[Supplementary material]

[For RESEARCH section]

Marking the sacral landscape of a north Arabian oasis: a sixth-millennium BC monumental stone platform and surrounding burials

Olivia Munoz[1,*], Marianne Cotty[2], Guillaume Charloux[3], Charlène Bouchaud[4], Hervé Monchot[5], Céline Marquaire[6], Antoine Zazzo[4], Rémy Crassard[7], Olivier Brunet[8], Vanessa Boschloos[9] & Thamer al-Malki[10]

[1] *Centre National de la Recherche Scientifique (CNRS), Archéologie et Sciences de l'Antiquité, France*

[2] *Musée du Louvre, Département de Antiquités Orientales, France*

[3] *Centre National de la Recherche Scientifique (CNRS), Orient et Méditerranée, France*

[4] *Centre National de la Recherche Scientifique (CNRS), Muséum national d'histoire naturelle, Archéozoologie & Archéobotanique, France*

[5] *Labex Resmed, Paris Sorbonne Universités*, *France*

[6] *Université Paris 1 Panthéon-Sorbonne—UFR d'Archéologie, France*

[7] *Centre National de la Recherche Scientifique (CNRS), French Center for Archaeology and Social Sciences (CEFAS), Kuwait*

[8] *Archéologie et Sciences de l'Antiquité, Nanterre, France*

[9] *Department of Archaeology, Ghent University, Belgium*

[10] *Saudi Commission for Tourism and National Heritage, Riyadh, Saudi Arabia*

[*] *Author for correspondence (✉ olivia.munoz@cnrs.fr)*

OSM 1. Radiocarbon dates from Dûmat al-Jandal (by O. Munoz, G. Charloux, M. Cotty & A. Zazzo).

The radiocarbon dates discussed in this text are listed in Table S1 by area of investigation (platform, survey in the surroundings, and ancient necropolis). While the dates from the platform area and the ancient necropolis were obtained from samples collected in the excavation trenches by the archaeologists, most of the dates from the nearby cairns originate from human bone bioapatite samples (Zazzo & Saliège 2011). They were collected during the 2015 survey in the surroundings of Dûmat by Anaïs Chevalier (PhD candidate at University of Paris 1) within the framework of the Saudi-Italian-French archaeological project in Dûmat al-Jandal.

All the radiocarbon dates have been calibrated with Oxcal v4.2.4 (Bronk Ramsey 2009), with IntCal13 atmospheric curve (Reimer *et al*. 2013). The calibrated dates are given with a 95.4% range probability (2σ).

Table S1. Radiocarbon dates from Dûmat al-Jandal protohistoric structures.

LAB #	**Context**	**Nature**	**Species**	**Radiocarbon age BP**		**Date, cal BC/AD (2σ)**	
Platform area							
UBA-32224	Deposit 2 [SD18_L2200_SU2616]	Charcoal	*Tamaris*	6619	±37	5625 BC	5490 BC
SacA44356	Deposit 1 [SD18_L2200_SU2608]	Bone (apatite)	*H. Sapiens*	6110	±30	5210 BC	4940 BC
SacA44357	Tomb L2201	Bone (apatite)	*H. Sapiens*	5735	±30	4685 BC	4500 BC
SacA44355	Deposit 4 [SD18_L2200_SU2605]	Bone (apatite)	*H. Sapiens*	4555	±30	3485 BC	3100 BC
UBA33305	Fireplace [SD18_L2200_F2635]	Charcoal	-	2386	±32	730 BC	395 BC
UBA33306	Tomb L2204 [SD31_SU2910]	Charcoal	-	2026	±32	155 BC	AD 55
Cairns (survey)							
SacA44370	Tomb 1089	Bone (apatite)	*H. Sapiens*	5645	±30	4545 BC	4370 BC
SacA44358	Tomb L2206	Bone (apatite)	*H. Sapiens*	5545	±30	4450 BC	4340 BC
SacA44367	Tomb 1086	Bone (apatite)	*H. Sapiens*	5385	±30	4335 BC	4075 BC
SacA44378	Tomb 1091	Bone (apatite)	*H. Sapiens*	4310	±35	3020 BC	2880 BC
SacA44368	Tomb 1087	Bone (apatite)	*H. Sapiens*	3960	±30	2575 BC	2345 BC
SacA44369	Tomb 1088	Bone (apatite)	*H. Sapiens*	3235	±30	1610 BC	1435 BC

SacA44359	Tomb L2207	Bone (apatite)	*H. Sapiens*	2470	±30	770 BC	430 BC
SacA44371	Tomb 1090	Bone (apatite)	*H. Sapiens*	2390	±30	730 BC	395 BC
Ancient necropolis							
SacA44361	SectD_Trench10_SU5523	Burned bone (apatite)	*H. Sapiens*	2150	±30	360 BC	60 BC
SacA44360	SectD_Trench2_SU5501	Bone (apatite)	*H. Sapiens*	2145	±30	355 BC	55 BC
SacA44366	SectD_Trench10_SU5526	Bone (apatite)	*H. Sapiens*	1895	±30	AD 50	AD 215

OSM 2. Notes on the human bones from the Deposits 1 and 4 (by O. Munoz).

Deposit 1 consists of two concentrations of human bones lying horizontally in the stone filling of the platform, about 0.80m from the bedrock. The first concentration is mainly represented by a secondary deposition of five long bones diaphysis (femur, radius and three portions of indeterminate long bones), as well as a skull cap fragment about 100mm in diameter, a femur head fragment, a vertebral arch fragment, and a cuneiform fragment.

A few dozen centimeters further north, at the same altitude, few fragments of indeterminate long bones were grouped with altered remains of a coxal bone.

Unfortunately, the poor state of conservation of the human remains limits their proper identification. At least one individual is represented, and the format of the bones found corresponds to an adult skeleton. However, the absence of the extremities of the long bones does not make it possible to ascertain the state of synostosis. It can therefore only be stated that at least one individual over 15 years of age is represented.

Some long bones had axial deformations due to the weight of the stones and sediments covering them. This suggests that they were still "fresh" (containing collagen) when they were buried, because in the opposite case (totally dry bones), they would have been fractured.

In Deposit 4, 2647 bone fragments have been collected, from which 450 have been identified. The remaining 2197 were too fragmentary to be precisely determined (e.g. small fragments or splinters from a skull(s), long bone diaphysis, or spongious bone). At least five

individuals are represented in this assemblage including one subadult (1–4 years old), and four adults.

The position of the bones and artefacts, which rested at varying depths in the sediment, indicate a secondary deposit and probable disturbances. Although the provenience of the primary deposit is unknown, we can assume that it comes from a funerary structure in the vicinity, as suggested by the presence of small bones and pearls, and the presence of disrupted stone tombs in the area (e.g. Tomb L2201; Figure 2). Finally, the state of preservation of the bones, rather good despite their fragmentation, suggests that they have not been exposed to climatic agents for long periods (limited weathering). Therefore, it is unlikely that these funerary remains would have been disposed of in front of the eastern wall of the platform.

OSM 3. Tables of the archaeobotanical and faunal studies (by C. Bouchaud & H. Monchot).

Table S2. Identification of the archaeobotanical remains found in the Niche 1 (SU 2616) of the platform (table by C. Bouchaud).

Fraction	**Amaranthaceae**	***Fadherbia albida***	***Tamarix* sp.**	**Indeterminate**	**Total**
SU_2616-1 (2mm)			3		3
SU_2616-2 (0.5mm)			3		3
SU_2616-4 (2mm)	3	32	2	3	40
SU_2616-5 (2mm)			9	1	10
Total	3	32	17	4	56

Table S3. Identification of the faunal remains found in the platform (table by H. Monchot).

Phase	***Caprinae***	***Bos***	**Large herbivore**	**Indeterminate**	**Total**
Phase I (n=89)	28	20	1	40	89
Phase I-IV/Dep.2 (n=32)	1	9	0	22	32
Phase I-IV/Dep.4 (n=72)	1	46	6	19	72
Phase I-V (n=27)	0	17	0	10	27
Total	30	92	7	91	

OSM 4. Notes on the beads found in Deposit 4 and SD31 (L. 2204) (by O. Brunet).

Thirteen beads mixed with the human remains were recovered from Deposit 4: two cylindrical shell beads, three cylindrical stone beads, three flat beads of whitish stone, and five carnelian beads.

Although the materials and typologies of the beads do not refer to a precise chronological period, the presence of chalcedony (worked and unworked) is particularly interesting, as it hints at mid- to long-distance contacts from the Chalcolithic to the first millennium BC. Chalcedony deposits, which carnelian belongs to, seem to be present in western Saudi Arabia in small quantity, as stated by M. Tosi (Tosi 1980). Flint drills discovered in Rajajil, 32km from Dûmat, suggest local working of hard stones in the area (Adams *et al.* 1977: Pl. 15, n° 17, 28, 29; Eichmann *et al*. 2006: 101). Some 270 km south-west, at Taymā', a carnelian bead workshop was found (Bawden *et al.* 1980; Miller 1984; Hausleiter 2013; Al-Ghabban *et al.* 2010: 250–51). Beads found there show similar sizes and the same technological know-how. This could suggest a local origin for carnelian products. For later contexts, however, an Egyptian origin of carnelian beads can be assumed (Aston *et al.* 2000: 26–27; Bloxam 2006), and is supported by the artefacts discovered during the excavation of a looted tomb located at 20m of the platform (SD31, TB L2204, excavated by Anaïs Chevalier (PhD candidate at University Paris 1; Figure 2). There, several carnelian beads were found in association with *Dentalium* and *Pterygia crenulata* shells, whose species may be found in the Red sea (Bar Yosef 2005), as well as an Egyptianized scarab (see OSM 5), and a faience bead with a light green superficial glaze (Figure 9). It is well known that Egypt was one of the main areas of development of this glazing technique (Caubet & Pierrat-Bonnefois 2005). Radiocarbon dating from this tomb indicates a much more recent date than the platform and the Deposit 4 (155 cal. BC–AD 55; Table S1). In Taymā', several objects with Egyptian influence were also discovered (see al-Ghabban *et al.* 2010: 231; Hausleiter 2013).

Therefore, if contacts between North-Western Arabia and Egypt are well attested for the first millennium BC, more investigation will be needed to prove such contacts during the protohistoric period.

OSM 5. Notes on scarab O.2910-1 from a looted tomb (SD31, TBL2204) (by V. Boschloos).

This scarab-shaped seal-amulet is made of steatite and traces of blue glaze remain inside the engravings. The object is pierced longitudinally and measures 12 × 8 × 7mm. Its base is

engraved with a stylized representation of a human figure (most probably male) facing right. While its right arm hangs down next to the body, its left arm is raised in front of the figure. He wears a long skirt, decorated with crossing lines, either indicating decorative patterns or folds in the fabric. A vertical incision is discernible in the lower right part, connected to the front of the skirt. On the edges, sections of a line surrounding the entire design are still visible.

The figure most likely represents an Egyptian Pharaoh, as the contours of the headdress indicate that he is wearing the *Pschent* or the Egyptian Double Crown. He is shown in a standing pose, with one foot visible below. Depictions of a single royal figure as a main motif appear on scarabs as early as the seventeenth–sixteenth century BC (e.g. Ben-Tor 2007: pl. 63, n° 6-7 & 20, pl. 102, n°14 & 25), but they are particularly popular during the Egyptian New Kingdom (eighteenth–twentieth dynasties, *c.* 1550–1075 BCE), especially during the early to mid-eighteenth dynasty, and between the mid-nineteenth and mid-twentieth dynasty (Wiese 1990: 11). The image of the standing pharaoh is also occasionally engraved on Egyptian scarabs at the beginning of the Late Period (twenty-sixth dynasty, *c*. 664–525 BCE) as a result of an 'archaising' trend in that period, for example, on a scarab attributed to the twenty-sixth dynasty found at Tel Dan: Keel (2010: 390–91, n°21) and parallels cited there. However, the great majority of these scarabs show the king holding the *ḥqa* sceptre, the *was* sceptre, and/or the flagellum, wearing the Khepresh or Egyptian Blue Crown, in his ceremonial function as divine leader. One variation of the theme is the standing royal figure with a cobra or uraeus, which highlights the protective and apotropaic power of the royal figure, and consequently of the seal-amulet. Either single or in pairs, the cobra is placed in association with the king (next to or below his feet), or is in direct contact with the king, attached to his skirt (Wiese 1990: 18–24, see p. 23 for the interpretation of the cobra attachments as belts in the royal dress).

The latter seems to be the case on the scarab from Dûmat al-Jandal. Such cobras are protruding outwards from one or both sides of the king's skirt, hanging down from it and looking outwards, in this case from the front. However, the best parallels for the present scarab depict a kneeling pharaoh with a uraeus attached to his skirt (kept in the Egyptian Museum in Cairo, see Wiese 1990: 20 n°231-233, abb. 32). Most interestingly, the standing or kneeling pharaoh with uraei is most frequently attested on scarabs dated to the Ramesside Period (e.g. Teeter 2003: n°11). Even though only a few bear royal names that would allow linking them to particular kings or dynasties, the style of their engravings and the

morphology of the scarabs suggest that this iconographic sujet does not appear before the nineteenth dynasty (Wiese 1990: 20).

Furthermore, the morphology of this particular scarab does not exclude a date as early as the New Kingdom (for typological characteristics see Keel 1995: 50–51). When seen from above, the legs surround the beetle like a frame, and small v-shaped notches are engraved on the humeral callosities (the 'shoulders' of the beetle). The legs are carved out and may have been decorated with parallel hatching. Unfortunately, the state of preservation of the scarab's surface does not allow discerning details on the scarab's head and legs.

In conclusion, I should emphasize that this is one of the few scarabs from controlled excavations in Saudi Arabia (see also concluding remarks in Boschloos & Akkermans in press). Less than a dozen scarabs have surfaced in the Arabian Peninsula, and all were found along the coast of the Arabian Gulf and in Southern Arabia. The presence of this scarab at Dûmat al-Jandal, in the Northwest of Saudi Arabia, is currently an isolated find. Contrary to other finds on the peninsula, it probably arrived by land. The presence of Egyptian-style objects at the site is explained by its proximity to the Sinai and to the Southern Levant, where large numbers of Egyptian and Egyptianising scarabs circulated from the early second millennium BC to at least the mid-first millennium BC.

References

ADAMS, R., P.J. PARR, M. IBRAHIM & A.S. MUGHANNUM. 1977. Saudi Arabian archaeological reconnaissance—1976: preliminary report on the first phase of the comprehensive archaeological survey program. *Atlal* 1: 21–40.

AL-GHABBAN, A.I., B. ANDRE-SALVINI, F. DEMANGE, C. JUVIN & M. COTTY. 2010. *Routes d'Arabie: archéologie et histoire du royaume d'Arabie Saoudite, catalogue de l'expostion*. Paris: Musée du Louvre=.

ASTON, B.G., J. HARRELL & I. SHAW. 2000. Stone, in I. Shaw & P.T. Nicholson (ed.) *Ancient Egyptian materials and technology*: 5–77. Cambridge: Cambridge University Press.

BAR-YOSEF, D.E. 2005. The exploitation of shells as beads in the Palaeolithic and Neolithic of the Levant. *Paléorient* 31: 176–85. https://doi.org/10.3406/paleo.2005.4796

BAWDEN, G., C. EDENS & R. MILLER. 1980. The archaeological resources of ancient Taymâ: preliminary investigations at Taymâ. *Atlal* 4: 69–106.

BEN-TOR, D. 2007. *Scarabs, chronology, and interconnections: Egypt and Palestine in the Second Intermediate Period* (Series Archaeologica 27) Freiburg & Göttingen: Orbis Biblicus et Orientalis.

BLOXAM, E. 2006. Miners and mistresses: Middle Kingdom mining on the margins. *Journal of Social Archaeololgy* 6: 277–303. https://doi.org/10.1177/1469605306064244

BOSCHLOOS V. & P.M.M.G. AKKERMANS. In press. From a land far far away: Egyptian(Ising) amulets from Jebel Qurma, north-eastern Jordan. *Studies in History and Archaeology of Jordan* 14. Amman: Department of Antiquities of Jordan.

BRONK RAMSEY, C. 2009. Bayesian analysis of radiocarbon dates. *Radiocarbon* 51: 337–60. https://doi.org/10.1017/S0033822200033865

CAUBET, A. & G. PIERRAT-BONNEFOIS. 2005. *Faïences: faïences de l'Antiquité. De l'Egypte à l'Iran*. Paris: Musée du Louvre.

EICHMANN, R., A. HAUSLEITER, M.H. AL-NAJEM & S.F. AL-SAID. 2006. Tayma, spring 2004: report on the Joint Saudi Arabian-German Archaeological Project. *Atlal* 19: 91–116.

HAUSLEITER, A. 2013. Tayma (north-west Arabia): Saudi-German Joint Archaeological Project. *Bulletin of the British Foundation for the Study of Arabia* 18: 35–36.

KEEL, O. 1995. *Corpus der Stempelsiegel-Amulette aus Palästina/Israel. Einleitung*, Volume 10 (Orbis Biblius et Orientalis-Series Archaeologica 10). Freiburg & Göttingen: Orbis Biblius et Orientalis.

– 2010. *Corpus der Stempelsiegelamulette aus Palästina/Israel. Katalog Band II: Von Bahan bis Tel Eton* (Orbis Biblius et Orientalis-Series Archaeologica 29). Freiburg & Göttingen: Orbis Biblius et Orientalis.

MILLER, R. 1984. Flakes stone industries of Arabia and the Gulf from the Late Iron Age to early Islamic times, in R. Boucharlat & J.-F. Salles (ed.) *Arabie orientale: Mésopotamie et Iran méridional de l'âge du Fer au début de la période Islamique*: 145–50. Paris: Recherches sur les Civilisations.

REIMER, P.J. *et al*. 2013. IntCal13 and Marine13 radiocarbon age calibration curves 0–50 000 years cal BP. *Radiocarbon* 55**:** 1869–87. https://doi.org/10.2458/azu_js_rc.55.16947

TEETER, E. 2003. *Scarabs, scaraboids, seals and seal impressions from Medinet Habu* (Oriental Institute Publications 118). Chicago (IL): Oriental Institute.

TOSI, M. 1980. Karneol. *Reallexikon der Assyriologie* 5: 448–52.

WIESE, A. 1990. *Zum Bild des Konigs auf Ägyptischen Siegelamuletten* (Orbis Biblicus et Orientalis 96). Freiburg & Göttingen: Orbis Biblicus et Orientalis.

ZAZZO, A. & SALIEGE, J.-F. 2011. Radiocarbon dating of biological apatites: a review. *Palaeogeography, Palaeoclimatology, Palaeoecology* 310: 52–61. https://doi.org/10.1016/j.palaeo.2010.12.004