we have now a good set of radiocarbon dates (Biagi 2010; Biagi et al. 2017; 2018) (Table 1).

Moving ca. 85 km east of the Hab River mouth, the first AMS-dated occurrence of T. telescopium has been obtained from a small spot of marine and mangrove shells discovered on a limestone terrace ca 30 m high, near Gharo (Garo-1: GrA-59844: 6320±60 BP, δ13C -3.64, on T. telescopium). The site is located ca. 4-5 km north of the ruins of the ancient city of Bhambor (Majumdar 1934: 19; Cousens 1998: 64) From a geo-historical point of view, T. telescopium sample relates to one of the westernmost mangrove channels of the palaeo-Indus, whose movements have been frequently discussed since long (see f.i. Tremenheere 1867; Raverty 1895; Wilhelmy 1968; Lambrick 1986; Flam 1999; and lastly, based on many AMS dates, Biagi et al. in press 2018).

East of Gharo, a group of shell middens and mangrove shell scatters has been found, and dated, west and south of Thatta, one of the ancient capitals of Sindh. The sites are usually located on the top of calcareous and sandstone hillocks, rising 10-30 m from the alluvial plain of the Indus ca. 15-40 m above the sea level. Because of the seaward accretion of the Delta, these flat mesas and spurs (as the Makli Hills, Tharro Hills, Shah Husein, Beri, and Aban Shah) (Fig. 18-20) formed a small archipelago during the Holocene and even during the historic period, as Arrian's account on Nearchos journey mentions some "isles" when the Alexander's fleet reached the sea in the third century BC. The results yielded by nine sites show the local presence and exploitation of mangroves molluscs since the mid of the 8th to end of the 6th millennium BP. One interesting exception is Shah Husein (JSH-1bis: GrA-66636: 5800±40 BP, δ13C -4.79; JSH-2: GrA-45181: 4245±40 BP, δ13C - 3.21; and JSH-10, GrA-62255: 2715±30 BP, δ13C -5.18, all on T. telescopium), an isolated rocky cliff ca. 13 km west- southwest from Thatta (Fig. 20), which yielded evidence of several mangrove shell scatters as well as chipped stone artefacts (Biagi 2010: Fig. 20). The latter date shows that a mangrove environment lasted locally probably as late as the Hellenistic period, along one or more creeks connecting the site to the seaside over a period of four millennia.

The Tharro Hills are located some 13 km west of Thatta (Fig. 5). The site is located on the top of a limestone terrace. It is surrounded by two parallel, semi-circular stone walls. During the intensive survey carried out in January 2008 (Biagi and Franco 2008), many specialised areas were recorded, 41 of which yielded characteristic Amri chipped stone tools (Fairservis, 1975: 175), among which are bladelets with semi-abrupt retouch, truncations and typical elongated scalene triangles. Two similar radiocarbon dates were obtained from specimens of Ostreidae (THR-1: GrN-27053: 5240±40 BP, δ13C, -0.64) and T. palustris (THR-3: GrA-47084: 5555±35 BP, δ13C -5.15) respectively, sampled from a well-defined spot of shells located along the southern edge of the inner wall that confirm one again the Chalcolithic attribution of the site.

The radiocarbon dates from mangrove shells are a good indicator of the presence of local, past intertidal forests, which show physical contact between freshwater, continental environment, and true marine shorelines. Therefore they can be used to reconstruct with good approximation the way and the speed the Delta protruded towards the sea from the middle Holocene to the present. However, they cannot mark any precise topographical limit, because mangroves can flourish along the banks of the channels quite inland. This is undoubtedly true for a complex and intricate Delta, which is “a product of energetic interaction between fluvial and marine processes”, as is the case for the Indus (Shroder 1993: 37).

Between the 7th and 6th millennia BP the Indus Delta coastline formed a wide arc from Manora-Ghizri Creek, in the west, to Thatta-Makli Hills, in the east. We can suggest that the western part of the Delta, from Karachi to Bhambor-Gharo, developed during this period, while later seaward accretion was slower, as suggested already more than a century ago (Tremenheere 1867). In contrast, south of Thatta, the Delta prograded seaward much faster even in historic times, ca. 30 m per year (Shroder 1993: 37). According to the available data it is not possible to define with precision the dynamics, courses and location of the ancient Indus palaeo- channels (Wilhelmy 1968) that changed greatly also during the last two centuries (Seth 1978: 291). However, the timing of the east to west shift of the Delta still remains unknown in its details (Kazmi 1984).

Many hypotheses have been proposed during the last three centuries to interpret the route followed of Nearchos’s fleet to return toward Mesopotamia, moving along the north Arabian Sea coastline of the 4th century BC, thanks to the information provided by Greek and Roman historians (Eggermont 1975; Kevran 1995; Baynham 2005; Biagi 2017). Following the classical chroniclers, in the Hellenistic period the head of the Delta was located at the latitude of Thatta (Haig 1894), which is in accordance with the available the radiocarbon data. A similar opinion is shared by T.H. Lambrick (Lambrick 1986: 113), who suggested that the western coast of the Delta moved close to the Makli Hills and Pir Patho (Thatta) in Alexander’s times. This hypothesis is not consistent with both the radiocarbon results, and the reconstruction by P.H.L. Eggermont (Eggermont 1975), though his interpretation of Aban Shah hillock as “the island in the sea” is not confirmed by our T. palustris AMS date (OBS-1: GrA-47082: 3790±35 BP, δ13C -9.17), which would be consistent with a true close mangrove environment.

According to the geomorphologic evidences, deltaic morphologies are found as inland as 55 km north-east of Hyderabad in historic times (Holmes 1968). Similarly, the aerial photographs and the distribution of archaeological sites presented by L. Flam in the Delta (Flam 1999), suggest that the 6th-5th millennium BP coastline was probably located somewhere between Hyderabad and Thatta. This idea would better fit with our dates, and also explain such an early date as is that obtained from the surface of Kot Raja Manjera, near Jhirak (KRM-13: GrA- 47083: 4635±35 BP, δ13C -6.17, on T. palustris), at present ca. 150 km from the mouth of the main Indus channel.

4. Discussion

Thirty years of surveys and excavations carried out by the Italian Archaeological Mission in Sindh and Las Bela led to dramatic changes in the prehistoric archaeology of the two regions.

The human presence is ascertained from the Early Palaeolithic with several Acheulian knapping workshops where bifacial hand-axes have been produced exploiting Rohri Hills chert. It has been hypothesized that Sindh, and in particular the western banks of the Indus River Valley might represent the south-easternmost edge of the territorial expansion of Homo neanderthalensis, due to the presence of a few, though characteristic chert implements undoubtedly of Levallois-Mousterian tradition (Biagi, Starnini 2014; 2018a).

The Late (Upper) Palaeolithic scenario and the arrival of the first Anatomically Modern Humans (AMH) in the region is, at the present state of knowledge, only drafted, although many surface finds scattered all over the Rohri Hills and in the collections of the late Professor A.R. Kahn, stored in the Department of Geography of Karachi University, can be attributed to different moments of this period (Biagi 2018). Indeed, one of the many difficulties of Palaeolithic archaeology in Sindh is the absence of cave or rock shelter sequences that challenges a detailed radiocarbon-based reconstruction of the events and cultural traits that developed in the region during the Late Pleistocene. In addition, the study of the chipped stone assemblages collected by Professor A.R., Khan in the1970s drastically changed our view of the Pleistocene and Early Holocene prehistory of Sindh. For instance, before his discoveries nothing was known of the Late (Upper) Palaeolithic and Mesolithic settlement pattern of Lower Sindh, and of the characteristics of the lithic industries of these periods. At present we know that groups of Final Palaeolithic and Mesolithic hunter- gatherers systematically settled close to freshwater springs and high-quality sources of knappable raw material. They produced different types of lunates and, in a slightly later period of the Holocene, trapezoidal geometric armatures obtained with microburin technique, inhabited coastal zones, and river banks and desert sand dunes close to freshwater basins, among which are those of the Thar Desert around the present caravan city of Thari. At present, dozens of sites of this period are known in Sindh, making the Mesolithic prehistory of the country one of the richest of the Indian Subcontinent (Biagi 2003-2004; 2008b).

The surveys carried out along the coast of Las Bela in Balochistan and the Indus Delta in Sindh showed the archaeological importance of both these territories. From the radiocarbon results obtained from the Las Bela shell middens, and the Indus Delta rocky outcrops we know that the northern coast of the Arabian Sea started to be settled during the last centuries of the 8th millennium BP, and that coastal seafaring also began in this period (Biagi 2011). The radiocarbon results help us interpret the chronological sequence of the changes that took place along the northern Arabian Sea coast during most of the Holocene period. From many points of view the events can be compared to those that occurred along the coast of the Oman Peninsula and also the Arabo-Persian Gulf (Berger et al., 2013; Biagi et al. submitted c).

Regarding the Bronze Age, the Rohri Hills have revealed an aspect of the Indus Civilization of which very little was previously known: the presence of huge chert mining centres that undoubtedly played a very important role in its complex economic system. Impressive examples are known from the Shadee Shaheed Hills, on the top of which more than 2,000 chert mines and workshops have been discovered (Biagi, Pessina 1994; Biagi, Cremaschi 1991; Maifreni 1995).

However, it is regrettable that most of the Rohri Hills sites began to be destroyed already well before the first explorations conducted by B. Allchin in the 1970s (Allchin 1976). Similarly many sites of Las Bela province are also disappearing (Snead, 1993: 378). Moreover, the destruction of the archaeological sites of Sindh is still ongoing (Fig. 21 and 22) in the total indifference of any local, governmental and international political and cultural authority (Biagi, 2006). Therefore, it will be very difficult in the near future, when all the evidence will have totally disappeared before recording, documenting and properly investigating, to acknowledge the importance of the lithic resources in the economic system of the Indus Civilization.

To conclude, thanks to the results achieved by the Italian Archaeological Mission we can state that our knowledge of the prehistory of this part of the Indian Subcontinent has dramatically improved during the last thirty years (Fig. 23). Many data that were thought to be correct just a few years ago are no longer acceptable, and their updating and completion is absolutely necessary to keep the prehistory of Pakistan competitive in the wider picture of the archaeology of the Indian Subcontinent.

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Table 1 – List of the radiocarbon dates obtained from mangrove gastropods from the Indus Delta sites. Calibrations according to the marine curve developed from the sea core off the Makran coast (56KA: von Rad *et al.* 1999; Saliège *et al.* 2005: Fig. 1) ca. 300 km north-west of Port Okha in Gujarat (229±27 ^{14}C years: Reimer, Reimer 2001).

Site name	Coordinates	Altitude (m)	Material	Lab. n°	$\delta^{13}C$	Uncal BP	Cal BC 2σ	Reference
RHR-3bis (Rehri, Karachi - Sindh)	24°49'12"N-67°13'42"E	10	*T. palustris*	GrA-66631	-4.13	7045±45	5483-5287	Biagi *et al.* 2016
MH-15 (Mulri Hills, Karachi - Sindh)	24°55'41"N-67°07'14"E	67	*T. palustris*	GrA-63863	-4.01	7320±40	5711-5524	Biagi *et al.* 2016
MH-14 (Mulri Hills, Karachi - Sindh)	24°55'42"N-67°07'25"E	65	*T. telescopium*	GrA-63869	-4.57	6155±40	4504-4300	Biagi *et al.* 2016
MH-4B (Mulri Hills, Karachi - Sindh)	24°55'47"N-67°07'57"E	65	*T. palustris*	GrA-66630	-5.24	6035±40	4379-4156	Biagi *et al.* 2016
MH-18 (Mulri Hills, Karachi - Sindh)	24°54'45"N-67°06'30"E	65	*T. palustris*	GrA-23639	-6.6	5790±70	4211-3816	Biagi 2004
MH-17 (Mulri Hills, Karachi - Sindh)	24°54'43"N-67°07'55"E	65	*T. palustris*	GrA-66634	-3.98	5530±40	3850-3617	Biagi *et al.* 2016
Garo-1 (Bhambor - Sindh)	24°45'36.3"N-67°33'17.4"E	31	*T. telescopium*	GrA-59844	-3.64	6320±60	4726-4408	Biagi *et al.* 2016
THR-3 (Tharro Hills, Gujo - Sindh)	24°43'46"N-67°45'07"E	13	*T. palustris*	GrA-47084	-5.15	5555±35	3876-3635	Biagi 2011
Beri (Gujo - Sindh)	24°43'00"N-67°45'09"E	7	*T. palustris*	GrN-32166	-6.9	5960±50	4320-4041	Biagi 2010
JSH-1bis (Shah Husein, Gujo - Sindh)	24°42'26.0"N-67°48'38.3"E	12	*T. telescopium*	GrA-66636	-4.79	5800±40	4165-3910	Biagi *et al.* 2016
JSH-2 (Shah Husein, Gujo - Sindh)	24°42'26"N-67°48'39"E	19	*T. telescopium*	GrA-45181	-3.21	4245±40	2230-1926	Biagi 2010
JSH-10 (Shah Husein, Gujo - Sindh)	24°42'09.8"N-67°48'28.1"E	14	*T. telescopium*	GrA-62255	-5.18	2715±30	339-78	Biagi *et al.* 2016
KKT-2 (Kalan Kot, Thatta - Sindh)	24°42'17.3"N-67°52'23.5"E	22	*T. palustris*	GrN-32464	-5.5	6320±45	4700-4442	Biagi 2011
MKL-10 (Makli Hills, Thatta - Sindh)	24°37'40.6"N-67°51'41.2"E	25	*T. telescopium*	GrA-62256	-7.02	6140±40	4486-4274	Biagi *et al.* 2016
MKL-1 (Makli Hills, Thatta -Sindh)	24°36'52.5"N-67°51'36.5"E	24	*T. palustris*	GrA-50330	-3.929	5750±40	4074-3796	Biagi *et al.* 2016
KKT-4 (Kalan Kot, Thatta - Sindh)	24°42'15.3"N-67°52'15.7"E	27	*T. telescopium*	GrA-59843	-7.03	5460±60	3788-3498	Biagi *et al.* 2016
KKT-3 (Kalan Kot, Thatta - Sindh)	24°41'54.8"N-67°52'40.4"E	32	*T. telescopium*	GrA-50324	-5.01	5270±40	3579-3336	Biagi *et al.* 2016
OBS-1 (Aban Shah, Thatta - Sindh)	24°22'17.8"N-67°58'20.6"E	8	*T. palustris*	GrA-47082	-9.17	3790±35	1616-1398	Biagi 2011
KRM-13 (Kot Raja Manjera, Jerrack - Sindh)	25°01'21"N-68°12'37"E	45	*T. palustris*	GrA-47083	-6.17	4635±35	2771-2469	Biagi 2011
KDJ-1 (Khadeji River, Karachi - Sindh)	25°02'15.8"N-67°25'14.9"E	115	Marine bivalve	GrA-63862	-4.44	8275±45	6670–6434	Biagi 2018

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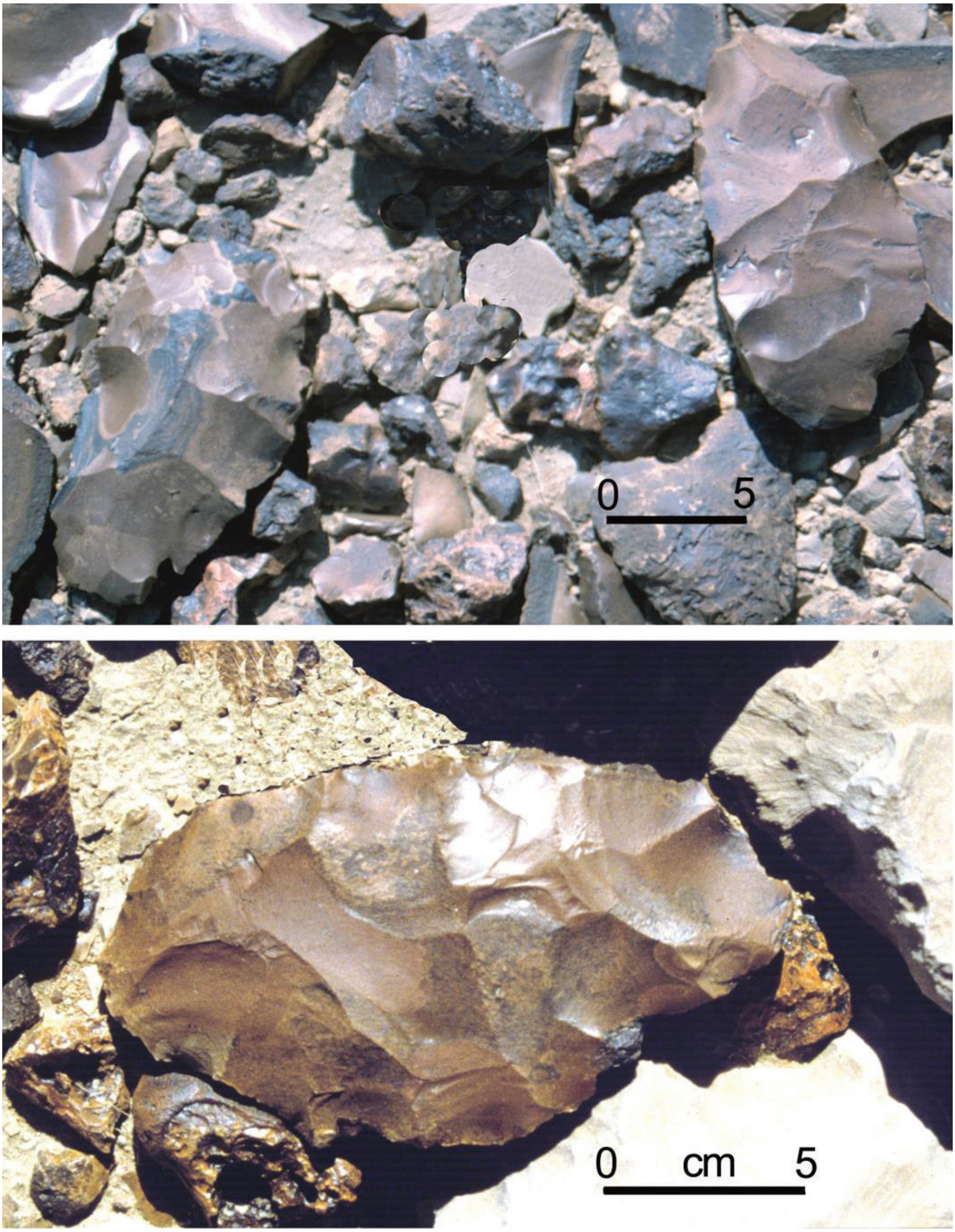

Figure 1 – Rohri Hills, Ziārāt Pir Shābān (ZPS1): Rough-outs of Early Palaeolithic, Acheulian hand- axes on the surface of the site (photographs by P. Biagi, March 1995).

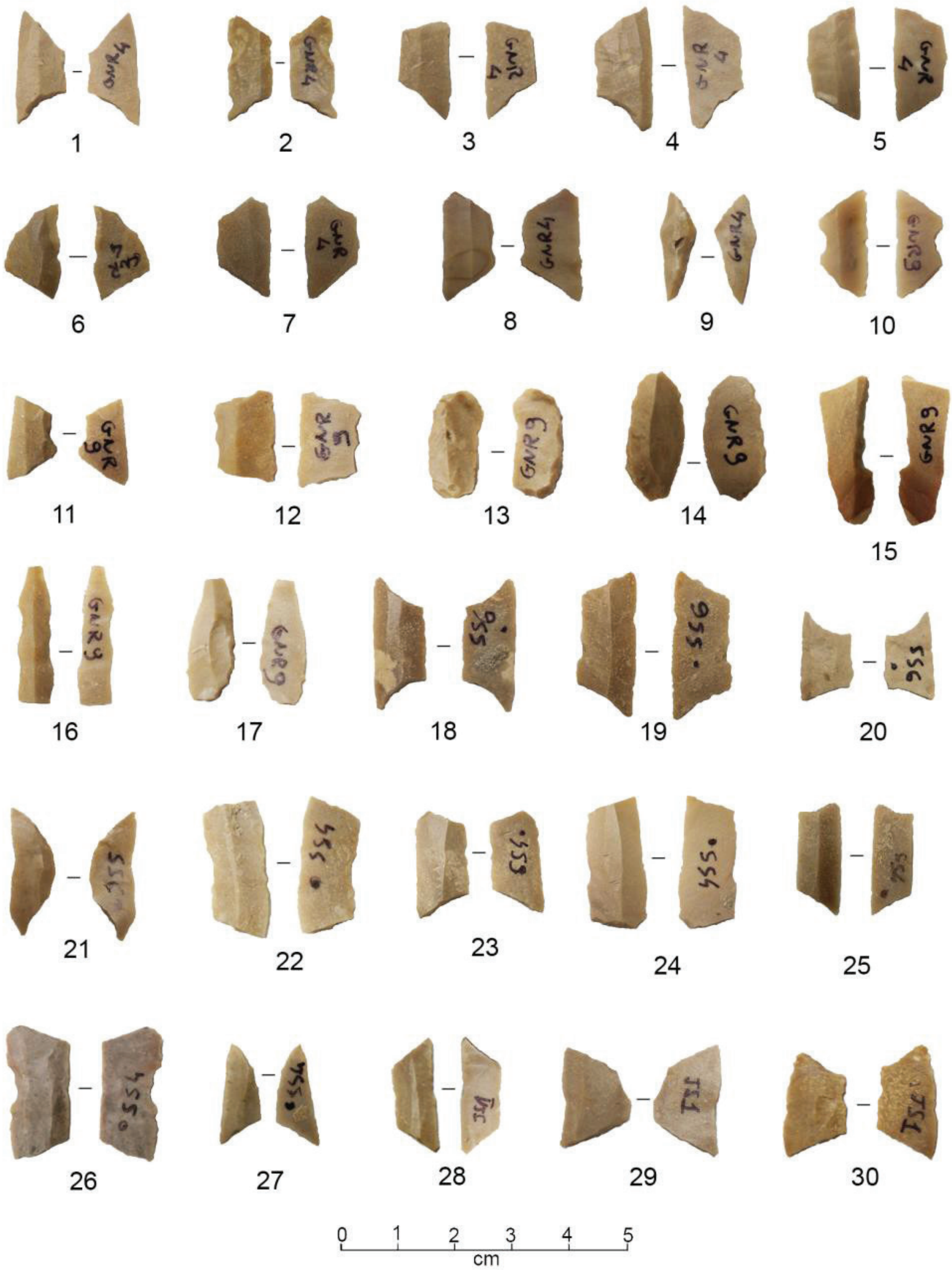

Figure 2 – Thar Desert Lake District (Thari): Mesolithic microliths from the sites of GNR-4 (nn. 1-9), GNR-9 (nn. 10-17), SS-6 (nn. 18-21), SS-4 (22-27), and JS-1 (nn. 28-30). Trapezoidal microliths of typologically different types are nn. 1-8, 10-12, 18-20, 22-26, 28-30. For the locations of the sites see Biagi, Veesar (1998-1999) (photographs by E. Starnini).

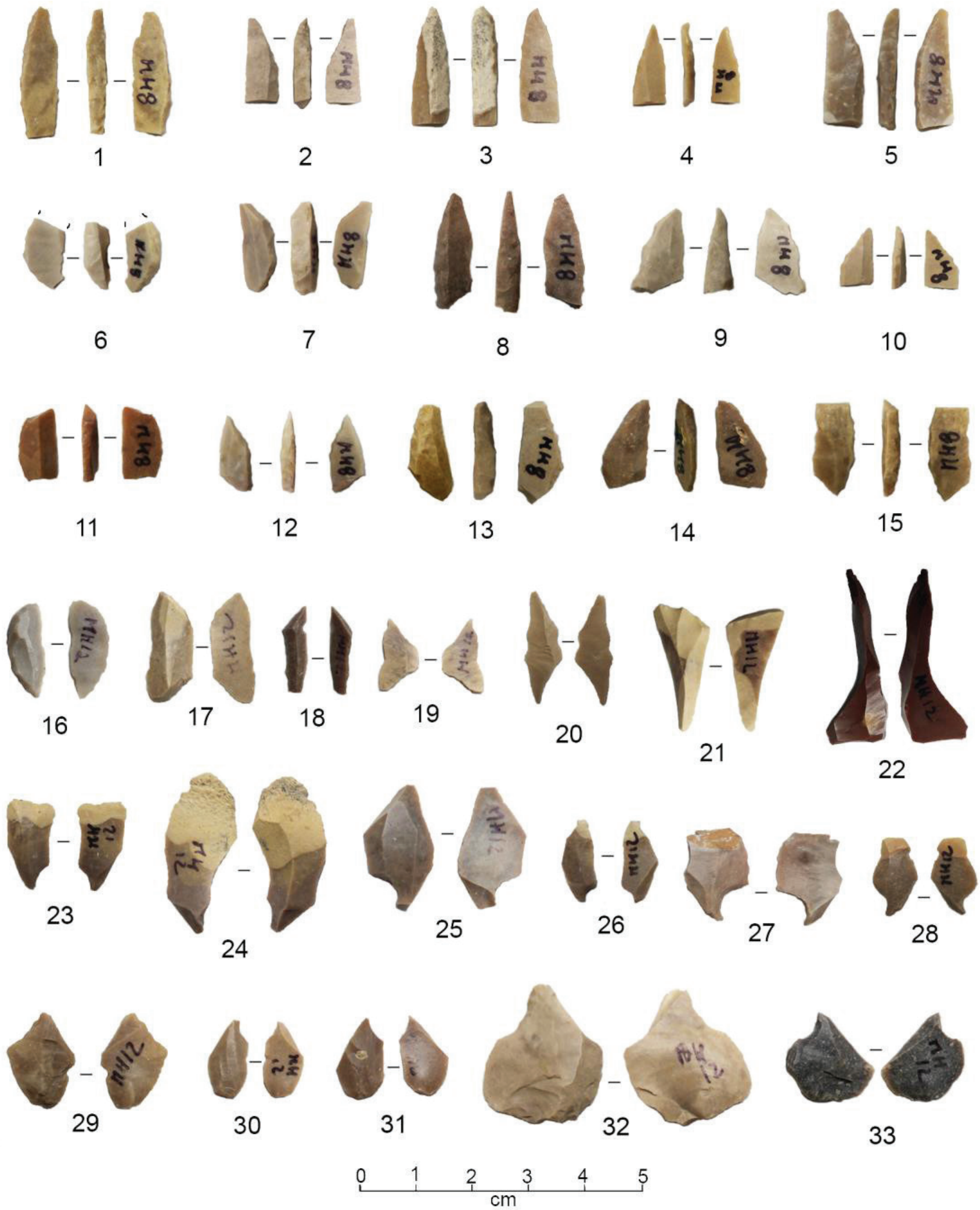

Figure 3 – Mulri Hills (Karachi): Mesolithic microliths from sites MH-8 (nn. 1-15) and MH-12 (nn. 16-20). Core rejuvenation flakes (nn. 21 and 22), distal microburins (nn. 23-28) and proximal micro-burins (nn. 29-33) from site MH-12. Note specimen n. 22 obtained from dark red Gadani chert (photographs by E. Starnini).

Figure 4 – Lake Siranda (Las Bela): The 7th millennium BP shell midden of SRN-29, discovered along the south-eastern terrace of the dry basin, from the south-east (photograph by P. Biagi, January 2012).

Figure 5 – Tharro Hills (Gujo): Satellite image of the terrace on which the fortified, Chalcolithic Amri Culture settlement is located at the eastern edge (red square), with the indication of the Neolithic (blue dot) and Chalcolithic (black dot) radiocarbon-dated shell scatters. In the upper left corner is a magnified image of the Chalcolithic site with the distribution of lithic artefacts (black dots and spot), ceramic potsherds (red dots), marine and mangrove shells (blue spots), ashy sediments (white spots), and some of the mounds (yellow spots) (after Biagi, Franco 2008: Fig. 7 and 8).

Figure 6 – Tharro Hills (Gujo): Profile of the terrace on which the fortified, Chalcolithic Amri settlement is located, from the east (photograph by P. Biagi, February 2001).

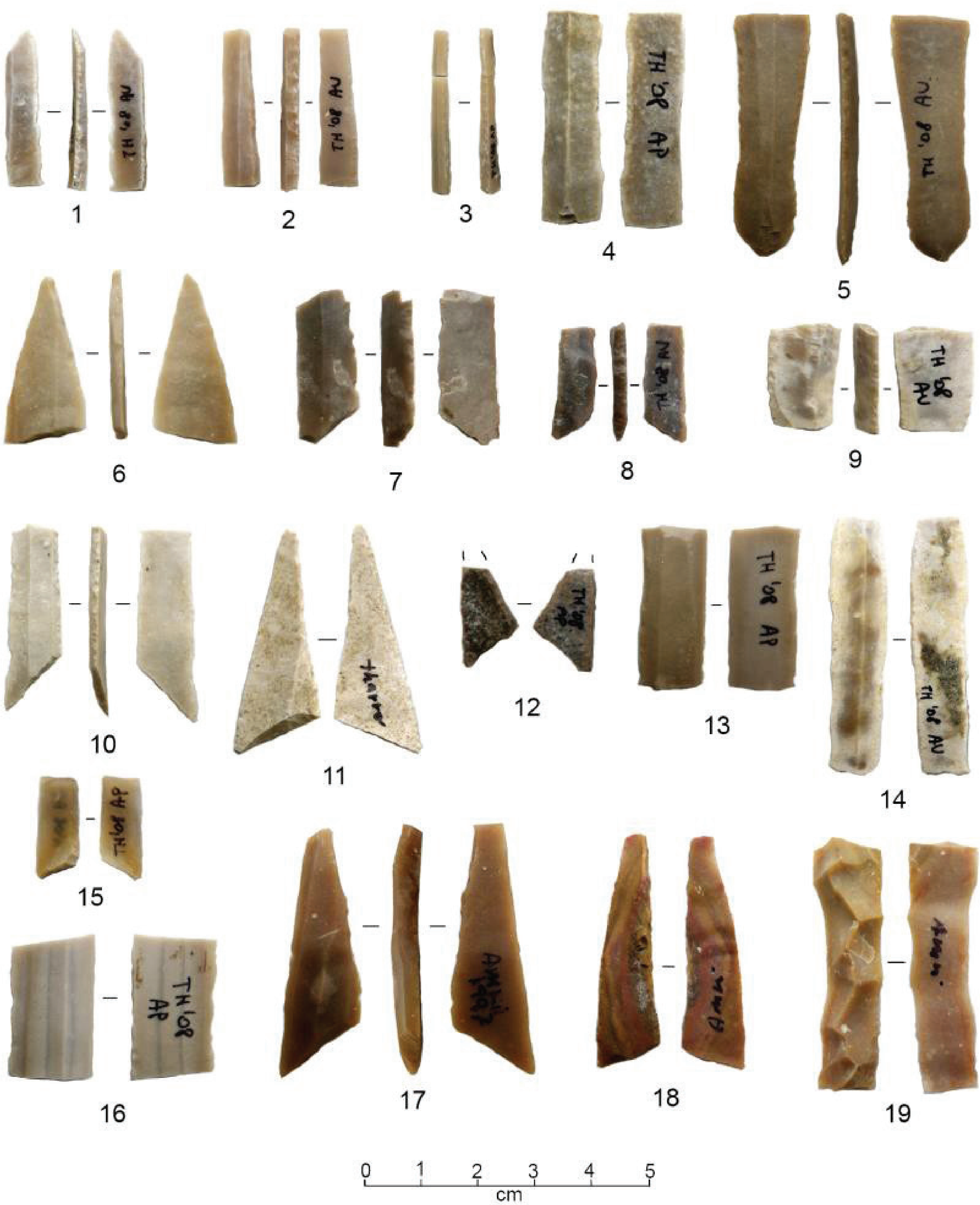

Figure 7 – Characteristic Amri Culture blade tools from the Chalcolithic sites of the Tharro Hills (nn. 1-16) and Amri (nn. 17-19). Scale triangles (nn. 6-8, 10-12, 15, 17 and 18), and crested blade (n.19) (photographs by E. Starnini).

Figure 8 – Rohri Hills (Khairpur): the surface of part of the chert mining area where the excavated site of RH-862 is located. The mining pits look like rounded light brown sandy spots opening among limestone rubble (photograph by P. Biagi, February 1994).

Figure 9 – Sonari (Karachi): The Bronze Age fishermen site SNR-1 located inside a limestone saddle (red rectangle) facing the Hab River mouth, from the south-east (photograph by P. Biagi, January 2013).

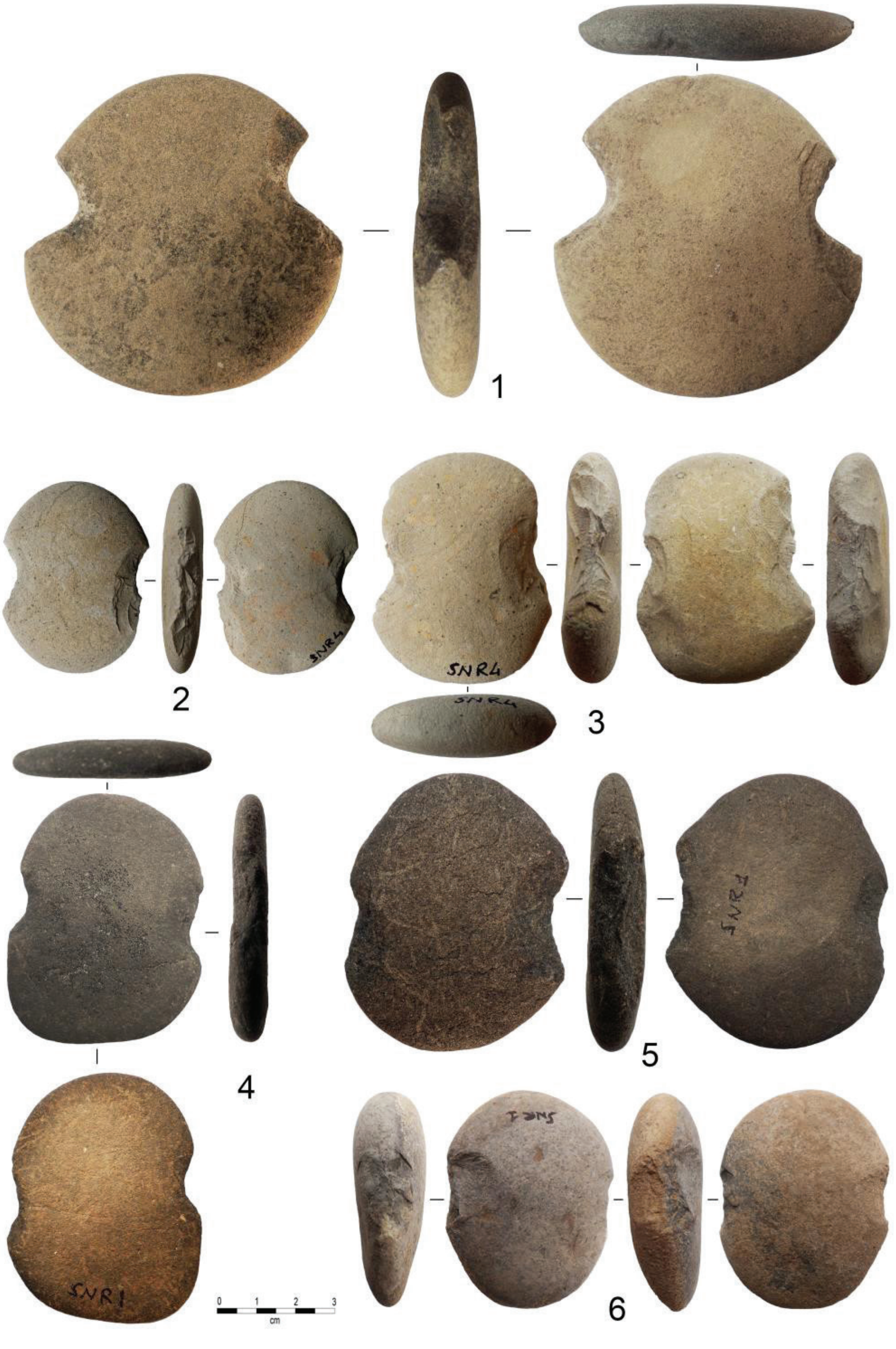

Figure 10 – Sonari (Karachi): Characteristic net sinkers from the Bronze Age fishermen settlement SNR-1 (photographs by E. Starnini).

Figure 11 – Rohri Hills (Khairpur): Characteristic Bronze Age, Indus Civilization, bullet cores from chert mine RH-862 (photograph by P. Biagi).

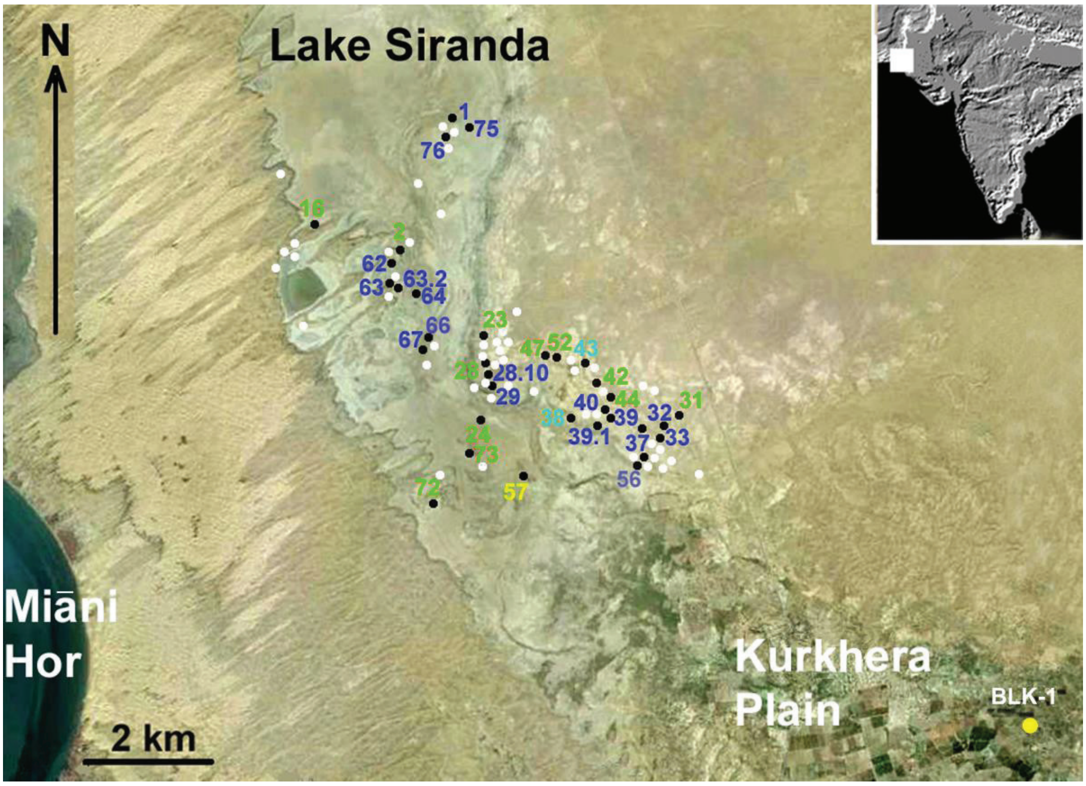

Figure 12 – Lake Siranda (Las Bela): Distribution map of the AMS radiocarbon dated shell middens: 8th millennium BP (light blue dots), 7th millennium BP (blue dots), 6th millennium BP (green dots), 5th millennium BP (yellow dot), undated sites (white dots) and Balakot (BLK-1) (after Biagi *et al*. submitted c).

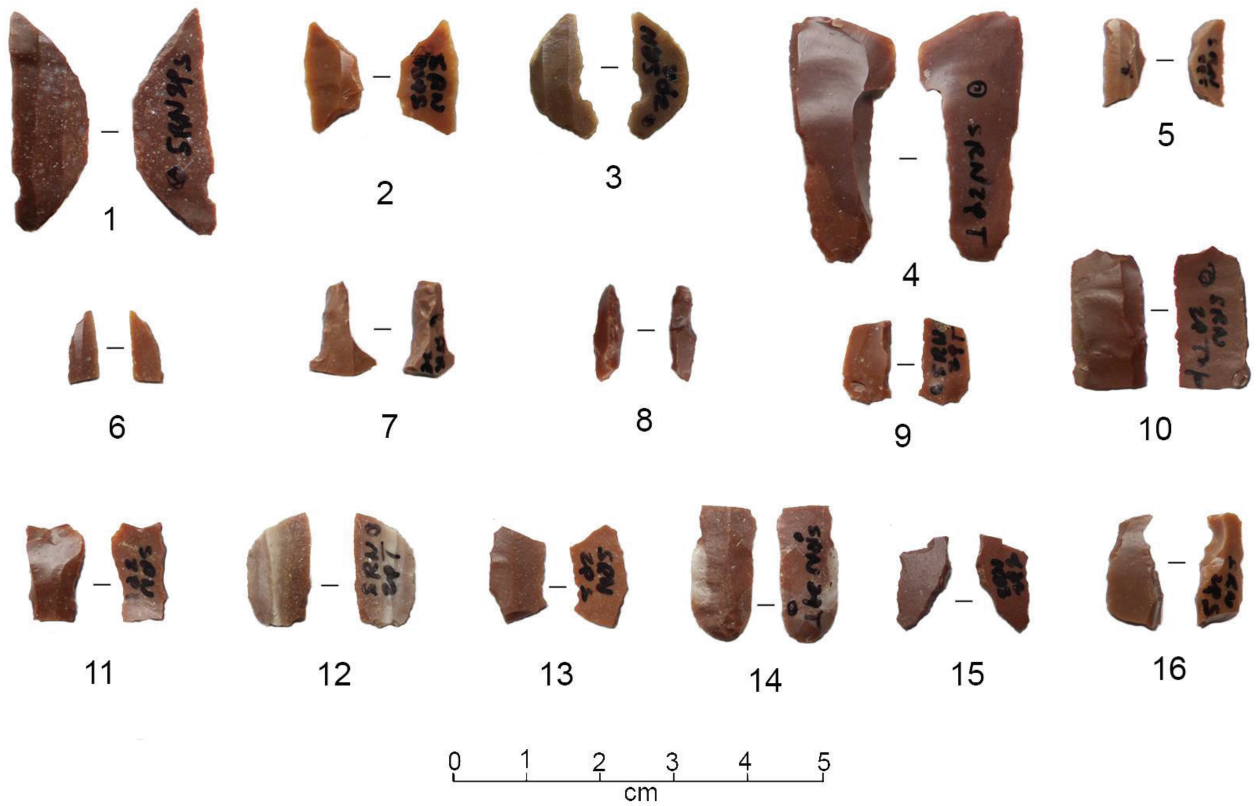

Figure 13 - Lake Siranda (Las Bela): Chipped stone tools of dark red Gadani chert from the surface of the 7th millennium BP shell midden SRN-29, among which are three isosceles trapezoidal geometrics (nn. 1-3) and two exhausted drill points (nn. 7 and 8) (photographs by E. Starnini).

Figure 14 – The mangrove environments of Karachi Gulf at high tide (above) and Miāni Hor (below). Note the presence of many *Telescopium telescopium* gastropods on the surface of the picture below and *Avicennia marina* and *Rhyzophora* shrubs in the same image (photographs by R. Nisbet, January 2012 and 2013).

Figure 15 – Daun Bay (Las Bela): one of the 5th millennium BP shell middens discovered close to the shoreline south of the bay (photograph by P. Biagi, January 2008).

Figure 16 – Sonari (Karachi): Rectangular stone structures of the Bronze Age fishermen village SNR-1, with floors covered with small *Meretrix* marine bivalves (photographs by P. Biagi, January 2013).

Figure 17 – The Khadeji River (Karachi) from the 9th millennium BP Mesolithic site of KDJ-1 (photograph by P. Biagi, January 2014).

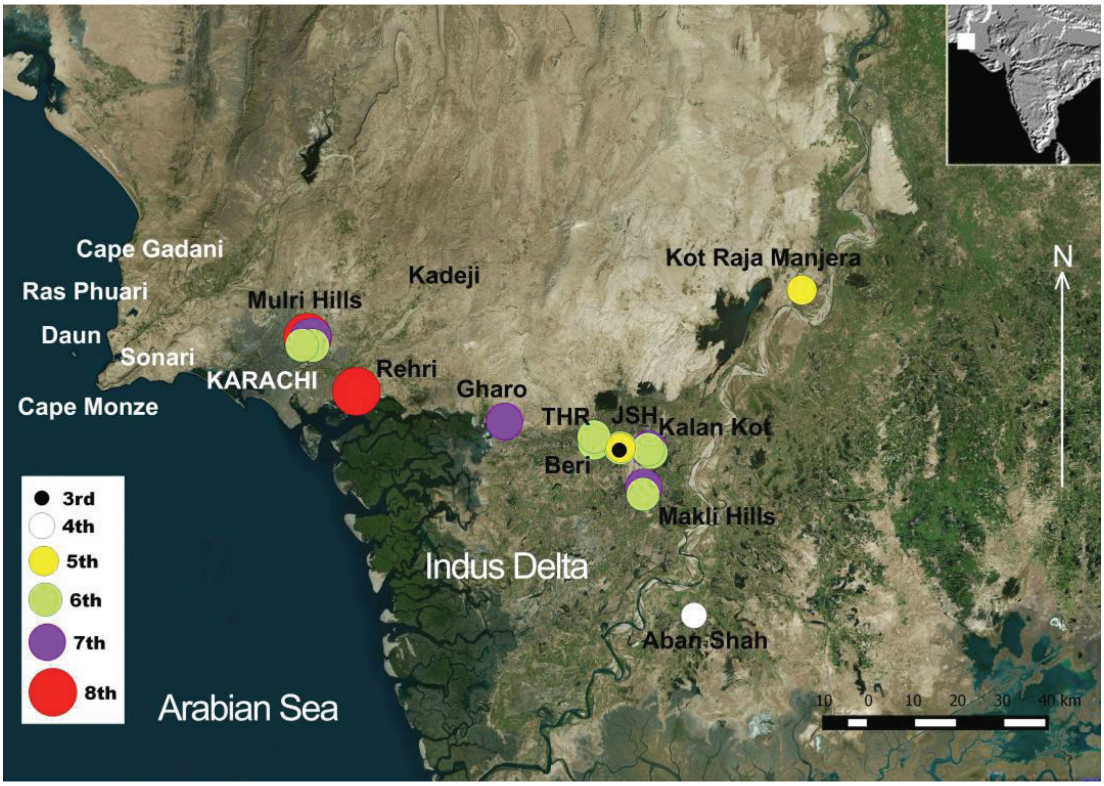

Figure 18 – Indus River Delta: Distribution map of the mangrove shells radiocarbon-dated sites (drawing by R. Nisbet).

Figure 19 – Shah Husein (Gujo): The small *Telescopium telescopium* shell scatter of JSH-1bis, AMS dated to the 6th millennium BP (photograph by P. Biagi, August 2013).

Figure 20 – Kalan Kot (Thatta): The *Telescopium telescopium* shell midden of KKT-4, AMS dated to the 6th millennium BP (photograph by P. Biagi, January 2011).

Figure 21 – Ongar (Milestone 101): the limestone terrace on which the first Palaeolithic tools were discovered in the 1970s, totally destroyed by industrial quarrying (photograph by P. Biagi, January 2013).

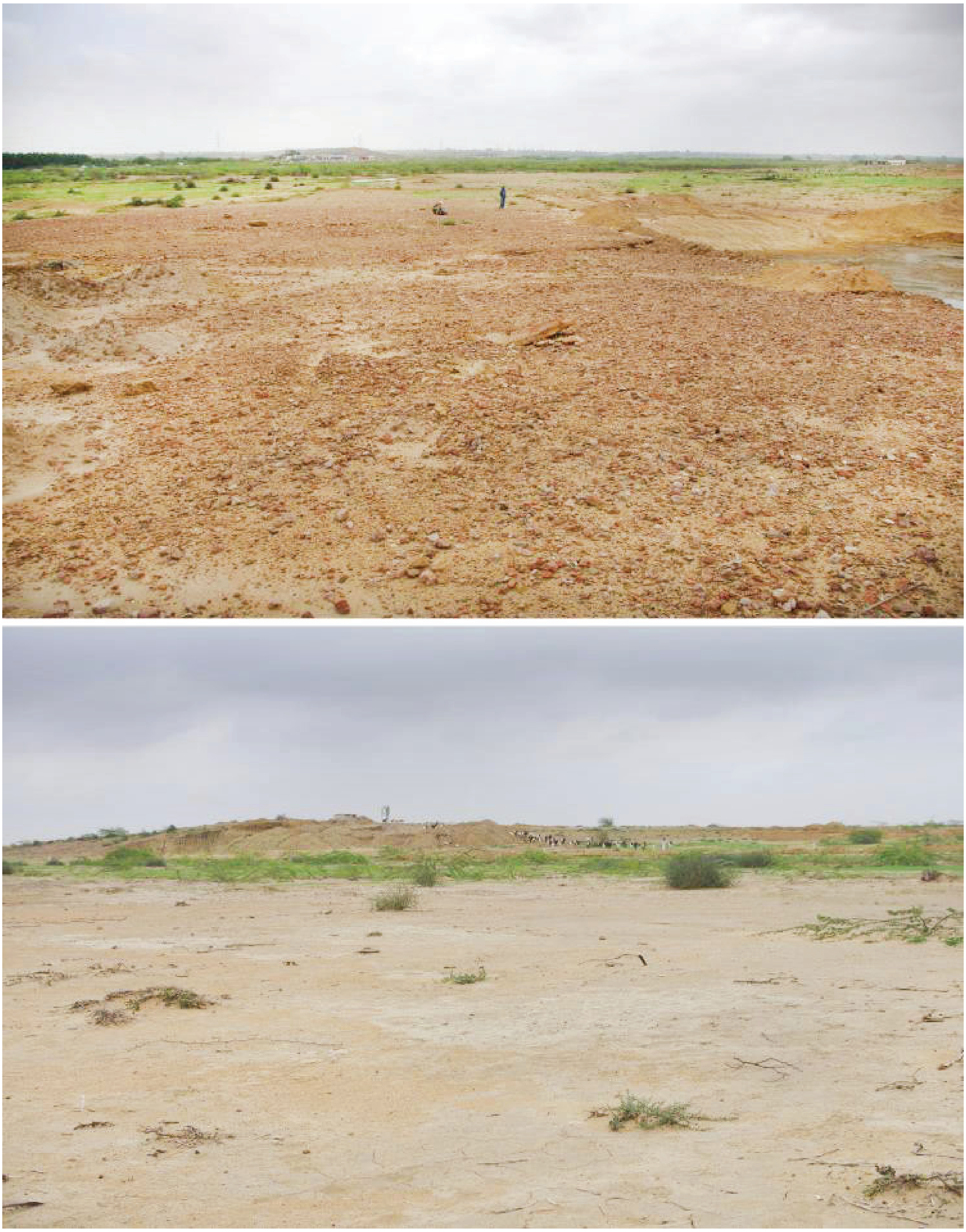

Figure 22 – Gazkal (Karachi): The important Indus Civilization settlement with stone structures, discovered by Professor A.R. Khan in the 1970s along the eastern bank of the Bazar River, ca. 40 km north-east of Karachi, half destroyed by industrial development (photographs by P. Biagi, January 2014).

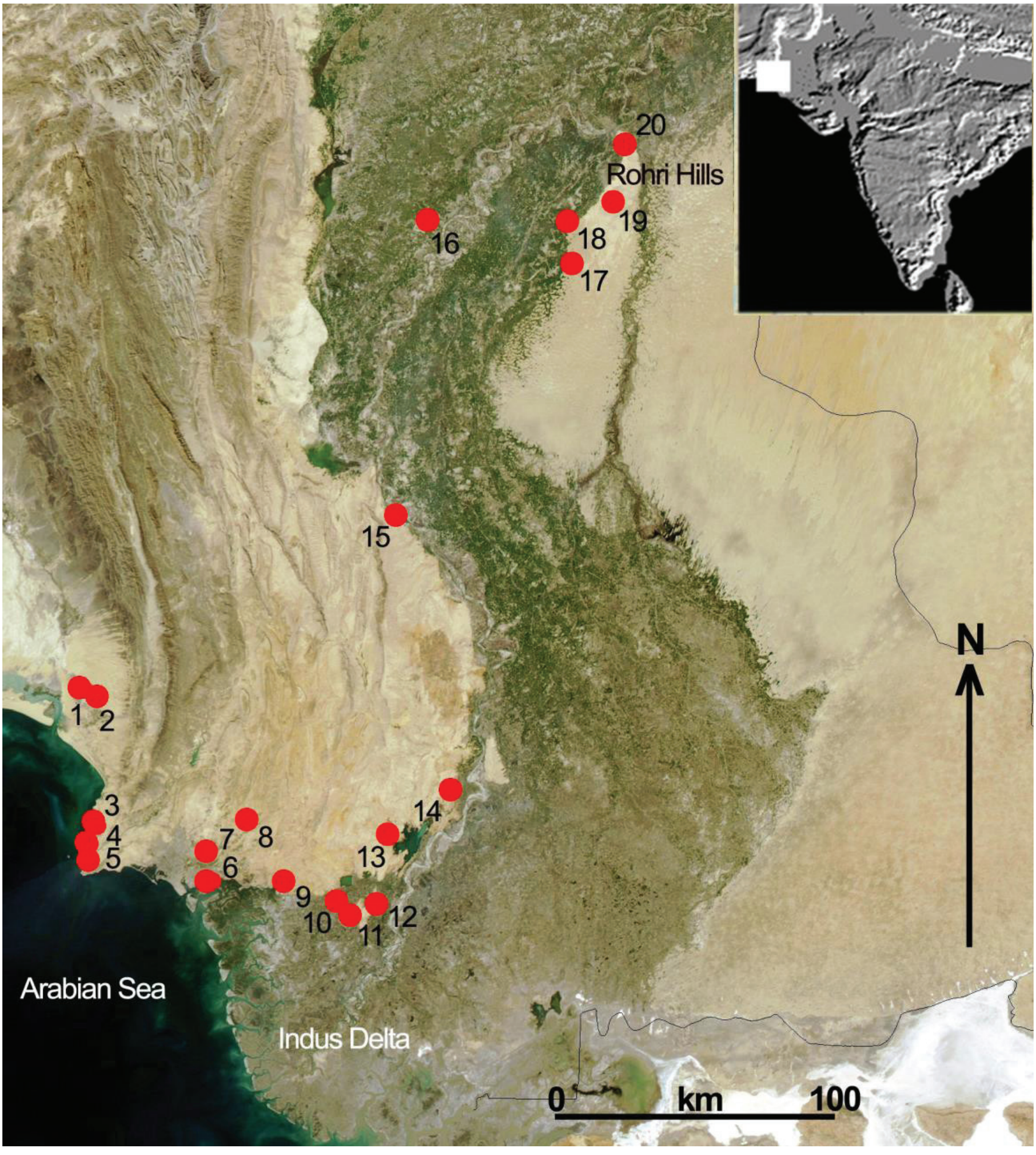

Figure 23 – Approximate location of the most important archaeological sites mentioned in the text, independently from their age and cultural attribution. Lake Siranda (1), Balakot (2), Capes Gadani and Phuari (3), Daun Bay (4), Sonari (5), Rehri (6), Mulri Hills (7), Khadeji (8), Gharo (9), Tharro Hills (10), Shah Husein (11), Makli Hills (12), Jhimpir (13), Ongar (14), Amri (15), Monenjo-Daro (16), Thar Lakes District (18), Seeraj-ji-Takri (19), and Aror (20) (drawing by P. Biagi).