

The First Excavation Season at the Early Bronze Age Settlement of Ras Al Jinz RJ-3

Valentina M. Azzarà & Alexandre P. De Rorre

ABSTRACT:

This paper presents the results of the first excavation season at the Early Bronze Age settlement of Ras Al Jinz RJ-3, in the coastal southern Sharqiyyah. Unexplored until the recent excavation campaign, except for a small sounding excavated during the 1990s by the Joint Hadd Project (JHP), the Um An Nar site of RJ-3 most likely formed a single, large settlement with the site of RJ-2, located on the other side of the bay, and explored for over two decades in the frame of the JHP. Based on preliminary survey, the distribution of surface material at RJ-3 hinted at a specialised area, related to different sorts of craft activities. The results of the current season of excavation confirm the presence of craft-related areas, at least for the most recent Um An Nar occupations, which were extensively excavated. Furthermore, a series of deep trenches shows the presence of three periods of occupations, spanning from the late Neolithic to the end of the Um An Nar period, and with an intermediate phase that might be ascribed to the very beginning of the Bronze Age. Although the chronological frame of this occupation needs to be verified through further explorations, a stratigraphic sequence of over 2.5 m is quite exceptional in the coastal contexts of the area. Besides, shall the presence of a Hafit phase be confirmed, the site would display a continuity of occupation so far unique in coastal Sharqiyyah.

KEYWORDS: Early Bronze Age, Um An Nar period, Settlement areas, Craft activities, Oman.

موسم التنقيب الأول في مستوطنة العصر البرونزي المبكر في رأس الجنز (RJ-3) فالتنتينا م. أزارا

الملخص:

تعرض هذه الورقة نتائج موسم التنقيب الأول في مستوطنة العصر البرونزي المبكر في رأس الجنز (RJ-3) على الساحل الجنوبي من محافظة الشرقية. ومن المرجح أن موقع فترة أم النار في رأس الجنز ٣ الذي لم يكن مستكشفاً حتى حملة التنقيب الأخيرة، باستثناء موقع المجلس الصغير الذي تم التنقيب عنه في التسعينيات من القرن العشرين بواسطة مشروع الحد المشترك (JHP)، قد شكل مع موقع رأس الجنز ٢ (RJ-2) مستوطنة واحدة كبيرة، حيث يقع رأس الجنز ٢ على الجانب الآخر من الخليج. وقد تم استكشافه لأكثر من عقدين من الزمان وذلك في إطار مشروع الحد المشترك. واستناداً إلى المسح الأولي، فقد أشار توزيع المواد السطحية في رأس الجنز ٣ إلى وجود منطقة متخصصة تتعلق بأنواع مختلفة من الأنشطة الحرفية. وتؤكد نتائج الموسم الأخير من التنقيب وجود مناطق ذات صلة بممارسة الحرف، وذلك على الأقل بالنسبة لأحدث استيطان من فترة أم النار. وقد تم التنقيب في هذه المناطق على نطاق واسع. علاوة على ذلك، تظهر سلسلة من الخنادق العميقة وجود ثلاث فترات من الاستيطان، تمتد من أواخر العصر الحجري الحديث إلى نهاية فترة أم النار مع ودود مرحلة وسيطة يمكن أن تُنسب إلى البداية المبكرة من العصر البرونزي. وعلى الرغم من أن الإطار الزمني لهذا الاستيطان يحتاج إلى التأكد منه من خلال مزيد من الاستكشافات، إلا أن التسلسل الطبقي الذي يزيد عن ٢,٥ متر يعتبر استثنائياً جداً في السياقات الساحلية للمنطقة. إلى جانب ذلك، ففي حالة تأكيد وجود مرحلة حفيت، فإن الموقع سيعرض استمرارية استيطان فريدة من نوعها حتى الآن في ساحل الشرقية.

الكلمات المفتاحية: العصر البرونزي المبكر، فترة أم النار، مناطق الاستيطان، الأنشطة الحرفية، عُمان.

INTRODUCTION

Located at the easternmost tip of the Arabian Peninsula, and bordered by the most oriental fringe of the Al Hajar Mountains - the Jabal Salim Bin Khamis -, the bay of Ras Al Jinz is part of the niyabat of Ras Al Had, which separates the Gulf of Oman and the Indian Ocean (Figure 1-2). The

region is characterised by a broad spectrum of natural resources, both terrestrial and marine, which have led to an intense exploitation of the territory from the Neolithic onwards (Cleuziou and Tosi, 2000: 19).

The area constitutes a broad archaeological compound, with a continuous occupational history from the 6th millennium BCE onwards,

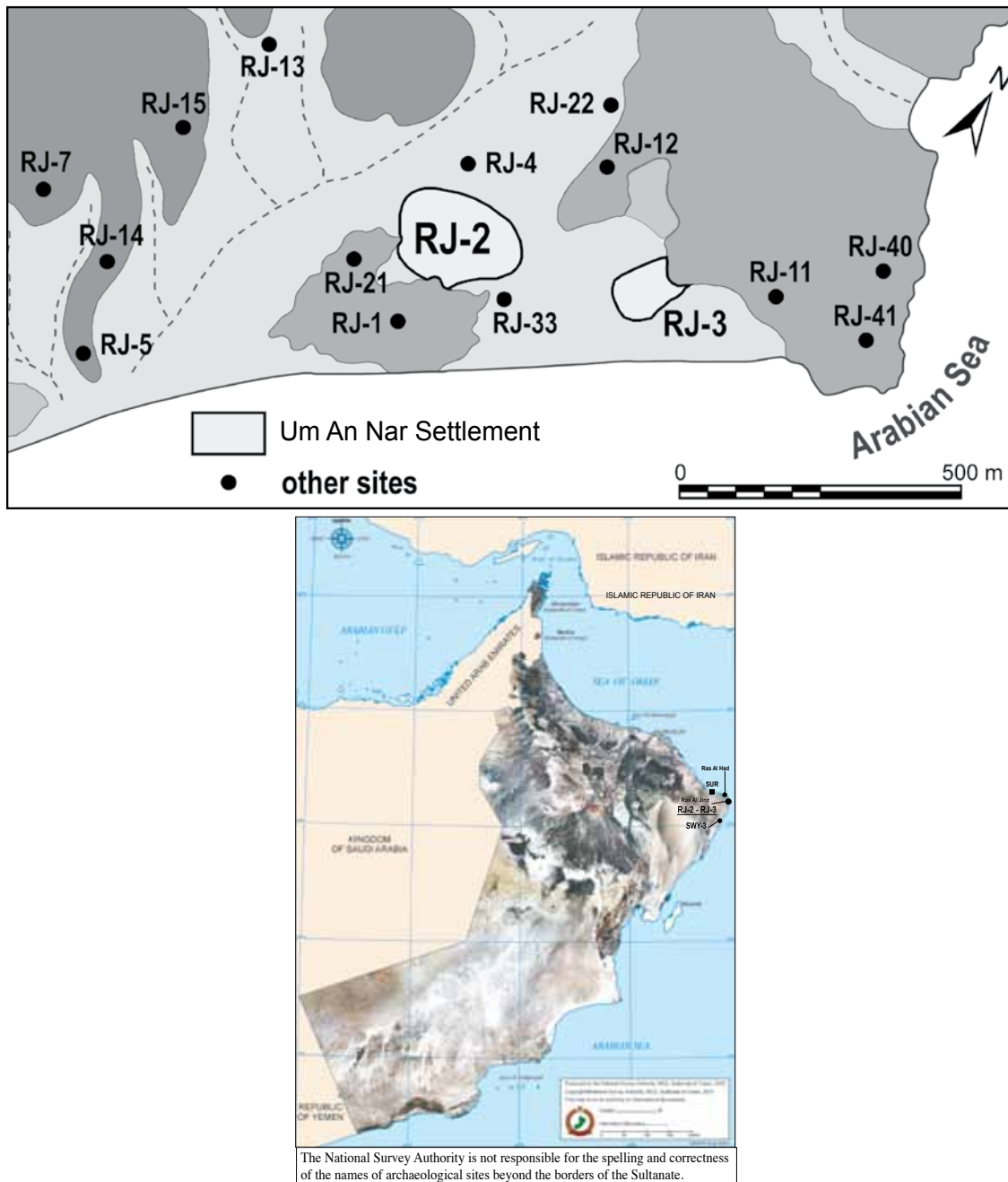


Figure 1: *Map of the Oman Peninsula with the localisation of Ras Al Jinz and other locations cited in the text (map: V. Azzarà, on a base map of H. David); map of the Ras Al Jinz bay, showing the UAN settlements of RJ-2 and RJ-3 and the position of other sites in the area (map: V. Azzarà, redrawn after Cleuziou & Tosi 2000: fig. 4).*



Figure 2: *The bay of Ras al-Jinz, view from the north-west (photo: Y. Guichard).*

representing a unique complex in the regional landscape. Accordingly, the main excavated occupation, RJ-2, is one of the foremost Early Bronze Age (EBA) settlements in the region, providing a well-documented sequence of more than 500 years throughout the Um An Nar period (UAN, ca. 2600/2500-2000 BCE) (Azzarà, 2018; Azzarà and De Rorre, 2018; Cleuziou and Tosi, 2000).

The site, in particular, provides solid evidence for (direct or indirect) interactions with overseas regions, hinting at somewhat prominent position of the settlement in the regional exchange network; however, the area of Ras Al Jinz does not provide effective terrestrial connections with the inland, and the bay does not offer suitable shelter for large ships. On the other hand, RJ-2 yielded a large amount of bitumen slabs from boat caulking (Cleuziou and Tosi, 1994) and we may assume that the area participated at a secondary level to a system of sea-shipping involving major ports-of-trade and smaller berthing locations (cf. Azzarà, 2018). Conversely, we can suppose that the area presented

a natural harbour during the EBA, and was then more favourable to berthing activities. If this was the case, variations of the geomorphological setting should be observable within the bay; the site of RJ-3, located at the opposite side of the bay, and closer to the seashore, represents the ideal spot to delve into this question (cf. Figure 1). Unexplored until the recent excavation campaign, with the exception of a small sounding conducted during the '90, the Um An Nar site of RJ-3 most likely formed with the site of RJ-2 a single, large settlement, extended on 3 or 4 ha (Figure 3).

Aiming at a broader comprehension of the EBA settlement complex of Ras Al Jinz, the Archaeological Project at Ras Al Jinz RJ-3 was established in 2018 under the direction of V. Azzarà and A. De Rorre, with a long field-campaign at the beginning of 2018, financed by the National Geographic Society. Preliminary sounding, required to assess stratigraphic sequence and plan field-strategy, was conducted during the 2017 campaign of the Ra's al Jinz Study Program, led by V. Azzarà (cf. Figure 6, cf. Azzarà, in preparation). The data



Figure 3: *The shallow mound of RJ-3 before the excavation, view from the north (photo: A. De Rorre).*

collected during the 2018 campaign allowed us to confirm and define more precisely the chronological frame established during preliminary explorations, corroborating the hypothesis of contemporary occupations at the two sites (cf. infra). The results of our recent excavations indicate as well that RJ-3 was a specialised area related to different sorts of craft activities, as suggested at first by the nature and the distribution of surface material. Besides, preliminary geomorphological data suggest that the area immediately adjacent to the site was marked by repeated variations of the sea level through time.

METHODOLOGY

The project implies a multi-scalar and multi-method approach. The stratigraphy detected in the preliminary sounding conducted in 2017 displayed aceramic anthropogenic layers, related to Neolithic occupations, obliterated by thick aeolian sediments, which were covered in their turn by 100-120 cm of

intensively anthropised EBA deposits, marked by Indus and Um An Nar ware.

Based on data collected through this test-trench, surface surveys and finds collection conducted over the years by the Joint Hadd Project directed by S. Cleuziou and M. Tosi, our work strategy combined large scale excavations and deep trenches (Figure 4).

The latter have exposed the benches of seasonal wadis running through the site, allowing to document the possible extent, the material culture and the chronological frame of both Neolithic and Bronze Age occupations, while limiting the removal of later deposits. Besides, the vertical sequences have been documented and sampled to analyse the geomorphological setting of the bay (cf., e.g., Berger et al, 2013); the study, complemented by the geophysical survey of the area, was conducted by J.-F. Berger and his team, in the frame of a collaboration between the Ras Al Jinz Archaeological Project and the ANR NEO-Arabia.

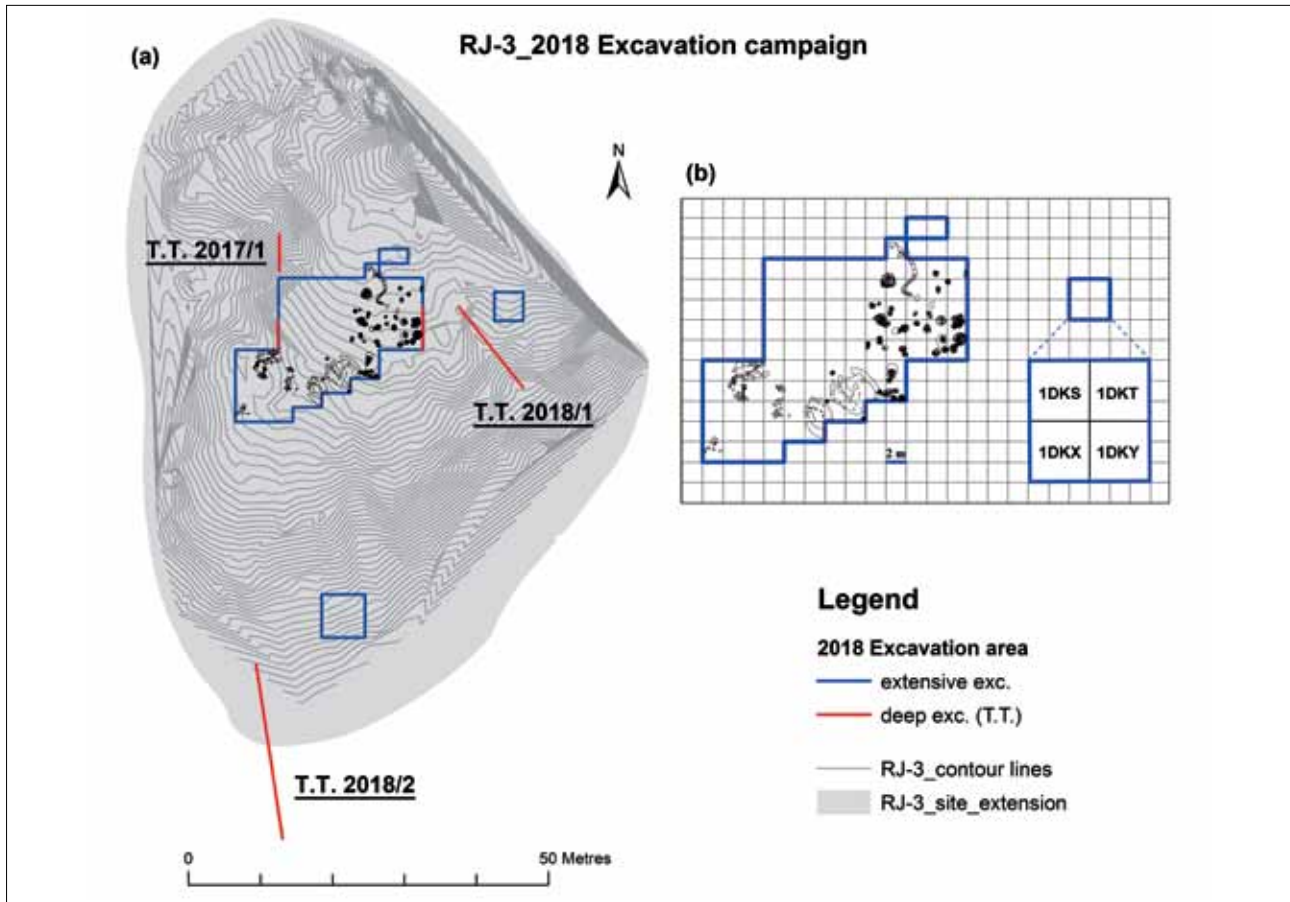


Figure 4: (a) map of RJ-3, indicating the position of extensive excavation areas and deep trenches excavated during the 2018 field campaign; (b) map showing the alphanumeric grid system used for the setting of soundings and the recording of finds retrieved in situ and by sieving (map: V. Azzarà).

Extensive excavation has focused on EBA vestiges (Figure 5). Stratigraphic digging aimed at in situ 3D recording of finds, complemented by systematic dry-sieving with 2 and 3 mm mesh and targeted wet-sieving of soil samples; a soil sample was also collected for every SU/quadrat. All excavation contexts were mapped through an electronic theodolite (Leica TPS 300) and through ortho-rectified photomosaics (Agisoft Photoscan Pro). These data have been processed through intrasite analyses in a GIS environment (ArcMap 10.0).

RESULTS OF THE 2018 EXCAVATION CAMPAIGN

As already pointed out, 2018 excavation season at RJ-3 focused on a series of goals defined following

the information gathered during preliminary investigations, goals that were reached through a strategy combining deep and extensive excavations.

A more precise definition of the cultural sequence was one of the main objectives for this season. Another fundamental query concerned the presence of craft-related areas and the configuration of productive activities, question aroused by the nature and the distribution of surface material. Finally, a campaign of geomorphological sampling was aimed at defining the geomorphological setting of the bay through time.

DEEP EXCAVATION TRENCHES

A total of five test trenches were dug in different zones of the site. Three of the trenches, rather



Figure 5: *The extensive excavation area opened at RJ-3 in 2018.*

extended in length and/or in depth, were aimed at defining the chrono-stratigraphic sequence of the settlement, while the remaining two, dug at the eastern and western limits of the excavation area, were mostly meant to verify specific stratigraphic issues. The stratigraphy has confirmed the presence of Neolithic levels (most likely dated to the 4th millennium BCE), and of a long Um An Nar occupation (c. 2600-2000 BCE), as we had supposed during preliminary investigations; besides, it has shown the presence of an intermediate phase, that might be ascribed to the very beginning of the Bronze Age (Hafit period, c. 3100-2600).

One of the trenches was the sounding excavated in 2017, T.T. 2017/1, which was reopened, and then extended both in depth and in length (Figure 6). From top to bottom, the sequence showed what seemed to be intensively anthropised blackish deposits on 40-60 cm, standing on top of greyish deposits marked by EBA pottery (Indus and Um An Nar ware), covering in their turn less anthropised deposits and, at the bottom of the sequence, a series of laminar, blackish

deposits dating back to the Neolithic. Following longer exposure to the elements, and in connection with the evidence observed on extensive excavation (cf. *infra*), the top, black layers, actually proved to consist of anthropogenic deposits intermingled by modern activities (i.e. mechanic excavation).

The remaining cultural layers, at the opposite, were in situ, and presented several sorts of structures (fireplaces, post-holes...); in the bottom layers, we recovered a series of large flint scrapers, typical of the 4th millennium BCE, confirming the presence of a Neolithic phase (eg. Borgi et al 2012; Charpentier 2001).

In addition, we could document an intermediate anthropic phase, stratigraphically located in between the Neolithic and the Um An Nar occupation, and separated from both by aeolian non-anthropogenic deposits. Such layer did not present EBA pottery, nor did it present typically Neolithic artefacts. Given its position, it is possible that the occupation is related to the beginning of the Bronze Age; radiometric data on samples collected during the current season, and



Figure 6: The test-trench opened at RJ-3 in 2017 (T.T. 2017/1). From the top, the sequence shows on the first 40-60 cm what seemed to be intensively anthropised deposits, which revealed to be intermingled layers disturbed by mechanical excavations in a recent past. Underneath them, the section documents three phases of anthropised layers in situ, interspaced by sterile deposits, and related, from top, to an Um An Nar occupation, an EBA-possible Hafit occupation and a Neolithic occupation (photo: V. Azzarà).

possibly extensive excavation during the following campaigns, shall offer more solid evidence for the likelihood of having a Hafit occupation on site.

The first test-trench of the current season, T.T. 2018/1, was dug up along the filled-up remains of a seasonal wadi, in the north-eastern sector of the settlement (Figure 7a). The trench, 14 m in length, was deepened in two points, for a total length of 4 m, where we reached the virgin soil underneath the human occupations, at a depth of 3 m. To the east, the stratigraphy indicates three distinct occupations, marked by intensively anthropised blackish deposits, interspaced by aeolian or little anthropised deposits. The deposits at the bottom of the sequence, about 280 cm underneath the surface, have delivered a fragmented

hook made by mother of pearl (Figure 19.5), which can be positively ascribed to the Neolithic; comparisons for this kind of implement can be actually found at several Neolithic sites along the Omani coast, such as Khabba KHB-1 (Cavulli and Scaruffi 2012), Ras Al Had HD-5 (Borgi et al. 2012), Ra's al-Hamra RH-5 (Marcucci et al. 2011). To the west, the anthropisation appeared to be less intense; however, Bronze Age structures and deposits have been documented on at least 150 cm from the top. About 150 cm underneath the surface, the sequence presented a structure made of large, uneven stones, which yielded a large metal blade (Figure 18.6). On top of it, the occupation was marked by a large stone-lined fireplace (180 cm in diameter), consisting of regularly fitted angular stones

of medium size (c. 20 cm).

The T.T. 2018/2 (Figure 7b, 8) was excavated in the south-eastern area of the site, towards the sea, on 24 m (of which 13 were drawn, Figure 8) in order to verify the passage between anthropogenic levels and natural beach levels, and define the geomorphological conformation of the bay during the occupation and before it. As a whole, this trench presented extremely interesting evidence. It allowed us to document again a long occupational sequence, from the Neolithic to the Um An Nar period, although the total depth of the deposits is much thinner than in the northern area of the site. The sequence might show marine transgressions and/or sea-level retreats, and possibly the presence of a small lagoon, or a small humid depression (Berger and Grugnaux, 2018). A series of soil samples have been collected for sedimentological, geophysical and geochemical analyses, and the results of the analyses will elucidate the different hypotheses.

EXTENSIVE EXCAVATION AREAS

Along with the excavation of deep trenches, the field work encompassed extensive excavation, to verify the distribution of evidence on the large scale and the possible functionalisation of different areas. As a whole, we opened 344 m², using as an alphanumeric reference grid of 2 by 2 m² (cf. Figure 4).

We launched extensive operations by opening



an area of 10 x 10 m² on the topmost area of the site, not far from the trench itself. Immediately after the scraping of the surface layers, however, it was evident that the area had been disturbed in a recent past by mechanical excavations, which had left on the field the characteristic traces of a caterpillar track and bucket teeth (Figure 9). The layers were disturbed and intermingled on about 50-60 cm, similarly to the situation noticed in T.T. 2017/1 (cf. supra). Although it has not been possible to define how many centimetres (or metres) had been removed from the site, it was possible to delimit the area affected by the mechanical excavation both on the southern and on the eastern limit. Underneath the disturbed layers, we could document a greyish sandy level, related to occupations still in situ; only partially explored during this season, this layer corresponds to the last UAN occupation documented in T.T. 2017/1.

Immediately to the east of this area, a second sector of 10 x 10 m² revealed the presence of layers in situ, marking the last EBA occupation as well, and yielding a complex of firing structures documented on at least three successive levels. On the very top of the surface, the area presented numerous structures, and in particular a cluster consisting of two parallel alignments of small stone-lined fireplaces associated with a larger and more complex hearth, located to the east and measuring about 150 cm in diameter (Figure 10).

Very similar, large fireplace was located on the other side of the alignment, although it is not clear if this structure was i) self-standing, ii) if it was associated with the double alignment documented to



Figure 7: (a) Test-trench 2018/1, showing a sequence of anthropic and non-anthropic deposits on a depth of ≈ 3 m. The deposits at the bottom of the sequence have delivered a fragmented shell hook typical of the regional Neolithic occupations; (b) Test-trench 2018/2, excavated at the eastern limit of the site. The trench allowed detecting episodes of marine transgression and possible evidence of a paleo-lagoon (photos: V. Azzarà).

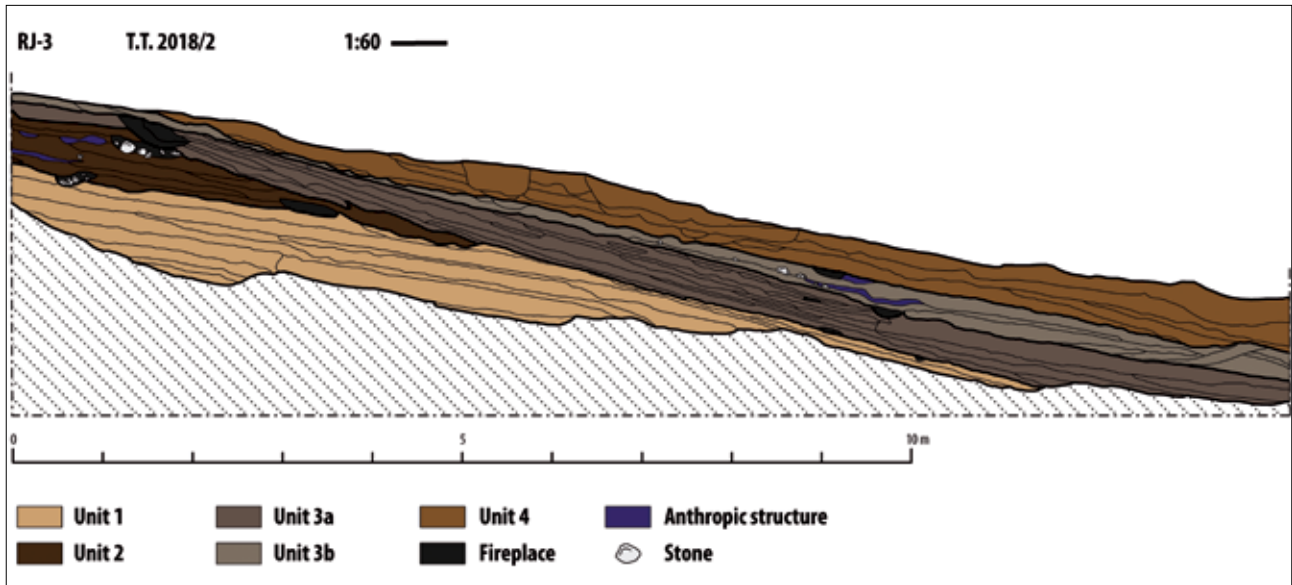


Figure 8: *T.T. 2018/1*, excavated between *RJ-3* site and the beach. The section represents the main lithostratigraphic units, each one presenting several sub-units (drawing: V. Azzarà).



Figure 9: Zenithal image showing the traces of caterpillar track and bucket teeth detected in the surface layers of the first extensive sounding (photo: A. De Rorre).

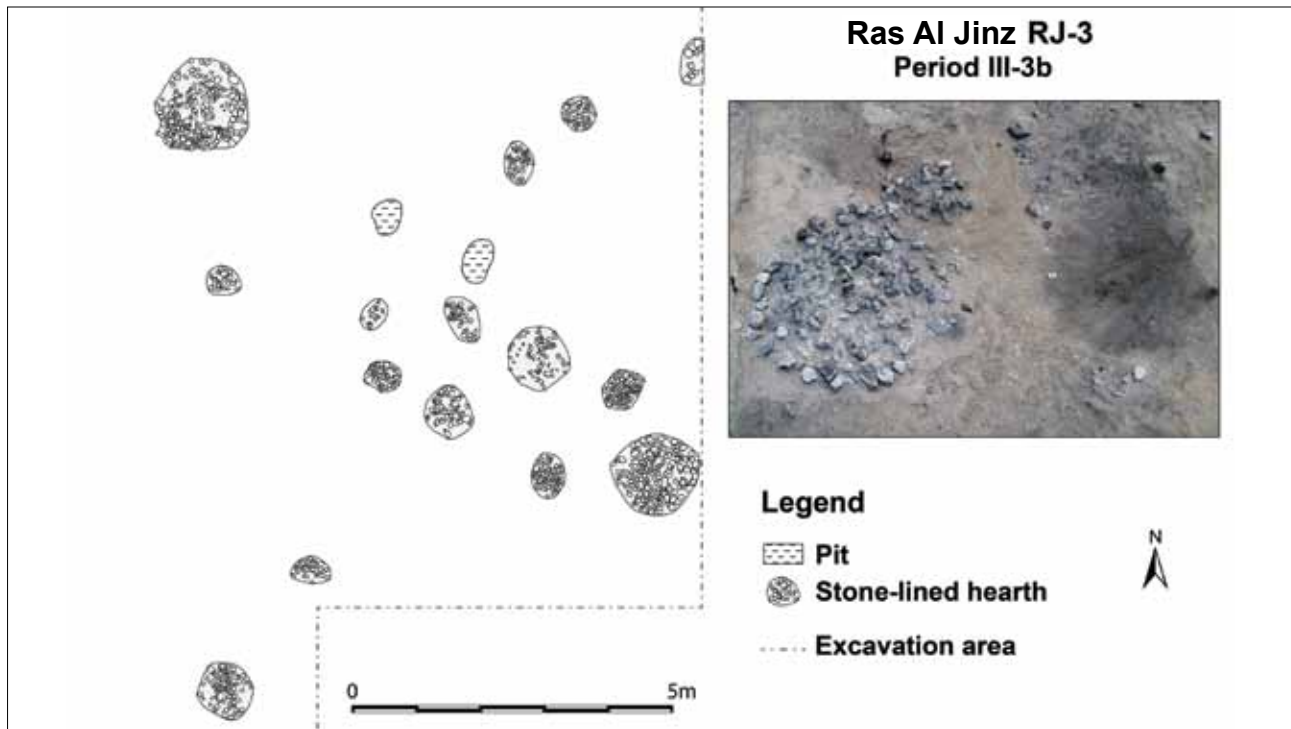


Figure 10: *The structures related to the occupation labelled as Period III-3b, consisting of a double alignment of small fireplaces, associated with larger hearths located to the north-west and to the south-east (plan: V. Azzarà).*

the east, and perhaps smaller structures in between were removed, iii) or if it formed a similar cluster with structures that would have been located to the west, in the area disturbed by mechanical activities, as it might be suggested by the disrupted remains of fireplaces in this sector.

The second level from the top presented a less regular arrangement, although the area was already marked by numerous fireplaces; the two large hearths documented on the topmost level were already in use during this occupation, which presents another large structure to the west, surrounded by small fireplaces, and two shallow pits probably used as dumping spots when cleaning the fireplaces (Figure 11). In both cases, the fireplaces were associated to loose, sandy layers, greyish to dark grey, characterised by tossed faunal remains (mainly rests of mytilidae and fish bones).

The third and most ancient level of fireplaces was set on top of a silty-clayey soil (SU 32, Figure 12), quite compacted, and marked once again by numerous faunal remains all over the surface; at times, such remains were clustered against the hearths, intermingled with ashy, dark grey to

blackish deposits.

Immediately south of this complex, we opened an area of 44 m², where we could reach the occupational level labelled to the north as SU 32. Contemporary to this level, we have documented the remains of at least one hut (labelled as S1 – Structure 1, Figure 13, background), and the possible rests of a similar structure, which seems to extend towards the south (S2, Figure 13, foreground). Marked by postholes and a calcified floor, S1 presented several clusters of unfinished artefacts, tools and wastes related to the manufacture of shell and stone ornaments.

More in detail, S1 consisted of the calcified remains of a roughly oval ephemeral structure, whose outer limits were indicated by a series of post-holes, most likely related to the installation of thin posts, as the average diameter of the negatives was of about 10-15 cm (Figure 14). The occupation surface was indicated by the presence of a calcified, extremely compacted layer, whitish-greyish in colour, reaching a depth of 15/20 cm in some points.

This suggest that the structure presented an in-

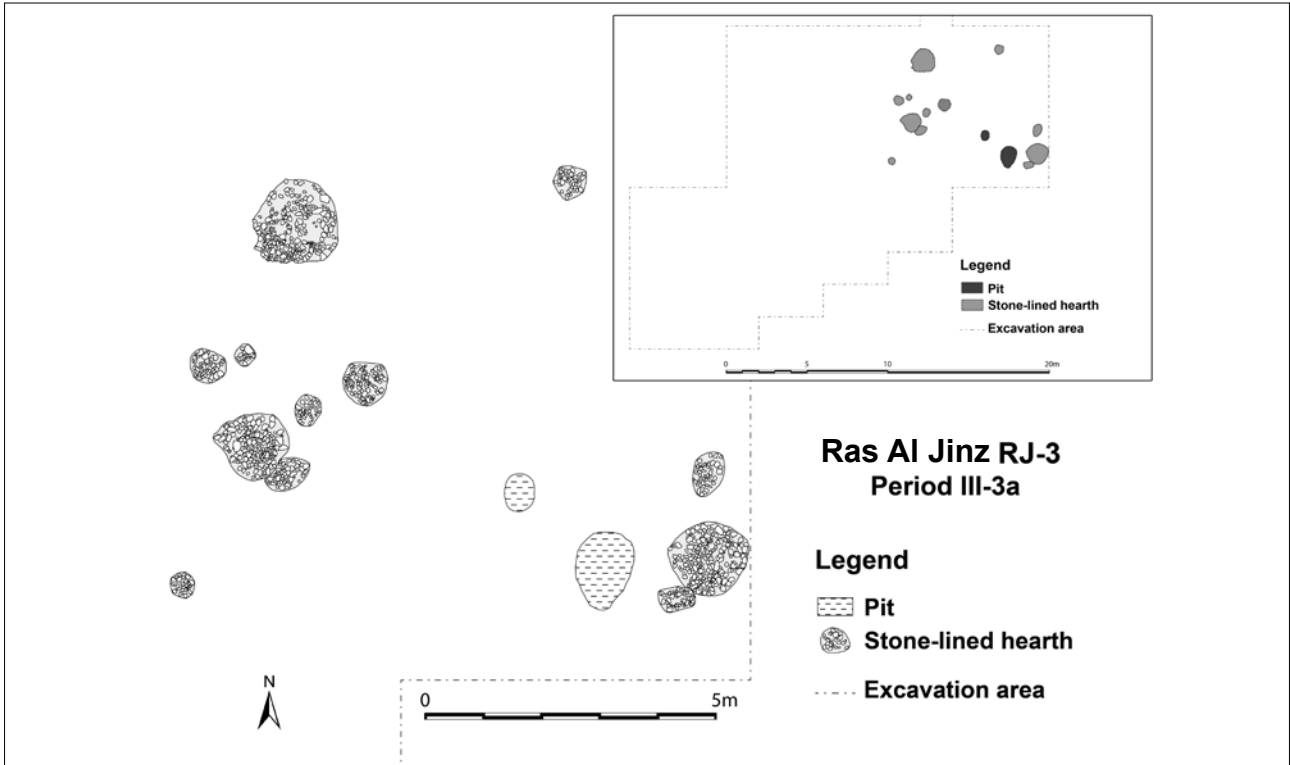


Figure 11: *The structures related to the occupation labelled as Period III-3a (plan: V. Azzarà).*

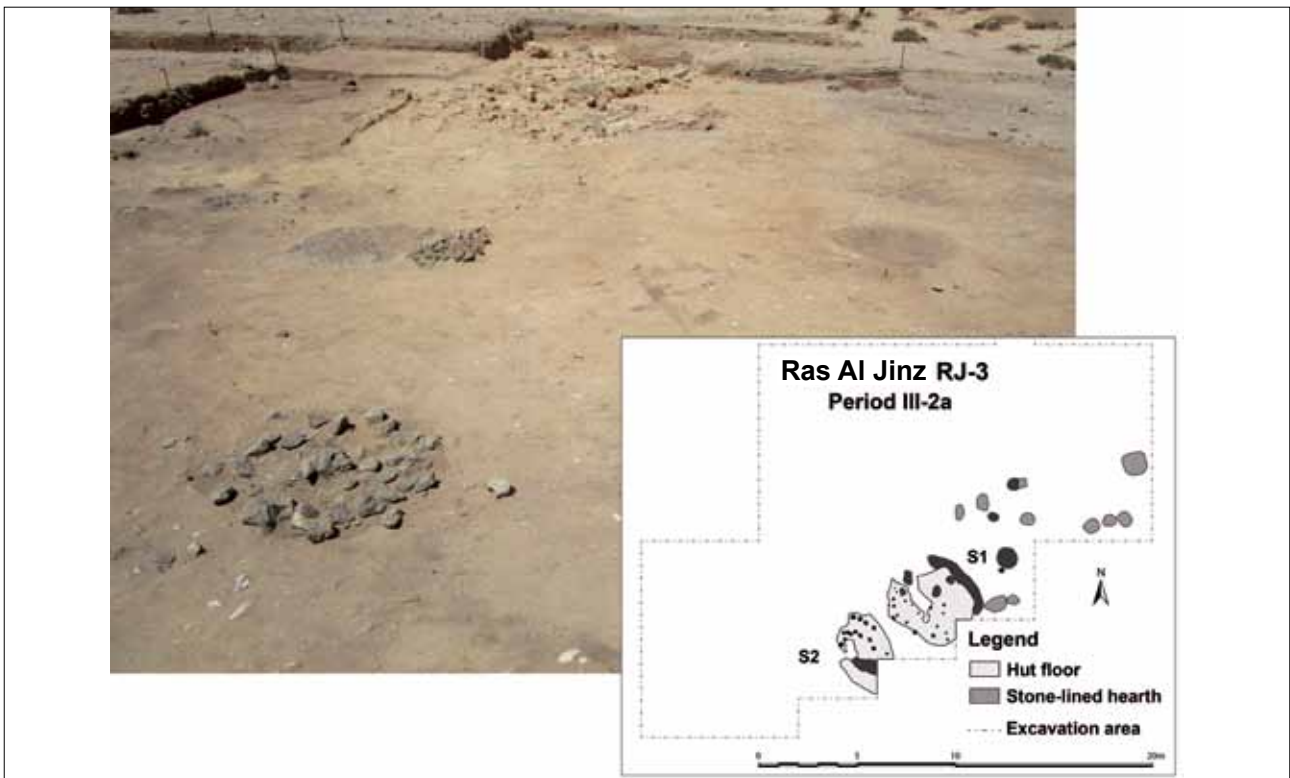


Figure 12: *The occupation labelled as Period III-2a, marked by the floor level SU 32, view from the south (photo, plan: V. Azzarà).*

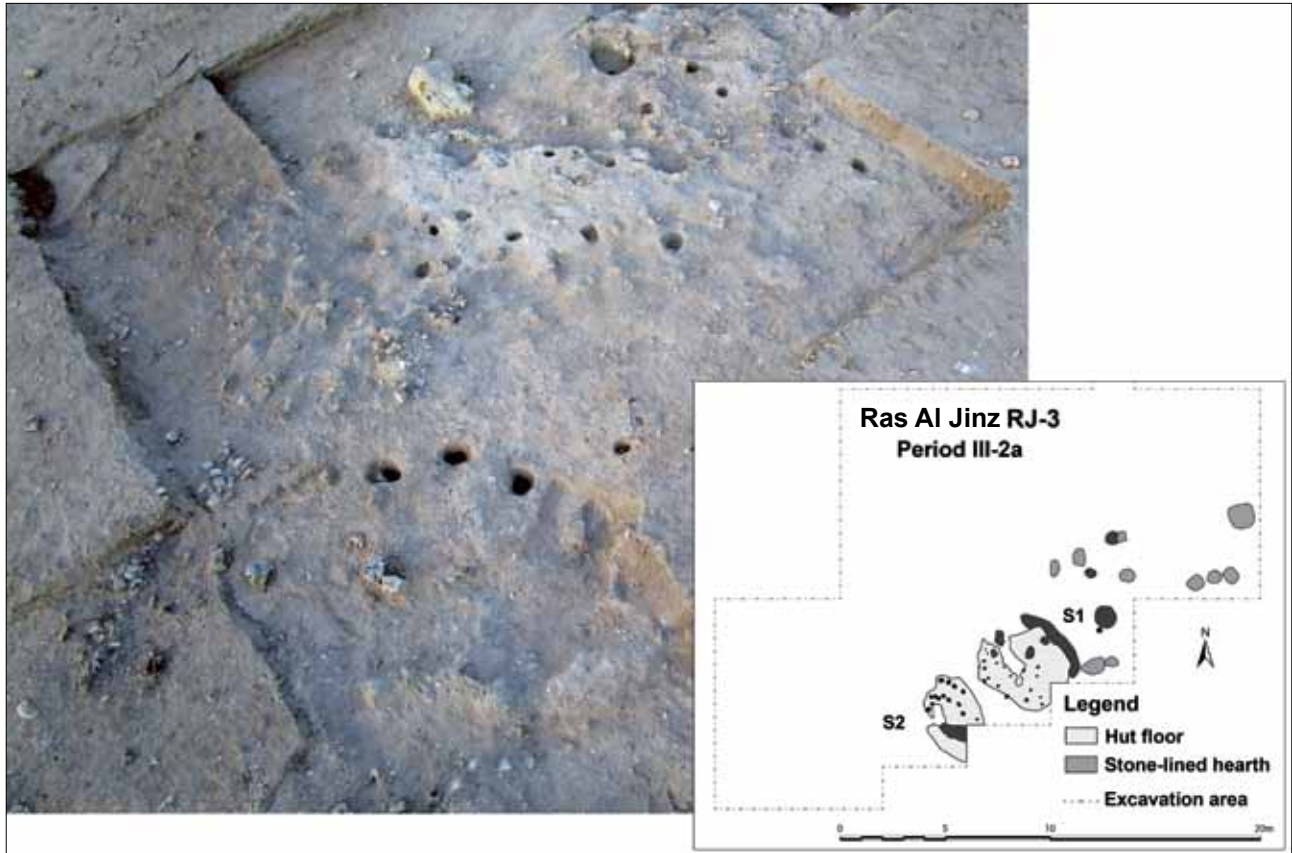


Figure 13: *The huts S1 (background) and S2 (foreground), marked by post-holes and by a calcified occupational floor, view from the south-west (photo: A. De Rorre; plan: V. Azzarà).*

built floor, more than a simple occupied surface; following the abandonment, the decay of organic materials deposited on the surface might have produced the calcified level marking the structure itself. The absence of a specific texture in the calcified remains, despite a meticulous cleaning of the vestiges, suggests that the organic material deposited on top of this floor could have consisted of leather, more than woven fibres.

The hut presented on the external side, to the east, a sort of deep foundation trench, that might have been deliberately filled to maintain the bottom of an ephemeral superstructure. On the internal surface, the shelter presented much smaller pits, roughly circular or oval, mainly used for storing different toolkits (Figure 15, 16d). Besides, on the northern side of the hut, two “Conus slabs” were located on top of one another (Figure 15, 16e); such groundstones consist of relatively regular slabs marked by a series of circular hollows, on one or

both the flat surfaces, used to maintain the spires of Conus shells during the production of standardised rings (cf. Charpentier, 1994).

Unsurprisingly, the area yielded numerous remains of Conus shells at different stages of processing (perforated and unperforated spires, discarded body whorls – both fragmented and entire –, unfinished rings, and so forth) (Figure 16a-c, 16f, 19.10-15). In addition, several elements in mother of pearl and quartz, at various stages of the operational sequences, indicate that the area was associated with the production of different types of ornaments (cf. Figure 19.1-4, 19.8). As a whole, the characteristics of the assemblage suggest that this area was functionally specific, and related to standardised specialised production of ornaments, and shell ornaments in particular.

Most likely, the hut was part of a larger complex of structures, as suggested by the remains of a similar vestiges, located to the west of the hut

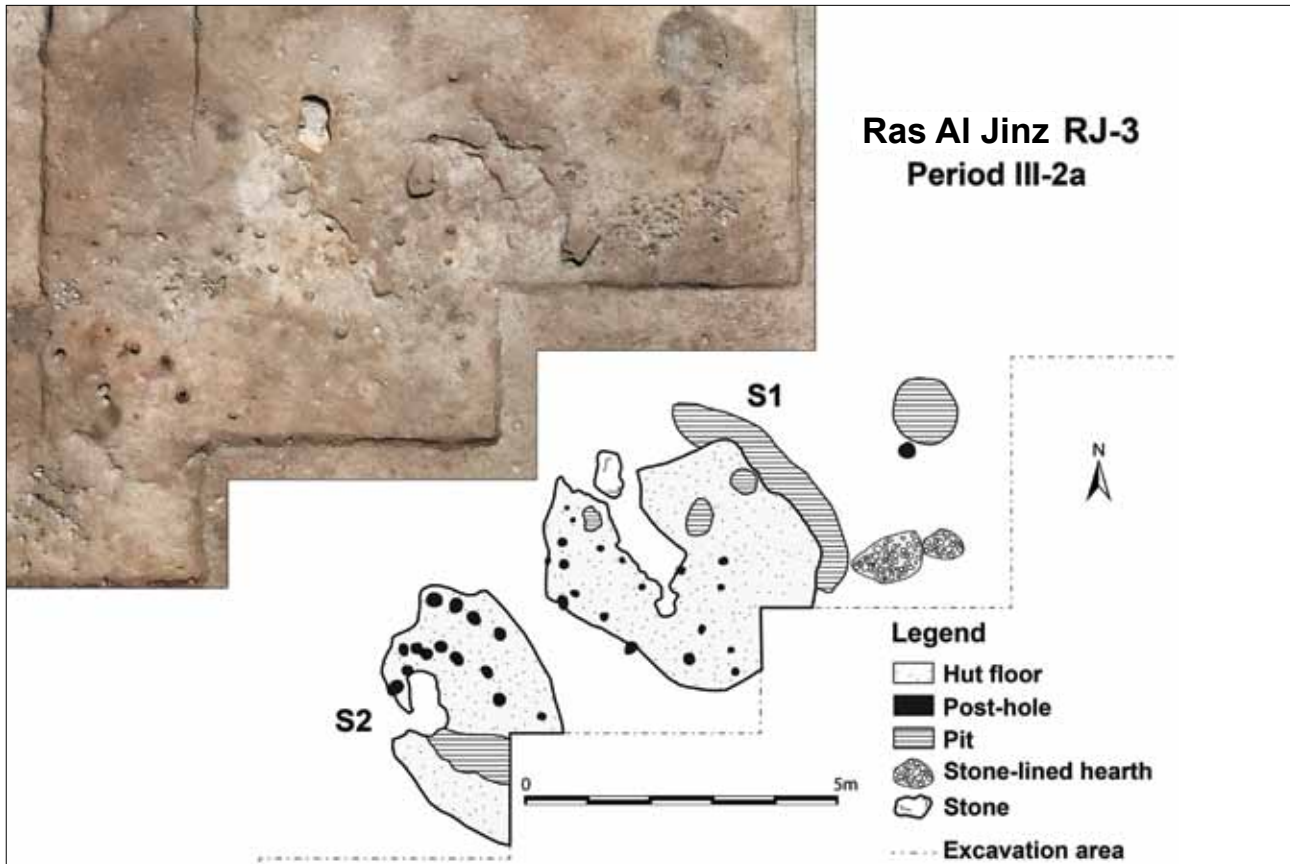


Figure 14: Zenithal photograph and plan of the huts S1 and S2 (photomosaic: A. De Rorre, X. Desormeau; plan: V. Azzarà).

S1, marked by the presence of post-holes and by a hardened occupational floor (S2, Figure 14, cf. supra). As the hut is so far incomplete, the area will be further explored during the next season of excavation, to verify the extension of this complex, and its characteristics.

Similar structures were actually detected at RJ-2, and they seem to be related to the second part of Period III at the site (Cleuziou and Tosi 2000); data concerning these structures are quite laconic, but the evidence of RJ-3 might shed new light on the remains of the nearby occupations at RJ-2 as well.

Underneath the level of occupation related to this functionally specific complex, we could document, to the north, what seems to be a large stone structure (S3, Figure 17). As it is stratigraphically located underneath such levels, the stone structure has been only partially exposed during the recent season. In its current form, the construction presents an external face made of large, squarish blocks, abutted

by an in-fill of small angular stones, deposited on several layers. So far, the structure lacks what would be the internal face of a double-sided wall, but further exploration will possibly clarify the spatial arrangement and the vertical depth of the construction, as well as its state of preservation.

The evidence exposed so far does not allow assuming any specific purpose for the structure. Although unlikely, it is possible that it served as a protection for more ephemeral dwellings; if this was the case, we shall find the physical traces of such remains at the level on which S3 was first installed. As a matter of fact, S3 is the most ancient feature uncovered so far in the extensively excavated area; based on the stratigraphic sequence, it is not associated with the firing complex, nor is it connected to the ephemeral huts that were located some 8/10 m south of it. Large pottery fragments found in association with the wall and the reutilisation of a *Conus* slab in the wall itself (Figure 17) confirm 2600 BCE as a terminus post



Figure 15: The hut S1, view from the north; on the foreground, a pit filled with lithic perforators and a “Conus slab” (photo: X. Desormeau).

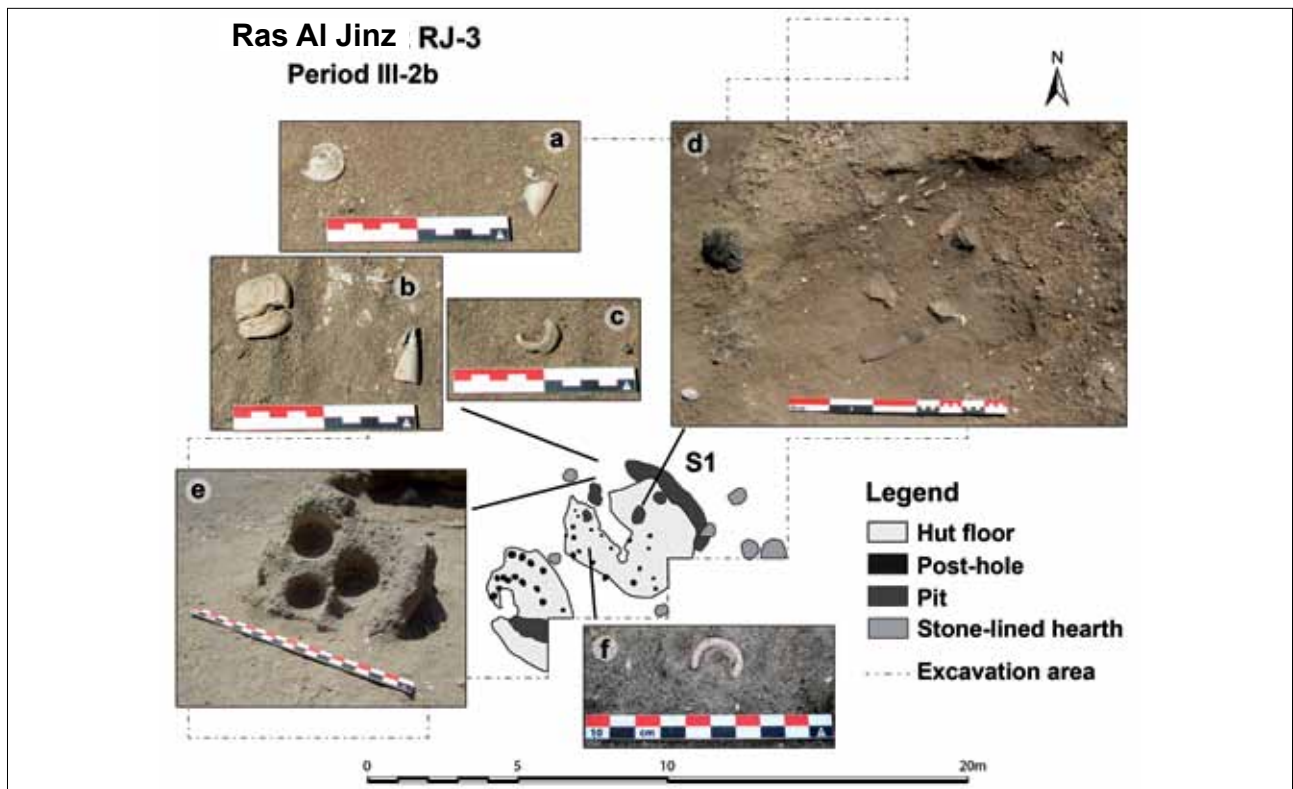


Figure 16: Plan of the huts S1 and S2, showing the position of different finds associated with S1: a) perforated spire and body whorl of Conus shells; b) broken spire and body whorl of Conus shells; c) broken unfinished ring of Conus; f) broken Conus ring; d) a pit filled with several lithic perforators; e) a “Conus slab” (photos, plan: V. Azzarà).

quem for the structure.

A possibly contemporary structural stone complex was identified on the westernmost limit of the excavation (S4, Figure 17). Here again, only the topmost level of the construction has been exposed during the current season; the structure, though, does not seem to present more than two or three courses of stones, and consists of east-west walls made of large, squarish slabs, and north-south partitions made of smaller blocks. The layers associated with this structure have yielded a series of artefacts that allows an attribution to the UAN period, such as copper/copper alloy artefacts and local UAN ware (Figure 17).

Finally, we briefly investigated a smaller sector located along the south-eastern limit of the settlement, some 30 m south of the main excavation

area, marked by alignments of very large, uneven stones, appearing on surface (labelled as S5). The comparison with similar evidence documented at RJ-2, on the eastern limit of the site, suggested the possible presence of an Iron Age hut; the material culture, however, did not allow a chronological attribution to the IA to date, and we shall wait for radiocarbon determinations and further exploration of the structure.

THE CULTURAL SEQUENCE

The stratigraphic evidence as shown by the sections of the test-trenches realised during the present season, combined with the results of extensive excavations, allows the definition of a tentative system of phases, which shall be refined

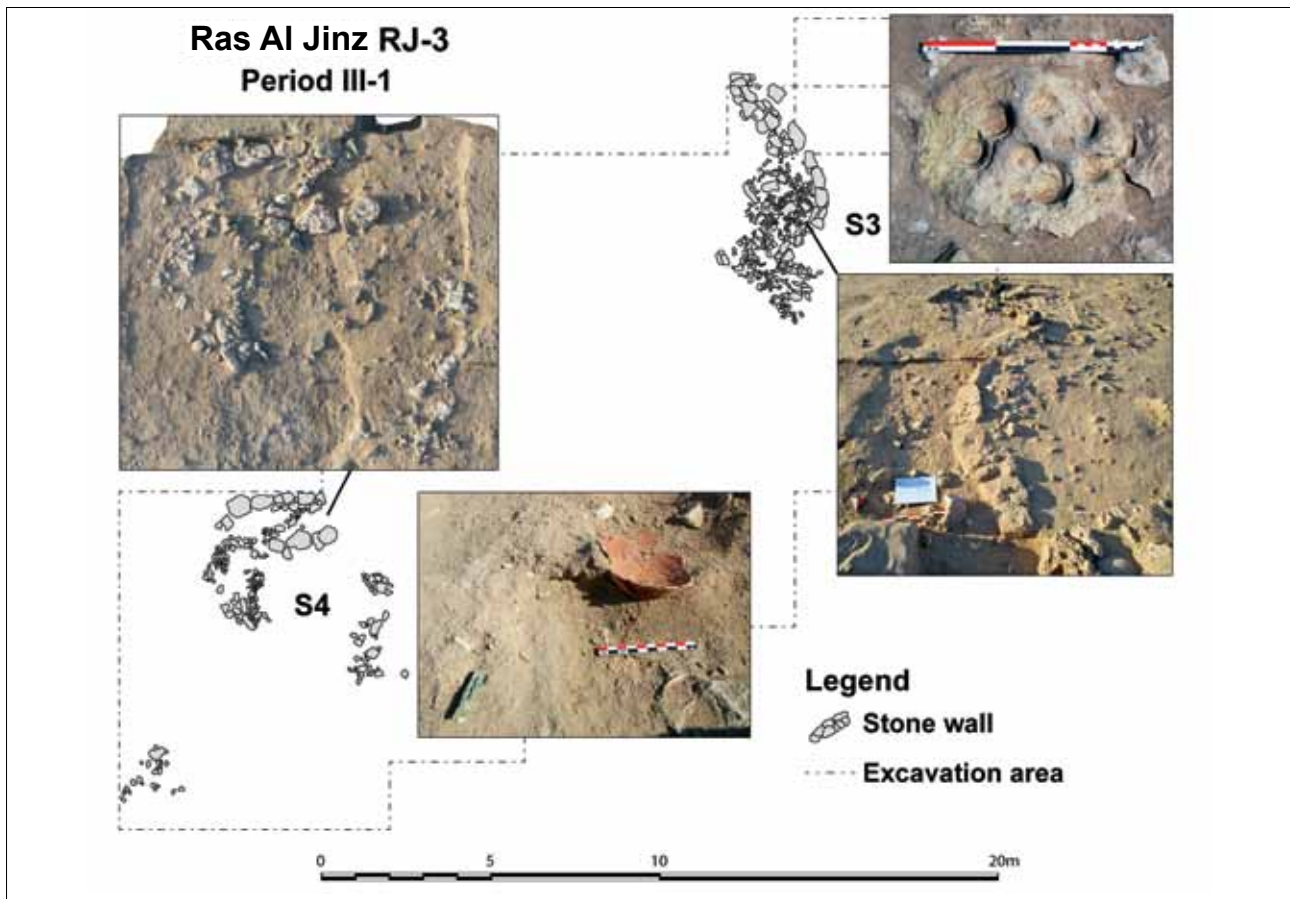


Figure 17: Plan of the stone structures S3 and S4; (top, right) the structure S3, view from the north, and the detail of a “Conus slab” recycled as an element of construction in the wall; (bottom, left) the structure S4, zenithal view, and a detail of pottery and copper tool abutting the wall (photos: V. Azzarà, A. De Rorre; plan: V. Azzarà).

during the following excavation campaigns. Besides, the results of C14 determinations on a series of samples collected during the current season confirm so far the chronology of the occupations, although this still needs to be defined more precisely.

The first occupation of the area, defined as Period I, was identified at the bottom of all the deep trenches excavated in various sectors of the site. This occupation can be ascribed to the Neolithic, based on both its stratigraphic position and the elements of material culture recorded within the deposits, namely lithic tools and a fishing hook made of nacre. These elements suggest that the area was settled during the 4th millennium BCE (Late Neolithic); a charcoal sample collected at the bottom of the sequence in T.T. 2017/1 indicate a radiocarbon date of 4490 ± 30 BP (sample RJ3_T1-16, 2σ 3332-3040 cal BC). The spatial extension of this settlement hints at regular occupation of the bay, more than at occasional frequentation. On top of this level, we could document an occupational phase ascribed to the Early Bronze Age, although it is not possible yet to define if the settling dates back to the very beginning of the EBA, or if it is related to the second half of the 3rd millennium BCE. This phase, which can be defined as Period II, is overlaid by the occupations positively dated to the Um An Nar period, which we shall label as Period III.

Large scale excavations have exposed so far at least three successive occupations related to the UAN (Period III); given that future excavations will help us refine the sequence and will expose additional occupations, we can tentatively consider the existence of three phases, labelled as Phase III-1 to Phase III-3. The most ancient (Phase III-1) would be related to the stone structures that have been partially exposed in the northern area (S3 and S4). On top of it, the occupation related to the ephemeral huts (S1 and S2), likely part of a functionally specific area involved in craft activities, would constitute Phase III-2; this phase presents at least two sub-phases, that can be labelled as Phase III-2a and III-2b. At the end of this occupation, the cluster of fireplaces, most likely constituting another functionally specific arrangement, could be comprised in Phase III-3, including so far two sub-

phases, Phase III-3a and III-3b. Although it is still difficult to define the occupational range within the UAN period, the presence of soft stone vessels of the Série Recente indicates that the settlement dates from at least c. 2300 BCE (e.g. Cleuziou and Tosi 2000); a few pieces of Bicolour Sandy Ware suggest as well that the site was still occupied at the very end of the 3rd millennium BCE (cf. Azzarà and De Rorre 2018). A radiocarbon date from a charcoal sample collected in T.T. 2018/2 suggests that the site might have been occupied earlier during the UAN period (sample RJ3_T2-5, 3960 ± 30 BP, 2σ 2565-2348 cal BC).

Should the date of the stone structure detected in the southern area of the site be confirmed, the settlement might also present an Iron Age occupation (Period IV), although this hypothesis needs to be confirmed by further explorations and analyses.

THE MATERIAL CULTURE

The analysis of ecofacts and artefacts detected during the 2018 excavation campaign is in process and will be completed during the following months. However, the preliminary results already offer significant clues on the occupation and the functional characters of the settlement, and allow the definition of a chronological setting.

Concerning the latter, as remarked above, the retrieval of a fishing hook made of nacre at the bottom of a test trench (Figure 19.5), together with the presence of lithic scrapers typical of the 4th millennium BCE, confirm the occurrence of a Late Neolithic occupation on site. At the other end of the sequence, the material culture could not confirm, so far, the presence of an Iron Age occupation, which is suggested by the characteristics of a stone structure detected in the south-eastern area of the site. The pottery, on the other hand, indicate that RJ-3 was occupied at the very end of the 3rd millennium; the site has yielded several potsherds of Bicolour Sandy Ware, a type of local pottery characterised by an orange surface and a sharply zoned grey core, very distinctive of the Final Um An Nar phase at RJ-2, and showing parallels at Khor Bani Bu Ali SWY-

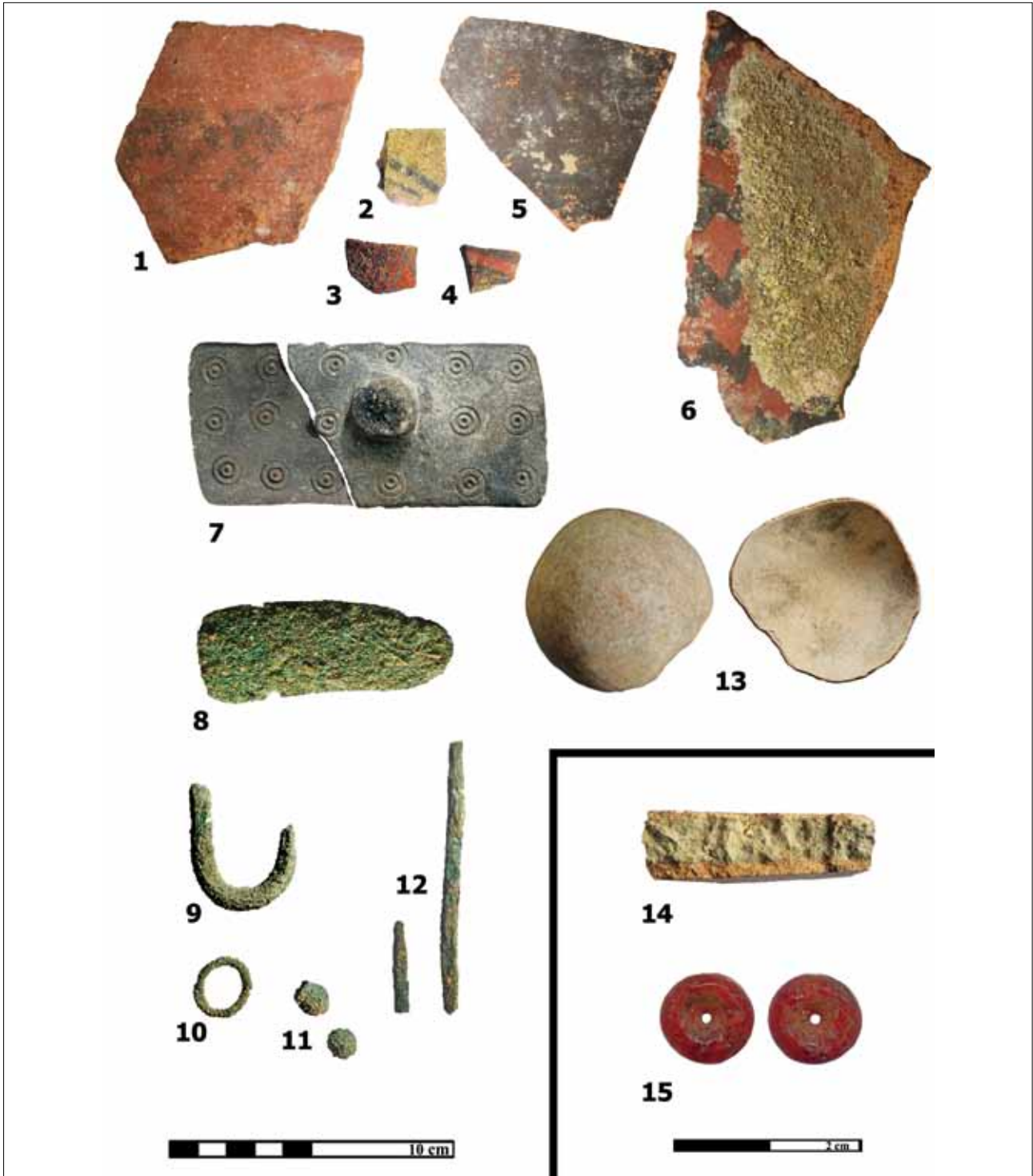


Figure 18: 1-3, 11) Examples of the potsherds detected at RJ-3: 1. Omani Black-on-Red Sandy Ware; 2. Omani Black-on-Buff Sandy Ware; 3-4. Omani Black-on-Red Fine Ware; 5. Indus Black Slipped Jar; 6. Indus Black-on-Red ware; 14. local Bicolour Sandy Ware (Final Um An Nar occupations). 7) Softstone rectangular lid with dot-in-circle decoration. 8-12) Elements of the metallic assemblage: 8. dagger/blade; 9. fishing hook; 10. ring; 11. beads; 12. punch. 13) The bottom of an ostrich eggshell. 15) Short-barrel carnelian beads (photos: RJ-3 Project).

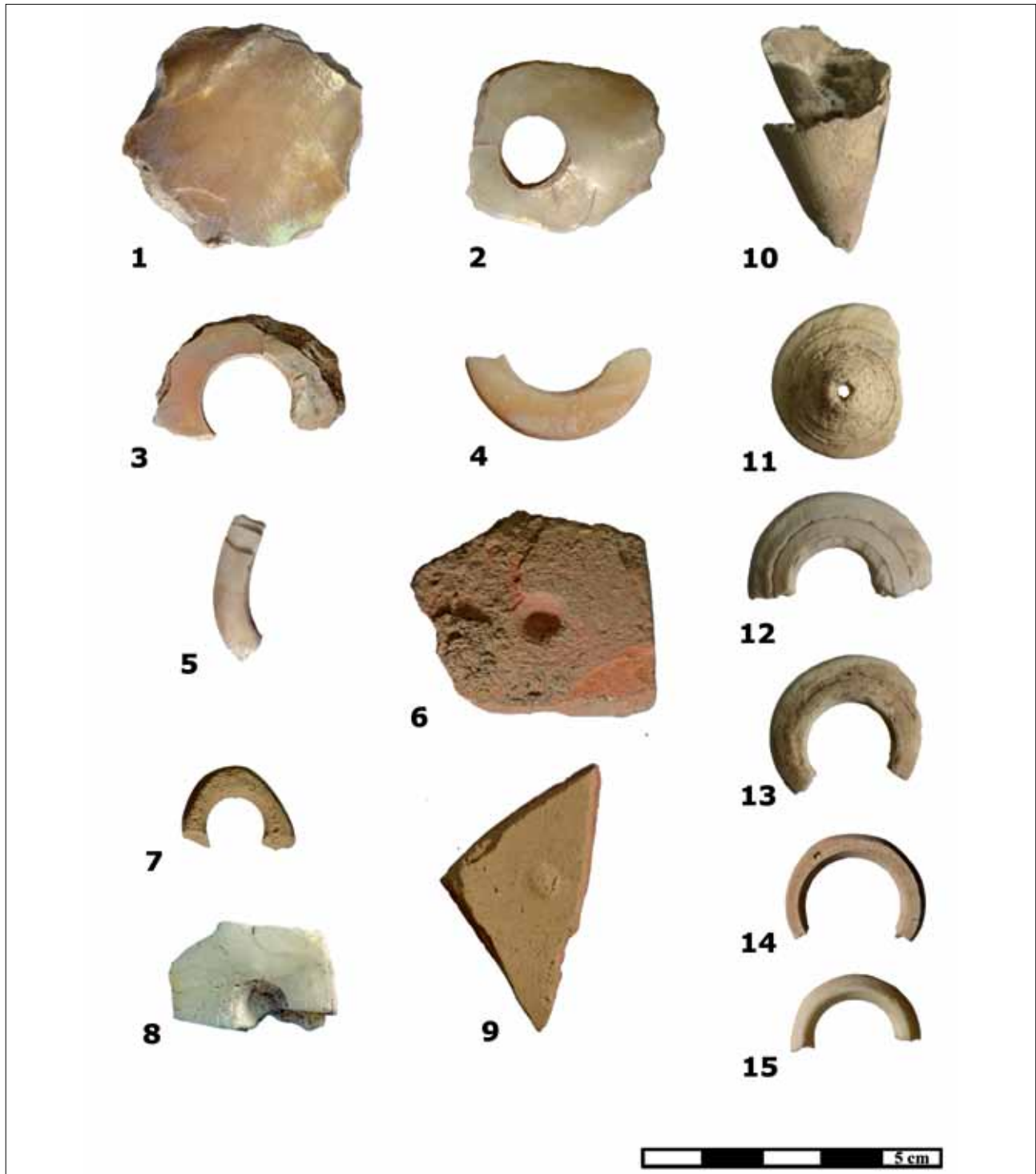


Figure 19: 1-4) Elements of *Pinctada m.* shell, related to the manufacture of nacre rings: 1. blank; 2-3. unfinished rings; 4. broken ring. 5) Fragmented hook made of nacre, detected at the bottom of T.T. 2018/2, typical of the Neolithic occupations. 6-7, 9) Elements of perforated pottery. 8) Small block of quartz with unfinished perforation. 10-15) Elements of *Conus* shell, related to the manufacture of *Conus* rings, indicating different phases of the chaîne opératoire: 10. body whorls; 11. perforated apex; 12-15. unfinished rings, different phases of processing (photos: RJ-3 Project).

3 (Figure 18.14) (cf. Azzarà and De Rorre, 2018; Cleuziou and Tosi, 2000; Méry and Marquis, 1998). More generally, the pottery collection, consisting so far of 579 sherds, mostly very fragmented, does not differ much from the assemblage of RJ-2 (cf. Cleuziou and Tosi 2000).

The corpus of local potteries is largely dominated by Sandy Ware, buff or red/orange, with several pieces of Black-on-Red (Figure 18.1) or Black-on-Buff Ware (Figure 18.2), comparable to the assemblage of other Early Bronze Age occupations in the region, such as Bat, al-Ziba, and Maysar 1 (e.g. Méry 2000; Schmidt and Döpfer 2016; Thornton and Ghazal 2016); Fine Red Painted Ware (Figure 18.3-4) is less frequent, similarly to the other settlement contexts in the area (cf. Cleuziou and Tosi 2000; Méry 2000); as already said, the site has also delivered a few pieces of Bicolour Sandy Ware (Figure 18.14; cf. Azzarà and De Rorre 2018).

Imported potteries mostly consists of Black-Slipped Jars of Indus origin (Figure 18.5), associated with other types of Indus pottery (Figure 18.6), which were largely widespread at RJ-2 (e.g. Cleuziou & Tosi 2000).

Similarly to RJ-2, RJ-3 has also yielded a series of fragments of softstone vessels, which are generally ascribed to the late UAN phases, and indicate more precisely 2300 BCE as a terminus a quo for the associated occupations. Among the vessels, it is significant the presence of a rectangular lid, complete although fragmented in two pieces, marked by the typical dot-in-circle decoration (Figure 18.7); the remaining sherds consist of seven fragments of decorated bowls, mostly rimsherds. Comparable artefacts have been unearthed at other settlements sites, such as RJ-2 (David 1996; Cleuziou & Tosi 2000), although these vessels have been predominantly found in funerary contexts (e.g. David 1996; 2011; Döpfer and Schmidt 2014).

The site has also yielded several elements of stone jewellery; out of 113 beads of different types, we remark in particular six short-barrel beads made of carnelian (Figure 18.15), and 75 micro-beads made of chlorite or synthetic enstatite.

As for the other elements of the material culture, preliminary surveys had shown a wide presence of artefacts related to the production of shell, stone and pottery ornaments. The field works have actually confirmed these observations, as we could retrieve in the excavated areas different indicators of activities, related to the various phases of the chaînes opératoires, such as raw materials, wastes of production or unfinished artefacts and finished goods as well (Figure 19), along with the associated toolkits (cf. supra).

In this regard, the massive presence of large lithic composite tools/perforators is noteworthy (Figure 20.5-8). Preliminary observations on the lithic toolkits show that out of 421 tools, either opportunistic or purposely made, perforators and broken perforators tips, would represent 60% of the total assemblage. These objects, always obtained on thick laminar supports, can be considered as functionally specific, as they were only associated with the production of *Conus* and nacre rings, and used during several phases of the operational sequence, such as the separation of the spires from the body whorl, the apex removal, or the perforation itself (cf. Azzarà, 2015; Charpentier, 1994; Hilbert and Azzarà 2012; Marcucci, 2004). The perforators were associated with *Conus* slabs (Figure 20.9), specific tools well documented at RJ-2 and considered as indicative of standardised production (e.g. Charpentier 1994).

In association with this evidence, groundstones of different sorts constitute another significant part of the assemblages at RJ-3, as 136 of these objects have been collected during the present season (Figure 20.1-4). More accurate study of these artefacts will allow defining the range of activities for which they might have been used. Given their concentration, and the general characters of the material assemblages on site, it is possible that these tools were related to specific production/manufacturing activities; at least 24 of these objects seem to have been used as files/polishers, while 15 can be classified as hammers and 19 as grinders and pestles.

The functionally-specific trait of the settled area,

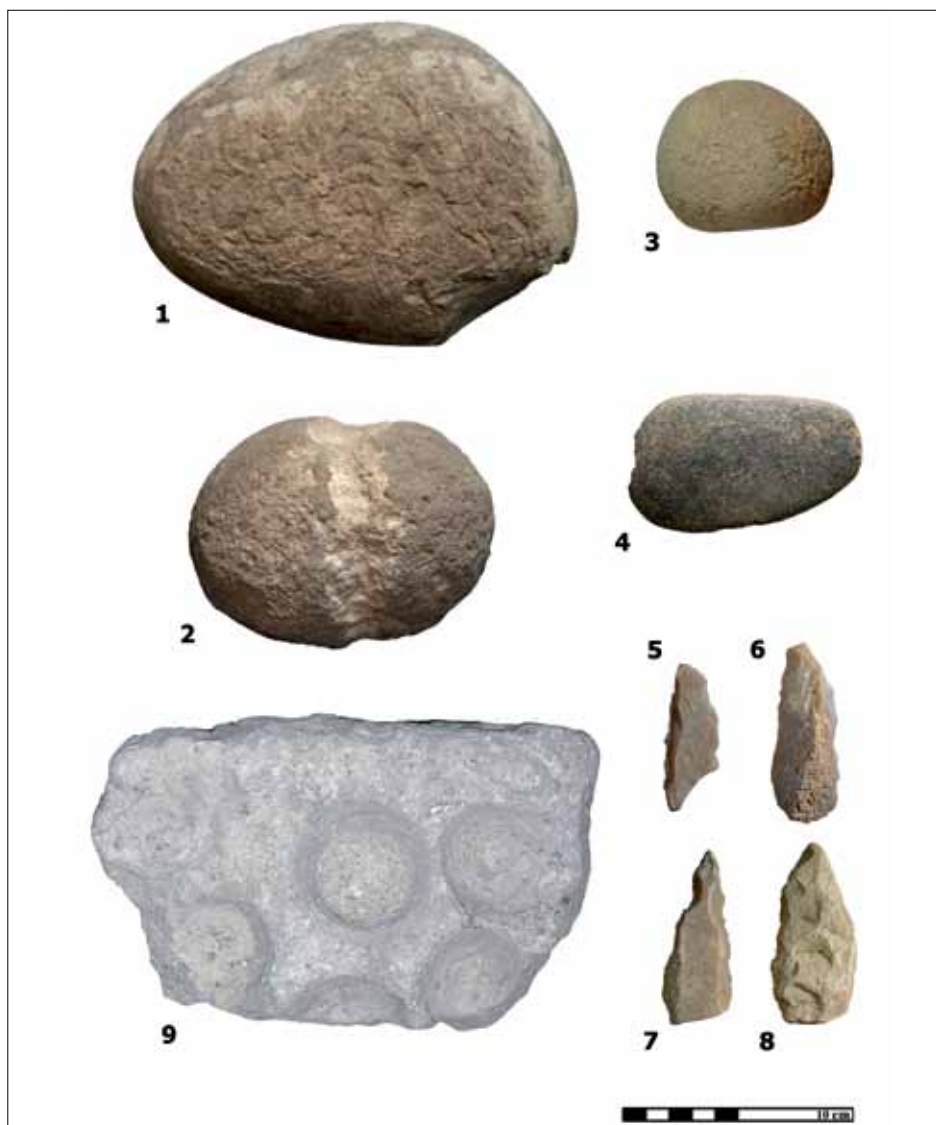


Figure 20: (1-4) Examples of groundstones from RJ-3: 1. Hammerstone; 2. net-sinker; 3. grinder; 4. grinder-pestle. 5-8) Lithic perforators associated with the manufacture of *Conus* and nacre rings. 9) A *Conus* slab, a groundstone typical of the UAN occupations in the area, indicative of standardised production of shell rings, found in association with the structure S1 at RJ-3 (photos: RJ-3 Project)

at least for the phases and sectors excavated so far, is somehow corroborated by the characteristics of the metallic assemblage. During the 2018 campaign, we retrieved a total of about 1000 metallic remains, of which nearly 700 represent entire or fragmented identifiable objects (Figure 18.8-12). Among these artefacts, fishing hooks are seldom represented, as we have only found two hooks (Figure 18.9), in utter opposition to the situation documented, on the other side of the bay, at RJ-2, whose metallic

assemblage presents a great majority of hooks and bars for the production of hooks (cf. De Rorre, 2007; 2012; Cleuziou and Tosi, 2000). In the same way, the number of net sinkers collected at RJ-3 (five sinkers in total, cf. Figure 20.2) is paltry with respect of the weights retrieved at RJ-2, regardless of the duration of the field work at RJ-2 itself (cf. Azzarà, 2015); hooks and net sinkers actually mark the whole surface of the settled area at RJ-2, and one could expect the same evidence at RJ-

3, if they had a similar development. However, and despite the fact that RJ-3 is much closer to the seashore, the site does not seem to be related to fishing activities at all. More generally, given also the significant difference of architectural remains and shelters, we might suppose that RJ-3 was not a domestic/residential area, at least during the last EBA occupations. This hypothesis needs of course to be verified, and further explorations are required to refine our perception of the systems of settings and systems of activities at RJ-3.

Aiming at the broader understanding of such systems, specialised studies on artefacts and ecofacts will benefit of GIS-aided distributional analyses, both in a synchronic and diachronic setting, combining key indicators such as unfinished artefacts, tools and waste products with the organisation of spatial layout.

Finally, the site has yielded a large fragment of an ostrich eggshell, and namely the bottom of the shell (Figure 18.13). The shell specimen would be most likely related to the Arabian ostrich, which populated the region until the beginning of the twentieth century, but we cannot exclude, at the moment, a different provenance of the eggs, since the exchange of such goods was an important part of the trade networks in the past (e.g. Borzatti von Lowernstern et al, 1993).

Concerning the remaining ecofacts, the deposits have yielded fragmented and entire seashells ascribed to about a hundred of different species, the most represented of which consists of Mytilidae. Bone remains are well represented as well, with a predominance of marine faunas (fish, sea mammals, reptiles). Specialised studies that will inform us about procurement and consumption strategies are in process.

CONCLUSIONS

Following preliminary tests in 2017, the first year of the project has consisted in a full three-month field-season, aimed at collecting high-quality data for qualitative and quantitative analyses.

Although further explorations are required for a broader understanding of the settlement, the data collected so far offer significant clues on the over-all organisation of the settled area and on the chronological frame of the occupation.

Ras Al Jinz RJ-3 shows a long sequence of occupations from the Late Neolithic to the Final Um An Nar period (cf. Azzarà and De Rorre, 2018), quite exceptional for a coastal site in the region; furthermore, the area possibly documents Hafit levels, at least on a part of the site. Should the presence of a Hafit phase be confirmed, this would allow us addressing the evolution of socio-economic complexity throughout the 3rd millennium BCE within the same settlement complex.

In addition, the levels extensively explored to date have yielded significant indications on the functional organisation of space, with areas related to specific craft activities, whose study will allow us grasping more accurately the interaction of techno-complexes and the organisation of activities; more generally, the site itself appears as functionally different from the coeval occupation of RJ-2.

The excavation of RJ-3 completes a long cycle of investigations on the occupations of the Ras Al Jinz bay, putting into light a unique complex, where settlement evidence and funerary remains are not only both represented, but have also been explored and thoroughly studied (e.g. Azzarà, in preparation; Cleuziou and Tosi, 2000; 2007; Munoz, Ghazal and Guy, 2012); combined with such data, the new explorations of the bay will offer essential clues to tackle the EBA complexification and address the socio-cultural and economic dimension of this Eastern Arabian community.

ACKNOWLEDGEMENTS

The field works were funded by a grant allotted by the National Geographic Society, which will also cover part of the lab analysis on the material culture (grant number HJ-135R-17). The UMR 7041 ArScAn – VEPMO provided part of the technical equipment used in the field.

The authors would like to thank Mr. Sultan al-Bakri (Director General for Archaeology), Mr. Khamis al-Asmi (Director of the Department of Excavations and Archaeological studies), Ms. Sumaya al-Busaidi (Head of the Department of Archaeological Studies), Mr. Khalil al-Nadabi (Head of the Department of Archaeological Studies), as well as all the personnel of the Ministry of Heritage and Culture of the Sultanate of Oman. We are also indebted to Mr. Khamis al-Amri for his support in the field.

Thanks are due to Dr. J.-F. Berger (Director of the ANR NEO-Arabia, UMR 5600 EVS-IRG), and to his team, in charge of the geomorphological study of the Ras Al Jinz bay, as well as to Dr. F. Bassinot (UMR8212 LSCE, ANR NEO-Arabia), who provided us with the C14 dates, performed through the French “Plateforme Nationale Artemis LMC14” by the team of J.-P. Dumoulin (UMR8212 LSCE). Finally, we are very grateful to Dr. E. Maini (University of Bologna), Ms. E. Fortini and the archaeological team working at Ras Al Jinz RJ-3.

We thank as well the anonymous reviewers for their valuable comments and suggestions.

BIBLIOGRAPHY

Azzarà, V.M. 2012. *The Organization of Food Processing at HD-6 (Sultanate of Oman)*. In R. Matthews & J.Curtis (eds.), *The Archaeology of Consumption & Disposal. Proceedings of the 7th ICAANE, 12-16 April 2010, British Museum and UCL, London. 1, pp. 251-268, London: Harrassowitz.*

Azzarà, V.M. 2015. *L'architecture omestique et l'organisation de la maisonnée dans la péninsule d'Oman à l'âge du Bronze ancien (IIIe millénaire av.N.E.)*. (Unpublished PhD thesis) Université Paris 1 Panthéon-Sorbonne, Paris, France.

Azzarà, V.M. 2018 Exploring Cultural, Social and Economic Complexification: Settlement Life through the Um An Nar Period at Ras Al Jinz RJ-2. In S. Döpper (ed.), *Beyond tombs and towers – domestic architecture of the Um An Nar period in Eastern Arabia*. Series Arabia Orientalis 4, pp. 97-120, Wiesbaden: Harrassowitz.

Azzarà, V.M. (ed.) (in preparation) *Excavations at Ras Al Jinz (Oman): The Coastal Sharqiyyah From the Neolithic to the Iron Age*.

Azzarà, V.M. & De Rorre, A.P. 2018. Socio-Cultural Innovations of the Final Um An Nar Period in the Oman Peninsula: New Insights from Ras Al Jinz RJ-2”. *Arabian Archaeology and Epigraphy* 29: 10-26.

Berger, J.-F. & Brugnoux, G. 2018. Geoarchaeological and Geophysical Report of RJ-3 Site and its Surrounding”. In V.M. Azzarà & A.P. De Rorre (eds) *The Archaeological Project at Ras Al Jinz RJ-3. Report on the first excavation campaign at RJ-3 (11th January 2018- 16th April 2018)*. (Unpublished circulated report), Muscat, Ministry of Heritage and Culture.

Berger, J.F, Charpentier, V., Crassard, R., Martin, C., Davtian, G. & López-Sáez, J.A. 2013. The Dynamics of Mangrove Ecosystems, Changes in Sea Level and the Strategies of Neolithic Settlements along the Coast of Oman (6000-3000 cal. BC). *Journal of Archaeological Science* 40: 3087-3104.

Borgi, F., Maini, E., Cattani, M., Tosi M. 2012. The Early Settlement of HD-5 at Ras Al Had, Sultanate of Oman (fourth-third millennium BCE)”. *Proceedings of the Seminar for Arabian Studies* 46: 27-40.

Borzatti von Lowernstern, E., Masseti, M. Vianello, F. 1993. On the Former Distribution of the Ostrich (*Struthio camelus syriacus* Rothschild, 1919) in Southern Jordan. *Studi per l'ecologia del Quaternario* 15.

Cavulli, F. & Scaruffi, S. 2012. The Holocene Settlement of KHB-1 (Ra's al-Khabbah, Sultanate of Oman): an Overview”. In J. Giraud-Gernez & G. Gernez (eds.) *Aux marges de l'archéologie. Hommage à Serge Cleuziou*. Travaux de la maison René-Ginouvès 16, pp. 405-429, Paris: De Boccard.

Charpentier, V. 1994. A Specialized Production at Regional Scale in Bronze Age Arabia: Shell Rings from Ra's al-Junayz Area (Sultanate of Oman). *South Asian Archaeology 1993*, 271: 157-170.

Cleuziou, S. & Tosi, M. 1994. Black Boats of Magan: Some thoughts on Bronze Age Water Transport in Oman and Beyond from the Impressed Bitumen Slabs from Ra's al Junayz. *South Asian Archaeology 1993*, 271: 745-761.

- Cleuziou, S. & Tosi, M. 2000. Ras Al Jinz and the Prehistoric Coastal Cultures of the Ja'alan", *Journal of Oman Studies* 11: 19-73.
- Cleuziou, S. & Tosi, M. 2007. *In the Shadow of the Ancestors: The Prehistoric Foundations of the Early Arabian Civilization in Oman*, Muscat: Ministry of Heritage and Culture.
- David, H. 1996. Styles and Evolution: Soft Stone Vessels during the Bronze Age in the Oman Peninsula. *Proceedings of the Seminar for Arabian Studies* 26: 31-46.
- David, H. 2011. Les vases en chlorite". In S. Cleuziou, S. Méry & B. Vogt (eds.), *Protohistoire de l'oasis d'Al-Ain. Travaux de la Mission Archéologique Française à Abou Dhabi (Émirats Arabes Unis), Les sépultures de l'Âge du Bronze*. BAR International Series 2227, pp. 184-201, Oxford: Archaeopress.
- De Rorre, A.P. 2007. *Un atelier à l'âge du Bronze sur le site de RJ-2 (Ras Al Jinz, Sultanat d'Oman)* (Unpublished MA Dissertation) Université Paris 1 Panthéon-Sorbonne, Paris, France.
- De Rorre, A.P. 2012. Un atelier de bronzier du III^e millénaire au Sultanat d'Oman». In J. Giraud-Gernez & G. Gernez (eds.) *Aux marges de l'archéologie. Hommage à Serge Cleuziou*. Travaux de la maison René-Ginouvès 16, pp. 475-482, Paris: De Boccard.
- Hilbert, Y. H. & Azzarà, V.M. 2012. Lithic Technology and Spatial Distribution of Artefacts at the Early Bronze Age Site HD-6 (Sharquiyyah Region, Sultanate of Oman). *Arabian Archaeology and Epigraphy* 23: 7-25.
- Marcucci, L.G. 2004. *L'industria su conchiglie di Conus sp. nell'Oman durante l'Antica età del Bronzo (c. 3000-2000 a. C.)* (Unpublished MA thesis) Università di Bologna, Bologna, Italy.
- Marcucci, L.G., Genchi, F., Badel, E. & Tosi, M. 2011. Recent Investigations at the Prehistoric Site RH-5 (Ra's al-Hamra, Muscat, Sultanate of Oman). *Proceedings of the Seminar for Arabian Studies* 41: 201-222.
- Méry, S. 2000. *Les céramiques d'Oman et l'Asie Moyenne. Une archéologie des échanges à l'âge du Bronze*. Paris: Édition du CNRS.
- Méry, S. & Marquis, P. 1998. First Campaign of Excavation at Khor Bani Bu Ali SWY-3, Sultanate of Oman», *Proceedings of the Seminar for Arabian Studies* 28: 215-228.
- Munoz, O., Ghazal, R.O. & Guy, H. 2012. Use of Ossuary Pits during the Um An Nar Period: New Insights on the Complexity of Burial Practices from the Site of Ras Al Jinz (RJ-1)", Oman. In J. Giraud-Gernez & G. Gernez (eds.) *Aux marges de l'archéologie. Hommage à Serge Cleuziou*. Travaux de la maison René-Ginouvès 16, pp. 451-467, Paris: De Boccard.
- Schmidt, C. & Döpper, S. 2016. Um An Nar Pottery Assemblages from Bāt and al-Zībā and their Functional Contexts, *Proceedings of the Seminar for Arabian Studies* 46: 247-262.
- Thornton, C.P. & Ghazal, O.R. 2016. Typological and Chronological Consideration of the Ceramics at Bat, Oman. In C.P. Thornton, C.M. Cable, & G.L. Possehl (eds.), *The Bronze Age Towers at Bat, Sultanate of Oman. Research by the Bat Archaeological Project 2007-12*. Ser.: Univ. Museum Mon. 143, pp. 179-216, Philadelphia: Univ. Penn. Museum of Arch. and Anthr.

CONTRIBUTORS ADDRESSES:

Dr. Valentina M. Azzarà

Faculty of Archaeology, Leiden University, e-mail: valentina.azzara@gmail.com, PO Box 9514, 2300 RA Leiden, The Netherlands

Alexandre P. De Rorre,

Independent researcher, Email: derorrealex@yahoo.fr