Traditional Salt Extraction in Qurayyat, Oman: An Indicative Analogy of Prehistoric Practices

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Abstract. *This study is the outcome of a field inspection of the salt extraction processes in Qurayyat, Oman, also known as Khor Al Malh. The investigation revealed that some of the inhabitants of Qurayyat dig water ponds along the sea shore, and these ponds are eventually filled with seawater that later evaporates, leaving behind salt in the ponds. These artificial seawater ponds are used for salt production. Field interviews in Qurayyat confirmed that this is a long-standing tradition passed down through generations from the inhabitants' ancestors. Right through the history, salt has always been considered a necessity and a vital need for humankind. Consequently, this paper concluded that the method of extracting salt in the Qurayyat region is likely the same method used by many prehistoric groups in Oman.*

Keywords: *Qurayyat, Khor Al Malh, traditional method of salt extraction, salt is a vital necessity for of humans, prehistoric groups and salt extraction, a reasonable analogy between traditional methods of salt extraction and prehistoric methods.*

Introduction

Our understanding of prehistory Oman is not yet complete, since the palaeo-ecological conditions that largely prevailed and influenced the palaeo-economic conditions of the area remain partially comprehended. Therefore, many gaps mark the archaeological records of the country, which limit reasonable comprehension of the past. This lack of knowledge is justified by the fact that relatively few archaeological and paleoenvironmental investigations have been carried out in such a vast country of diversified geography and ecology. Thus, the archaeology of many areas in Oman remains unresearched. Again, the variety of habitats and h0w prehistoric groups adapted to the bioclimatic and ecological conditions is unspecified. Therefore, lack of data has impeded understanding of many aspects of prehistory.

Worldwide, traditional societies have identified various sources of salt and developed methods of extraction (Adshead 2016). An ancient method used by some traditional groups can be summarized in the following.

Early societies used pottery vessels to evaporate brine (salty water). By this method, salt was extracted and dried. In early times, certain pots made of a coarse ceramic material for salt collection. These pots are known as '' Briquetage'' in which brine is boiled to extract salt. Archaeological investigations recovered briquetage fragments, which indicate the salt working sites. The earliest evidence for the briquetage method come from the late Neolithic and Chalcolithic sites of Poiana Slatin. Weller and Dumitroaia (2005) explore the salt production of Poiana Slatinei as early Neolithic evidence of salt production in the region of Romania. Moreover, Lane and Morris (2001) and Harding (2013) discussed widely salt and its making in prehistoric Europe.

This paper is the outcome of a field study

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that focussed on Khor Al Malh "حلملا روخ" in Qurayyat, one of the sites of salt extraction, in the Sultanate of Oman, (Map 1). Research proves that salt (sodium chloride) production is conducted by the following methods:

1. Solar evaporation of seawater.
2. Mining of rock salt deposits.

In Qurayyat, Oman, people extract salt by solar evaporation of seawater in a costal location known locally as Khor al Malh. Moreover, the 'Oman Observer' (Aug. 4, 2018), under the title "'Cultural Symbols' in Qurayyat Seek Attention" acknowledged the presence of prehistoric rock engravings and prehistoric settlements in several locations in Qurayyat.

This paper is based on a field study that examined and documented the traditional salt extraction process adopted in the Qurayyat coastal town in the Sultanate of Oman (Map 1). In Qurayyat, salt extraction is carried out through the evaporation of the seawater.

The study focussed mainly on Qurayyat, one of the coastal sites of salt extraction in the Sultanate of Oman. Indeed, there are many sites of salt extraction in the country. The study investigates this salt extraction method because it is an inherited practice passed down through generations. This method can possibly be a useful analogy to establish reasonable equivalence to prehistoric salt extraction processes. Indeed, traditional salt extraction from seawater is a worldwide practice. However, it would be useful to consider Qurayyat and salt extraction processes before assuming this attempt.

Qurayyat

Qurayyat, is a small coastal town in the Sultanate of Oman, known for fishing and historical significance. It is found in the Muscat Governorate and is located approximately 83 kilometres to the southeast of Muscat (Map 1). The town is situated on fertile plains, with the Hajjar Mountains rising to the west.

In Qurayyat, small-sized and shallow pools or ponds are dug and filled with seawater along the coastal areas. Seawater in these ponds eventually evaporates leaving behind salt crystals. Indeed, the seawater is saturated and strongly impregnated with common salt.

Al Kindi (2021) reports that Khor al Malh in the Wilayat of Qurayyat is an important base in the life of some of the inhabitants of the region. The date of exploiting this source of salt remains unknown. In addition, the date of its development and first progress as a salt-producing field in Qurayyat also remains unknown.

"Khor Al Malh (Salt Estuary) is located 6 km south of the centre of Qurayyat and it is one of the most impactful locations in the state as fossil fuels and human presence remains that are linked back to 3000-4000 BC were found there. The naming of the place comes from the craft of its people as for hundreds of years, people extract salt in traditional ways."

(https://en.wikipedia.org/wiki/Qurayyat,_Oman#:~:text=Khor%20al%2DMilh%20(Salt%20Estuary,extract%20salt%20in%20traditional%20ways.)

Salt

All through the history of mankind, salt has had a crucial role in the needs and life of societies. The available evidence implies that salt usage dates back to at least 6000 BC (cf. "The History of Salt Works, https://www.saltworks.us/salt_info/history_Salt." of_salt.asp.; Kurlansky 2003 and Encyclopaedia Britannica "Salt in Ancient Civilizations." https://www.britannica.com/topic/salt.).

Again, the earliest evidence of salt production dates to around 6000 BC in China, where people

extracted salt from salt springs. Salt is a vital necessity and an essential ingredient for several physical functions; after all, it is a basic source of sodium and chloride, which are needed electrolytes. It is evident that sodium is crucial for nerve and muscle function, fluid balance, and blood pressure regulation. Moreover, chloride is necessary for maintaining blood pH and pressure, and is a constituent of abdominal acid. Additionally, sodium is vital for nerve and muscle performance and function. It is also involved in the regulation of fluids in the human body (cf. https://pmc.ncbi.nlm.nih.gov/articles/PMC3951800/#:~:text=Sodium%20is%20an%20essential%20nutrient,Deficiencies).

It is widely known that salt is vital for the human diet. It is also used consistently to season, preserve, and store food. It is an essential element in the diet of all humans, since it is the main supply of sodium in the human diet. In this regard, Cassiodorus, the famous Roman senator fourteen centuries ago, stated the following (cf. ElMahi 2000):

"Mankind can live without gold, but not without salt."

The chemical properties of salt are presented in the following (cf. (NASA Aquarius, https://salinity.oceansciences.org/learn-more.htm?id=46).

"Sodium chloride or common salt is the chemical compound NaCl, composed of sodium and chlorine. Salt occurs naturally in many parts of the world as the mineral halite. Seawater has large amounts of salt, since it contains an average of 2.6% (by weight) NaCl, or 78 million metric tons per cubic kilometer".

The information below about salt is accessible in a file titled "The History of Salt: From Ancient Times to Modern Kitchens", available on: (https://www.seasaltsuperstore.com/blogs/what-is-salt/the-history-of-salt-from-ancient-times-to-modern-kitchens#:~:text=The%20importance%20of%20salt%20dates,Roman%20soldiers%20to%20purchase%20salt).

"Throughout the ages, salt has been revered for its preservative properties, economic value, and its role in the culinary traditions of every culture. The earliest evidence of salt production dates to around 6000 BC in China, where people extracted salt from salt springs. Salt's preservation properties were immediately recognized, as it was used to preserve meat and fish, allowing ancient peoples to store food for times of scarcity."

In ancient Egypt, not only did salt play a vital role in preserving food but also in the mummification process, as it helped to desiccate bodies, preventing decay. Ancient Egyptians also had a deep understanding of the culinary uses of salt, incorporating it in their breads, stews, and other foods.

The famous "Salt Roads" of Africa, for example, were established as a way of transporting salt from the northern salt mines in places like the Sahara to sub-Saharan Africa, where it was traded for gold, ivory, and other commodities. In ancient Rome, soldiers were sometimes paid in salt, giving rise to the term "salary", derived from the Latin word "salarium," which referred to the allowance made to Roman soldiers to purchase salt (cf. ElMahi 2000).

As mentioned above, the earliest evidence of salt extraction in ancient civilizations dates to circa 6000 BC. In Romania, salt was boiled from spring water, and in China, salt springs were the source of salt. On the other hand, early evidence of salt is reported from the Nile Valley in the Egyptian Gebelein, which dates to (ca. 2345BC – 2181 BC). (cf. Wilde and Behnert. 2002).

Many traditional societies, who have no way into coastal areas and salt ponds, have developed processes to extract salt from several vegetable sources. For example, in New Guinea Highlands, several tribes engaged in extracting salt from tree bark, though known as a long and tiresome practice. (cf. https://www.quora.com/How-did-prehistoric-humans-meet-their-daily-salt- needs#:~:text=How%20did%20people%20get%20salt,names%20like%20Middlewich%20and%20Norwich.&text=Getting%20salt%20in%20their%20diet,for%20something%20else%20of%20value).

Traditional Salt Extraction in Qurayyat

In the Sultanate of Oman, archaeological records do not contain any evidence that can shed light on salt extraction and production processes. Nonetheless, this survey, carried in coastal parts of Qurayyat, reveals the presence of ponds, known locally by the name of 'Khor Al Malh' (Fig.1). Residents of the small town use these ponds, where seawater evaporates, to extract salt. For them, it is a traditional practice passed down through generations from ancestors. The investigation outcome is shown and presented in the following Figs (Figs. 2,3,4,5) that summarize the field task.

Discussion

Exploration of the salt site in Qurayyat, Oman, considering all aspects of prehistoric salt extraction processes, draws attention to examining prehistoric practices of the salt extraction processes adopted in the region. Until recently, there has been no direct prehistoric evidence referring to the salt extraction processes in Oman. Thus, a reasonable analogy can possibly shed light on the prehistoric salt extraction processes in the region. Therefore, a rational analogy can establish similarity between the traditional practices of salt extraction on the one hand, and the prehistoric processes on the other. And as it is known, analogy is a comparison between one thing and another, typically for the purpose of explanation or clarification.

In Oman, prehistoric sites dating back to the Stone, Bronze and Iron Ages are inspected and considered for evidence of the adopted salt extraction processes. Research on the Palaeolithic and Neolithic of the Stone Age sites, comprising of Ras Al Hamra, Wadi Al Wattayah, and Bat, al-Khutm, al-Ayn, Qurum, and Qarat al-Kibrit (Map 2) reveals evidence on the practices adopted by the inhabitants in these regions. The evidence demonstrates the use of sea resources such as fish and marine molluscs. However, there is no direct evidence of any sort of salt extraction or use.

On the other hand, examination of the Neolithic sites in Oman during the 7th to 4th millennia BC reveals development of coastal settlements. Inhabitants of these seaside sites practiced fishing and gathering marine molluscs. However, again, no evidence of salt extraction has been documented.

Additionally, study of the Bronze and Iron Age sites in Oman reveals the same; therefore, the archaeological records of Oman include no evidence of prehistoric salt extraction processes. Indeed, no evidence of salt extraction or use was discovered. In fact, despite the lack of evidence of any activities related to salt extraction in these sites, the fact persists. A good reminder notes by Late Professor Tigani's point out the following:

''Lack of evidence is not evidence.''

Therefore, the absence of proof for something does not definitely mean that the thing does not exist. However, despite the absence of evidence of ancient salt extraction practices, this paper argues that prehistoric

Fig.1: Interviews carried out with the salt extractors and inspecting salt ponds in Khor Al Malh, Qurayyat.

Fig.2:The ponds are filled with sea water especially during summer time.

Fig.3: Sea water in the ponds, and reshaped by the salt workers into square shapes.

Fig.4: Men collect the extracted dry salt from the ponds, in khor Al Malh, Qurayyat.

Fig.5: Salt is packed in sacks to be collected by salt merchants in Qurayyat.

inhalants knew salt and used it in several ways. Salt is undeniably a necessity for humans' life; it is a fundamental basis of sodium and necessary chloride and electrolytes. Sodium is imperative for nerve and muscle function; it is vital for maintaining blood pressure order and balance. Without salt, humans cannot live or survive. An early proof of salt production dates back to around 6000 BC in China, where people extracted salt from salt springs.

This paper attempts to investigate traditional salt extraction methods on the one hand, and establish an analogy with prehistoric salt resources and methods, on the other. It aims to compare the traditional process adopted now to a possible prehistoric method for explanation and clarification. Again, it focuses on the relationship between the components of the process; hence, resources of salt and methods of extraction salt are the focus.

The location of the prehistoric sites is essential in this attempt; however, consideration is due to the fact that the location of these sites is controlled by certain factors namely, "push factors" and "pull factors". "Push factors" are the circumstances and conditions that motivative and drive a group of people to move from the area they occupy. On the other hand, "pull factors" are the favourable state and conditions that attract a group of people and can possibly fulfil their needs. Therefore, prehistoric groups moved to areas that could help fulfil and realise their needs.

The sea, and namely the coastal areas in Oman sea, have always been a "pull factor" and an attraction to prehistoric groups, offering locations for their settlement. Prehistoric groups settled in such coastal areas, and; hence the establishment and development of coastal settlements and communities.

Certainly, the various sea resources offered prehistoric groups essential food supplies of fish and shellfish such as molluscs. Eventually, this motivated the establishment of prehistoric settlement sites along the coast in Oman (cf. Berger et al. 2003; Ibrahim & ElMahi 1997; DeSanto et al. 1997 and Burcin et al. 2003). Biagi (1999) argues that archaeological excavations of shell middens reveal shell gathering in Oman in ancient times. Until recently, Omani people have lived in coastal settlements along the sea of Oman. These societies also depended on fish and gathering molluscs. ElMahi (2000) has studied these societies in Al Batinah region; their fishing practices and fish preservation processes, finding them deeply tied to a seasonality of a subsistence strategy. Moreover, ElMahi (1999) investigates the inhabitants mollusc harvesting activities in Al Batinah region arguing that they are deeply related to their essential supplementary diet.

This paper contends that inhabitants of prehistoric coastal sites in Oman encountered ponds with seawater along the coast. Water in these ponds eventually evaporated over time, leaving behind salt for any person passing by. This was probably a rich source for the inhabitants of the coastal sites. Nonetheless, this paper argues that people in these regions used salt from other sources. The writer suggests that prehistoric inhabitants of these sites engaged in fishing and gathering sea mollusc. The paper contends that traditional groups inhabiting the coast line in Oman have been equally engaged in fishing and gathering mollusc (Cf. ElMahi 1999 and 2000). It argues that before discovering ponds with salt, these prehistoric groups used salt from other sources. This must have been the case, because these prehistoric groups could not have survived without salt. Again, there is no evidence indicating any other sources of salt that prehistoric groups could have used along the coasts of Oman.

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ملخّص: يمثل هذا البحث نتاج عمل ميداني لدراسة وتوثيق عملية استخلاص الملح في منطقة خور الملح في قريات بسلطنة عمان. فقد أتضح بأن بعض سُكان منطقة قريات في عُمان يقومون بعمل أحواض بالقرب من شاطئ البحر. ثم تُملأ هذه الأحواض بماء البحر، حيث يتبخر الماء فيها تاركاً الملح الذي يقوم أهل قريات بجمعه. وتمت عملية جمع البيانات من خلال الانغماس المباشر فيما يقوم به أهل منطقة قريات من استخلاص للملح. وخلال هذا العمل الميداني تمت مقابلات وتسجيل ملاحظات تفصيلية عن أسلوب ووسيلة استخراج الملح. وقد تجلى من هذا العمل الميداني بوضوح التماثل الذي يمكن أن يفسر وسائل استخراج الملح في فترات ما قبل التاريخ. فالإنسان لا غنى له عن الملح الذي يعد ضرورياً للحياة. وعليه، خلص البحث إلى أن وسيلة استخراج الملح في منطقة قريات قد تكون هي الوسيلة ذاتها التي اتبعتها العديد من مجموعات ما قبل التاريخ في عُمان. ڈكلمات مفتاحية: قريات، خور الملح، وسيلة استخلاص الملح التقليدية، حاجة الإنسان للملح، مجموعات من فترات ما قبل التاريخ واستخلاص الملح، التشابه بالمقارنة مع ما كان يفعله الإنسان في الماضي.

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