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Papers from the 1st Workshop

Archaeology in Africa

Potentials and perspectives on laboratory & fieldwork research

Edited by
Savino di Lernia and Marina Gallinaro

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with contributions by
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with foreword by S. di Lernia

All'Insegna del Giglio

This book is dedicated to Sebastiano Tusa,
colleague and friend

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5. Archaeological research in northern Sahara. Thoughts on the experience of a Tunisian-Italian research program (2014-2017) in post-revolutionary Tunisia

Emanuele Cancellieri, Jâafar Ben Nasr

Abstract. Following the 2011 'Arab spring', archaeological research in large parts of the Sahara is still at a halt, except for a few areas where it is possible to foresee the possibility of resuming field research at a full capacity in the near future. Nevertheless, the complex and dynamic post-revolutionary socio-political evolution of the countries involved in the 'Arab Spring' makes us believe that the design and carrying out of the field research must undergo a reconsideration and should be inspired by the criteria of flexibility and modularity. In the present paper, we discuss these aspects by reporting the experience of a Tunisian-Italian research project (2014-2017) engaged in the fields of environmental studies and prehistory of central-southern Tunisia.
Key Words. Maghreb; Chott el Jerid; collaborative research programs; archaeological field research; prehistory and palaeoenvironment; anthropology.

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1. Introduction

In the present work, we discuss the experience of a Tunisian-Italian research project (2014-2017) that have seen members of the *Institut National du Patrimoine* (TN), the University of Kairouan (TN) and the Sapienza University of Rome (IT) jointly engaged in the fields of environmental studies and prehistory of central-southern Tunisia.

The premises for the start of the collaborative research activity rooted in a series of preconditions, one of which was the will of the 'Archaeological Mission in the Sahara' of the Sapienza University of Rome to establish a research transect with high scientific potential that could ideally connect the North African Mediterranean belt with the central Sahara. At the time of the beginning of collaboration, security conditions in Tunisia were good enough to allow international teams to work in relatively remote areas of the country, like the northern expanses of the Sahara Desert and the steppe region immediately north of it. The country was, in fact, experiencing a period of enhanced stability after the events that characterized the advent of revolutionary instances, the start of the turmoil and its immediate aftermath. Contrary to the dramatic outcomes of the post-revolutionary process in Libya where the Mission had proficiently worked for more than half a century (e.g. Mori 1965; Cremaschi and di Lernia 1998; di Lernia 1999; Garcea 2001; di Lernia and Manzi 2002; Liverani 2005; Anag *et al.* 2007; di Lernia and Zampetti 2008; Dunne *et al.* 2012; Biagetti *et al.* 2013; di Lernia *et al.* 2013; Mori 2013; Cancellieri *et al.* 2016; Mercuri *et al.* 2018), which made the country definitively inaccessible to foreigners and put its heritage at risk, when not irremediably lost (di Lernia 2015; di Lernia and Gallinaro 2014).

The will of the colleagues from the University of Kairouan, in particular the members of the Department of Archaeology, to establish a contact and to launch a collaboration in the field of prehistoric archaeology of southern Tunisia eventually led to the signing of an agreement for the period 2014-2017, ruling a joint research project titled "*Climats, cultures et sociétés pré-et protohistoriques en Tunisie. Recherches environnementales, archéologiques et ethno-anthropologiques*" (Pre- and protohistoric climates, cultures and societies in Tunisia. Environmental, archaeological and ethno-anthropological research). The institutional partners were

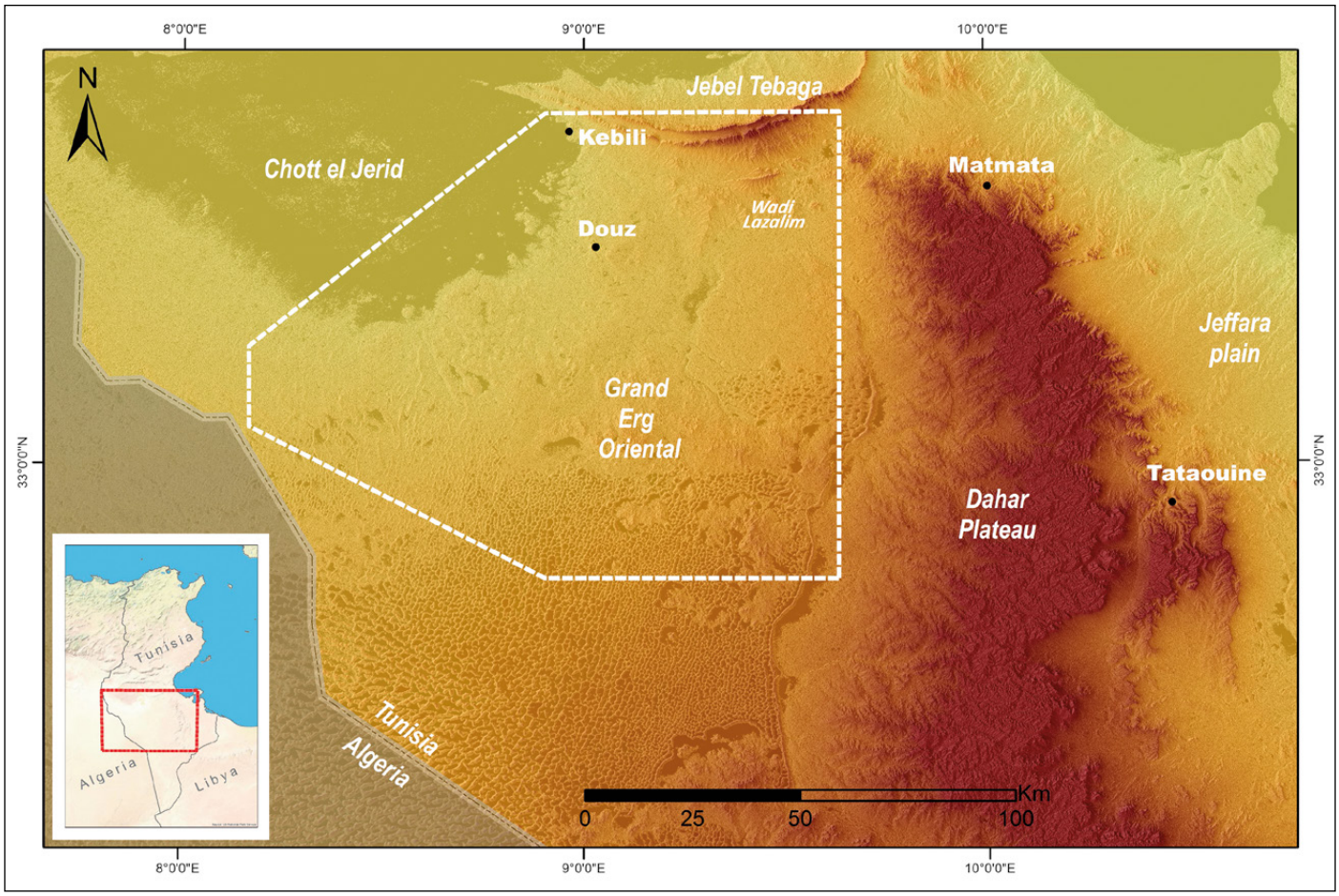

Fig. 5.1 – Map of the research area. Dashed polygon represents the approximate extent of the field researches carried out between 2015 and 2017 (© The Archaeological Mission in the Sahara, Sapienza Università di Roma).

the *Institut National du Patrimoine*, the *Faculté des Lettres et des Sciences Humaines de Kairouan* and the *Dipartimento di Scienze dell'Antichità* of Sapienza University of Rome. The scientific responsibility of the research project was allocated to Ridha Boussoffara (INP), Jaâfar Ben Nasr (University of Kairouan) and Savino di Lernia (Sapienza Università di Roma).

Field activity in the three years of the project was mainly concentrated in the Chott el Jerid and Jebel Tebaga areas (Kebili) because of the unfavourable security conditions that still affect the more southern regions. The research, conducted notwithstanding the serious internal situation dramatically hit by the terror attacks of 2015, allowed an assessment of the scientific potential of the area by means of geoarchaeological research, surveys and excavations, together with palaeoenvironmental samplings, radiocarbon determinations and genetic analysis of populations of the region (Ben Nasr *et al.* 2016; di Lernia *et al.* 2017), which provided a basis for reconstructing the cultural developments of the late Quaternary in this part of North Africa.

2. Geographic setting

Located between the Mediterranean and the Sahara, the study region (Fig. 5.1) is a pivotal area between the coast, the steppes and the desert. We have mostly studied one major transect intercepting the south of Chott el Jerid, the northern part of the Grand Erg Oriental and the steppe region of the Jebel Tebaga.

The Chott el Jerid is a vast dried natural depression located at the edge of the Sahara between the oases of Tozeur, to the north, and Douz, to the south, covering an area of over 5,000 sq. kilome-

tres. It is the largest salt lake in the region, and its underground fossil water feeds the oases around it. During the wet phases of the Pleistocene and the Holocene, the Chott el Jerid was a vast area of freshwater (Causse *et al.* 2003) and was an integral part of a hydrographic system fed by rivers that originated in the central Sahara mountains (Drake *et al.* 2011). A vast network of interconnected mega-lakes has repeatedly created favourable conditions for the formation of resource-rich environments, which has been a strong attraction for human groups and a very important catalyst for human migration. The Chott el Jerid was included in the UNESCO 'Tentative List' in 2008 for its environmental characteristics (http://whc.unesco.org/en/tentativelists/5385/) and is classified as a wetland of international importance under the Ramsar Convention (http://www.ramsar.org/sites/default/files/documents/library/sitelist.pdf).

3. Research objectives

Our research is a part of the general framework of studies on the prehistory of Tunisia which, in recent years, have produced significant results after the work of several Tunisian and international teams (e.g. Aouadi-Abdeljaouad and Belhouchet 2012; Ben Fraj 2012; Mulazzani 2013; Ben Nasr and Boukhchim 2015; Jaouadi *et al.* 2016). However, several regions and contexts, especially in the mountains and the Sahara, remain outside of this research and require systematic investigation programs to fill multiple geographical and chronological gaps and to better reconstruct human settlement during prehistoric periods in this part of the Maghreb.

The Tunisian-Italian research program thus focused on thematically linked research localities between the Chott el Jerid and the Dahar Plateau to further develop this research, to study previously unknown or poorly explored contexts, and to address Pleistocene and Holocene human settlement in the broadest spatial sense that goes beyond the intrinsic boundaries of a site.

The main research targets were related to the pre-protohistory of southern Tunisia and classifiable into distinct macro-phases of human occupation (Middle Stone Age, Epipalaeolithic, Neolithic), including the ethnographic and genetic signature of the living communities.

The research objectives focused around the following main axes: i) the geographic meaning of northern Sahara in relation to crucial phases of expansion and cultural diversification of early *H. sapiens* in the Late Quaternary; ii) the human population dynamics in North Africa and the repopulation of the Green Sahara at the onset of the early Holocene; iii) the funerary practices and social dimensions of late prehistoric and protohistoric societies; iv) the genetic makeup of sedentary and nomadic people in Saharan and peri-Saharan areas.

4. Field activity

The joint research project had a rather complicated beginning. The first planned field mission was cancelled only a few days before the departure because of the tragic outcome of the kidnapping of a French hiker in September 2014 in Algeria. Although the dramatic event occurred in a region rather distant from our research area, it nevertheless prompted the Italian diplomatic authorities to take precautionary measures for our mission and suggested to postpone it.

The following year (2015) has been difficult as well. We have been able to conduct only short field activities and laboratory analyses. The objectives of these missions were to check, in the field, the structures identified by remote sensing analysis; to identify archaeological sites to be investigated and sampled; and to start the samplings for genetic analyses.

The terrorist attack on March 18 on the Bardo museum, in Tunis, occurred while we were in the field in the surroundings of the town of Douz. Also in this case, for a precautionary principle, we interrupted the fieldwork and the activities in course. We have nevertheless been able to visit two main sectors: the flat rocky zone to the east of Douz, and the sandy dune area to the south.

The geoarchaeological research has been fast, the sampling reduced to the minimum and focussed on datable materials. In the dune area we recognized several surface sites with a high density of lithic artefacts, mostly early Holocene in age (Fig. 5.2). In the flat rocky area, east of Douz, we discovered some stratified Pleistocene sites along the Wadi Lazalim, where lithic artefacts are stratified within sedimentary successions.

The short field mission conducted in November 2015 was focussed on the investigation of sites in the dune area south of Douz and the sampling of biological material for genetic analysis of nomadic herders. The fieldwork was followed by a study-stay conducted at the *Institut National du Patrimoine* in Tunis and was directed to the analysis of archaeological materials collected in the field.

Security conditions in the research area between autumn 2015 and spring 2016, the privileged period for field activities in the

Fig. 5.2 – General view of early Holocene site 15/6, Grand Erg Oriental (© The Archaeological Mission in the Sahara, Sapienza Università di Roma).

Fig. 5.3 – Tumuli of necropolis 15/11, Grand Erg Oriental (© The Archaeological Mission in the Sahara, Sapienza Università di Roma).

Fig. 5.4 – A view of Wadi Lazalim. In the background, the Middle Stone Age site 15/1 (© The Archaeological Mission in the Sahara, Sapienza Università di Roma).

Sahara, have been repeatedly weakened by episodes of social instability and terrorist acts. The country experienced forms of violent clashes lasting several days, in particular during the revolts burst in January 2016 in several cities – Kasserine, Le Kef, Sidi Bouzid, Kairouan, Kebili, Douz – including the capital Tunis. March 2016 witnessed an assault by members of Daesh on the city of Ben Guerdene, on the border with Libya, not far from our study area. All this has had negative repercussions on the planning of field activities, which has seen numerous reformulations of both scheduling and objectives, as well as on the effectiveness in pursuing the research targets within the foreseen time frames.

In September-October 2016 we have been able to conduct a long and intensive field mission, and we had the possibility to explore several sites and sequences distributed over a large area in the region of Kebili. Research activities focused on 1) palynological, geochemical and sedimentological samplings; 2) intensive surveys, surface collections and excavation of test trenches in the area of Wadi Lazalim; 3) the archaeological investigation through intensive surveys, mapping and excavations in the necropolis located in the Ben Chroud area (Fig. 5.3); 4) the biological sampling of different ethnic groups.

Finally, in September-October 2017 it was possible to carry out a longer field mission, which saw the participation of a large

number of people. The Mission has seen the continuation of the research already initiated and benefited from a substantial enlargement of the territory covered by territorial surveys. The areas studied were the south-eastern limit of the Chott el Jerid, the northern part of the Grand Erg Oriental, the mountainous area of the Jebel Tebaga and the rocky area directly south of it.

Research on the MSA was concentrated along the Wadi Lazalim (Fig. 5.4), with the reprise of the excavation of the trenches studied in 2016, the excavation of a new trench on a newly discovered site, and systematic surface collections.

Research on the early Holocene phases was mainly conducted through surveys in the Grand Erg Oriental. The systematic sampling of archaeological material was accompanied by the sampling of materials for palaeoenvironmental and chronological determinations. Activities in the field of funerary archaeology first consisted in the identification of monuments within a transect that included the entire Wadi Lazalim catchment area. Subsequently, the research lied in excavating funerary monuments, chosen according to their physiographic location and architectural typology. The DNA sampling campaign focused exclusively on nomadic herders and was carried out in Douz, in the area of the Jbil National Park and in the area of the Ksar Ghilane oasis.

5. An overview of the main achievements

Our research in Southern Tunisia contributed to increasing the knowledge about Saharan MSA, still fragmentary and clustered in a few areas (Wendorf *et al.* 1993; Cremaschi and di Lernia 1998; Garcea 2001; Clark and Gifford-Gonzalez 2008; Hawkins 2012; Foley *et al.* 2013), by identifying several contexts of the relevant time period in the area of Wadi Lazalim, where deposits containing MSA stone artefacts have been first identified (Ben Nasr *et al.* 2016). The rather fresh and sharp margins suggesting little to medium transport and their inclusion into sediments potentially datable by luminescence techniques made the area a good choice to make intensive research (di Lernia *et al.* 2017). This has been conducted through the excavation of test trenches along the profiles of the wadi and surface collections of artefacts in the surroundings. Stratigraphic distribution and state of preservation of the lithic material suggest that the archaeological content has been eroded and transported from a short distance. Notwithstanding the limits posed by the state of preservation and the nature of the deposits investigated, we believe that the evidence collected represents the first step towards a better understanding of the MSA occupation of this region.

The northern Saharan region in Tunisia offered also a key to understand who were the 'pioneers' that repopulated the desert in the early Holocene. Human occupation of the relevant time period has been so far recognized in the dune area south of Douz (Ben Nasr *et al.* 2016; di Lernia *et al.* 2017). In these surface palimpsests, the archaeological materials are dispersed on the surface and are generally characterized by high density. Surface lithic scatters are very rich, diversified, and apparently include all the products of flaking activities. Armatures, like geometrics and backed bladelets, are very abundant, so are tools like endscrapers and retouched blades. The materials from sites 15/6 and 15/7 were intensively investigated by means of a technotypological analysis in order to obtain quantitative and qualitative data.

Chronology, based on AMS radiocarbon dates on fragments of ostrich eggshell (di Lernia *et al.* 2017), is almost coincident with the beginning of the Holocene, thus supporting the hypothesis of a rapid population event by small bands of hunter-gatherers from northern refuge areas taking place as environmental conditions permitted it (Cancellieri and di Lernia 2014).

As far as the research on the funerary world is concerned, the data record from the Tunisian Sahara is far less rich respect to the northern parts of the country (e.g. Miniaoui 2013). Our research, carried out by desk-based studies and field work, added information to the knowledge already established, e.g. after the systematic field investigation of funerary monuments undertaken in the region of Douz and in the Jeffara by F. Paris and M. Gaki (2010).

Our research first consisted in using geo-referenced 1/100.000 topographic maps to extrapolate points already classed for the presence of monuments. Then, the data has been processed in a GIS environment to test the associations between sites and landforms, as well as to identify major concentrations by means of density analyses. In the field, we have verified the remote data, carried out intensive surveys, and selected a series of monuments, be they isolated or clustered into necropolises, for intensive investigation. This is the case, for example, of site 15/11 (di Lernia *et al.* 2017), which is located on an elevated area some 30 km south of Douz and counting 15 tumuli (Fig. 5.3). The GPS mapping of the necropolis was followed by the acquisition of pictures for 3D photogrammetric models (Lucci *et al*. 2019). Two monuments have then been excavated. Both resulted to be looted, and only small fragments of bones and few elements of grave goods were found.

Finally, we should also underline that our project contributed to the transfer of knowledge and skills sharing, that were achieved by training Tunisian and Italian PhD/MA students in archaeological field research methodology. More specifically, this consisted in improving skills in the elaboration and design of ad-hoc field research interventions; in the fields of GIS elaboration of territorial data, be they gathered by remotely sensed datasets, surveys or excavations; in the investigation and documentation of surface sites or the excavation and sampling of stratified contexts typical of arid environments; in the digital recording and treatment of archaeological contexts, also by photogrammetric techniques and 3D modelling.

6. Some thoughts from our experience

This brief account serves as a pretext for some reflections about the constraints, but also the opportunities, presented by the reprise of international collaborative research within the complex scenarios of some north African countries, especially those that were involved in the 'Arab Spring'.

Security conditions in North Africa severely changed in the last few years, and it has become thus mandatory to approach the fieldwork with a different perspective. One point to consider is, for example, the need for some armed protection: while working side by side with armed guards is routine for many archaeological missions working in different parts of Africa, for others, used to spend entire months in remote corners of the desert without any need for it, this has been an absolute novelty.

As far as the planning and carrying out of field activities is concerned, we have learned that these should be first inspired, more than ever, by criteria of modularity and flexibility, by identifying, for example, several research areas representing an array of possible alternatives within an integrated trans-regional research project, with the aim of quickly reprogramming the intervention areas after circumstantial evaluation of risks and constraints. Tunisia sees the alternation of diversified morpho-sedimentary contexts in a few hundred kilometres. For this, it fully offers the possibility to build research transects across diverse regions and environments, allowing this way to investigate the cultural responses to the environmental changes of the late Quaternary within an integrated regional program.

In close connection with the aforementioned aspects, flexibility is thus expected also from the institutions of the countries where research is conducted, in particular, those in charge of managing international cooperation contracts and issuing research permits. Very understandably, the will of foreign missions to work on several areas risks to be perceived as a means to expand as much as possible 'their own' territories of pertinence. Nevertheless, a shift is required. It is sufficient to imagine, for example, the not remote possibility of a fund assigned for researches in a certain area where suddenly it is no longer possible to work, for whatever reason. If the parties involved – including funding bodies – have previewed the possibility of shifting research target, in the frame of an integrated and organic research project, then a readjustment, for everyone sake, is likely feasible. Otherwise, the risk of getting to a long stalemate is continuously around the corner. We could certainly stress that in a dynamic socio-political situation like that of post-revolutionary Tunisia, the frequent change of institutional managers and local administrators make the process of building and maintaining durable relationships and a shared research path somewhat complicated, but this is certainly a matter of time.

Fluctuating security conditions make the organization of field missions too early on the start date rather difficult, which has profound repercussions on several aspects. One of these is related to budgetary constraints and the time allocated to expend research funds, for which funding bodies could preview measures to counter some unpredictability of using funds by that date in that specific place, an example by adopting 'budget freezing' measures or allowing the changing of research target from one site (or region) to another, or even allowing the changing of the research target from an excavation to the study of a museum collection. Thus, when supporting research in 'difficult' regions, funding agencies should be aware of the degree of risk and are hopefully expected to adopt flexible measures to manage expenditures reports. While this is not always possible, it is observed that a degree of flexibility is generally granted by private funding agencies because of less tight administrative and bureaucratic constraints, when compared to public institutions.

In any case, actual feasibility of doing fieldwork certainly still represents a privileged prerequisite for researches to be funded. Demonstrating to have the possibility in hand to reprogram and redefine the areas of intervention – or at least being able to provide one 'plan B' as risk mitigation measure – is a reassuring element, often mandatory, for most funding agencies.

In recent years, also for security reasons, the time allotted to field missions has been much reduced. Moreover, it is not always possible to involve many people in field activities. While it is always preferable to perform as much as possible numerous and diver-

sified activities within the time and space of the same field mission, it could happen that work packages must be unpacked into smaller – modular – ones to be performed at different times and in different places. This is an option that has in some cases to be taken into consideration, even if relocating and postponing activities (e.g. analysis of materials), or splitting field research itself into autonomous segments to be done at different times (e.g. survey, excavation, sampling) means that some fixed expenses (like travel) are going to double or triple.

As regards field missions themselves, these are expensive, and to some extent risky. It is thus necessary to postpone and relocate all the activities that need not necessarily be done on the field and it is mandatory to design fieldwork programs focussed on the investigation of well preserved, possibly multi-evidence contexts. Remote techniques and desktop studies can help focusing and circumscribing the research areas to be investigated by fieldwork. In the field, it should be adopted an expeditious approach to research activity. Photogrammetric techniques of survey and documentation, and other means of fast data acquisition achievable with digital tools, allow postponing complex and time demanding necessary operations to subsequent desktop phases.

7. Concluding remarks

This brief and not exhaustive account of our 2014-2017 research experience, and the thoughts unevenly presented here raise some points that can be relevant for the design of new research projects, or the prosecution of already started ones, and have mostly to do with flexibility, viewed as the possibility of diversification of research activities in space and time. A certain degree of flexibility is certainly and primary required from archaeological missions, which are asked to be plastic enough to change programs in due course or even cancel them. But it should also be expected from funding bodies and public institutions.

We then would like to reaffirm the urgency of informing local communities of the aims of the researches that are being conducted within their territories and involving them in cultural initiatives. As a matter of fact, the area we investigated is a renowned tourist location which was largely visited by people also attracted by its environmental and cultural heritage. The numerous local museums of the region are exemplary of the attention that the communities deserve to the traditional heritage, which should be taken into consideration when designing collaborative programs in heritage investigation, preservation and valorisation. When desert tourism will get to a hopefully soon and full reprise, the local economy could surely benefit also from the progress and activities made by research on cultural heritage, archaeology and environment.

We would like to conclude by recalling that the project passed through difficult times, and the efforts spent in keeping the research alive required strong will and patience. Nevertheless, the relevance of the project and the will to pursue the proposed aims made it so that the engagements by all parties involved were honoured, and the objectives overall attained.

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