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Central Saharan rock art: Considering the kettles and cupules

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ABSTRACT

All the main Central Saharan mountainous massifs present rock art from various periods, stretching from prehistory until the recent historical era. The paintings and engravings have been documented, described, and classified into the chronological-stylistic groups. However, a special group of carvings called kettles and cupules have been given little or no attention in the rock art studies. Since these artificial formations are abundantly present in the Central Sahara their systematic study is needed.

After a short presentation of the Saharan rock art groups, this paper examines kettles and cupules situated in the territory dominated by the earliest paintings called Round Heads, in the mountains of the Algerian Tassili, Algerian Tadrart and the Libyan Acacus. The results of the author's prolonged fieldwork are presented here, namely the quantity and distribution of kettles/cupules in the study area, their presumed relationship to the Round Head paintings, and their possible function.

1. Introduction

Since the first discoveries by Europeans in the nineteenth century, research in the Central Sahara has been precarious, often made by accidental travellers rather than by academics. As a result, after several decades of research no exhaustive inventory has yet been established and not all rock art sites have been discovered, since new images have been reported each year (Hallier and Hallier, 2000; Maestrucci and Gianelli, 2005; Soleilhavoup, 2007; Civrac et al., 2009).

Until 2010 research in this region was quite active including individual surveys (e.g.Hallier and Hallier, 2003; Soukopova, 2011) as well as international projects (Hachid et al., 2010; Le Quellec, 2016). Due to the growing political insecurity since 2011 with entire regions being closed to the public, there has been a stagnation in the Central Saharan research. Consequently, most research has been directed towards other geographical areas.

The results presented here are based on fieldwork undertaken by the author between 2005 and 2008 in the key Central Saharan mountainous regions: the Tassili n'Ajjer, the adjacent Algerian Tadrart and Libyan Acacus which constitute the study area of this research (Map 1). Tassili n'Ajjer is a 1500–2100 m high sandstone plateau covering 80,000 km^2 (Stoppato and Bini, 2001). To the south, the Algerian Tadrart forms a continuous mountain range with the Acacus in Libya, both massifs being divided by a political border. These are sandstone plateaus reaching 1300 m in height; Acacus on the east and Algerian Tadrart on the south slope becoming less and less marked with isolated small massifs surrounded by sandy desert. Ancient riverbeds called wadies cut across the plateaus; they are filled with sandy fluvial sediments including archaeological material (Cremaschi and Trombino, 1998).

The primary objective of the fieldwork was to document the earliest forms of rock art with special attention given to the man-carved holes called kettles and cupules. The term “kettle” is used for larger oval or circular holes carved in horizontal rock support. Cupules are shallow small holes a few centimetres in diameter, carved on horizontal or vertical surfaces. Although abundantly present in the study area, these carvings have rarely been published or studied (Tauveron, 1999). By presenting the quantity and distribution of kettles/cupules, their relationship to other rock art and their possible function, this article aims to promote this neglected field of research and to show the importance of including kettles and cupules into the study of the Saharan rock art.

2. Methodology

The research methodology was based firstly on an evaluation of all published literature, information from the internet and from personal correspondence with other researchers. This information constituted the base for the expansion of the list of all relevant sites in the study area. I also collected all data available concerning the

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climatic changes in the Sahara during the Pleistocene and Holocene.

Secondly, I collected data *in situ*. During the fieldwork around one hundred sites were investigated which represent a sample of several hundred painted/engraved panels and more than 1300 kettles and cupules (Fig. 1). Around 5000 photographs were taken which constituted the base for the quantitative analysis represented in the Map 1.

3. Climatic changes and archaeological evidence

Over the last 20,000 years, the Sahara has passed through a number of climatic events (Petit-Maire, 2003; Gasse, 2006). Between 20,000 and 13,000 BP the Sahara did not behave as a unitary climatological system; the mountainous areas experienced significantly wetter conditions than the lowlands, resulting in substantial differences in environment. Whilst high altitude regions had significant rainfall causing the formation of lakes, they were surrounded by dry lowlands experiencing extreme aridity. The mountains had enough humidity for people, animals and vegetation to survive in the Late Pleistocene.

The period before 20,000 BP is associated with a so called Aterian culture originally dated between 40,000 and 20,000 BP (Tillet, 1997; Hachid, 1998). However, recent radiocarbon measures have provided dates that support an age from 60,000 to 20,000 (Garcea, 2004).

Although the climatic conditions in the region were humid as early as the 16th - 15th millennium BP (Cremaschi, 1998), the period before 10,000 BP has not yet provided 14C data from shelters. A pre-Epipalaeolithic human presence is attested in the open but the lithic industry outside shelters cannot be dated (Tauveron, 1999).

From 10,000 BP excavated shelters show these sequences:

- the Epipalaeolithic (10,000 to 8800 BP) demonstrating a hunting economy with specialized exploitation of mammals, particularly mouflon, simple stone structures and rare pottery;
- the Mesolithic period (8800 to 7400 BP) with abundant grinding stones and pottery as a result of increasing sedentism and wild plant gathering;
- the successive Pastoral phase, based on cattle herding, dated to 7500 BP (Barich, 1987).

Fig. 1. Two large deep circular kettles associated with smaller oval kettles and several cupules on the top of a large boulder. Two shallow carved grooves are leading from the border of both large kettles towards the outside (Imha shelter, Acacus).

4. Rock art groups

According to the technique of production, patina, anthropological type, fauna, themes depicted, superimpositions and style, Saharan rock art is divided into six large distinct groups:

- Bubaline engravings
- Kel Essuf engravings
- Round Heads paintings
- Pastoral engravings/paintings
- Caballine engravings/paintings
- Cameline engravings/paintings

The Bubaline (called after the *Bubalus antiquus*, an African buffalo, which became extinct at around 5000 BP) rock art group includes large, naturalistic depictions of wild animals engraved with deeply incised and polished lines (Barnett and Mattingly, 2003). The Kel Essuf (literarly 'spirits of dead' in the language of the Tuaregs) rock art group on the contrary, represents extremely stylized small anthropomorphic figures with their body consisting of an oval with short arms, legs and a penis. These are executed by shallow engraved incisions or by very fine pecking. Whilst the Bubaline engravings are present on boulders in the open, Kel Essuf are located often inside rock shelters.

The Round Head paintings are characterized by the representation of anthropomorphic figures and wild animals, mainly mouflon and antelope. Symbolism is perceptible in all the compositions rich in dances, processions, masks and supernatural creatures. Whereas Bubaline engravings are very rare in the area dominated by Round Heads, the Kel Essuf engravings and Round Head paintings share the same territory and sometimes the same shelters.

The paintings of the Pastoral style are distinguishable from the Round Heads through the representation of domesticated cattle represented and the technique used to create them. This clear break between rock art styles has been attributed to the arrival of new people in the Central Sahara (Sereno et al., 2008). Pastoral art is attested all over the Sahara, as well as the Caballine and Cameline rock art groups which reflect the process of desertification in the Sahara. Large wild African fauna disappeared and were replaced by horses and dromedaries.

4.1. Saharan rock art chronologies

The chronology of the Saharan rock art has always been the scholars' most controversial argument (Aumassip, 1993; Muzzolini, 1995; Mori, 2000). The problem relates to the oldest chronological-stylistic groups, namely the Bubaline, the Kel Essuf and the Round Heads, whereas the recent art is chronologically secure because of the depiction of animals introduced to the Sahara in a dated period. The lack of direct dating resulted in two chronologies being established: a high and a low period (Hachid, 1998; Muzzolini, 1995):

Based on the dark shade of the patina, consisting of clay

Styles	High chronology (^{14}C years)	Low chronology (^{14}C years)
Bubaline	10,000–7500 BP	7000–4500 BP
Kel Essuf	before 9800 BP	from 7000 BP
Round Head	9.800–7500 BP	7000–2800 BP
Pastoral	7500–2800 BP	7000–2800 BP
Caballine	from 2800 BP	
Cameline	from 2000 BP	

minerals, manganese and iron oxides deposits, an Early Holocene, or even Late Pleistocene date, was proposed for the Bubaline rock art (Mori, 2000). The organic matter trapped in rock varnish layers during their deposition was dated and showed that the innermost layer formed between 9200 and 5500 BP (Cremaschi, 1996; Zerboni, 2008). Comparing the Bubaline with other African rock art, it may have originated much earlier than 10,000 BP. In the Nile Valley in Egypt, Qurta engravings representing wild animals were dated to at least 15,000 years BP (Huyge et al., 2011).

The chronological position of the Kel Essuf engravings in regard to the Bubaline engravings is not certain since they have not been found superimposed. When the rock surface is patinated, the patina of the Kel Essuf art is always dark. However, their position in the relative chronology is well established regarding the Round Head paintings, which are always found superimposed on these engravings (Soukopova, 2012). According to the dark patina and similarity to the Round Head images some authors (Mori, 1967; Hallier and Hallier, 1999; Striedter et al. 2002–03) consider the Kel Essuf art to be the earliest anthropomorphic engravings in the Central Sahara from which the Round Head paintings subsequently evolved.

Artistic production in the Sahara is attested to as early as the 10th millennium BP in the form of decorated pottery dating at 9420 ± 200 BP (cal BP 10,726 ± 300) (Roset, 1983) which supports the high chronology. In Acacus, in a shelter with Round Head images, grinding stones and a wooden spatula with traces of red ochre (suggesting painting activity), were dated to 8790 BP (Di Lernia, 1999). A sample of a Round Head painting in the Acacus was also dated to 5580 ± 210 BP (cal BP 6379 ± 240) (Ponti & Sinibaldi, 2005) which may indicate the continuity of this art long after the arrival of the herders. In the Tassili samples of paintings have been taken in 2008–2009 but the results did not provide any reliable direct dating (Hachid et al., 2010).

5. Kettles and cupules

Kettles in the study area appear both singularly or in groups. If grouped, oval and circular shapes may coexist on the same surface or only one kind of shape is present. Kettles are of various dimensions and depth and they occur in a variety of environmental contexts:

- inside or outside rock shelters,
- carved on the floor or on boulders inside shelters,
- on isolated stone blocks in the open.

Whereas kettles are always in a horizontal or slightly inclined position, cupules are often carved on vertical rocks. They appear singularly as well as in numerous accumulations, numbering dozens at single sites (Fig. 2). Cupules are found on the floors/walls in shelters or on large isolated boulders. In several cases boulders containing cupules were transported into shelters by people because they do not appear to have been fallen from the shelter's roof. They are often located next to kettles but in some sites only cupules are present. Their dimensions vary between individual sites as well as within a site.

In the study area I identified:

- 47 sites presenting 1362 kettles and/or cupules (Map 1)
- 28 of these sites also presented the Round Head paintings (the total number of Round Head sites in the study area is 48).

During my fieldwork kettles and cupules were examined because there has been a suggestion that they are associated to the Round Head paintings (Mori, 2000). My survey showed that

Fig. 2. A boulder with at least 40 cupules of various dimensions (Abri Freulon shelter, Algerian Tadrart).

kettles/cupules often occur in the same shelters decorated with Round Heads which may indeed indicate a relationship. However, they also occur with other forms of rock art as well as in empty shelters.

The distribution of kettles/cupules in the study area is not homogeneous (Map 1). They are abundant in the north-western Tassili, in the Algerian Tadrart and in the Acacus. It is important to note that kettles and cupules are rare in the main area of the Round Head sites, namely the Tassili de Tamrit, where these paintings are most numerous.

Kettles occur mainly in lower altitudes which may be related to the climate and to rain water. The connection to water, already suggested by several authors (Tauveron, 1999; Mori, 2000; Striedter et al. 2002–03), may explain the lack of kettles in the Tassili de Tamrit. In this highest point of the study area rains were abundant in prehistoric times; if kettles were designed to collect water, they were not necessary in the Tassili de Tamrit, where water was available, but they were needed in the lower altitudes where the water was scanty during dry periods.

5.1. Chronology and function of kettles and cupules

We have only one approximate dating of kettles. At Uan Muhuggiag shelter in the Acacus two kettles were covered by a layer dated at 7438 ± 220 BP (calBP 8255 ± 209) indicating the date after which these kettles were not used any longer (Mori, 2000); Striedter, Tauveron and Ferhat (2002–03) propose the dating of the Algerian Tadrart kettles to the Late Pleistocene. My fieldwork revealed that when the rock presented the patina, the kettles and/or cupules were also fully patinated.

Not only the period, but also the function, of kettles and cupules is difficult to be determined. Some kettles are large enough to contain liquids and they are apparently carved in relation to a water course, such as a water-fall in a rock shelter. Other kettles, even though also related to water, are too shallow to contain anything inside them, so that the practical function is rather to be excluded. The same is valid for cupules which could only hold a tiny amount of material. It is possible that cupules were created as a secondary product of an activity, for example the hitting of the rock surface for a special purpose, such as in rituals or using the rock as lithophones (Hachid, 1998; Bednarik, 2008).

The fieldwork has shown that the majority of kettles were connected to water. Surprisingly, in several cases cupules were apparently related to waterfalls. Kettles carved in isolated rocks in

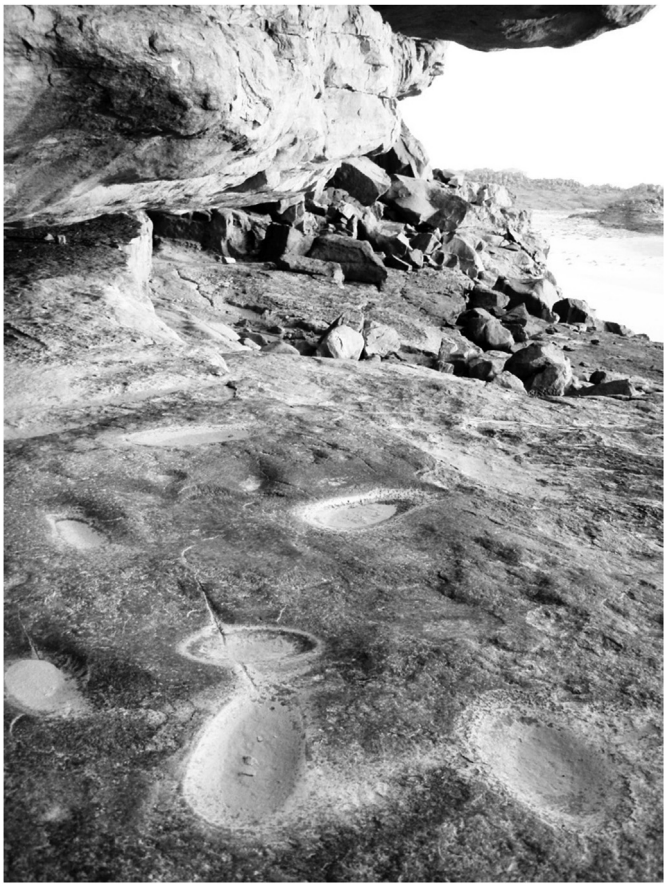


Fig. 3. The accumulation of shallow kettles under an ancient waterfall and near to the Round Head paintings (In Abtal shelter, north-western Tassili).

the open were exposed to rain, kettles in shelters were also often carved under the ancient waterfalls. The traces of these waterfalls are still visible in shelters; they are vertical stripes of a different colour than the surrounding rock, either darker or lighter. In many cases the stripe left by the waterfall is leading directly into the kettle under the wall. Many large kettles present shallow carved grooves leading from the border towards outside suggesting a channel for liquids. Deep large kettles may have functioned also as food containers.

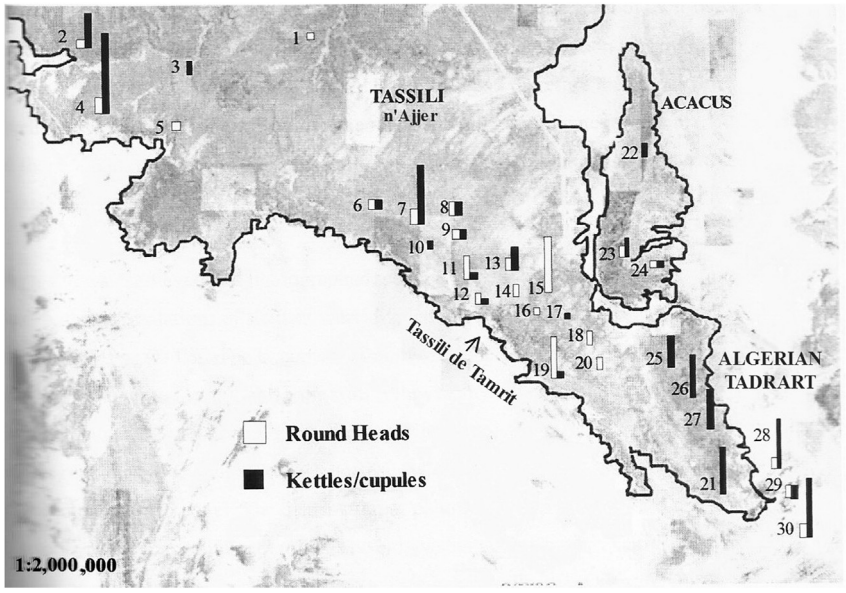
At In Abtal shelter in north-west Tassili (Fig. 3) a group of shallow kettles are located under an ancient waterfall. Since they could have been carved in other parts of the shelter, their location under the waterfall is clearly intentional. They are too shallow to be containers and so their use is possibly symbolic. Round Head paintings in this shelter are dancing horned figures, which may indicate special events occurring here and involving possibly also kettles and water.

In different sites the function of kettles was probably different, according to their dimension, depth and location. This function may have changed through time. Whereas the original use is unknown, in the historical period large kettles were used for grinding cereals by local nomad women. Such a use is possible in prehistoric times but is unlikely in case of accumulations of kettles. For example, at Uai Rassen (Map 1) thirty large deep kettles are accumulated side by side. As estimated by a local guide, around fifteen people could have lived in this shelter simultaneously. If so, the number of kettles as possible grinding spots would be largely overestimated in comparison with the number of persons.

Besides kettles and cupules, other forms of carving exist in the study area, namely grooves. They are extremely simple rock carvings usually in forms of short lines. They are particularly abundant in the Algerian Tadrart where, in some cases such as at Abri Freulon, they are superimposed by Round Head paintings.

6. Conclusion

After a short presentation of the archaeology and the climatic



Map 1. Distribution of sites with Round Head paintings and kettles/cupules. The numbers represent these sites: 1. Imirhou; 2. In Abtal, Tin Ahar, In Temeilt, Uai Rassen; 3. Tin Baidakoren; 4. Tin Mzghigauin, In Tahadaft, Tararit Iniaren; 5. In Truia; 6. Tiechiami, Techakelaouen, Tissoukai, In Eleghi; 7. Tin Tekelt, Uan Mata; 8. Uan Aguba, Uan Bender, Uan Derbauen; 9. Uan Assakamar, Tin Talaq; 10. Tin Kel Djanet, Afakakardau; 11. In Itinen en haut, In Itinen en bas, In Etouhami; 12. Tan Zoumaitak, Wadi Inaleuan; 13. Tin Aboteka; 14. Tin Tazarift, Tin Teferiest; 15. Sefar; 16. Tin Kani, Tissouar; 17. Tin Tabagar; 18. Ozanehare; 19. Jabbaren I, Jabbaren II, Aouarnhat; 20. Adjefou, Wadi Amazzar; 21. Tin Hanakaten; 22. Auis; 23. Wadi Teshuinat, In Ferdan, Uan Muhuggiag; 24. Imha, Tanshalt, Fozzigiaren; 25. Mulenaga, Uan Oxam, In Djeran; 26. In Tehaq; 27. Wadi Tadunadj, Bohedien; 28. Wadi Tin Uded; 29. Aman Sammedni high shelter, Oued Iberdjen Uan Tabarakat; 30. In Ezzane shelter, Abri Freulon. (Google Earth map modified by the author).

changes that occurred in the Sahara during the last 20,000 years, this paper examined the main groups of rock paintings and engravings. An entire section was dedicated to a so far neglected field of the Saharan research, namely kettles and cupules. Although these carvings are abundantly present in the Central Sahara, they have usually been given secondary attention. This paper introduced this rock art category presenting their distribution, possible function and their relationship to other rock art groups.

For their presumed association to the Round Head paintings (Mori, 2000) this aspect has been examined in depth. The association of kettles and cupules with the earliest paintings cannot be excluded because they are found together in several sites. However, the fact that kettles/cupules are almost missing in the most important area of the Round Heads, namely the Tassili de Tamrit, suggests that they were not an essential element of this artistic tradition.

The principal findings presented here do not represent an exhaustive set of information needed for the complete understanding of the kettles and cupules. More aspects to be examined emerged during the fieldwork. One of the most promising fields of research appears the systematic study of the landscape. Not only the kettles/cupules but all rock art sites should be examined in the relation to their environment in an effort to understand the pattern of their selection and a possible function. Since the kettles and cupules are found in all the continents (Bednarik, 2008), a comparative/ethnographic study at least within the African context is necessary.

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