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FACULTY OF LAW, ARTS & SOCIAL SCIENCES

School of Humanities
Archaeology

Maritime Cultures of the Erythraean Sea

by

Ross Iain Thomas

Thesis for the degree of Doctor of Philosophy

November 2009

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF LAW, ARTS & SOCIAL SCIENCES

School of Social Sciences (Archaeology)

Doctor of Philosophy

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In the year 30BC Ptolemaic Egypt was annexed by the Roman Empire. In 106AD The Nabataean Kingdom was also annexed, becoming the new Roman province of Arabia Petraea. In the first three centuries AD an explosion in the long distance trade between the Roman Empire and various states in India, East Africa and South Arabia, known as the Erythraean Sea trade was sparked by Roman Imperial interests and the expensive tastes of Rome's growing elite. In the north of the Red Sea, this created bustling, cosmopolitan port communities at Aila, Berenike and Myos Hormos. The peoples of both Egypt and Nabataea could only await the implications for their lives in being subject to empire and the economic opportunities available through providing for its elite. More specifically, these annexed kingdoms had indigenous populations who inhabited the desert coastal regions of the Red Sea, that were perceived in antiquity as being ethnically distinct and whose various relationships with the Roman Imperial authorities were varied, often chequered. Here they are discussed. The purpose of this study is to discover the role of maritime activities in the construction of group identities in the northern Red Sea ports of the first three centuries AD. This question has five component parts:

- How is group identity (such as ethnicity) defined?
- How is identity represented archaeologically?
- How to identify maritime activities?
- How important were maritime activities in defining group identities?
- How can we recognise the various power relationships that shaped these identities?

This study provides detailed analyisis of original material from Aila, Berenike and Myos Hormos, namely maritime artefacts that cover many finds groups (metal, cordage, basketry, bone, shell, horn, wood, pitch, stone) as well as reanalyis of published or forthcoming material from the finds groups of ceramics, stoppers and faunal remains from these sites. Used together as a source on the lives of the various port communities on the Red Sea, these artefacts provide an independent source of information with which to compare historical documents on these communities. This is an original approach to the question of how ethnic identity was distinguished within port communities through assessing consumption practices (such as diet) and maritime activities.

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Abbreviations

AI	Inventry code for Aila finds, followed by year, find code and find number.
BAR	British Archaeological Reports
BE	Inventry code for Berenike finds, followed by year, find code and find number.
CIS	Corpus Inscriptionum Semiticarum
FHN	Fontes Historiae Nubiorum
IGR	Waddington in *Inscriptions Grecques et Latines de la Syrie*
JS	Jaussen & Savignac in *Mission Archéologique en Arabie I, II*
MH	Inventry code for Myos Hormos finds, followed by year, find code and find number.
NISP	Number of identified specimens
O.Ber	Ostrakon from Berenike, followed by inventory number.
O.Claud	Ostrakon from Mons Claudianus, followed by inventory number.
O.Krok	Ostrakon from Krokodilo, followed by inventory number.
O.Max	Ostrakon from Maximianon, followed by inventory number.
O.Myos	Ostrakon from Myos Hormos, followed by inventory number.
Periplus	The unauthored first century AD pilot *Periplus Maris Erythraei* (translated by Casson 1989)
RAP	The Roman Aqaba Project, directed by Tom Parker

1 Introduction

In the year 30BC Ptolemaic Egypt was annexed by the Roman Empire. In AD 106 The Nabataean Kingdom was also annexed, becoming the new Roman province of *Arabia Petraea*. In the first three centuries AD an explosion in long distance trade between the Roman Empire and various states in India, East Africa and South Arabia, known as the Erythraean Sea trade was sparked by Roman Imperial interests and the expensive tastes of Rome's growing elite. In the north of the Red Sea, this created bustling, cosmopolitan port communities at *Aila*, *Berenike* and *Myos Hormos*. The peoples of both Egypt and Nabataea could only await the implications for their lives in being subject to empire and the economic opportunities available through providing for its elite. Within these annexed kingdoms were ethnically distinct indigenous populations who inhabited the desert coastal regions of the Red Sea, whose relationships with the Roman Imperial authorities were varied, often chequered. Here they are discussed. The purpose of this study is to discover the role of maritime activities in the construction of group identities in the northern Red Sea ports. This question has five components:

- How is group identity (such as ethnicity) defined?
- How is identity represented archaeologically?
- How to identify maritime activities?
- How important were maritime activities in defining group identities?
- How can we recognise the various power relationships that shaped these identities?

An interdisciplinary approach using a variety of archaeological, epigraphic and historical sources will seek to answer these questions. The subjects of the study are the inhabitants of three Red Sea ports; *Aila*, *Myos Hormos* and *Berenike* (Figure 1.1), during the first three centuries AD. These ports are studied in detail, with other nearby and contemporaneous sites discussed for comparative purposes. Maritime activities were significant in the founding of these settlements and the utilisation of the sea as a resource, or means of transport, by their inhabitants, was crucial to their continued occupation.

The material used in the study was made available by four projects in the region. Two projects at *Myos Hormos*, including The University of Chicago (Whitcomb & Johnson 1979; Whitcomb & Johnson 1982; Whitcomb 1996) who worked on the site between the years 1978-1982 and subsequent excavation by Southampton University between 1999 and 2003 (Peacock & Blue 2006). The *Berenike* excavations undertaken by Delaware and Leiden Universities (Sidebotham & Wendrich 1995; 1996; 1998; 1999; 2000) between 1994 and 2002 and finally by North Carolina state university at *Aila* between 1994 and 2003 (Parker 1997; 1998b; 2000; 2002; 2003b). Whilst the data available this project was partially dependant upon the sample strategy used by the directors of these projects, access to extensive excavation records and published material has allowed for this study to utilise an intra as well as inter-site approach. The various publications on the archaeology of the Red Sea often describe the cosmopolitan demographic present in its ports, before rapidly moving onto 'safer' subjects such as economy. For example; "

the nomads (of the region around *Aila*) presumably included elements of the *Thamudic*[1] tribes…perhaps these nomads periodically visited *Aila* to exchange animal products …for agricultural and manufactured goods available in the city" (Parker 2006: 229) and "archaeological and faunal evidence from *Berenike* and epigraphic evidence from the desert hinterland and region suggests the presence of Italian and western Mediterranean residents at *Berenike* and western Mediterranean trade through the port is greatest in the early Roman period" (Sidebotham & Wendrich 1998: 451-2). Whilst these statements would appear to be supported by the various sources of evidence available, such statements are rarely conclusively argued with a comprehensive study on what constitutes a specific tribe or ethnic group and how this is represented archaeologically in each case (for notable exceptions see Sidebotham 2004; Barnard 2005). This study systematically assesses the evidence using both inter and intra-site approaches, for different group identities in the archaeological, epigraphic and historical record. Analysis of how material culture and the written word are used to construct identities will explain when, where and why certain groups were in the Red Sea ports. This will acquaint the reader with various groups of people, including; Roman citizens, Greeks, Hellenised Egyptians, Egyptians, Indigenous peoples from the coast and desert (*Ichthyophagi, Trogodytes* and *Blemmyes*), Arabs (including *Nabataeans* from Jordan and *Palmyrenes* from Syria), Indians and East Africans (Including *Adulites* and *Aksumites*). This text will identify their presence, but more importantly explore how their group identities were maintained on a daily basis through the various practices undertaken in the Red Sea ports.

[1] The ethnonym *Thamudic* is often applied uncritically to a linguistic group who wrote the ancient North Arabic dialect *Thamudic* or the region of northwestern Saudi Arabia and southern Jordan in which they are found (MacDonald 1999: 436-8). The name comes from one of the tribes in the region, though various tribes were known to use this script (ibid.; Al-Fassi 2007).

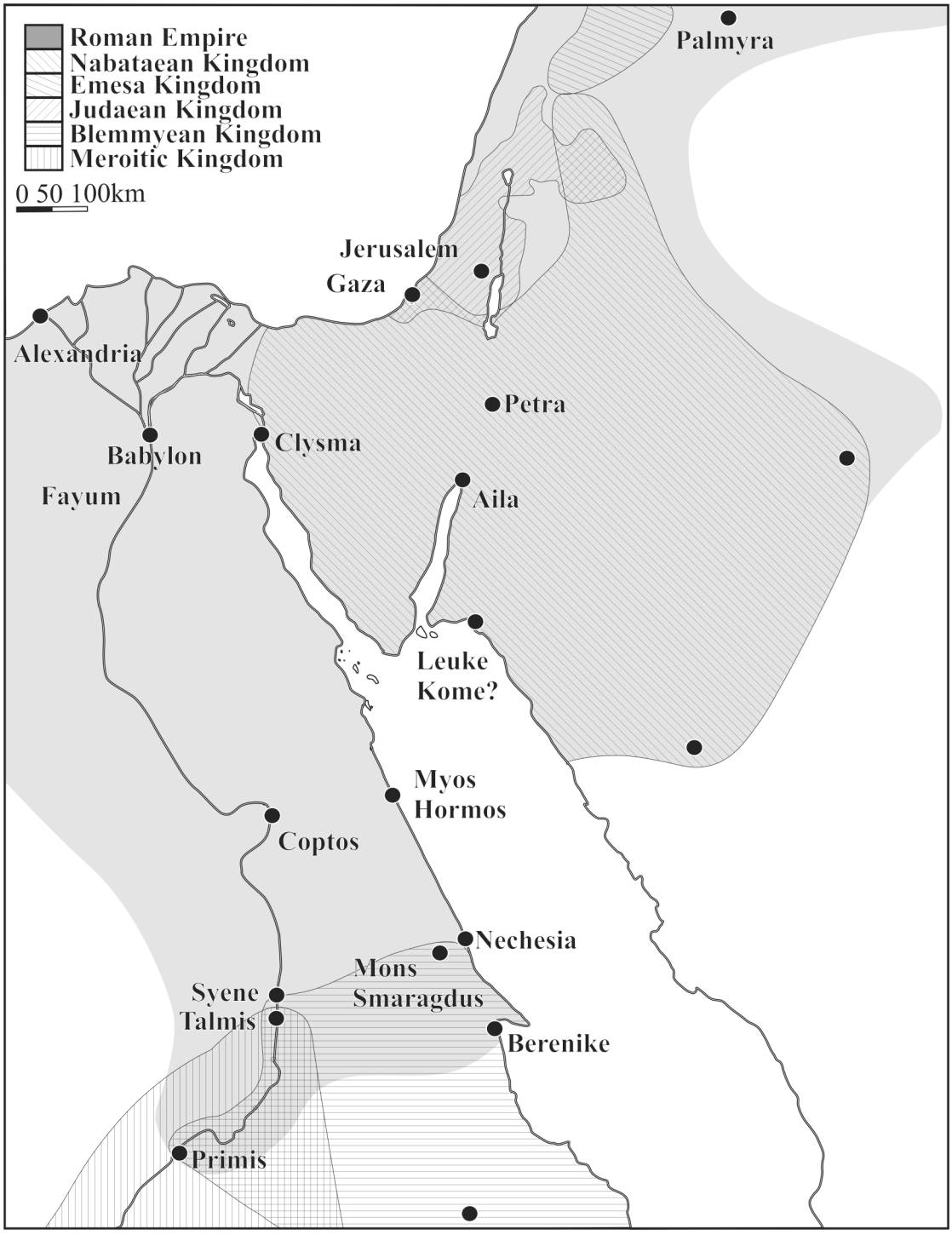


Figure 1.1 Political powers of the northern Red Sea region, showing the maximum extent of kingdoms and empires during the early Roman period (after Ball 2000: 33, 48 and 61; Kirwan 1974: 45; Anderson et. al. 1979: 128).

Accounts of the inhabitants of this region were written in the early Roman and the preceding Ptolemaic period (for example Mela *De Chorographia*; Agatharchides *On the Erythraean Sea*; Herodotus *Histories*; Strabo *Geography*; Diodorus *Library of History*; Pliny *Natural History*; Ptolemy *Geography*). These Greco-Roman accounts assigned numerous ethnonyms (ethnic labels) to the various *ethne* of the Red Sea coast they discussed. The Greek term *ethne* is often associated with 'ethnic group', the interpretation of which is part of ongoing debate (Hall 2002: 17). These were written however, by Greek or Roman authors who were members of a privileged colonial

power and carry noticeable politically motivated bias' (Hartog 1988: 205; Hall 1989: 191) influenced by the specific socio-political (in this case colonial) context from which they came (Fabian 2000). Historical sources are represented here as a specific class of source through which one can approach how the abstract concept of ethnicity was perceived differently in Antiquity, by different peoples. First however, group identities such as ethnicity and nationality, their ascription, distinction, creation and maintenance, needs to be defined.

Ethnicity, like all group identities, is a complicated subject to understand and define in any discipline. The historical data available for this study gives us a number of ethnonyms, but it is clear that these actually represent exonyms (ethnonyms given to a subject population by another population). It is important to recognise different approaches to the categorisation of ethnonyms within their cultural context, for different groups may recognise different characteristics as ethnically distinct (Astuti 1995: 465). Ethnicity can be distinguished through the use of *indicators of ethnicity*, which are specific cultural features singled out as ethnically significant. These mark 'ethnic boundaries', imagined borders that make one ethnic group distinct from another (Barth 1969: 15; Goudriaan 1992: 76). They are the product of the prevalent *theory of ethnicity* of the viewer's cultural background, which determine what cultural features are singled out as ethnically significant (Astuti 1995: 465). As these *theories of ethnicity* are not universal (ibid.), an intimate understanding of the social context has to be attempted so as to understand how identity was constructed in each case. Multiple, often contradictory characterisations of an ethnonym are often preserved, because of the variable influences on historical sources. *Emic* accounts, meaningful to ones self-ascription to an *autonym* (ethnonym assigned to and for ones own group) or *etic* accounts meaningful to an observer's characterisation of an *exonym* (ethnonym assigned by observer to an *other* group) will appear quite different (Jones 1997: 56-7; Díaz-Andreu et. al. 2005). Outside of post-modern relativist perspectives, ethnic identities are and were usually objectified as being homogenous, unchanging and historically linked to a specific place or descent (Jones 1997: 106; Hall 2002; Díaz-Andreu et. al. 2005), a trait that was particularly important when defining self and other identities in the Greco-Roman world (Hall 2002: 217). We do however know that ethnic identities change over time as part of the very process of maintaining their difference from others, whilst simultaneously interacting with other groups (Jones 1997: 106). Thus, any approach to group identities must be capable of accommodating the multiple (constantly changing) perspectives that existed in the past as they do today. For this reason even the most biased view is important for understanding how a group identity was viewed by people outside it, as well as members of it.

The methodology developed for this study has two main components. The first component is to recognise group identities in the archaeological record, the second to reconcile or explain differences between the qualitative historical data with the quantitative archaeological material. Archaeological evidence of group affiliations comes in many forms; here the focus is on the identification of specific practices that were important in the maintenance of group affiliations. Such practices are discussed, comparing the significance of and relationship between, consumption practices and vocational activities, as understood within its specific social context.

Consumption practices are important for group identity (Appaduri 1986). Comparisons between diet and how it was prepared, served and eaten (Sahlins 1976; de Boeck 1994: 258; Falk 1994; Serjeantson 2000) are culturally significant and have been explored in other Roman provinces (King 1985: 187; Okun 1989: 124; Mattingly 2006: 220-2). What food is consumed is a significant indicator of ethnicity that marks 'food boundaries' differentiating peoples (Appaduri 1988: 15; Falk 1994: 75; Peckham 1998: 172). The range of fauna from the Nile, Eastern Desert and Red Sea regions is discussed in relation to its potential ethnic significance (Wattenmaker et. al. 1979; Wattenmaker 1982; Van Neer & Lentacker 1996; Van Neer & Ervynck 1998; 1999; Hamilton-Dyer 2001; Leguilloux 2003). Supporting evidence comes from the analysis of amphora stoppers, which can suggest what liquids were being consumed (Thomas & Tomber 2006). Also the consumption of tableware ceramic forms is discussed, with reference to how food is being consumed (Meadows 1995; Fincham 2002; Hawkes 2002). This methodology should be able to suggest if there are distinctively different consumption patterns present in the faunal and ceramic record. This will highlight whether there are any specific food or drink products that were associated with specific populations. Comparisons with inland sites will highlight whether the maritime context is unusual or different from that pattern suggested by more sedentary populations.

As these are maritime ports, one would expect that much of the evidence for activities relating to vocational practices at *Aila*, *Berenike* and *Myos Hormos* would be concerned with maritime livelihoods (shipwrights, sailors, fishermen, pilots and riggers) or subsistence activities (fishing, shell collection). Such activities were clearly recognised as important in the Greco-Roman characterisation of peoples. For example, livelihood or subsistence, known as *diaitia* in Greek, was a central cultural criteria of Greek identity in Herodotus and can also be seen in other classical authors (Hartog 1988: 259; Agatharchides *On the Erythraean Sea*: 32-40, 66; Herodotus: 8.144.2; Diodorus *Library of History*: 3.15.15). In reality the significance of maritime activities was likely to vary depending upon a specific (or individual) context. There are anthropologically attested cases where maritime activities are culturally distinctive and crucial to ones ethnic or group identity (Astuti 1995) and cases where this is archaeologically visible (McNiven 2003: 344). In these cases a 'recurrent set of significant maritime traits' were important or central to their construction of a specific and distinct 'maritime culture' (Westerdahl 1994: 265) or ethnic group. There are also cases where maritime activities represent maritime vocational identities and not a distinct 'maritime culture' or ethnic group (Hunter 1994; Parker 1995a: 93).

Comparing the type and frequency of different maritime activities with consumption practices will identify what groups within the Red Sea port communities were involved in what maritime activities and how significant it was to them (see Chapter 3). Other people represented in the ports may have only had the most tenuous link with the sea, in as much as that they lived in a port for part of the year, posted as soldiers or operating as traders (Sidebotham 2004: 105-116). Some could be described as 'maritime cultures', others not, all are important in understanding the cosmopolitan demography of these ports.

Social context can be understood on many different levels. Evidence from vocation and consumption practices can only be fully understood by placing artefacts within their specific social

context (Kleppe 1977: 32), which in turn has to be understood within its specific archaeological and wider landscape context. On a local scale this study will focus upon areas of different function over the first three centuries AD. Differences over time and in different areas of each site can then be compared between sites. The dataset used from each site involves all forms of artefact and epigraphic material available from site archives and published accounts. On a wider regional scale, each port site needs to be understood as a part of its wider landscape. These landscapes include those accessed by different groups, marked by them in different ways. A Roman road landscape was marked with forts, towers and the inscriptions of travellers. A coastal landscape of settlements, middens, fish traps, navigation cairns and anchorages is also visible. Finally, a desert landscape of wells, cairn burials, camps and rock art sites, used by the indigenous desert nomads is also visible and distinct. Only by taking into account the specific local and regional influences can vocation and consumption practices be fully understood.

The second component to the methodology draws together the results from the historical and archaeological data. Historical data is crucial to the understanding of identity in any historical period. If one attempts to understand the influences of the specific social context that determined each author's bias, then a better, more nuanced understanding of the various perspectives on how group identities were perceived at these ports in Antiquity can be achieved (elaboration on this brief summary is present in Chapter 10). These can then be compared with the ostrakon and papyrus letters on the subject of *others* preserved at Eastern Desert sites (Bülow-Jacobsen et. al. 1994; Cuvigny 2003b; De Romanis 2003), providing a detailed account of the Greco-Roman theories about ethnicity and accounts of ethnic groups on the Red Sea that have been preserved and discovered to date. This history will provide the basis for a methodology using the notion of *discrepant experience*.

Discrepant experience is a post-colonial method first used by Edward Said (Said 1993: 35-50) to highlight how the discrepancy between two accounts of the same subject relates to an unequal power relationship. Discrepant experience is used in archaeology for a post-colonial reading of the archaeological evidence for power relationships between colonial powers and colonised peoples (Alcock 1997b; Hingley 1997; Mattingly 1997c; 2006). Here the notion of discrepant experience is used to highlight the difference between the characterisation of peoples in the historical and epigraphic record (as evidence for perceived differences of ethnic groups) and the actual activities of people present in the archaeological record (as evidence for practices of group identity ascription and differentiation). The differences will then be discussed with reference to the power relationships present between the different groups present in the Red Sea ports. Unequal power relationships (if identified) may explain how and why certain ethnic groups were distinguished from one another, within the multi-ethnic social systems present within port communities. Specifically the role of certain groups, the opportunities and hindrances experienced by them may be better understood through what roles they had in maritime activities such as sailing, ship maintenance, trading and fishing.

In conclusion, this study will approach the questions of how identities were constructed, why they took the specific forms they did and how they are represented archaeologically at the Red

Sea ports. To do this the study will use archaeological evidence from the Roman Red Sea ports of *Aila*, *Berenike* and *Myos Hormos* to identify the practices used in the construction of identity, providing the indicators of identity and how they were used to define differences between groups. Supporting historical and epigraphic evidence will provide alternative perspectives on how groups defined themselves through ascription and others through distinction. To understand how different groups within ports constructed identity, differences within sites and between sites will be explored through intra and inter-site analysis. This will highlight any differences in the demography at each port and any differences in the relationships between the different groups within each site. Ultimately this study will aid the understanding of the social context of the Erythraean Sea trade through a better understanding of the 'maritime cultures' involved.

1.1 Erythraean Sea Trade

Red Sea archaeology has been the subject of renewed interest by archaeologists, anthropologists and linguists in recent years (Lunde & Porter 2004: 353; Starkey 2005). The Erythraean trade represents long distance maritime trade between Roman Egypt, Africa, Arabia and India and numerous classical accounts (Indicopleustes; *Periplus Maris Erythraei*; Strabo; Pliny) of this trade have motivated some to focus on the ancient economy (Sidebotham 1986; Parker 2003a). This study diverges from other studies, by being dedicated to the people involved in the trade, rather than the trade itself.

The Erythraean Sea trade was an extensive network of maritime routes that consisted of numerous cultures and political states. The cultural connections present during the first three centuries AD had a long history of involvement by peoples from India, Africa and Arabia, that Mediterranean peoples entered into as a product of Hellenistic involvement in the region following Alexander the Great's empire building in the area. After Egypt was inherited by the Ptolemaic kingdom, the Ptolemys' looked to the Eastern Desert and the Erythraean Sea for resources to increase their power base and maintain their armies (Casson 1993; Hölbl 2001). The most important resources appear to have been gold from the Eastern Desert and elephants from East Africa, though trade with Arabia and India would not have been insignificant (Casson 1993; Young 2001). The infrastructure built by the Ptolemys' linked the Nile via a network of desert roads (guarded by fortified wells, Sidebotham & Zitterkopf 1995) and a canal between the Nile and *Clysma* (Redmount 1995) to the newly constructed colonies on the Red Sea that were to facilitate access to the resources of the Red Sea and East Africa (Figure 1.2). The Red Sea canal opened by Ptolemy II allowed for access to *Clysma* (also known as *Arsinoë*) on the Red Sea, via *Heroopolis* (near the modern Suez Canal) to *Babylon* (Old Cairo) on the Nile, then onto Alexandria. South of *Clysma* Red Sea port colonies of *Philotera*, *Myos Hormos* and *Berenike* were built on the modern Egyptian coastline (Figure 1.3), beyond which were *Soteira* and *Ptolemais* (Agatharchides *On the Erythraean Sea*: 5.86).

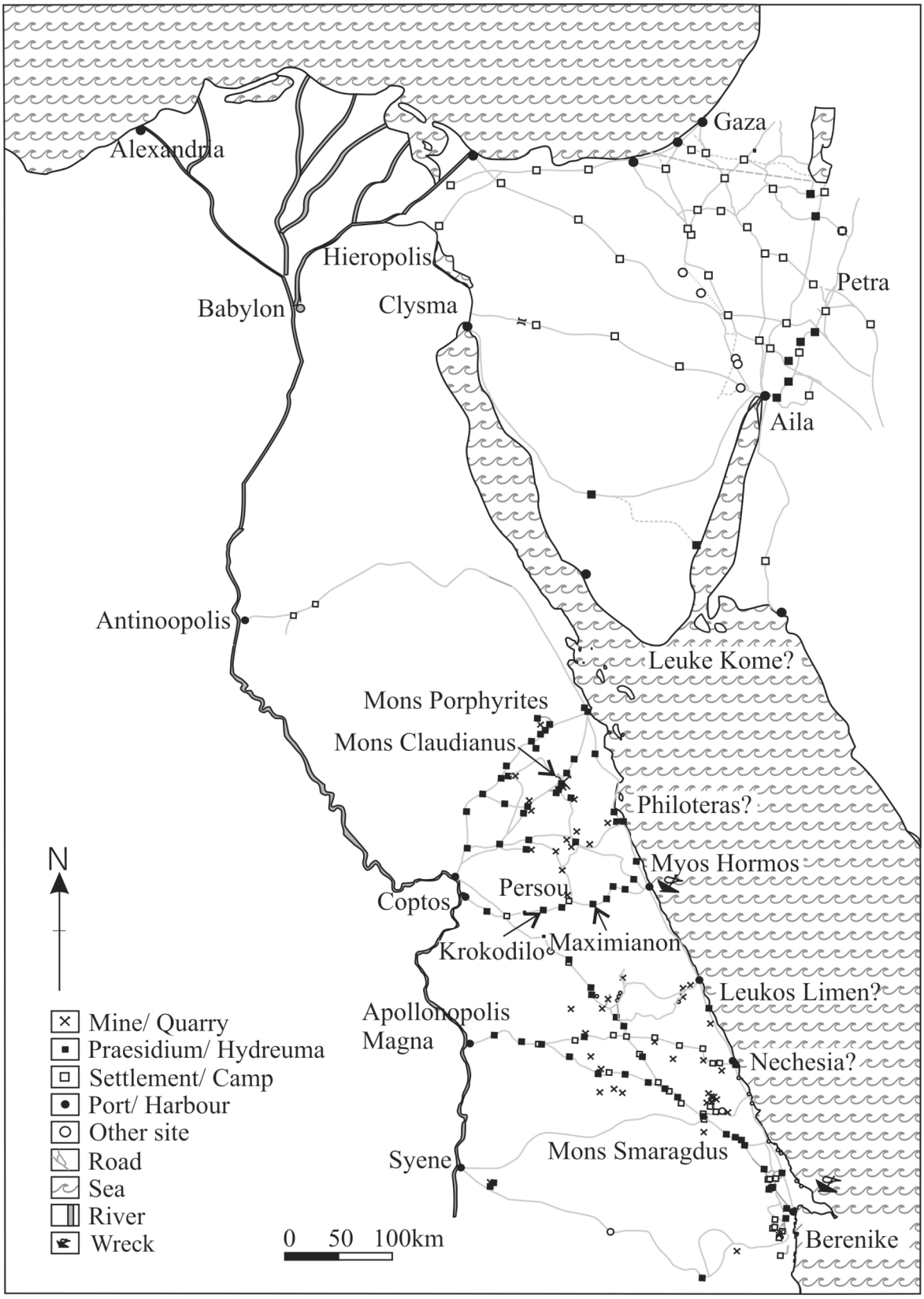


Figure 1.2 Transport geography and the Roman road landscape (after Maxfield 1996: 10; Sidebotham & Zitterkopf 1995: 40; 2000: 118; Sidebotham et. al. 2004: 8-9; Ingram 1981: plates 65-67; Meshel 2000: ii, 140; Parker 2005: 421).

Following Roman annexation of Egypt in 30BC, interest in the Erythraean Sea shifted from sourcing of elephants to the long distance luxury trade with Arabia and India (Sidebotham 1986;

Young 2001) and active involvement in this trade by Roman subjects grew rapidly during the Augustan period (Strabo *Geography*: 16.4). It appears that the Red Sea canal had fallen into disuse at this time, until it was re-dug by Trajan at the beginning of the second century AD (Redmount 1995: 127). The movement of traders and their goods was concentrated over the Eastern Desert roads guarded by forts linking the main Red Sea ports of *Myos Hormos* and *Berenike* with Coptos and Edfu on the Nile (Sidebotham & Zitterkopf 1995; Bülow-Jacobsen 1998), from where transport to Alexandria then on to the Mediterranean could be conducted. This Alexandria via Coptos to the Red Sea ports axis has been identified in the epigraphy and ceramic assemblage (Hayes 1996; Tchernia 1997: 239), but the primacy of this route is also clear from the caravan courier accounts from the *Nicanor* archive found at Coptos (Fuks 1951). This overland route remained important even after the rebuild of the Red Sea Canal as this also supplied the Eastern Desert quarries (such as *Mons Porphyrites* and *Mons Claudianus* Maxfield & Peacock 1996; Maxfield & Peacock 2001), gold (*Persou*, known as Bir Umm Fawakhir Meyer 1995; Klemm et. al. 2002) and emerald mines (such as *Mons Smaragdus* Shaw et. al. 1999; Shaw 2002; Sidebotham et. al. 2004).

Evidence for the people involved in this trade is preserved along these routes, such as caravan firms delivering goods to and from the Red Sea ports (Fuks 1951; Bülow-Jacobsen 1998), the traders, sailors and shipwrights working on the boats (Lewis 1983; Bülow-Jacobsen 1998; 2003) and the soldiers and the tax farmers (known as *Arbarchs*, Young 2001) controlling peoples movement through it. Evidence for the involvement of powerful trading families based in Egypt and central Italy (such as the *Peticii*, Tchernia 1997: 247) and possibly even Imperial involvement via Imperial Freedmen (Sidebotham 1986; Thomas & Tomber 2006) highlights the high economic rewards for those who succeeded in fulfilling the growing Roman elite's demand for of pepper and affordable pearls (Tchernia 1997). The desert routes were guarded by numerous forts, maintained by the state that in turn passed this cost onto the traders in the form of taxes demanded by the *Arbarchs* (tax farmers). Tolls were demanded from people travelling from Coptos into the Eastern Desert region (Lewis 1983), whilst import duties were levied at the port of entry (Young 2001). Whilst the major Roman Red Sea ports of the first three centuries AD had Ptolemaic foundations, a number of ports appeared in later Roman literature (such as *Nechesia* and *Leukos Limen* in Ptolemy) although *Myos Hormos* and *Berenike* appear to have remained the major Red Sea ports (*Periplus*: 1-4; Strabo *Geography*: 2.5.12; Pliny *Natural History*: 6.101-6), from whence trade with Arabia, Africa and India was conducted.

Luxury items from Africa were sourced by Egypt via the Nile from Nubia (Adams 1988). During the Greco-Roman period the state of *Meroë* (figures 1.1, 1.3) dominated Nubia and the control of this trade and exploration and contact via the Nile was still attempted during Nero's reign and after (Chami 2004). Another avenue was the Red Sea, exploited since the Old Kingdom by Egypt to reach the region known as *Punt* (thought to be the modern region of Eritrea, Kitchen 2004) a source for African and Arabian goods. Ptolemaic interest in this region, following Ptolemy II's initiated exploration of the region produced a source of elephants for the Ptolemaic war machine, but also opened up trading opportunities (Casson 1993). Ptolemaic understanding of the

east coast of Africa was concentrated to those areas with colonies in what is now Sudan and possibly beyond. In this region the port of *Adulis* (Figure 1.3) was later to take precedence in the trade, operating independently it appears for a while (Tomber 2005), prior to being subsumed by the growing power of the Aksumites in modern Ethiopia. *Adulis* became a major trading emporium over the first three centuries AD, to the point that Aksum had become a middleman in the trade between India, Arabia and the Mediterranean world by the third century AD (Fattovich 2004; Phillips 2004; Raunig 2004; Manzo 2005; Tomber 2005). Reasons for this may be political and economic problems in the Roman Empire during the third century AD. Also the decline of *Meroë* and the rise of the *Blemmyean* kingdom in upper Nubia centred on *Talmis* (Figure 1.1, modern Kalabsha Strouhal 1984) represent a major change in the political geography of the region out of which Aksum benefited. Aksum expanded its influence over *Adulis* on the Red Sea and at times parts of Yemen also (Figure 1.3; Raunig 2004; Manzo 2005). Aksum traded via the Red Sea from *Adulis* and also overland with the *Blemmye*s, who themselves had drawn some of the Eastern Desert mineral resources away from Rome.

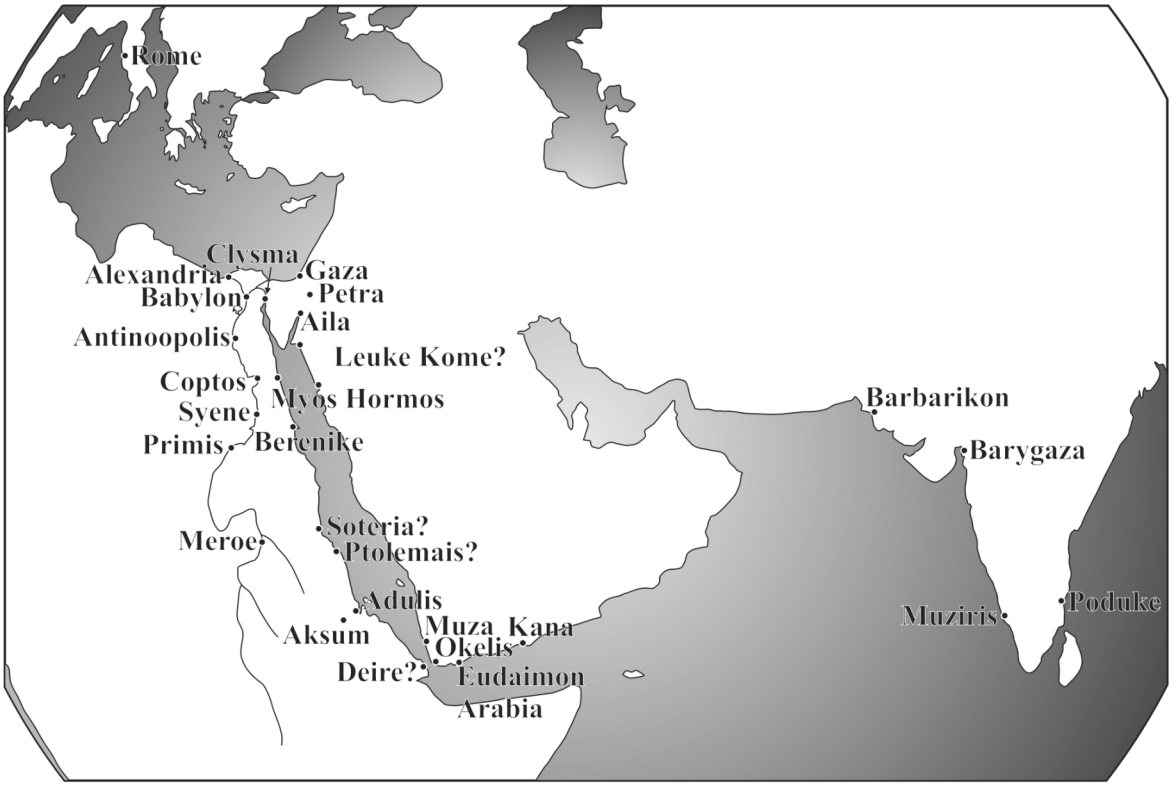


Figure 1.3 Map of important Erythraean Sea trade sites. Based on Google Earth image, so scale is increasingly affected by the curvature of the earth towards the curved corners of the image that are foreshortened as a result.

South of *Adulis* were 'the straits', defined by the *Adulites* Bay to the west and the *Avalites* Bay to the east. This was the shortest route across the Red Sea and a major point of contact between South Arabia and East Africa. A number of ports are listed as being within this area, the most notable being the settlement *Deire* (Figure 1.3) at the closest point of Africa to Arabia. Beyond the straits

and the *Avalites* Bay was *Azania* that possessed 'the far side ports', a number of market towns in the Gulf of Aden and shore of the Indian Ocean (Casson 1989b after *Periplus Maris Erythraei*).

The riches of South Arabia, namely frankincense and myrrh, were an integral part of religious activities in the ancient world (Hoyland 2001: 103). Sourced only from the modern regions of Yemen, Oman and Somalia (and in myrrh's case some parts of eastern Ethiopia), access to these resins was tightly controlled by the South Arabian states as a source for their wealth. Mediterranean distribution at *Gaza* was controlled by the *Nabataeans* (in modern Jordan), who transported the resins from *Leuke Kome*, *Aila* and *Petra*, where it was brought by the Arab tribes of the *Minaeans* and *Gerrhaeans* from Arabia (Kitchen 2001). Growing Ptolemaic interest in Red Sea trade (certainly by Ptolemy VII's reign, Hourani 1995: 24) may have been one of the reasons for Nabataean piracy in the Red Sea region (referred to in Agatharchides; Hölbl 2001).

Although this trade appears to have been mostly in the hands of the Arabs prior to 30 BC (Hourani 1995: 21), by the Augustan period attempts to secure the source of incense resulted in the failed expedition of *Aelius Gallus* (Strabo *Geography*: 16.4.20) and a punitive destruction of *Eudaimon Arabia* (modern Aden, if the author of the *Periplus* is to be believed, *Periplus Maris Erythraei*: 26; De Romanis forthcoming). However, during the Augustan period it is clear that direct maritime trade had occurred and this is detailed in the *Periplus* (ibid.). Whilst the west Arabian coast appears to have been ignored by Greco-Roman sailors (Strabo *Geography*: 16.4.18), sailing down the African coast until crossing 'the straits' (modern Bab-el-Mandeb) to modern area of Yemen was one of the three major Erythraean Sea routes discussed in the *Periplus*. The Arabian ports of *Muza, Okelis*, *Eudaimon Arabia* and *Kane*, were major emporia for the supply of incense and also harbours en-route to India. The complicated political situation there saw various wars and civil wars involving the South Arabian states (modern Yemen) of *Saba*, *Himyar*, *Qatabanite* and *Hadramawt* that ultimately resulted in the ascendancy of *Himyar* in AD 270 following a failed invasion by the Aksumites (Robin 1997: 52-3; Kitchen 2001: 162). The major role played by these states in the Erythraean Sea trade is attested by the wide cultural contacts with Rome, Africa, the Persian Gulf and India attested at *Kane* (Sedov 1992; 1996) and the political control exerted by *Saba* over *Azania* in the first century AD (Casson 1989a: 191). The wide trade network used by the Arabian merchants is attested in the *Periplus* suggest that the Greco-Roman traders benefited from already well-travelled maritime trade routes (Hourani 1995: 23, 32; *Periplus* 23; Kitchen 2001: 169).

Trade with North India is detailed in the *Periplus* concentrated at the ports of *Barbarike* and *Barigaza*, (*Periplus*: 38-49). The complicated political geography of 'North India was deeply divided' (Thapar 1966; Fussman 1997; *Periplus* 38.1-3 and 47.3-6), with the changing fortunes of the Parthians, Bactrians, Kalingas, Kunindas, Kushans and Guptas (Thapar 1966: 92-108). Evidence of direct trade with this region from *Myos Hormos* and *Berenike* is however limited, with interest focused on the region known as *Limyrike* in South India (Tomber 2000a). However trade with North India may be underestimated in the archaeological record (Tomber pers. comm.). Southern Tamil speaking India was controlled by the *Pandyas*, *Cheras* and *Cholas* (Thapar 1966: 109-35; Allchin 1995; Kulke & Rothermund 1997: 148-51) traders from which came to Egypt, as

represented in Tamil epigraphy inscribed on ostraka at *Myos Hormos* and *Berenike* (Mahadevan 1996; Sidebotham 2004), corroborated by numerous examples of South Indian pottery (Tomber 2000a; Tomber & Begley 2000). Whilst contact with the Mediterranean was present before, there was a significant increase in this contact after the Roman annexation of Egypt (Mazzarino 1997: 83; Strabo *Geography*: 2.5.12). From historical sources we know that direct trade between Egypt and southern India via the Red Sea occurred some time after Alexander (Pliny *Natural History*: 6.100) and although Hourani places this development at some point between 110 and 51BC (Hourani 1995: 24) it appears it was "very rare (for Ptolemaic merchants) to leave the straits" (Pliny *Natural History*: 17.1.13). The reason for this was the navigational skills and knowledge required to use the monsoon winds between South Arabia and India were advanced (Mazzarino 1997). Already an important entrepôt between north and South India by the third century BC (De Romanis & Tchernia 1997), *Muziris* was the first of the Tamil ports. Beyond *Muziris* southern and southeastern India were also involved in the trade, most famously the site of Arikamedu (ancient *Poduke*) displays archaeological evidence of the Greco-Roman traders (Begly 1993; 1996), though this is not the only site from southern India to contain such finds (Raman 1991). Greco-Roman involvement in this trade was clearly focussed on the importation of black pepper and pearls in exchange for wine and gold, though many other items were traded alongside (*Periplus*: 56).

1.2 Environmental background

The opportunities open to the port communities of the northern Red Sea were both constrained and enabled by the specific environmental setting of their settlement in its surrounding hinterland. Environmental conditions were however different from today due to climate and manmade environmental change, together with human ingenuity that enabled the desert landscape to be exhaustively used during the first three centuries AD. The northern Red Sea coast consists of a number of desert zones, with the Egyptian Eastern Desert to the west, the Sinai between Suez and Aqaba and the Negev and Hejaz Deserts to the east (Figure 1.4). This arid environment has superbly preserved archaeological landscapes with desiccated organic remains. Also settlement was limited in subsequent periods. However, this is not an environment in stasis as is often assumed (Wilkinson 2003). Continual occupation, including particularly extensive mining activity in the fourth to sixth centuries AD (Shaw 2002: 250), has concealed earlier structures. First to sixth century AD Roman activity has also left a significantly larger archaeological footprint than that left by the indigenous nomadic population. The latter have not been studied to the same extent and those sites that have been identified are more difficult to date and interpret (Barnard 2008). Also the majority of desert settlements are situated in the wadis, where deep waterborne deposits have destroyed or concealed early structures, water features and harbours (Peacock 1993: 232).

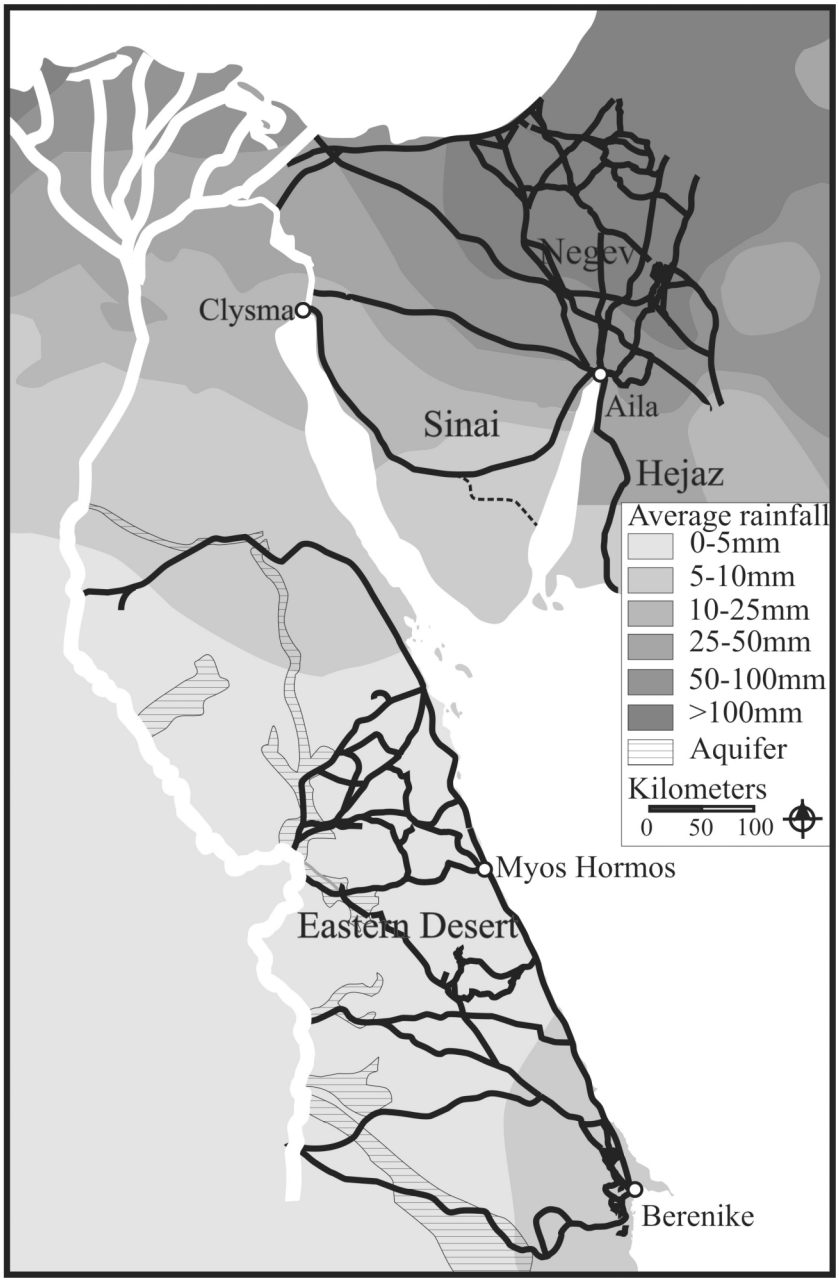


Figure 1.4. The modern northern Red Sea environment. Major Roman period roads (in black) rivers and canals (in white) are displayed (after Butzer & Hansen 1968: 423; Gheith & Sultan 2002; Zitterkopf & Sidebotham 1989; Sidebotham & Zitterkopf 1995, 2000; Sidebotham 2002).

1.2.1 Geological and environmental context

The Eastern Desert north of Wadi Hammamat was known as the Arabian Desert (Procopius *Histories*: xix. 1) or the 'Egyptian mountains' (Agatharchides *On the Erythraean Sea*: 1.10). The area south of Wadi Hammamat was known as the 'Nubian Desert', where the majority of gold mining took place. It is clear that the Ptolemaic period writer Agatharchides saw Egypt as being bordered by and thus separate, from the Eastern Desert (Agatharchides *On the Erythraean Sea*: 1.10) and Greek ostraka mention people going 'to Egypt' from Eastern Desert settlements (Kaper 1998: Bülow-Jacobsen comment, 306). The Egyptian Eastern Desert consists of three main geological zones: the western sandstone uplands, the Red Sea hills and Red Sea coastal plain to the

east. Through this a series of wadis have cut through the hilly landscape. The Red Sea hills rise to over 2000m in places and contain extensive mineral wealth, including: gold, copper, lead, topaz, emeralds (Morrow et. al. 2002: 12), marble, porphyry and diorite stone (Maxfield & Peacock 1996; Peacock & Maxfield 1997; Sidebotham et. al. 2001; Wendrich et. al. 2003; Sidebotham et. al.2004). Today the Eastern Desert is a hyper-arid environment with a mean average rainfall of less than 5mm per year (Butzer & Hansen 1968: 423), making life impossible for all but the hardiest of desert species. Much of the rain falls as localised heavy rain concentrated between November and February on the mountains varying from 2 to 200mm per year, causing violent wadi flushes that destroy buildings in their path (Gheith & Sultan 2002). This wadi runoff is collected in regularly recharged aquifers only 8 to 12 meters from the surface (Gheith & Sultan 2002). In Antiquity water from these aquifers was accessed via springs and wells, sometimes utilising an animal powered saqîyã wheel made of qadus pots to raise the water, identified at sites such as *Mons Porphyrites* (Tomber 2001). Wadi runoff collection was facilitated by walls placed along the wadis, such as that found (Figure 1.5) at Wadi Nakheil (Whitcomb & Johnson 1979: 273; Peacock 2007: 32-3). Both water and manure (*O.Claud* 280) allowed for small-scale horticulture at Sikait (Sidebotham et. al. 2004), *Mons Claudianus*, its Hydreuma, Barud (van der Veen 1998: 232), Wadi Fawakhir and Wadi Hammamat (van der Veen 1998: 234 citing Ruffing 1995). In this way many of the vegetables available in the Nile were grown in the Eastern Desert and traded between settlements, including, but not limited to; cabbage, turnip, leaf or spinach beet, cress, lettuce, endive/chicory, basil, mint, common rue, purslane, molocheia¸ surmadion and mustard (van der Veen: 236, van der Veen 1998: 234-6, Tables 2 and 3).



Figure 1.5. Wadi runoff wall from a water management system at Wadi Nakheil (Peacock 2007: 32-3). Similar structures were found at *Mons Claudianus* (Peacock & Maxfield 1997: 165).

The Sinai, Negev and Hejaz regions were collectively known as *Nabataea* (Strabo *Geography*: 16.4.18) prior to Roman annexation of the Nabataean kingdom and '*Arabia Petraea*' (Ptolemy *Geography*) subsequently. The topography of the Negev varies greatly, with a combination of changing rainfall and altitude (400m below to 1000m above sea level) creating four distinct phytogeographic regions. The Sinai is made of three regions: the northern limestone anticlines, a central highland zone criss-crossed by wadis and the southern igneous mountainous region, rising to over 2500m. The Hejaz is a highland area sloping down to the Red Sea. The Sinai, Negev and Hejaz are mostly arid to hyper-arid deserts receiving between 5mm and 100mm rainfall per year (Figure 1.4) that allow for agriculture in some regions where careful water management is undertaken. Nevertheless nomadic pastoralism was the prevalent economy in desert areas. Archaeological evidence of nomadic life in the eastern Sinai and Negev includes triangular-shaped gazelle or ibex hunting traps built of low stonewalls named 'desert kites', also depicted as rock art and Safaitic inscriptions (dating to the early centuries AD, Meshel 2000: 139). They appear to have been used continuously since the pre-pottery Neolithic period (Meshel 2000: 141). Water was expertly managed by the *Nabataeans* of *Arabia Petraea*, who channelled it into cisterns via wadi run-off walls and aqueducts. Substantial developments in hydrology and agriculture allowed agriculture to exist in the desert margins of *Arabia Petraea* (Wilkinson 2003: 169) that some argue enabled the *Nabataeans* to adapt from a nomadic economy in the fourth century BC to a sedentary kingdom in the first century AD (Ball 2000: 64). There were however nomadic groups operating within the Nabataean kingdom that continuing to hunt gazelles and herd cattle and sheep.

1.2.2 Meteorological context of transport

The transport network used to supply the port communities with consumables and trade items included overland, river and sea routes. Meteorological factors made some of these routes difficult, dangerous or impossible at certain times of the year, leading some to speculate that the Eastern Desert ports were only seasonally occupied (Whitcomb & Johnson 1979). Whilst it is now known from the ostraka that there was activity on the roads to the Eastern Desert ports all year round (Bülow-Jacobsen, Cuvigny & Fournet 1994, Bülow-Jacobsen 1998, 2004), seasonality did play a part in the use of the roads, Red Sea canal, Nile and the Red Sea and Indian Ocean.

The road network built by the Ptolemys, Romans and *Nabataeans* included regular forts and road stations with wells and cisterns for travellers, guided to the ports and mines in the Red Sea region by milestones, towers and cairns. The stations were two to three hours horse ride apart, along 'the *Myos Hormos* Road' (οδος Μυσορμιτικη) and 'The *Berenike* Road' (οδος Βερενικης) in the Eastern Desert (comment by Bülow-Jacobsen in Kaper 1998: 301). Stations along the *Mons Porphyrites* and *Mons Claudianus* quarry roads had animal lines built to tether the teams of donkeys required to move the large stone objects. In the Negev, water management allowed for agriculture to support settlements along the *Gaza-Petra* road. The emperors Trajan and Hadrian improved the canal and road infrastructure. Following the annexation of Nabataea in AD 106, Trajan built the *Via Nova Traiana* linking Aqaba with *Petra* and Bostra as well as re-digging the canal from the Nile to *Clysma*, whilst Hadrian built the *Via Hadriana* in AD 130-137 (Sidebotham & Zitterkopf 1997: 221) that started at *Antinoopolis*, crossed the Eastern Desert, just north of Abu Sha'ar, before turning south following the coastline of the Red Sea (Figure 1.2). Various inscriptions and ostraka provide ample evidence for the use of these roads peaking in May-June, but present all year round (Bülow-Jacobsen 2003) as well as constant activity in the ports (Meyer 1992: 48). It appears that water management, small-scale horticulture and supplies from the Nile allowed for the Eastern Desert settlements to function even in the very hot summers. Imperial interest in Red Sea infrastructure at the beginning of the second century AD clearly had a profound effect in facilitating Red Sea trade all year round.

Trajan's canal to *Clysma* (Figure 1.2) opened up passage for ships from the Mediterranean to the Red Sea. To what extent seagoing or river vessels used this route is uncertain, though the canal was heavily reliant upon the Nile flood and only operational between the months of September and December or possibly January depending upon the flood (Cooper forthcoming). Similarly the Nile was seasonal, due to the Nile flood created by the heavy rains of April and May that fall over the White Nile basin and Ethiopia. When this flood reached Egypt, the raised water levels allowed for goods to be transported in larger vessels and thus larger quantities more economically. The seasonality of the Nile and the canal would have influenced when traders would have chosen to supply the Red Sea ports with items for export (Table 1.2).

Greek and Roman geographers knew the northern part of the Red Sea as the Arabian Gulf, whilst the term Erythraean Sea was applied to the greater area of the Red Sea, Arabian Sea and

Indian Ocean (Strabo *Geography*: *16*.4.20, Procopius *Histories*: 19.1). The meteorological situation in the Arabian Gulf and the wider Erythraean Sea is significant for understanding the constraints on maritime trade and travel. The Red Sea is hot and dry, with some of the highest annual temperatures in the world (Davies & Morgan 1995: 27). The modern wind regime is governed by the northeastern winter and southwestern summer monsoons of the Arabian Sea. The northeastern winter monsoon starts in a northeasterly direction in the Arabian Sea, but turns easterly at the Gulf of Aden before turning southeasterly and southerly up the southern part of the Red Sea. How far the northeastern monsoon reaches up the Red Sea depends upon how far north and east a trough of low pressure from central Africa that brings the monsoon winds pushes up the Red Sea axis. Mid-way up the Red Sea the southeasterly monsoon winds meet prevailing northwesterly of the northern Red Sea at the winter convergence zone, which is marked by cloud, rain and sea mists. This convergence zone usually occurs somewhere between 21 degrees mid-way up the Red Sea and 13 degrees at the southerly base of the Red Sea (Davies & Morgan 1995: 27-30). The prevailing northwesterly of the northern Red Sea are influenced by eastern Mediterranean winter depressions that cause local south or southwesterly *Khamsin* seasonal winds followed by strengthened northerlies. The summer monsoon from June to August starts as a northwesterly in the Red Sea before turning west in the Gulf of Aden and southwesterly into the Arabian Sea. The modern prevailing wind direction in the northern Red Sea is clearly from the northwest, although 20-25% of winds (Table 1.1), including diurnal wind (changes in winds over day and night) and seasonal winds such as the *Khamsin* south or southwesterly of February to May would allow for northerly progress to be made by sail. These wind direction figures have been used to determine the capability of ancient seafarers to travel north up the Red Sea and explain trading patterns (for example Casson 1991, Facey 2004), although such attempts have subsequently been found to underestimate the technological and sailing ability of sailors in the region (Whitewright 2007a; Ward 2007). Also as yet no one has been able to confirm or disprove whether the wind regime was the same in Antiquity as it is today.

Season	% north or northwesterly	Beauford force scale	% calm
October – December	67%	3-4	8%
January – March	74%	4	5%
April – May	73%	4	7%
June – August	75%	3-4	5%

Table 1.1 Wind regime tables of direction and force (Davies & Morgan 1995: 29-30).

Ancient mariners would have used diurnal and seasonal winds to make steady northerly progress, using a series of natural anchorages available along the west coast of the Red Sea. Some headlands (*Lepte Acre, Mons Smaragdus, Mons Acade and Mons Aeas*) are mentioned by classical geographers (Agatharchides, Diodorus, Strabo and Ptolemy) that offer excellent protection from northerly winds as anchorages. A number of ports (*Berenike*, *Nechesia, Leukos Limen*, *Myos Hormos*, *Philotera*) are listed in the same accounts, though the precise location of some of these sites is not known today. Archaeological surveys of the region have revealed cairns (used to this

day for navigation), pottery sherds, shell middens, architectural features, graves and shipwrecks near or at modern anchorages. Such anchorages are usually only five nautical miles apart, to a maximum of 16nm on the route between *Berenike* and *Myos Hormos*. Studies of Viking settlements have found suitable night harbours were four *vika* (a Nordic rowing measure equal to four nautical miles) or sixteen nautical miles apart, suggesting that northerly progress up the Red Sea was quite well served by a mixture of natural anchorages and permanent settlements. Such settlements would not have required lighthouses as approaching Red Sea anchorages and harbours is only recommended in good light due to the dangers of reefs and submerged rocks (Davies & Morgan 1995: 44-48).

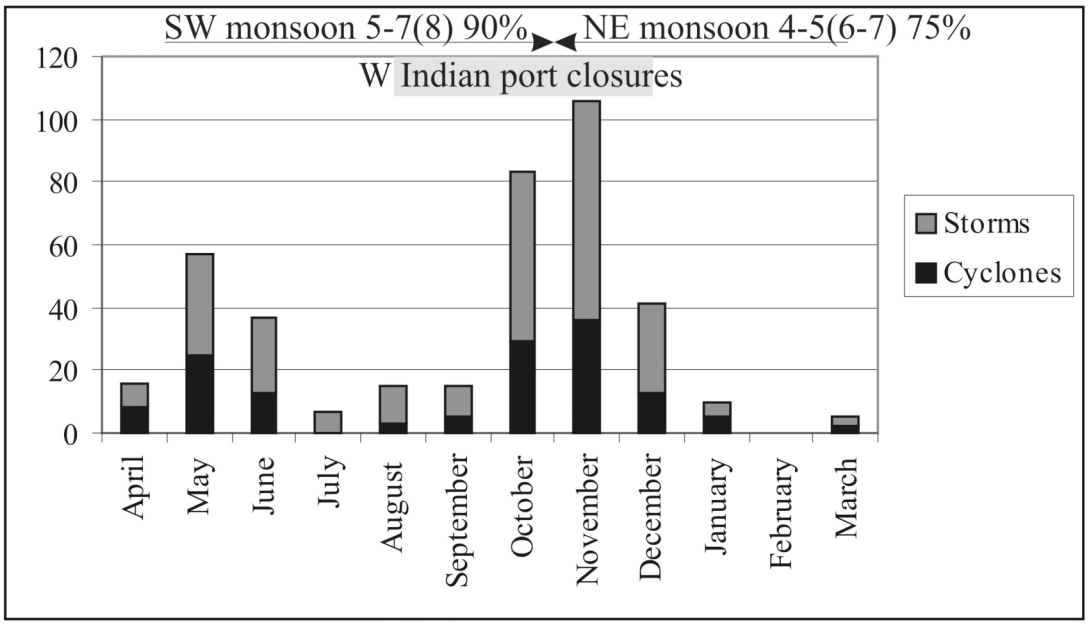


Figure 1.6. Frequency of storms and cyclones in the Indian Ocean (after Heikell 1999: 39). The prevailing wind direction, (Beaufort) force and prevalence for each month is presented at the top of the graph. Note the grey bar above the graph represents the period when ports of western India are commonly closed today.

Constraining factors of the weather also influenced where the trade was going to and from: East Africa, South Arabia and India. Strabo describes 120 vessels leaving for India from *Myos Hormos* each year (Strabo *Geography*: 2.5.12). Modern meteorological information from pilots recommend only limited periods when the southwest and northeast monsoons should be used for this journey, with long periods when west Indian ports are closed due to the high risk of cyclones and storms (Figure 1.6). Indeed a ship arriving from *Myos Hormos*, *Berenike* or *Aila* must arrive on the southwest monsoon by September and wait until January before returning on the northeast monsoon, least risk highly dangerous weather conditions (Table 1.2).

Month	*Clysma* canal	Destination ports					Fort Ostraka
		India	South Arabia	East Africa		Red Sea	
				Far side	*Rhapta*	*Adulis*	
May		Maintenance				1 Leaving Egypt	7
June		Maintenance				1 Leaving Egypt	6
July		2 Leaving Egypt	1 Leaving Egypt?	1 Leaving Egypt	1 Leaving Egypt	1 Leaving Egypt	4
August		3 Arriving India	1 Leaving Egypt		3 Leave *Rhapta*	1 Leaving Egypt	2
September	Canal open	3 Arriving India	1 Leaving for Muza		3 Leave *Rhapta*	1 Leaving for Adulis	2
October	Canal open	4 Storms	1 Leaving for Muza	2 Arriving Egypt		1 Leaving for Adulis	2
November	Canal open	4 Storms	1 Leaving for Muza	2 Arriving Egypt	4 Arriving Egypt	2 Arriving Egypt	4
December	Canal open	4 Storms		2 Arriving Egypt	2 Arrive *Rhapta*	2 Arriving Egypt	0
January	Canal open?	5 Leaving India				1 Leaving for Adulis	1
February		5 Leaving India				1 Leaving for Adulis	1
March		6 Arriving Egypt				1 Leaving for Adulis	2
April		6 Arriving Egypt				1 Leaving Egypt	3

Table 1.2 Seasonal Red Sea harbour and sailing activities. The arrival, maintenance and departure of ships from the Red Sea ports depending upon destination (after *Periplus*: 6, 14, 24, 39, 49, 56; Pliny *Natural History* 6.101-6; Casson 1991: 8; Meyer 1992: 48; De Romanis forthcoming; Cooper forthcoming). Dated ostraka from the Eastern Desert forts represent activity on the *Myos Hormos* road in most months (Bülow-Jacobsen 2003). The numbers represent the sequence of the sailing journeys.

1.2.3. Environment and climate change

Greco-Roman descriptions of the Eastern Desert and its species of flora and fauna have in the past persuaded archaeologists that the climate in the early centuries AD resembled those of today (Cappers quoting Theophrastus in Kaper 1998: 304). However it is now accepted that the environment in the pre-Dynastic period (c.5000-3100BC) was savannah, not desert (Morrow, Morrow & Cherry 2002: 12). Up until 2350BC it certainly received heavier or more frequent winter rains than there are today (Butzer 1960: 1624). The 'Norwegian desertification project' pollen analysis suggests the Eastern Desert was a greener environment in the early Roman period than previously thought and that desertification was promoted by Roman period deforestation and possibly climate change (Bülow-Jacobsen in Kaper 1998: 303). Also deep wadi fluvial deposits now cover many early Roman structures in the Eastern Desert, such as at Sikait (Author pers. obs.) and have resulted in extensive siltation of early Roman harbours, such as at *Myos Hormos*, *Nechesia* and *Berenike* (Peacock 1993, Plaziat et. al. 1995). These deep wadi deposits do not cover late Roman structures, suggesting that rainfall had reduced by that period. The process of runoff,

erosion and wadi deposition is likely to have been accentuated by the deforestation of desert shrubs used as fuel in the gold processing extensively undertaken in the Ptolemaic to late Roman periods (Agatharchides *On the Erythraean Sea*: 61 note 2). To this day the nomadic inhabitants of the desert rely upon these desert shrubs for their goat flocks and carefully maintain what plants there are left (Floyer 1893: 419). On the coast extensive siltation would have covered mangrove environments that are a rich source of shellfish, fish and wood. The environment has become increasingly arid since the Roman period, possibly as a result of human activity in the region. Similarly studies suggest greater precipitation during the Nabataean to Byzantine periods than at present in the Negev (Wilkinson 2003: 169), that is also supported by the faunal record of Lejjun and Qasr Bshir in Jordan (Toplyn 1995: 595) and *Petra* in Jordan (Studer 2007: 267; Erickson-Gini 2007: 52). An increase in humidity after 190BC, peaking in AD 90 (Bruins 1994: 307-8; Frumkin, Magaritz et. al. 1991) has been used to explain Nabataean sedentarism (MacDonald 2001), though this has been subsequently dismissed as simplistic environmental determinism (Rosen and Rosen 2001).

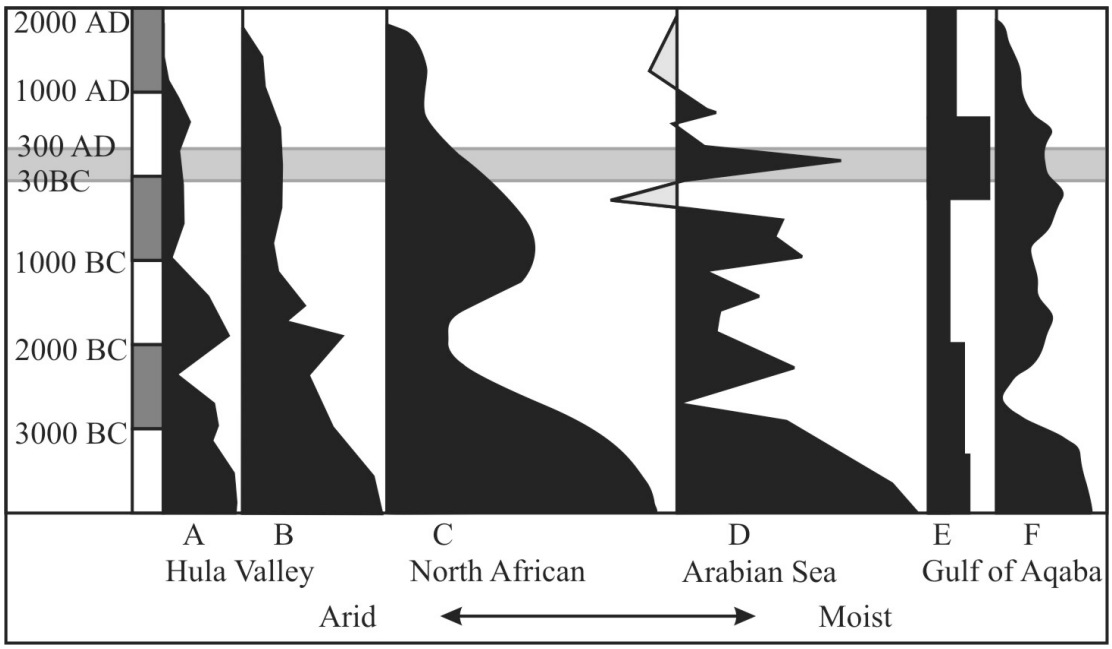


Figure 1.6. Climatological data from the Red Sea and surrounding areas. Illustrates a moister climate between 30BC and AD 300 compared to modern levels. This is based on: arboreal pollen counts from the Hula Valley in northern Israel (Graph A and B, Horowitz 1974: 411), the North Africa palaeoclimate (Graph C Muzzolini 1982 in Morrow et. al. 2002: 15), the strength of the Indian Ocean monsoon based on zinc: aluminium ratios (Graph D Sirocko 1996: 60), sedimentation caused by runoff and aridity index in the northern Red Sea region (Graph E and F, Arz et. al. 2003: 119).

The major weather systems that govern wind and rainfall in the Red Sea today are the eastern Mediterranean and the Arabian Sea monsoons. Increased arboreal pollen counts from Hula valley, Israel cores reveal a damper environment was experienced in Antiquity (Figure 1.6, Horowitz 1974: 411). This was corroborated by ^{18}O isotopes data from spelothems at Soreq cave, Israel (Arz

et. al. 2003: 120). Cores from the Gulf of Aqaba containing data on palaeo-temperatures (^{18}O isotopes), salinity and sedimentation runoff rates (clay content) have produced an aridity index suggest that the climate has become increasingly more arid since c.5250BC. It also shows it was wetter 2000 years ago and that this was probably caused by a southward extension of Mediterranean rain (Arz et. al. 2003: 118-9).

The Arabian Sea monsoons strength can be inferred from trace element analysis in sea cores that suggest the monsoon has progressively weakened since 3500BC, resulting in a southerly shift in the southwestern monsoon and desertification of parts of Saudi Arabia (Sirocko 1996: 53). Some researchers have identified moist phases within the last 3400 year period (Rangarajan and Dhananjay 2000: 789). The stronger monsoon was associated with monsoon rains reaching Saudi Arabia (Wilkinson 2003: 169) and the strong southeasterly winds associated with it must have reached further north than present. In Antiquity Foul Bay (or 'Gulf of the Fish-eaters' as it was known to Pausanias: 1.33.4), in which *Berenike* sits, was renowned for its tempestuous winds, strong currents, rough waters and sea mists (Strabo *Geography*: *1*917: 16.4.7, Agatharchides *On the Erythraean Sea*: 5.32). These classical accounts match modern descriptions of the winter convergence zone where the southeasterly monsoon winds meet the prevailing northwesterly. Also the peridot mine known as Serpents Isle (St Johns Island) in the same bay is currently known by its Arabic name 'Geziret Zabargad' (misty island), because of the sea mists 'which envelop the island' caused by the convergence zone. This means the convergence zone and the southeast monsoon was experienced significantly further north in Antiquity than is common today where it is experienced at 21 to 13 degree latitude (Davies & Morgan 1995: 27-30). Finally, studies of North–African paleo-climates suggest increasing aridity since 3000BC and over the first three centuries AD, when it was still wetter than at present (Muzzolini 1982, Morrow et. al. 2002; Butzer 1960: 1624)

There can be no doubt that the Eastern Desert was greener in the Roman period. Whilst the area was a desert by both modern an ancient standards, the indigenous vegetation and water management systems enabled small scale horticulture to take place and sustain herd and flock populations. This provided local food for the ports of the Red Sea. The situation in Sinai, Negev and Hejaz is less clear, though it appears to have been a damper environment and water management systems allowed for agriculture on the desert fringe (Wilkinson 2003: 169). Rainfall was either heavier or more evenly spread resulting in increased flora (where not deforested), runoff and deposition assisted by deforestation, whilst small scale horticulture was practiced in the Eastern Desert and desert fringe agriculture in *Arabia Petraea*. The impact that human or climatic changes had on desertification is not certain, as human environment change has the tendency to blur indications of climate change (Wilkinson 2003: 169). Although the causes remain unclear, the environment has changed and it is dangerous to assume that the wind directions in the northern Red Sea were identical to what they are today, as the relative potency of the Arabian and Mediterranean weather systems that govern them may have had a different balance in Antiquity.

1.3 Sources on the Erythraean Sea trade

A range of (mainly fragmentary) geographies, histories and poetry preserve Greco-Roman accounts of the Red Sea region and its peoples. This classical literature includes few primary accounts, most relying on the heavy and uncritical borrowing of earlier secondary sources or hearsay. This means that these sources were often out of date by the time they were written. All carry distinctive cultural bias of the writers (MacAdam 1989; Lawrence 1998), such as Pliny's moral agenda that 'bemoans the effect of Eastern trade on Roman society" (Tomber 2008: 22; Thapar 1997: 15-6; Tchernia 1997: 252).

The first references to the indigenous peoples of the Eastern Desert and northern Red Sea coast were recorded in Herodotus' history. Herodotus labelled the coastal population *Ichthyophagi* (literally 'fish eaters'), whilst he named the nomadic Eastern Desert dwellers *Troglodytes*. The rather dubious nature of Herodotus' account means that his work as a historical source is generally discredited (Grene 1987: forward in his translation of Herodotus). Following Alexander's campaigns in the east, numerous Hellenistic geographies and histories were based on what had been seen during Alexander's campaigns (such as the fourth century BC writings of Nearchus quoted in Arrian *Indica*) and during the campaigns and expeditions by representatives of the subsequent Hellenistic kingdoms in Egypt and Asia (Theocritus, Agatharchides copied by Photius and Diodorus).

The Ptolemaic period in Egypt saw a great increase in Greek knowledge of Arabia and East Africa. The third century accounts of explorers on the Red Sea were used in Agatharchides of Cnidus' late second century BC book *On the Erythraean Sea* (preserved only in later accounts of Diodorus, Strabo and Photius). It is a "font of information and lore about the people dwelling along the red sea littoral and his stories have an anthropological ring to them" (Sidebotham et. al. 2008: 30; Tomber 2008: 22; Burnstein 1989: 13, 22, 29-33). The first century BC *Library of History* by Diodorus of Sicily was also based on the otherwise unknown third century BC accounts of Euhemerus' *Sacred History*, the merchant Iambulus as well as Agatharchides. These early accounts give us some of the most detailed information of the *Trogodyte*s and *Ichthyophagi* of the Red Sea region that were known of in Ptolemaic society as they were mentioned in the third century BC poetry of Theocritus (Eide et. al. 1996: *FHN*: I.116; Dijkstra 2005: 49; Theocritus: 7.114). The Hellenistic sources discuss the construction of the Ptolemaic ports of *Myos Hormos* and *Berenike*. *Aila* does not appear to have been constructed at this time, though the Arab kingdom of the *Nabataeans* who later built *Aila*, are labelled as operating as pirates in that region (Diodorus *History*: *3*.40).

Following the annexation of Egypt by Rome in 30BC the earliest account of *Aila*, as well as further information of *Myos Hormos* and *Berenike* were written by Strabo (*Geography*: 2.4.12, 16.4.24). Strabo's early first century AD *Geography* was based on his own firsthand experiences of Egypt, Yemen and Ethiopia (Tomber 2008: 22) and those of his friend the general *Aelius Gallus* who commanded a failed mission to South Arabia. He also drew heavily upon the accounts of Hellenistic sources, such as Eudoxus of Cyzicus, Hipparchus, Artemidorus and Agatharchides

(Thiel 1967; Kitchen 2004; Tomber 2008: 22). A particularly dubious account of the inhabitants of East Africa was written by Strabo's contemporary Pomponius Mela (Mela: 1.22-48), who relied heavily upon Herodotus in his *De Chorographia*, though he does appear to be more up to date on the location of some Red Sea ports (Seeger et. al. 2006: 9).

Writing over the mid first century AD until AD 77, Gaius Plinius Secundus' (Pliny the Elder) 37 book encyclopaedia *Natural History* (Pliny *Natural History*: 6.163-89) was compiled from the work of 100 collaborators (Tomber 2008: 22) and drew upon the first century BC authors Juba, *Aelius Gallus* and the second century BC author Artemidorus as authorities on the Red Sea. This is an unusual mix of conflicting accounts based on hearsay and more reliable secondary sources on the Erythraean Sea trade and the inhabitants of East Africa, India and Arabia and so is "uneven in its reliability" (Tomber 2008: 22).

In the mid-late first century AD, the *Periplus Maris Erythraeai* (Casson 1989b; Salles 1995; Robin 1997; Schoff 2001; Tomber 2008: 20) was written as a practical guide to the ports and markets available on the Erythraean Sea. This is a firsthand account of a merchant sailor on the ports, people and trade. Surviving as a Tenth century AD copy, the *Periplus* is an ongoing subject for debate being an excellent source on "plain commercial information" and sailing times (De Romanis forthcoming), it is accurate on locations, but many trade items are not discussed (Tomber 2008: 21). Interestingly the contemporary Nabataean port of *Aila* is omitted.

Claudius Ptolemy's (AD 100-170) mid second century AD *Geography* maps the location of a large number of settlements across the Red Sea and gives some information on the peoples who inhabited that are. However due to a miscalculated in the circumference of the world, the map was largly inaccurate. It is different from the first century AD accounts of Pliny and the Periplus and "may reflect the evolution in trading patterns and emporia between the first and second centuries" (Tomber 2008: 29-30 after Casson 1995; Groom 1994: 202, contra Seland 2007: 73-4 who argues that Ptolemy's Geography was reworked in the eleventh century AD).

Occasional mention of the Erythraean Sea ports and their inhabitants were written during the second century AD in the writings of the Greek philosopher and historian Dio Cocceianus Chrysostomus (AD c.40–c.120, Dio Chrysostom *Discourses*) and the Greek biographer Lucius Mestrius Plutarchus' *Lives of the Greeks and Romans* (AD 46-120, Plutarch *Lives*). During Hadrian's reign, or the third century AD, the geographer Dionysius Periēgētes wrote in his book *Geographici Graeci Minores* an account on *Aila* based on the first century BC geographers Eratosthenes and Posidonius (Periēgētes *Geographici Graeci Minores*). His work was translated into Latin by the fourth century AD writer Rufus Festus Avienus (Avienus *Descriptio Orbis Terrae*). In the third or fourth century AD, the Latin compiler Gaius Julius Solinus wrote *De Mirabilibus Mundi* (Solinus *De Mirabilibus Mundi*) and the Greek novelist Heliodorus of Emesa wrote *Aethipica* (Heliodorus *Aethipica*). Both Solinus and Heliodorus drew heavily upon the more dubious fantastic elements of Herodotus, Pliny and Mela and are of limited use. By the third century AD, authors on the Red Sea region uncritically borrowed from previous, now out of date, authorities on the subject

From the third century BC to the third century AD, useful Indian sources written in the Tamil and Buddhist literature (Dikshitar 1939; Sircar 1951; Agrawala 1953; Kangle 1960; 1963; 1965; Pillai 1968; Trautmann 1971; Kumar 1989; Rangarajan 1992; Boussac & Salles 1995; Ray 1995a) discuss *Yavana* traders reaching southern India. During this period *Yavana* meant Greek or Indo-Greek, primarily visitors from the Roman east (Ray 1995; Tomber 2008: 27). The Sangam Tamil poems (300 BC-AD 300), include the Akananuru and Purananuru anthologies that discuss the Indian port Muziris that was involved in long distance trade with the Roman Empire. However this trade was rarely discussed in Tamil literature, which has just c.50 references to trade and only 10 to *Yavanas* (Seland 2006: 45; 2007: 71; Tomber 2008: 26-8).

Byzantine sources dating from the fourth to eighth centuries AD provide some useful accounts of how political changes had influenced trade routes over the third century AD and the emergence of certain ethnic groups as major political units. These accounts consist mainly of ecclesiastical histories and the writings of Byzantine secular historians, though some minor geographical, literary and official documents have also survived. Ecclesiastical histories plot the early history of the church and use dubious tales of the indigenous peoples of the Red Sea region such as the *Trogodyte*s and *Blemmye*s as an analogy for godless *Barbarians*. Some of the earliest sources of this kind come from the fourth to fifth century AD, that include the writings of Eusebius Bishop of Caesarea (AD c.263–c.339, Eusebius *Onomasticon*: 6.17-21), St Epiphanius Bishop of Salamis (AD c.310-403, Epiphanius *Panarion*) and St Theodoret Bishop of Cyrrhus (AD c.393-c.457, Theodoret translated by Schaff, P. 1892), the monk historian and translator Tyrannius Rufinus (AD c.344-410) and Church historian Philostorgius (AD c.368-439, Philostorgius *Ecclesiastical History* is summarised in Photius' *Bibliotheca* discussed below). Later sixth and seventh century AD ecclesiastical histories were written by St. Antoninus Placentinus, Bishop of Beirut's (late sixth century AD, Antoninus Placentinus *Itinerarium*), John of Ephasus Bishop of Constantinople (AD c.507-c.586, John of Ephasus *Ecclesiastical History*), the monk Cyril of Scythopolis (AD 525-558, Cyril of Scythopolis *The lives of the monks of Palestine*), the monk of John Moschos (AD c.550-619, John Moschos *The Spiritual Meadow*), the writings of St. Sophronius Bishop of Jerusalem (AD c.560-638) and St Anastasius abbot of Mt. Sinai (Seventh century AD). The most useful account for the sixth century AD comes from the Alexandrian merchant and monk Cosmas (Cosmas Indicopleustes *Christian Topography*). This theological text appears to be an eleventh century AD document based on secondary sixth century sources (Tomber 2008: 23).

St. Photius Patriarch of Constantinople (AD c.810-893, Photius *Bibliotheca* or *Myriobiblon)* collected extracts and abridgments of 280 volumes on various subjects including geography, history and ecclesiastical history by many otherwise unknown classical authors. These include the Hellenistic writer Agatharchides (discussed above), as well as the Byzantine historians Olympiodorus, Zosimus and Nonnosus. Olympiodorus of Thebes (AD c.380-425) travelled to Upper Egypt and wrote of his firsthand accounts of the Blemmyes in his *History*. The Imperial treasurer and historian Zosimus wrote his *Historia Nova* in the AD 490's-510's, borrowing heavily from previous authors (clear from the changes in style in the document). The sixth century AD

Byzantine ambassador Nonnosus wrote a firsthand account of his embassy and mission to the Red Sea, *Aksum*, *Himyar* and Arabia.

The minor geographer Marcianus of Heraclea wrote his *Periplus Maris Exteri* in the third or fourth century AD (Marcianus *Periplus Maris Exteri*). The Greek geographer Agathemerus wrote his *Sketch of Geography in Epitome* in the fifth century AD. Stephanus of Byzantium wrote his geographical dictionary *Ethnica* in the sixth century AD (Stephanus *Ethnica*). The early seventh century AD Byzantine geographer George of Cyprus wrote the *Descriptio Orbis Romani*, (AD 600-610) in Greek, listing the cities of the Eastern Roman Empire. These geographies borrowed much from previous writers or explorers from the first three centuries AD. Contemporary literary texts discussing the region and its peoples include the fifth to sixth century grammarian AD Timotheus of Gaza's *On Animals* from Egypt and India. The Latin grammarian Priscian of Caesarea wrote the Latin textbook *Institutiones Grammaticae* (AD c.500) that also mentions the region in passing.

Official documents include the legal document *The Theodosian Code*, commissioned by Flavius Theodosius (AD 401-450, Flavius Theodosius *The Theodosian Code and Novels*) to formalize the systems of law. Other documents by unknown authors include the *Notitia Dignitatum* and *Peutinger Table*. The *Notitia Dignitatum* represents the administrative organisation of the Eastern and Western Empires for the c.400's and 410's, including officials, governors, vicars and military commanders. The *Peutinger Table* is a painted itinerary or schematic road map of the world known to the Romans in the a mid fourth century AD, though only a medieval copy survives (Tomber 2008: 30).

Secular fourth to seventh century AD histories are useful sources on Byzantine wars in Nubia, Upper Egypt and Arabia against the *Blemmye*s and the Arabs during the third and fourth centuries AD. They provide useful details of the Byzantine perspective of major political events of the day. The poetry of Claudius Claudianus is a major source for the end of the fourth century AD (AD c.370-404, Claudian translated by Platnauer 1922). The historian Ammianus Marcellinus', (AD c.325-391) 18 surviving books from his Latin *Res Gestae Libri* cover the period AD 353-378, providing a comprehensive account with a strong political and religious agenda (Ammianus Marcellinus *Res Gestae Libri*). Flavius Eutropius' (fourth century AD) 10 book *Breviarium Historiae Romanae* is a rather lightweight history of the Rome upto the fourth century AD. The fragmentary remains of the fifth century AD eight book *Byzantine History* of the diplomat Priscus is preserved in other volumes such as that of the historian Procopius. Procopius of Caesarea (c 500-565AD) is the principle Byzantine historian of the sixth century AD, who wrote the *Wars of Justinian, Buildings of Justinian* and the *Secret History.* Together these histories are complementary accounts of the busy and frequently violent relationship between Rome and Byzantium with its Red Sea neighbors. By the Byzantine period the previously dangerous and unknown East Arabian coast of the Red Sea had been recognized as possessing a "great number" of natural harbours, used in preference (Procopius XIX.6-17) to the previously preferred African coast (*Periplus Maris Erythraei*), whilst focus on the ports shifted to the Northern ports of Aila and Clysma (Ward 2007), with Roman interest continuing in Berenike and the Farasan Islands (Nappo forthcoming).

Papyrus and ostraka, records of everyday transactions and messages complement these literary sources. At Coptos the *Nicanor* Archive details caravans transporting goods over the Eastern Desert to *Myos Hormos* and *Berenike* (Tait 1930; Fuks 1951) and along these routes the forts that protected the roads have revealed similar material (Bülow-Jacobsen et. al. 1994; Cuvigny 2003a). Finally at the port sites themselves hundreds of ostraka and papyrus fragments have been uncovered at *Myos Hormos* (Bagnall 1979; Bagnall 1986; Peacock & Blue 2006) and *Berenike* (Bagnall et. al. 1999; Bagnall et. al. 2000). Even at *Aila*, where environmental factors have made preservation poor, inscriptions have allowed for the site to be conclusively identified (Parker 1997).

At Quseir al-Qadim, both the Chicago and Southampton teams found clear evidence of a cosmopolitan and diverse population at the port, represented by Latin, Greek, Demotic, South Arabian, Tamil, Nabataean, possible Palmyrene and unidentified scripts (Mahadevan 1996; Brankaer 2002; 2003). The Chicago team suggested based on the epigraphic evidence, that the ports Greek and Egyptian speaking inhabitants were in contact with Arabs and Indians, that there may have been an 'Indian colony living at the site… also ... a Nabataean graffito … perhaps indicate(d) the presence of Nabataean traders at Quseir' (Whitcomb & Johnson 1979: 63-4). Also Indian, Adulite, Aksumite and South Arabian pottery suggest that some of these visitors may have lived at the port for at least part of the year (Tomber 2005). Further epigraphic evidence comes in the form of names (Greek, Roman, Egyptian and some identified as Arabic, others still unidentified) and ethnic labels such as the '*Trogodyte*s' (*O.Myos* 543) and '*Ichthyophagi*' (*O.Myos* 512) mentioned in ostraka.

At *Berenike* scripts and languages represented at the site include Greek, Latin, Demotic and Hieroglyphic Egyptian, Tamil-Brahmi, Aramaic and Palmyrene. Egyptian, Greek, Roman, Semitic and Palmyrene names have been found on the epigraphy present on site (Sidebotham 2004). Like *Myos Hormos*, Indian, Nabataean, South Arabian, Adulite and Aksumite pottery have been found on site alongside Egyptian, local Eastern Desert wares and imported wares from across the Roman Empire (Tomber 2000a; Tomber & Begley 2000; Tomber 2005). A number of different approaches to ethnicity and cultural identity have been explored by the different specialists at *Berenike* (who have also worked on the wider surveys in the Eastern Desert around *Berenike*) that have started to filter out in the form of articles and within the season by season final reports. Two different approaches have been attempted, one looking at the discrepancy between diets of different inhabitants of the port (Van Neer & Ervynck 1999, discussed in more detail in Chapter 3) and artefactual approaches based on ceramics (Barnard 2005). Some attempt to synthesise this information has also been attempted, combining historical sources and epigraphic material with the above two approaches (Sidebotham 2004). Sidebotham's chronological summary of the important finds leads him to conclude "the population was varied in size and composition (both ethnically and from the social-economic point of view) during the approximately 800 year history of the port" (Sidebotham 2004: 114).

The *Berenike* excavations were also a base from which wider surveys of the Eastern Desert were made and have led to excavations at emerald mine and quarry sites (Sidebotham et. al. 2001; Sidebotham et. al. 2004) in the region, surveys of road stations and Eastern Desert settlements

(Sidebotham et. al. 2002). Surveys undertaken on the *Berenike* to Coptos road and the *Via Hadriana* (or coastal road), have helped date a number of forts and camps along the route, illustrating the busy nature of the Eastern Desert in Antiquity (Sidebotham et. al. 1991; Sidebotham & Zitterkopf 1997; 1998; Sidebotham et. al. 1999; Sidebotham & Zitterkopf 2000; Sidebotham 2002a). Cuvigny and Bülow-Jacobsen have also excavated two first and second century AD forts, (*Maximianon* and *Krokodilô*) along the *Myos Hormos* to Coptos road (Cuvigny 2003a), the epigraphic evidence from which has been very informative concerning the movement of goods and peoples across this road (Bülow-Jacobsen et. al. 1994; Bülow-Jacobsen 1998; 2003). Part of the reason for this activity is the Eastern Deserts mineral wealth. To the north and west of *Myos Hormos* the quarries of *Mons Claudianus* (Peacock & Maxfield 1997) and *Mons Porphyrites* (Maxfield & Peacock 1996) and the gold mine at Bir Umm Fawakhir (Meyer 1995) have been excavated. Ostraka from *Mons Claudianus* have however produced further details on the interaction between Greco-Roman inhabitants and the indigenous nomadic populations (Cuvigny 2003b, detailed in Chapter 5).

Studies relating to identity at *Aila* have been limited to date as the main emphasis has been on the ports economy (Parker 1995b). However, there has been significant investment in the excavation and interpretation of a putative 'church' in trench J east (Parker 1998a; Rose 1998; Parker 1999; Mussell 2001) and exploring the archaeological record for evidence of a Christian community attested in the historical record from the third century AD onwards. A combination of the economic focus of the research design and a lack of epigraphic data has meant that discussion of Nabataean, Roman, Indian ethnic identities etc have been largely ignored by the excavators. One notable exception is the study by Retzleff who considers *Aila* 'in two cultural contexts: as a Red Sea port, with comparanda in Egypt and as a Nabataean settlement' (Retzleff 2003: 45). Whilst this article is still very much economic in focus and does not deal with the issues of ethnic and group identities explicitly, Retzleff does cite architecture and material culture from the site as evidence for cultural connections between *Aila* and the Egyptian Red Sea ports (Retzleff 2003).

In conclusion there is substantial historical, papyrological, epigraphic and archaeological evidence for the involvement of various ethnic groups at the Red Sea ports of *Aila*, *Berenike* and *Myos Hormos* during the first three centuries AD. This potential has been recognised by archaeologists, but attempts have been limited to specialist reports, occasional articles and conclusions of interim reports. In-depth analysis of these, often conflicting, sources is required to understand which kinds of information are most reliable and to explain what contradictions exist and why.

2 Culture and Identity

Theoretical approaches to culture, identity and ethnicity have been the subject of numerous articles, books and theses within archaeology and other disciplines. Many of these studies are contradictory and use different definitions of the term culture and the material that may represent it. For this reason one must first clearly define culture and how it relates to identities and ethnicity, before a clear methodology on how ethnicity and 'maritime cultures' can be identified by archaeological, epigraphic and historical evidence. The definition of culture used in this study is 'culture as shared meaning' (Hall 1997b: 1-2; Huskinson 2000b: 7). This is not to be confused with 'material culture' a term used by archaeologists to describe the physical remains left by past societies, or 'archaeological cultures', groups of material culture (Trigger 1989).

The development of archaeological theory on culture has been summarised by Jones (1997: 106). Jones defines three major phases in the development of archaeological theory on culture, (see also Trigger 1989: 148, 289, 370). The first major trend, labelled 'culture-historical' made a straightforward one to one correlation between 'archaeological cultures' and ancient cultures and ethnic groups. They worked with the assumption that ethnic groups were homogenous (little differentiation within a culture) and bounded (with clear divisions with other cultures). To this end ethnic groups and cultures were displayed as geographically visible often in the form of distribution maps.

The second phase 'new archaeology', reviewed the 'nature of archaeological distributions and the status of archaeological cultures as classificatory entities' (Jones 1997: 106) and as a result of this ethnic entities were rarely an explicit focus of analysis in processual archaeology (Jones 1997: 111) as functionalist conceptions of culture focussed on economic rather than cultural factors.

More recently post-processual approaches have revived ethnic studies, arguing that material culture is an active constitutive dimension of social practice and human agency and as a result have questioned the existence of bounded homogeneous ethnic and cultural entities. Post-processual approaches emphasise the processes that form and maintain ethnic and cultural identities. As individuals possess diverse identities (class, gender, ethnicity, etc) ethnicity and culture cannot be bounded or homogenous and the social context changes with time and situation. This means that in the field of archaeology it is now widely accepted that artefacts do not directly correlate with group identities, but instead are just one of many ways used to communicate cultural distinction and affiliations. In order to identify past peoples from archaeological evidence, the meaning of material culture must be understood in the specific archaeological context rather than being assumed to represent a discrete ethnic or other group identity.

Culture is important in the study of group identities as cultural influences determine what symbols or indicators are appropriate to use for communicating difference between identities. For example, Hellenistic, Oriental or Roman cultures have all been cited in the archaeological literature

as having influenced how identities are visible in the archaeological record. Cultural influences may also effect how identities were perceived in Antiquity. In the Mediterranean and adjacent regions two cultural processes widely discussed in the current literature are Romanisation and Hellenisation, the spread of Roman and Greek culture through the adoption of some cultural features by other groups (Bilde et. al. 1992; Mattingly 1997b: 8). Van Dommelen's (1998) study of ceramics in Carthaginian and later Roman Republican Sardinia illustrates the influence of 'Romanisation', or Roman colonisation on the display of local identity in Sardinia during the Roman Republic third to first centuries B.C. Under Carthaginian rule, Sardinian ceramics copied Punic forms. During this period urban centres and rural areas had very similar assemblages. This contrasted with the assemblages from Republican colonisation, where ceramics from urban centres were much more Roman, whilst rural forms continued to be Punic. Van Dommelen suggests that rural elites chose to cultivate and display their Punic (or Sardinian?) identity as a strategy of 'silent resistance' (van Dommelen 1998, 43-44).

Millar's study suggests that Greek language and culture persisted in the Near Eastern provinces of the Roman Empire well into the fourth and fifth centuries A.D. The Eastern Roman provinces could still be viewed as a zone of Greek culture at that time, despite increasingly dominant Christian identity that was linguistically represented by Syriac (Millar 1998: 176). Greek was still the primary public language and Syriac had not yet been adopted widely for this purpose. This was however a region in which two groups, the Samaritans and Jews, maintained their identity through language (Millar 1998, 176). Both these examples illustrate the use of archaeological approaches and sources complementing historical sources. They also illustrate how identity could be displayed through material culture and language and indeed the role of culture in selecting how an individual displays their identity.

Identity can be described as an individual's group affiliations, with which one may feel a sense of belonging and shared fate (Diam 1998: 76). Actions, beliefs, belongings or language may display shared identities. Whilst identities are influenced by larger cultural affiliations, they are specific, but also multi dimensional (ibid.). An individual may possess to a number of identities simultaneously (Díaz-Andreu et. al. 2005) hierarchically nested together as groups and subgroups from the broadest cultural identities to specific local identities (Gardner 2002). These groups do not have neat boundaries and are not always recognisable in the same way, there are differences and complexity. Vocation and cultural identity can frequently be related, for example changes in the 'foreignness' of late Roman military assemblages in Britain may represent changes in the construction and negotiation of 'military' and 'Roman' identity there (Gardner 1999: 414-5).

Identities have been perceived as unchanging, for example; gender or racial identities are often perceived as natural, assumed and unchanging. Ascription to cultural, national or religious overarching identities does not replace ethnic identity, but rather co-exist, sometimes influencing the dress, language or other ways one would normally communicate identity. These include Roman citizen identity (originally exclusive and later, due to Caracalla's universal grant of citizenship inclusive Roman citizen identity, Liebeschuetz 1998: 131; resulting in an increased flexibility of the term 'Roman' Greatrex 2000: 275), exclusive Hellenistic identity and the inclusive spiritual

Christian identity (Lieu 1998; Miles 1999: 5; Curran 2000; Winter 2000). They may also be confused with ethnic identity in the literature of writers not aware of the difference. For example, some Indian sources appear to make generalisations about Greeks and Romans, collectively labelling them '*Yavanas*' (Ray 1995b: 79). Ascription to these identities may affect the status of individuals positively or negatively depending upon their vocation or gander. All these factors are important for understanding the multi-ethnic social system that existed in the ports of the Red Sea in Antiquity.

2.1 Boundaries

Ethnicity is the subject and source of much debate in current literature in the social sciences, humanities and arts, resulting in a number of theoretical studies approaching how ethnicity can be defined and ethnic groups can be identified and studied (Pohl 1998; Huskinson 2000a; Mitchel & Greatrex 2000; Maas 2001; Corradini et. al. 2003). The essentialist perspective held by proponents of a one–to-one direct relationship between culture, race, language and ethnicity (known as 'culture historical' in archaeology) though often assumed in the past, has (since) been widely discredited for its deterministic approach. The topic of ethnicity was unfashionable for a long time following its misuse just prior and during the Second World War (Hall 1997a: 1).

In the 1950's and 60's Social anthropologist Barth (1956, 1964, 1969) worked on his theory that ethnic identity, though ascribed to, was also defined through being different from other ethnic identities. He argued that ethnic identities could be best understood through the specific situation of an identity and how difference from other groups was maintained through the use of 'ethnic boundaries'. Possibly Barth's most important insight was his shift in emphasis from the identification of the parts that make an ethnic group, to the boundaries that make an ethnic group distinct from others. This 'instrumental approach' takes into account the situational aspects of the society that made it. Barth describes ethnic identities as self perpetuating, sharing fundamental overt cultural values, possessing a field of communication and interaction and being recognised as 'a category distinguishable from other categories of the same order' (Barth 1969: 15). This approach has influenced many other studies, which define ethnic groups as; the 'objectification of cultural difference' (Jones 1997: 96), or 'a way of organising cultural differences' (Goudriaan 1992: 76). Building upon this definition, Goudriaan has identified some major criteria shared by all ethnic groups. Ethnic groups are:

- A category used by individuals to define themselves as members of a group different from other ethnic groups.
- Specific features of culture are singled out as ethnically significant. These act as boundary markers (henceforth *indicators of ethnicity*).
- Cultural features such as religion, occupation, mode of life and language are used to serve as boundary marks, but ethnic identity cannot be reduced to any one of these.

- The survival of an ethnic identity is reliant upon the maintenance of boundaries.
- The marking of ethnic boundaries is a normal feature of social life and a universal trait of human experience. It can reside in everyday actions (Lucy 2005). The way in which it manifests itself may vary greatly as does the degree of tension between groups.

(Modified from Goudriaan 1992: 75-77)

Accepting that ethnic identities 'are not considered to be fixed entities with an objective existence based on inherent qualities of the people belonging to them, but as projections of the minds of those participating in ethnically coloured interaction' (Goudriaan 1992: 76), then ethnic boundaries can be interpreted as imagined borders perceived by the viewer. These imagined boundaries become visible through the use of *indicators of ethnicity* to mark or label differences between ethnic groups and represent shared belonging within an ethnic group. There are a number of possible *indicators of ethnicity* used by groups, all of which may be important in the representation of ethnic identity, though ethnicity cannot however be reduced to one single cultural feature (Goudriaan 1992: 76; Hall 1997a: 32; Macdonald 2000: 38, 47), but must instead be viewed as a part a wider vocabulary used to communicate differences between ethnic groups. Possible cultural features that may carry ethnic meaning include:

- Language, including the use of bilingualism, dialects, regional names and of course ethnic labels.
- Beliefs represented by religion, burial customs, or rituals.
- Presentation, including ethnically significant dress or adornment. Body or hair decoration and perception of fashion as it relates to decency, gender dimorphism and status.
- Structures and the association of function with architecture and artefacts.
- Belongings are symbols in themselves, representing a choice by the owner to be seen as possessing a specific material culture.
- Actions such as methods of eating and cooking can be ethnically significant. They may also be represented in the belongings or beliefs and rituals.

Artefacts could be used as physical indicators of ethnic boundaries, or involved in actions (personal adornment, burial practices, eating, cooking etc) that are used as indicators of ethnicity, that would otherwise not have survived in the archaeological record (Hodder 1982). For example, the utensils from which a specific way of eating may take place (Perkins 2000: 203), or objects used in or possessing symbolism of religious activities, may betray elements of an individual's ethnic identity. The context from which an artefact is found can associate architecture or burial customs with artefactual evidence of identity. Alternatively in the domestic sphere, the association of belongings and structures highlights many elements of how the inhabitants lived their lives as members of their ethnic group. The archaeological record is complemented by historical and epigraphic sources that provide evidence of language, dialects, beliefs, actions, presentation, personal names and ethnic labels that define an individual's identity. Such a methodology presents archaeologists an opportunity to infer ethnic identity through the identification of ethnic indicators within an archaeological assemblage. However, we must discover what criteria determined the

ethnic meaning an artefact possessed at a specific time and place to a specific group of people that once marked the boundary of identity (Diam 1998: 79). Even superficially clear examples of this are problematic, as is the case with Jewish identity and religion in Antiquity (Janowitz 2000: 214). Whilst any study must be careful not to create false interpretation of random patterning (Potts & Blau 1998: 36), recent studies have shown the benefit of artefactual based studies on ethnic identity (for a more recent example see van Dommelen 1998: 25; Smith 2003). However, Barth's structuralist approach is not without its problems. As these boundaries were imagined rather than real and required a constant effort to maintain, the indicators of these boundaries were constantly changing. It has been argued that this makes 'ethnic boundaries' rarely specifiable (Gamble 1999: 63).

Ethnic boundaries demarcate territory in multiple dimensions, covering geographical space, status and time. For this reason ethnic identities usually possess a shared history (Hobsbawm & Ranger 1983). This is clearly seen in the case of ancient geographers who in certain cases report the origins of a group (Lawrence 1998: 100). A shared history gives a group its origin; using history to define its temporal boundaries as it uses material things to distinguish is social and geographical boundaries. Like material culture, history is also manipulated by the members of an ethnic group and it changes, and its meaning may also change (Hobsbawm & Ranger 1983). This history is constructed using ethnic fact or fiction, often using myth to construct a belief in common descent (Dench 1995: 11; Hall 1997a: 26, 185). Ethnicity is in fact distinct from other identities because of its historical dimensions (Hall 1997a: 2). The history is important socially because of its manipulation over time for political reasons that often define other important issues such as territory (geographical, vocational and ideological) and the ethnic groups interact with other groups (Pohl 2003: 6-15). Whilst a shared history may be a crucial ethnic indicator, it is not universally so, although some anthropologists appear to think so (see argument of Astuti 1995) and some privilege the historical dimensions of ethnicity in defining roles (for example Romulus' role in defining Roman gender roles). In her study on the fishing peoples of Madagascar called the Vezo, Astuti discovered that they possessed no such shared history in their definition of self identity, instead their identity was visible through daily actions, skills and scars acquired through their way of life on the coast.

Barth's model is suitable for archaeologists to apply their data to and it accounts for the relative situation of ethnic identity, whilst placing it within a positivist model. It does however neglect the interpersonal aspects of more recent subjectivist approaches (Jones 1997: 76). Different approaches to ethnicity each have their own flaws, well summarised by Jones (ibid.). Objective models apply general theories to society as a whole, whilst relative studies are preoccupied with the specific and the individual. Whilst objectivity does not exist, people would have believed their views of ethnicity were objective in Antiquity. Whilst ethnic groups may not be bounded and homogenous in reality, that may well be how they were perceived in Antiquity. This objective model is then crucial to our understanding of how identity was perceived in Antiquity even if their model didn't in fact work. Because ethnic boundaries and the indicators used to display ethnic difference change over time, an approach that can account for the change in criteria (or 'filters'

Goudriaan 1992: 77), that decide what represents ethnicity within guidelines set by wider cultural influences and the passing fashions, is required. One such example is the highly visible material culture left by 'Romanisation' (Freedman 1993; Barret 1997; Fincham 2000) of annexed and conquered territories. This is a highly visible, but superficial, veneer that disguises the continuity of local traditions in tandem with adoption of some overarching and distant Roman cultural influences on ways of life (Gardner 2002). For this reason we cannot assume that ethnicity is and was constructed in the same way by all cultures and so any archaeological or historical approach needs to understand the specific social context within which these changes and decisions were taking place.

2.2 Context

In order to locate indicators of ethnic groups, it is first necessary to understand and locate the 'strategies of distinction' (Pohl & Reimitz 1998: 5) used to maintain ethnic boundaries. The criteria determine the meaning of artefacts and actions that represent ethnic identity within a specific social context. This makes the meaning of potential indicators of ethnicity change over time. 'This requires an approach that contextualises the artefacts within society's ideas that influenced their use, i.e. we need to see basic value orientations that influenced overt signs and symbols' (Kleppe 1977: 32) and be able to recognise these changes over time. To contextualise the artefacts, or indicators of ethnicity, we must understand how ethnic identity is maintained, for an ethnic identity may have to undergo significant changes over time to remain distinct from other identities. It has been argued that some identities have been 'used as strategies of distinction, others as strategies of integration in different contexts' (Pohl 2003: 5). One could argue that all identities are required to act as both simultaneously, in order to preserve their existence as a distinct identity. There were certainly in Antiquity conscious strategies of interaction made possible by the manipulation of identities (Pohl 2003: 5). It is also well documented that ethnic identity exists by 'channelling conflict… and privileging some conflicts over others' (Pohl 2003: 6). Indeed there is a strong case put forward that the early medieval ethnic group identities of Europe were 'not so much as fixed entities… but as precarious communities ... which needed considerable efforts for their preservation' (ibid.). The considerable effort channelled into preserving distinct ethnic identities, through their integration and distinction is achieved through interaction and power relationships with other identities. This is the social context one needs to discover. However, in doing this it is crucial to prevent reworking past assumptions into a new thesis, for example Barrett recognised a social context used by Hodder (Hodder 1986) in his approach that itself was used a methodology he had previously criticised (Barrett 1987: 471).

Approaches to how ethnicity is defined within the social context have been explored by Jones and others (Jones 1996, 1997, Smith 2003), using Bourdieu's (1977) concepts of the 'habitus' and 'doxic knowledge'. The habitus is described as the process that engenders

perceptions that influence human agency. Doxic knowledge is a form of social knowledge or experience that creates classifications used every day such as class and gender, learnt from conditions of existence (Jones 1997: 100). It is argued by Jones and Smith that through understanding the habitus and doxic knowledge that determined specific ethnic ascription we can have a sufficient understanding of the social context that will provide us with the ethnic meaning that was attached to specific material culture in the past. A parallel idea, though not influenced by Bourdieu's work, is the approach of Astuti writing on a maritime group called the Vezo of Madagascar. She developed her theory of *ethnotheory*, based on Linnekin and Poyer's argument that 'people constitute their ethnic identity through their common origins…that this ethnic theory of identity… should not be assumed to inform all theories of identity...(but) to recognise other, alternate constructs of identity and difference…(to allow us to) investigate other peoples identities, rather than to assume that these must be ethnic theories' (Linneken and Poyer 1990, 5 Astuti: 464-5). In this way Astuti distinguishes between 'ethnic theory' based upon shared origins and 'ethnotheory' specific to a group identity. In this way a group's (in this case the Vezo) self-identity may not follow standard 'ethno theory' of anthropological research, but be based on different criteria (Astuti 1995: 465) It is through an understanding of these *ethnotheories* (henceforth *theories of ethnicity*) that we as archaeologists can reconstruct what meaning was associated to artefacts within their specific social and archaeological context.

The modern relativist stance of any study of the social context from which one can reconstruct past views on the construction of ethnic identity, are of course going to create different conclusions, as ethnic groups are in fact segmented in character (Jones 1997: 100). This is because the characterisation of people is determined by one's perception. To illustrate this, researchers in the social sciences have separated the sources of data on the behaviour and characterisation of peoples into two different groups, known as *etic* and *emic* accounts (Jones 1997: 56-7). *Emic* accounts are described as meaningful to ones self-ascription to an *autonym* (ethnonym assigned by self), whilst *etic* accounts are meaningful to an observer's characterisation of an *exonym* (ethnonym assigned by observer). Both types of account are important in the construction of identity and are related through the interaction between the self and the other. Both types of account will often appear quite different as they represent different perceptions and motives in the portrayal of an ethnic group, each based upon an individuals bias, experience and circumstances. It is however the discrepancy between different perceptions of ethnic identity that is most informative about the construction of identities. As ethnic identity is ascribed to and defined through difference from the other, the difference between sources is informative about the very nature of the power relationships that have been formative in the construction of ethnic identities of self and other.

2.3 Power

The evidence for social context comes from three main sources, ancient historical texts, epigraphic texts and archaeological data. There are of course problems with an ancient author's account representing subconscious or conscious bias in the writing, resulting in a tendency towards a specific perspective resulting in a derogatory representation of other groups. For example, Clarke's study of the seminars of Plotinus shows that any Oriental inheritance in the text has been filtered through Greek ethnography and philosophy and may tell us more about the writer than his/her subject (the author's preconceptions of the subject rather than the subject itself Clarke 1999: 123). Miles and Heather argue that the construction and manipulation of '*Barbaria*n identity' by the Roman Empire was due to issues of power, ultimately aimed at aiding and influencing imperial foreign policy (Heather 1999: 254; Miles 1999: 7). As Said (Said 1978: 6) has argued, these constructs were created at considerable material investment and were if not purposefully, then subconsciously supported by members of a colonialist power. In late Antiquity Miles suggests 'the *Barbarians* were barbarised and the east orientalised' for political reasons (Miles 1999: 5). As historical and epigraphic documents carry the writer's biases and errors preserved in their message for the intended audience, these are particularly good sources for seeing how an individual (representative of their group identity) perceived ascription to a specific ethnic group. This is because objective truth does not exist, as each individual has different perceptions of identity.

These different perceptions allow us to more clearly understand the processes that construct identity, through understanding the discrepancy between the divergent experiences of power relations (*discrepant experience*, Said 1993: 35-50). This method has the basic pretence that 'essentialist theories and modern nationalism defend the experience of their perspectives rather than promoting full knowledge of it and as a result, (they) will demote the different experience of others to a lesser status' (Said 1993: 36). It is my argument that this post-colonial tool for understanding perspectives of the modern and recent past are also valid for application to the Hellenistic kingdoms and the Roman Empire. Whilst the term colonialism is usually reserved for the period of the fifteenth to the twentieth century AD, the Roman Empire and Hellenistic kingdoms share many features with colonialism, as they built and maintained colonies on other continents within their empires, subjugating, converting and displacing indigenous populations or political and economic power. Discrepant experience is a tool 'that juxtaposing experiences with each other … to make concurrent those views and experiences that are ideologically and culturally closed to each other and that attempt to distance or suppress other views and experiences' (Said 1993: 37). The point of this is that each *theory of ethnicity* is an abstraction, specific to a certain perspectives. As an approach to understand these multiple perspectives, *discrepant experience* can be used to highlight the differences and explain the influences of power relations on the characterisation of peoples. These power relations define how identities are constructed within a specific social context. It is the divergent experiences of different groups within a society that give us our best understanding of how power relations work within a society and the impact of patterns of domination (Mattingly 1997b: 13). One way a better contextual understanding can be achieved, is by comparing the use of ethnic labels in literature, with what was used on a daily level, preserved in the epigraphic record, with ethnic indicators preserved in the archaeological record.

Archaeological approaches using the notion of *discrepant experience* have involved the use of historical sources (Fincham 2001) and archaeological data, most frequently when applied to the evidence for the resistance of indigenous populations to Imperial powers in the archaeological landscapes (Alcock 1997b; Mattingly 1997c; Fincham 2000; Webster & Cooper 1996; Mattingly 2006).

In his study of the fens, just south of the wash, Fincham described how different lived experiences were represented in the archaeological landscape. Three different patterns emerged, each representing different methods of presenting status following Roman occupation. For some sites displayed distinctly Roman features of elaborated tiled architecture, whilst others continued to display status in the distinctly indigenous Iron Age tradition of portable wealth (Fincham 2000: 33-4). The problems of such approaches are also discussed, with a lack of text with which to reconstruct the voice of the subaltern, producing a reliance on archaeological data (Mattingly 1997c: 11-5) and the potential dangers of reducing the subject of interaction between different groups in the context of Roman occupation to a simplistic dualistic approach (Mattingly 1997a: 117). Also often hierarchy is assumed when there is archaeological evidence for various groups interacting (Osborne 2007). Clearly the success of such archaeological approaches utilising the notion of *discrepant experience* require careful understanding of the social context and in the case of studies of ethnicity an understanding of the subtleties of changing *theories of ethnicity*.

Distinction and interaction are intertwined; with distinction occurring whist interaction is taking place. This means that studies of power relations that take place through cultural contact or interaction are particularly relevant to studies of ethnic identity. These power relations provide an explanation of the social reasons for ethnic identity to be characterised in a certain way. This is particularly visible in legal documents from Antiquity. Not only are ethnic labels used in certain contexts, but also the role an ethnic label plays in legal practice signifies how groups interact in the public sphere (Pohl-Resl 1998: 205; Matthews 2000: 39). Power relations are the way in which all aspects of life are negotiated and take both negative and positive forms (empowerment). This is because power relationships are not unilateral, but bilateral and multidirectional, particularly important when treating Romanisation, where its simplistic treatment as a unilateral transfer of culture from Rome to the conquered provinces, is no longer upheld (Mattingly 1997b: 6). Similarly it is important not to allow correlations between power relations and ethnic identity to persuade one of the reductionist and determinist arguments about the nature of ethnic identity as being primarily economic in purpose (i.e. direct correlation of ethnicity with interest groups, Jones 1997). Instead power relations provide methods for studying the social context from which choices about ethnic ascription were made. This is not to say that ethnic identity doesn't have economic dimensions, but that economy doesn't alone determine ethnic display. Some models of how power relations influence ethnic identity and its display include economic 'stress', interpretations of the Romanisation 'resistance or opportunity' situation and 'ethnic specialisation' and 'ranked ethnicity' models.

One major catalyst for changing power relations is the introduction of a political, social or economic 'stress' on the social system in place. This would influence both opportunities open to

and guarded by different groups. An ethnic identity may become particularly important for its access to certain resources and result in more rigorously marked boundaries by its members in order to maintain a favourable position (Hodder 1979: 446). Alternatively on occasion the climate is not favourable to highly visible ethnic differentiation (Mitchel 2000: 139). At times of success, communication and symbiotic relationships would see a reduction in the definition of boundaries between ethnic groups (Odner 1985: 5).

Some post-colonialist approaches to Romanisation and Imperialism have questioned the nature of power and cultural exchange between Rome and the provinces. The process of acculturation obviously has a significant role in the display of ethnic identity of people from the provinces. This has produced a number of different approaches, some recognising 'landscapes of resistance' (Alcock 1997a: 111), where a population of an area appear to have actively resisted Romanisation as a form of 'silent resistance' (van Dommelen 1998: 44) and areas where Romanisation has been more widely accepted in a 'landscape of opportunity' (Mattingly 1997a: 134-5). Similarly, like landscapes a site or city may possess a distinct identity of its own (Clarke & Harrison 1998: 1; Kennedy 1998: 69). One of the cultural features used to define ethnic identity is religion, areas where this was influenced by acculturation caused by Romanisation and the resistance to it (Webster 1997: 170; Whittaker 1997: 160), which would have a knock on effect for indicators of ethnicity. Another approach to this question of acculturation is the treatment of different status groups within a society, in Roman Britain the process was quite different for the elite (Hanson 1997: 78) than the rest of the population (Hingley 1997: 96-7).

Individuals and groups use power negotiations to gain access to certain resources. In some cases certain types of resource are negotiated for an ethnic group, such as survival niches, or specific vocations. This 'ethnic specialisation' plays an important part in displaying ethnic identity (Haaland 1969: 71). In some cases ethnicity influences status and thus access to certain privileges and resources. This is called 'ranked ethnicity' (Hall 1997a: 131) and is a way of preventing confusion and potential confrontation over resources. The role of this in relation to the ethnic groups present in the Erythraean Sea ports will be explored in future Chapters.

Group identities would have competed with other identities such as status, gender, religion, age, nation, vocation/profession, community and family for recognition in Antiquity, as they do today. The scale of these identities over time and space means that they all had different dynamics and influences on the archaeological record, as they would have had salience in certain situations. Individuals possess numerous identities simultaneously, making the meaning of material culture difficult to unravel (Gardner 2002: 344). Material culture or the actions performed with them could signal a specific identity, but had to do so without being misunderstood for another identity. This is not to say that artefacts could represent numerous identities themselves, just that in those cases it could only do so where identities were linked, for example ethnic or gender specialisation in vocations. A good example of nested identities in a maritime sphere, is Wynne-Jones' study of the Kilwa region of the East African coast, where she recognises that there were "numerous processes of group and individual identification … and that material culture [was] implicated in the construction of many of them" (Wynne-Jones 2007: 340).

2.4 Group identity(s)

As discussed earlier in this Chapter, ethnicity does not exist as an identity in isolation. It has been argued that the primacy of relativist approaches to ethnicity, have caused the lines between ethnic and other identities to be blurred. It is because these other identities have the potential to resemble ethnic identities that makes such distinction difficult when using a relativist approach. However, such relativist approaches undervalue or ignore the cultural components of ethnic identity, these models are empty (of culture) and neglect human agency, cultural and psychological dimensions in favour of the deterministic economic and political relationships of interest groups (Jones 1997: 61). Jones (1997: 61, 76) suggests that ethnic identity can be distinguished from other forms of social grouping or identity such as gender and class and argues for the analytical unity of the concept of ethnicity. However, identities such as class and gender are used in the display of ethnicity and vice versa (Smith 2003). An example of burial techniques in Nubia shows indigenous Nubian burial techniques continued to follow Egyptian invasion only in female burials, male burials following an Egyptian model (ibid.). Another example is the high quantity of Hellenistic names selected for males in Egyptian society in the early Roman period, whereas the women of the same class possessed Egyptian names (Rowlandson 2004). For this reason the relationship between ethnic and maritime cultural identities in the northern Red Sea ports is explored, not only because it is a good example of how identities are used in ethnic display, but also because maritime cultures are particularly ignored in the literature in general (Westerdahl 2008). The objective is to understand the role of maritime activities in ethnic display and to what extent maritime cultural identity is distinct from ethnicity.

The term 'maritime culture' was first defined in archaeology by Keith Muckelroy, as 'maritime culture comprises all the aspects of ships and seafaring, but excludes related communities onshore' (Muckelroy 1978: 227). However, Prins was discussing maritime cultures in the 1960's (Prins 1965). Muckelroy defines 'maritime cultures', as a sub-culture within a three dimensional matrix which represented the (then) archaeologists' view of a society (Muckelroy 1978: 227). This owes much to Dr Clarke's theories in 'Analytical Archaeology' and carries its processualist perspective on cultures. In order to understand these communities Muckelroy proposes three headings under which analysis can be focussed; nautical technology, warfare and trade and lastly shipboard societies (Muckelroy 1978: 230). This theoretical approach and the very existence of 'maritime cultures' have been called into question since (Parker 1995a). The very use of the term culture is problematic within archaeology. This problem is well summarised by Haland; 'The concept 'culture' seems to have a double meaning, both the collection of artefacts belonging to one class according to the archaeologists criteria of classification and a group of people which the archaeologists assumes is the bearer of the cultural tradition he believes he has identified by his classification.' (Haland 1977: 1-2). Secondly, there is a problem with identifying 'maritime

cultures' as distinct from other cultures and there are published examples of shared identity between 'maritime cultures' and non 'maritime cultures' (Parker 1995a: 93). Parker argues that 'maritime cultures' would be especially difficult to identify archaeologically; 'the analogues for finding a different maritime group in the wider society are not strong and anyway the likelihood of identifying a separate material culture from seaborne assemblages is small' (Parker 1995a: 94). A third problem with Muckelroy's definition of 'maritime cultures' and repeated in Parker's critique is the subconscious associations made between shore-based communities having a non-maritime identity. Flatman clearly sets out the problem in his article; 'Existing archaeological theories were evolved by land-based western societies… from the established culture-perspective, all conceptions of the sea and things related to it are defined in relation to the land, ''maritime cultures'' being perceived as not fully 'maritime' due to established relations with shore-side, shore-based individuals and groups' (Flatman 2003: 151). Flatman goes on to discuss how this perception is particular to western land-based perspectives as 'Oceania cultures fail to perceive' the shore as a barrier to cross (Flatman 2003: 151). The seascape here is not assumed to be a barrier, as all boundaries within a landscape or seascape are culturally constructed. They are only experienced as such 'in relation to the activities of the people for whom it is recognized or experienced as such' (Ingold 1993; 156). Muckelroy's arbitrary exclusion of shore-based communities involved in maritime activities in his definition may have been motivated by his concentration on wreck rather than port sites, rather than any real difference in cultural identity in Antiquity or the present. Indeed Muckelroy's definition taken to its extreme implies that shipbuilders stop possessing a maritime cultural identity when they down tools. The problem with both Muckelroy's definition of 'maritime culture' and Parker's critique of it is that they both assume that these cultures are homogenous and bounded. As we have seen in Chapter 2.1 above, this perception of culture is no longer supported as it does not take into account the subjective nature of culture and the relative perceptions different people can have of it. Also Parker's statement that 'the likelihood of identifying a separate material culture is small' should not discourage any attempts to do so, especially as his classification of a 'maritime culture' is rigid and limited to ship-board communities and not their families and wider communities that also benefit from sea.

Westerdahl's definition of 'maritime cultures' as a 'recurrent set of significant, maritime traits' (Westerdahl 1994: 265) is somewhat more satisfactory as it specifically includes shoreline communities ('coastal culture') whose environment, landscape, economy and cultural features that can only be described as 'maritime'. In this way a 'maritime culture' could be used to describe a group wholly or partially dependent upon the sea, incorporating individuals whose vocations facilitate maritime activity; fishing, sailing, piloting, shipbuilding, rigging, maritime trade, maintenance of harbour facilities etc. Just as social context is formulaic in the construction of ethnic identity, 'maritime cultures' also have to be understood in relation to their specific circumstances. To this end Westerdahl has published a range of articles detailing with what he has labelled the 'maritime cultural landscape' (Westerdahl 1992; Parker 2001), known elsewhere as a 'seascape' (Cooney 2003). These approaches explore the relationship between the coastal environment and the identity of 'maritime cultures' (or 'saltwater people' McNiven 2003). In his

most recent publication, Westerdahl (2008) outlines the different aspects or facets of the maritime cultural landscape that he lists as: topographical, economic, communicative, political (or power), resource (both inner and outer), cognitive, ritual, social, urban harbour and leisure landscapes. Also dealing with ritual landscapes, Cooney, introducing a world archaeology volume of approaches to 'seascapes' argues that 'traditionally, people in coastal areas shared similar daily preoccupations and, through the process of ritualization, these preoccupations came to play a central role in cosmological and religious belief and their material expression' (Cooney 2003: 324). She goes on to describe how 'seeing and thinking of the sea as seascape-contoured, alive, rich in ecological diversity and in cosmological and religious significance and ambiguity- provides a new perspective on how people in coastal areas actively create their identities, sense of place and histories' (Cooney 2003: 324). Also in this volume, McNiven's study of indigenous northern Australian saltwater peoples clearly illustrates this community's deep spiritual connection to the sea, cosmologies and rituals linked to the sea 'are central to the construction and reaffirmation of a 'saltwater' identity' (McNiven 2003: 344). He suggests on the strength of the anthropological and related archaeological evidence for this that 'an archaeology of seascapes is more than an archaeology of marine subsistence and procurement technology; it must also be an archaeology of spiritscapes and rituals that mediate human spiritual relationships with the sea' (McNiven 2003: 329). Another important study from this volume approaches the use of the ship as a symbol in past societies. The authors suggest that 'cosmologies, long-distance travel and beliefs about death and (the) supernatural were closely intertwined. It seems hardly surprising that societies whose daily lives may have involved travel by sea should have chosen the ship as a symbol' (Ballard et. al. 2003: 398). In conclusion these studies on seascapes clearly illustrate how central the sea was to constructing and maintaining identities of the people who lived on it. It also illustrates how these identities were distinguished through ritual and recorded in the archaeological record.

To reconstruct the specific maritime context in which a 'maritime culture' existed, an approach to the maritime cultural landscape must be applied. The influences of the physical and phenomenological (including both cognitive and ritual elements) must be understood for they are the situation in which these identities were placed and influenced the experiences of those that lived there. This allows the experience of saltwater people whose actions carried out certain roles; fishing, pilotage, ship maintenance, sea trading etc, to be better understood. On the larger scale the position and role of specific ports within a maritime transport network is important for understanding what cultural influences its inhabitants would face. The port or harbour also has a specific role as a cultural contact zone that influence the formation of ethnic and other identities (Falck 2003: 106). Within these meeting places Falck suggests that the port is hybrid, the material culture present is a hybrid expression in itself rather than representative of distinct pure ethnicities (ibid. 114). An expression of hybridity can be seen as a third space between alike and different, rather than a simple hierarchic relationship of power within a multiethnic social system (ibid. 110). One could argue that hybridity is not just represented in ports but is representative of ports. In the Roman Red Sea ports, ships arriving from India, Arabia and East Africa would have brought people, their trappings (material culture) and their ideas, creating a cosmopolitan atmosphere that

subsequent archaeologists may interpret as hybrid from the material culture left there. Then an assemblage representative of 'maritime culture' would be expected to be hybrid in nature. Whilst this interesting model suggests a possible explanation for the construction of identities at port sites, 'maritime cultures' have in some cases been recognised as distinct ethnic identities (for example the Vezo, Astuti 1995) and in others not even a separate group identity (see above argument, Parker 1995a). This hypothesis can be tested using the following methodology to find the connection between the construction of identity, maritime activities and consumption practices.

3 Methodology

One key point of this research is its novel approach identifying the different demographic units that constitute a port community using the archaeological, epigraphic and historical data available. This requires a methodology that clearly defines how the theoretical approaches outlined in the previous Chapter can be applied to disparate forms of evidence found in the field and library. This methodology could be similarly applied to other archaeological sites where its inhabitants are undertaking other (not necessarily maritime) activities.

The methodology at its simplest level compares and contrasts the evidence for maritime activities, food and drink preparation, presentation and consumption within discrete archaeological contexts. The archaeological context is studied for further evidence of its inhabitants and the activities undertaken, based on epigraphic and architectural evidence. Comparisons between areas of a port site and between sites can then be made. The results of these comparisons and the epigraphic record can then be compared with the historical literature, to see what contradictions are made concerning specific groups within the port community and why. However, there are a number of issues concerning the limitations of the evidence that include preservation and sampling, classification, quantification, statistical analysis and the nature of the archaeological context. One needs to be aware of these limitations and how these can be overcome methodologically to create a statistically viable sample for analysis and an academically viable resource for study.

3.1. The source material: Sampling and scale

The extensive variety of finds classes studied here, were made from a range of different materials (pottery, stone, bone, horn, shell, wood, metal, textile, resin, cordage, plaster) from three sites (Aila, Berenike, Myos Hormos) excavated by four different teams (Chicago, Delaware, North Carolina and Southampton). Different site formation processes, preservation and sampling strategies have each influenced the dataset used here. This is unavoidable in archaeology and the methodological tools discussed below are intended to get around the potential pitfalls of intra- and inter-site analysis.

Firstly, the preservation of all finds classes is dependent upon human activity C-transforms) and natural preservation factors (N-transforms), events collectively known as 'site formation processes' (Schiffer 1972: 156-65; Schiffer 1976). Whilst much of the Eastern Desert is hyper-arid and allows for superb preservation of organic material, there are damp areas close to the water table where preservation is poor. This is particularly true at Aila that suffers from a fluctuating water table (Author pers. obs.). However, waterlogged deposits also preserve organics well in some cases when anaerobic environments exist (Thomas 2006: 88, trench 15). For this reason the preservation of wood, metal, textile, resin, cordage and plaster varies between sites and within different areas of each site. Also artefacts/ecofacts may be moved, redeposited, reused or

destroyed by animals and humans using them for food, fuel or reuse. This is particularly the case with wood, metal, cordage, bone and textile, but can also be the case with pottery, stone, horn, shell and resin. Redeposition is a major problem in some Eastern Desert sites, resulting in a large quantity of older (residual) material mixed in with more recent dumping, often the result of clearing of an old dumping area for construction (Bingen 1996).

Secondly, sampling strategy undertaken by excavators on each site has influenced the dataset available for study. The sampling strategy cannot be described as random or systematic at any of the sites as they are instead based on research objectives and results of surface pottery survey (Aila), visible architecture (Berenike, Myos Hormos) and geophysical techniques (Berenike, Myos Hormos). Once areas of ancient activity were located at each site, they would continue to excavate or expand the area depending upon the results. For this reason the quantities in different sites and different areas vary greatly in composition (depending upon the type of site) and in quantity (depending upon the context and the volume excavated). Choices have to be made, because even at Berenike, the most extensively excavated of the three ports, maybe only 2% of the surface area have been excavated, and even then often only to the later phases of occupation. At Berenike much of the excavation has been concentrated in the main eastern Late Roman settlement, although in 1999 a magnetometer survey of the wider area prompted excavation of the Ptolemaic industrial area (Sidebotham & Wendrich 2007: 16). At Myos Hormos the Chicago excavations concentrated on the more substantial buildings of the eastern Mamluk and Early Roman settlement. The subsequent Southampton team concentrated on locating and excavating the harbour facilities and foreshore, whilst testing some of the Chicago interpretations in the eastern settlement area. At Aila work was concentrated in a number of areas, Nabataean and Early Roman settlement (B and M, Retzleff 2003; Parker 1995; 2003), Church and its grave-yard (J and A, Parker 1999; 2003), the City wall (J, Parker 2003) and domestic areas (A, L and K, Parker 1994; 2003), despite attempts to locate the harbour facilities (Parker 1997: 38). This is by no means a criticism of the sampling strategy just recognition that the interpretation of each site is based upon a sampling strategy than concentrates on a specific period, architectural features or maritime function.

Thirdly excavation techniques play a major role in the quantity of small finds recovered. In all sites the standard system involved excavation by local archaeological labourers (usually with a number of years experience) supervised by a trench supervisor (trained archaeologist who also undertook the recording and any detailed work), themselves supervised by an area supervisor. At Berenike every bucket of spoil was dry sieved with a 1 mm mesh, so that no finds or fine bones were lost. At Myos Hormos and Aila only selected samples were sieved and used for flotation. The main concern with this inconsistency is the recovery of very fine fish bones. That said the results suggest similar species were found at both Berenike and Myos Hormos, and any differences were not the result of the size of species.

Finally, the quality of finds recording and publication influences the researchers interpretation. Fortunately in all cases extensive Access databases of the finds were available for use from all sites, often alongside a digital photo archive. Despite the excellent system in place for all projects, extensive specialist knowledge is required to correctly identify the often poorly

preserved fragmentary finds. The preservation at Aila and in some contexts at Myos Hormos and Berenike were so poor for some metal finds that the interpretation or descriptions were occasionally of limited use, adding an element of uncertainty into the classification of the artefacts (for this reason in Chapter 8, the maritime artefacts of Aila are classified as either certain or uncertain artefacts). Where artefacts were handled directly or complete photo archives were available greater certainty was possible. Where publication records were used (for example the Chicago excavations, or the Berenike ceramic records), there was a concern over what was selected for publication (Whitcomb & Johnson 1979; 1982) and how complete these accounts were. Reliance on published data was limited, as site archives were usually available.

3.2. Context and sample size

The unit of study is limited by the resolution allowed by the excavation techniques used and preservation of deposits. In this study a number of domestic occupation or industrial refuse deposits will be studied. Domestic and small-scale industry refuse was often dumped together, presumably by individuals living nearby. The distribution of these artefacts is significant as it is not random, but represents the repeated dumping of one or more households dumping their domestic rubbish and waste from their maritime activities. The material deposited relates to the daily rubbish produced by household(s) living nearby and so represents household or family/community groups made up of individuals of genders and age groups. Detail on the individuals is preserved in the papayrological record, but it is on the family or community group scale that this study concentrates because of the nature of how the material is deposited and whom that represents.

Discrete context (or loci on America excavations) discovered in excavation can often contain just a small quantity of artefacts/ecofacts. For this reason the approach used here often groups contexts from the same phase of occupation in a specific trench or area so as to get a significant sample size for analysis. Sometimes a garbage dump or the occupation of a specific structure can be dated to the beginning, middle or end on a specific century, other times it cannot be dated more precisely than 'the early Roman period'. The quantity of maritime artefacts is much smaller than the quantity of bones and ceramics found. For this reason a descent sized sample may not be available for each phase of occupation and so when discussing maritime artefacts only the 'early Roman period' are discussed (for example much of Berenike, with the exception of the trash dumps). The objective is to retain precision available in the dating, without losing accuracy and retaining a large enough dataset for analysis. In the following Red Sea port Chapters each context will describe how the specific archaeological deposits represent a specific household, or group of households, so as to understand better 'the actions of the people within a specific context as opposed to just the context itself' (Meadows 1995: 133). In order to relate the associated structures or archaeological features with the maritime activities taking place and the identities of those involved, different areas of the port sites will be compared, allowing for intra-site analysis.

3.3. The classification of materials

The classification of the material has three constitute parts. Firstly, its identification, secondly, its classification and finally, how it its grouped with other artefacts based upon use/function (which leads onto the following section: the meaning of the artefacts). Firstly, only specific classes of artefacts were selected for study, for their perceived importance in identifying the presence and role of different groups within the Red Sea ports. This or other studies could expand to other find classes and improve the detail and increase our knowledge of these groups. This evidence comes in many forms, such as items of jewellery, clothing, or other artefacts that may be distinctive of specific group identities. An example is shell jewellery that is found in relative abundance (Reese 1982: 383) in the Roman deposits at *Myos Hormos*. The use of shell for the creation of beads and pendants (Figure 3.1) may well have singled individuals out as members of a particular group. Positive association of such jewellery with fishing equipment, shellfish bowls and scoops may be culturally significant. The find groups assessed include: tablewares, amphora stoppers, faunal remains and maritime artefacts. In Chapter 4, ceramic and shell tablewares, amphora stoppers and faunal remains are discussed, concerning what food and drink was consumed, how it was served and prepared. Maritime artefacts that relate to ship maintenance and fishing techniques that are outlined in the Chapter 3.

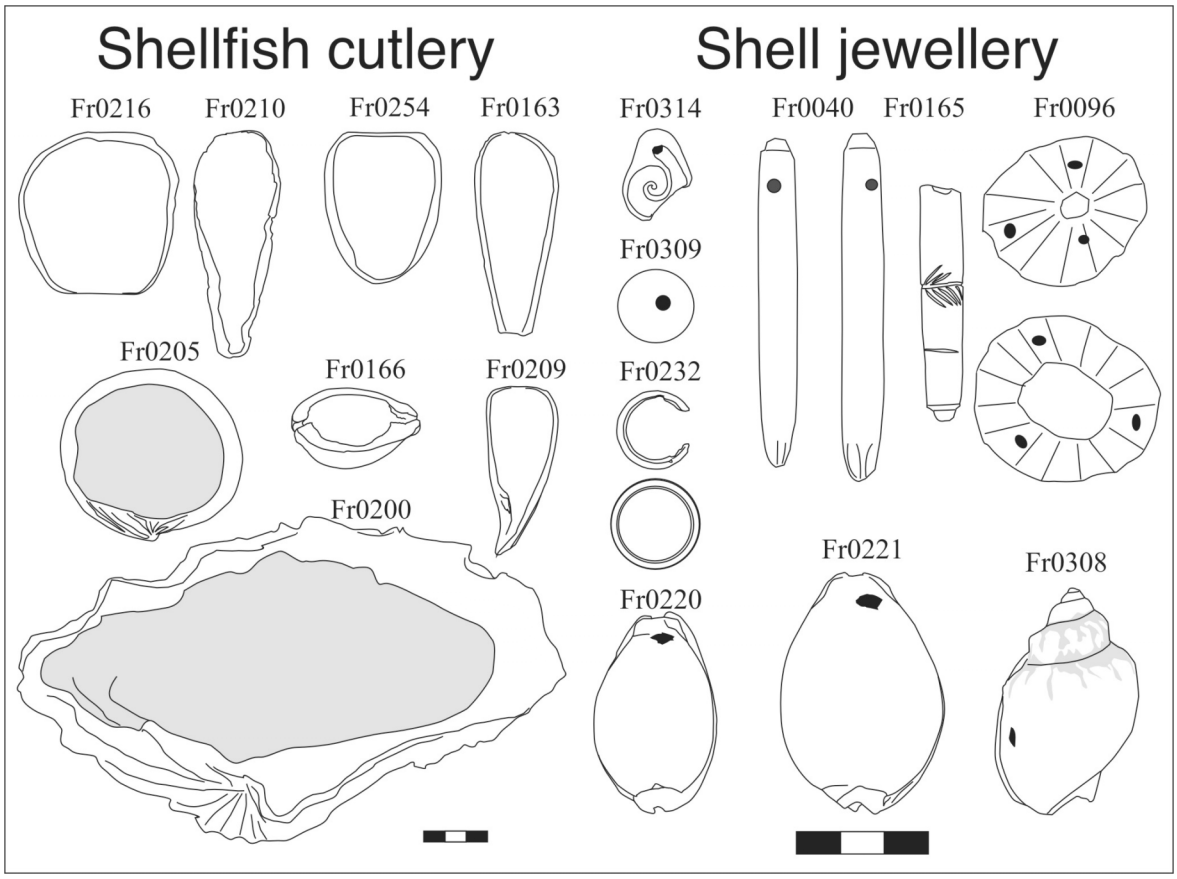


Figure 3.1 Shell, sea urchin and turtle shell jewellery and cutlery from Roman deposits at *Myos Hormos*. Note grey area denotes residues on the surface of shell bowls. Drawing by author.

Artefacts were identified either in the field (in the case of Southampton University Quseir al-Qadim Project), or from find records (Berenike, Aila) and published records (Chicago University Quseir al-Qadim project). Maritime artefacts are not easily identified, because they are rare, poor ly preserved, regionally specific (to the Red Sea) or because the finds specialist is not used to seeing maritime artefacts (Chapter 4). This requires another look at the records to identify finds on the basis outlined in the subsequent Chapters. Different specialists in the field recorded ceramics and faunal materials. To be able to compare the data recorded by specialists who use different conventions, classification needed to be standardised and to make this data manageable often also needed to be grouped (or *pooled*). For this reason a standard convention for classifying pottery forms (cup, bowl, dish, plate,) was used for all tablewares (criteria for standardised guidelines for the definition of pottery forms is outlined by Darling (1994) see Chapter 5 for the statement of conventions and terminology used). Similarly, wares were grouped (Red Slip, Faience, Thin walled, Nabataean fine ware), as are faunal remains (based upon the environment from which they came), to present the differences in a manageable and meaningful way, so that classifications relate to actual use and choices in Antiquity.

3.4. The Meaning of Artefacts

Whilst the artefacts are interesting in themselves, this study is interested in their function and what activities they were used for. The artefacts are classified and grouped to emphasise differences in assemblages that relate to specific activities undertaken. In the case of tablewares, the use of different forms (cups, bowls, platters etc.) relate to different dining activities (outlined in Chapter 5). A direct relation between form and function is however often impossible as, in the case of Egypt, pottery samples cannot be taken out of the country for lipid analysis (Barnard & Eerkens 2007) that may help us identify what foodstuffs were stored in and eaten out of them. Also lipid analysis made in other Roman provinces may not relate to how tablewares were used on the Red Sea. What is significant is that a variety of vessels were or were not used in different cases and that this represents different dining habits. Similarly, it is not always possible to securely identify artefacts with a specific form of fishing. A float could be used on a fishing line or net for example, though it is likely to be used for fishing.

Maritime artefacts are the material remains of maritime activities, people's interaction with the sea, they can be used to infer a person's vocation as maritime as they are 'indicative of cultural traditions' (Westerdahl 1994: 267; Maarleveld 1995: 3-7). Within a given land or seascape, tasks are undertaken that are simultaneously both technical and social activities (they should not be arbitrarily separated), with both special and temporal qualities (Ingold 1993; 158-63). These tasks represent a 'taskscape', preserved in the form of artefacts and archaeofaunal evidence. Maritime activities as representative of technology, knowledge and skill have been the subject of recent studies exploring their significance in maintaining and transforming social identity between people (Sturt 2006; Farr 2006; Richards 2008). The location of these artefacts is then significant when

considering their social distribution, both inter and intra-site and their association with other forms of evidence.

At the core of this study is the assumption that the distribution of material culture and the selective consumption of fauna can, if interpreted correctly, be used to identify the construction and maintenance of identities in Antiquity. More specifically that food has social meaning beyond the materialist perspective of economic cost benefit and that the method of food preparation and presentation has social meaning, representing an etiquette or way of consuming fauna (Chapter 5). Also that people attach value to specific vocations, in this case maritime vocations, making them important elements in the construction of class, caste and ethnic group identities. The relationship between different maritime activities, diet and how people were eating can then be compared for different areas of a site, between sites and over different periods. To do this the maritime artefacts studied will be grouped into those representing: fishing, ship hull maintenance and rig and sail maintenance activities (Chapter 4). All these tasks required different skills that may have been specialised in Antiquity. The concentration of specific technologies and techniques (be they local or Mediterranean in origin) in each area will be highlighted.

3.5. Quantification

Because of the disparate range of materials and different preservation conditions all artefacts/ecofacts are quantified as *nisp* (number of identified specimens). This was chosen because it is the preferred method of quantification used for faunal remains (Van Neer & Lentacker 1996: 346), but also because it is impossible to quantify the maritime artefacts in any other way (try quantifying estimated vessel-equivalent, or *eve* for a ship on the basis of a fragment of sail), and it is important that all groups are quantified in the same way when being compared to one another. The problem with *nisp* is that it is not the most accurate measure of the quantity of vessels, in the case of pottery or the most precise reconstruction of the dietary importance of meat, in the case of faunal remains (Davis 1987: 36; Van Neer & Lentacker 1996: 346). Indeed, even with sieving, smaller animals may be underrepresented due to preservation, different species have different numbers of diagnostic bones and differential fragmentation of bone can also be an issue (Davis 1987: 36) However as a statistical tool it does have the added bonus of being unmodified and not reliant upon any form of assumption and so is a good measure that can be used to compare material from different trenches and sites.

3.6. Statistical analysis and significance of inter and intra-site analysis

The statistical analysis presented in the body of the text are descriptive statistics, used to summarise information as clearly and accurately as possible, often in a pictorial way such as a graph (Clegg 1982: 49). In all cases the material is displayed comparing like with like, usually as a % of the total. As the sampling was not random and because the quantity of finds vary so much due to the variety of factors outlined above, the quantity of artefacts/ecofacts is presented as a

percentage of all items found in that area. For example Red Sea fauna is presented as a % of all fauna found in each trench or area, maritime artefacts are presented as a % of all small finds, dishes and bowls as a % of all tablewares. This will highlight the concentration and type of maritime artefacts, fauna and tablewares used in each area. This will identify the involvement of people in certain areas of the site in specific maritime activities, the preferred diet and the variety of tableware vessels used in the serving of these foods, that can be compared inter and intra-site in the Red Sea ports.

Another important form of statistical analysis concerns the use of inferential statistics (Clegg 1982: 49-56). These measure the significance of the sample and the statistical analysis undertaken. Significance is reliant upon the sample size, its composition and how the samples are classified. For this reason large samples were used where possible to have the highest statistical significance possible. Ceramic assemblages were usually over 100 examples, faunal assemblages in hundreds or thousands. Maritime artefacts were rare. The 580 from Myos Hormos and 631 from Berenike were distributed thinly and that demanded adjacent trenches and periods were pooled together to create an assemblage that was suitable for statistical comparisons and testing.

The combination of intra (within) and inter (between) site analysis was applied to the data to highlight differences between sites and between different areas of the same site. Comparisons with fort and inland settlements would also help distinguish between groups. Intra-site analysis is important because it takes into account the diversity of a port's demographic make-up. Without intra-site analysis a fictional 'average' population would be invented, based upon the average of the whole site excavated to date. Whilst this may be accurate for a fort, it would be very misleading for a cosmopolitan port. It was hypothesised that there should be significant difference in the archaeological assemblage across port sites, because the types of activity undertaken and the people involved in it were different in different areas of the settlements.

Statistical significance was measured with the raw data to see whether the maritime, faunal and ceramic assemblages showed any significant differences depending upon what context they came from. Significance is expressed as a precise numerical probability value. The statistical significance Chi square test (or χ^2, Clegg 1982: 91-101) was undertaken on the data from different areas of each site that measure significant differences in the assemblage (Appendix Chapter 14, Table 14.1). In all cases a less than 0.001 significance (or 0.1% chance) of the results being due to chance, justifies using these artifacts/ecofacts for both intra and inter-site analysis as usually a significance of 0.05 (or 5% chance) or worse would suggest that the patterning was random. However, the significance of the statistical test is dependent upon how the material is classified and grouped/pooled. Justification for the classification (for example of a cup) and grouping (for example of Red Sea fauna) follows in Chapters 4 and 5.

The results outlined in Chapter 9 were also measured for statistical significance. T-tests were used to measure the significance of the dataset in supporting a hypothesis based on two variables that were either related or unrelated (Clegg 1982: 87-90). An example of a related datset is the hypothesis that contexts with a high proportion of fish bones (are related to) having a positive correlation with a high proportion of small finds that are of a maritime function. An example of an

unrelated dataset is that Nabataean sites have a higher proportion of sheep/goat bones than Roman forts in the Eastern Desert. The results of these tests are in the appendix (Chapter 14) where they are also explained and referred to in the figure captions for the graphs in Chapter 9.

3.7. Interpretation

The quantitative data used can tell us that different artefacts are being used and that different fauna is being consumed across a site over time. The statistical tests can confirm that this is not random and that pairs of variables (such as tableware forms and fauna consumed) are related. The data and its presentation as *descriptive* and *significance statistics* cannot tell us why these patterns exist that are the product of peoples choices in Antiquity. To interpret the meaning of these results we have to first accept that the distribution of these artefacts/ecofacts is not random and the product of activities that were significant to the societies that deposited them. The artefact/ecofacts chosen for this study were selected because they are commonly key indicators of ethnic and group identity in many modern societies (Chapters 4 and 5). This distribution pattern exists can then explain who the people were that deposited the artefacts/ecofacts when combined with epigraphic, ostraka and papyri sources. The data combined will then tell us what a group eat and drank, how they consumed it and what their involvement with shipbuilding, maintenance and fishing was, piecing together key areas of their identity. To this a range of qualitative data available from the archaeological context, concerning architecture and epigraphy, can be added to support the quantitative data.

The amount of information on who these people were is limited by the unit of study and the objects studied. Because of this household units are considered rather than individuals, perfect for the study of group identities and ethnicity, but preventing more detailed work on other equally important identities such as gender or age. It is for this reason that this study talks of people in plural not in neuter, it is not the intension of this study to discuss the Red Sea port communities as sexless, but to save that much needed and complementary to this study as a subject for future research. There are now studies available on the subject of women in Nabataean society (Al-Fassi 2007) and in Greco-Roman Egypt (Rowlandson 2004) that highlight how different opportunities were for women depending upon what society they lived in during the first three centuries AD, but also how these opened up with the possibility of trade ventures and how women could manipulate their ascription to different ethnic identities to further their opportunities. It is worth mentioning the Nicanor transport business employed Isodora to represent them in Myos Hormos between 37 and 41 AD and that this is not an isolated case of a woman working on the Red Sea (Meredith 1956: 58; Tait 1930: numbers 244, 257).

Finally once the social significance, or meaning of the patterning of artefact/ecofacts distribution across the Red Sea ports is explained, the results will be compared with historical accounts of the Red Sea port communities. This will illustrate the discrepancy between the Greco-Roman authors' perspectives of group identities and the reality of port communities as reconstructed from the archaeological evidence. These differences represent the discrepant

experiences (Said 1993) of indigenous and Greco-Romans groups, maritime and desert peoples, that are the product of power relations between them.

4 Maritime activities

'Maritime cultures' have been described as a group wholly or partially dependent upon the sea, or a 'recurrent set of significant, maritime traits' (Westerdahl 1994: 265). The approach used here focuses on the maritime activities undertaken by a group and their social significance. This is because maritime activities determine the experiences, vocations and identity of port inhabitants, a process of forming identities through inter-action with the seascape. Direct and indirect evidence of these activities comes from a range of literary, epigraphic, faunal and archaeological artefacts. Previous approaches to 'maritime cultures' have focused on studies of the seascape (Westerdahl 1992; 1994; 2005; Cooney 2003; McNiven 2003; Chapman 2005), whilst artefactual studies have remained in the realm of technological or economic studies (Parker 1992; Steffy 2000; Jurisic 2000; Pomey 2004; Sidebotham 2007; Whitewright 2007). Here archaeological artefacts are treated as material culture, representative of activities that have economic and technological, but also social significance in the relationships between people (Farr 2006). Each artefact represents activities undertaken that enable economic benefits such as fishing, sailing, piloting, shipbuilding, rigging, maritime trade, maintenance of harbour facilities. However, they are also rarefied by specialised knowledge of the sea that allows for access to various marine resources. This Chapter will identify maritime artefacts, their source, the activities undertaken in isolation and in conjunction with other artefacts as a kit, their construction, use and reuse and their purpose and value to society.

Subsequent Chapters (Chapters 5-8) will discuss the patterning of their distribution, the occurrence of these maritime activities at different areas of a site and between sites over time. Then the patterning will be explained as to why and who caused this distribution to be visible in the archaeological record through comparisons with other forms of evidence (Chapter 4) corroborating the construction of group identities. To explain the pattern created by the social distribution of artefacts 'requires us to develop an understanding of how artefacts are used across the population' (Eckardt 2005: 143). Then an explanation can be made as to 'what kinds of identities are reflected and created by these objects?' (Eckardt 2005: 143).

The maritime artefacts present on the Red Sea are representative of two different economic activities, fishing and ship maintenance or sailing. These artefacts can be subdivided into specific maritime activities, such as line fishing, net fishing, fishing traps, shore or boat based fishing, the maintenance of ships hull's, rigging and sail making (Figure 4.1). These all require the use of different materials and skills, for example maintenance of a ships sail and rig would require rope making, knot tying, splicing, sail making, horn and wood working skills. Each activity can be quite specialized (as they are today) and may be represented at specific locations across the site. Similarly fishing is diverse, including various netting, basket trapping, tidal trapping, line fishing and harpooning techniques. Techniques are specific to the marine environment and the fish, reptile

or sea mammal sought, which in turn is related to demand for specific seafood. Also installations were constructed to store seafood alive to be transported and traded at a later date. All these activities represent the most significant investment time for those that undertook them and must have been central to both their personal and collective group identity.

4.1 Ship maintenance

Mediterranean-style ships with 'shell first' hulls and brailed square sails were used in the Red Sea ports during the first three centuries AD, positively identified by the archaeological evidence (Whitewright 2007; Blue et. al. forthcoming). "The uses to which watercraft were put…have to resist far more complex forces than buildings [and] therefore…often represent the technological cutting edge of a society" (Adams 2003: 27), so complicated in fact, that "in any pre-industrial society…a boat or a ship was the largest and most complex machine produced" (Muckelroy 1978: 3). Whilst various authors have approached the potential of ships and boats as cultural indicators (Hasslof 1972; Prins 1986; Maarleveld 1995), the association between boatbuilding traditions and ethnicity has remained elusive (Westerdahl 1994; Parker 1995). As a tradition of shipbuilding the Mediterranean shell first technique (Steffy 1994; 2000; Pomey 2004) and its associated brail ring rig (Casson 1971; Whitewright 2007), were used in the Mediterranean, North Sea, Atlantic, Red Sea and Indian Ocean from the fourth century BC to the early seventh century AD (Whitewright 2008: 151). Because of this wide geographical distribution, it is impossible to associate it with a specific ethnic identity. The ship (Figure 4.1) was however seen as a distinctive indicator of a broader Greco-Roman identity by Tamil speaking Indians, who called them the 'the good vessels, masterpieces of the *Yavanas*' (this term was used to describe both Greeks and Romans, from the c. AD 150 Tamil poem the *Kauliliya Arthasastra*, Sidebotham 1986: 23; Chaper 1.3: 25). Similarly in Ptolemaic and Roman accounts in Egypt, a Nile river vessel with Greek hull and sail technology was labelled *Hellenikon*, after its Greek origins (Lewis 1983: 143), confirming the significance of constructing and maintaining watercraft in the construction and maintenance of identities, especially in a region where such technology was unusual.

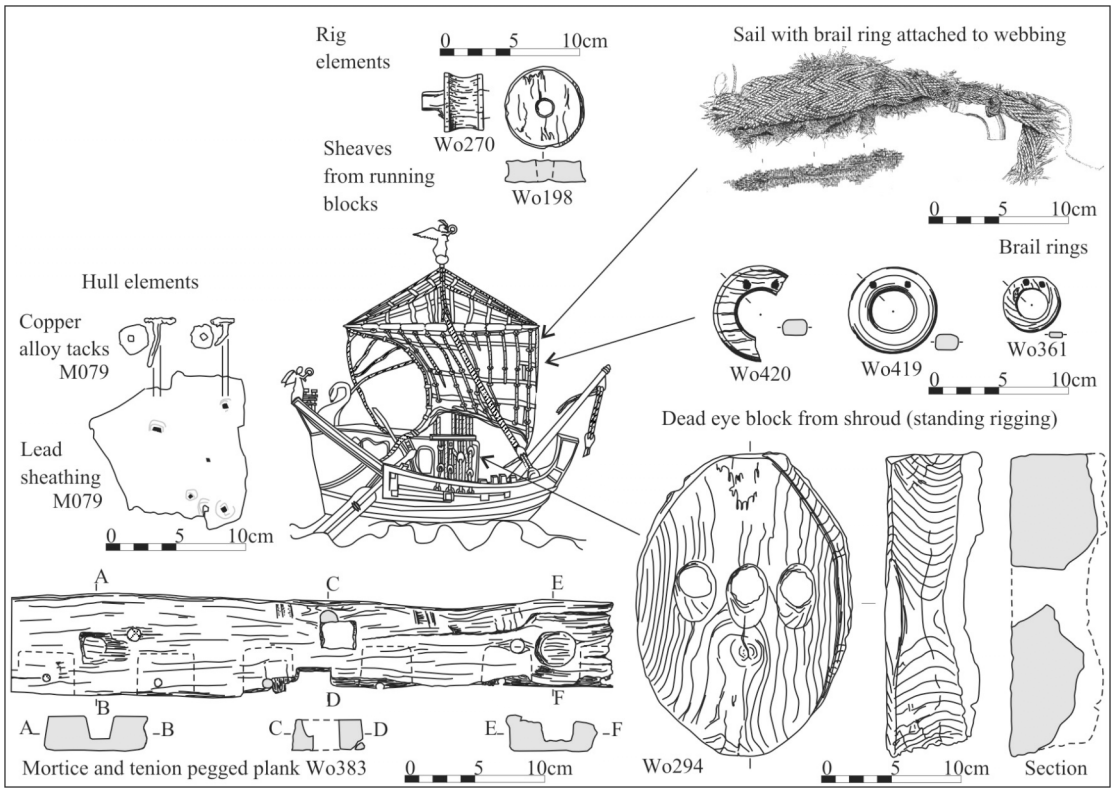


Figure 4.1 The Greco-Roman ship. Illustrates the location of distinctive technological features (after Whitewright 2007: 284, 286, forthcoming; Thomas forthcoming).

The maintenance of boats and ships at the Red Sea ports would have involved the care of a range of watercraft. Evidence for these maintenance activities on the Red Sea comes from literary, iconographic, epigraphic, faunal and archaeological sources, representing individual or multiple elements, the process of construction or the action of maintenance. For the Classical period in the Mediterranean, Casson identified in the literary sources the use of a range of watercraft classes, such as merchant sailing ships (*strongyla ploia, navis oneraria* or *corbita*, Casson 1971: 169), war galleys (*biremes, triremes* and *quadremes*), 'merchant' galleys and boats (*keles, phaselus* or *kerouros*, Casson 1971: 157). *On the Erythraean Sea* this situation is mirrored, with fourteen different craft forms represented in the texts on the Red Sea, including fishing boats or rafts, skiffs, light oared vessels, warships, small and large sailing vessels, transport ships and elephant carriers (Table 4.1). War galleys may have been based at the 'naval base' of *Myos Hormos*, certainly following *Aelius Gallus*' failed campaign (Strabo *Geography*: *1*7.1.45). The epigraphic evidence suggests that a range of everyday fishing (*O.Max* 175, *Schedia* for fishing, Bülow-Jacobsen 1998; *O.Myos* 512, *Schedia*, Van Rengen 2002), dispatch (*O.Ber II*.129, Bagnall et. al. 2005), transport and merchant vessels (*O.Ber I*.86, Bagnall et. al. 2000) would have been a far more common sight along this coast. The ancient authors also describe East African, Arabian and Indian ships and boats that were different from theirs (Table 4.1).

Translation	Original term	Location	Reference
Raft, boat	σχεδία	Nabataea, Africa, Egypt	*Periplus* 7, Strabo *Geography*: *16*.4.18, *O.Myos* 512, *O.Max* 175
Skiff, galley, tender	σκάφη*	Nabataea, Ptolemaic, Arabia, Africa	Diodorus *History*: *3*.39, 3.43, *Periplus* 3, 33, Strabo *Geography*: *16*.4.18.
Packet boat, tender	ἐφόλκιον	Egypt,	*Periplus* 33 *O.Ber* 129.
'Oared' craft	ἐπίκωπος	*Berenike*	Diodorus *History*: *3*.40.1-9,
Fast galley	φάσηλος	Roman military	Strabo *Geography*: *16*.4.23
'Long ship', galley	μακρόν πλοῖον (σκάφη*)	India, Roman military Ptolemaic military	*Periplus* 44, Strabo *Geography*: *16*.4.23 Diodorus *History*: *3*.43
Bireme Trireme Quadreme	δίκρης τριήρης, τετρήρης (σκάφη*)	Roman military Roman military Ptolemaic military	Strabo *Geography*: *16*.4.23 Strabo *Geography*: *16*.4.23 Diodorus *History*: *3*.43
Small lighter or large ship.	πλοῖον	Egypt, Arabia, Africa, India	*Periplus* 4,10,19,32,36, 37,39,56 *O.Ber* 86, Diodorus *History*: *3*.39 Strabo *Geography*: *2*.5.12
Greek ship	πλοῖον (Ἑλληνικά) πλοῖον Ἑλληνικόν	Arriving in India	*Periplus* 52
Found outside of the Red Sea			
Elephant ships	ἐλεφαντηγὸς	Ptolemaic military	Petrie II40a, Diodorus *History*: *3*.40
Transport vessels	σκευαγωγὰ	Roman military	Strabo *Geography*: *16*.4.23
Raft of bladders	σχεδία (ἀσκῶν)	Arabia	*Periplus* 27, *Pliny Natural History*: *4*.34
Sewn boat	μαδαράτε	Arabia	*Periplus* 36
Sewn boat	ράπτῶν πλοιαρίων	Africa, Arabia	*Periplus* 15, 16, 36
Dugout canoes	μονοξύλων πλοιων	Africa, India	*Periplus* 15, 60
Dugout canoe	cottonara	India	Pliny *Natural History*: 6.105
Catamaran	σάνγαρα	India	*Periplus* 60
Oared long ships	τράππαγα, κότυμβα	India	*Periplus* 44
Large vessel	κολανδιοφωντα	India	*Periplus* 60

Table 4.1 Watercraft mentioned in texts on the Red Sea and Indian Ocean. Note* marks a term used indiscriminately by classical authors as a rowed vessel from a fishing boat to a quadreme[2].

[2] In a passage by Diodorus (*History* 3.39) this has resulted in the term σκαφη/σκαφον being translated by some in the same passage to describe 'Ptolemaic warships' and 'Nabataean rafts'. This shows a clear cultural bias by some modern scholars privileging Greeks and Romans with greater technical ability than the *Nabataeans*. However, this translation may have been influenced by Strabo's (16.4.18) later version of the account that describes these vessels as σχεδια (schedia).

The maintenance of ships and the undertaking of maritime activities required a range of specialists discussed in the literature of the time for the Mediterranean world (Casson 1971: 389-98). This included navy officers (*trierarchus, gubernator, proreta, celeusta, pausarius, suboptio*), navy sailors (*velarii, subunctor, pitulus, portisculus, symphonaicus, duplicarii*), marines (*duplicarii, dolatores* as well as army ratings), navy administative staff (*beneficarius, secutor, scriba, grammateus, adiutor, librarius, exceptor*) and religious staff (*coronaries, victimarius*). Merchant operations included owners or charters (*kyrios, naukleros, nauclerus, navicularius, synnaukleroi, dominus*), a captain, skipper or shipmaster (*kybernetes, gubernator, magister navis, pistikos*), first mates (*proreus*), administrative personal (*toicharchos, perineos, diaetarius*), guards (*nauphylakes*) and sailor crew (*naustologos, chreiakoi*). The maintenance of ships was the shipmasters' responsibility, though undertaken by the first mate and shipwrights (*naupegos, faber navalis*) and caulkers (*stuppator*). Other important roles within the harbour were undertaken by ballast men (*saburrarius*), stevedors (*saccarius*), crane operators (*professionarius de ciconiis*), divers (*urinator*) and boatmen (*scapharii, lyntrarii, lenuncularii*) or fisherman (*epakter*) that may also operate as lighterman (*levamentarius*) or pilots (Casson 1971: 389-400). Literary evidence for maritime specialists on the Red Sea includes Arab skippers, crew and agents (κυβερνηταις, χρειακοις, χρωμενοι) from *Musa* (*Periplus* 16), whilst Greco-Roman sailors (Photius *Bibliotheca*: 250.83 456b-7a, 250.92 457b; Diodorus *History*: *3*.40.1-9, 3.44.4) and merchants (Diodorus *History*: *3*.18.3-6, 3.47.8-9) are also discussed.

Epigraphic evidence from the Red Sea provides us with details of the supply and outfit of ships and the custom's process (Bagnall et. al. 2000; 2005). We know letters were sent on the 'packet boat" to the 'harbour-man' (*O.Ber*. II 129). There is also an inventory of maritime equipment (*O.Ber*. II 131) that includes sail braces, pulleys, rope, mast belts and "gum". The value of the vessels and the trade they undertake is reflected in the tax charged in AD 90 for crossing the Eastern Desert, listed at the Coptos toll-house, on the crews, shipyard hands and raw materials for ship maintenance on the Red Sea.

Red Sea skipper (Lewis 1983), pilot (Meyer 1992)	8 dr.
Red Sea bowsman	10 dr.
Sailor	5 dr.
Caulker/shipyard hand	5 dr.
Artisan (Lewis 1983) skilled worker (Meyer 1992)	8 dr.
Sailors' women (Lewis 1983) or coming by boat (Meyer 1992)	20 dr.
Ships mast	4 dr.
Ships yard	1 dr.

Table 4.2 Translation of the Coptos tariff (Lewis 1983: 141; Meyer 1992: 48).

4.2 Archaeological evidence for ship building, maintenance and repairs

Archaeological evidence for hull maintenance activities comes in the form of various elements and materials discarded at different stages of the construction or repair process has been found at both *Myos Hormos* (Thomas & Whitewright 2001; Blue et. al. forthcoming) and *Berenike* (Wild & Wild 2002, 218). They are made from wood, copper, iron, pitch, lead and shell. Here they are discussed in sequence, detailing their identification, source, explanation of the activities they represent and purpose.

Preserved in both anaerobic lagoon and desiccated desert conditions, ships' planks with technical features of mortises, dowels, tenons and pitch sealant distinctive of the classic Mediterranean shell first shipbuilding style, have been found at *Berenike* and *Myos Hormos* (Vermeeren 2000a; Whitewright 2007-a; Figure 4.2). Chips and shavings of exotic species of wood have also been found in harbour contexts, association with maritime artefacts are most likely a by-product of this carpentry. The planks and chips were predominantly of Indian and East African species teak and blackwood (van der Veen forthcoming; Vermeeren 2000b). The use of Indian and African wood is not surprising, either as repairs whilst abroad or imported, as Mediterranean wood imported through Egypt would have been expensive as it was taxed in the Eastern Desert (Lewis 1983: 141; Meyer 1992: 48; *O.Krok.*41; Bülow-Jacobsen 2003: 420; Bagnall et. al. 2005; Sidebotham 2007) and locally available species were too small for most boatbuilding purposes. Also teak was renowned in Antiquity for its proof against decay (Vermeeren 2000a: 8, quoting Theophrastus). However, small pieces of local lagoon or desert species (acacia, mangrove, palm and tamarisk) and planks of Mediterranean wood (coniferous, oak and elm) were used at *Berenike* (Vermeeren 2000a: Table 2). Whilst the planks, dowels, tenons, chips and shavings represent ship building and repair, the planks themselves are most frequently found in secondary contexts, being reused as architectural elements (Thomas & Masser 2006). Similarly the planks, wood shavings and chips are most likely under-represented as they could be transported for and/or burnt as fuel. Nevertheless the artefacts still represent access to these maritime resources, rarefied by the lack of fuel and building materials available locally.

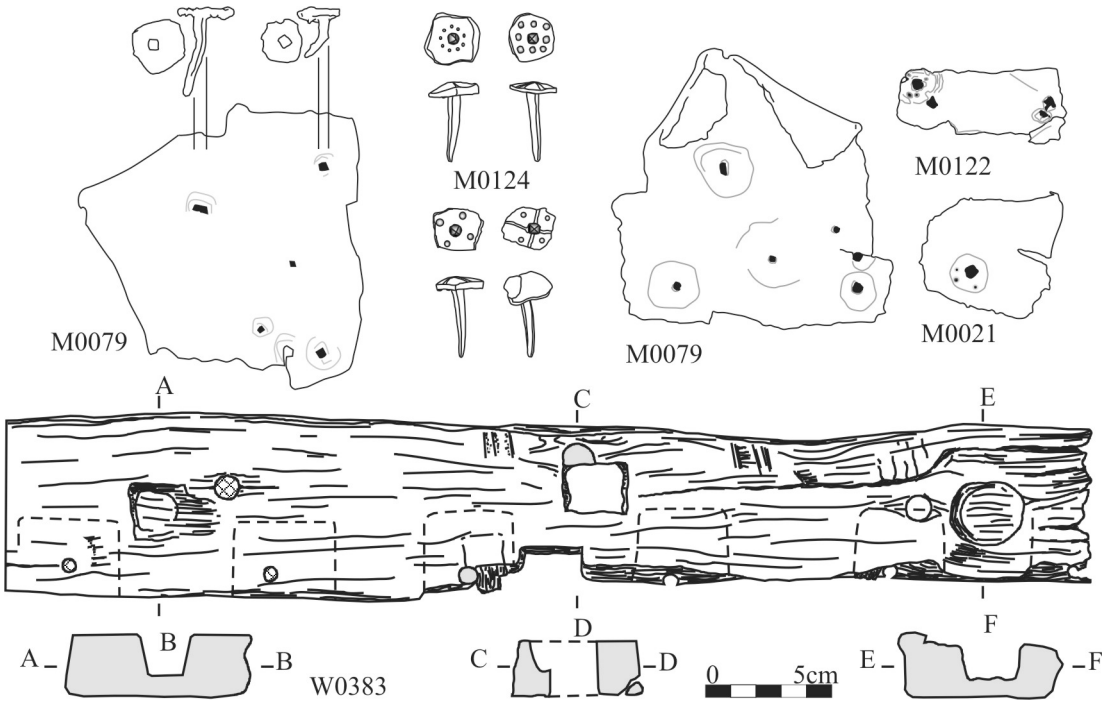


Figure 4.2 Mediterranean style plank with pegged mortise and tenon joints and hull sheathing (Whitewright 2002, forthcoming; Thomas forthcoming).

Numerous examples of pitch have been found at *Berenike* and *Myos Hormos* (Thomas & Masser 2006; Harrell 2008; Vermeeren 2000a: 5; Figure 4.3). Although not exclusively used as a ships sealant (also used for waterproofing for containers, as an adhesive, paint, fuel or medicine, Harrell 2008: 168), it can be clearly identified as such when found on, or in association with planks (Vermeeren 2000a: 5) or barnacles removed in the antifouling process (see below, Thomas forthcoming-a). This was a sealant made from pine resin/pitch or bitumen that could be mixed with hardening agents, fibre or material and/or wax (Hocker 1995: 199) as well as pigments (Collombini et. al. 2003: 659). The presence of hearth installations on the harbour at *Myos Hormos* (Blue 2006b: 15; Thomas 2006b: 14; Whittaker 2006: 10; Whittaker et. al. 2006) may have been used to melt this pitch. Pine pitch could not be produced locally, a papyrus letter suggests it was imported via Egypt as 'gum' used for 'outfitting a ship' (Bagnall et. al. 2005: 45-7), whilst Dead Sea bitumen imported from Nabataea was identified at *Berenike* (Harrell 2008: 169). Although some hard woods, such as teak were resistant to decay, pitch was often applied to the outside, to protect from borers, leaking joints and fouling and on the inside to protect from rot caused by bilge water (Parker 1992: 199; Hocker 1995: 199). Pitch can be found in boats of the classical period in the Mediterranean (Parker 1992; Meiggs 1982: 467).

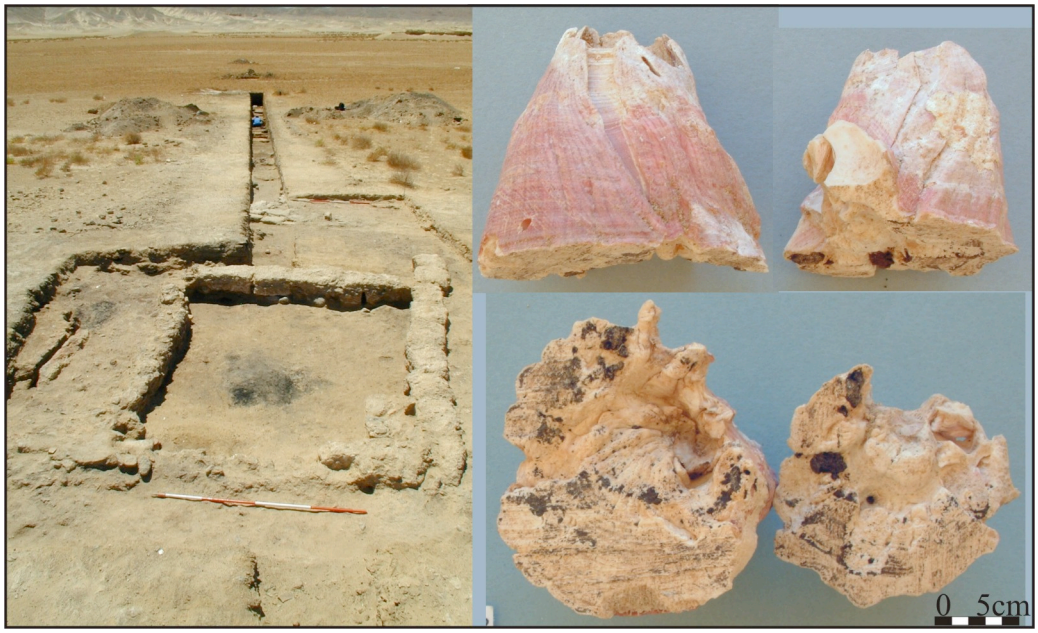


Figure 4.3 Pitch covered barnacles and metal working installations (Peacock and Blue 2007; Quseir finds archive).

Across *Berenike* and *Myos Hormos* fragments of lead sheeting and copper 'sheathing tacks' were often found together (Blue & Peacock 2006: 67-94; Hense 2007; Sidebotham 2008; Thomas forthcoming). Lead sheeting has also been found at *Aila*, though its function has not been determined (Parker pers. comm.). The sheathing tacks have a c. 20mm diameter head with grips and a square in section shaft c. 30mm long. The lead sheeting is c. 2mm thick, often with impressions from the head and square holes left by the shank of the sheathing tacks. Some of these were found near a forge at *Myos Hormos* (Whittaker 2006; Whittaker et. al. 2006). Lead and copper ores exist in the Eastern Desert (El-Kholy & Selim 1968; Hassan & Hassan 1981; Shortland 2006) and were mined from the second millennium BC, but do not appear to have been smelted into its metal form (Shortland 2006) and large copper mines were present in the Sinai and at Timna near Aqaba. Isotope analysis of this sheathing and tacks if undertaken in the future, should answer these questions. Although lead may have been cheap in Antiquity (Hocker 1995: 199-200) the processing or importation of this heavy material in the Eastern Desert region represents a significant investment of resources. Hull sheathing was applied as large lead sheets 1-2mm thick, laid over the pitch and textile sealant, fixed by copper sheathing tacks in a characteristic 'quincunx' pattern (Hocker 1995: 197). It is attested on the hulls of some Mediterranean wrecks of the fifth century BC to third century AD (Parker 1992: 199[3]). No complete sheets have been found, instead the fragments or spare rolls and tacks represent storage for recycling or repair patches (Thomas & Masser 2006; Rosen & Galili 2007: 2). Hull sheathing was used as a preventative measure or repair work (Parker 1992: 199; Hocker 1995: 198-200; Kahanov 1999). It could prevent ware or fouling

[3] Material cost (Parker 1992: 199), labour costs (Hocker 1995: 202), or its replaced with driven or clamp seamed caulking, imported from northern Europe (Hocker 1995: 202) have all been suggested as possible explainations for its abandonment. At *Myos Hormos* a putative caulking wedge was found in trench 6B (Figure 4.3 W0078).

(the growth of barnacles and seaweed) of the pitch sealant, against marine borers such as the mollusc Teredo Navalis (Parker 1992; Hocker 1995; Steinmayer & MacIntosh Turfa 1996) and reducing sagging of the hull. It could repair joints and seams, or patch areas of damage or rot, prolonging the life of a seriously deteriorated hull (Kyrenia Hocker 1995: 197).

Acorn barnacles with pitch and wood impressions were found at *Myos Hormos* (Thomas forthcoming). They had been removed from waterproofed (but not sheathed) planks. Barnacles and seaweed (fouling) can grow on the hull of watercraft over the course of a season reducing speed by up to 40% after just 6 months of growth (Hamilton-Dyer pers. comm.) and weaken the hull. This is why the tedious manual job of removing these barnacles (antifouling) was important.

Ballast stones found at *Aila*, *Berenike* and *Myos Hormos*, were found to originate in Yemen, from basalt outcrops known at Aden and Kana (Peacock et. al. 2007). These represent the necessity of loading ballast that has no purpose other than to balance the ship when carrying the very light cargos (incense and spices) that were traded for the heavy Egypt exports (wine amphorae). This is well illustrated by the first century AD Fury Shoal wreck that was outbound with Italian wine amphorae, but also carried traces of basalt ballast from a previous inbound trip from Yemen. The importance and skill involved in correctly ballasting a ship is illustrated by the presence of a specific label for ballast men (*saburrarius*, Casson 1971: 399).

Archaeological evidence for sail rig maintenance was also very well represented at *Berenike* and *Myos Hormos* (Thomas & Whitewright 2001; Whitewright 2007b; Blue et. al. forthcoming; Wild & Wild 2002: 218; Handley forthcoming). Some scaps of rope, sail and brail rings were stored for subsequent use, though most were worn or broken examples damaged through use or during construction. Rigging is made up of the sails, cordage and spars, each of which can be subdivided into components made from textile, cordage, wood, horn and shell. Here each artefact is discussed individually, detailing their identification, source, explanation of the activities they represent and purpose.

Cordage was found across *Berenike* and *Myos Hormos*, made from a range of fibres and constructed in a number of ways that may represent rigging. Rigging can be divided into 'standing' (fixed, supports the mast and spars) and 'running' (moving, manipulates the sail). Unfortunately this rope was often re-used and is yet to be positively identified as exclusively maritime in function at *Berenike* or *Myos Hormos*. However, wooden blocks used in both the running and standing rigging were discovered. A deadeye block, used to spread the attachment of the shroud fixing the mast to the hull (standing rig) was found at *Myos Hormos*. At both *Berenike* and *Myos Hormos*, sheaves from running blocks used to change the direction of running rigging (downhauls, halyards, sheets, brail lines or toppinglifts) were found. The cordage could not have been made from locally available raw materials, flax bast could have been brought over from Egypt or further afield. The wooden blocks were imported, with East African blackwood, Indian teak represented (van der Veen in Whitewright et. al. forthcoming).

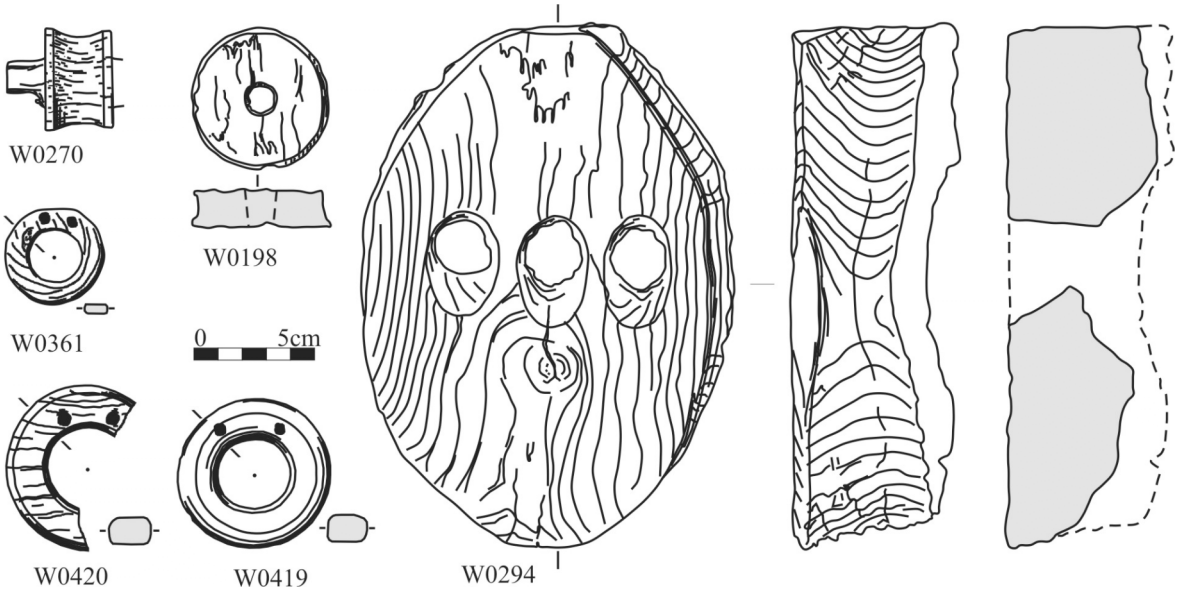


Figure 4.4. Rig elements. Sail, brail ring, sheaves and deadeye. (Whitewright 2002: 284, 286, forthcoming).

Sails are identifiable from their construction with webbing (reinforced strips) and evidence of the attachment of brail rings (Wild & Wild 2002-a, 2002-b; Handley forthcoming). Wooden, horn or lead brail rings are often found in isolation. They are fairleads attached to the sail to guide the brail lines that control the sail. Cotton was used for the sails, whilst flax and cotton were used for the webbing reinforcement strips (Wild & Wild 2002b). The construction of the textile suggests that the sails were made from imported Indian textile (Wild & Wild 2002a). The rings were made from East African blackwood, Indian teak, or locally available horn. Both the cordage and sail elements of the rig show clear evidence of the maintenance of the rig at *Berenike* and *Myos Hormos*. This was undertaken using materials brought over from the Nile, possibly from further afield than Egypt, but also with materials from India and East Africa. Presumably some of these artefacts were created in India and East Africa, representing maintenance or even original construction of the vessels abroad (Blue et. al. forthcoming)

In conclusion, the presence of these maritime artefacts shows that sailing ships were being built to a high standard utilising all the techniques well known in the Mediterranean region. It appears that a Mediterranean shipbuilding tradition was preferred to indigenous sewn or dugout traditions used on the Erythraean Sea (Table 4.1). It is likely that a range of watercraft are represented by the material identified, but the techniques used and the investment in the hull sheathing suggests that much of this evidence comes from reasonably sized merchant vessels. The materials used were often from far a field and represent construction or maintenance in India and/or East Africa.

4.3 Fishing

Fishing is now understood to have been a major industry in some areas of the Mediterranean (Bekker-Nielsen 2002; 2004b: 84; Trakadas 2004; Ayodeji 2004; Wilson 2006). 'Primitivist' perspectives on fishing during the Roman period have been conclusively countered by Bekker-Nielsen and others (see contributions in Bekker-Nielsen 2004a). Whilst the humble fisherman (Casson 1971: 392; *piscator, piscicapus*, ἁλιεύς, ἰχθυοθηπάς, ἰχθυεθηρητήρ, ἰχθυβολας, ἰχθυβολέυς, θάλαττουργός, Ayodeji 2004: 64) was generally perceived in Roman society as low in status, indeed some were slaves. However, high demand for fresh fish and fish products distributed by fish mongers motivated fishermen to organise into associations and subsequently became affluent (ibid.). Fishing was undertaken on different scales, including recreational, subsistence and various scales of commercial ventures. Such ventures were undertaken from the shore, or in fishing boats (*epactron*, or more general terms such as *lembus, lenunculus, horia, cydarum/kydaron, rataria, Schedia*, Casson: 162, 330). Some had specially constructed fish tanks (*navis vivaria*, σκάφοσ, ἐχετλιον, Ayodeji 2004: 64).

The combination of literary (Table 4.3) and iconographic data used in Bekker-Nielsen's study of Greek fishing terminology from the *Halieutika* of Oppian, identify what fishing gears and techniques were used in Antiquity (Bekker-Nielsen 2002). Nets in Antiquity were described as λινόν (made of flax), δικτυόν/rete (webbed) or κύρτος/nassa (wheel). A number of different nets were used, that involved different strategies and different target species. Active net fishing techniques included casting nets, used to catch fish from above, whilst a range of draw or drag nets and seines were used to catch them from below. Passive (unmanned) techniques were undertaken with ground nets (like gill nets), creels or basket traps set on the sea floor. These techniques undertaken aboard small fishing vessels are depicted on mosaics from Tunisia (Figure 4.5). It depicts the use of fishing lines, a drag net (γρῖφος, right hand side), creels (σφαιρῶν, left hand side) and what is most probably a casting net (ἀμφίβληστρον, on the bottom). This illustrates the importance of small boats in the ancient fishing economy.

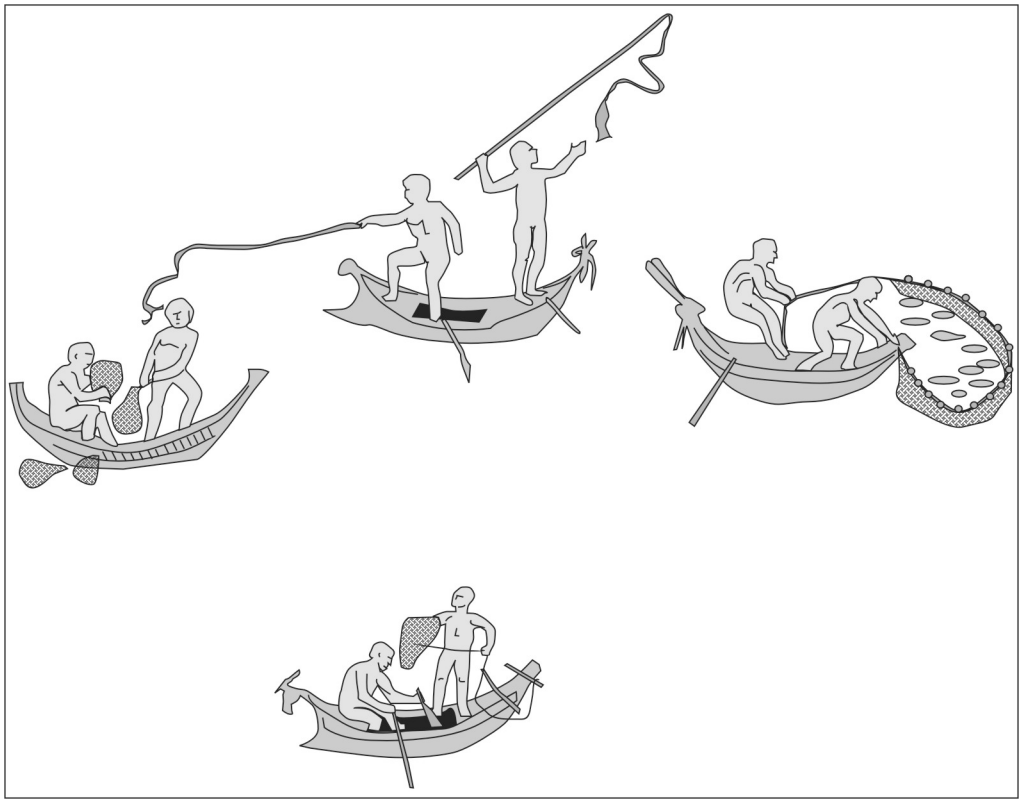


Figure 4.5 Fishing techniques displayed on Tunis mosaic (after Sousse museum mosaic 46).

Greek term	English term	Function	Material
κάλυμμα	Cover net, or veil net	Fine net for small fish	λίνόν (flax)
ἀμφίβληστρον	Casting-net	Circular, cast from above	λίνόν (flax)
γρῖφος	Draw-net	Category of nets	λίνόν (flax)
(γρῖφος) γάγγαμον	Drag-net	Small net drawn through water	λίνόν (flax)
(γρῖφος) ὑποχὴ περιηγὴς	Round bag-net	Medium net? Or a scoop net on a pole	λίνόν (flax)
(γρῖφος) σαγήνη	Seine	Large net drawn to shore	λίνόν (flax)
σκολιὸς πάναγρος	Crooked trawl	Large drag net	λίνόν (flax)
πέζα	Ground-net	Passive trap	λίνόν (flax)
σφαιρῶν	Ball-net, or creel	Passive trap	λίνόν (flax)
κύρτος	Basket trap	Passive trap	Wickerwork

Table 4.3 Mediterranean fishing techniques (Bekker-Nielsen 2004b).

The Mediterranean Roman model of fish demand cannot be assumed for all of North Africa. In Nubia fish appear to have been a taboo foodstuff (Welsby 1999). Classical literary accounts of indigenous Red Sea population describe their fishing methods as quite different from that in the Mediterranean (Table 4.3). Indigenous Erythraean Sea fishing techniques were described as being based on basket traps (*Periplus*: 15), permanent fish traps, fish ponds, shellfish collection (Agatharchides *On the Erythraean Sea*: 5.32), beach seins (used by the South Arabian *Ichthyophagi* discussed by Arian quoting Nearchus: 393) or from oared boats (Diodorus *History*:

III.9). The most vivid description is of stone tidal traps built across channels and inter-tidal pools (Agatharchides *On the Erythraean Sea*: 5.32-6).

> 'The homes of the aforementioned peoples are located along rocky shores, which have deep depressions, irregular ravines, narrow channels and curving inlets. Where these exist suitable to their need, they place rough boulders in the depressions so as to form several narrow passageways. Then when the tide is borne in to the land from the sea, which happens twice each day…, the sea covers the whole rocky shore, It also brings with its surge from the straits many fish which remain near shore browsing in the sheltered recesses for food. But when the ebb tide occurs again, the water flows back through the stones and passageways to the depths that attract it, but the fish that remain behind in the hollows are easy prey and food for the *Ichthyophagi*. The other fish…are easily subdued, but when *bearded scorpion fish, moray eels, dogfish, seals* and all creatures of this sort fall into the trap, the enterprise becomes dangerous' (Agatharchides *On the Erythraean Sea*: 5.32-3, the fish species were corrected from the translation). Diodorus elaborates, informing us that stone and horn weapons were used to subdue these animals (Diodorus *Library of History*: 3.15.5-7).

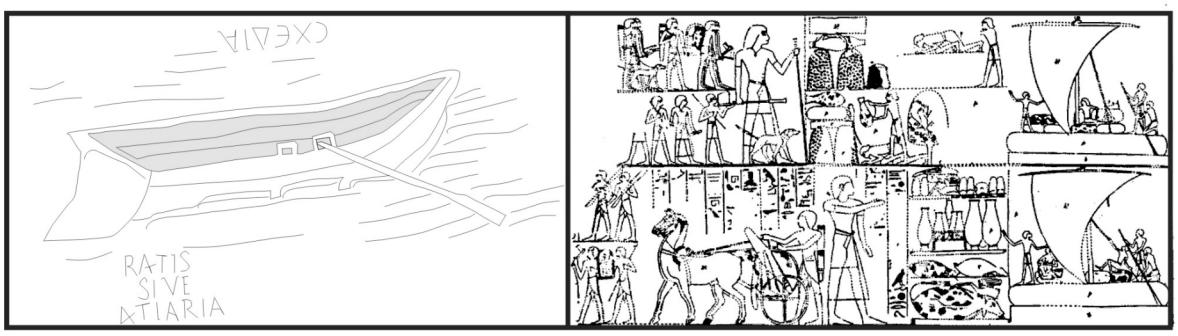


Figure 4.6. Iconographic representations of small boats. Line drawing of a third century AD cχεδία (σχεδία) present on the 'Althibarus mosaic' of the Bardo Museum, Tunis. Boats arriving in Egypt from *Punt*, modern Eritrea (Theban tomb 143, after Kitchen 1993: 599).

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Small oared craft are described as taking an abundance of fish in the region south of *Berenike* (επικωποις, Diodorus *Library of History*: 3.40.1-9). A boat called *Schedia*, often translated as a raft, was most frequently used in the ancient literature (Casson 1989: *Periplus* 7; Strabo *Geography*: 16.4.16-18), or the epigraphy (Van Rengen 2002: *O.Myos* 512; Bülow-Jacobsen et. al. 1994: *O.Max* 175) of this region. Iconographic evidence from the third century AD Althibarus mosaic (Figure 4.6) depicts a small, flat-bottomed rowed boat, is an illustration of a North African *Schedia*. The only depictions we have of indigenous Red Sea watercraft date back to c.1430/1420 BC, where the flat-bottomed boats are depicted with triangular sails (Figure 4.6). There is however, with the exception of an oar from *Berenike* (Vermeeren 2000a; 2000b), an absence of these vessels in the archaeological record. This is not surprising as only two fishing boats have been published from the early Roman period (Parker 1992: 25-6), one from Galilee, Israel (first century AD), the other from Fiumicino, Italy (second century AD, Boetto 2006).

4.4. Archaeological evidence for fishing

Archaeological evidence comes in the form of numerous artefacts (Thomas forthcoming-a; Thomas & Masser 2006; Van Rengen & Thomas 2006), fragments of fishing gear that allow us to reconstruct the methods used. Installations also provide information on how the catch was preserved for subsequent consumption or trade. The fish remains provide information on the environments fished and ethnographic parallels allow us to determine what fishing methods may have been used to catch specific fish species. Epigraphic evidence includes orders for fish and fish preserves and permits for individual's fishing boats, informing us about supply, preservation and demand for fish. Archaeological, archaeofaunal as well as epigraphic evidence then provides us with evidence of the fishing equipment and methods used to catch specific target species in certain environments, how they were preserved, marketed, purchased and by whom.

Floats were made from wood or reused cork amphora stoppers (Figure 4.7). Both types had centrally drilled holes. These may have come from fishing lines or nets. Weights were made from stone, coral, shell, lead or ceramic. These were attached to the line in a number of ways, by a drilled hole, a pecked groove round the outside or even a carefully tied net (Figure 4.7). Identifying fishing methods from the weights used is difficult. It is likely that the larger coral weights may have been used for traps or passive net techniques. Stone and coral weights could be used for lines, but have also been found on Abu Sha'ar nets (Wendrich & Van Neer 1994). Reused lead hull sheathing were rolled into the same form as modern casting net weights (Figure 4.9) and those found on Mediterranean wrecks Dor and Yassi Ada (Dor and Yassi Ada Kuniholm 1982; Galili et. al. 2002). Folded round lead weights with pierced holes resemble line sinks. Ceramic tubular weights would also operate well as net weights as they would roll and not catch or tangle within the net (Figure 4.9).

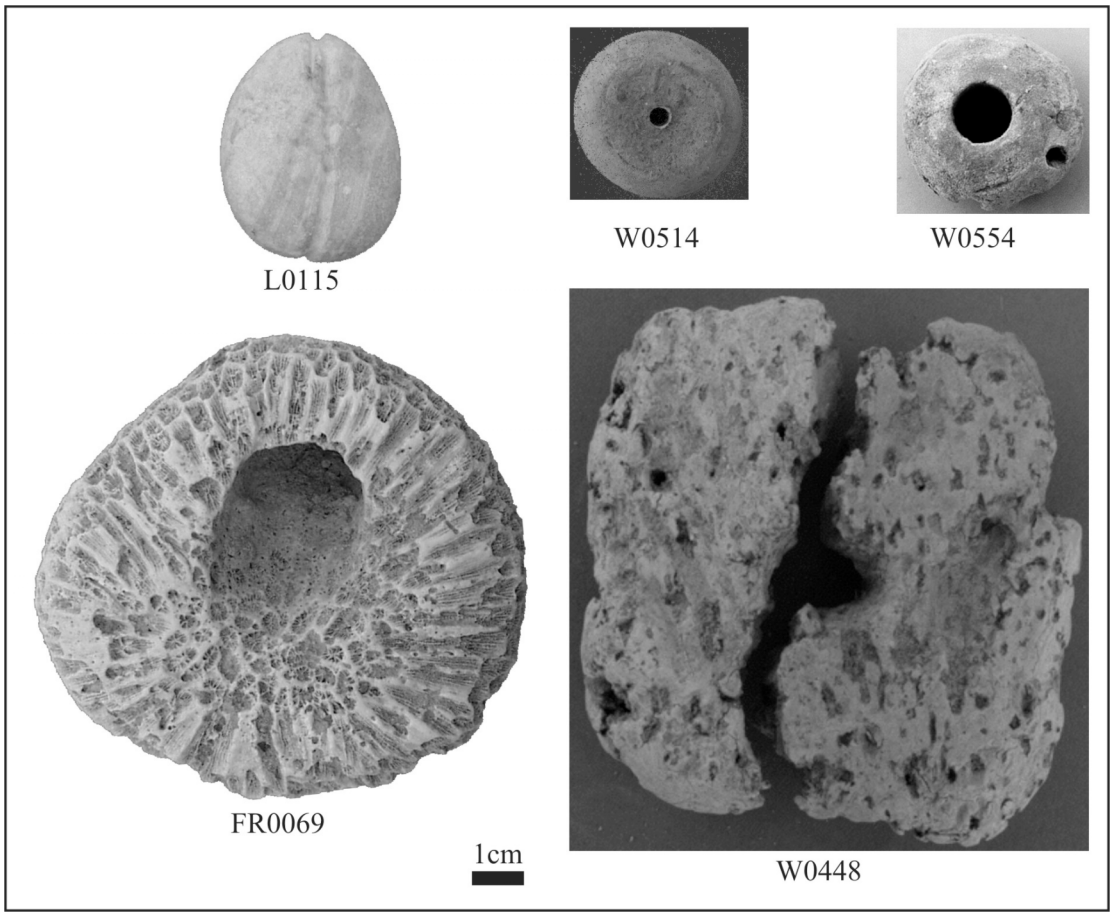


Figure 4.7 Fishing floats and weights from *Myos Hormos* (Quseir finds archive).

Fishing net fragments were found in the desiccated deposits of *Myos Hormos* (27 examples, Thomas forthcoming-a; forthcoming-b; Handley forthcoming), *Berenike* (Veldemeijer 2004; 2005b; a; 2006) and Abu Sha'ar (Wendrich & Van Neer 1994). They were constructed from bast fibre, usually flax (Veldemeijer 2004; 2005b; a; 2006), tied with mesh knots. Although flax seeds (linseed) were found at *Berenike*, flax fibres could not have been produced locally due to the quantity of fresh water required for processing (Cappers 2006: 97). Instead, the flax must have been imported as fibre, cordage or as completed nets from the nearest source, Egypt. Nets up to 740 mm long were found (Thomas forthcoming-a), though many were made into sandals (MH03CB0304). The nets from *Berenike* and *Myos Hormos* came in two sizes, a pattern also recognised at Abu Sha'ar (Wendrich & Van Neer 1994: 184). The mesh size is the widest distance when a net is pulled apart (or the total of the four sides divided by two). Fine-meshed nets were found with string diameter of c.1mm and mesh spacing averaging 24mm. These are 'veil nets' (κάλυμμα), fine casting nets used by wading inshore, or from a boat, for catching small species of fish such as sardines (Figure 4.8). More common are coarser nets with string diameters of c.3.8mm and mesh spacing averaging 70mm (Figure 4.8). These would have been used to target larger fish species and may have been used for a number of techniques, such as drag or trawl nets. Beach seine are unlikely to have been used in the constricted reef environment of the Red Sea ports, because they require shallowly sloping long beaches.

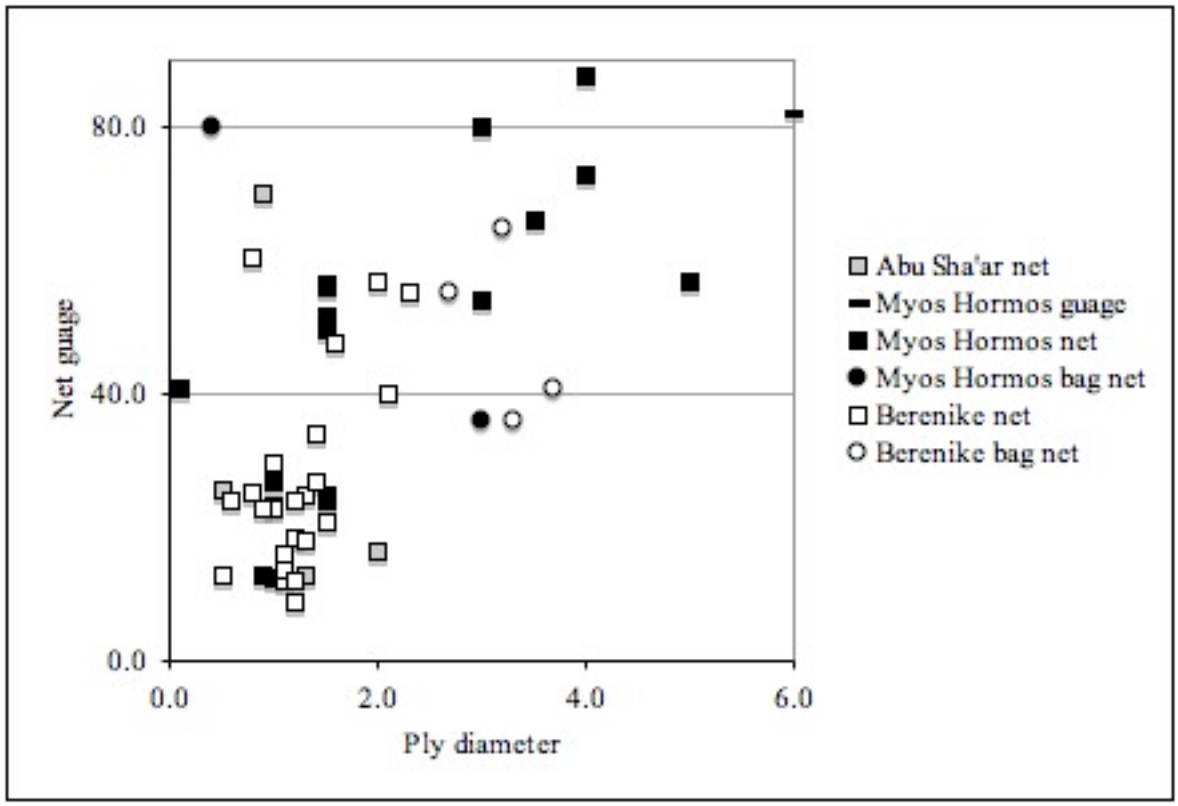


Figure 4.8 Fishing net mesh and cord sizes from Abu Sha'ar, *Berenike* and *Myos Hormos* (Wendrich & Van Neer 1994; Veldemeijer 2004; Thomas forthcoming and Handley forthcoming). Note two groups, those with a small ply diameter and <40mm net guage and those with larger ply and net guage.

Evidence of net making at the Red Sea ports comes in the form of polished rectangles of turtle bone found at *Myos Hormos* (Figure 4.9), called 'mesh measures'. Also known as a 'mesh spreader', 'mesh stick', 'mesh tool', 'net paddle', 'net spacer' and 'paddle', there is a strong argument that these tools were used to maintain the desired mesh size of nets during their construction (Frazier 2005: 364). At *Myos Hormos*, the short side of these were found to be the same size as large mesh nets (Figure 4.8).

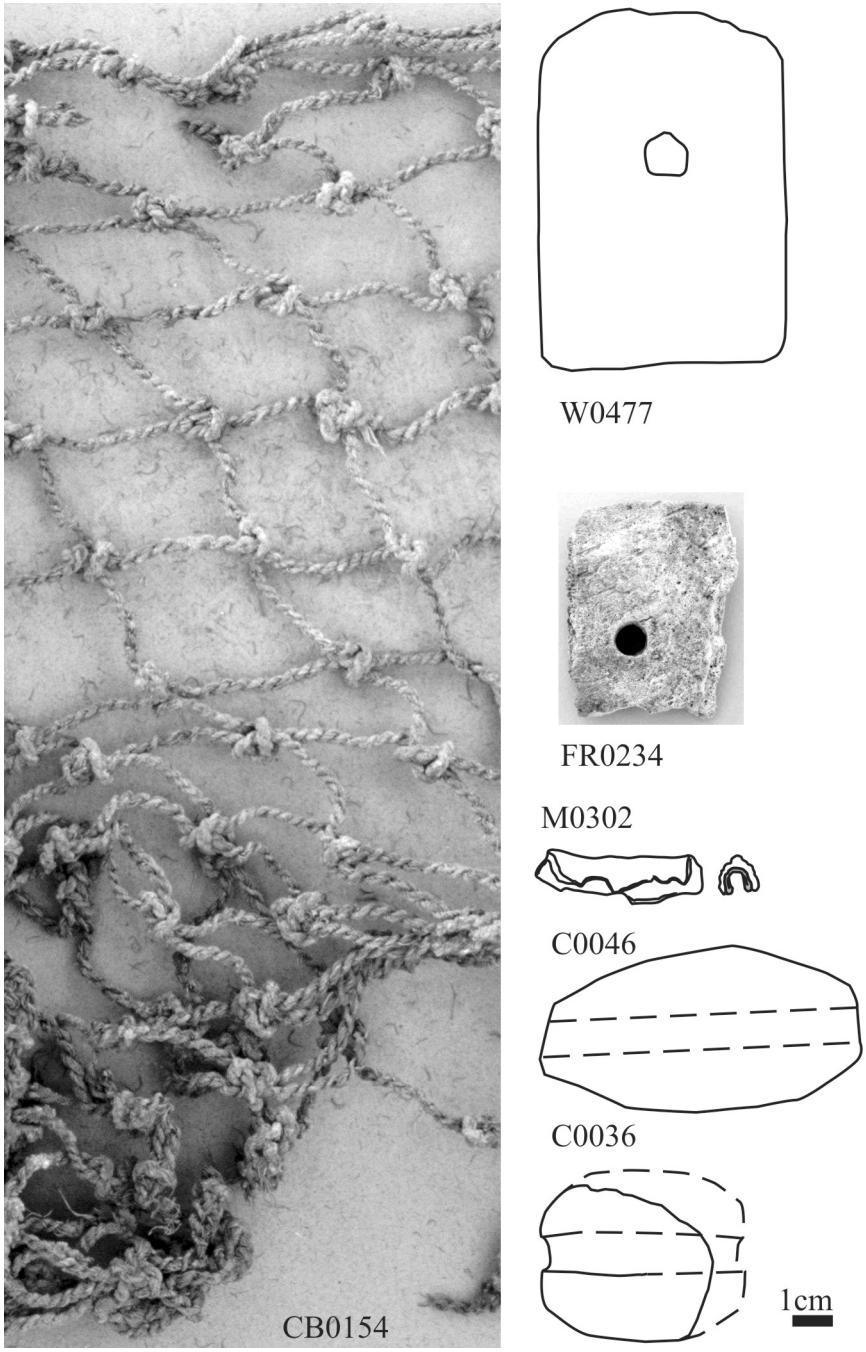


Figure 4.9 Fishing nets, weights, floats and 'mesh measure' MH03FR0234 made from turtle bone (after Quseir finds archive).

Net bags were also found at *Berenike* (Veldemeijer 2004; 2005b; a; 2006) and *Myos Hormos* (Thomas forthcoming-a; forthcoming-b; Handley forthcoming). These were made from grass, palm or bast fibre tied with reef and half knots. Veldemeijer has persuasively argued that similar finds found at *Berenike* were not used for fishing, because the materials and knots were not suitable, as they would absorb water, become heavy, be damaged easily and be difficult to repair (Veldemeijer & Van Rode 2004). However, better materials would have had to be imported (see above). Also the weight and strength of a passive net trap would not have been such important features as they are with constantly manipulated active nets. Finally, these finds were usually associated with evidence of fishing activity (Thomas 2007; forthcoming-a). These may then be tentatively identified as

fishing bag or ball nets (Σφαιρων CB0143, Figure 4.10). Iconographic evidence provides some clues as to how these may have been used (Figure 4.5). They could have been baited and set up as a trap, trailed behind boats or even used to keep fish alive (without losing them) whilst aboard boats (Bekker-Nielsen 2005b).

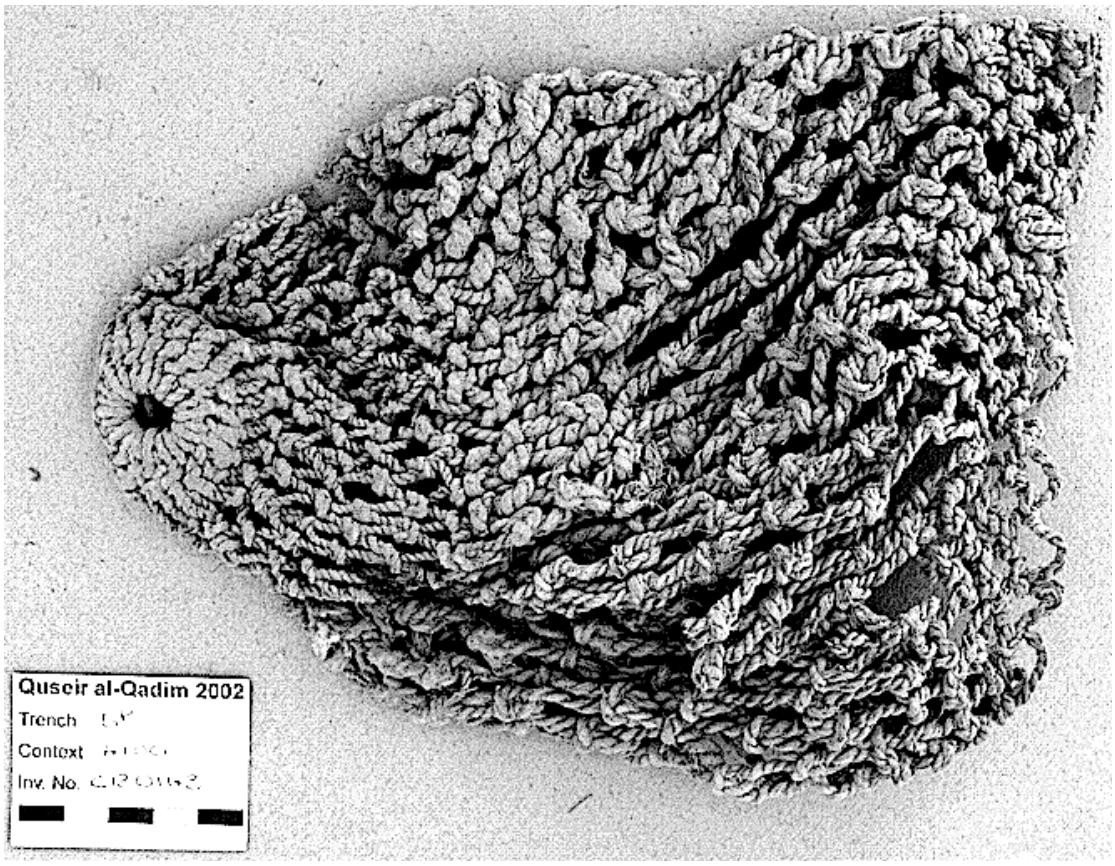


Figure 4.10 Net bag, putatively used as a creel (σφαιρäν, Quseir finds archive).

Basket traps were another passive form of fishing used on the Red Sea. Two fragments of fish trap were found at Abu Sha'ar, both made from rush, but with different construction techniques (spiral 'twinned' and conical 'four systems', Wendrich & Van Neer 1994). Fragments of basketry constructed from wood, grass and cordage at *Myos Hormos* cannot be conclusively identified as basket traps. Basket traps have traditionally been made from woven palm fibre, attached by cordage to a float to mark their position at 4-12m depth (Beech 2004). They are baited and mainly catch reef fish.

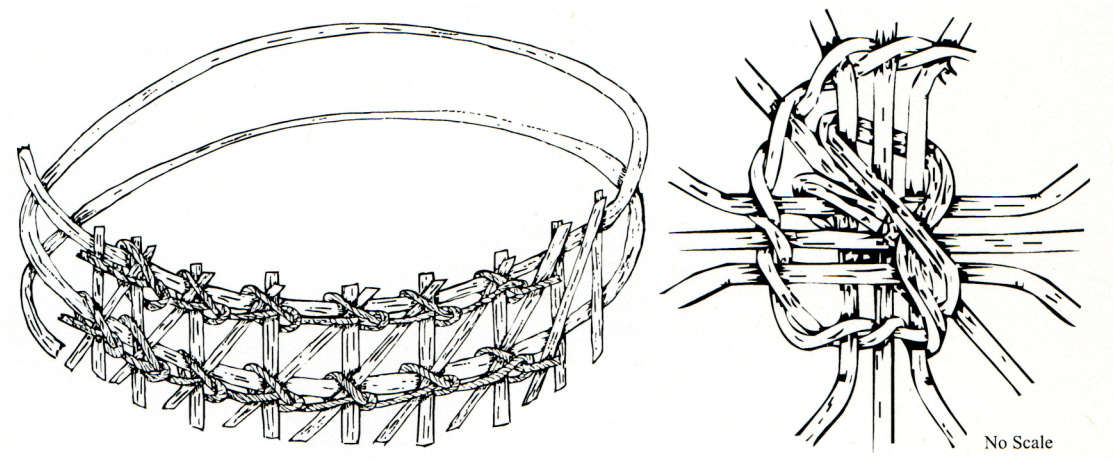


Figure 4.11 Fishing basket traps from Abu Sah'ar (Wendrich & Van Neer 1994: figures 7 and 9).

Permanent stone built tidal traps such as those described by Agatharchides (*On the Erythraean Sea*: 32) have been identified along the Egyptian Red Sea coast between *Berenike* and *Myos Hormos* at Qulan. There the technique is remembered, though no longer used by the Ababda nomads (Tony Rouphael pers. comm.) and they are as yet undated. They are like Spanish coralles and Late Islamic fish traps in the Persian gulf (Beech 2004), but constructed from coral creating ponds in which to trap fish, when the tide retreats (Figure 4.12). At *Myos Hormos* a Late Augustan to second century AD stone-lined pond four meters across was built into the manmade harbour surface that may also have operated as a fish trap (Figure 6.10, trench 7A Peacock & Blue 2006: 71) if open to the sea at high tide (Bradford 2000: 44; Bradford 2001). An alternative method was to dig traps into the foreshore at *Myos Hormos* creating ponds at low tide (trench 10 and 14, Whittaker 2006: 84-7). Similar pits have also been found in *Berenike* dating to the Ptolemaic period (Sidebotham & Wendrich 2008). However, it is possible that the stone-lined pond and dug pits were not traps, but instead ponds to keep fish and shellfish alive (Agatharchides *On the Erythraean Sea*: 35; Strabo *Geography*: 16.4.13; Diodorus *Library of History*: 3.16.4-7), or for another purpose unrelated to fishing. There is no evidence of transportable or semi permanent fish tidal traps (made of netting, palm and mangrove) used to this day in Quseir and areas of the Persian Gulf to catch parrotfish in the shallows of reefs (Hamilton-Dyer pers. comm.; Beech 2004). However, they are unlikely to have left any archaeologically identifiable traces. The purpose of these various forms of tidal traps is to catch a range of reef and sandy bottom fish and turtle and mammal species as they come in to feed at high tide.



Figure 4.12 Permanent fish trap at Ras Qulun (Photo supplied by Tony Rouphel)

Line fishing is well attested at Red Sea port sites, with hooks found at *Aila* (Parker), *Berenike* (Hense 2007), Abu Sha'ar and *Myos Hormos* (Thomas forthcoming-a). They were also found at Eastern Desert sites such as *Mons Claudianus*, presumably embedded in fish traded there (Maxfield 2001: 416). Whilst fishing hooks can be made from shell, bone or metal, only common copper alloy and rare iron hooks have thus far been identified, as well as wooden gorges (see below). Fishing hooks appear to have come in two main forms, either small copper alloy hooks 10mm by 20mm long, or larger 30mm by >50mm long iron hooks (Figure 4.14). Both forms came in both barbed and non-barbed forms, presumably depending upon the preference of the user. Barbed hooks retain fish on the line more securely, but take longer to unhook. Also barbed hooks foul more easily that could waste valuable time if fishing over a particularly prolific shoal of fish when this mishap occurs (Beech 2004: 67). Whilst copper and iron ores are available in the Eastern Desert, they do not appear to have been mined during the Roman period. The closest contemporary sources of copper were in the Sinai and near *Aila* (Parker 2006). Metal working areas in *Aila* (Parker 2006), *Berenike* (Hense 2008) and *Myos Hormos* (trench 10, Whittaker et. al. 2006) are the likely source of these hooks.

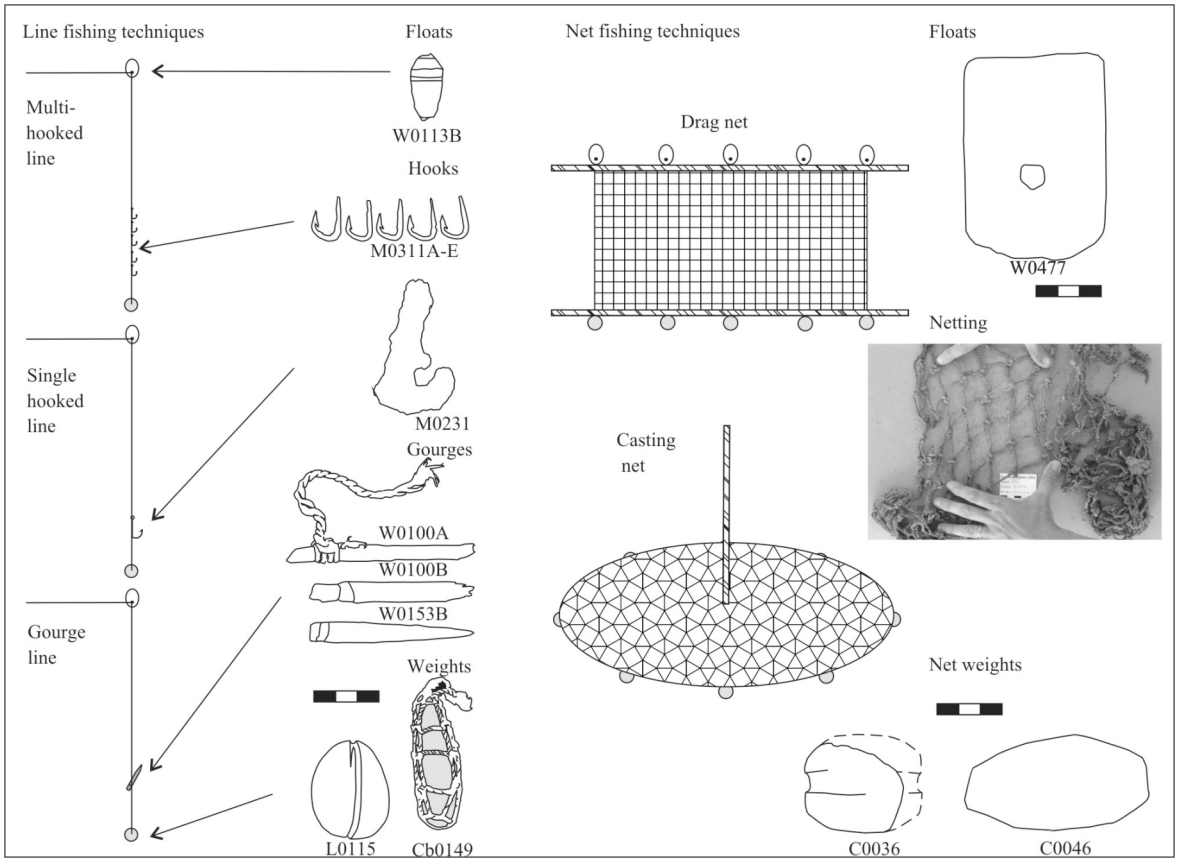


Figure 4.13 Fishing line and net techniques reconstructed from finds found at *Myos Hormos*.

The size of the hook is likely to relate to the size of fish preyed upon. Also the smaller hooks were often found in groups, even corroded together, suggesting that they were from multiple hooked lines (MH.M0311, MH.M0025, Figure 4.14) described by Oppian (*Halieutika* 3.78; 3.468ff, Bekker-Nielsen, 2004: 89-90) for catching sea bream. Sea bream were consumed at many Eastern Desert and Red Sea sites (Wendrich & Van Neer 1994; Van Neer & Lentacker 1996; Van Neer & Ervynck 1998; Van Neer & Ervynck 1999; Hamilton-Dyer 2001; 2003). The larger iron hooks were only found in isolation (Figure 4.14) and would have been baited for larger fish species.

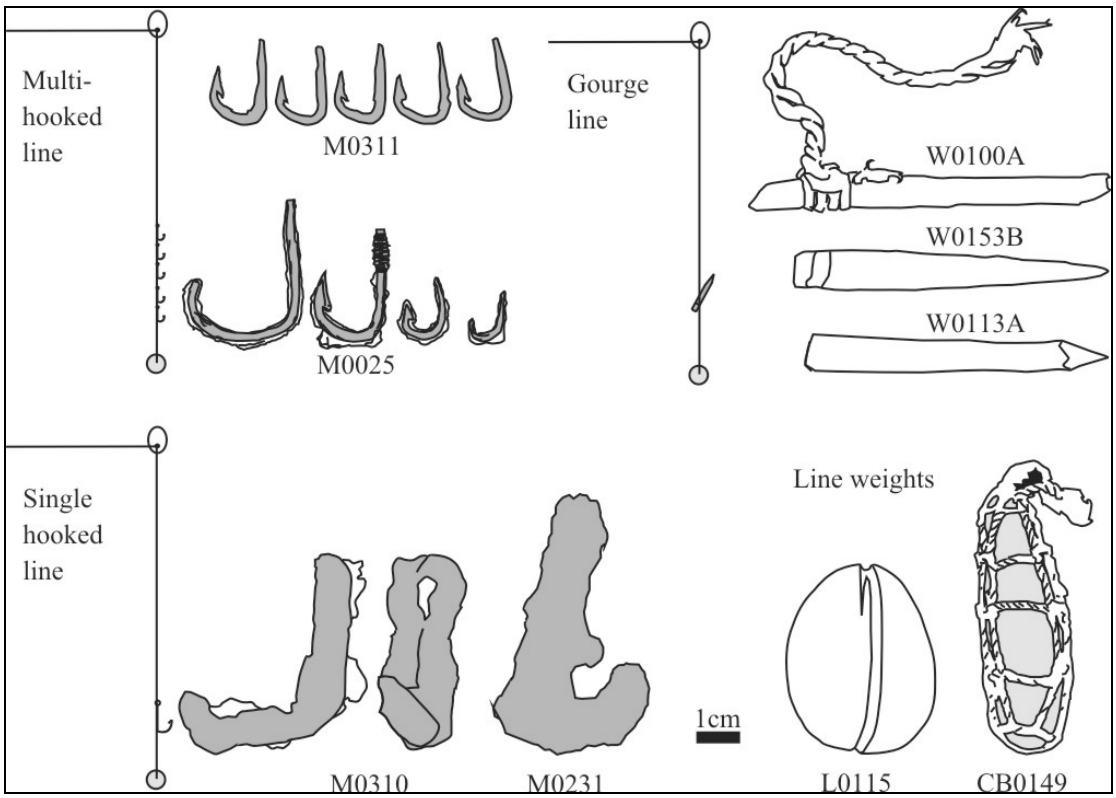


Figure 4.14 Fishing line techniques reconstructed from finds found at *Myos Hormos*.

A number of gorges have been identified at *Myos Hormos*. These examples are sticks 40-80mm long with either one or both ends sharpened and a notch cut to facilitate tying a line (figures 4.14, 4.15) mostly made from locally available wood such as tamarisk (Hiebert 1991: 155). A gorge can be made from any straight piece of shell, bone or wood attached to a line, baited and laid parallel with the line. Any fish that eats the bait is caught by making the line to go taut, causing the gorge to stick in the throat or belly (Beech 2004: 68). These are an Indian Ocean and Persian Gulf tradition, commonly found in Oman (Beech 2004: 68; Phillips pers. comm.; Charpentier et. al. 2004). This is not a technology found in the Mediterranean (Anell 1955: 72-85; Ayodeji 2004). Gorges are likely to have been used to catch larger fish and sharks and so represent the use of a specific technique to fill a specific demand (Hamilton-Dyer pers. comm.).

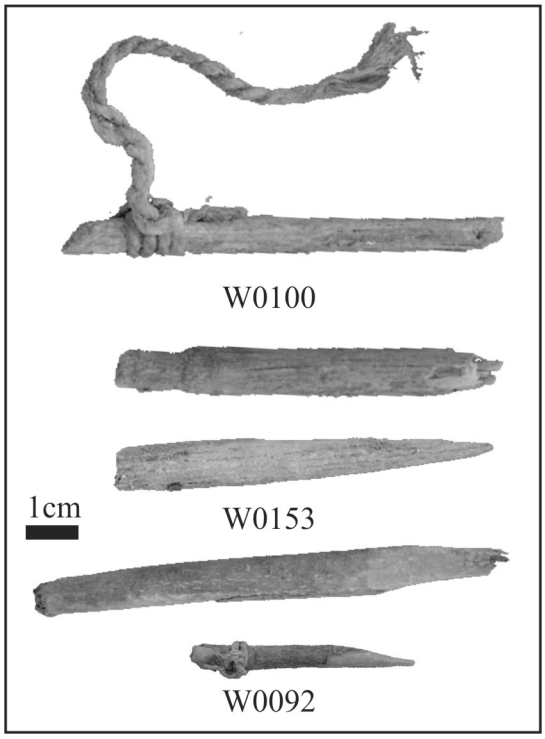


Figure 4.15 Fishing gorges from *Myos Hormos*.

4.5 Archaeofaunal evidence for fishing

There is only limited literary evidence for seafood caught in the Red Sea, with authors concentrating on the unusual such as dogfish, seals, bearded scorpion fish and moray eels (Agatharchides in Diodorus *Library of History*: *3*.15.5-7). This has been complemented by the ostraka record, with parrotfish and mullet. al.so represented (Table 4.5). However, it is the faunal remains of fish, sea mammals and turtles preserved at *Aila*, *Berenike*, *Myos Hormos* (Hamilton-Dyer 2003) and Abu Sha'ar as well as sites inland that imported fish from the Red Sea (*Mons Claudianus*, *Mons Porphyrites*, Hamilton-Dyer 2001; Hamilton-Dyer 2007) that greatly increase our knowledge of the fish targeted, the environment fished and the methods used.

The species fished are numerous, most common were parrotfish, though grouper, emperor, triggerfish, shark, sea bream, jack and trevallie, surgeon and unicorn, snapper, wrasse, goatfish and mullet were all also popular. Garpike and needlefish, squirrelfish, various perciformes taxa, moray, various gerres species, boxfish, porcupine fish, pufferfish and sardine were also found (Hamilton-Dyer 2003), though possibly not specifically targeted. Due to the species' different diets and habitats, different fishing techniques and environments were used to catch them. Near *Aila*, *Berenike* and *Myos Hormos* sandy bottom, reef and open water environments were accessible if the correct equipment, knowledge and methods were employed. For this reason the environment fished can be deduced from the fish caught (Table 4.4). Red Sea fishes preferred environments have been discussed by Van Neer in his discussion of fishing practices in *Berenike* and his terminology is used here (Van Neer & Lentacker 1996).

Common name	Tidal trap	Basket trap	Trawl net	Casting net	Hooked line	Multiple line	Trolling line	Environment
Parrotfish		B	W	W				Reef
Grouper		B			B,W	B		Reef
Emperor		B			B,H,W			Reef
Trigger				W	W			Reef
Shark					W	B		Open
Seabream	B	B	W		B,H	O		Sandy
Jacks & Trevallies	B	B	W		B,W		B	Open
Surgeon & Unicorn			W	W				Reef
Snapper	B	B	W		H			Reef
Wrasse			W		W			Reef
Goatfish				W				Sandy
Mullet	B			W,B				Sandy
Barracuda	B		W	W			B	Reef
Gar-pike & Needlefish	B			W				Open
Squirrel			W	W				Reef
Gerres	B							Sandy
Sardine				B				Reef
Rabbit	B	B		W				Reef
Grunt		B	W		B,W			Reef
Mackerel					B		B	Open
Tuna							B	Open

Table 4.4 Ethnographic data on species caught with different fishing techniques in the Red Sea and Persian Gulf (source listed in Table as W= Wendrich & Van Neer 1994; H= Hamilton-Dyer 2001; B= Beech 2004). Note O= Oppian commenting on Mediterranean fishing (Bekker-Nielsen 2005b). Environment based on Van Neer's terminology (Van Neer & Lentacker 1996).

Ethnographic studies of traditional and modern fishing techniques in the Red Sea region and the Persian Gulf have also provided useful information as to how fishing equipment relates to faunal remains in the archaeological record. From this it is clear that a mixture of line, net and trap techniques must have been used in a number of different environments (sandy, reef and open water) to catch the large range of species consumed at all Red Sea sites. Line techniques would have been used to catch both reef and open-water species such as shark, but also and would have also been effective for catching barracuda, jacks and trevallies. Net and trap techniques must have been used to catch parrotfish, as well as mullets, sardines and a range of reef species. Commonly consumed reef fish such as grouper, emperor, trigger, seabream, snapper and wrasse could have been caught with a variety of trap, net and line techniques, making them easy to aquire.

4.6 Preserving and marketing fish

Epigraphic evidence for preserving and marketing fish illustrates that a range of fish products were marketed across the Eastern Desert of Egypt (Bülow-Jacobsen 2003; Leguilloux 2003). These included shellfish and orders for specific fresh fish species to be targeted. However, fish were also salted, dried, pickled, smoked and rotted into sauces (Table 4.5). Though necessary to prevent putrification, these products were also popular for their peculiar taste (Curtis 1991; Trakadas 2005; Wilson 2006). These would have required specific installations, expertise and resources such as salt, spices and vegetables (Van Neer et. al. 2007). This complements the superb preservation of faunal remains that includes perfectly preserved and filleted parrotfish (Hamilton-Dyer 2003) as well as fish sauces (Van Neer, el al. 2007; Van Neer & Parker 2008).

English	Greek	Reference
Shellfish	βάλανος	(Bülow-Jacobsen 2003)
Unknown fish	γλαυκισκάριν	(Bülow-Jacobsen 2003)
Parrotfish	σκάρος	*O.Max.* 793, *O.Krok.* 1, *O.Krok.* 63,
Salted/dried parrotfish	τεμάκιον (σκάρος)	*O.Max.*793
Mullet	κεστρεῖς	*O.Krok.*1, *O.Krok.*63,
Rock mullet	τρίγλη	*O.Max.*707, *O.Max.*1300, *O.Max.*869
Fish (fresh)	ὀψάριν	*O.Krok.*1, *O.Krok.*63, *O.Max.*1138, *O.Max.*1463, *O.Claud.*241
Tarichos pickled in brine.	ταρίχιον	*O.Claud.*1264
Temachion salted or dried	τεμάκιον	*O.Max.*876 *O.Claud.*233
Hallex fish sauce	ἅληξ	*O.Max.*279, *O.Max.*1512
Garum fish sauce	γάρος	(Tomber 2006: 210)
Filleted and 'cooked for preserving' (smoked?)		*O.Max.*639
Little fish	ιχτηύδια	*O.Claud.*242

Table 4.5 Fish species and fish products exported by *Myos Hormos*. Sources include ostraka from *Maximianon*, *Krokodilô* and *Mons Claudianus* (Bülow-Jacobsen 2003; Leguilloux 2003; Hamilton-Dyer 2001; Tomber 2006).

The importance of the fishing, preservation and marketing is confirmed by Red Sea fish found on the Nile at Shenhour (Van Neer et. al. 2004), across the Eastern Desert and the Levant (Van Neer et. al. 2004). Red Sea fish and shellfish (and to some degree turtle and sea mammals also) were important to most peoples' diet at the Red Sea ports (Hamilton-Dyer 2001; 2007; Thomas 2007). Whilst it is possible that subsistence fishing was undertaken, it is certainly the case that commercial fishing was also taking place, confirmed by the wide distribution of Red Sea species across the Levant and Egypt as well as epigraphic evidence for orders and permits (Table 4.5). The form of this fishing involved line, passive and active net and trap techniques from all available Red Sea environments. The materials used to construct fishing gears included a mixture of local and imported resources. However, much of the imported materials, such as lead, cork and flax were probably reused from discarded ship elements (Thomas & Masser 2006). Distribution was

undertaken at *Mons Claudianus* by people the Greek speakers there labelled Arabs (Cuvigny 2003b), whilst a permit application was applied for by one *Pakubis Ichthyophagos* (Van Rengen 2002; Thomas 2007). The epigraphic record confirms then that these specialist fishermen were, in these instances, the indigenous inhabitants of the Red Sea coast known to the classical geographers as the *Arabaegypti Ichthyophagi*. (Ptolemy: 4.5.101). The maritime artefacts show us that there was a range of fishing equipment available and used by the fishermen of *Myos Hormos*, that was accessed from a variety of environments, using different techniques to fulfil the specific demands for an established market. Whilst the intensity of this industry is not quantifiable, it involved fishermen, people creating fish preserves and merchants marketing the fish to isolated desert sites. This contradicts the 'primitivist' accounts given by Greek and Roman geographers (Agatharchides *On the Erythraean Sea*: 5.32-40; Strabo *Geography*: 16.4.5-20; Pliny *Natural History*: 6.176), accepted uncritically by some academics (see critique in Bekker-Nielsen 2002; Bekker-Nielsen 2005a).

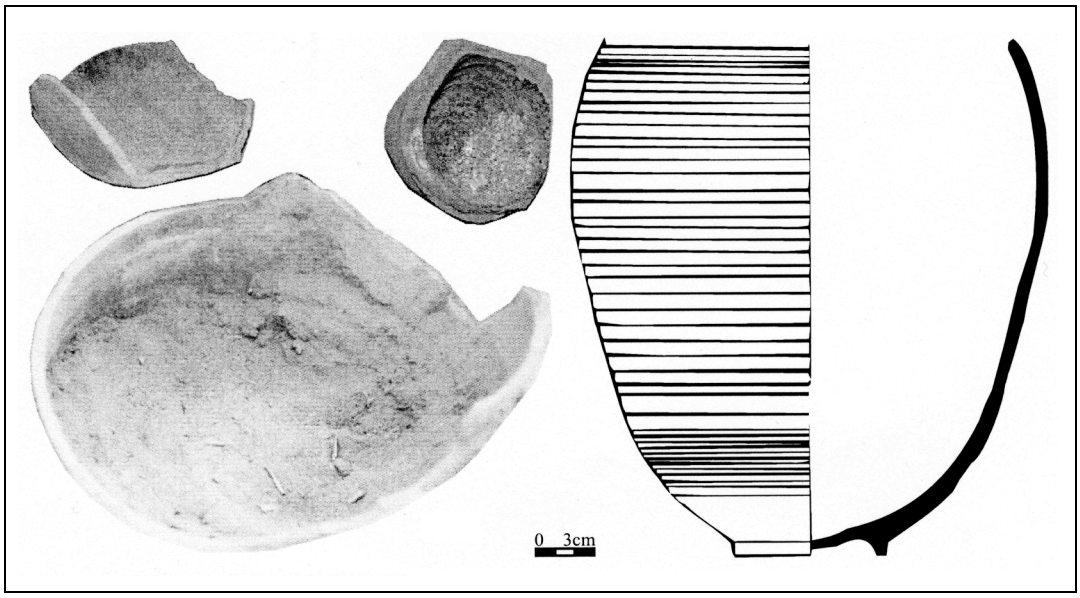


Figure 4.16 Fish sauce produced at *Aila* (Van Neer & Parker 2008: figure 3 &4) and consumed at *Mons Claudianus* (after Van Neer et. al. 2006: figure 2).

5 Consumption Practices

Anthropological and archaeological approaches to food have long been divided into two camps, materialist and culturalist approaches. Materialist approaches are highly positivist, looking at need, profit and efficiency. They stress the importance of agricultural economics and bio-ecology over culture. Culturalist approaches look at eating, cooking, food, food taboos and food production and consumption 'as crucial symbolic categories and practices in the organization and generation of cultural identity, socio-cultural relationships and symbolic patterning of experiences' (de Boeck 1994: 258). The role of environment cannot be ignored when viewing consumption patterns in past populations (Simoons 1982). Some argue that the pig was abominable to many Near and Middle Eastern cultures, because the pig was poorly suited to the hot, dry and increasingly desertified environment of Egypt, the Levant and Arabian subcontinent (Harris 1997: 71). Furthermore, Harris suggests that the 'food aversions and preferences of four major religions – Hinduism, Buddhism, Judaism and Islam- are on balance favourable to the nutritional and ecological welfare of their followers' (Harris 1997: 79). So food aversions or preferences may be environmentally influenced, but become socially imbedded in the practice of defining self and other identities. However, environment cannot explain how food is used in the distinction and display of identity, for this we have to turn to the useful insights supplied by culturalist approaches (Sahlins 1976; Falk 1994; Lupton 1996).

It is clear from various culturalist studies of food in society that food plays an important part in the construction of identity. What is or isn't perceived as edible, is not objective, it is given the meaning of edible, through various 'culturalised transformation' techniques, such as cooking, preparing, fermenting, drying, smoking etc (Falk 1994: 70). This creates 'food boundaries' between different groups of people that may be ethnically significant (Falk 1994: 75). These food boundaries are often defined through categorising culturally significant foodstuffs as taboo or delicacy to distinguish between different groups of people (Sahlins 1976: 174; Falk 1994: 83). The role of food boundaries in society is illustrated to this day today where 'dining across caste or ethnic boundaries is still a relatively delicate matter' in India (Appaduri 1988: 7). Food boundaries are not just created and changed by society, they also form the basis of a 'food based characterization of the other' (Appaduri 1988: 15), a way of separating the self from the other. In Britain, it has been argued that food boundaries are changing, where 'an analysis of the differentiations of foods, peoples and places used within culinary culture' have suggested 'a globalised, diverse and outward-looking identity is being constructed through British culinary culture' (Cook et. al. 1999: 225). So if 'Eating (and the etiquette that surrounds it) is a cultural practice that marks off the insiders from outsiders … [and] … definitions of whether something is edible or inedible are culturally contingent' (Peckham 1998: 172), how can we understand cultural constructions of food?

Cultural constructions of food can be divided into two forms; Absolute and relative. Put simply this means:

· Absolute X should/should not eat Y.

· Relative X should/should not eat Y from Z, which is determined by relationship between X and Z and totally independent of the nature of Y. (Meigs 1997: 96).

Note X and Z are individuals, Y is a specific foodstuff.

Meigs' study of the Hua illustrates the social reasons for certain relative constructions of food, for 'at the heart of the Hua understanding of food and eating is a statement of understanding about identity and the boundaries of self' (Meigs 1997: 104). Meigs goes on to say that 'in a small-scale society, moreover, food is understood to be the product of the labour of known individuals, the output of their blood, their sweat, their tears'. As output of one person and as input into another, this relative construction of 'food is a particularly apt vehicle for symbolizing and expressing ideas about the relationship of self and other' (Meigs 1997: 105).

Further insights into cultural construction of food can be learned from the artefacts used to prepare and present food. An integrated approach to the archaeology of food incorporating pottery, animal bones and plant remains studied together to learn how food was prepared and eaten (see also King 1985: 187; Meadows 1995: 138; Hawkes 2002: 45) can also be informative about their cultural identity, as food is culturally constructed. Meadows cites examples of how different rations of pig to sheep and the limited use of specific forms or extensive use of whole services of 'Samian wares' represented more or less 'Romanized' inhabitants of Britain (Okun 1989: 124; Meadows 1995: 136-7). Meadows is however careful to identify that the social and cultural differentiation represented in that integrated approach to eating and drinking produced results on 'the Romanisation of Britain (that) was unique to Britain' (Meadows 1995: 138). Similarly in France, Richardson identified a continuation of Iron Age indigenous practices in the deposition of animal remains (and ritual) that fused with Roman cultural ideals to produce a 'specifically Gallo-Roman society' (Richardson 1997: 88).

More subtle analysis of the influence of status on diet have suggested that there were significantly different constructions of what is or is not perceived to be edible depending upon one's status within society. For example, Hawkes argues that the poor of Roman Britain had a more conservative diet, that was closed to Roman influences (Hawkes 2002: 46-8). Also Serjeantson's treatment of high status diet in Late Medieval England showed the addition of small birds to the diet that would not have been considered by other classes within society (Serjeantson 2001). The problem with some models of Romanisation and the 'Romanized life style package' is that it is so often assumed and not understood with regard to how this life style was transmitted (Hawkes 2002: 47). Instead we must look at the specific context, which is always more detailed than simple Roman verses native polarizations. For example, Roman legionaries came from different parts of the Empire with different dietary preferences (because of their different cultural and status origins); the African legionaries of Legio VI in Britain had coarse ware ceramics made especially to fit with their method of food preparation (Swan 1992).

Integrating ceramic data with faunal remains requires analysis that accommodates for the subtleties of social and cultural differentiation, that identify meaning through understanding its

context. There can be no doubt that following the late Augustan switch from shiny black wares to red slip wares (*terra sigillata*), that a Roman origin in style or form was instantly recognizable in Antiquity. Perkins has argued that 'the production and trade of Italian-style red pottery can … be seen as a mechanism for both spreading and defining a 'Roman' material culture and indeed a Roman identity' (Perkins 2000: 203). However, there are a number of different contexts within which a bowl may be used and could have different meaning attached. Also a 'Roman identity' could mean different things to people during different periods, regions or in different contexts (Laurence & Berry 1998; Huskinson 2000). For example, status or ethnicity could be represented, alternatively when severed from its context it may represent a curio or piece of exotica. Nevertheless, the form of the ceramics also implies that the pottery would have been used in eating and drinking and this too was a culturally determined activity.

Augustan *terra sigillata* seems to have been used in a 'set' with a matching cup and plate forming a personal set of tableware and the vessels were presumably suited to eating Roman food in the Roman fashion' (Perkins 2000: 203). However, we cannot assume from the presence of *terra sigillata* sherds that a service of fine tableware is represented and is representative of Roman food etiquette; one specific form could be used for different functions by different people. For this reason it is necessary to understand its context; how it was used and what was eaten out of it. What was eaten can be learned from the faunal analysis reports of the domestic refuse dump contexts within which the ceramics were deposited. How the ceramics were used can be studied through analysis of the variety of forms found within these contexts, a methodology in which the act of discrepant consumption establishes the meaning of 'things' (Fincham 2002: 36). This could be done by comparing the presence, absence and relative frequency of different forms (bowls, dishes, cups, plates, closed forms, beakers) as part of a service that will illustrate how ceramics were used differently in the preparation and presentation of food. Intra-site analysis may detect differences in the forms used in certain areas that would suggest the various inhabitants of a site had different ways of eating. When compared to the faunal evidence, a clear insight into how and what the inhabitants of specific areas of the site were eating can be ascertained. These intra-site comparisons of the consumption of ceramics and faunal remains can then be compared to the evidence of different maritime activities on site (Chapter 3). This will illustrate how these maritime activities were important in the construction of identity at the Roman Red Sea ports of the Erythraean Sea.

Pottery plays a central role in the acting out of eating and drinking behaviour for those societies that use it. The role of the preparation, presentation and consumption of foodstuffs has long been understood to be important for all societies in the expression and promotion of status and difference in society (Orton et. al. 1993: 227). The immediacy (aided by their non-recyclable nature), the everyday and personal quality of ceramics makes them a valuable part of the material culture used as a language for communicating difference. What Hodder calls 'transmitting information about the producer, owner or user' (Hodder 1986: 122-4). The usefulness of pottery in understanding the construction of identity in Antiquity has been illustrated in previous studies (Barnard 2007; Swan 1992; Fincham 2002). For example, the role of pottery in domestic, ritual and burial contexts has been used to illustrate a resistance between a local Punic culture and a colonial

Roman culture in third to second century BC Sardinia (van Dommelen 1998). The relationship of ceramics with faunal assemblages within its social context, allows for the social meaning of material culture to be understood (Meadows 1995; Hawkes 2002). However, we must also be aware that there are changes represented in the archaeological record that are not indicative of ethnic identity. We must be careful to identify differences that are specifically culturally significant and not be distracted by temporal changes in the sourcing of material culture. For example, a change in the source of Roman style *terra sigillata* may represent changing market forces rather than any significant difference in its cultural significance to its owner. Also it is possible that the meaning of an artefact will change depending upon its situation and this may happen during its use-life or 'biography' (for biographical approaches to material culture see Appaduri 1986; Kopytoff 1986; Gosden & Marshall 1999). *Terra sigillata* may have been instantly recognizable as having a 'Roman' origin or signature, though not necessarily perceived as an indicator of ethnicity. It may have been used by non-Romans (through cultural contact) to emulate, to elevate status or possibly just to use because it was available, it was there. Instead distinction in use, what was used from what was available will be explored. It is quite possible that other distinct ethnic groups were buying into a 'Romanized life style package', but only in part, taking some elements but leaving others; this may well be explained by wider socio-political factors (Chapter 5).

The distribution of ceramics can be analysed statistically to see how they were used. What Fincham calls 'discrepant consumption', described as the act through which 'the meaning of things are established' (Fincham 2002: 36), by representing culturally significant differences between peoples. Fincham studied the consumption of African red slip and Tripolitanian red slip in Wadi Ghizra, by plotting the distribution of bowls, dishes and platters. He discovered that the 'core mode of pottery consumption is through the use of medium sized dishes' (Fincham 2002: 41), which represents the primary element of a red slip service in this context. Different sites during different periods showed either higher or lower levels of additional ceramic elements, a larger or smaller service, suggesting that some inhabitants used the red slip wares differently (Fincham 2002: 42). This approach will be applied to the ceramic assemblage of the Red Sea ports because differences in the tablewares forms used are expected between sites and within sites.

5.1 Diet on the Red Sea

In the paper 'Good to eat and good to think with: classifying animals from complex sites', Serjeantson discuses the relative merits of different forms of classification; anthropogenic/non anthropogenic, scientific classification, domestic/wild and food/non food (Serjeantson 2000). In this article Serjeantson argues for an approach to the faunal record that takes into account the cultural significance of the consumption of fauna. An important element of this study is the analysis of different levels of edibility, where she classifies fauna as; normally edible, edible within limits, non-edible and taboo (Serjeantson 2000). Recognising culturally significant classifications of fauna are crucial for understanding consumption patterns. For this reason the faunal assemblages from the Red Sea ports were classified by the different environments from which they were

sourced (Van Neer & Lentacker 1996; Van Neer & Ervynck 1998; Van Neer & Ervynck 1999; Hamilton-Dyer 2002; 2003) as farming, hunting, fishing and trading practices.

To quantify these results, they are counted by the number of remains per species positively identified by faunal specialists (unidentified species are not included in the analysis). The weight and the minimum number of individuals (MNI) has not been included, as the significant difference between the size of different species and the likelihood that larger species will be butchered and divided up between numerous groups make for this study any such statistical measurements misleading as to their supposed significance to dietary contribution. Instead, the percentage a species makes of the whole sample of identified bone fragments will be used as a measurement of the relative importance to the diet of the community that discarded each deposit. This has been done to produce values that are comparable between trenches of different sample sizes. These proportions will then be compared for intra and inter-site analysis, allowing comparisons to be more easily made than would be the case if absolute counts were to be compared.

Various approaches have been used in the quantification and representation of the fauna from individual Eastern Desert sites (Van Neer & Lentacker 1996; Hamilton-Dyer 2001; Leguilloux 2003), each presenting the consumption of fauna at each site in full. Fauna included sheep, goat, gazelle, ibex, cattle, pig, dog, cat, horse, donkey, camel, lizard and snake, chicken, ostrich and other wild birds, Nile catfish, various Red Sea fish and shellfish[4]. The categorization of fauna used is determined by the method of acquiring it. The methods of hunting, fishing and farming used represent different specialist skills. Knowledge of production (method and source) has cultural significance, influencing choices made when acquiring food (Appaduri 1986: 41). As the species in question are either difficult or impossible to acquire outside of their environment, the fauna are divided into broadly environmental groups (Table 4.1); Red Sea and its immediate environs, domestic or wild animals from the Eastern Desert, animals used primarily for transport and fauna originating from the Nile valley[5]. Within these broad groups there are various subgroups, indicative of dietary preferences or specific sourcing techniques that may themselves be culturally significant. The Red Sea fauna include marine fish, mammals and reptiles from sandy bottoms, reef or open water environments, representing different tastes, techniques and technology (Van Neer & Ervynck 1998; Van Neer & Ervynck 1999). The different skills and tools required specialists representing different vocations within the port communities. Fishermen used a variety of tools to catch the range of species present in different marine environments (Wendrich & Van Neer 1994; Beech 2004). The source (nomad, fisherman, farmer) and means of acquisition (hunted, farmed or fished) represent within an individual diet a culturally significant choice in who they were willing to trade with, eat with and whose diet they wanted to emulate. Fauna transported over from the Nile as food or subsequently raised at the ports, represent contact with Greco-Egyptian farmers.

[4] Shellfish have omitted from this analysis due to inconsistencies over their recording at different sites (Wattenmaker et. al. 1979; Wattenmaker 1982).

[5] Some of these species were poorly suited to the Eastern Desert and were raised in the ports with varying degrees of success. I have omitted rats, dogs and cats from the analysis as these species do not appear to have been consumed, but instead represent dead scavengers or pets (Hamilton-Dyer Pers. comm.).

Preference for Nile species such as pig and cattle represents a significant outlay of resources. However, the consumption of camel, horse and donkey are likely to represent post working life butchering (Hamilton-Dyer 2001: 299) rather than dietary preference.

Red Sea fauna	Eastern Desert fauna	Nile/domestic fauna	Transport
Reef fish	Sheep	Cattle	Donkey
Sandy bottom fish	Goat	Pig	Horse
Open water fish	Hunted gazelle or ibex	Chicken	Camel
Turtles	Reptiles	Nile fish	
Sea mammals	Wild birds		

Table 5.1 Fauna representative of different environments consumed at the Red Sea ports (Hamilton-Dyer 2002; Van Neer et. al. 1996, 1998, 1999).

Red Sea and Eastern Desert fauna were easier to acquire for the inhabitants of the Red Sea ports, as they were locally available. Red Sea fauna includes: Red Sea fish, turtles, sea mammals and sea or migratory birds. The variety of fish types caught suggests a variety of fishing techniques were undertaken by specialised fishermen. It is likely that these foodstuffs remained important in the diet of the inhabitants of all Eastern Desert populations because of they were relatively readily available. The fish caught however came from a variety of different marine environments. Van Neer grouped the Red Sea fishes into different marine environments; reef, sandy bottom and open water (pelagic) species (Van Neer & Ervynck 1998: 361).

Domesticated goats and sheep were likely to be a major part of the economy of the Eastern Desert nomadic population, much as they are today. However, the inhabitants of the ports may also have kept sheep and goats. Amongst the sebakhs of *Berenike* and *Myos Hormos*, goat/sheep accounts for the majority of domesticates found there (Wattenmaker 1982; Van Neer & Ervynck 1999; Hamilton-Dyer 2003). However, there are differences in the quantity of sheep and goat in relation to other domesticates, suggesting that different ethnic groups were represented by different diets (Sidebotham & Wendrich 1999: 452). The faunal remains from *Berenike* and *Myos Hormos* suggest that an Eastern Desert diet would rely heavily upon domesticated goat and sheep, supplemented by hunted species such as hare, dorcus gazelle, Barbary sheep and ibex which may also have been part of a prestige pastime (Van Neer 1998: 366). It is likely that a range of reptiles would have supplemented this diet as both lizards and snakes are also found amongst the faunal remains of *Berenike* (ibid.).

The presence of Nile species also suggests cultural influences on dietary choices. It is suggested that the proportion of pig remains can be seen as a marker for the degree of 'Romanisation' projected by the culinary choices of the inhabitants of the ports (Van Neer & Lentacker 1996: 350). At *Berenike* it has been argued that pigs were unlikely to have been reared in such a hot climate and were probably brought from the Nile (Van Neer & Ervynck 1998: 385), though they were reared in *Mons Claudianus* and possibly also in *Myos Hormos* (Hamilton-Dyer pers. comm.). Whether they were or were not bred at the Red Sea ports is a moot point, as they were eaten. This means somebody either had to transport them from the Nile, or raised them in

difficult circumstances (probably only possible through regular replenishment of breeding stock from the Nile), because they were determined to eat pork. Pigs were not the only species representative of Roman Egypt populations. A limited number of cattle were brought alive from the Nile (Van Neer & Ervynck 1999: 340), whilst chicken populations would have had to be maintained by regular replacements. Equine and dromedary remains probably represent consumption of transport animals (Van Neer & Ervynck 1998: 383) and are found exclusively in early Roman Deposits (ibid.). Freshwater species of catfish from the Nile were also found at *Berenike* (Van Neer & Lentacker 1996: 350) and *Mons Claudianus*. Roman tastes may also have been represented in the preparation of *garum* utilizing local Red Sea fish (Van Neer & Ervynck 1998: 352). Van Neer concludes that the high proportion of pig and the presence of Nile fish in the first two centuries AD 'may suggest the Romanized subjects (at least from the culinary point of view), both civilian and military, represented a significant and notably upper level segment of society at *Berenike* during this period, the most prosperous time in the history of the port' (Van Neer & Lentacker 1996: 354; Van Neer & Parker 2008: 1821).

In conclusion, the faunal assemblage within these deposits can be expected to vary significantly depending upon the dietary choices of the port communities. These assemblages show major differences over time. The main reason for this is the introduction of fauna from the Nile to the diet of the populations of Red Sea ports in the early Roman period (late first century BC to third century AD). From the third century AD onwards the quantity of Nile imports reduces greatly over time (Van Neer & Ervynck 1998: 384). These temporal factors certainly produced major differences over time, caused by increased or decreased cultural contact and the changing demography of the port sites. There are also significant contemporary differences within each site to be looked at. Whilst some would argue that the range of faunal exploitation is directly related to the success or decline of the ports, dietary stress cannot explain the divergent subsistence strategies of contemporary groups within *Berenike* (ibid.: 378).

Excavations at *Berenike* and *Myos Hormos* have studied faunal assemblages across the sites and have revealed different diets that are likely to have been culturally significant (Van Neer & Lentacker 1996; Van Neer & Ervynck 1998; Van Neer & Ervynck 1999). The divergent substance strategies utilized over time and in different areas of the settlements can then be used to document how different ethnic groups defined identity through the consumption of fauna. The relationship between diet and etiquette can be bridged through studying how food was eaten. One avenue for research could be comparing different diets with the associated range of ceramic forms used, or vessels made from other materials. Then a detailed intra and inter-site analysis of what the inhabitants of the Red Sea ports were eating, incorporating ceramic analysis to reconstruct how they were eating, should provide an insight into how identity was constructed through food boundaries and etiquette.

5.2 The use of tablewares in Red Sea ports

The major tablewares used in the Red Sea ports during the first three centuries AD were limited to a small number of wares: Roman red slipped *terra sigillata*, Egyptian faience ware (henceforth faience ware) and Nubian thin walled (also known as barbotine) ware. *Terra sigillata* is a highly advanced form of red slip pottery made from finely levigated clays with a high lustre illite clay slip and fired in carefully controlled conditions of 980-1260 C (Tite et. al. 1983). Developed from Hellenistic Black slip wares (Hayes 1972: 9) and emulating gold vessels (Vickers 1994), *terra sigillata* is associated with Roman culture and is found in great quantities throughout the Roman Empire, its bordering regions and as far as India (Wheeler & al. 1946; Comfort 1991). The study of *terra sigillata* is generally under exploited, with a concentration on its use in specialist typological studies as a dating tool, rather than its role within society (Willis 1997: 38). However, it is readily amenable to statistical studies, distribution and incident analysis and should be used to explore the social explanations for artefact patterning (ibid.). One crucial element is how was *terra sigillata* regarded, was it 'treated differently from other pottery types' (ibid.). To answer this question one must study it alongside other tablewares available in the Red Sea ports. The *terra sigillata* found at the Red Sea ports and in the Eastern Desert generally come from the eastern Roman Empire (at certain times) and found alongside non *terra sigillata* forms, including Egyptian tablewares (Tomber 1992: 137-42; 2006). These forms can then be studied statistically for how individual fabrics and specific forms were used, in different areas and at different times at the Red Sea ports. But first we must introduce the ceramics available to the Red Sea inhabitants.

A range of *terra sigillata* have been discovered in the Eastern Desert region, originating from Italy, Syria, Turkey, North Africa and Egypt. Italian *terra sigillata* also known as Arretine ware (in the older literature, that also includes sigillata from Gaul), was produced in Italy, first appearing in Rome during the late Republic and was used throughout the Roman world during the first centuries BC and AD. They are represented in deposits from the Augustan period to the Julio-Claudian period, much like the Campanian Dressel 2-4 amphora forms imported at this time. Eastern *terra sigillata* A was produced in northern Syria near Antioch since the second century BC (Hayes 1972: 8) and can be found in the Eastern Desert from the late first century BC, though it rapidly declined in popularity after AD 100, with a resurgence in the mid second century AD at *Berenike* and *Mons Claudianus* (Hayes 1996: 57) and *Myos Hormos* (Tomber 2000: 54). Eastern *terra sigillata* B was produced in western Turkey near Ephesus. Whilst less common than eastern sigillata A at *Berenike* and *Myos Hormos* (Hayes 1996; Tomber 1999; 2000; Tomber 2001), eastern sigillata B was found in relatively large quantities. Cypriot sigillata was first produced in the first century BC and widely transported by the beginning of the first century AD, though it was not common in the Eastern Desert. After AD 150 it rapidly declined. African red slip was identified at *Berenike* from the second century AD (Hayes 1996: 197) and at *Myos Hormos and Mons Claudianus* (Tomber 2000: 54; 2006: 24; forthcoming).

Egyptian copies of *terra sigillata* forms were quick to follow Italian production. A red slipped pottery utilizing a pink marl fabric from the environs of Aswan first appeared in the first century BC and continued into the late Roman period (Rodziewicz 1992: 103). Egyptian red slip with a brown Nile silt fabric were produced from the second century AD and continued into the late Roman period (Tomber 1992: 141). Both early Aswan and Nile red slips were not particularly significant at the Red Sea ports during the early Roman period. All these ceramics are similar in form, with ranges of vessels produced for specific functions, including platters, plates, bowls, dishes, cups, jugs and very rare colanders.

Other Egyptian tablewares were also used at the Red Sea ports and may represent an intentional decision not to use the 'Roman' associated Red slipped tablewares, possibly in favour of a Ptolemaic or Egyptian style. Faience ware has a glassy blue glazed surface that resembles faience (Nicholson & Peltenberg 2000), a traditional technology from the Ptolemaic and Pharaonic periods before Roman annexation. Imperial Roman period faience is turquoise-blue in colour, whilst earlier Ptolemaic and Pharaonic examples were darker blue. At the beginning of the Roman period the faience potteries (such as Kom Hellul, Memphis, Petrie 1909; Shortland & Tite 2005: 14) started producing rougher material with a strong thick glaze, some of which copied *terra sigillata* pottery (ibid.). Faience ware is relatively common in the Eastern Desert sites from the first to third centuries AD. 'Thin walled ware' was produced in Upper Egypt and Lower Nubia at sites such as Aswan (Hayes 1996: 162). It is recognisable for its exceptionally thin wall, possibly used to emulate glass and some examples have raised barbotine decoration often in white or cream. 'Thin walled ware' has been found at a number of Eastern Desert sites such as *Myos Hormos* (Tomber 2000), *Mons Porphyrites*, *Mons Claudianus* (Tomber 2001) and *Berenike* (Hayes 1996: 162). Both faience ware and thin walled ware come in a range of forms, including bowls, dishes, cups, plates and beakers, though they are generally more limited in range than the *terra sigillata* wares.

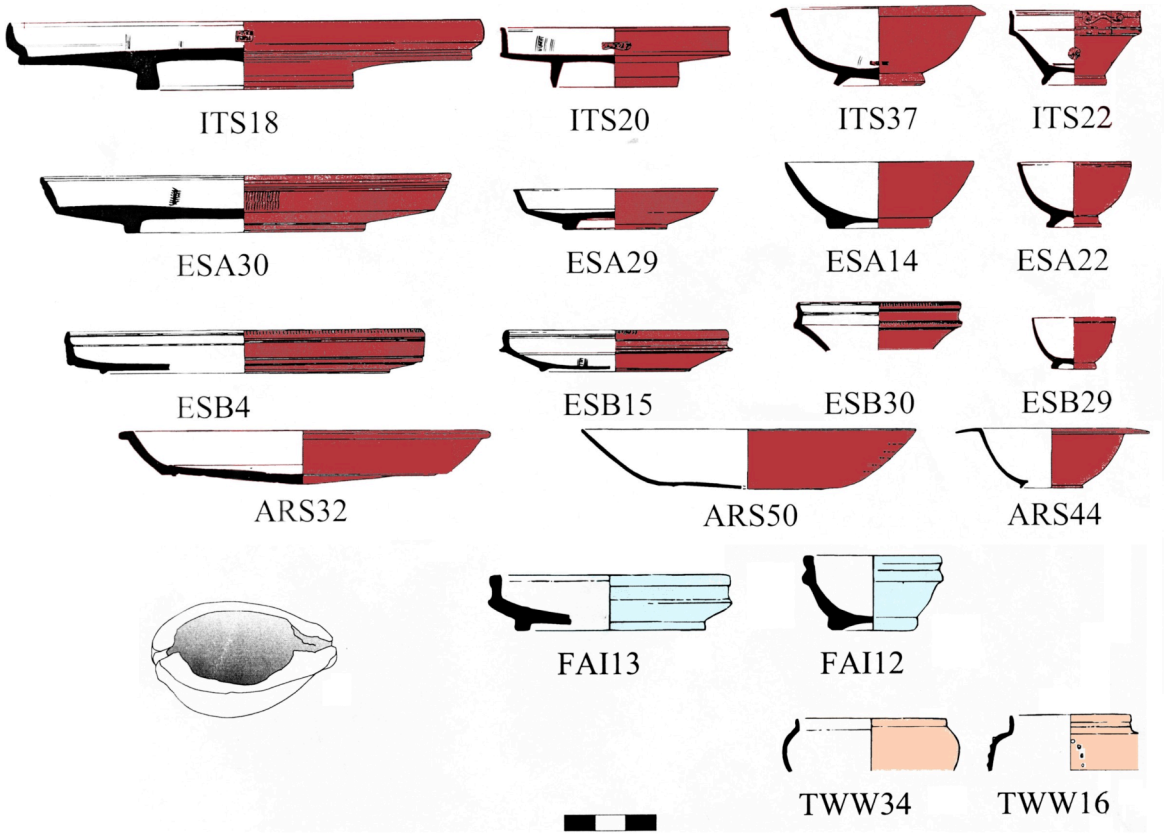


Figure 5.1 Tablewares used at the Red Sea ports. Italian *terra sigillata*, (ITS after Ettlinger 1990), African red slip, (ARS, Hayes 1972) Eastern *terra sigillata* A and B (ESA and ESB, Hayes 1985) and faience and thin walled wares (FAI and TWW, Tomber 2007).

Ceramics were not the only vessels used at the Red Sea ports. One particularly interesting group of artefacts is a range of shell bowls, dishes and scoops. Parallels from earlier archaeological sites along the Red Sea coast suggest that this is an indigenous tradition. A technology of flaked bivalve shell scrapers and knives has been reported from shell midden sites in the southern Red Sea (Phillips & Charpentier 2002; Charpentier et. al. 2004; Phillips 2004), from the second millennium BC to the Iron Age, at sites such as Khawr al-Umayrah near Aden, where they were associated with net weights, gazelle points, files, hammer stones, a wide range of spears and shell bowls and dishes. There is however a complete lack of midden sites excavated along the Yemen Red Sea coast between the fifth century BC and fifth century AD, (Phillips 2004) making any direct analogies with our Red Sea port data impossible. These shell dishes, bowls and scoops have been discovered in Roman deposits from *Myos Hormos* (Figure 3.1; Figure 5.1; Reese, H. M. S. 1982: 379-84), *Berenike* (Van Neer & Ervynck 1999: 333) and other sites in the Eastern Desert (Hamilton-Dyer 2001: 362). Their distribution across the site is significant, as the use of these tools represents a choice not to use the Egyptian and Roman forms of pottery that were abundant on the *Myos Hormos* and *Berenike* sites.

In the following chapters all tablewares from selected deposits will be subdivided into the following form categories; beakers, cups, bowls, dishes, plates and platters and an *other* category (including closed forms, colanders and jugs). Placement of ceramic forms into these categories is

determined through specific criteria (Table 5.2 below). Whilst this is not the only system used for determining form, it has the benefit of being easily applicable to the dataset in hand. This is significant because the forms found within a given context would suggest that the society that deposited it utilised a range of tableware forms, or a 'tableware service' to eat out of, rather than just using dishes or bowls. Specific forms from Italian *terra sigillata* typologies have been recognised to complement one another, and when combined constitute specific matching 'services' (Ettlinger 1990; Hayes 1997: 44 'service II'). In this study the term service is used more broadly to mean the range of basic forms required to constitute a complete service of tablewares, namely a platter or plate, cup or beaker and other closed forms that would be used alongside dishes and bowls. The difference here is that the services may not be matching (ie. all from the same source), indeed the inhabitants of the Red Sea ports may have to mix and match tablewares to create a service depending upon what was available.

Basic vessel form	Metrical criteria	Common examples from known typologies
Platter/plate	Height is less than one seventh of the diameter	ITS18, ESA30, ESB4, ARS32
Dish	Height is between one seventh and one third of diameter	ITS20, ESA29, ESB15, ARS50, FAI13
Bowl	Height is between one third and equal to diameter	ITS37, ESA14, ESB30, ARS44, FAI12, TWW34
Cup	Open vessel with the height close, or equal to the diameter	ITS22, ESA22, ESB29
Beaker	Closed vessel with the height close or greater than diameter	TWW16

Table 5.2 Metrical criteria for pottery forms. Based on Darling's guidelines for archiving Roman pottery (Webster 1969: 8-11; Darling 1994: 8). Example include common forms from the Red Sea ports of Italian *terrqa sigillata* (ITS, Ettlinger 1990), Eastern *terra sigillata* A and B (ESA and ESB, Hayes 1985), African red slip (ARS, Hayes 1972) Faience and thin walled wares (FAI and TWW, Tomber 2007).

Shell bowls and scoops will also be included to indicate their consumption in relation to this patterning. These forms will then be plotted using sherd count of each identifiable form, providing the relative proportion of each form and the diversity of tableware services within any given context.

This patterning will illustrate what forms and wares are most common and and how people are eating, which can then be used to explain differences within and between ports. The relationship between patterns of ceramic use and faunal consumption will highlight 'food boundaries' present that can then be compared to what maritime activities were undertaken by the same demographic of the Red Sea ports

6 Myos Hormos

Quseir al-Qadim is five miles north of the modern town of Quseir and has recently been confirmed as the Roman port of *Myos Hormos* (Peacock 1993; Peacock & Blue 2006). Also known as Aphrodite's harbour, *Myos Hormos* was built in the Ptolemaic period and is first mentioned by Agatharchides, writing in the second century BC. However, only limited residual evidence of Ptolemaic occupation has been found. *Myos Hormos* was a port of great importance in the early Roman period for the trade with Africa, Arabia and India. Despite the difficult journey against the prevailing northerly winds (Davies & Morgan 1995: 29), Strabo leads us to believe this port was more important than *Berenike* in the late first century BC (Bülow-Jacobsen 1998: 65). Unlike *Berenike* however, *Myos Hormos* was abandoned during the period of economic and political difficulties faced by the Roman Empire in the mid third century AD (Boardman et. al. 1992: 860).

Archaeological remains were first recorded at Quseir al-Qadim in the 1820's. John Gardner Wilkinson was the first to produce a sketch map of the site and then his contemporary James Burton visited in 1822-4. In the early 20th century, Arthur Weigall visited in 1909, followed by G.W. Murray who collected antiquities from the site in 1921 and 1930. However, it was not until 1978 that Quseir was excavated by Chicago University, who did a further two seasons. This site was erroneously identified as *Leukos Limen* and dated to the first and second centuries AD (Whitcomb & Johnson 1979; Whitcomb & Johnson 1982). The site was then excavated by Southampton University between 1999 and 2003, who positively identified it as *Myos Hormos* with the discovery of an AD 93 papyrus loan contract (Peacock & Blue 2006).

Chicago and subsequent Southampton University excavations have revealed a large settled area with associated harbour facilities and industry dating from the late first century BC to the third century AD (Peacock & Blue 2006). The combined *Myos Hormos* excavations have revealed distinct changes in the level and form of trade that passed through this port. The earliest period (late first century BC to mid first century AD) suggests a significant period of trade, with Italian and Egyptian amphorae well represented (also historically attested, Fuks 1951) and some Rhodian and Croatian examples (Tomber 2000b). A western origin for the imports is supported by the presence of cork stoppers in this period (Thomas 2001). Tablewares from Turkey, Syria and Italy were also found almost exclusively in this period (Tomber 2000b). An explosion in the level of Erythraean Sea trade is suggested by the huge rise in wine being consumed at the site in the late first century AD. Certainly the investment of effort in the consolidation and rebuild of substantial harbour defences in the late first to early second century AD suggest significant activity taking place here at this time (Peacock & Blue 2006: 175). Preliminary studies of the artefacts from *Myos Hormos* suggest that this was followed by a slight drop in trade but persisted on a reasonable level until the mid second century AD (Thomas 2001; forthcoming; see also Peacock & Blue 2006). There was significant use of the harbour facilities in most areas during the second century AD (Blue 2006a; Thomas 2006a: 94), though reduced use and subsequent abandonment of other areas at this time (Whittaker 2006; Whittaker et. al. 2006). By this point Egyptian wine clearly

dominated the market, with huge numbers of Egyptian amphorae and exclusively Egyptian stoppers found on site, suggesting that amphora contents originated in Egypt, even if the amphorae were imported (on reuse see Thomas 2001; Thomas & Tomber 2006). The late second century heralds the decline of *Myos Hormos* and its reduced role in the Erythraean Sea trade. Third century deposits are rare in *Myos Hormos* and by the mid third century the settlement had all but disappeared (Peacock & Blue 2006: 174-5), possibly linked to problems with the harbour silting up during this period (Blue 2006a: 61).

6.1 The landscape around Myos Hormos

Myos Hormos is positioned just off the Wadi Hammamat, a major route between the Red Sea and Coptos since Predynastic times. In Antiquity many fortified camps guarded this route that have recently been excavated (Cuvigny 2003a). The Wadi Hammamat was also a source of metals and minerals with gold and lead ores available at Bir Umm Fawakhir (Meyer 1995). The settlements along this route also appear to have produced vegetables that were traded across the Eastern Desert (Bülow-Jacobsen 1998; 2003). The major quarries of *Mons Porphyrites* (Maxfield and Peacock 2001) and *Mons Claudianus* (Peacock and Maxfield 1997) to the northwest of *Myos Hormos* provided exotic building stones for Rome and a market for foodstuffs from the Red Sea (Hamilton-Dyer 2007).

6.2 The cityscape of Myos Hormos

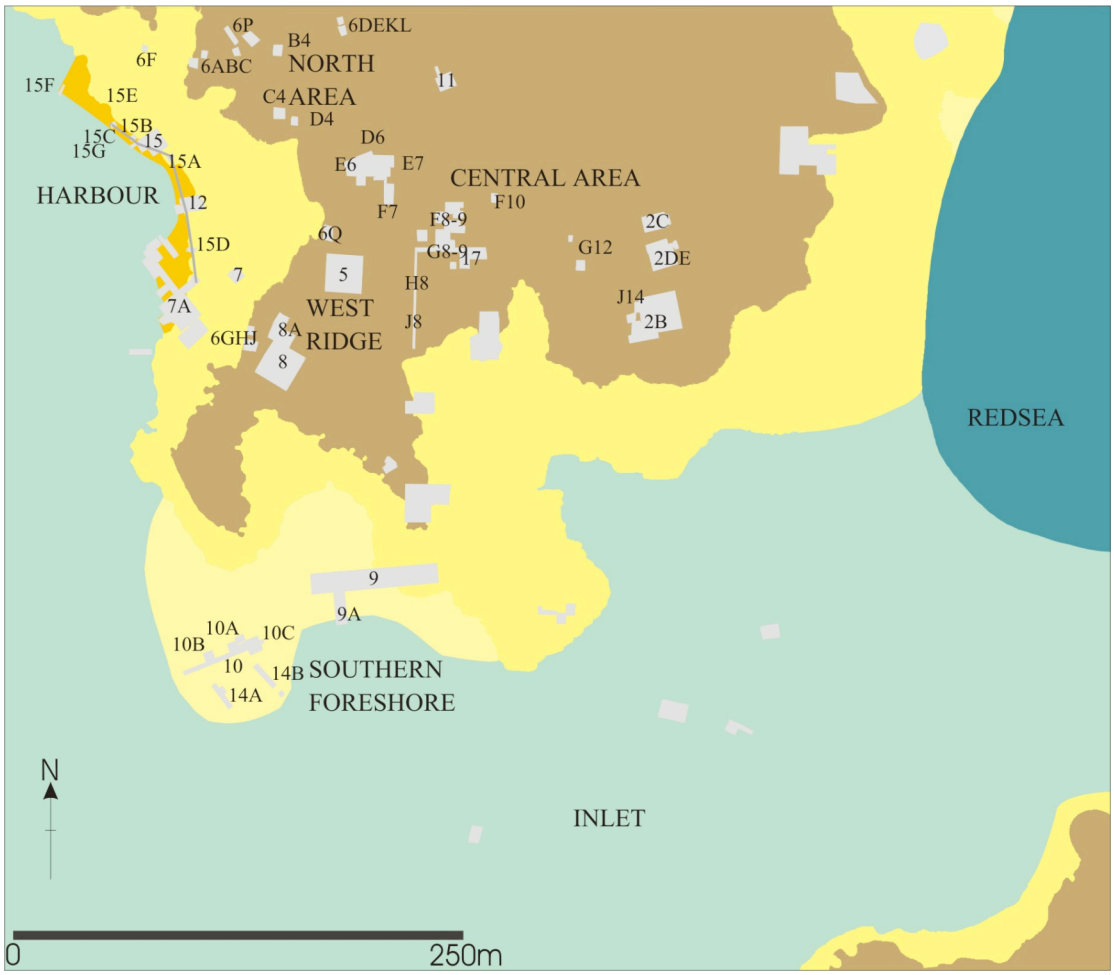


Figure 6.1 *Myos Hormos* trench and areas mentioned in the text (after Earl and Glazier 2006: 35-41; Blue 2006: 59)

Myos Hormos, is first mentioned by Agatharchides, writing in the second century BC, where the Southampton University team excavated a late first century BC to mid third century AD port settlement. *Myos Hormos* was built around an inlet from the Red Sea offering calm waters and excellent protection from the prevailing northerly winds. Specially constructed against this inlet are harbour facilities to the west. To the south a series of metal working areas, in the central area domestic structures and warehouses. The inlet (Figure 6.1) has since silted up, a process that was taking place during the Roman period (Blue 2006a).

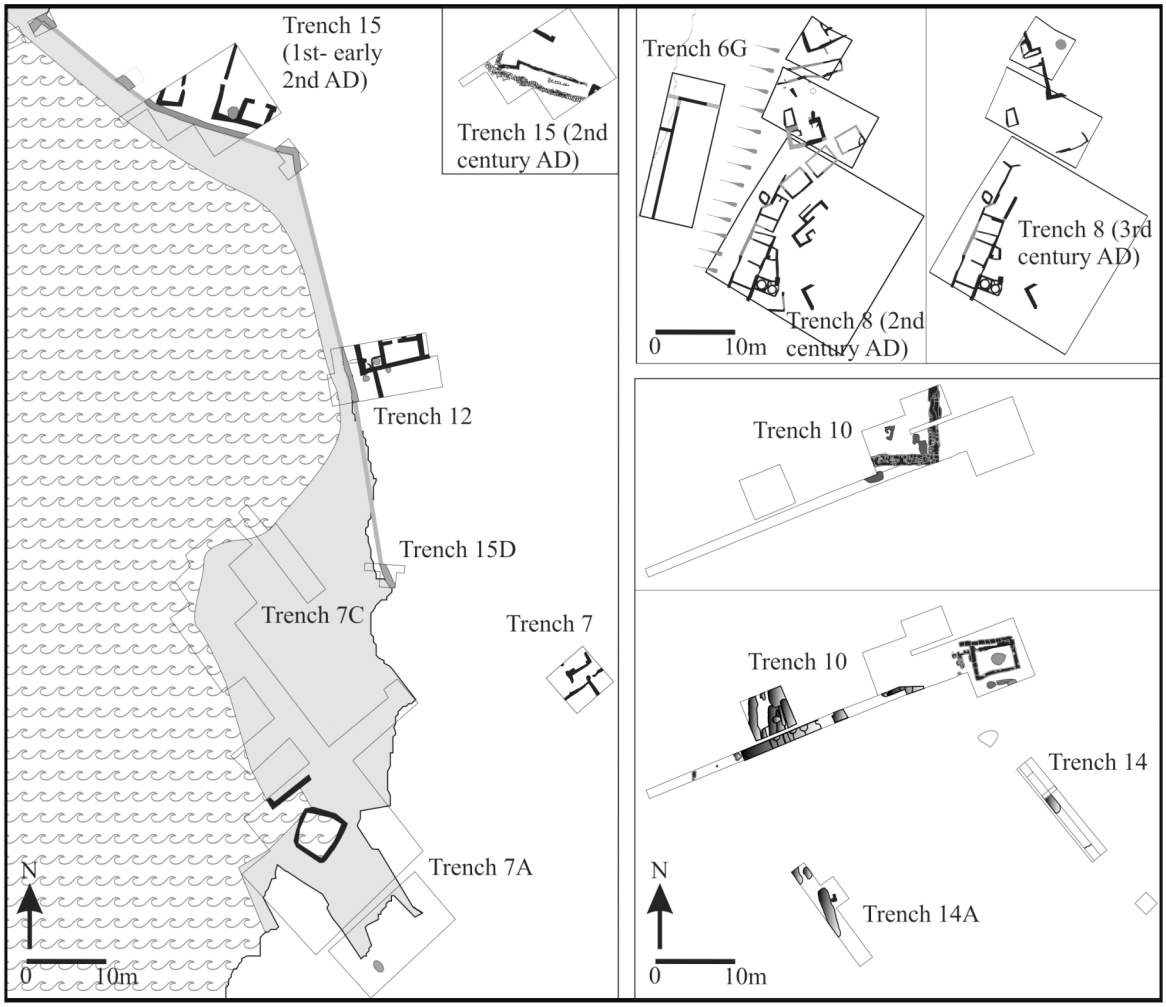


Figure 6.2 Structures from the southern and western areas of *Myos Hormos* (after Peacock & Blue 2007: figures 5.3, 5.5, 5.13, 5.14, 5.19, 5.23, 5.24, 5.28-30, 7.12). Note reclaimed land in light grey on the left and a stone sea defecnce in dark grey just back from it.

Myos Hormos is made up of two distinct geographical regions, the settlement and the harbour (Peacock & Blue 2006). This can be subdivided into a number of discrete regions based on geographical proximity and shared architectural features or function. For this reason descriptions of the trenches will be discussed within these areas:

- The central settlement, including a number of substantial two storey mudbrick structures and associated sebakh (refuse dump) dumps (Southampton trenches 2B, 2C, 2D, 2E, 11, 17 and Chicago trenches D6, E6, E7, F7 or 'Villa', F8, F9, F10, G8, G9, G12, H8, J8 or ''central building A'', J14 or ''central building B'').
- The harbour, including various harbour facilities and industrial areas or warehouses (Southampton trenches 7, 7A, 12, 15, 15A, 15B, 15C, 15D, 15E, 15F, 15G).
- The western ridge overlooking the harbour, that includes a series of poorly constructed single storey mudbrick structures with adjacent sebakh (refuse dump) dumps (Southampton trenches 5, 6G, 6H, 6J, 6Q, 8, 8A).

- The northern area of the site, which consists of a number of sebakh dumps associated with mudbrick structure (Southampton trenches 6A, 6B, 6C, 6D, 6E, 6F, 6K, 6L, 6P and Chicago trenches B4, C4, D4).
- The southern foreshore includes a number of industrial installations and surface deposits (Southampton trenches 9, 9A, 10, 10A, 10B, 10C, 14A, 14B).

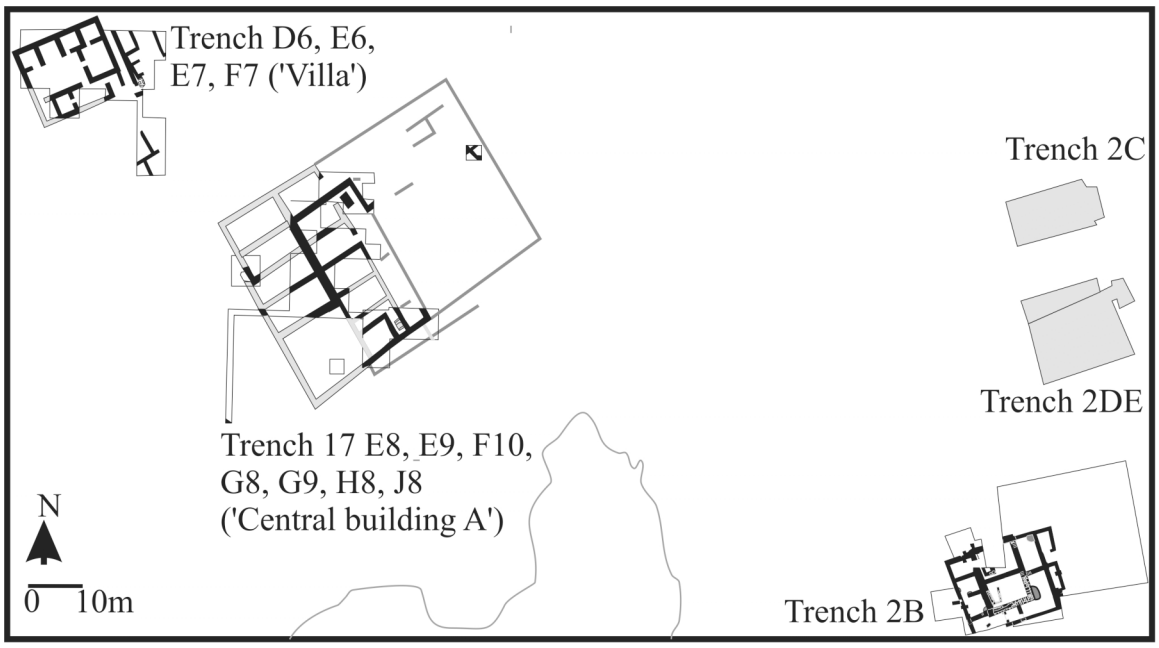


Figure 6.3 Structures from the central areas of *Myos Hormos* (after Whitcomb & Johnson 1982; Peacock & Blue 2007: figures 7.2, 7.17).

Only specific domestic occupation or refuse contexts were suitable for comparative analysis. This was based upon statistical significance of the sample and the security of the context (ie. they were not disturbed by Islanmic or moderbn activity). This was particularly limited for the faunal analysis (Hamilton-Dyer per. com).

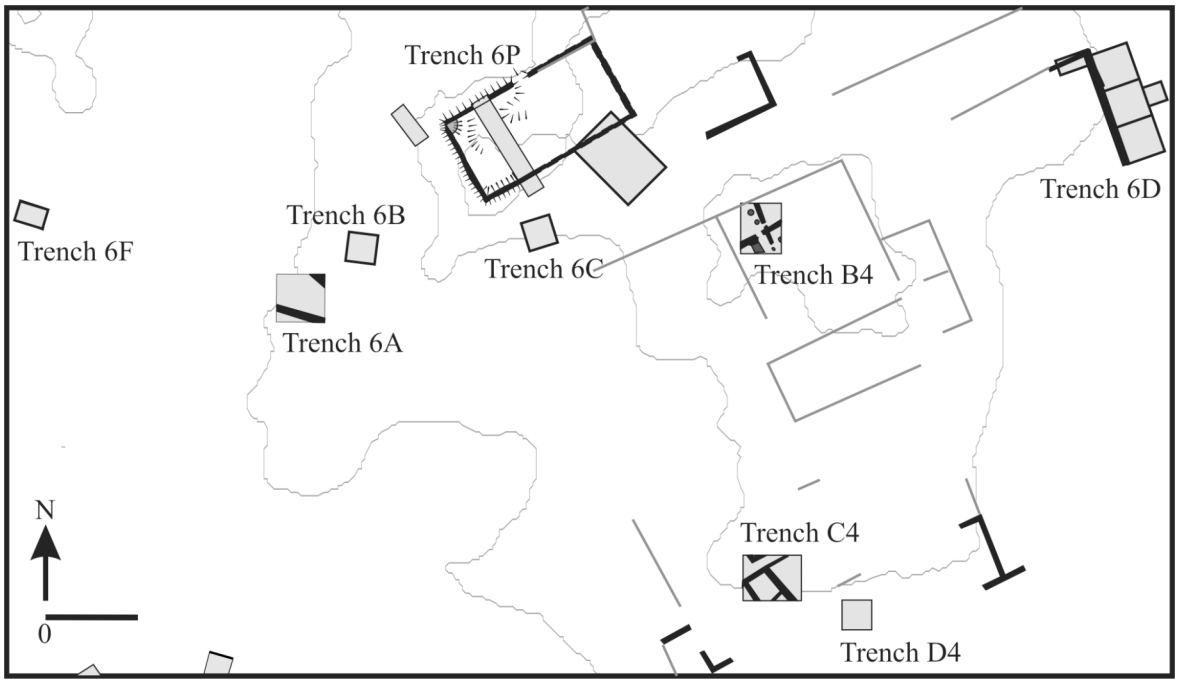


Figure 6.4 Structures from the northern area of *Myos Hormos* (after Peacock & Blue 2007: figure 7.30, 7.32).

6.3 Maritime activities within Myos Hormos

The distribution of maritime artefacts across *Myos Hormos* highlights the concentration of different maritime activities around the inlet, the harbour facilities and within the town. Maritime artefacts representing ship maintenance and fishing were found in abundance. Artefacts from ship construction or repair include elements of hull, rig and sail maintenance Fishing gears representing line, net and trap fishing methods were also represented. Within these two groups a number of different specialist skills, vocations and technologies are represented.

The fishing equipment represents fishing activity in the certain environments governed by the technology as representative of the technique used. As some of these techniques require significant outlay of time and expense, some form of vocational specialisation is likely (Chapter 3). Wide ranges of fishing techniques are represented at *Myos Hormos*, including line fishing (both hook and gorge types), net fishing (probably cast and seines) and fishing pots or baskets. Evidence for ship building technology at *Myos Hormos* is abundant. Rigging elements such as sails, both standing (dead eyes) and running blocks (sheave blocks) are represented, as are a huge number of brail rings. The seasonal maintenance of merchant vessels has left traces of ships hull work, including mortise and tenon elements of planking, lead sheathing and the broad headed copper tacks used to secure the sheathing to the hull (see Chapter 3). Waterproofing in the form of pine pitch has also been found on site, though this may relate to the sealing of wine amphorae. Indeed the two may have been related as these merchant vessels would have exported wine amongst their cargo (Casson 1989b: *Periplus* 6,7,17,24,28,39,49 and 56). It seems more likely that this pitch would have been used for ships, as with the exception of repairing occational leaks, amphorae should have been lined with pitch prior filling.

The distribution of over four hundred Roman period maritime artefacts across *Myos Hormos* is presented below (Figure 6.5). The relative size of the pie charts illustrates that maritime artefacts were found across the whole site, but also variation in what activities they represent. One can see that artefacts from the ships' rig or hull dominate the assemblage, as one would expect of a site that owed its success to Erythraean Sea trade. The central area shows a concentration of rigging equipment, the south elements of hull and hull maintenance. The west of the site around the harbour possessed a significant number of fishing artefacts.

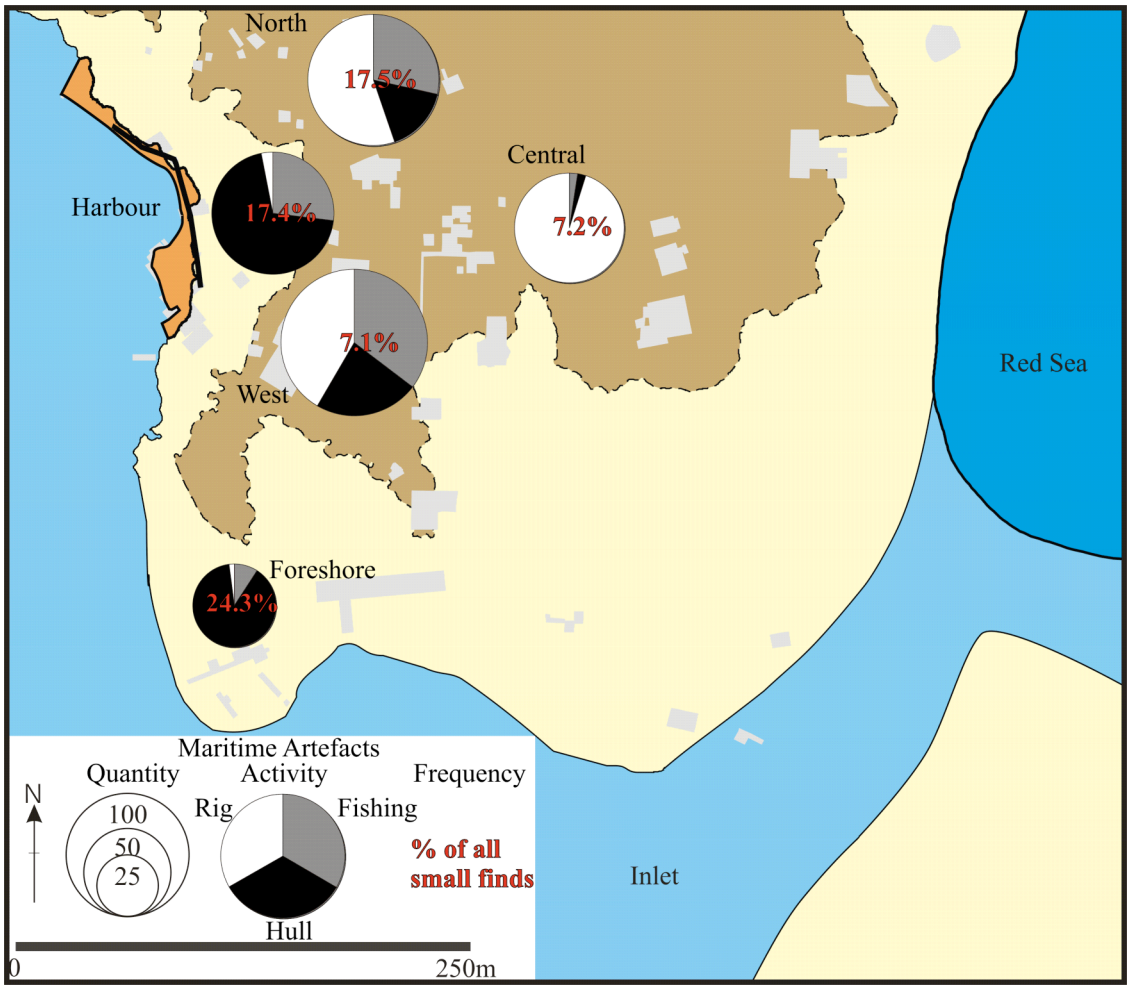


Figure 6.5 Maritime artefacts from *Myos Hormos*. Displays the quantity of artefacts (size of pie chart), the percentage of small finds that were maritime artefacts (in red) and the proportion of maritime artefacts that represent rigging including sailmaking (white sectors), hull maintenence including antifouling (black sectors) and fishing (grey sectors). Figures represent data from the late Augustan to third century AD. Based on data in Table 14.2, Appendice 14.3.

The archaeological assemblage clearly shows that the whole site was associated with maritime activities of some kind, with a very high occurrence of maritime artefacts across the site. Both domestic and industrial areas were associated with a mixture of fishing and ship maintenance activities. Three major types of activity are highlighted (figures 6.5 and 6.6). The first is primarily that of hull repair and maintenance, associated with the metal working area on the foreshore (trenches 9, 10 and 14) and harbour (trenches 7, 7A, 12 and 15). The buildings in the central and eastern parts of the settlement (trenches 2B, 2C, 2D, 17, 'Central Buildings A and B' and the 'Villa') possessed exceptionally low quantities of fishing equipment, but instead possessed large quantities of ships rig elements. The domestic occupation and refuse deposits next to the harbour facilities in the north (trenches 6A, 6B, 6C, 6D, 6E, 6M and 6L) and west (trenches 6G, 6H, 6J and 8) were closely associated with all maritime activities, including hull and rig maintenance and fishing. It was however in the north and western areas that the vast majority of fishing equipment was found and they were the only areas that a wide variety of fishing techniques were represented in the archaeological record, including elements of fishing line, net and basket trap.

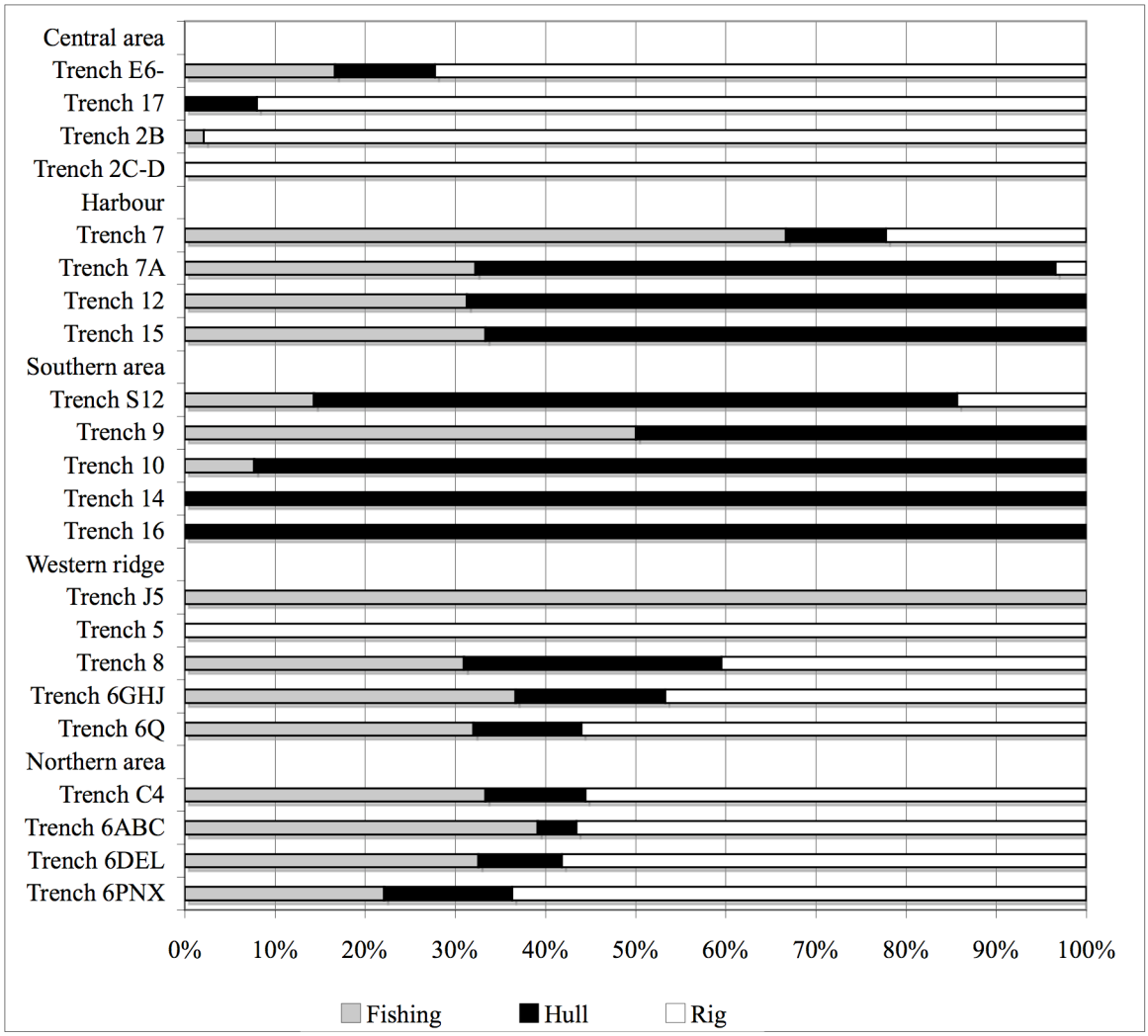


Figure 6.6 Distribution of maritime artefacts across *Myos Hormos* (data from Quseir finds archive). Based on data in Table 14.2, Appendice 14.3. Though the sample size from each trench varies significantly (0 to 90) each area has between 67 and 162 maritime artefacts and the pattern for each area is repeated in each trench, visible in the graph above. Statistical significance recognised in Appendice *14.9*, Table 14.12.

Evidence for ship maintenance differs across the site. In the harbour and foreshore areas, ship artefacts were primarily from the hull; lead sheathing and copper alloy tacks, not to mention the many iron nails and pine pitch fragments found that has not been included in this study (for they may have had other functions). The use of the foreshore for anti-fouling and repairing hulls is a universal phenomenon and also represented by barnacles found in trenches 10 and 14, which have clearly been removed from wood and pitched wood (Hamilton-Dyer 2002: 67). In the domestic areas above the foreshore, are many pieces of rig and sail. These expensive or rare wooden artefacts like blocks, sheaves and brail rings were kept aside for later use, in a dry and secure environment of domestic or store buildings (such as the 'Roman Villa' and 'central building A').

The large numbers of maritime artefacts distributed across the whole site illustrates that the majority of the population of *Myos Hormos* was associated with maritime activities. It also illustrates that these maritime activities were concentrated in specific areas depending upon the

function of the areas or the people living there. Hull maintenance artefacts were found at the harbour, rigging in the central and eastern area and fishing in the north and western areas. To review the identity displayed by the individuals of *Myos Hormos*, consumption patterns of fauna and ceramics from domestic refuse or occupation deposits will be assessed for these different areas of the site.

6.3.1 Maritime activities in the harbour

Excavations in the northwestern area of *Myos Hormos* by the Southampton University team started in 1999 revealed a significant amount of activity dating to the Roman period. Following subsequent investigation this was later discovered to be the Roman harbour area (Blue & Peacock 2006: 67-94). Strong evidence for maritime activities was represented here, although the preservation conditions were not as good here as elsewhere on the site due to salt and damp. The harbour area consisted of a substantial hard surface deposit constructed from amphorae and pottery and redeposited refuse including a range of artefacts and animal bones. The harbour had a late Augustan foundation (late first century BC) and was built, at least in part, on top of a mangrove swamp (Thomas 2006b: 88), an environment favoured by coastal populations of the Red Sea for shellfish collection (Van Neer & Ervynck 1998). On top of this surface was a stone sea defence (the grey line on Figure 6.2) that protected buildings behind from flooding. Extensive excavation of the Roman harbour of *Myos Hormos* was undertaken by the Southampton expedition that included four main trenches (7, 7A, 12 and 15) and seven small test trenches (15A-G). The harbour consisted of a shallow sloping surface constructed against rocky bluffs from complete and damaged amphorae (Peacock & Blue 2006: 175). This extended from trench 7A in the south to 15F in the northwest (Figure 6.1). It is believed that this surface was used to unload lighters and smaller craft that could be dragged onto the shore. Larger vessels would have anchored offshore, in the lagoon to the southwest (ibid.). Into this surface was cut a pool and inlet, lined with stones, possibly used to keep fish or shellfish alive (Blue & Peacock 2006: 71).

In places back from the foreshore was built a sea defence, from large stone headers mortared together with hydraulic cement (Thomas 2006b, marked as the grey line in figure above). It is uncertain whether this was constructed in one phase or not, possibly following a flooding event in the mid first century AD. This sea defence was then later rebuilt in the second century AD. The defences protected a series of mud-brick buildings (trenches 12 and 15 Blue 2006b; Thomas 2006b). The close proximity to the shore suggests these buildings were involved in some maritime activity. They may relate to ship maintenance and or have operated as warehouses. The maritime artefacts excavated in this area included a large amount of lead sheathing and copper tacks, perhaps unsurprisingly suggesting that this area was used for the maintenance and repair of ships hulls (Blue 2006b: 84). The hearth instillations found in trenches 15 and 12 may have been used, amongst other things, for melting pitch for waterproofing repairs (Thomas 2006a: 90). Rigging elements were poorly represented here.

Whilst the Erythraean trade was seasonal (Casson 1989b; Peacock & Blue 2006), the maintenance of trading vessels was expensive in both resources and time. This makes it likely that there would have been significant investment in ship maintenance just before and just after the busy trading season. The scale of the maintenance undertaken in *Myos Hormos* is well attested in trenches 7A and 12, where a large quantity of fragments of lead sheeting and copper allow tacks used in hull maintenance were found (see Chapter 3). The picture is less clear in trenches 15 and 7. Despite the large size of trench 15, very few artefacts were recovered from there, including only two copper tacks, no fishing equipment and no shellfish artefacts. The structures may have been used for storage and hearths associated with it used in ship maintenance (Thomas 2006b: 90). Trench 12 however had ample evidence of hull maintenance and the installations there are likely to represent hearth and fires for heating pitch, working lead and copper for the hull sheathing (Blue 2006b: 84).

The fishing equipment discovered in the harbour are representative of hooked line fishing used for catching pelagic and reef fish. What is conspicuous is the limited evidence of nets or net weights (only two ceramic net weights were found) that would suggest seines, casting nets or portable fish traps. These artefacts are better represented in the western and northern areas of the site. Shellfish gathering is possibly represented in the pool constructed into the harbour foreshore. Whilst a large area of mangrove would have been destroyed in the construction of the surface, there would have still been substantial area in which to gather shellfish in the rest of the lagoon, of which some are likely to have been kept alive in such pools (Agatharchides *On the Erythraean Sea*: 32-3)

The maritime artefacts from the harbour were mostly found in contexts dating to its use, rather than it construction. For this reason it is important to recognise that whilst the harbour facilities would have been constructed for the maintenance of trading ships and possibly the storage of their cargoes, fishermen sailing out of the port also used the area. Fishing is well represented, though only hook line fishing can be securely identified. We can assume that fishing activities would have set out from this area, especially those involving sailing vessels kept within the harbour. Small sailing or rowing vessels are likely to have been required to access better fishing grounds just off the reef, which in itself requires greater expense and skill in its application as a technique. In conclusion, the harbour facilities were clearly constructed for the purpose of facilitating the Erythraean Sea trade, as supported by numerous examples of hull maintenance activities taking place represented lead sheeting, copper tacks and pitch found there and the construction of hearths required in the preparation of pitch and softening of lead for hull sheathing. The same activities were also taking place at the southern foreshore. In trench 10 metal working installations were found alongside deposits the result of anti-fouling (cleaning of a ships hull of barnacles). Acorn barnacles were found with pitch and wood grain still preserved (Whittaker et. al. 2006: 80).

The ship maintenance activities would have required skilled shipwrights, smiths and ship hands to complete. The range of skills and number of people involved would have been significant and suggests a sizable population present at *Myos Hormos* with these highly specialised skills.

6.3.2 Maritime activities in the central settlement

The central settlement of *Myos Hormos* consists of a series of large mudbrick structures aligned approximately north, northwest to south, southeast, although this was not a rigidly enforced street plan (Peacock & Blue 2006: 176). Originally excavated by the Chicago team in 1978, 1980 and 1982, the Southampton team returned to the area in 2003. The area consists of a large 'central building A' to the south (Figure 6.1), 'central building B' (G12 Whitcomb & Johnson 1982: 44) and the 'Roman Villa' to the west. A number of architectural elements were also found in the 'pipeline trench' dug to the south (trenches H8 and J8), though these were not fully explored. The finds published from the central settlement are quite different in character from the harbour, northern and western areas. Maritime artefacts found in this region are almost exclusively related to ship's rig. There is an almost complete absence of fishing tackle. This divergence from the distribution of maritime artefacts found elsewhere way be explained by the function of the buildings and the identity of their occupants.

'Central building A' (Figure 6.3) is a well-built two storey 40m by over 50m structures consisting of a series of rectangular rooms (trenches F8-10, G8-9 and 17 Whitcomb & Johnson 1979: 28; Whitcomb & Johnson 1982: 37; Whitcomb 1996; Masser 2006). Excavations by Southampton confirmed an early first century construction of the 'central building A' and first to second century occupation of this area, with subsequent abandonment sebakh providing a terminus post quem of late first to second century AD. Some ceramics from the 'villa' may represent third century AD material (Whitcomb 1982), though a second century AD terminus post-quem is most likely for the abandonment of that area (Tomber pers. comm.).

Bituminous residues found within 'central building A' (trench F9) may have been intended for ship maintenance (pitch was used to seal planks), or for sealing goods. The storage of amphorae appears to have been a major preoccupation in this building (Whitcomb & Johnson 1979: 28), with storage amphorae and amphora stoppers well represented in the Chicago and Southampton excavations. Some of the Greek stamped stoppers are representative of Egyptian wine, possibly from the Fayum (Thomas 2001). Masser, Southampton's excavator of trench 17, concluded that 'the emptiness of the northeast room indicates that the ground floor was probably used for storage. The upper storey, however may have been occupied and this is certainly indicated by the large pile of refuse in the passageway behind the stair block'. He goes further and suggests that the 'central building A' represents 'considerable investment, whether by an official administration or a private individual' (Masser 2006: 146). A large number of elements of ship's rig were found, including a large length of cable, 21 horn and wood brail rings and a fragment of sail. A small section of plank with mortise and tenon and a copper alloy tack was also found. Clearly the function of this structure was concerned with the storage of amphorae and the maintenance of sailing vessels. It can therefore be suggested from the scale of the building that this was the warehouse of a major trader in the Erythraean Sea trade, exporting Egyptian wine amongst other things. The inhabitants of 'central building A' are therefore likely to be involved in Erythraean Sea trade and had regular contact with Egypt. Artefacts from occupation layers and refuse by the stair block, include Greek

writing, Greco-Egyptian style faience wares and Roman style *terra sigillata* wares (Whitcomb & Johnson 1979: 28; Whitcomb & Johnson 1982: 37), suggesting that Greek speaking Roman subjects, probably from Egypt lived in a domestic area above the warehouse.

To the west, the 'Roman Villa' (Figure 6.3) is a much smaller structure, approximately 15m by 16m. It is similarly arranged with storerooms around a central courtyard (trenches D6 and E6). Adjacent buildings included ironworking facilities and an altar installation (trenches E7 and F7 Whitcomb & Johnson 1982: 20). Built early in the first century AD and occupied into the second century AD, the function of the 'villa' is aided somewhat by the peculiar preservation that includes two untouched store rooms, including a cellar covered with wooden beams, matting and entered via a trap door (Meyer 1982: 201). The interpretation of the storage rooms in the 'villa' was 'implicit' (Meyer 1982: 210), the finds include domestic objects such as mills, bowls, baskets, cooking pots, a fishing net and an imported lamp (Meyer 1982: plate 60g RN12 E6b-29). Commercial activity may be suggested by the presence of coins and wine amphorae, though Meyer suggests this was not a merchant's main warehouse based on the finds (Meyer 1982: 213). However, it is likely that anything of great value would have been cleared prior to abandonment. Also amongst the storage vessels were a number of fragments of putative ship's rig that were not studied in detail in the Chicago publications. Here a brail ring, a block and two sheaves were found amongst other wooden artefacts that may be further ship elements (they have not been illustrated or described in detail to allow for certain identification). In conclusion, the 'villa' contains both domestic material and evidence of ship maintenance work.

In the central area fishing is limited to isolated artefacts. It is unlikely that fishing was a major activity of any of the population that inhabited this area over the course of the late Augustan through first to second centuries AD. Hull maintenance is also poorly represented with only two examples, clearly this activity was taking place elsewhere. Whilst this does not discount the fact that individuals may have been working on the ship's hull, it does discount the idea that any of the activities relating to this work was undertaken or stored here. It is likely that this would have been concentrated around the areas specifically constructed for that purpose in the harbour area. However, rigging and sail making was very well represented in the central area. A huge number of items were found in the occupation and subsequent refuse deposits of trench 17 (central building A) and in the refuse of trench 2B (central building B). In addition a number of complicated rig elements were stored in the cellar of the Villa. These items may represent stored spares, discarded used ones. Rigging and sail making were (as they are today) highly skilled activities that required training. These skills were instrumental in the facilitation of Erythraean Sea trade and were as a result highly marketable. For the Erythraean sea trade, these would have been especially important, as the wind conditions were not very forgiving. Whether these items were produced or merely stored by these individuals is unclear. A direct link with Erythraean Sea trade can however be firmly stated.

6.3.3 Maritime activities on the western ridge and northern areas

The western area was built upon a north-south running ridge. It includes a domestic refuse deposit 6Q, domestic structures in trenches 8 and 8A (Thomas & Masser 2006) and the refuse dump of 6G, 6H and 6J just below it (Van Rengen & Thomas 2006). The main period of occupation started in the late first century AD. Trench 8 is a multiphase domestic area built out of mudbricks with stone footings and mangrove and palm roofing. It has ovens and a mill to the south, a row of small huts adjacent to a gravel street in the middle and a number of buildings around a gravel courtyard in the north (Thomas & Masser 2006). The multiple phases consist of: phase 2A (late first century AD) and a subsequent rebuild phase 2B (early to mid second century AD). Then a period of abandonment was followed by a different alignment of the structures in phase 3 (late second to early third century AD) and finally the construction of a large, though rough composite building to the north in phase 4 (third century AD). Trench 6GHJ (to the west) is a domestic refuse dump, supported by mudbrick retaining walls, with early second century to early third century deposits (with some residual first century ceramics). Here the material culture is similar to that of contemporaneous trench 8 (Van Rengen & Thomas 2006: 149).

Subsequent clearing of the domestic areas influenced the distribution of finds in the second century AD deposits. The majority of finds were found in the adjacent refuse dump below. The range of discarded objects includes a range of fishing tackle, shell bowls and shell jewellery. Fishing equipment including fine and coarse meshed net types, basket traps, gorge and hook fishing lines that would have been used to catch a wide variety of fish from different environments. An ostrakon from trench 6G, dating to the mid second century AD names an individual *Pakubis Ichthyophagos* (Pakubis the fish-eater). This ostrakon (Figure 6.7) is a request granted for a permit for a number of small fishing vessels (*Schedia*) to sail north to *Philotera* (Van Rengen 2002). It is likely that this is a fishing expedition as these *Schedia* vessels are commonly associated with that trade (Bülow-Jacobsen et. al. 1994: 30, *O.Max* 175). The association of this epigraphic evidence for fishing activities alongside fishing equipment is made even more significant considering its association with the ethnonym *Ichthyophagos*. The significance of this ethnonym will be discussed in subsequent Chapters. Combined with the fishing equipment and shell jewellery, this is the clearest evidence for *Ichthyophagi* operating in *Myos Hormos*. There were also various ship fragments, including elements from small and larger vessels. The finds from the north of trench 8 were particularly representative of larger sailing vessels, possibly involved in Red Sea trade, as they were associated with an Indian lamp, Indian pottery and Indian graffiti (Tomber pers. comm.). Casting nets, fishing pots, gorge and hook line fishing were all used to catch a variety of fish from different environments (Chapter 3),

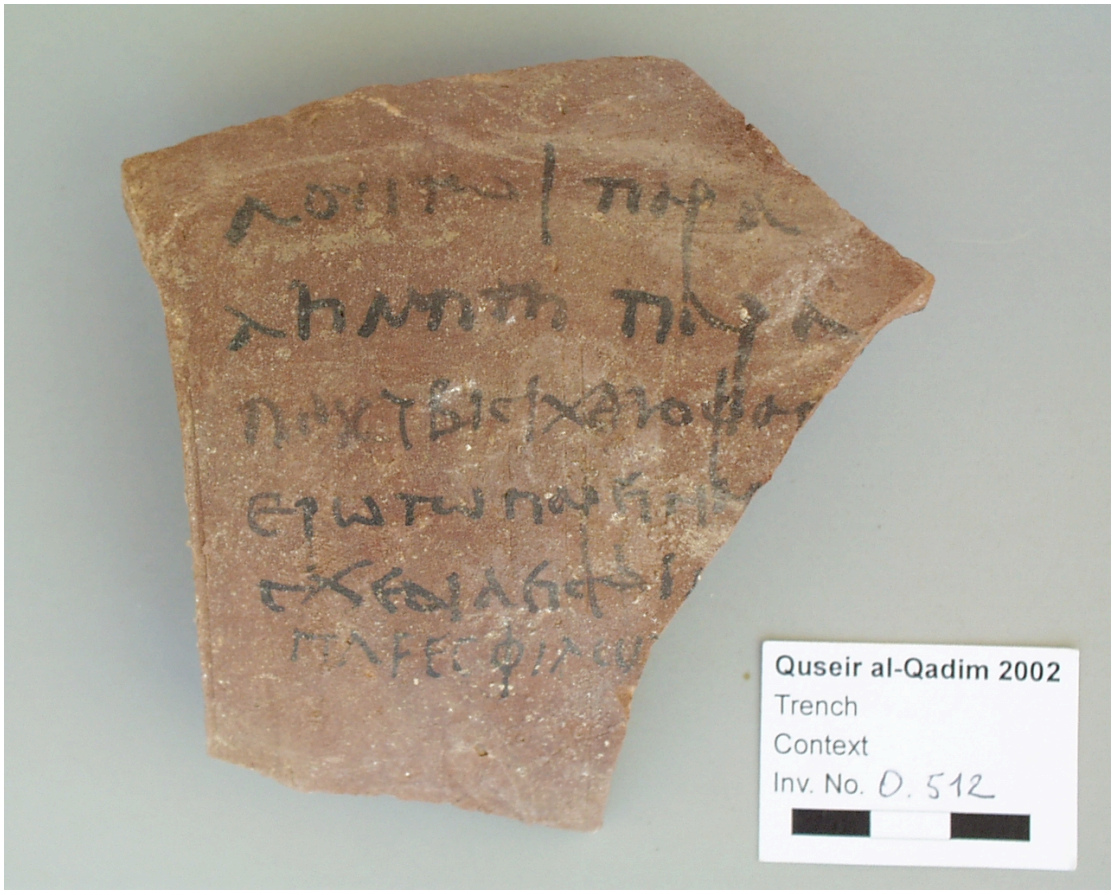


Figure 6.7 *O.Myos*. 512 successful permit request to the tax farmer, written by *Pakubis Ichthyophagos* to who wanted to move his *Schedia* (small fishing boat) to *Philotera* (Quseir finds archive, Van Rengen 2002: 53-4).

A number of trenches were excavated in the northern area of *Myos Hormos*. The deposits found mostly consisted of well-preserved refuse dumps (sebakhs). Most of the deposits were not associated with domestic structures, but instead represent deposition (or redeposition) of household refuse from nearby areas (Van Rengen & Thomas 2006: 146-7). Trenches 6A, 6B and 6C represent early first century AD refuse, whilst to the east, artefacts from 6D, 6E, 6K, 6M and 6L were deposited in the late first to early second century AD. Between the sites, refuse dumped against the city wall in 6P dated from the first to early second century AD.

This northern area contained a range of maritime artefacts, including a significant quantity of ship's hull and rig elements (Van Rengen & Thomas 2006: 147, 149 and 153). Fishing equipment was also frequent and the deposits show a range of fishing methods such as gorge and hooked line, fine and course meshed nets and creels were used by the people that deposited it (see Chapter 3 for explanation). This area had similar fishing equipment to that from the western area.

Fishing activities represented in the northern and western areas were numerous and diverse. A full range of fishing activities were represented, with nets (6Q, 6P, 8, 6G, 6H, 6J) basket traps/fishing pots (6P, 6H), barbed and un-barbed, copper and iron, hooked fishing lines (6Q, 6P, 6D, 6E, 6G, 6H, 6J, 8) for small and medium fish, and gorge fishing lines for larger fish and sharks (6H, 6D and 6E). Also a number of associated fishing gear such as floats (6Q 6E 6L 8) and weights (6P, 6H) were found. Unfortunately tidal traps are unlikely to ever be securely identified, although

some of the net or basket trap elements may have been from a tidal trap. We can however suggest, from the presence of parrotfish across the site and especially in these trenches, that this technique was most likely used in Antiquity as it is today to catch this species (Wendrich & van Neer 1984).

The range of fishing skills are numerous and most likely locally taught as the use of gorges (in trenches 6H, 6D and 6E) has a long Red Sea tradition going back into pre-history (Chapter 3, Phillips & Charpentier 2002; Phillips 2004), whilst it was not commonly deployed in the Mediterranean and certainly not on the Nile. The skills implied by these artefacts go beyond just the activity of fishing, but include knowledge of the local waters and fish stock. It also includes the ability to handle small fishing vessels required for all gorge and most likely most hook line fishing. With net and basket traps/fishing pots, an intimate knowledge of the best environment, how to set and bait the trap and indeed retrieving the trap all required specially taught skills. The people who deposited these items were involved in a diverse and productive fishing economy that is likely to have produced a significant surplus for sale to other inhabitants of *Myos Hormos* and Eastern Desert sites (as suggested by the ostrakon record from Eastern Desert settlements that purchased this fish from the indigenous 'Arabs' and '*Ichthyophagi*' Bülow-Jacobsen et. al. 1994; Cuvigny 2003b).

Evidence of tools and artefacts for hull maintenance are also found in significant quantities in these areas. In the case of trench 8 fragments of used lead sheeting appear to have been stacked and cached for later reuse, suggesting that the individual who stored these thought they still possessed some value (possibly as repairing patches). Also the presence of what may be considered a caulking wedge from trench 6B, suggests that some of the people living in these areas had skills useful to Red Sea traders. Certainly the seasonal nature of some of the more popular trading routes were likely to produce periods of the year when certain skills, such as rigging and hull maintenance were in high demand, producing periods of opportunity for those who could get by with a bit of knowledge of the subject. Also there would have been jobs that required less skilled, but larger numbers of individuals, supervised by a shipwright. These may explain the occurrence of some of these artefacts in these areas. Similarly the presence of rigging elements and fragments of sail suggest that these people were involved in all areas of maritime activity in *Myos Hormos*. Whilst some rigging elements may represent fragments of smaller fishing vessels, this cannot explain some of the larger elements that are likely to represent ocean-going ships.

Specific areas of the site were used for specific maritime functions. The harbour area and southern foreshore were clearly the focus of ship hull maintenance activities. Whilst we must recognise that cordage, textile and wood artefacts may be preserved in the harbour, it is also likely that for this same reason people in Antiquity would not have chosen to store these objects there anyway. Instead elements of rig and sail could have been quite easily removed from the boat and stored in the dryer central area. The additional benefit of this is that no one else could 'borrow' items of the rig, whilst the boat was unattended. Secondly, the comparison of the domestic occupation and domestic refuse deposits from the northern and western areas and the central and eastern areas produces two divergent patterns. Whilst in the north and western areas a full range of activities and skills are represented, in the central and eastern areas the maritime artefacts

discovered are almost entirely concerned with ship maintenance. This suggests that the inhabitants of 'central buildings A and B' and the villa were highly specialised individuals concerned mainly with Red Sea trade.

In the north and western areas a full range of fishing strategies are represented with basket traps, nets, hooked lines and gorge line fishing methods deployed (Table 14.2). This diversity of fishing methods would produce a greater diversity of fish in the diet of those that caught, or purchased the fish off these individuals. The presence of rigging, sail, hull maintenance and a full range of fishing equipment within the maritime artefact assemblage of the northern and western areas suggests that the individuals who deposited this material culture were involved in many diverse activities at the port. Their involvement in the maintenance of trading vessels may have been seasonal or taking place when the opportunity presented itself, whilst fishing activities would have produced a more reliable income.

The analysis of maritime artefacts have then revealed significant differences in the maritime activities undertaken in different areas, suggesting that the maritime skills and vocations undertaken by different individuals in the port of *Myos Hormos* also varied. But what was the identity of these maritime specialists? The next section shows how consumption practices differed across the site and how this relates to ethnic and status identity.

6.4 Consumption patterns at Myos Hormos

The consumption patterns present at *Myos Hormos* will here be explored in two case studies (methodology outlined in Chapters 3 and 5). The first study below involves the use of tableware pottery across *Myos Hormos*, by assessing what forms and styles were used. The second involves looking at differences in the consumption of fauna across *Myos Hormos*.

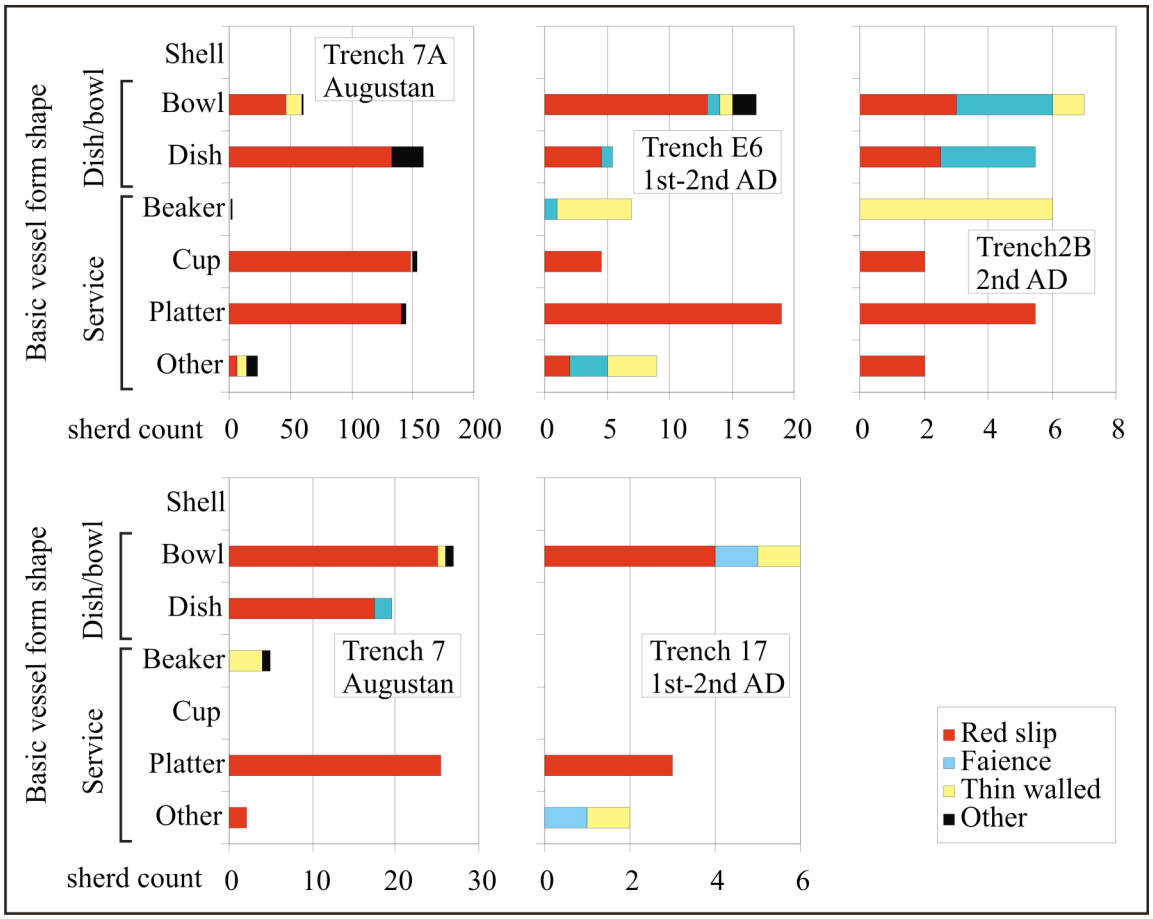


Figure 6.8 Distribution of tableware forms used at *Myos Hormos* in trenches 7, 7A, 2B, E6 ('Villa') and 17 (data from Appendice 14.7, after Tomber forthcoming). Distribution quantified by number of identified sherds displaying the basic vessel form (dish, bowl, platter, cup, beaker, other, shell) and ware (red slip, faience, thin walled and other). Note the high occurrence of beakers, cups, platters and other service wares, that suggest a wide range of tableware vessel forms were used in these areas.

- The Late Augustan redeposited domestic refuse used in the fills of the harbour amphora surface in trench 7A shows a range of tableware styles and forms were used, including vary rare examples as far a field as India. However, red slip wares imported from Italy and the eastern Mediterranean predominates and full services of these *terra sigillata* are represented (Figure 6.8, Appendice 14.7). Cup forms were more common in trench 7A than in later deposits, when beakers became more popular.
- The Late Augustan domestic refuse deposits from the harbour structure in trench 7 closely resemble that of trench 7A. Imported red slip wares predominate and a wide variety of forms were used (Figure 6.8, Appendice 14.7).
- The early Roman (first to second century AD) domestic refuse from trench E6, 'the Villa' in the central area of the settlement is especially varied in form, probably due to the wide date range for its occupation. Similar in composition to the Harbour deposits of 7 and 7A, it is mostly represented by red slip wares, although thin walled wares from Upper Egypt and Lower Egyptian faience wares were also significant (Figure 6.8, Appendice 14.7).

- The early Roman (first to second century AD) occupation deposits from central area trench 17 ('central building A'), produced only a few identifiable tableware forms. This small assemblage does suggest a range of styles and forms were used by the occupants of this building (Figure 6.8, Appendice 14.7).
- The Antonine domestic refuse deposits from central trench 2B, use a range of imported Red slip and Egyptian faience and thin walled wares. The forms used include complete ranges from mugs and beakers to closed vessels (Figure 6.8, Appendice 14.7).

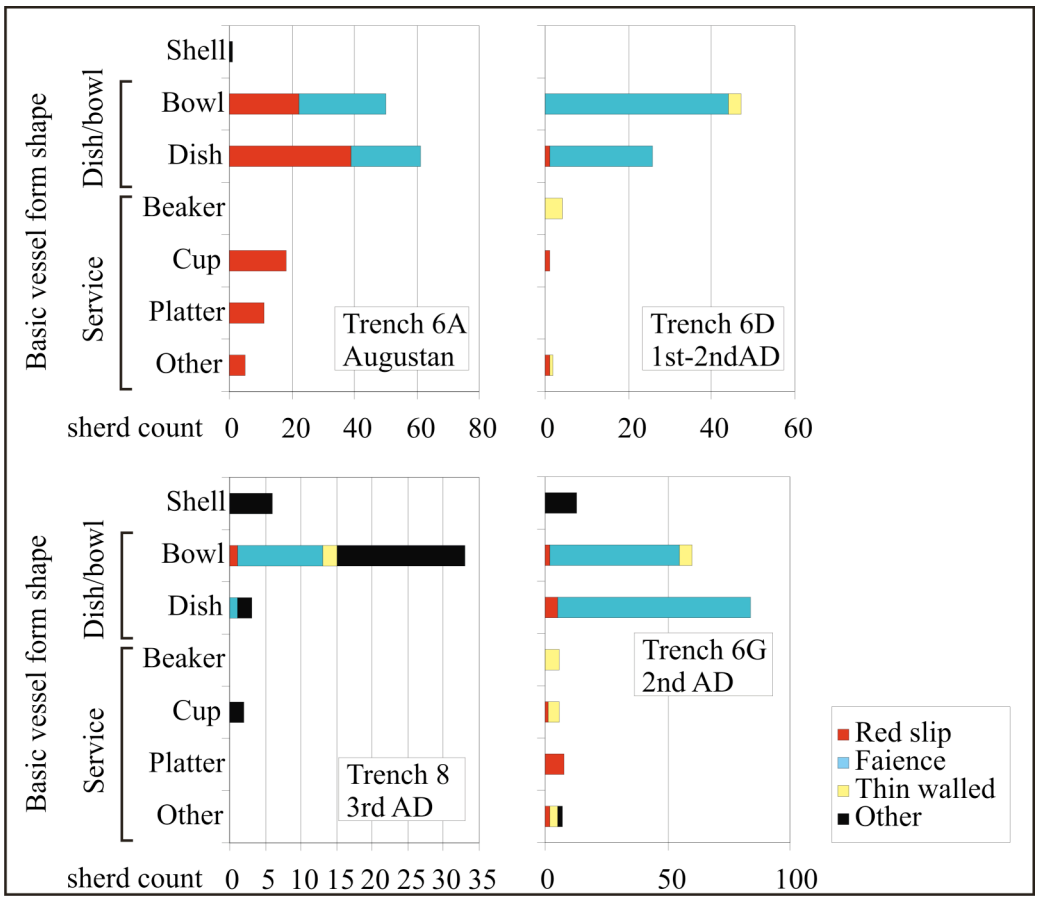


Figure 6.9 Distribution of tableware forms used at *Myos Hormos* in trenches 6A, 6D, 6G and 8 (data from Appendice 14.7, after Tomber forthcoming). Distribution quantified by number of identified sherds displaying the basic vessel form (dish, bowl, platter, cup, beaker, other, shell) and ware (red slip, faience, thin walled and other). Note these sites had a high occurrence of dish and bowl forms and of shell bowls and scoops.

- The Late Augustan domestic refuse from northern trench 6A is quite distinct from that of trenches 7 and 7A, despite being close geographically and temporally. Here greater utilisations of Lower Egyptian faience wares were used, although red slip wares are still dominant. Forms are generally limited to bowls and dishes, with only a small number of other service forms represented. A small number of shell vessels were also found (Figure 6.9, Appendice 14.7).
- The early Roman (late first to early second century AD) domestic refuse from northern trench 6D is significantly different from the contemporaneous deposits of trench 17, Villa and the earlier deposits of trenches 7 and7A. Here Red slip is very rare and in preference

for Lower Egyptian faience wares. The forms used were almost entirely dishes and bowls (Figure 6.9, Appendice 14.7).

- The Antonine domestic refuse from western trench 6G is reminiscent of trench 6D and 6A, with the dominance of faience wares and the restricted forms used. Interestingly there is a significant use of shell bowls in this deposit, like trench 6A (Figure 6.9, Appendice 14.7).
- The Severan period deposits from western trench 8 showed a very limited range of dish and bowl forms used and high occurrence of shell bowls (in 6A, 6G and 8) suggests close similarities to the consumption patterns of trenches 6A, 6D and 6G. This bias towards bowl forms was also noticed in the courseware assemblage (Figure 6.9, Appendice 14.7).

The consumption of tableware ceramics at *Myos Hormos* comes down to a distinction between the use of specific wares and forms. Whilst red slip wares were generally associated with a large range of forms, this was not always the case. It appears that red slip wares were used by all of *Myos Hormos*' inhabitants (figures 6.8, 6.9). This is attested in all periods, as were thin walled and faience wares. An explanation of this may be that red slip were seen as high value, associated with their distinctly Roman origins. Their wide use however negates any possibility that the presence or absence of different wares were used to distinguish of ethnic or any other form of identity. The changing use of tableware varieties is related to wider distributions and is chronological rather than relevant for intra-site analysis (Tomber 2000b: 54). However, significant differences could be seen across *Myos Hormos*, when one considers different consumption patterns of tableware forms. As the shape of the form determines to a degree how one uses it to eat (in what combination of forms), this then represents differences in how groups were eating at *Myos Hormos*. Unfortunately without the option of lipid analysis available for the study of Egyptian pottery, the dishes served in the different basic forms cannot be known for certain. The form distribution from each trench does however show two distinct patterns; one with a variety of forms and the other with a limited range of forms.

One group was limited to dish and bowl forms selected from a range of red slip, faience and thin walled wares tablewares. These were supplemented by a range of shell vessels, including shell bowls and scoops (up to 20% of the assemblage). Other forms such as platters/plates, cups, beakers, closed vessels, jugs and colanders (henceforth service forms) were very rare (<25% Figure 6.9, 6.10).

A second group had a large range of service forms, including platters/plates, cups, beakers, closed vessels, jugs and colanders, from a range of red slip, faience and thin walled wares. These service forms accounted for 45 to 60% of all tablewares. The rest were made up of bowls and dishes. This group did not utilise shell bowls or scoops. Though this second group were often associated with large quantities of red slip, when red slip was not so readily available faience and thin walled ware were used in combination to provide the necessary forms for complete dining services (figures 6.8, 6.10).

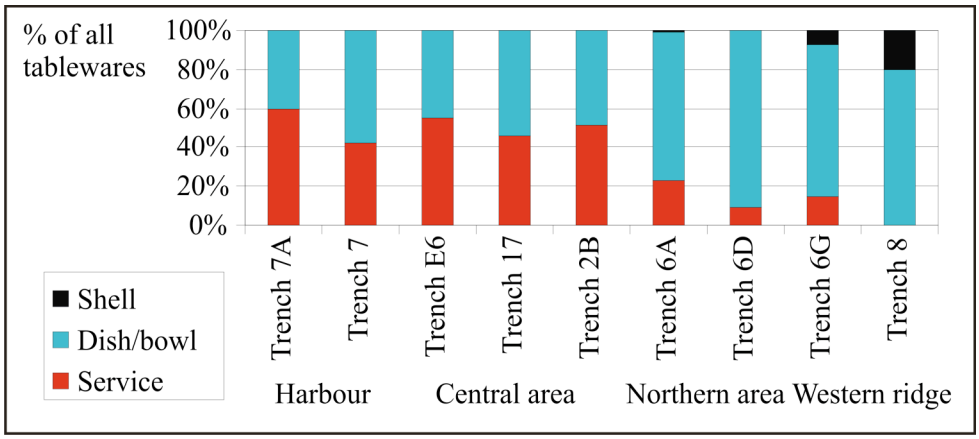


Figure 6.10 Simplified distribution of tableware forms used at *Myos Hormos* (data from Appendice 14.7 after Tomber forthcoming). Grouped into dish and bowl forms (in blue), shell bowls and scoops (in black) and service wares (platters, cups, beakers, jugs and strainers in red). Statistical significance recognised in Appendice *14.9*, Table 14.12.

Both these consumption patterns were found in all periods except the third century AD, when only dishes and bowls forms were regularly used. Because the third century AD is poorly represented at *Myos Hormos*, it its uncertain whether the absence of services forms at this time is representative of the whole (much diminished) site, or just the few locations it was found. Whilst patterns of services didn't change over time, the styles did. Over the course of the first century AD Italian *terra sigillata* became less frequent, being replaced with eastern *terra sigillata* forms (Tomber 2000). Red slip was less frequently found in the second century than in deposits of the first century AD, when they were superseded by Egyptian styles of pottery such as thin walled and faience wares (Tomber 2006). Clearly Roman style red slip pottery was adopted instantly as it is found across the site in all periods. However, it was not used in the same way across the site as only bowl and dish forms were used in the west and northern areas, whilst the complete services were used in the central area and in the harbour deposits. The use by some of complete service sets would set one apart from those that used only the bowl forms and continued to eat in an un-Roman way. In this manner the ceramic assemblages from the construction of the harbour (7A) and the large two storey buildings from the central area (such as the 'villa', central buildings A and B, trench 17 and 2B) of *Myos Hormos* represent complete Roman services, suggesting a Romanised manner of eating. Whilst in the northern and western areas of the site, dish and bowl ceramics were used alongside locally made shell vessels and could be perceived as more indigenous. The apparent increase in popularity of the shell vessels through the second and into the third centuries AD shows these traditional serving vessels remained popular in all periods.

6.4.1 Diet at Myos Hormos

Some important patterns can be seen in the faunal deposits found at *Myos Hormos*. Differences between the environments in which the fauna were sourced (see Chapter 3) illustrate the influence taste had on the consumption of fauna at the port. As *Myos Hormos* was well provisioned from the Nile (Tait 1930; Fuks 1951; Bülow-Jacobsen et. al. 1994; Bülow-Jacobsen

1998; 2003) the opportunity for foodstuffs to arrive from the Nile and the introduction/replenishment of non-indigenous domestic species has created significant differences in consumption patterns across the site. Possibly the most obvious difference is between domestic mammal and bird species and fish.

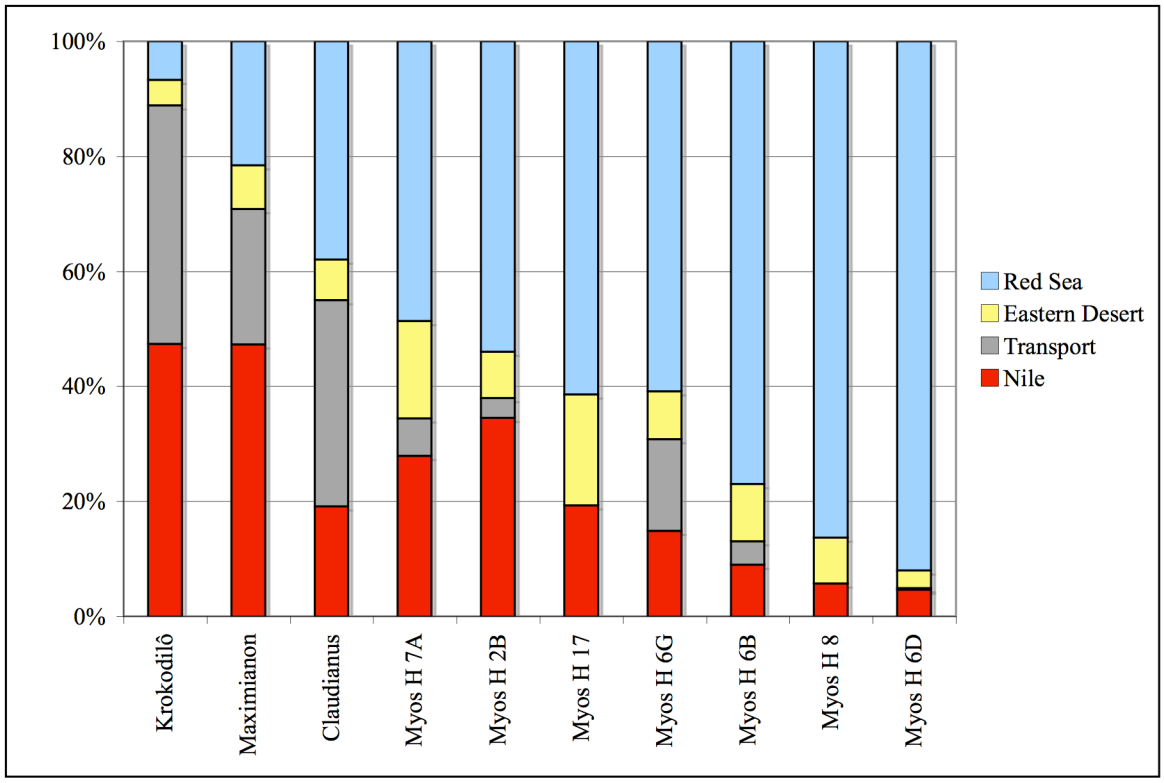


Figure 6.11. Proportion of fauna consumed in each area of *Myos Hormos*, grouped by source environment. Nearby Eastern Desert forts of *Krokodilô*, *Maximianon* and *Mons Claudianus* (Leguilloux 2003; Hamilton-Dyer 2007, data after Hamilton-Dyer forthcoming) are listed for comparative purposes. Based on data from Appendice 14.6, statistical significance recognised in Appendice *14.9*, Table 14.12.

In the central and eastern areas species indigenous to the Nile (fowl, pigs, cow) and the desert/Nile (sheep/goat) account for 40-50% of the fauna retrieved from there. These were the sites with most similarities to the Roman forts in the region (Leguilloux 2003). In the sebakhs in the northern (6B, 6D) and western areas (8, 6G), they account for only 10-20%. Fish were always the most significant fauna retrieved from any deposit, however the central areas did not rely so much upon this local resource. Eating transport animals (donkeys, horses and camels) was rare in all deposits except 6G. As these animals would have been of more use transporting water, it is unlikely they were consumed unless they were lame or already dead (Chapter 3). Also as these animals had a closer relationship with their human masters and may indeed have been named, it is quite possible that people may have felt somewhat uncomfortable about eating these animals, almost as if it were taboo (see for example arguments in Serjeantson 2000 and also Chapter 3). We do however know that donkeys were eaten at *Mons Claudianus* after they had died of natural causes (Hamilton-Dyer 2001). The quality of the tough meat from older hard working animals and issues with the fact the

animal had died of natural causes and not been slaughtered for the specific purpose of consumption, suggests that the meat of equids and camels would have been perceived as low quality meat. Certainly it would have been perceived as lower status than that of meat intended for consumption such as cow, sheep, pig.

Two distinct groups were identified in this manner

- A 'fish diet' (>60 to>90% Red Sea fish species) representing a distinctly local faunal assemblage reliant upon Red Sea fish and mammal species, supplemented with very small proportions of Nile or domestic desert species. Meat is often from 'low status' transport animals.
- A 'meat diet' (40-50% domestic mammal meat), including a significant proportion (20-35%) of non-local Nile species and supplemented by Red Sea fish species (50-60%). 'Low status' transport animal meat is rare.

The central area 2B and the harbour construction 7A were distinctly meat-orientated diets, whilst 8, 6B and 6D were distinctly Red Sea fish assemblages trench 6G was between groups, as a large amount of transport animals were found in this deposit that would otherwise resemble a more 'fish' diet. Analysis of domestic and hunted mammals and birds suggested that generally cattle were rare across the site, a pattern shared across the Eastern Desert (Van Neer & Lentacker 1996; Van Neer & Ervynck 1998; Van Neer & Ervynck 1999; Hamilton-Dyer 2001; Leguilloux 2003). Pig (normally around 40%) and chicken (up to 30%) were found in relatively large quantities in the central area and in the harbour construction deposits. Wild bird and hunted desert fauna were mostly absent from the central area and harbour.

In the western and northern areas of the site pig was rare (0-30%) as was chicken (0-8%). Cattle were better represented than in other areas, perhaps substituting pig for cultural reasons. Indeed in trench 6D no pig was found, though a large proportion of the mammal and bird assemblage was cattle. Wild bird and hunted desert fauna were represented in these areas and mostly absent from the central areas. Finally transport animals were rare from the central areas and much more common in the west and northern areas. Again two patterns emerge, using the same terminology as above:

- The 'meat diet' assemblages included larger proportion of pig (c.40%) and fowl (2-30%). Cattle was relatively rare, but normally present (0-13%). Transport animals were rare (8-21%) but present in all deposits. Wild bird and hunted desert fauna were absent in all but one context (7A), where it accounted for <1% of the total.
- The otherwise mostly 'fish diets' included as a proportion of the small quantity of mammal and bird fauna consumed, a much lower proportion of pig (0-30%) and chicken (0-8%), but a higher proportion of cattle. Transport animals were absent in the third century AD deposits of 8, but were present in large quantities in the first and second century AD deposits (4-37%). Wild bird and hunted desert fauna were much more common (1-12%).
- The lack of transport animals in the third century deposits may represent wider economic implications for the port, which was clearly receiving limited supplies from the Nile at this time. The complete absence of pig from trench 6D is significant. The Egyptians according

to Herodotus saw pig as unclean (Herodotus: 2.47). It is quite possible that the indigenous inhabitants of the Red Sea shared this taboo.

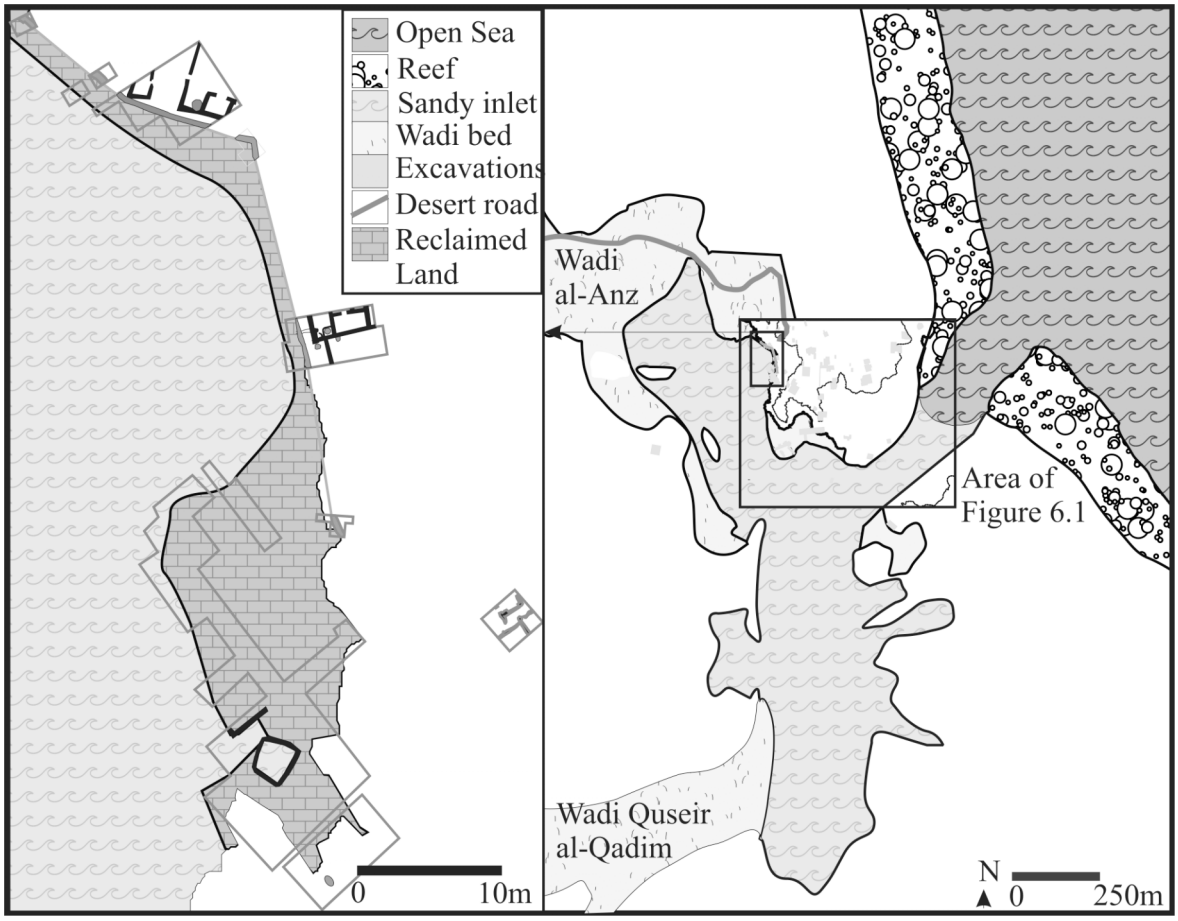


Figure 6.12 Fishing environments around *Myos Hormos* with inset of the amphora surface reclaimed land used for the Roman harbour facilities (after Peacock & Blue 2007).

Understanding the cultural significance of the consumption of different fish, marine mammal and turtle species is slightly more complicated, as there is such a variety to be found in the environs around *Myos Hormos*. A number of different environments were used in all periods, including the sandy bottom of the *Myos Hormos* inlet itself, the reef just in front of the port and the open sea beyond (Figure 6.12). It would appear that the reef offered the greatest catch to the inhabitants of *Myos Hormos*, although other environments were also used. This preliminary study suggests a limited range of reef fish were consumed (mainly parrot fish) in the central area (2B, although additional information is required to confirm this). The harbour, western and northern areas utilised a greater variety of fish and would have required a greater range of fishing techniques to do so. Particularly significant are the inhabitants of trench 8 that clearly utilised a variety of different sea fauna in their diet (Figure 6.13).

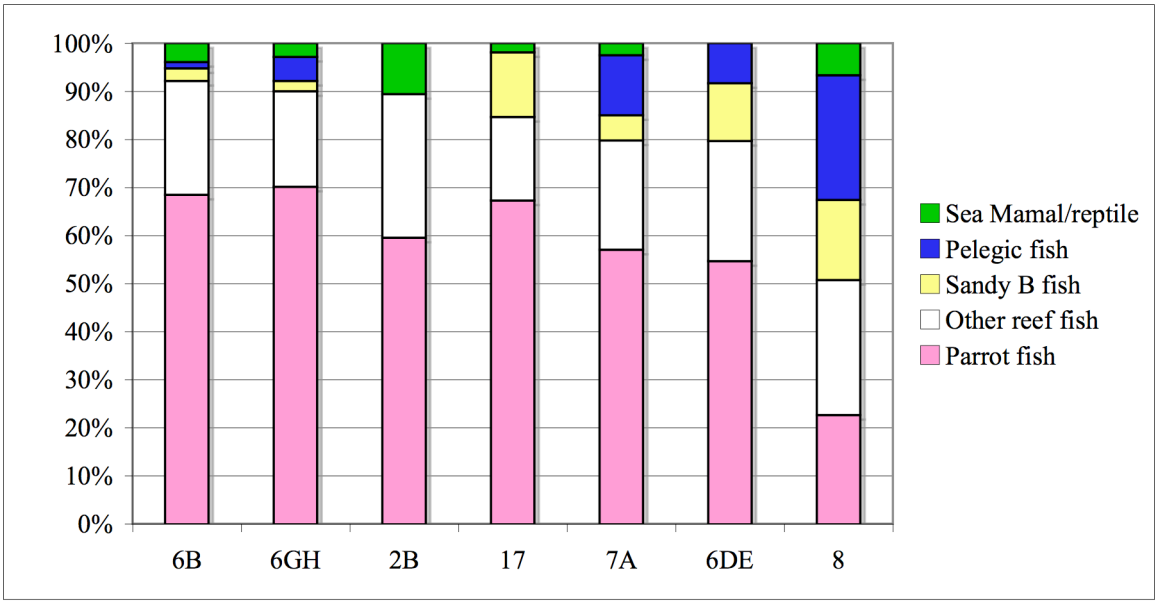


Figure 6.13 Proportion of Red Sea fauna consumed at *Myos Hormos*, sourced from different marine environments and representing different fishing techniques (data after Hamilton-Dyer forthcoming). Based of data in Appendice 14.6.

In conclusion the faunal record suggests that there are two distinct and different diets at *Myos Hormos* that were in existence simultaneously through all periods, except the third century AD.

- The first diet is fish orientated, utilising a variety of Red Sea fish and sea mammals and reptiles from a variety of environments and supplemented by hunted desert fauna, wild birds and the ubiquitous sheep/goat. By the second century AD, this diet also contained some transport animals (equid and camel) and may have also emulated to some degree a more Roman diet by the increased amount of pig and chicken in the second and third centuries AD, although it appears that cattle was generally preferred.
- A second diet was more 'meat' orientated. A significant quantity of pig and chicken constituted this diet that was also supplemented by cattle and sheep/goat that was available locally. This 'meat' diet in addition to utilising less fish, also appears to have been more selective in what fish it consumed, utilised a smaller variety of fish species.

Over the course of the life of the port it appears that what started as divergent diets in the early first century AD became more similar by the second century AD, with the 'fish' diet utilising a greater variety of Nile sourced foods. With a specifically Egyptian diet, one would expect no pig to be represented (as pig was taboo, Chapter 4), though other Nile foodstuffs were consumed. Whilst trench 6DE possessed no pig, the distinctively Red Sea character of the other fauna consumed there makes it unlikely that this represented a population of individuals from the Nile. Instead it is quite possible that this represents a Red Sea group who may have shared a sense of disgust or indifference to eating pig. It is likely then that the demography represented here is of two populations one eating a Greco-Roman diet, be it by Hellenised Egyptians, Greeks or Romans and another by an indigenous population with a preference for seafood.

The quantity and type of liquid provisions consumed can be learnt from amphora stoppers (Thomas 2001; Thomas & Tomber 2006). Wine and oil was traded by specialist Greek speaking wine (*oinopolai*) and oil traders who recorded their names on the stoppers. Once opened the stopper was discarded, so each artefact represents the opening and consumption of one amphora, allowing some accuracy in measuring the quantity of wine and oil consumed in each area. The number of stoppers opened is compared to the number of tableware sherds (used as a proxy) below (Figure 6.14).

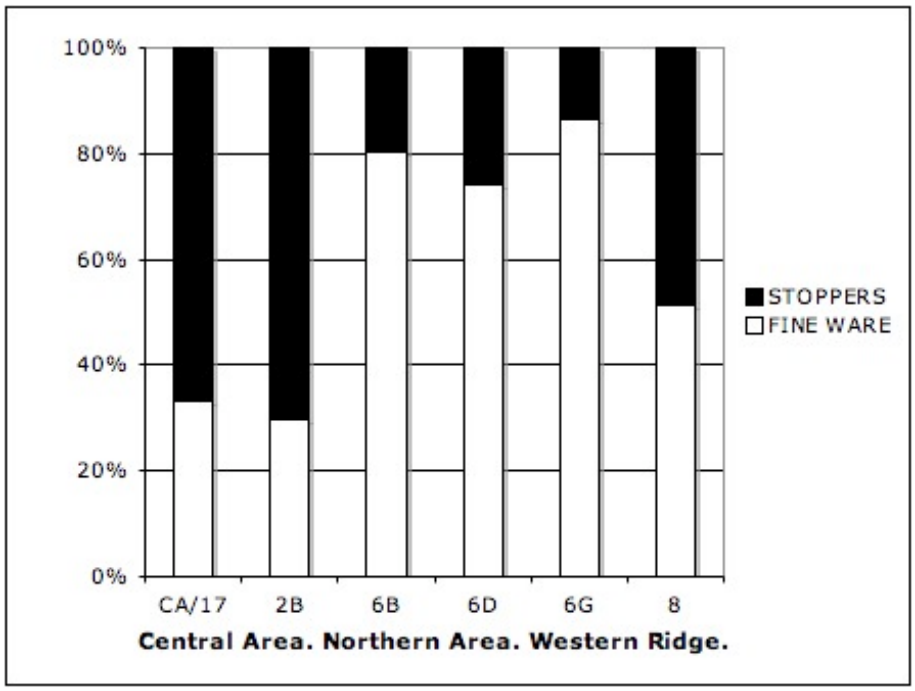


Figure 6.14 The discrepant consumption of wine and oil across *Myos Hormos*, based on amphora stopper data. Ratio of amphora stoppers to tableware fragments. Due to poor preservation, trench 7A was not included. Based on data in Appendice 14.7; Thomas 2008; Thomas forthcoming-b).

The consumption of wine and other liquid commodities was highest in the central area. Whilst wine and oil was consumed in all areas, fifteen times more stoppers were opened by the inhabitants of the central and eastern areas, as were in the north and west. These intra-site patterns signify different consumption practices, representing different access or demand determined by status and/or identity.

6.5 Identity at Myos Hormos

There is a close relationship between the tableware, wine and fauna consumption patterns and what maritime activities were being undertaken at *Myos Hormos*. Nile based diets were eaten with a high quantity of wine and oil out of complete Greco-Roman style tableware services by those involved in the long distance trade at *Myos Hormos*. This group clearly had strong links with populations on the Nile. Those involved in fishing activities had limited access to oil, wine, Nile and Eastern Desert fauna, but instead eat fish out of simple bowl forms, sometimes made of shell. It is likely that at *Myos Hormos* diet and tablewares would have distinguished status. However, this is not the

complete picture. Over three centuries the tablewares used by both groups changed little in form and remained distinct. Differences in diet were particularly marked in the first century AD. By the second century AD, the fishing population appear to have emulated Greco-Egyptian diets to a small degree. There are also clear food boundaries represented by the complete absence of pig in 6D and the general prevalent diversity of Red Sea and hunted desert fauna in some deposits and the absence of transport animals and prevalence of pig and chicken in other 'Greco-Roman' deposits. How these assemblages transformed raw animal meat into food was also different and represented by their ceramic repertoire. The tablewares however if anything become more marked with only specific 'Roman style' forms adopted by the locals, indeed there appears to be an increase in the use of shellfish utensils in the later periods.

The association of 'Greco-Roman' diet and ceramics assemblages with the construction of the harbour facilities (trench 7A) and the occupation of a number of large two storey buildings in the central area, suggest the individuals living and working there were living a Greco-Roman life, in which their Greco-Roman identity was important. These structures were filled with elements of large ocean going Mediterranean ships and represent a range of maritime activities and highly specialised skills such as antifouling and hull maintenance, rigging, sail making, the general maintenance and fitting out of ships for the Indian Ocean trade as well as related (and implicit) subsequent activities of sailing, pilotage, navigation and trade. A relatively affluent, wine consuming Greco-Roman group undertook these activities.

Contemporaneously elsewhere on the site a totally different lifestyle was taking place. Professional fishermen, utilising nets, basket traps, tidal barriers and lines with hooks and gorges on occasion using small fishing vessels to go out to sea, were catching fish from a range of environments in the area. These people ate very different diets and used a more restricted range of ceramic tablewares. They did however use shellfish implements that had a long tradition of use in the Red Sea region (Phillips 2004). These people appear to have borrowed some of the material culture brought by the Romans (red slip bowls for example) and ignored others (such as the platters and cups). They appear to have emulated some of the Roman symbols of status, such as consumption of wine and certain fauna. Despite this emulation it appears from the evidence here that these people continued to be fishermen and do not appear to have consumed tableware and domesticated fauna to the same degree as their merchant neighbors, be it for economic reasons or cultural preference.

One possible exception is the multi-cultural deposits from the northern part of trench 8 from the third century AD (treated together with trench 8 in the analysis above). These deposits from the fauna and tableware assemblages appear local Red Sea in nature, near identical to those from the southern part of the trench that otherwise represent fishing equipment. But the maritime activities associated with these deposits may represent ship maintenance and trade. Certainly Indian and Aksumite ceramics are represented in this assemblage. Whether the inhabitants of this area are indigenous peoples somehow facilitating Erythraean Sea trade undertaken by non Greco-Roman foreign traders (Aksumites or Indians?) is not certain during the unstable times of the third century AD.

7 Berenike

Approximately 300 kilometres (200 miles) east of Aswan and 800 kilometres (500 miles) south of Suez, *Berenike* is on the west coast of the Red Sea. Identification of the site was clear from the numerous classical accounts (Agatharchides; Strabo; Diodorus; Pliny; Ptolemy) describing a nearby headland called *Lepte Acra* (modern Ras Banas). *Berenike* was first identified by Juan de Castro and d'Anville in the seventh century and subsequently rediscovered by Belzoni in 1818. Wilkinson mapped *Berenike* in the early nineteenth century, as did Murray in the 1920's and Meredith in the 1950's. Wellstead excavated *Berenike* in the 1930's, concentrating on the highly visible temple of Serapis (Wellstead 1938). Subsequently *Berenike* and the surrounding area have been extensively researched by Delaware and Leiden University from 1994 to 2001 (Sidebotham & Wendrich 1995; 1996; 1998; 1999; 2000; 2008; Sidebotham 2002b), who confirmed the identification of the site with conclusive epigraphic evidence (Bagnall et. al. 2000). Excavations at *Berenike* have revealed a substantial settlement occupied from its founding in 275 BC by Ptolemy II (Philadelphos), king of Egypt, who named it after his mother, Berenike I, to the mid sixth century AD. The most important reason for creating this new harbour was the need of the Ptolemy's for war elephants (Murray & Warmington 1967; Casson 1993). However, this sheltered port made this an obvious location as an anchorage and it is likely that this and the already established infrastructure helped the growth of *Berenike*'s secondary function as a Red Sea trade port during the late Ptolemaic period. When Egypt was annexed in 30 BC, the growing interest in the Erythraean Sea trade and possibly also *Berenike*'s role as a military and administrative centre caused major demographic and physical changes to the fabric of this polis.

7.1 The landscape around Berenike

Berenike was linked to its immediate hinterland and further afield by road, track and sea. For this reason *Berenike* cannot be understood in isolation, but instead as part of various landscapes. The various landscapes (including seascapes) around *Berenike* have been influenced by human agency in a number of different ways. The Eastern Desert and its coast have been marked by a number of obvious and ephemeral features that represent human activities including moving through, subsisting in and exploiting the sea and desert.

The seascape is the least studied element of *Berenike*'s hinterland, partially because of the ephemeral nature of its archaeology. Along the coast a number of manmade features have been surveyed (Sidebotham 2002b) or noted by navigators (Morgan & Davies 2002). These relate to occupation and exploitation of the sea for food by indigenous populations and its use for maritime long distance trade. Pottery scatters, structures, burials and shell middens represent occupation, whilst cairns, ports, wrecks and natural anchorages represent sea navigation. Roman ports between *Berenike* and *Myos Hormos* are few, with *Nechesia*, 100 miles to the north, the only example confirmed (Seeger 2001).

Nechesia was also connected to *Berenike* by the *Via Hadriana* and contained one of the few forts along that route (Sidebotham & Zitterkopf 1997; 1998; 2000). In adverse wind or sea conditions natural anchorages could have provided short-term havens. Along the coast between *Berenike* and *Nechesia* and in the 'Bay of the *Ichthyophagi*' south of *Berenike*, manmade shell middens near natural havens suggest indigenous fishermen and shellfish gatherers occupied these sites. Offshore reef anchorages also could provide short term safety, though these anchorages could easily become hazards in the wrong conditions and wrecking is preserved in both the historic (Agatharchides *On the Erythraean Sea*: 5.85) and archaeological record (for example wrecks known from Fury Shoal, Quseir al-Qadim and St Johns Reef (Amsler & Ghisotti 1996; Haldane 2001). Dangerous shallows and reefs would have prompted sailors to give the coast south of *Berenike* a wide berth (Agatharchides *On the Erythraean Sea*: 5.85). En route south is 'Snake Island' (modern Gaziral Zabargad, or St John's Island) which possessed precious stone (periodot and olivine) mines just south of the summit of the island (Davies & Morgan 1995) and was served by poor anchorages to the west and possibly north. This island would have required provisioning from *Berenike*, something attested in the historic record (Agatharchides *On the Erythraean Sea*: 5.84). Evidence for fishing, shellfish collection and sailing are often geographically closely related, as cairns, burials, occupation scatters, structures and ancient shell middens (occasionally with associated stone tools) and fish traps (though they cannot be securely dated) are often in the immediate vicinity of natural anchorages. The presence of cairn burials, cairns and middens, on the coast suggest that their visibility from the sea was significant. Certainly ancient authors recognise this (Agatharchides *On the Erythraean Sea*: 5.36). Some pottery and stone tools have been found in association with shell and fish faunal remains from shell middens or occupation sites on the coast (Sidebotham 2002b). However, very little else is known of the indigenous coastal populations of the Eastern Desert, other than the inhabitants of the Roman ports, something that is unlikely to change until excavation of a midden site is undertaken.

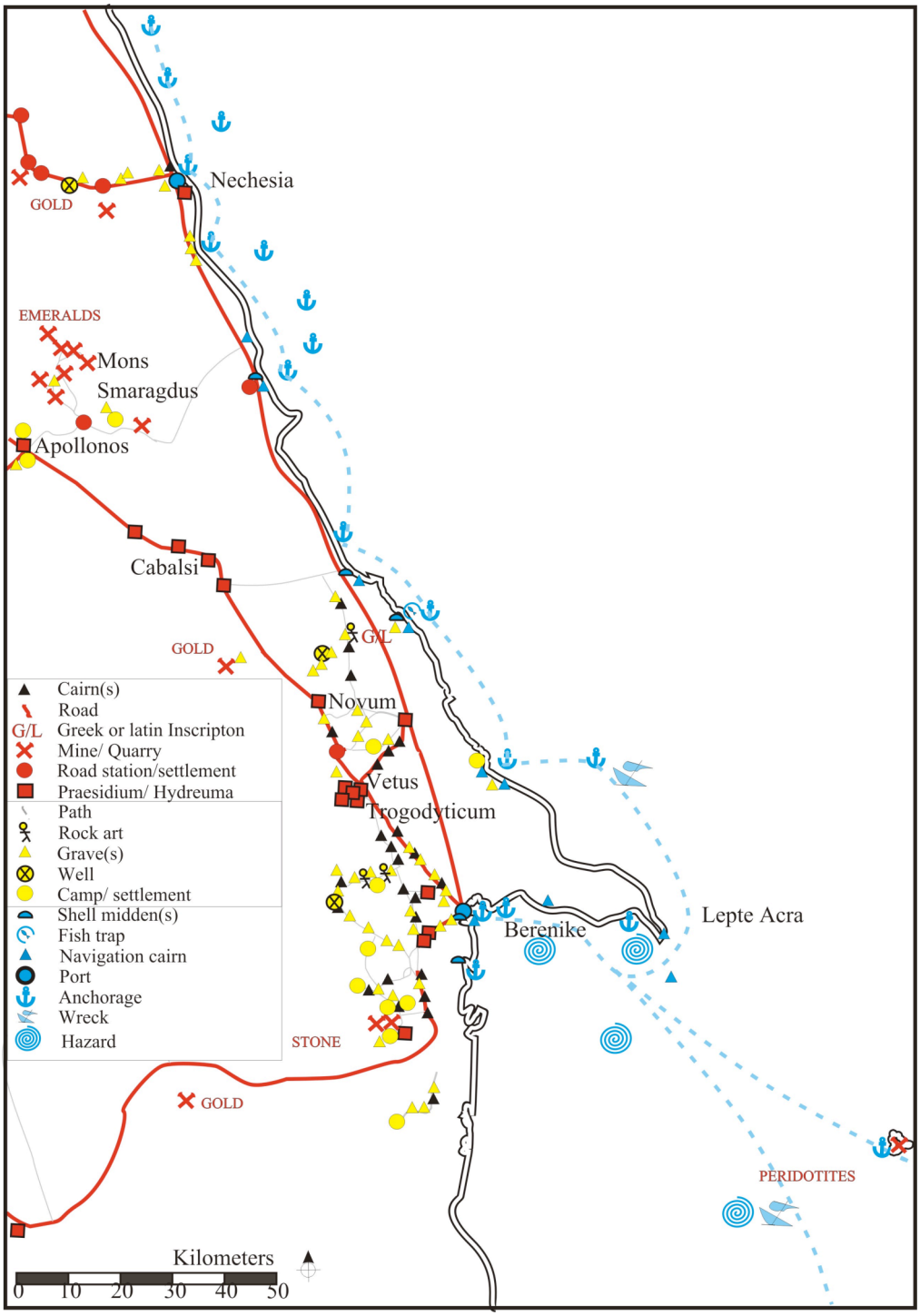


Figure 7.1 *Berenike* hinterland (after Sidebotham & Wendrich 1999: 350; Davies & Morgan 1995; Sidebotham et. al. 2004: 7-8; Sidebotham pers. comm.)

Perhaps the most obvious human activities relate to controlling movement through the desert. Roman roads link the ports, mines and quarries of the Eastern Desert. These rather simple roads were often little more than cleared tracks, in some places built up where ground was difficult, marked by cairns (Sidebotham et. al. 2004), guided by towers (Zitterkopf & Sidebotham 1989) and guarded by forts (Sidebotham 1991; Sidebotham et. al. 1991; Sidebotham & Zitterkopf 1995; Maxfield 1996; Bülow-Jacobsen 1998; Sidebotham 2002a; Cuvigny 2003a). Each fort (Praesidium or Hydreuma) had a water supply provided by a well or a cistern supplied by wadi runoff (ibid.). Examples of these in the vicinity of *Berenike* include those at Shenshef, Wadi Lahmi, Kallalat,

Siket and hydreuma whose classical names are known as *Vetus Trogodyticum*, *Novum, Cabalsi* and *Apollonos* (Sidebotham 2002a). Where large numbers of animals were passing animal lines are found (such as at *Mons Smaragdus*, or in the quarry areas of the northern Eastern Desert. Sidebotham et. al. 2004).

The main routes linked the Red Sea ports with the Nile. In *Berenike*'s case the *Via Hadriana* (Sidebotham & Zitterkopf 2000) linked it to *Antinoopolis* and the other Red Sea ports and the *hordos Berenike* linked it to Koptos. Along these routes rock art (often depicting ships) and Greek or Roman graffiti mark places where camps were made for short rest stops. Another route appears to have linked *Berenike* with *Syene* (Aswan), though this Ptolemaic road looks to have been all but abandoned by the Roman period (Sidebotham & Zitterkopf 1995). Off the major roads, a number of routes to mines and quarries providing precious stones, building stone and gold were policed. In the immediate vicinity of *Berenike* there were gold mines at Mweillah, el Ileya and Umm Howeitat, large emerald mines at *Mons Smaragdus* and a quarry in Shenshef (Sidebotham & Wendrich 2000).

The most pressing requirement of *Berenike* must have been water. This was provided by a number of wells within fortified Hydreuma at Kallalat, Siket and possibly the five forts at *Vetus Trogodyticum*, though it is thought that Kallalat would have been the primary source of water for the settlement (Sidebotham & Wendrich 2000: 363). The fact that all the water resources were so heavily guarded, illustrates the insecurity of the Roman military administration in the region.

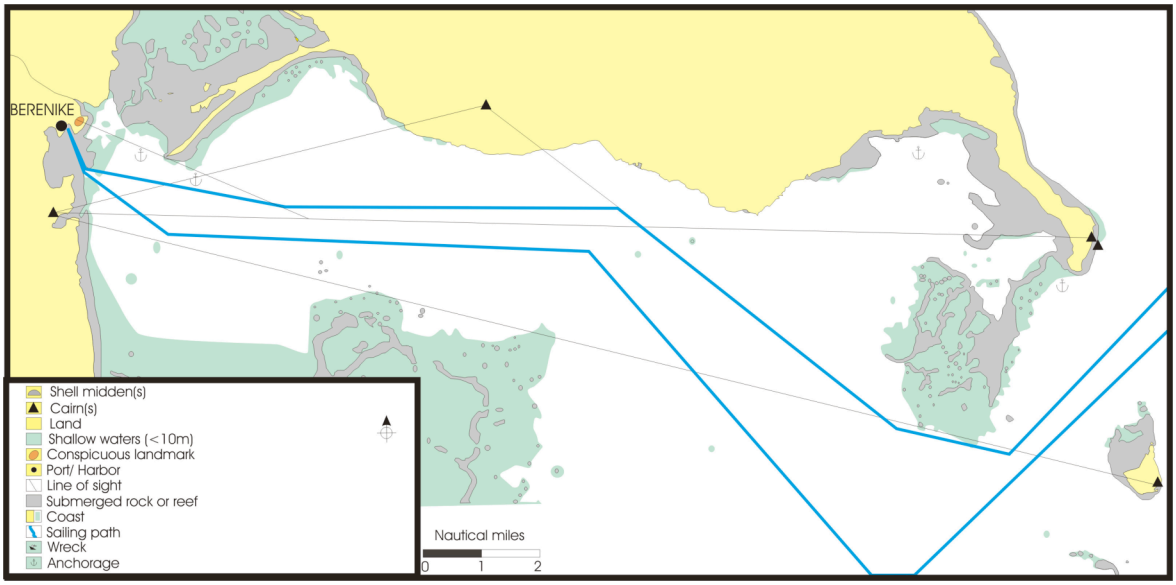


Figure 7.2 *Berenike* approaches (after Admiralty chart 3043, Davies & Morgan 1995).

In the immediate hinterland of *Berenike* there is evidence of another population. Off the main Roman roads, cairns, rock art and burial cairns are dotted along wadi paths and passes. Easily visible these features link together a number of camps, settlement and well sites (Figure 7.1). The cairn burials are quite distinct from Greco-Roman style burials, being made of a substantial circular stonewall up to a meter high (Barnard 1998). This burial tradition is very similar to that found in parts of Sudan and Nubia (Sadr 1994; Sadr et. al. 1994; Sadr et. al. 1995) during the same period

and represents a change in burial technique roughly contemporaneous to the introduction of Eastern Desert Ware pottery, that appears in the third century AD (Strouhal 1984; Strouhal 1991; Barnard 2002; 2004; Barnard 2005). The occurrence of settlements, wells and burials off the major Roman roads suggests that these features represent indigenous nomadic populations that inhabited the area known as *Trogodyticum* to the Greeks and Romans.

The hinterland of *Berenike* was vibrant and busy, with numerous different activities represented in the landscape. Roman exploitation of the Deserts resources and Roman control of water, mineral and communications in the Eastern Desert was significant, but not complete. Nomadic populations lived on the periphery of the Roman road landscape and are likely to have interacted regularly with the inhabitants of *Berenike*. Similarly coastal populations of *Ichthyophagi* are archaeologically visible along the coast, often associated with areas that may have been used as emergency anchorages for ships involved in the Erythraean Sea trade. The importance of this hinterland as a network for supplying *Berenike* with water, food (sheep, fish, shellfish and products from the Nile), security, building supplies and mineral wealth cannot be understated. Also it would have supplied people, whose skills are not so easy to assess here, though may have operated as guides, pilots and translators. Natural landmarks were marked cairns, recognised in archaeological surveys and also pilots of the region. These may be aligned with other natural or manmade features for navigation purposes as they are today. This appears to be confirmed by the location of such sites near to known good anchorages (Figure 7.1 and 7.2). It is also possible that these cairns (graves or even middens) were erected to help identify good fishing grounds, as were customary in various cultures, such as traditional Maori accounts of named *tohu* or landmark signs (Barber 2003: 446).

7.2 The cityscape of Berenike

Detailed survey of Berenike illustrates the sites busy architecture laid out on a promontory jutting out east into the sheltered waters in the shadow of Ras Banas (Figure 7.2), yet this only represents the final phase of the sites occupation from the late fourth through to the mid sixth century AD. *Berenike* clearly changed form during various phases of its occupation. The terminology used here for the different regions of *Berenike* is outlined in Sidebotham and Wendrich (2007: 4-18). The Ptolemaic and early Roman period site was significantly different and numerous major construction phases during the first and second centuries AD significantly changed the topography of the site.

Berenike did not always look like this, however. From its foundation in c. 275 BC, *Berenike* was positioned to the southwest of the promontory (Figure 7.3), behind a substantial earthwork that is thought to represent harbour installations of some kind (Sidebotham 2007). The precise date and function of this feature is as yet untested by excavation. Whilst there appears to have been some refuse dumping (trench 16) and limited construction (trench 13, Figure 7.3) inside the promontory at this time, the western area appears to have been the focus of the Ptolemaic settlement, especially industrial activities probably relating to the maintenance of ships. This area is

particularly densely filled with lead sheeting and pitch fragments that are likely to relate to hull maintenance. The presence of hearths (trench 36) are reminiscent of similar facilities on the foreshore at *Myos Hormos*. Activity in these facilities started in the early Ptolemaic, through to the late Ptolemaic period. Early Roman activity is represented, though it is likely that the main site relocated onto the promontory at some point during the Augustan period. A magnetometry survey prompted excavation of what was later to be labelled the Ptolemaic industrial area. Magnetic anomalies from a magnetometry survey in the area discovered a large number of metal finds such lead sheeting, iron nails, copper tacks and fittings (Sidebotham 2007), thought to be for ship maintenance (Thomas & Whitewright 2001). To the east of this, topographic survey suggests a harbour of Ptolemaic age around an inlet (Sidebotham & Wendrich 2001; Sidebotham 2004) underneath early Roman structures. Around this area a large quantity of basalt ballast, found to originate from South Arabia (Peacock & Blue 2006; Peacock et. al. 2007). Around the western area a number of shell middens were found amongst the industrial activity. It is possible that these represent the more indigenous elements of the town's demography, although these too are not dated (Figure 7.3).

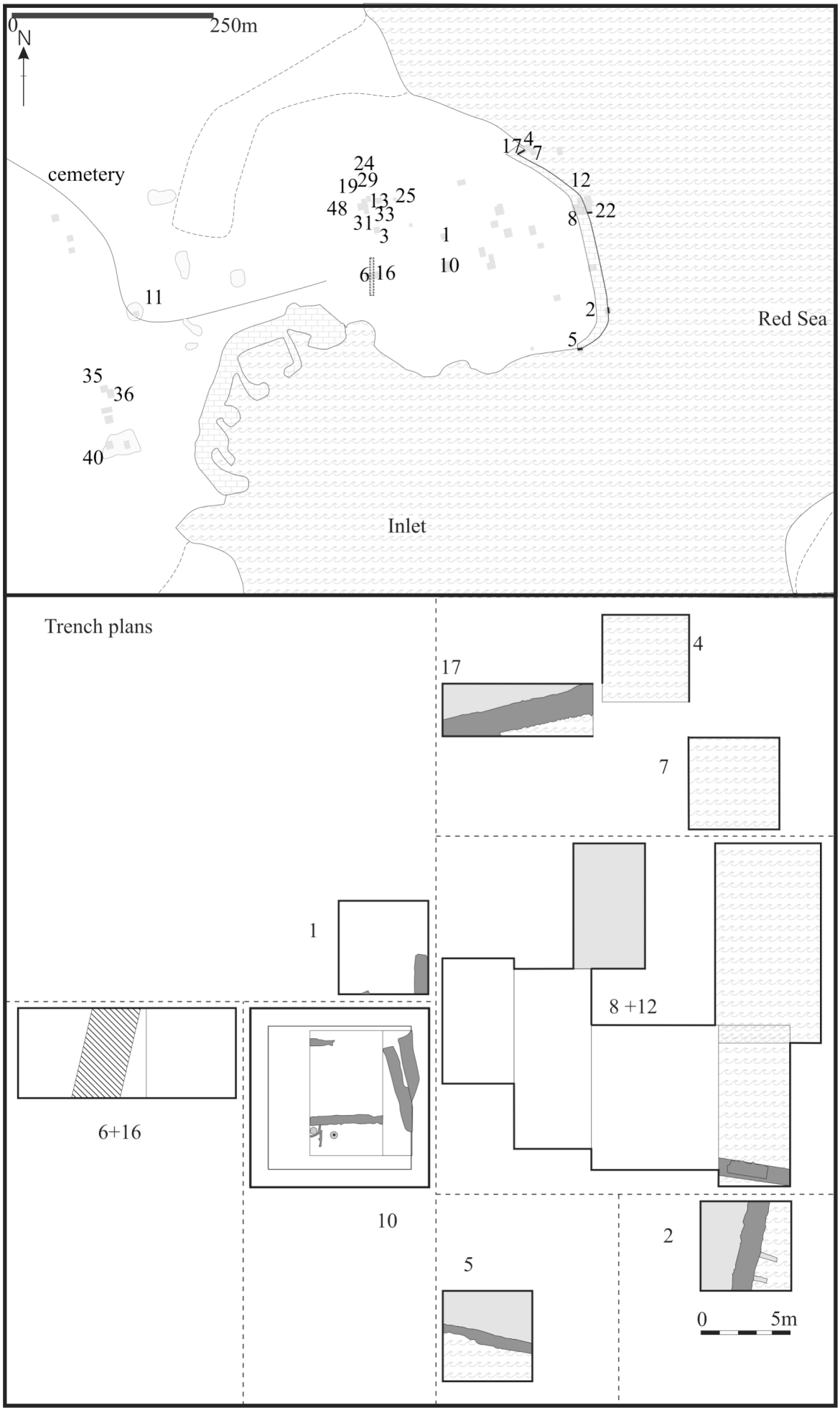

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Figure 7.3 First century AD *Berenike* (after Sidebotham & Wendrich 1996, 1998, 1999, 2000, 2007).

During the Augustan period it appears that there was a major phase of construction that saw the laying of a pottery fill across the eastern portion of the promontory and various sea walls, breakwaters and piers (Harrell 2008: 167-8). The pottery fill appears to have served two purposes, one to create a solid surface at the intertidal zone, secondly to reclaim land from the sea and thirdly to provide a foundation on which to construct sea defences and piers. Whilst this phase has only been accessed in limited areas of the excavation, it is clear that this was a major event or series of events that greatly increased the size of usable space on the promontory for harbour facilities. This may have been stimulated by the silting up of the Ptolemaic harbour facilities. There is some evidence of earlier marine facilities in trench 17, where underneath an Augustan 'seawall' (Harrell 2008: 168), there is evidence of some form of wooden pier or groin piled into the marine deposits of the foreshore (Sidebotham & Wendrich 2000: 74; Figure 7.3).

The durability of the Augustan phase of construction was sorely tested by repeated silting episodes during the first century AD, with repairs and rebuilds aimed to combat breached sea defences occurring independently in different trenches after at least two flooding episodes, one in the mid first century AD, the other mid to late first century AD. One of these episodes prompted major alterations to the seawall in trench 17, which was rebuilt and backfilled to the north with a pottery fill creating a raised surface (Sidebotham & Wendrich 1996; 1998: 50; 2000: 75) not unlike that found at trench 15 in *Myos Hormos* (Thomas 2007).

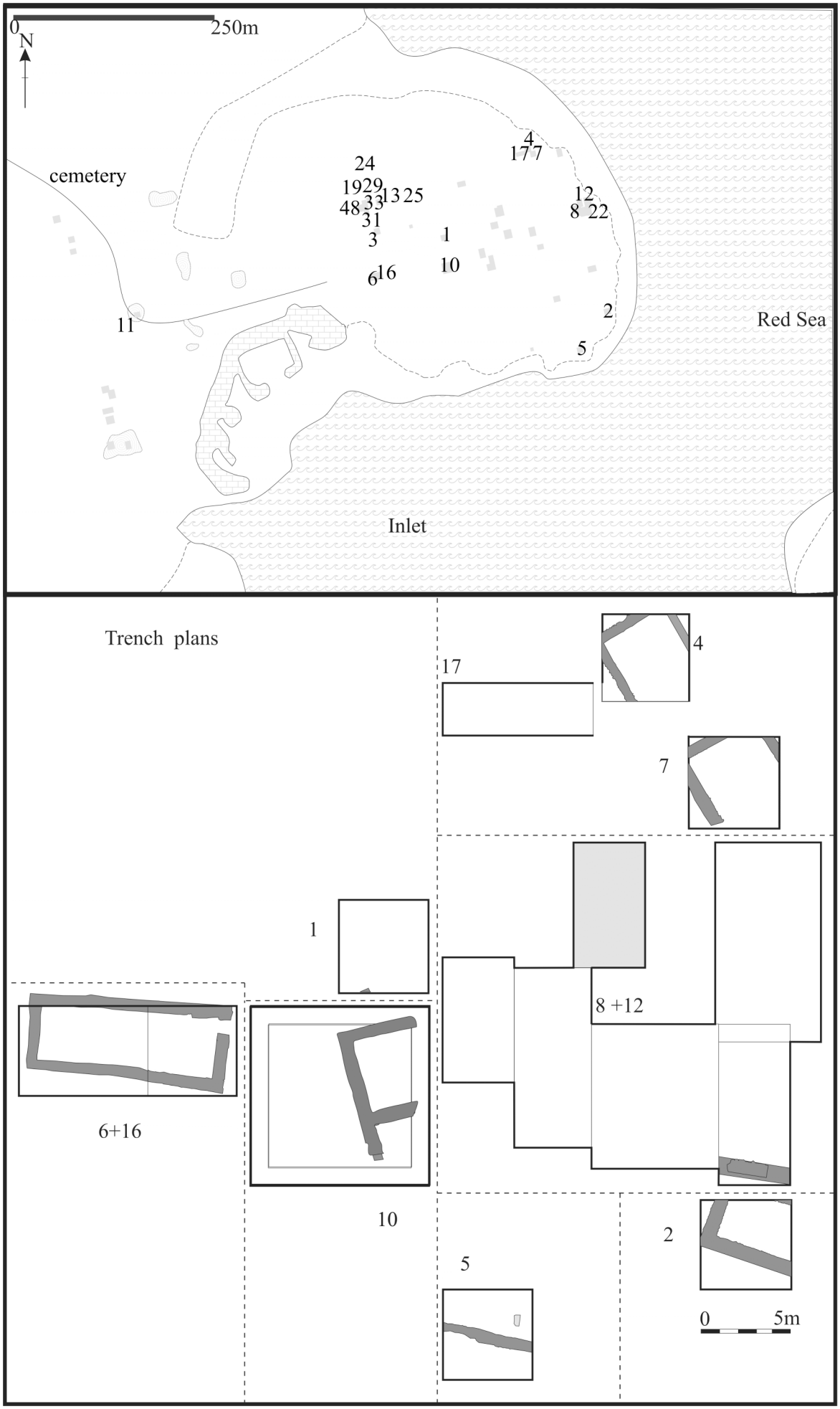

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Figure 7.4 Second century AD *Berenike* (after Sidebotham & Wendrich 1996, 1998, 1999, 2000, 2007).

A third major flooding episode in the early second century AD saw the sea defences in trenches 4, 7, 17 and 2 covered with silt that appears to have prompted a second major phase of land reclamation pushing the foreshore eastwards. At the beginning of the second century AD a number of small rectangular buildings were constructed over the sea defences. The occupation of these structures was however short lived in the north of the site with flooding damaging the building during the second century AD. This northeastern area then appears to have been used as a working surface during the second and third centuries with a series of reinforced postholes (possibly for propping boats up) and a child burial the only other evidence for activity here at that time.

The town centre started to become established during the first century AD. A north-south boundary ditch 2.6 meters wide running through trenches 6 and 16 probably marks the western extent of the main settlement area at the beginning of the Roman occupation, the northern extent of occupation is encroached by a large c.30 x 70m Roman dump that has been extensively excavated (trenches 3,13, 19,24,25,29, 31,33,48).

Early Roman structures excavated in the town centre include first to third century AD buildings and domestic occupation in trenches 1 and 10, although much of the settlement was not excavated below the fourth to fifth century AD occupation phases. It is worth noting that much of the domestic occupation deposits and refuse would have been dumped in the Augustan and first century AD land reclamation exercises undertaken in the east of the site.

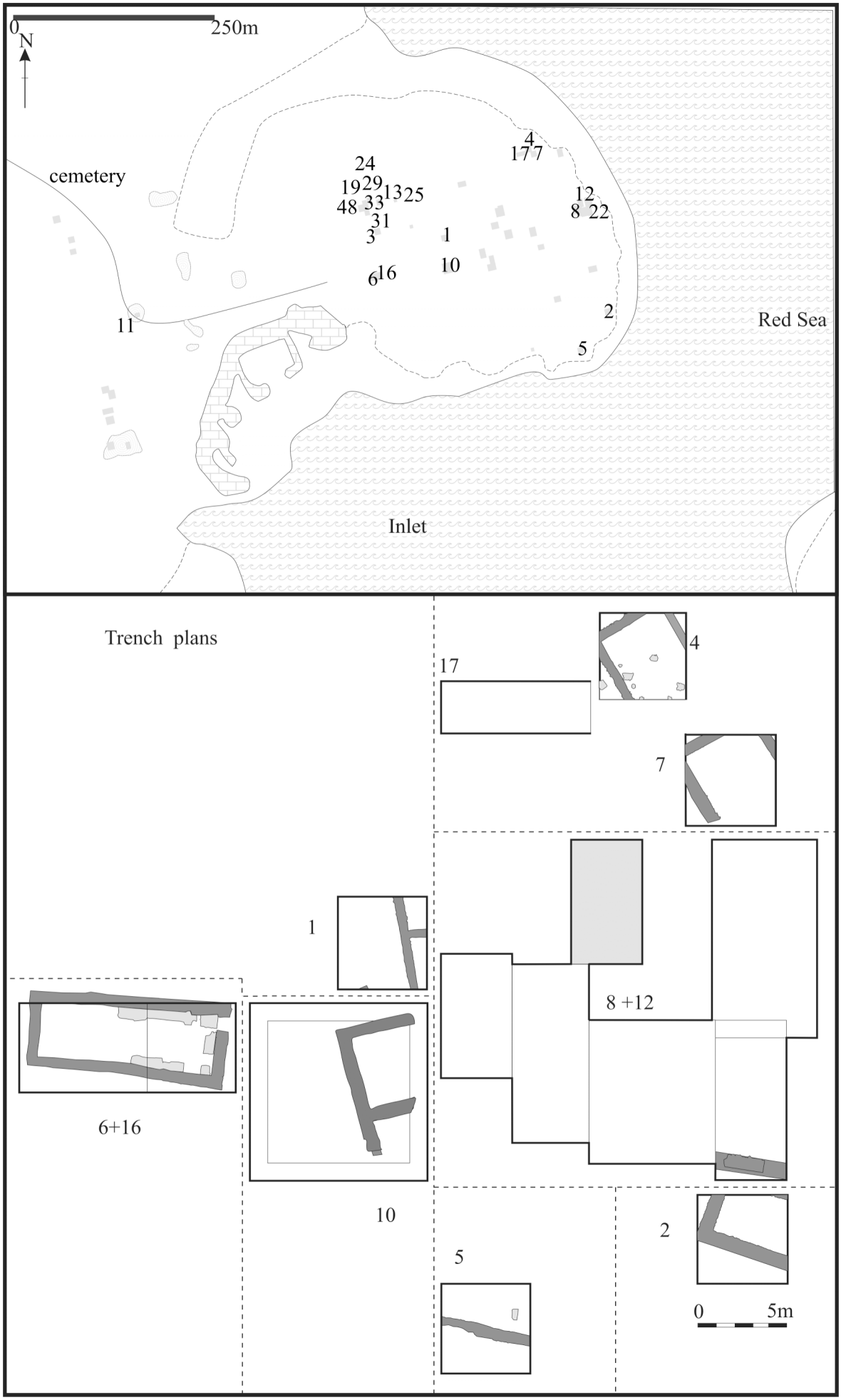

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Figure 7.5 Third century AD *Berenike* (after Sidebotham & Wendrich 1996, 1998, 1999, 2000, 2007).

During the second and third centuries AD the growing town spread westwards over the boundary ditch. A number of shrines appeared at this time catering for the various religious denominations of auxiliaries, soldiers and traders that made up *Berenike*'s cosmopolitan demography. Pagan shrines were found just to the west and south of the main settlement, in the Serapis temple excavated by Wellstead, a pagan shrine in trench 10 and a Palmyrene one in trenches 6 and 16.

An early Roman dump is to the northwest of the town centre, just north of the suggested entrance to the site (Sidebotham & Wendrich 2001). It covers Ptolemaic mudbrick structures (trench 13) and a first century BC windblown sand layer. The majority of the deposits date to the mid and late first centuries AD, though they do often have an earlier component that is most likely residual. Second century AD is limited to a grave cut in trench 48 and fourth to fifth century AD activity is rare, present only as disturbed surface deposits of otherwise first century AD deposits.

From the material available only a limited number of deposits could be analysed with regards to the publication of the ceramic and faunal assemblages. No doubt this will change once the site is fully published. In the interim there is enough evidence for extensive intra-site analysis. The maritime artefacts have been identified from a mixture of publications and the finds archive. The trenches vary greatly in location, function and date (Table 7.1). The material is quantified by number of fragments allowing direct comparisons to be made between pottery sherds, bone fragments and maritime artefacts. However, the *Berenike* archive occasionally grouped an unspecified number of related items together under a single registration, which can influence the accuracy of statistical analysis.

7.3 Maritime activities at Berenike.

Numerous maritime artefacts have been discovered at *Berenike*. Each represents a different activity, skill or specialisation. The dataset includes the presence of three main groups of maritime artefact discussed in Chapter 4; fishing, rig and sail and hull elements. Fishing artefacts include fishing line hooks, gorges, floats and weights, fishing nets, creels, fishing pot, net weight and floats. Sail and rig artefacts include brail rings, sails (including reinforcement strips) and sheaves. Hull elements include planks, tenons, dowels, treenails, lead sheathing, copper tacks and pitch resin[6]. Other artefacts include fragments of an anchor and an oar. The seven distinct areas described above had very different assemblages (Figures 7.6, 7.9, Table 11.3, Table 14.4, Appendice 14.2).

Maritime artefacts account for just 2% of all small finds found at *Berenike*, however their distribution across the site differs greatly. Fifteen trenches (mostly late Roman trenches) possessed

[6] Other, not so conclusive evidence for maritime activities are discussed below, though not included in the tabulation or displayed in the pie charts.

no identifiable maritime artefacts at all, whilst the majority of the small finds from the dump (trench 13) were of maritime function.

Maritime artefacts accounted for 5.5% of all small finds registered from the Ptolemaic industrial area to the west. This was all concentrated in only three (trenches 11, 40 and 36) of the seven trenches in the area. In general the area provided substantial evidence for hull repair in the form of copper alloy tacks and lead sheathing. Sidebotham suggests that a number of large (>200mm) copper alloy nails found in the area may also have been used in hull and ship frame construction, though this cannot be conclusively confirmed (Sidebotham, 2007: 2). Fishing (2 artefacts) and sail maintenance (2 artefacts) were generally poorly represented in this area. Hull maintenance was particularly concentrated in trench 36, including some 95kg of lead sheets from this trench alone (Sidebotham 2007: 3). No other maritime activities were represented in this trench. The limited number of maritime artefacts found in trenches 11 and 40 had some evidence of sail maintenance in the form of brail rings and also possessed a net weight, though hull maintenance was the most prevalent activity represented there.

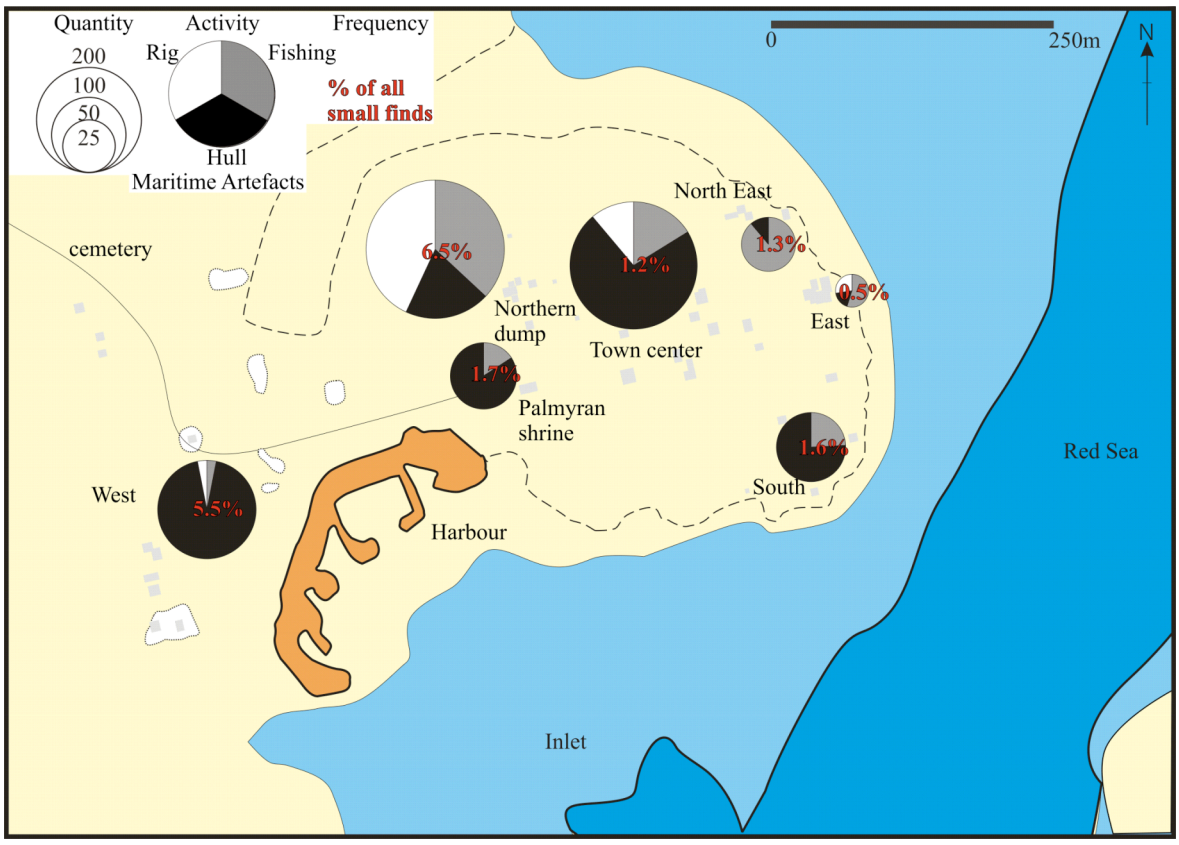


Figure 7.6 Distribution of maritime artefacts at *Berenike*. Displays the quantity of artefacts (size of pie chart), the percentage of small finds that were maritime (in red) and the proportion of maritime artefacts that represent rigging including sailmaking (white sectors), hull maintenence including antifouling (black sectors) and fishing (grey sectors). Figures represent data from the late Augustan to third century AD. Based on data in Table 14.4, Appendice 14.2.

Despite extensive excavation and a reasonable quantity (175) of maritime artefacts found, maritime artefacts account for only 1% of all small finds found in the town centre. Quite a variety were

found, including elements of sail and rig (12), fishing hooks and nets (31), but mainly elements of hull (132). The hull elements were mostly re-used planks used in construction and may not actually signify ship maintenance, but rather reuse of limited available wood resources. Of the 175 maritime artefacts found in the town centre only 15 were found in secure early Roman contexts of trenches 1 and 10, none were found in early Roman contexts in trench 37. Two percent of small finds from trench 10 were maritime in nature and the first to third century AD deposits produced exclusively secondary re-used ship timbers within the architecture. One percent of finds from trench 1 were maritime, though they were almost exclusively fishing artefacts. The third century AD occupation deposits produced two fishhooks and a net.

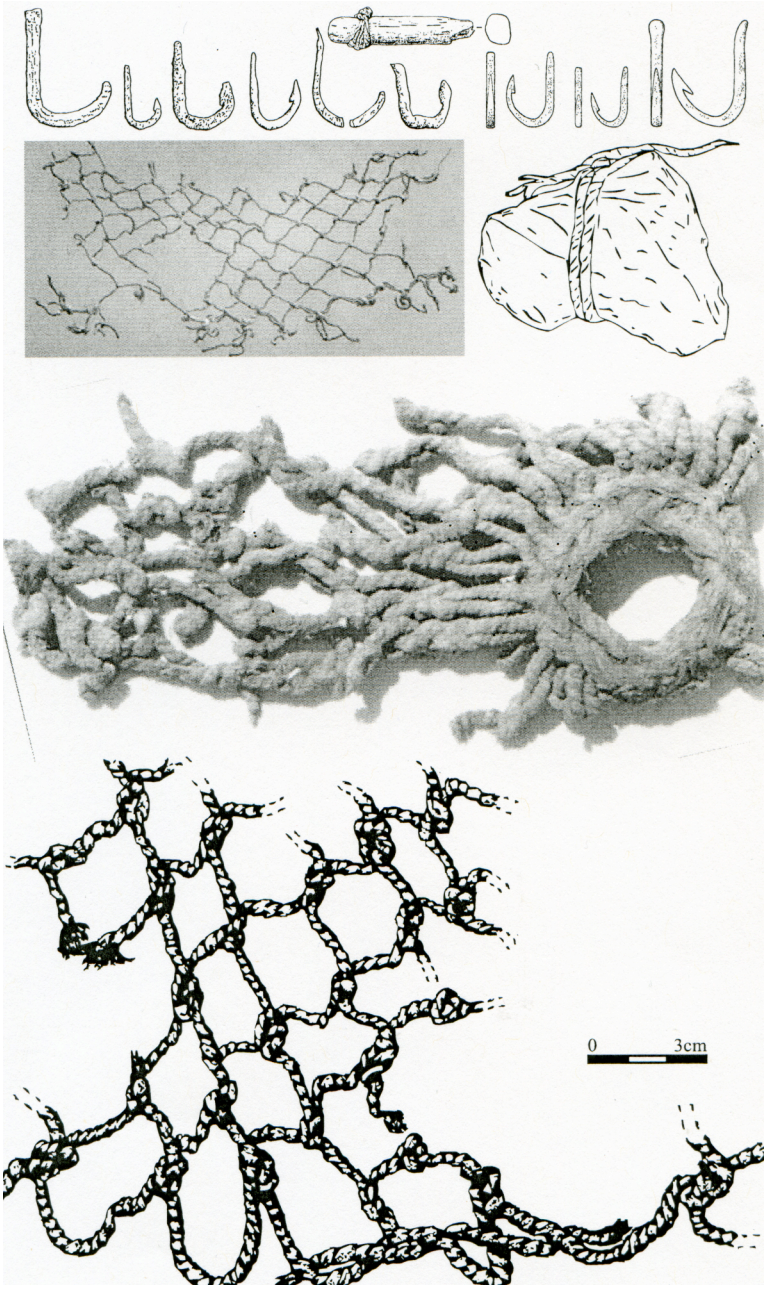


Figure 7.7 Fishing equipment from *Berenike* (after Veldemeijer 2004: 102-4; Veldemeijer & Van Roode: figures 6B, 7A).

From this analysis it would appear that maritime activities were not significant to the inhabitants of the centre of town. What limited evidence for maritime activity can be suggested is the re-use of

ship timbers and is a local architectural feature of the coral building construction, rather than evidence for maritime vocation or identity.

Nearby the Palmyrene and pagan shrine (trench 6/16) was also constructed from numerous pieces of re-used ship timber and was associated with some fishing equipment accounting for 2% of all small finds in this area. However, the timber probably relates to a fourth century AD rebuild. Fishing hooks and weights were rare and mostly from late Roman deposits. Only one-third century hook and a few copper tacks can be securely dated to the early Roman period, suggesting that maritime activities were not associated with this trench.

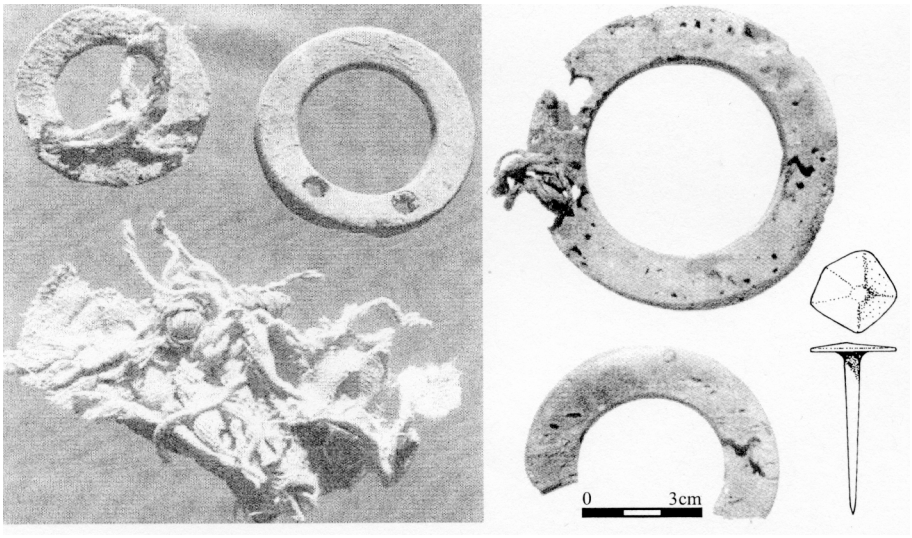


Figure 7.8 Ships sail, brail rings and hull tacks from *Berenike* (after Hense 1998: 202; Wild & Wild 2000: 268; Sidebotham 2007: 52).

The northwestern dumps were exclusively early Roman in date and provided the most detailed evidence for maritime activities at *Berenike* due to their good preservation. They contained many maritime artefacts (260 examples or 6.5% of all finds), consisting mostly of elements of sail and rig (108), though evidence of hull maintenance (51) and fishing activities (100) were also represented. An oar was found. However, the distribution of these artefacts was uneven and varied in composition. The maritime artefacts found in trenches 3, 13 and 24 consisted mainly of fishing gear (75 to 100%), though maritime artefacts accounted for 80% of all artefacts found in trench 13, whilst they accounted for only 2 to 4% of all artefacts from trenches 3 and 24. In trenches 19, 29, 31 and 48, maritime artefacts accounted for a steady 4 to 7% of all artefacts and consisted mostly of sail and rig elements. Trench 33 had 7% maritime artefacts, mostly evidence of hull repair (38). Associated mainly with ship maintenance (29), the maritime artefacts from trench 19 (5% of all small finds), were found alongside many wood chips, evidence of carpentry in the area (acacia, mangrove, bamboo, oak, Indian and Rhodesian teak, elm, beech, coniferous, palm, tamarisk and sandalwood, Vermeeren 2000a). Much of this debris probably represents the work of shipwrights, though this cannot be prooved. Trench 25 had no maritime artefacts at all, although teak and coniferous wood chips were found on the surface. From this it would appear that maritime

activities were producing a significant amount of the rubbish dumped outside the main settlement of *Berenike*.

Maritime activities differed between trenches and it is not surprising that those trenches that are geographically close have similar compositions (19, 29, 31 and 48). Ship elements are represented in the west of the dump (19,29,31,33 and 48), where refuse from various ship maintenance activities were deposited. Woodworking on the hull and elements of the rig (such as brail rings or sheaves) involved reusing various types of wood, mostly imported from East Africa or India (Vermeeren 2000-a). No maritime artefacts were found in the dump (25) closest to the town centre, which is known not to represent significant maritime activity (discussed above) and whilst some evidence of wood working was noticed there, this may have been for architectural or domestic reasons rather than maritime. Fishing equipment was associated with the periphery of the dump (3, 13 24) and maritime artefacts in general were particularly dominant in trench 13.

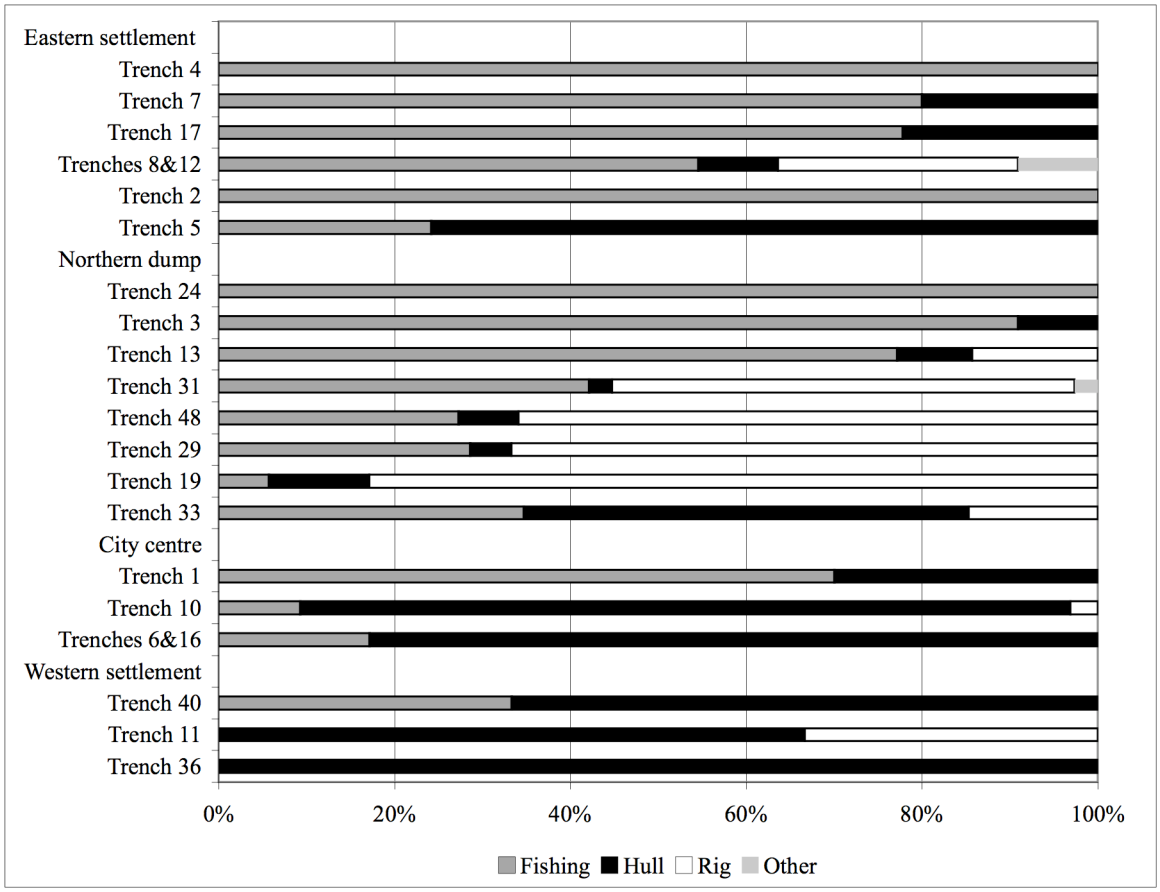


Figure 7.9 Relative proportion of maritime artefacts at *Berenike* (data from *Berenike* archive, Table 14.4, Appendice 14.2). Though the sample size from each trench varies significantly (0 to 97) each area has between 11 and 260 maritime artefacts and the pattern for each area is repeated in each trench, visible in the graph above. Statistical significance recognised in Appendice *14.9*, Table 14.12.

On the eastern shore only 11 Early Roman maritime artefacts were found in the environs of a late Roman Church (trenches 8, 12, 22, 30, 39, 46, 50-53), which accounts for under 0.5% of all artefacts from that area. This is perhaps not surprising due to its function as a church in the late Roman period and the only limited excavation of early Roman deposits beneath. The few artefacts

found consist of an even distribution of hull, sail and fishing equipment and part of an anchor. None of these artefacts could be securely dated to the early Roman period construction of the pier and the associated pottery fill. South of the late Roman Church, more substantial excavation of the southeastern shore was undertaken in trenches 2 and 2.3% of the artefacts found here represent maritime activities (30). A number of fishing artefacts were found in deposits post-dating the construction of the sea defence in trench 2 in the first through to third centuries AD. Fishing equipment and hull maintenance fragments of lead sheathing and resin possibly used for waterproofing were found behind the sea defence in trench 5, associated with major industrial activity in what was known as the 'iron phase' (second to third centuries AD) because of extensive (but corroded) iron and other metal finds found there. Poor preservation has probably limited the number of identifiable maritime artefacts found there.

On the northeastern shore the pier and subsequent early Roman structures excavated in trenches 4,7 and 17 (trench 26 did not reveal any early Roman structures) were associated with 27 maritime artefacts (1.3% of all artefacts found in that area) that mostly consisted of pieces of fishing equipment, including hooks, weights and floats. Fragments of lead and pitch were also found in trench 17 and the presence of two parallel lines of stone reinforced postholes 3.6m long and c. 2.5m apart may represent the 'blocking up' of a small boat hauled for hull maintenance. 'Blocking up' is the use of struts to support the weight of a ship or boat hull so as to be able to access the hull to maintain, antifouling and repair the hull. Other evidence for hull maintenance comes in the form of lead fragments from trench 17 dating to the first century AD, pitch fragments from subsequent fourth century deposits also from 17 and pine planks in the contemporaneous second to third century building in trench 7.

7.4 Consumption practices at Berenike.

A wide variety of species were consumed at *Berenike*, from different environments accessed by different technologies (Table 7.3). *Berenike* is in a very arid environment, next to the Red Sea. This means that desert and/or Red Sea fauna are locally available to those with the skills necessary to access these resources. Also Nile livestock, poultry and fish were imported specifically for food (Table 7.1). Finally Nile transport animals were also consumed. These were distinguished from Nile livestock as their primary function for transport may denote these as low status meat. The different species represented are as follows:

Red Sea species	Desert species	Nile species	Transport animals
Reef fish	Sheep (domestic)	Cattle	Camel (dromedary)
Pelagic fish	Goat (domestic)	Pig	Horse
(including sharks)	Dorcus gazelle	Chicken	Donkey
Sandy bottom fish	Barbary Sheep	Goose	
(including rays)	Ibex	Nile Catfish	
Migratory birds	Ostrich	Hippopotamous	
Turtles	Hare and Fox		
Dolphin	Lion and Leopard		
Dugong	Snakes and Lizards		

Table 7.1 Fauna representative of different environments consumed at *Berenike*. Excluding vermin, elephants, dogs, cats and invertebrates (note edible snails, Red Sea bivalves, crustaceans, echinoderms and molluscs were identified, after Van Neer et. al. 1996, 1998, 1999).

When considering the consumption of these species, it became apparent that there were three distinct patterns visible (Figure 7.10). Firstly, diets reliant on Red Sea fauna (80% to 95%) were present (henceforth Red Sea diet). Secondly, diets reliant on desert fauna (50% to 93%) were present (henceforth Desert diet). Thirdly, there were diets reliant on Nile and transport animals (over 30%) that were supplemented with desert and Red Sea fauna (henceforth Nile diet). There were mixed diets. It is also apparent that whilst the distinction between Desert and other diets were clear, that between Red Sea and Nile diet was not (as represented by trench 2 in both the first and second centuries below).

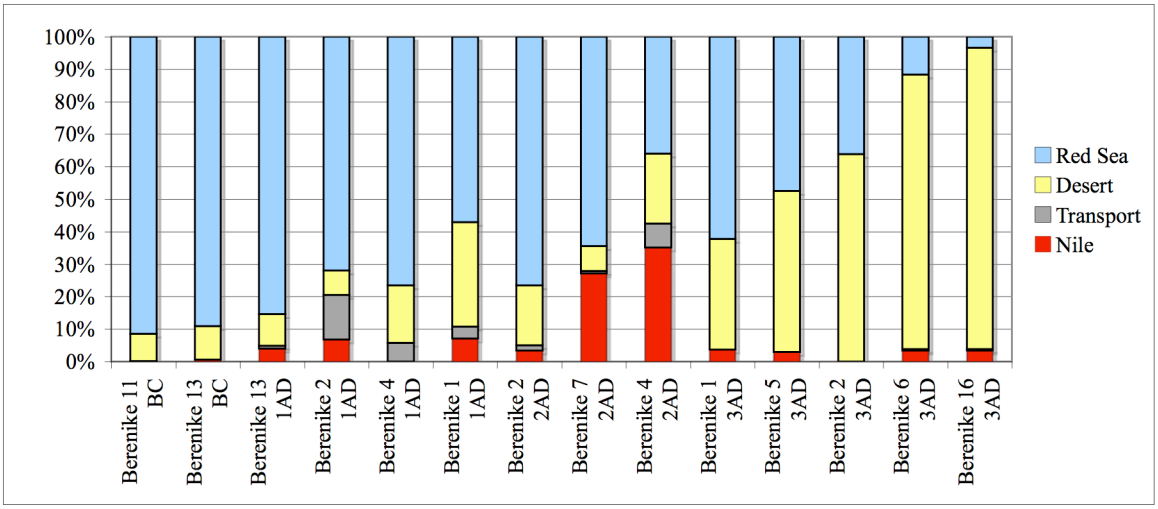


Figure 7.10 Proportion of fauna consumed in each area of *Berenike*. Grouped by source environment (data from Van Neer et. al. 1996, 1998, 1999). X-axis presents trench number followed by the date of the deposit. Based on data from Appendice 14.5, statistical significance recognised in Appendice *14.9*, Table 14.12.

The next step looks at the Red Sea fauna in more detail and comparing this across the site in relation to general consumption patterns and changes over time (Figure 6.11). The environment around *Berenike* is quite sandy, in fact the area south of Ras Banas is renowned today as it was in Antiquity as being particularly sandy and shallow, a perfect environment for catching species of fish living in the sand and silty bottom. There are however readily accessible reefs nearby, though deep water, where one could catch pelagic species of fish is a way distant.

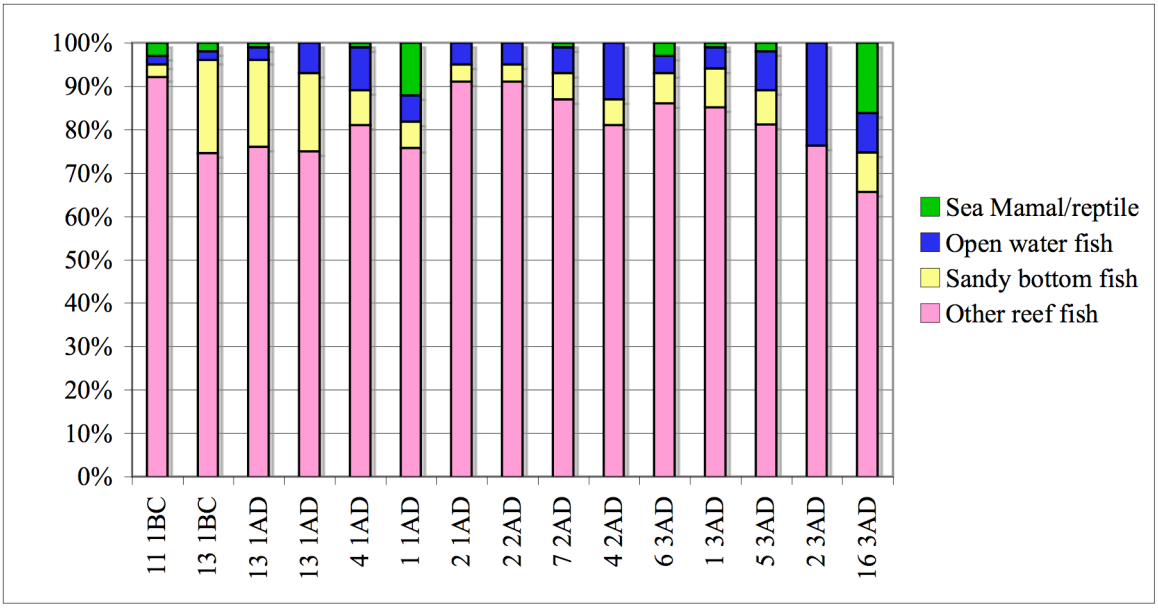


Figure 7.11 Proportion of Red Sea fauna consumed at *Berenike*, sourced from different marine environments and representing different fishing techniques (data from Van Neer et. al. 1996, 1998, 1999). X-axis presents trench number followed by the date of the deposit. Based on data from Appendice 14.5, Table 14.5.

There is a correlation between Red Sea diets and a greater variety of fish consumed, including a greater reliance on sandy bottom species (Table 7.2). The fish consumed by those who otherwise rely on land animals (Nile or desert diets), consumed a more resisted range of fish species, preferring open water fish (such as tuna), sea mammals and turtles. There is also a shift from sandy bottom to open water and turtles and mammals over time. What is uncertain is whether this was driven by changing tastes or changing fishing methods from shore based fishing to boat based fishing. An increase in the overall number of species consumed after the Ptolemaic period may suggest an increase in fishing technology, a change in methods and specialisation over time.

In an attempt to discern the boundary between Nile and Red Sea diets, the significance of certain meats can be assessed. It is known from classical literature that pig meat was taboo to Egyptians (Herodotus), whilst Greek and Roman populations clearly saw this as a delicacy (Meadows 1995: 220; Mattingly 2006), supported by numerous requests in the ostraka records of the Eastern Desert (Hamilton-Dyer 2001; Leguilloux 2003). It is also possible that specific cultural significance was attached to other species. Working transport animals may have been low status (Chapter 5), whilst hunted animals may have carried specific social significance relating to the activity of hunting and the ownership of the desert landscape that it represents.

The near or complete absence of pig and transport animals (donkey, horse and camel) in Red Sea and desert diet assemblages, suggests that there was limited access or limited demand for these foodstuffs by certain populations of the Red Sea ports. Nile assemblages had high quantities of pig and transport animals. Access to Nile fauna required a good network of connections with both farmers based in the Nile region and couriers such as those represented in the *Nicanor* Archive (Fuks 1951). This would have been expensive. The lower value tough meat of old

transport animals were popular with both Nile and mixed diets. This may represent low value substitute for higher value meats and restricted access to desert food resources.

The three distinct diets show clear temporal distinctions. A change in fishing techniques, or demand may represent the change in marine fauna consumed. Red Sea diets start in the Ptolemaic period and continue unbroken until the sixth century AD (Van Neer & Ervynck 1999). This is most likely an indigenous population that predate the founding of *Berenike*. Nile diets appear in the first century AD and continued into the second century AD, with mixed diets continuing into the third century AD (as represented by trench 1). The appearance of a desert diet in the third century AD, continuing until the abandonment of the site in the sixth century AD (Van Neer & Ervynck 1999), is perhaps most surprising in its absence from earlier deposits. Whilst the Desert and Red Sea diets continued until the late Roman period, they remained distinct, without any apparent mixing or emulation. This is unlike the first and second century AD assemblages, where the mixed Red Sea-Nile assemblages of trench 2 over the first and second centuries AD may represent emulation, lower status, hybrid or mixed deposits. Trench 2 does however confirm close proximity of Red Sea and Nile based consumption patterns and the people these represent.

Spatial distribution of consumption patterns suggests that Red Sea consumption practiceswere based in the peripheries of the site, in the west (trench 11) and the northwest dump (trench 13). Nile diets are attested within the central town area and with the construction of land reclamations, sea defences and warehouses by the north and southeastern shores. The northern deposits were associated with many wine stoppers, suggesting heavy wine consumption. Desert diets are associated with the late second to third century AD Palmyrene auxiliaries shrine dedicated to the god *Hierobol*, the Emperor Caracalla and his mother Julia Domna. (trenches 6 and 16). Subsequent third century occupation of this shrine and in the southeastern area was also associated with this consumption practice. Further study and publication is required however before any conclusions can be confirmed.

Diet	% of all fauna		% of fish			Marine species attested
	Pig	Transport	Hunted	Sandy Bottom	Pelagic, Turtles and Mammals	
Red Sea diet Fish = 81-92%	Taboo? <0.5%	Taboo? <1%	Taboo? <0.5%	Delicacy 3-22%	Rare 2-7%	Diverse 15-33
Nile diet All meat = 33-64%	Delicacy 4-20%	Emulation 1-14%	Rare 0-1%	Rare 4-8%	Common 7-19%	Limited 8-30
Eastern Desert diet Desert fauna = 50-93%	Taboo? <1%	Taboo? <0.5%	Rare 0-2%	Rare 0-9%	Common 7-24%	Limited 5-32

Table 7.2 Model of consumption practices at *Berenike*. Three major diet types described with the prevalence of taboo or delicacies found in each diet, such as pig, transport animals and different

fish (data from Van Neer et. al. 1996, 1998, 1999). Based on data from Appendice 14.5, Table 14.6.

In conclusion there are three consumption practices visible, with finer distinctions that can be made. These appear to have both social and temporal significance, representing the changing fortunes of different groups and the port itself through the first three centuries AD. The significance of these diets to individuals, would appear to be marked according to the faunal remains and should allow for clear stable isotope analysis results, should they be undertaken in the future[7]. To understand better the dynamic between different groups making up *Berenike*, just such a study of two beheaded individuals dumped in the abandoned western area at *Berenike* (Sidebotham & Wendrich 2001: 36) could be particularly informative.

7.4.1 Ceramic use at Berenike

Ceramic data of a significant scale suitable for the methodology outlined in Chapter 4 is currently only avaialble for trenches 2, 4, 5 and 13 (Figure 7.12). This is complemented by observations on the ceramic assemblage from other trenches. The tableware assemblage found at *Berenike* is typical of the Egyptian Red Sea ports (Chapter 5). The tablewares from trenches 2 and 4 represent a wide range of red slipped pottery, almost a complete service that we know was produced by the red slip workshops of Mediterranean, including platters, dishes, bowls, cups and beakers. This was also noted in the early Roman deposits of trenches 1 and 7. Interestingly trenches 5 and 13 are more limited in the forms represented regularly and this is associated with a greater variety of wares, with red slipped wares rare or absent, being replaced by Indian and Egyptian tablewares (Figure 7.12). A similar range of limited tablewares were found at trench 11, though all ceramics except jars and amphorae were exceptionally rare there.

[7] Nitrogen isotope analysis should show a clear difference between marine and land based diets. High δ15N values of up to 20‰ could be expected for Red Sea diets, medium values for Nile diets (that also use some marine fauna) and 10‰ or lower for Desert diets (Cox et. al. 2001).

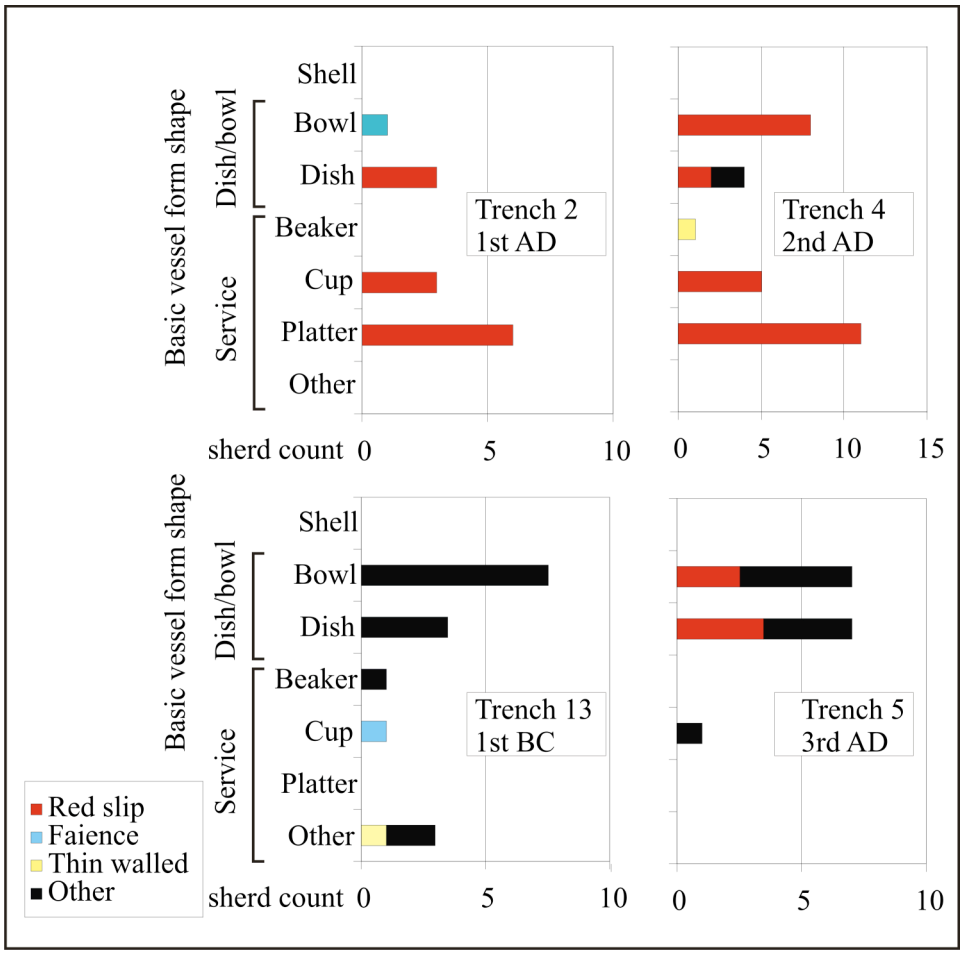


Figure 7.12 Distribution of tableware forms used at *Berenike* (data from Appendice 14.7, after Hayes 1996, Tomber 1998, 1999). Distribution quantified by number of identified sherds displaying the basic vessel form (dish, bowl, platter, cup, beaker, other, shell) and ware (red slip, faience, thin walled and other). Note the high occurrence of beakers, cups, platters and other service wares in trenches 2 and 4 as opposed to the reliance on bowls and dishes with trenches 5 and 13. Statistical significance recognised in Appendice *14.9*, Table 14.12.

Shell bowls were found in trench 12 amongst the foundations, predating the subsequent fourth century church, alongside fish remains (Sidebotham & Wendrich 1999: 36). There is no further published evidence on the early Roman material from this area, though comparisons with *Myos Hormos* suggest that these shell bowls are associated with indigenous Red Sea diets[8]. The Palmyrene and subsequent Pagan shrine (trenches 6 and 16) was associated with third century AD deposits containing globular bowls made from Eastern Desert ware, as they were in the upper levels of trenches 5 (Hayes 1996), as well as late Roman (fourth century AD onwards) deposits from trenches 1 and 4 (Rose 1995; Hayes 1996). These areas showed clear evidence discussed above for the consumption of desert diets, possibly feasting ritual activity associated with the shrine.

[8] There is no evidence that these vessels were in anyway related to practices going on within the subsequent stucture, being as they were found within and under its fourth century AD foundations.

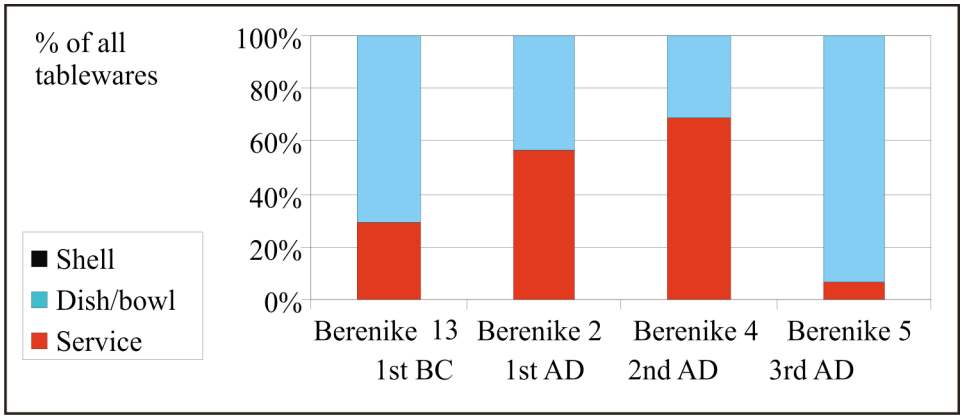


Figure 7.13 Simplified distribution of tableware forms used at *Berenike* (data from Hayes 1996, Tomber 1998, 1999). Grouped into dish and bowl forms (in blue) and service wares (platters, cups, beakers, jugs and strainers in red). Data from Appendice 14.7, statistical significance recognised in Appendice *14.9*, Table 14.12.

In conclusion this small sample suggests that areas 2 and 4 were associated with the use of a complete Greco-Roman service. These trenches were also associated with Nile based diets, including pig and transport animals (Table 7.5). Trench 4 was associated with higher value meat (pig) and a greater proportion of meat in the diet (33-64%, Table 7.5) and is associated with a greater range of service wares used (Figure 7.13), compared with trench 2, that has limited meat consumption (23-27%) and is more heavily reliant on lower quality meat from transport animals (up to 14% Table 7.5). Trench 5 shows a very limited range of tableware forms used as was associated with a desert diet, though faunal material was only published from the third century AD deposits that may post date the published ceramics. Trench 13 was associated with a clear Red Sea diet and the use of bowl and dish forms.

7.5 Berenike identities

The rich and broad range of information available to archaeologists, has allowed for the diverse and changing ethnic composition at *Berenike* to be identified over its long occupation (Sidebotham 2004: 105). A survey of this material suggests that the demography of *Berenike* was most diverse in the early Roman period (Sidebotham 2004: 113). This Chapter has outlined how practice, in the form of maritime activities and consumption patterns relating to how and what people eat, were used in the construction and differentiation of group identities in *Berenike*. To conclude this Chapter this can then be related to other forms of evidence from *Berenike*. Comparisons between maritime activities undertaken and consumption practices confirm a relationship between the three forms of evidence discussed here (Table 7.3). It is however not immediately apparent until the diet, ceramic assemblage, maritime artefacts and their specific archaeological context are understood in full.

Trench	Date	Diet	Ceramic service	Maritime artefacts		Associated structures
				Frequency	Activities	
1	1st-3rd	Nile	red slip service*	1%	Fishing 70%	Domestic
2	1st-2nd	Nile?	red slip service	1%	Fishing 100%	Harbour wall and store
2	3rd+	Desert	?			
4	1st -2nd	Nile	red slip service	3%	Fishing 100%	Warehouse
5	1st -2nd	?	Dishes and bowls	2%	Hull 80%	Industrial
5	3rd+	Desert	EDW bowls*			Dump
7	2nd	Nile	red slip service*	1%	Fishing 78%	Warehouse
6 & 16	3rd+	Desert	EDW bowls*	2%	(R) Hull 83%	Shrine
11	BC	Red Sea	Dishes and bowls*	2%	Hull 66%	Dump
13	BC-1st	Red Sea	Dishes and bowls	100%	Fishing 77%	Dump

Table 7.3 Diet, ceramic services and the frequency of maritime artefacts at *Berenike*. Items marked with * denote interpretations based on interim reports with data too limited for statistical analysis. (Rereuse of hull planking in buildings.) Data based of Appendices 14.2, 14.5.

The relationship between diet and ceramic forms takes the following form. Those consuming Red Sea diets used a limited assortment of bowl and dish forms. These consumption practices are found on the outskirts of the site. These appear to be associated with fishing activity, though the Ptolemaic period industrial dumps from trench 11 suggest those consuming this diet may also have been involved in a limited amount of hull maintenance. Also the ceramic assemblage from the early deposits from trench 5 suggests that this too may represent indigenous involvement in hull maintenance. Clearly indigenous coastal populations were heavily involved in fishing activities, but also possibly hull maintenance from the Ptolemaic through into the Roman period.

Nile diets were eaten out of red slip services. These were associated with domestic occupation within the town centre, or with land reclamation dumps and episodes of warehouse construction along the eastern shore. Maritime activities were poorly represented (1-3%) and mostly consisted of a very limited number and range of fishing equipment. However, when we

consider the context from which these come, that is hardly surprising. Trench 1 is a domestic structure within the town centre; trenches 2, 4 and 7 are associated with the harbour wall and the construction of warehouses by the coast. It is entirely possible that these stores would have items involved in trade, but not specifically maritime artefacts themselves. Also the majority of artefacts from these areas come from land reclamation deposits on which these structures were built and so represent relocated dumps from elsewhere, rather than the function of the structures themselves. The low levels of fishing equipment around this area should be expected as this was the eastern shore and probably relates to activities on the shore rather than in the structures adjacent to it. There is ample evidence (where maritime artefacts represent 4-16% of all artefacts) of the maintenance of hull and rig, present in the northern dump and western areas (trenches 19, 29, 31, 33, 48 and 36, see Figure 7.9) do not have their faunal and ceramic records fully published. This Nile diet and the associated red slip service tableware used to eat it with appears in the Augustan period, is associated with major construction, including land reclamation, sea walls and warehouses from the Augustan period. Rather than direct involvement in fishing and sailing, these appear more involved in the construction of the infrastructure used to facilitate Red Sea trade.

Desert diets were associated with bowl forms, usually globular Eastern Desert ware bowls. Desert diets were not associated with any significant level of maritime activity and the few (<2%) maritime artefacts represented were usually associated with hull timbers reused in the construction of buildings. These diets are represented from the third century AD onwards, possibly the late second century AD in the case of the Palmyrene shrine. This may mean that there are two desert populations represented in the archaeological record; Palmyrene Arabs operating as auxiliaries for the Roman army and third century AD Eastern Desert dwellers. Neither appear to be involved in maritime trade or fishing in any form. Their only association with maritime artefacts is the reuse of ship timbers in the construction of buildings.

The epigraphic evidence from *Berenike* presents a diverse range of names within the Greek, Latin and Demotic ostraka (Bagnall et. al. 2000; 2005). However, these are not the only scripts present from *Berenike*; Tamil (Mahadevan 1996) and Semitic scripts such as South Arabian/Aksumite (Gragg 1995) Palmyrene Aramaic or Old Syrian cursive (Dijkstra & Verhoogt 1999; Schmitz 2000), Nabataean/Ancient Arabic (Bagnall et. al. 2000; 2005) and Hebrew (Schmitz 2000) are also attested. Within these documents a number of personal names can be used to suggest an ethnic or geographical group identity based on prosopographic grounds (Bagnall et. al. 2000; 2005). These personal names suggest cosmopolitan mix of peoples present within *Berenike* (Table 7.4).

Identity suggested by personal name	1996-1998 seasons	1999-2001 seasons
Egyptian	34	36
Greek	29	38
Of which mixed Greek-Egyptian filiations	15	NA
Roman (Latin, Etruscan)	11	30
Gallic or Germanic	1	1
Semitic	2	3
Palmyrene (Semitic)	3	0
Indian (Tamil)	1	0

Table 7.4 Identity suggested by personal names at *Berenike* (Bagnall et. al. 2000; 2005). Note Egyptian names often have a strong Coptos cultic influence. Greek names include Macedonian, theophoric and common Greek names. Theophoric names are Hellenic renderings of Egyptian gods.

It does not however tell the whole story as the clear and distinct consumption practices shown in this chapter suggest desert and coastal populations that cannot be identified on the basis of names. This is because these groups did not fit into the Greco-Roman (or indeed our) definitions of ethnic groups. Ptolemy quite clearly states this when he uses the rather long label *Arabaegypti Ichthyophagi* for the coastal populations (Ptolemy: 4.8.108), that they share both Arab and Egyptian cultural features. Similarly Pliny describes the nomadic *Assari* tribe of the northern Eastern Desert as 'Wild Arabs', the hybrid product of the mixing of Arab and *Trogodyte* peoples (Pliny *Natural History*: 6.167). This means that we cannot rely upon names alone to extract identity, as the coastal and desert populations may be using Semitic and Egyptian names. If we treat texts as artefacts, comparing their distribution in relation to other artefacts, we discover a close relationship between activities undertaken, literacy, language and the use of language (Table 7.5). Documents were rare on the Eastern coastal areas near the harbour walls. However, association with industrial activities relating to hull maintenance in trench 5 and warehousing in trench 4, may explain the presence of Tamil and *Sabaean* letters through involvement in long distance trade. Greek, Demotic Egyptian and Semitic languages from the central town (trenches 6, 10, 21 and 37) and shrine areas were not associated with significant maritime activity. They were associated with a number of dedications relating to ritual activity.

In the northern dump, deposits with fishing equipment (trenches 3 and 13) rarely contained documents. Deposits with rig and hull artefacts did however, contain a large quantity of Greek documents relating to the customs process and a variety of other letters written in Demotic, Latin and Old Arabic/Nabataean, suggesting the involvement of various ethnic groups. As well as customs documents, there is also an inventory of maritime equipment (*O.Ber*. II 131) that includes sail braces, pulleys, rope, mast belts and 'gum' (Bagnall et. al. 2005: 47, O Ber II). There is also a letter to a Greek called Isiodoros 'harbourman', from his mother Hikane (*O.Ber*. II 129), who sent her letter on the 'packet boat' a *epholkion* (small boats, such as those used as ships boats for larger naval or merchant vessels. Casson 1971: 166-7).

Trench	Date (AD)	Nature of documents			Maritime artefacts	
		Greek	Other	Subject	Frequency	Activities
4	1st	0	1 Tamil	Fragment	3%	Fishing 100%
5	4th	0	1 *Sabaean*-Axumite	Fragment	2%	Hull 80%
6	2nd	1	1 Palmyrene	Dedication	2%	(R) Hull 84%
10	1st - 4th	10	2 Demotic	Letters	2%	(R) Hull 86%
21	4th	0	1 Hebrew 2 Palmyrene	Fragment	2%	Rig 65%
37	1st in 4th	3	0	Dedications	1%	Rig 50%
41	4th	1	0	Dedication	<1%	Rig 50%
3	1st	0	0	None	4%	Fishing 83%
13	1st	14	0	Letters	100%	Fishing 75%
19	1st	134	0	Customs	5%	Rig 85%
29	1st	12	2 Latin	Customs, equipment inventry	5%	Rig 70%
31	1st	13	1 Demotic	Customs	7%	Rig 55%
33	1st	38	1 Latin	Customs	7%	Hull 56%
48	1st	52	4 Nabataean, Aramaic and Old Syrian 1 Latin	Customs, letter to harbourman Isodorus	4%	Rig 66%

Table 7.5. Distribution of documents, language and subject in relation to maritime activities. (Bagnall et. al. 2005: 105).

A number of maritime activities relating to ship maintenance, long distance trade, warehousing and the customs process were generally associated with often literate, Greek speaking individuals who ate Nile fauna. There is evidence of Semitic and Indian peoples being involved, as represented by names and languages written. Indigenous coastal populations represented by their distinct diet and material culture are also represented as being heavily involved in various fishing activities, that may have increased in variety over the early Roman period (as suggested by the range of species consumed and the environments fished). These coastal peoples may also have been involved in ship maintenance. Two separate Desert populations appear. Palmyrene Arabs appear in the late second century AD as Roman army auxiliaries. At some point in the third century AD nomadic Eastern Desert dwellers appear in *Berenike*. They do not appear to have been involved directly in maritime activities and the port at that time appears to have declined in population as interest in the Erythraean Sea trade waned.

8 Aila

At the head of the Gulf of Aqaba, the modern city of Aqaba covers the ancient remains of *Aila*, also known as *Elana*, (Dionysius *Scholia*: 926), or *Agra* (Pliny *Natural History*: 6.32). First described at the end of the first century BC by Strabo (*Geography*: 16.2.30), though the Gulf of Aqaba itself was described first by Agatharchides (*On the Erythraean Sea*: 90), who was quoted by Diodorus in c.60-30BC (Diodorus *Library of History*: 3.43.4) as calling it the *Laeanites Gulf* at the head of the *Arabian Gulf* (modern Red Sea). Aqaba has been visited by numerous western travellers who tentatively identified the ancient ruins near the sea, as *Aila* (Ryuuppell 1822, Laborde 1828, Robinson 1838, Joy Morris 1840, Burton 1878, Lawrence 1913, Frank 1933, Stein 1939). The first archaeological investigation came in the form of two surveys by Nelson Glueck in 1934 and 1936, who discovered sherds and glass of Roman date. There was a small subsequent unpublished excavation by Salim Saad in 1954 that revealed Nabataean lamps and pottery. Donald Whitcomb of Chicago University conducted the first modern archaeological investigation between 1986 and 1993. Six field seasons of excavation revealed an Islamic fortified settlement and residual pre-Islamic artefacts (Mac Adam 1989, Zayadine 1994: 489). A survey by Meloy identified traces of mudbrick walls and ceramics dated from the first century BC to sixth century AD that he suggesting was classical *Aila* (Meloy 1991), to the northwest of the Islamic town excavated by Whitcomb. The Roman Aqaba Project finally discovered the positive identification of *Aila* in 1998 (henceforth RAP). Directed by Tom Parker, RAP conducted six excavation seasons between 1994 and 2002 (Parker 2003b). One further season was conducted in 2003 in conjunction with the Wadi Arabah project directed by Tina Niemi (Thomas et. al. 2007).

Excavations at *Aila* have revealed a substantial multi period site, founded at some point in the first century BC. The main activities represented at *Aila* appear to be industrial in nature with ceramic production and copper processing, utilising the mineral resources of Wadi Arabah (Parker 2006). It is likely that pottery production facilitated the export of fish products and date wine produced in *Aila*. Indeed evidence of Red Sea fish and fish products has been found at inland Nabataean sites and are likely to have been produced in *Aila*. Classical sources also suggest *Aila* played a significant role in the overland incense trade from South Arabia to *Aila* to *Gaza* (Strabo *Geography*: 16.4.4-18), though maritime trade is not suggested, indeed ancient authors emphasise the difficulty faced by sailors reaching the innermost recesses of the Gulf of Aqaba (Strabo *Geography*: 17.1.45). *Aila* is first described as being involved in the Erythraean Red Sea trade by Eusebius of Caesarea in at some point in the late third or early fourth centuries AD 'sailing to those selling from Egypt and from India' (Eusebius *Onomastikon*: 6.17-21).

RAP's objectives are outlined clearly on their web page, where Parker states that the project's principal goal is to reconstruct the "role of the city of Aila in the economy of the Roman Empire" (Parker 1994: 24). To this end RAP has succeeded in greatly increasing our knowledge of the role of *Aila* within local, regional and wider Roman and Red Sea economies. Archaeological evidence from *Aila* is not as well preserved as that from *Myos Hormos* or *Berenike*, due to the

fluctuation of ground water levels in the sandy deposits of *Aila*. Due to this artefact types are somewhat limited and epigraphic material is very rare. Also *Aila* is a very large site, of which only a small fraction has been excavated to any level (let. al.one to natural) and many questions remain as to the original layout of the settlements, the position of the harbour and its inlet[9]. Despite these difficulties a clear picture of *Aila*'s role as a port and Nabataean and later Roman settlement have been reconstructed. The earliest structures excavated date from the first century AD. However, surface pottery dating from the first century BC and even earlier coins, suggest earlier activity at this location. First century BC sources describe *Aila* as a successful city by that time (Strabo *Geography*: 16.2.30), suggesting that the site may well predate the archaeological evidence (Retzleff 2003).

The role of *Aila* in the incense trade is uncertain, as Strabo and Diodorus noted that frankincense and myrrh and spices from South Arabia may have passed through or past *Aila* on its way to *Petra* (Parker 2003b), though the site is not mentioned in the *Periplus* and there is as yet no archaeological evidence of contact with South Arabia at *Aila*. In the Nabataean and early Roman periods *Aila* appears to have been a major regional exporter of fish and fish products (supplying *garum* and dried fish to *Petra*, Tamara and En Boqeq, see Parker 2003b; Retzleff 2003) and a major copper smelting location and producer of worked copper alloy items. These objects were produced from ores available in the Wadi Araba and large quantities of slag and kiln wasters were discovered in the northwest of the site (Parker 2003b). There also appears to have been a major ceramic industry from Nabataean through to the Islamic periods, utilising local palm, acacia and tamarisk for fuel (ibid.). Bone carving is also represented (ibid.). The economy of *Aila* can be described as local, with the exception of the incense trade (that may have bypassed the site anyway), making the port site a regional producer of fish and potentially a base for short distance trade and piracy. There is however no conclusive evidence published on a naval presence there.

By the late third century AD, *Aila* is described as the destination of Egyptian and Indian merchant vessels (Eusebius *Onomastikon*: 6.17-21). Whilst there is only limited evidence of Indian contact in the form of a few Indian sherds, amphorae produced in *Aila* (Aqaba-Aksum form) are found in large quantities in Aksum, *Adulis* and Indian port sites from the fourth century AD onwards (Tomber 2004; Tomber 2005). Imports include the ubiquitous late Roman 1 amphora from Syria and *Gaza* forms. However, only a few Aksumite or *Adulis* handmade forms have been found, in stark contrast to *Berenike* (Wendrich et. al. 2003; Tomber 2005). It appears that by this time *Aila* has had an increased role in Red Sea trade, although it is arguable that this was as an industrial centre producing exports for trade that were distributed via *Berenike* and *Adulis*, thus explaining the more cosmopolitan range of artefacts found at those sites.

[9] Subject to ongoing investigations by Alivia Allison at Kansas-Missouri University, (Niemi Pers. comm.).

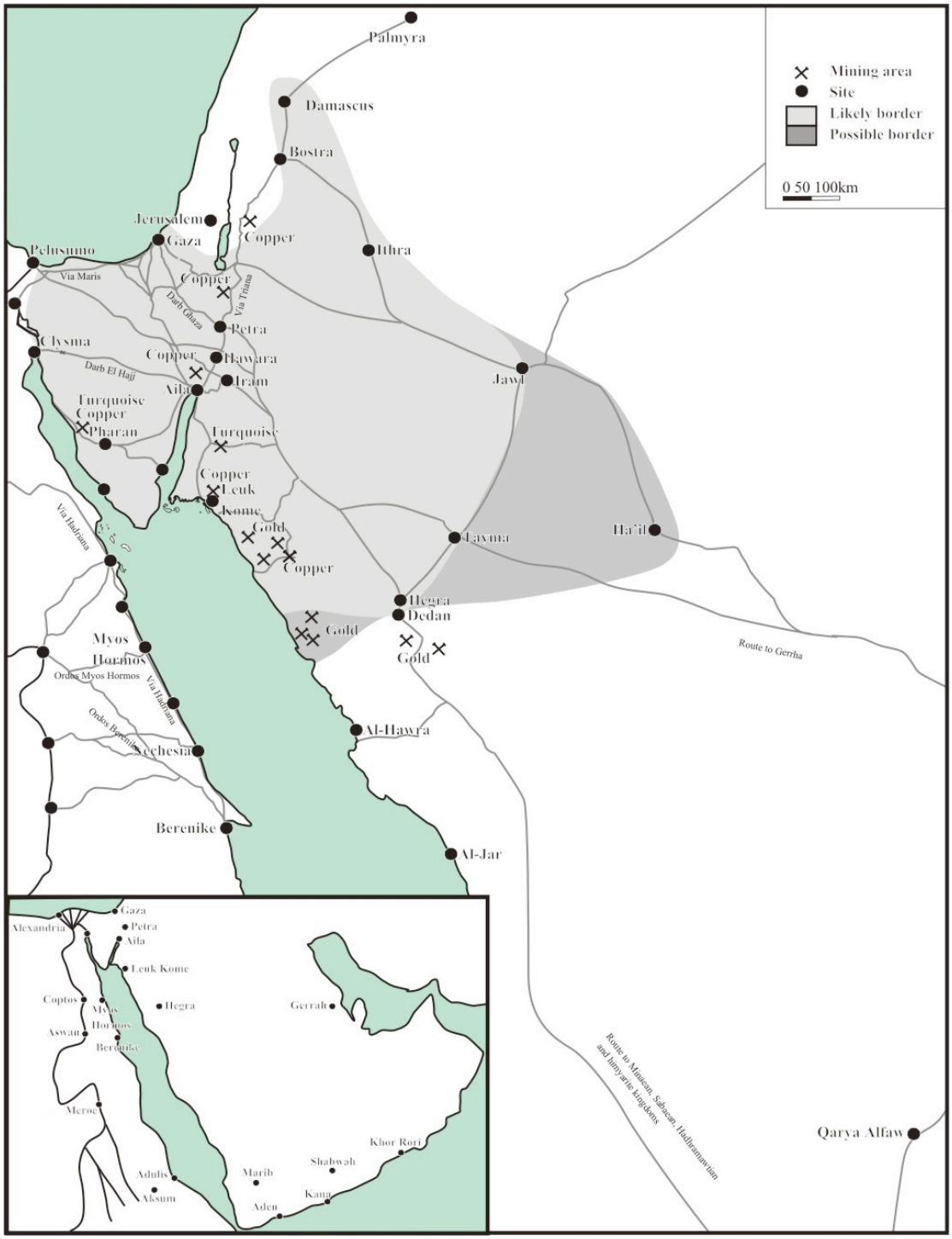


Figure 8.1 Aila location map. Nabataean territory displayed in grey with major roads and sites displayed (after Al-Fassi 2007: plate 2; Ball 2000: 33, 48 and 61; Ingram 1981; plates 65-67; Zarins et. al. 1983: plates 79-81).

8.1 Aila's hinterland

Aila was a coastal oasis surrounded by desert and flanked on the west and east by mountains. *Aila* was also surrounded by deserts, to the west, the Negev and Sinai, to the east and south the Hisma and Hejaz. *Aila* did however have the Wadi Arabah to the north, a tectonic fault line that benefited from greater rainfall than the surrounding deserts. Wadi Arabah provided *Aila* with a natural route to *Petra* (later site named *via Trajana*), though *Aila*'s location guaranteed that it was a major oasis

settlement on important land trade routes through roads such as the 'Dharb el *Gaza*', Dharb el Hajj' and *Via Trajana*' linking Arabia with Egypt and the eastern Mediterranean. *Aila* was also a Red Sea port, located at the inner most recess of the Gulf of Aqaba. It offered the inhabitants of Nabataea access to Red Sea resources and maritime trade.

Aila's relationship with the sea is complicated and varied; changing over time, though the sea's importance is confirmed in the sites very name. *Aila* and *Elath* (its Iron Age predecessor, probably located at the now inland site of Tell Khelefe, see Figure 8.4) were both named after the gulf, whose name according to Greco-Roman authors varied from *Laeanites* to *Aelanites* with numerous variations on the spelling. Similarly the people who inhabited the gulf region were known as *Laeanitae* (Pliny *Natural History*: 6.32) or *Elasioi* (Dionysius *Scholia*: 926), though these people were also known as *Nabataeans* and Arabs (in Agatharchides, Diodorus and Strabo), suggesting a complicated overlapping use of ethnic and tribal names in this region at that time.

The Gulf of Aqaba is a long, narrow and deep gulf created by tectonic activity (Thomas et. al. 2007). It is flanked on both sides by desert and settlements along this coast are present but rare, as are wells and oasis in these regions. Whilst the political situation over the last sixty years has caused the borders of four countries to be contested, it is still likely that the absence of sites represents at least a limited number of permanent settlements in this region.

Near the head of the Gulf of Aqaba the Nabataean fort at Dahab (Meshel 2000: 18) and two sites (Tayib Al Ism and Maqina) with Nabataean pottery (Ingraham et. al. 1981) confirm some activity along this coast, within Nabataean territory. The fort at Dahab guards what is now reputed to be the only all weather anchorage in the Gulf of Aqaba (Davies & Morgan 1995: 256). Just outside of the gulf are the island anchorages of Tiran and Jaz Sanafir some recognise as the important toll island of *Iotobel* (Ward 2007: 163-4). Just to the east is the major Nabataean port and fort site of 'Ayunah, that is the most likely location of the important Nabataean port of *Leuke Kome*' (Ingraham et. al. 1981). Further south the evidence for human activity on the coast rapidly diminishes to a number of poorly dated sites and limited pottery scatters. 'Ayunah was much better placed than *Aila*, if one follows the commonly espoused environmental argument that predominant northerlies would have discouraged maritime trade (Facey 2004: 7). Certainly classical references to Nabataean ports, particularly those that are discussing trade, are concerned with *Leuke Kome*, not *Aila* in the first centuries BC and AD (Strabo *Geography*: *16*.4.24, *Periplus*). Following Roman annexation of Nabataea, however *Leuke Kome* does not appear in texts. Instead *Aila* appears and by the late third century *Aila* is described as being involved in long distance trade with India (Eusebius *Onomastikon*: 6.17-21).

Trade is not the only maritime activity that was undertaken in the Gulf of Aqaba. Much has been made of the Greek accounts of piracy by a Nabataean fleet based within the Gulf of Aqaba (see Diodorus translated by Oldfather, C. H. 1933). Without needing to speculate further on the political meaning of these passages, suffice to say the *Nabataeans* used boats or ships in maritime activities from the third century BC. Though the form of the vessels and activities undertaken is largely unknown, we do know that the Ptolemys required triremes to pacify them. Marine resources such as shellfish and fish were definitely used by the *Nabataeans* from the earliest periods (Studer

2007; Parker 2006, 2007; Van Neer & Parker 2008). Much speculation about the Hellenising influence of the Hellenistic kingdoms and Rome have led some to conclude that seafood consumption represented a form of Romanisation of the Semitic peoples of Judea and Nabataea (Lev-Tov 2003). The current evidence cannot confirm this, though elaborations and growth of the fish products industry do suggest economic growth in fishing industries during the Nabataean period and subsequent Roman occupation (this too will be elaborated on later).

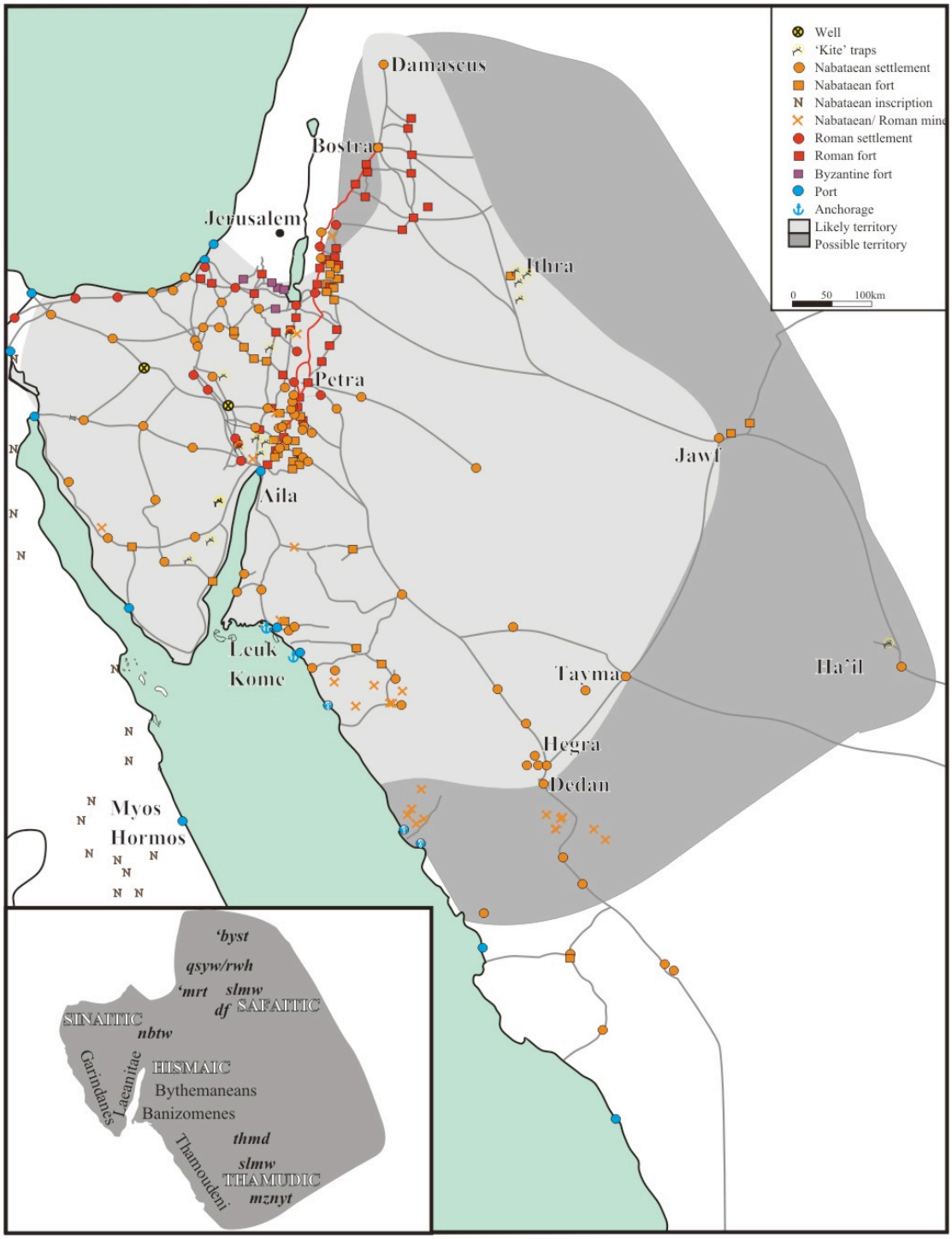


Figure 8.2 The Nabataea kingdom's borders and tribes (after Littmann & Meredith 1954: 28, 1955: 212; Adams et. al. 1977: plates 1-5; Parr et. al. 1978: plates 19-21; Ingram 1981; plates 65-67; Gilmore et. al. 1982: plates 1-3; Zarins et. al. 1983: plates 79-81; Ball 2000: 33, 48 and 61; Meshel 2000: ii, 140; Parker 2005: 421; Al-Fassi 2007: plate 2).

The archaeological landscape around *Aila* is littered with complicated layers of human activity relating to the involvement of various groups in the hinterland during *Aila*'s occupation. *Aila* was settled in the Nabataean period and the landscape of the northern Hisma is littered with Nabataean fortified settlements. Fortified settlements and towers were also found to the east of the Dead Sea (Parker 2005: 530). These forts represent the military threat faced by the *Nabataeans* from the Ptolemy's, Seleucids, Hasmonaeans, Romans, various North Arabian Oasis kingdoms (subsequently annexed) and possibly various nomadic tribes in the region. (Parker 2005: 530).

North of *Aila*, settlements and caravanserai along the king's highway linked *Aila* with *Petra*. Similarly, settlements to the west were positioned along roads to the important Mediterranean port of *Gaza* and to Egypt via the Sinai. To the southeast a limited number of sites were located in the southern Hisma and Hejaz. Settlements, some fortified, marked the spice trade route to the important North Arabian Oases of Dedan, Hegra, Tayma and Jawf and beyond these to southern and eastern Arabia. Nabataea was also interested in the gold, turquoise and copper mines of the Sinai and Hejaz. Already possessing extensive copper resources in the Wadi 'Arabah, turquoise and copper mines near Pharan made the soutwesterlies road from *Aila* important. Similarly Turquoise in the Hisma, gold and copper in the Hejaz compounded the importance of the incense road from South Arabia. Such was the wealth of the region, that it was an independent kingdom, until the *Nabataeans* defeated the kingdom of Lihyan in the first century BC. This was instrumental in increasing the wealth and power of the *Nabataeans*, who subsequently moved the focus of the aromatic caravan route to Hegra, Nabataea's second city. It is likely then that these resources; gold, copper, turquoise and imported items from South Arabia would reach *Aila* for processing and onward trade. Indeed there was much evidence of copper working in *Aila*, that most likely was sourced from the nearby mines of Timna in Wadi 'Arabah (Parker 2006: 225). Following Roman annexation mining activity and metal processing intensified in the late first and early second centuries AD, as attested in *Aila*, by greater frequencies of copper objects, ore and slag at this time (Parker 1997: 40; 2005: 530; 2006: 225).

The root of the term Nabataean *nbtw*, comes from the Arabic to dig a well and the ingenuity of these people to build wells, cisterns, aqueducts and redirect wadi runoff is renowned and may be the original meaning of the label *nbt* (Al-Fassi 2007: 19). This technology allowed for permanent settlement of areas that are today desert. However, the *Nabataeans* are described by Classical authors as nomadic Arabs (Diodorus *Library of History*: 3.43.4). Whether the *Nabataeans* perceived themselves as Arabs, is a debate discussed in Chapter 3 and whether the *Nabataeans* were nomads is also hotly contested. There can be no doubt that nomadic populations lived within Nabataea and there appears to be an increased sedentary population towards the end of the Nabataean period. However permanent settlements are attested from the earliest periods of Nabataean rule and we must assume that the Nabataean state included both nomadic and sedentary populations.

Annexation of Nabataea by the Roman Empire in AD 106 has been described as both violent (Bowerstock 1983: 78-82; Parker 1986: 123-4; Fiema 1987) and peaceful (Dolinka 2006),

depending upon ones interpretation of the evidence (Thomas et. al. 2007: 63). What is clear is the changing landscape as a result of Roman policy in the new Roman province of *Arabia Petraea* over the course of the second and third centuries AD. One of the earliest changes was the building of the *Via Nova Trajana* along the route of the already present kings highway, completed at some point between AD 111- 114 (Parker 2006: 223). Along this route were various Roman garrisoned towns, of which one of the earliest Roman forts can be identified as *Hawara* (modern Humayma, Oleson 1995: 317). In the early period of Roman occupation this was a fairly lightly defended frontier (Parker 2006: 538). Abandonment of rural farmsteads suggests in significant change in land use of the hinterlands as people moved to the growing fortified urban centres over the course of the second and third centuries AD (Parker 2006: 538).

Crisis in the late third century AD was sparked in the 250's as Sassanian Persia invaded. Saved by Rome's allies Palmyra in 259/60, a short period of stability was followed by rebellion by Palmyra 268/9 (Ball 2000: 79). In AD 273 Palmyra was destroyed by Rome, though the destruction of her once reliable ally exposed Rome's army in the late third century AD to camel and cavalry raids by nomadic groups, possibly motivated by drought (Parker 2006: 540). To deal with the threat troops were transferred from Palestine to Arabia in the 250's (Parker 2006: 539) and a number of forts (such as Zarqa) were constructed in the late third century AD and roads were repaired. By the 290's an integrated fortified frontier (boundary or military district) was established by Diocletian, named *limes Arabicus* after the roads used to connect the forts (Parker 2006: 542; Isaac 1988: 124-38), policed by border troops of native origin called *limitanei* (John Malalas 12.307-8) ruled by Ducs[10]. Elite troops were stationed behind near urban centres for tactical support (Parker 2006: 542). The combined effect of the new Roman frontier policy and the 'nomadic raiders' threat or justification resulted in a dramatic fall in the number of occupied sites on the desert fringe over the late Roman period (Parker 2005: 529).

Survey of Wadi Arabah recorded 330 sites, most (poorly dated) nomadic campsites, cemeteries, stone rings and cairns suggesting the immediate hinterland (or territorium) of *Aila* represents 'nomadic pastoralist tribes' not agrarian activity (Smith & al. 1997; Parker 2006: 233). This is mirrored on the Kerak plateaux where the majority of Nabataean sites along the desert fringe were campsites (Parker 2005: 529-30). The majority of the evidence for nomadic pastoralists on the desert fringes of Nabataea comes from the often sited inscriptions and rock art left by them. Whilst the core Nabataean territory and Sinai are marked by numerous Aramaic inscriptions in the Nabataean script[11] (see Macdonald 1998 on Sinai variant called Sinaitic), various ancient North Arabian scripts are present on the desert fringes to the north and south east of Wadi 'Arabah. Of these *Safaitic, Hismaic* and *Thamudic* are contemporaneous. *Safaitic* is found in southern Syria, northeast Jordan and northern Saudi Arabia, with isolated finds in western Iraq, Lebanon and even

[10] The term *limitanei* first appears in the fourth century AD writings of John Malalas, referring to events from the late third century AD. They consisted of *cohorts* and *alae* units garrisoning road forts part of the defensive *limes*.

[11] Nabataean script is an Aramaic (not Arabic as sometimes espoused) script and language, named after the *Nabataeans* who used it for monumental purposes. In the Sinai, Sinaitic is closely related to Nabataean, though is different on a number of issues, most markedly in date as all daTable examples post date the Nabataean state.

Pompeii (Macdonald 2000). *Hismaic* is mostly found in the Hisma Desert of southern Jordan and northwestern Saudi Arabia, though is also found near to *Petra* (Macdonald 2000). *Thamudic* represents a number of related languages from the Hejaz and Nadjad Deserts, though has been found in western Iraq, southern Syria, central Yemen, the Negev Desert and even Upper Egypt (Macdonald 2000). These scripts and languages are always found in graffiti, usually in association with rock art. These are indeed often associated with scenes suggesting nomadic pastoralist lifestyles including depictions of herds of sheep and goats, camels, horses and hunting (Macdonald 2000). It is however the scenes of warfare and raids that attract attention and have been used to associate disparate groups speaking related languages with the Saracen raiders, *Saraceni*, or 'tent dwelling Arabs' described by the classical sources such as Ammianus (Parker 2005: 536-8). The association of a single out of context *Thamudic* inscription at a cemetery at Zizia near Amman, has lead to further speculation of the first to second century AD burial ground of a *Thamudic* tribe operating as an ally of Rome (Parker 2005: 536-8). We should however note that osteological analysis of these human remains suggest that only one of the (female) burials examined may represent trauma and even this is not likely due to violence (Perry 2002). Instead a more cautious analysis of the inscriptions reveals that the their subject was more frequently about love, sexual conquests, ancestry and prayers than war and that this data provides us with useful information about tribal affiliations. What these inscriptions suggest to us is that various ancient North Arabic speaking nomadic tribes lived in the eastern areas of Nabataean control, such as the *'byst* ('*Ubaysah*), *qayw* (*Qusayy*) and *rwh* (*Rawhu*) in the north of Nabataea, whilst the *'mrt* ('*Amrah*) lived just east of the Dead Sea. The *df* (*Dayf*) and *slmw* (*Salamu*) had a broad sphere of influence, whilst the *thmd* (*Thamud*) and *mznyt* (*Muzaymah*) inhabited the southern region around Hegra (Al-Fassi 2007). The reality of the situation of these tribes is that they negotiated allegiance to various states depending upon socio-political and potentially economic decisions and ties. It was quite possible for example for an individual to be both of the tribe of *Rawhu* and a Nabataean (Al- Fassi 2007: 23, CIS II 3973), whilst members of the *Thamud* tribe were clearly operating as Roman soldiers in the fifth century AD (Macdonald & King 1999 436).

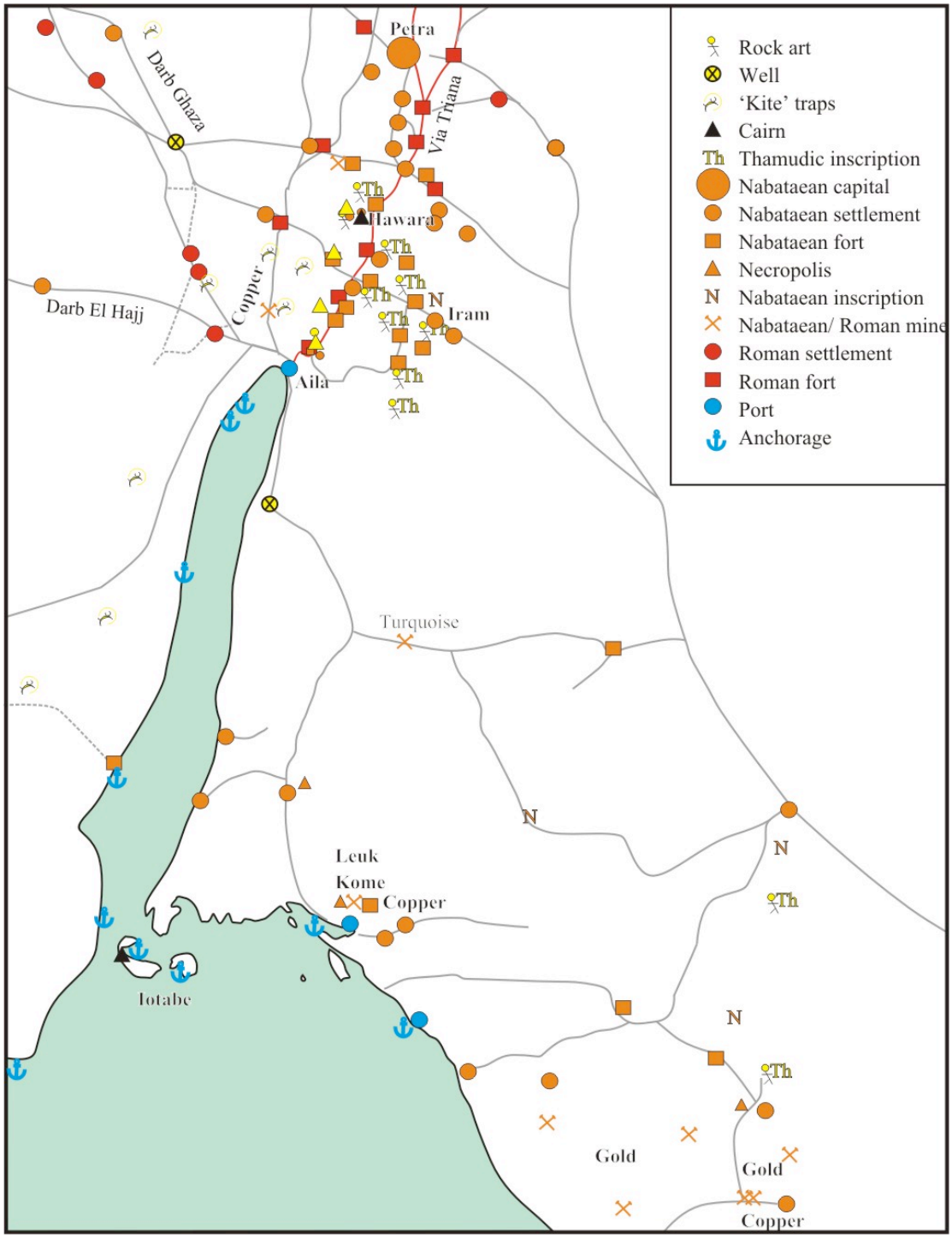


Figure 8.3 Aila's hinterland (after Ingram 1981; plates 65-67; Zarins et. al. 1983: plates 79-81; Meshel 2000: ii, 140; Parker 2003: 227, 2005: 421).

8.2 The cityscape of Aila

Aila appears to have been founded at some point in the late first century BC (although residual material from the early first century BC was also found). The earliest occupation evidence appears to consist of occupation surfaces, without any evidence for permanent structures. This may represent the earliest phases of the site being inhabited by nomadic populations (Retzleff 2003: 46),

or light wood and matting structures that are used in many parts of the Near East to this day (Meshel 2000: 159).

Permanent structures dating from the early first century AD are centred on two areas. Areas B, O and M in the north and the much less well-understood Areas A, J and K to the south. In addition a dam installation and associated clay collection site relating to pottery production was found in Area N. The architecture consists of a stone (usually cobblestone) or deep mudbrick foundation or footing, over which thick mudbrick walls were constructed. The surface of the walls would then be covered with mud plaster or lime plaster and then whitewashed. They usually had beaten earth floors, although flagstone or tile paved floors are also known. A drainage system made from reused ceramic vessels was even found in Area M (Retzleff 2003: 49), though this may be relating to industrial activities. Impressions of roof beams, suggest that wooden beams were used to frame a wooden or thatched roof, most likely constructed from palm (Retzleff 2003: 49). Installations included tabuns (ovens), hearths and pithoi storage bins, all frequently associated with benches. Amphorae were also sunken into the floor for additional storage. Some windows were glazed (Retzleff 2003: 49). The construction techniques have rightly been associated with those of Egyptian Red Sea port sites such as *Myos Hormos*, *Berenike* and *Clysma* although the layout is reminiscent of Nabataean dwellings with small rooms around open courtyard (Retzleff 2003: 55).

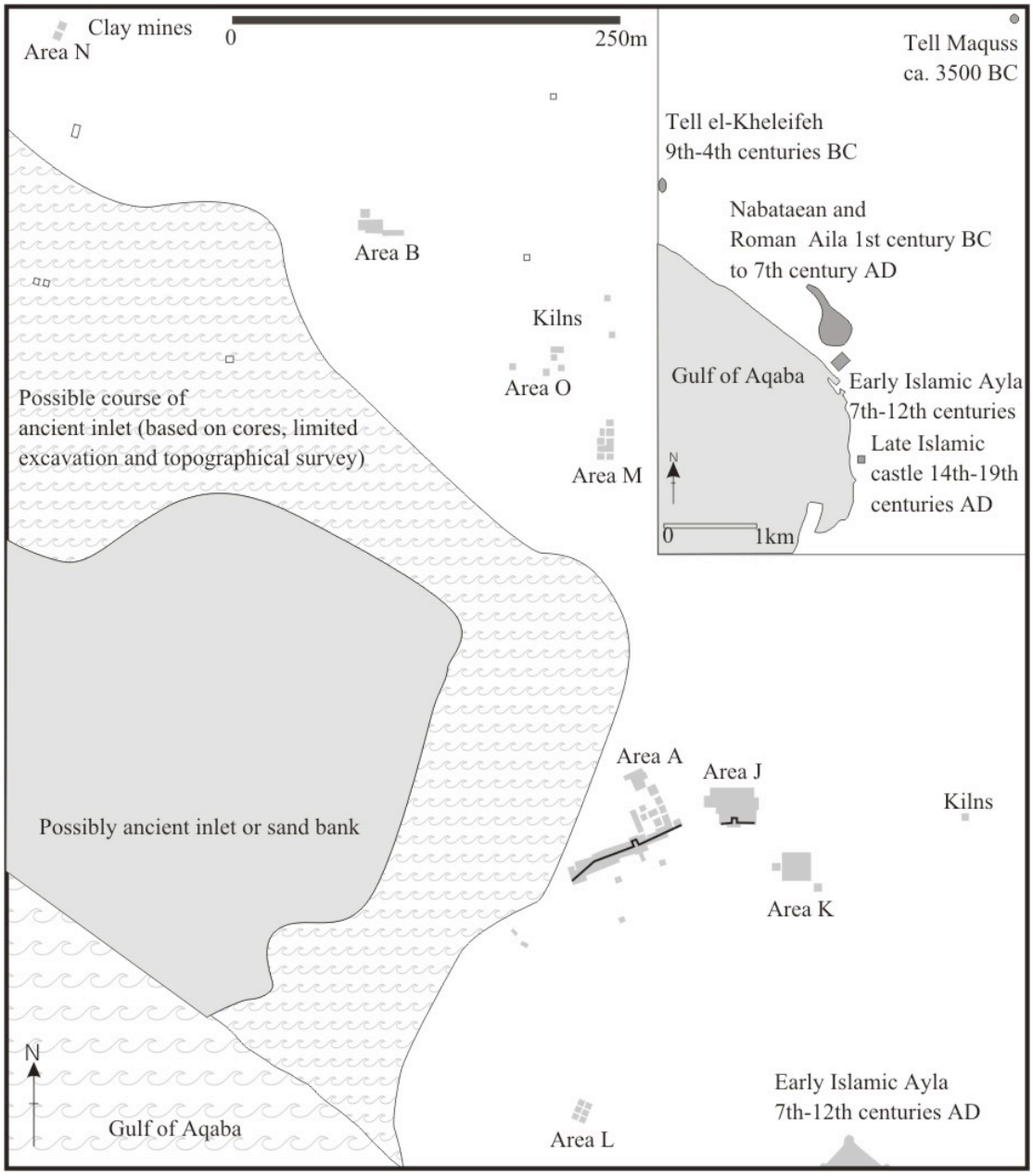


Figure 8.4 Aila site map (after Parker 2003: 322; Parker 1997: 23). The putative inlet is poorly dated and based on topography and preliminary core results by Alivia Allison, (Niemi pers. comm.).

Nabataean structures (late first century BC to first century AD) in Area B are of domestic function (B1, B2 and B3) with evidence of cooking activity, such as several tabuns and possible flourmills. Large scale, or commercial food production, as suggested by the flourmills and tabuns suggest this may represent a bakers and vessels for making fish products such as *garum* (Dolinka 2003: 23).

Adjacent Area O also had domestic structures, some with flagstone floors, with associated cooking activity (O1, O2, O5, O6, O7, O8 and O9) and storage bins. Trench O2 possessed a flagstone floor, a storage bin and a tabun associated with numerous cooking vessels. Trench O4 appears to have been the Nabataean city dump where large amount of kiln wasters and ceramic slag were found suggesting a kiln site nearby (Dolinka 2003: 28). Kiln wasters were also found in nearby Area M. Charcoal from this dump, associated with the kiln wasters was tamarisk and date

palm (Parker 2000: 378; Dolinka 2003: 28). The source clay mines (Dolinka 2003: 29) for the nearby kilns were found next to a stone dam installation (Parker 2000: 375) and associated with c. 1000 exclusively early roman or Nabataean sherds (Parker 1998b: 378).

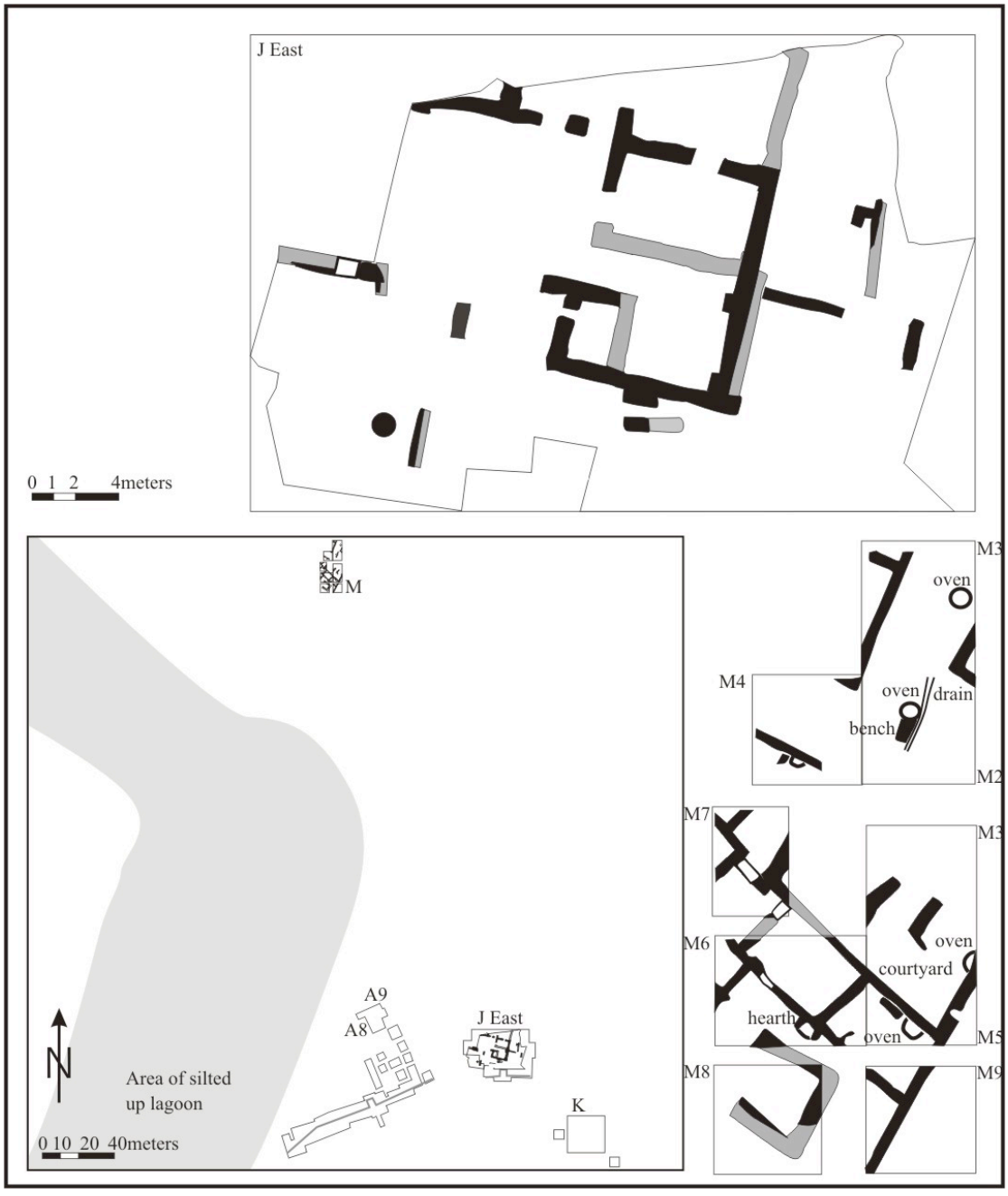


Figure 8.5 Nabataean Aila (after Parker 2000, 2002, 2003-b). Structures from the first century AD, including the domestic complex of area M and the monumental building of area J (of unknown function).

Area M produced evidence of occupational surfaces in Nabataean phase 1 without structures (Retzleff 2003: 331) dating from the mid to late first century BC. Structures from the subsequent Nabataean phase 2 were dated to the first century AD. The structures shared a similar alignment to contemporaneous Area O. Area M also appears to be a domestic mudbrick complex with tabuns, benches, hearths and storage niches (Dolinka 2003: 23). Unlike the kiln fuel, dung was used as

domestic fuel (Retzleff 2003: 51). A fine paved floor was present in trench M6. Evidence for household cultic ritual activity includes the presence of an incense altar found associated with sacrificial burnt pits and small terracotta figurines. Nearby murex shells, (used as a purple dye), were found alongside deposits of the pigment limonite.

In Area A, only trench A8 was excavated to Nabataean levels, though no architecture was found. Adjacent Area J possessed a large structure that was built in the first century AD, with substantial stone foundations/footings over sterile sands. This structure was by far the finest of Nabataean *Aila* (Thomas et. al. 2007). No conclusive evidence as to the function of this structure could be found, though the fine construction, scale and associated Nabataean tablewares suggest that this was a prestigious building. Unlike Areas B, M and O no evidence of domestic activity (i.e. hearths, tabuns, storage niches and bins) could be found, suggesting that this was administrative or ritual in function. This was destroyed at the beginning of the second century AD, probably by an earthquake (Thomas et. al. 2007). Nearby in Area K fine Nabataean domestic structures with cobble floors and a stone-lined hearth, trough and stone working platform were found along with working surfaces in stone, brick and beaten earth, associated with a water channel, a plaster lined trough and raw clay chunks (possibly from a cistern clean or for brick or pottery production). Areas M, O, J and parts of B experienced some for of abandonment at the end of the Nabataean 2 phase, dating to the beginning of the second century AD. This may have been caused by an earthquake (Thomas et. al. 2007), although others have suggested this was due to violent annexation of Nabataea by the Romans in AD 106 (Parker 1986: 123).

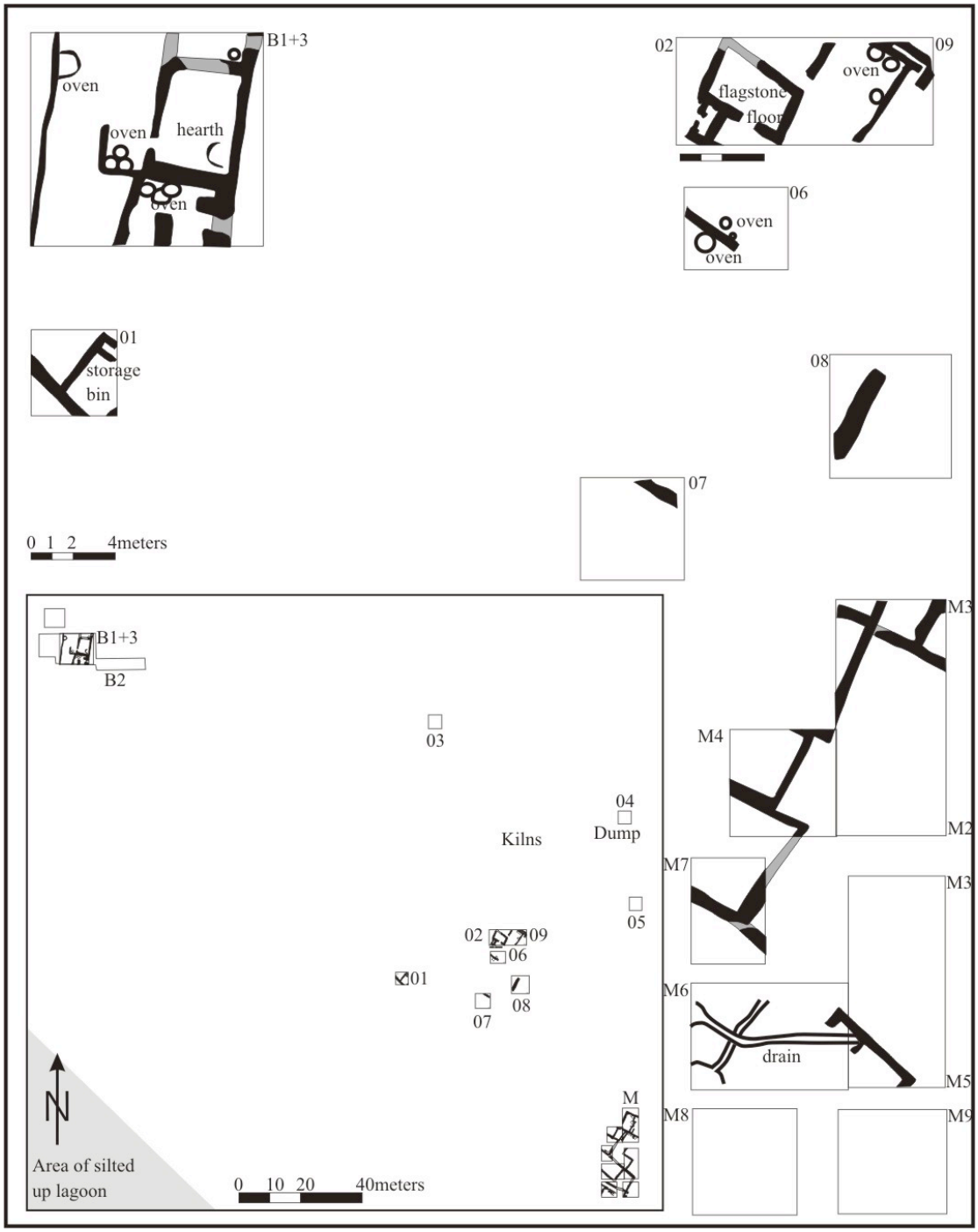


Figure 8.6 Second century AD Aila (after Parker 2000, 2002, 2003-b). Rebuilt domestic structures in areas B, O and M, with some evidence of industrial evidence in area M.

Reoccupation in the early second century AD remained mostly domestic in Areas B, M and O. In Area M there was evidence for window glass, though this period is typified by evidence for putative industrial activity as a large area was covered by two crossing drain installations. Elsewhere in Area M there were millstone fragments and storage pithoi built into niches and benches (Retzleff 2003: 52). One such storage pithos installation also had a baby burial within it offering an insight into the poorly understood infant burial practices in early Roman Nabataea. Kiln wasters were also found, suggesting that pottery production was continuing to occur in a nearby area. During this time there is limited evidence of activity in the southern area. Roman deposits

were reached in trench A8 and Area K, though little is known as to what they represent. In Area J, the area was abandoned (ibid.).

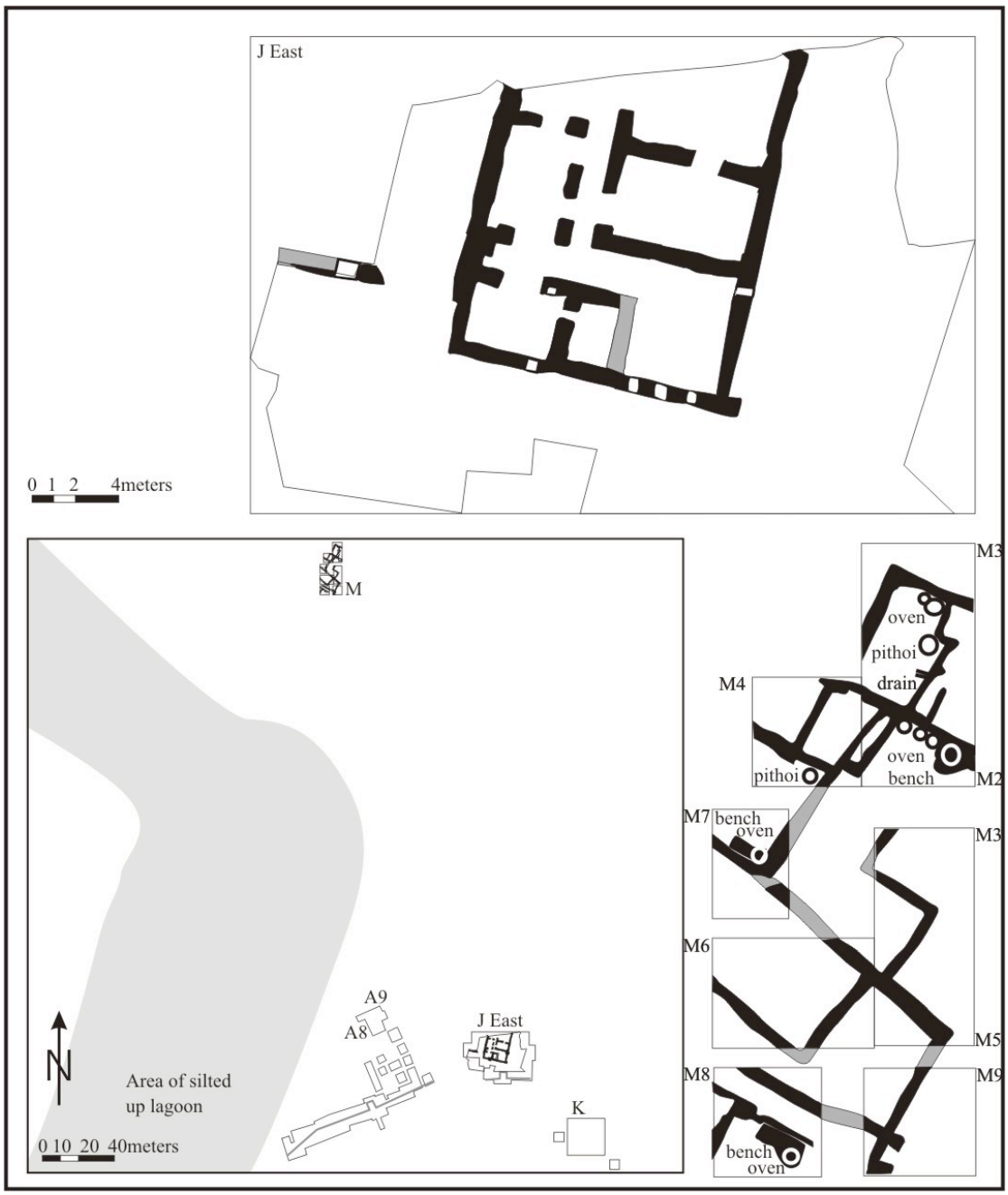


Figure 8.7 Third century AD Aila (after Parker 2000, 2002, 2003-b). Domestic buildings within area M and the reuse of area J for a new monumental building at the end of the third century AD, putatively identified as a church.

Areas B and O continued much in the same manner as the previous levels, building domestic complexes directly on top or reusing the walls of earlier structures, keeping the same alignment. A domestic compound in Area M was built of low quality materials, with poor footings and shallow foundations and badly put together mudbricks. Cooking installations were found along side evidence of domestic pottery production in the form of hearth fired handmade wares and moulds for making figurines (M4). Late third century levels were reached in trenches A8 and A9, as well as Area K, though no further information as to the form or function of the port can be learnt from

these areas. In Area J a monumental building was constructed at the end of the third century AD. This was built directly upon the ruins of the early second century AD Nabataean structure. This has been putatively identified as a church based upon the architectural layout, space use analysis, the archaeological context (lack of evidence for domestic activity within the structure) and the associated artefactual remains ('offering Table', glass lamps, 'ceremonial containers', high value bowls etc). It should be noted however that the most persuasive evidence for this being a church comes from its second and third phases of the early and middle fourth century AD, when the layout is more recognisable as a church and the artefactual evidence provided by those artefacts (that weren't retrieved) sealed under earthquake rubble in AD 363.

The excavations of *Aila* have provided extensive evidence for the layout and function of various areas of the site. It should be noted however that *Aila* was clearly a large site and only a fraction of the whole site has been excavated at all and much of what has been excavated has not been excavated to its lowest levels (Parker 2008). The data from the excavations is still largely in the process of publication. This combined with quite poor preservation conditions (caused by fluctuating ground water levels and salinity) limits the extent of inter and intra-site analysis that can be undertaken here. Despite this, a significant amount of information is available for some analysis for comparison to *Berenike* and *Myos Hormos*.

8.3 Maritime aspects of Aila

The particular preservation conditions of *Aila* are poor for organic material when compared to other port sites on the Red Sea. Also the movement of the water table and the saltiness of the sand makes the preservation of metal finds also quite poor (Retzleff 2003: 59). For this reason one would expect preservation of cordage and basketry, textiles and wood to be quite poor, leading to an under representation of specific types of fishing net artefacts, elements of rigging and most evidence for ships hull and hull maintenance. However, charred and waterlogged remains have allowed for wood remains to be studied and metal artefacts including fishing hooks and lead sheeting and nails have been found, although these are often heavily corroded and difficult to interpret as maritime artefacts conclusively. Artefacts representing maritime activity can be described as either confirmed, or likely (Figure 8.8) and include fishhooks, lead sheeting, lead fragments and (net or line) weights.

Despite the difficulties, we can conclusively say that the analysed wood from Nabataean and Roman periods is representative by the local species of palm, tamarisk and acacia (Parker 2006; 2007). None of these are suitable for shipbuilding and appear to have been used as fuel for pottery production around Area O. It is reasonable to assume that should shipbuilding and maintenance have been present on site that some of the off cuts and chips would have ended up as fuel. Metal finds from areas M and particularly A include numerous nails and spikes, though their use in shipbuilding cannot be confirmed without further study and may have been from domestic construction (Retzleff 2003: 59). Evidence for lead sheathing is suggested (though not proved) by the presence of lead sheeting and various small fragments. These were found to be exclusively

from the Roman contexts (Parker 1998b: 389), i.e. second to third centuries AD. The absence of such materials in Byzantine and later deposits in Aila agrees with the abandonment of the lead sheathing of ships in the Mediterranean (Hocker 1995; Kahanov 1999). However, we could also be seeing the reuse of lead from ships for subsequent non-maritime purpose. One might also expect to find pitch used for the sealing of ships timbers, as it was well known in Antiquity the *Nabataeans* controlled the trade of asphalt from Dead Sea used in caulking of ships (Strabo *Geography*: *16*.42-4, Josephus BJ 4.479-80, Pliny NH 5.72), although this is yet to be found in *Aila*. The indirect and inconclusive evidence of ship maintenance then appears to come from Roman contexts (second to third centuries AD) in Areas B and as residual dump deposits in A and J (Figure 8.8).

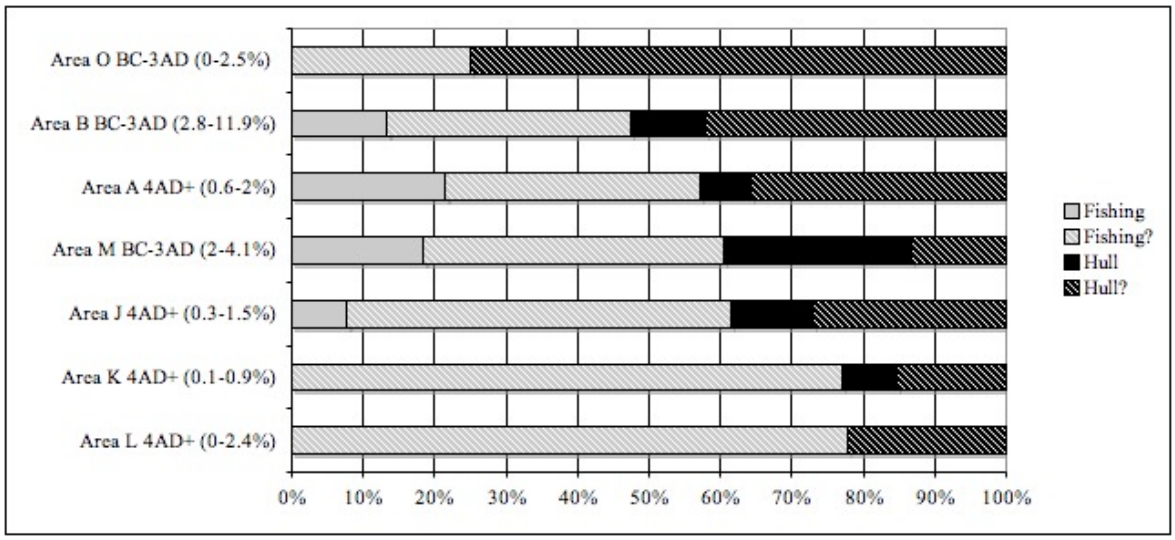


Figure 8.8 The distribution of maritime artefacts at Aila (data from Appendice 14.1, Table 14.9, from RAP finds archive).

Fishing hooks are well represented at *Aila*, though there are many fragmentary pieces of metal that are hard to identify with absolute certainty. Other than a few putative line or net weights (and a spear head that may have been for fishing), there is no evidence of any other fishing artefacts. Fishing artefacts are however by far the most prevalent and the only maritime artefacts that can be confirmed with absolute certainty. Despite being found in many trenches of all periods, it is only in Areas B and M that they were found in any quantity and can be said to represent a significant proportion of the artefacts found there. Both Areas B and M are associated with fish sauce production, including a pithos filled with the remains of the sauce *allec* in Area M (Van Neer & Parker 2008), suggesting that here small-scale fish sauce production was undertaken by the fishermen or their families. Interestingly fish hooks would have been used to catch a range of medium to large reef and open water fish, quite different from the fine meshed nets required to catch the small oily fish required for fish sauces such as *allec* or *garum*.

8.3.1 Comparative sites supplied by Aila

The evidence for fishing techniques is greater than one would first expect from reviewing the artefactual evidence, as the Red Sea fish species found at contemporary Nabataean sites provides a further insight into fishing methods used at *Aila*. This is particularly crucial as there is limited evidence currently available for *Aila* itself, making it necessary to discuss it here along side the *Aila* material. *Aila* is the likely source because it is the only major coastal settlement in the Gulf of Aqaba for this period, it is the closest to the Levant, it is the only known fish producer in the Nabataean kingdom and because fish products were transported in *Aila* ceramics (Studer 1994; Desse-Berset 1996). These studies undertaken elsewhere in Nabataea provide us with a wide array of reef, open water and sea bottom Red Sea fish species that would have been exported by *Aila* (Table 8.1). From these accounts it is possible to track the changing fishing industry at *Aila* from the faunal and artefactual remains of the fishing methods, fish processing and marketing of these products.

Species	Environment	Fishing techniques
Parrot fish	Reef	Trawl & casting nets, traps
Grouper	Reef	Lines & basket traps
Emperor	Reef	Lines & basket traps
Sardine/Herring	Open sea	Fine casting net
Eastern little tuna	Open sea	Trolling line
Wrasse	Reef	Unknown
Tuna/Mackerel	Open sea	Seines, casting nets & traps
Seabream	Sea bottom, Reef	Lines, & trawl nets.
Rabbitfish	Open Sea	Trolling line
Grunts	Reef	Lines, trawl nets & traps
Snapper	Sea bottom, Reef	Seines, casting nets & traps
Barracuda	Reef	Lines, trawl nets & traps
Trevallies	Reef	Lines, trawl nets & traps
Scorpionfish	Reef	Lines, trawl, casting nets & traps
Mullet	Sea bottom	Lines, seines, trawl nets & traps
Tuna	Open	Line
Lizardfish	Open	Line
Jacks	Open	Line
Sailfish	Open	Line

Table 8.1 Red Sea fish exported into Nabataea and Judaea (Van Neer et. al. 2004), probably from *Aila* (Studer 1994; Van Neer & Parker 2007). Some Red Sea species are difficult to differentiate from Mediterranean species *Aila* (see Van Neer et. al. 2004 for details). Fishing techniques used are based upon modern ethnographic studies (Wendrich & Van Neer 1994; Hamilton-Dyer 2001; Beech 2004).

The fishing industry was driven by demand for specific fish products. We know what species of fish were consumed and in what context they were found. By looking at the environment in which these species are found today and what fishing techniques are required to catch them, we can reconstruct the what fishing techniques were used where (Table 8.1, Figure 8.9). Because of the heat and distance that these would have been transported, the majority of fish products would have been preserved by drying, pickling, salting and controlled rotting. The popular fish products consumed in other Nabataean sites, exported by *Aila* are likely to represent fish products consumed

at *Aila*, however we should also assume that unwanted fish caught alongside target fish are also likely to have been consumed at *Aila* if the demand for them outside of *Aila* was poor.

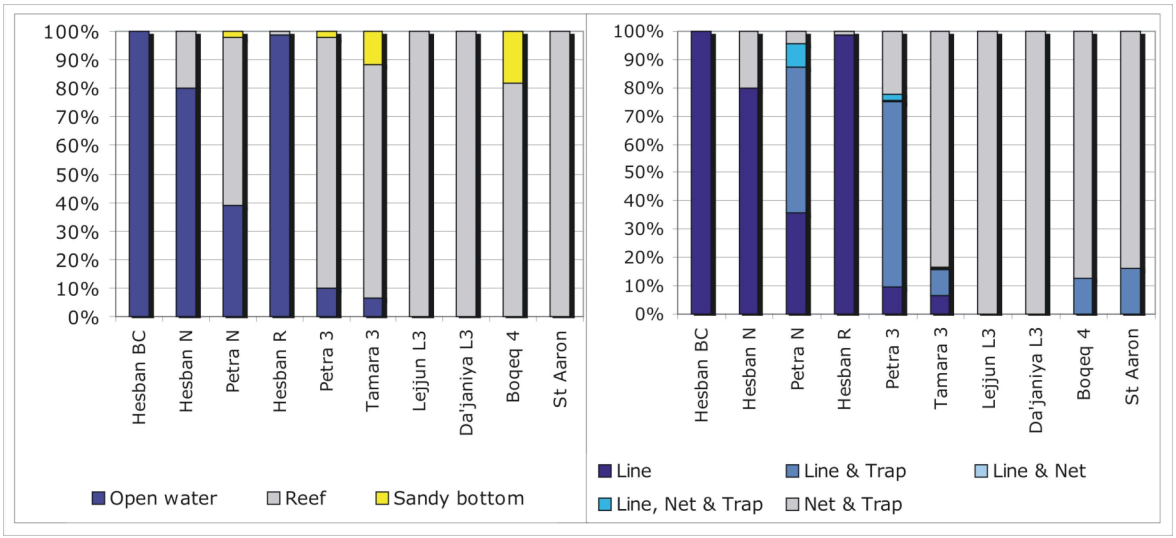


Figure 8.9 Fished environments and techniques used by the *Nabataeans* (data after Appendice Table 14.11, after Desse-Berset & Studer 1996; Lepikscaar 1995; Lernau 1986; Toplyn 1987, 1995, 2006).

Figure 8.9 shows that open water line fishing was undertaken since the Iron Age in the Gulf of Aqaba, before Aila was settled. Third and second century BC export of Red Sea tuna to Tell Hesban represents an advanced is specific fishing economy. This form of fishing requires access to open water species (most likely with boats) and substantial line fishing gear. The skills required to do this are extensive, from the construction of the metal gear, cordage and boats to the skills and knowledge of crews required for such an undertaking.

The settlement of *Aila* in the first century BC coincides with a greater exploitation of reef and benthonic species of fish that require net and trap techniques to catch. Whilst line-fishing techniques are still significant until the third century AD, a variety of fishing techniques fuelled by demand for a variety of fish species and fish products are clearly represented in the archaeological record. This new fishing economy either motivates or is motivated by permanent settlement of *Aila*. The reasons for this are threefold. Firstly, the techniques require a sedentary lifestyle to maintain and benefit fully from permanent fish traps (i.e. to justify the expense of their construction). Secondly, greater demand for fish from sites further away, that fuels this innovation, requires greater time and the construction of permanent installations to process the fish. Thirdly, specialisation of fishing and fish processing, as well as economic benefits for more intensive production make sedentary lifestyle expedient.

It is however not until the late Roman period around the third century AD when this change in practice is complete. By the third century AD there is a significant export of reef fish caught in traps and nets, fuelled mainly by the demand for parrotfish. This is widely distributed to

urban, military and monastic sites (Toplyn 1995, Studer 2002). Such is the success of the new fishing techniques and the demand for the fish products that the traditional technique of open water line fishing for tuna appears to disappear. However, it is likely that this limited sample only represents the broadest trends of the most common trade.

The production of fish sauces from small fatty fish such as sardine and herring is attested in Masada from the Herodian period (Lernau 1996). This is most likely a Mediterranean import. Production of such sauces from Red Sea species is however attested in *Petra* from the third to fourth centuries AD and represents the use of fine casting nets (Studer 1994). Evidence of fish processing has been identified in both Areas B and M. In Area M storage pithos included small fish bones, representative of fish sauce known as *allec* (Retzleff 2003; Van Neer & Parker 2008). In Area B, some 'ovens' have also been putatively identified as being involved in fish sauce production (Parker 1998-a). It is however outside of *Aila* that the most detail about Red Sea fish products from *Aila* can be understood. We know from classical accounts that pickled fish salted fish, dried fish and various fish sauces created through controlled rotting were in great demand across the Roman Empire (Curtis 1991; Trakadas 2004). Some form of processing was required to preserve fish because of the heat and distance travelled. The form of this processing can be interpreted from the archaeofaunal record. It is likely that from the third century BC tuna heads and bodies were being pickled or salted and transported inland to Tell Hesban in northern Jordan (LaBianca & von den Driesch 1995) By the first century BC parrot fish were most likely dried as they are today, or possibly even smoked, for which there is some evidence in the ostraka from the Egyptian Eastern Desert (Bülow-Jacobsen 2003; Leguilloux 2003). This practice continued into the Byzantine period (Schmid & Studer 2007). We don't yet know how the other reef fish caught at *Aila* would have been preserved, though pickling, salting or drying are likely. By the second century AD, fine meshed net fishing must have been practiced at *Aila* specifically to catch the small fatty clupieforme fish used in *allec* and *garum* such as that found in *Petra* (Studer 1994), which also continued into Byzantine period. Taste in such sauces appears to have been stimulated by contact with the Roman Empire and the Hellenistic kingdoms of the east and changing tastes over the early Roman period, have been traced across the Levant as a result of this (Lev-Tov 2003). The case of fish sauces and preserved tuna has been traces in Herodian period deposits in Masada and probably represent Herod's emulation of Roman customs (Cotton et. al. 1996).

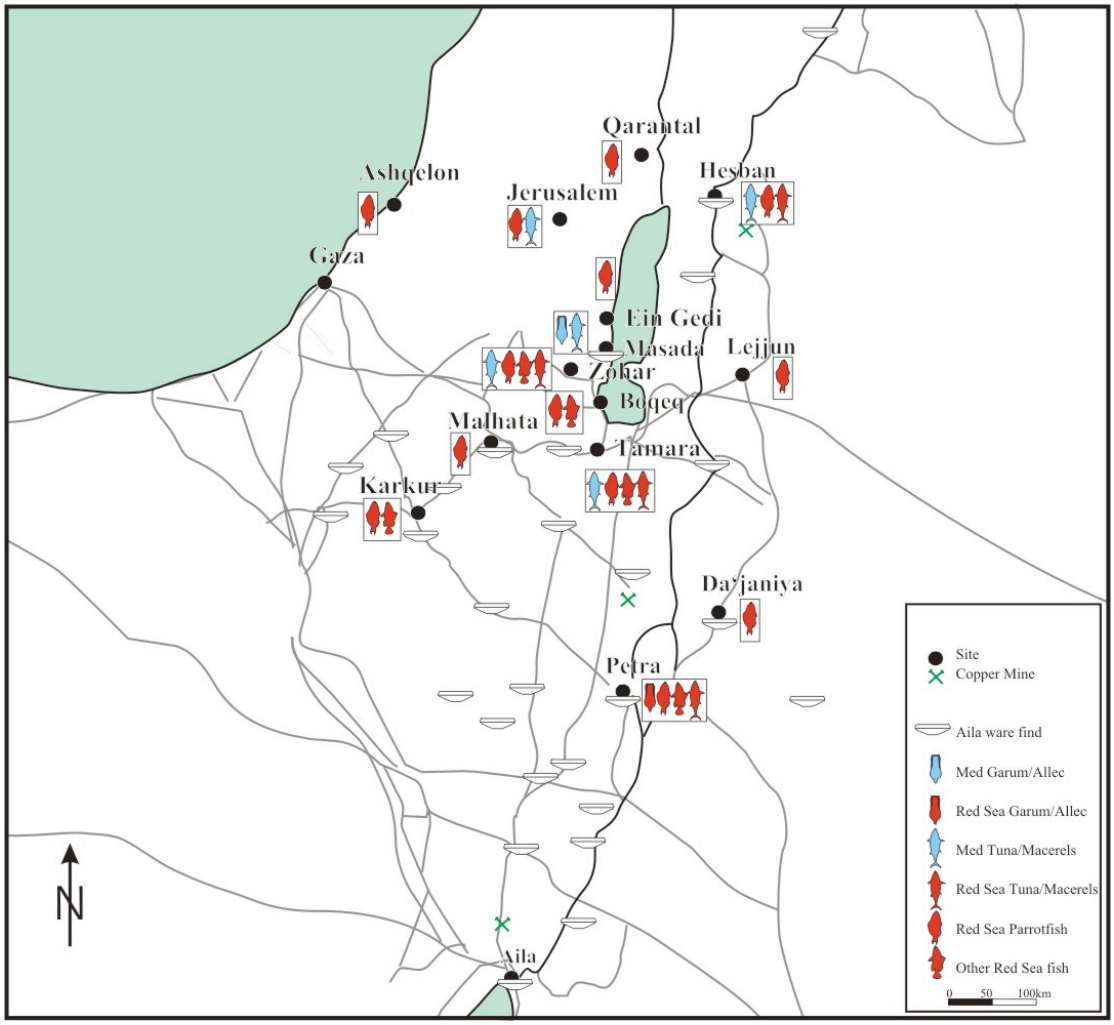


Figure 8.10 Distribution of exported fish products and *Aila* pottery (Van Neer et. al. 2004: 134, 137; Dolinka 2003: 83, 85; 2006).

Our understanding of the distribution of Red Sea fish products in Nabataea is limited by the detailed archaeofaunal studies available. However, various studies have successfully traced changes in the distribution of fish products in the eastern Mediterranean region (Van Neer et. al. 2004; Schmid & Studer 2007). What is clear from this survey is that Red Sea fish products were clearly distributed via Wadi Arabah to Tell Hesban in the form of pickled or salted tuna (LaBianca & von den Driesch 1995) in the second century BC, prior to the settlement of *Aila* (Figure 8.11). Following the foundation of *Aila*, between 63BC and AD 130 a greater variety of fish products to exported to Nabataea, mostly in the form of salted or pickled tuna and dried or smoked parrotfish to *Petra* and Tell Hesban (Studer 1994; LaBianca & von den Driesch 1995). However, other Red Sea fish were also finding there way to *Petra* also; emperors, groupers and seabreams are all well attested as well as some grunts, snappers and barracudas (though how these were preserved is unknown). This clearly represents a diversification of supply and demand of fish products at this time for during the middle and late Nabataean periods, Red Sea fish products have to compete with Mediterranean and riverine sources of fish such as the Nile and the River Jordan (Van Neer et. al. 2004). Production of *garum* or *allec* in *Aila* is likely in the second century AD however and is likely to have been produced for export as well as local consumption. Certainly by the Herodian

period *garum* was consumed at Masada, though this appears to have been sourced from the western Mediterranean (Cotton et. al. 1996). The wide exportation of fish products is confirmed by the few detailed archaeofaunal studies available, and *Aila*'s role within this trade is illustrated by the wide distribution of *Aila* ware throughout the core of Nabataean territory. The highly visible *Aila* ware pottery may represent the true extent of *Aila* fish product exports (Figure 8.10).

The export of tuna, parrotfish and other Red Sea species continues well into the Byzantine period, being distributed to urban (*Petra*, Tell Hesban), military (Boqeq, Tamara, Da'jania, Lejjun, Toplyn 1995; 2006) and monastic sites (St Aaron's in *Petra*, Studer 2002). Indeed Red Sea fish continued to be exported to *Petra* well into the crusader period, as suggested by the fort of Wadi Faasa in *Petra* (Schmid & Studer 2007). By the third century AD however tastes or supply appears to be more restricted, with parrotfish by far the most popular fish exported to Lejjun, Da'janiya, Boqeq and St Aaron's in *Petra* (Toplyn 1987, 1995, 2006; Studer 2002)..

8.4 Consumption patterns at Aila

Quantitative data is not yet readily available from *Aila* as the data is still being processed. Analysis on Area B however has been undertaken (Graham 2000), although not yet fully published. Qualitative data is also available in the form of the many interims published on *Aila*, comparative studies and trench reports, in which some of the details have been published (Parker 2002; Retzleff 2003; Toplyn 2006). These preliminary studies on *Aila* are complemented by studies from *Petra* and various Nabataean, Roman and late Roman forts that allow for comparisons to be made. These other studies provide comparative material and a greater understanding of the Red Sea fauna that was exploited, processed and exported and its importance to the inhabitants of *Aila*.

The fauna consumed at *Aila* come into four major groups, these are Red Sea species, desert species, domesticates and work (or transport) animals. The Red Sea species include a variety of Red Sea reef, pelagic and benthonic fish and shellfish. Desert species were dominated by domesticated goats and sheep. The goat and sheep consumed at *Aila* consisted mostly of desert adapted goats, whose age distribution suggests they were not raised locally, but instead brought in from elsewhere by nomadic herders (Parker 2002; Retzleff 2003; Toplyn 2006: 56). A few hunted animals were also consumed, such as gazelle, wild birds and small mammals, though hunting added "virtually no contribution to the diet" (Retzleff 2003). Other domesticates were very rare and consisted mostly of cattle, though these appear to be concentrated in the Nabataean period (Parker 2002). Chicken and pig were present but very rare. Work animals were also rare, though camel made a significant minority within this group. Evidence from fort sites in the Lejjun area suggest that work animals may have only rarely been eaten with butchering marks being found on c.1% of such animals (Toplyn 2006).

Red Sea species	Desert Species	Domesticates	Work animals
Shellfish (common) Red Sea fish (common) including: Reef fish Open sea fish Sandy bottom fish	Goat (common) Sheep (common) Gazelle (rare) Wild birds (rare) Hunted small mammals (rare)	Cattle (rare) Chicken (rare) Pig (rare)	Camel (rare) Horse (rare) Donkey (rare) Dogs (rare)

Table 8.2. Fauna representative of different environments consumed at *Aila* (Parker 2006).

When intra-site and temporal comparisons are made, based on the limited evidence available, it is clear that the diet at *Aila* is characterised by very high consumption of goat and sheep, followed by a significant consumption of various Red Sea fauna, including shellfish, reef, pelagic and benthonic fish. Forty murex shells were found in a Nabataean 2 phase in Area M, whilst hundreds of small fish bones in the floor of the late Roman 1 phase. In Area B early analysis suggested up to 70% (Parker 2006: 229) of the faunal remains were from Red Sea fish, whilst subsequent excavation suggested that this was more like 25% (Parker 2002). Either way in both trenches Red Sea fish and shellfish comprise a significant proportion of corpus (Parker 2006: 229). The vast majority of mammalian bones were of goats and sheep. Camel represented a significant minority, whilst cattle, pig and chicken were extremely rare. Cattle was found in Area B in reasonable quantities, i.e. 14%, in the Nabataean period (Parker 2002: 419), though completely absent in the subsequent Roman period. Evidence of dog, donkey and horse present but extremely rare and we may have to question whether these were consumed at all (see arguments in Toplyn 1995; Toplyn 2006). In conclusion, a desert-based diet is represented, supplemented with a significant amount of Red Sea fish (Figure 8.13).

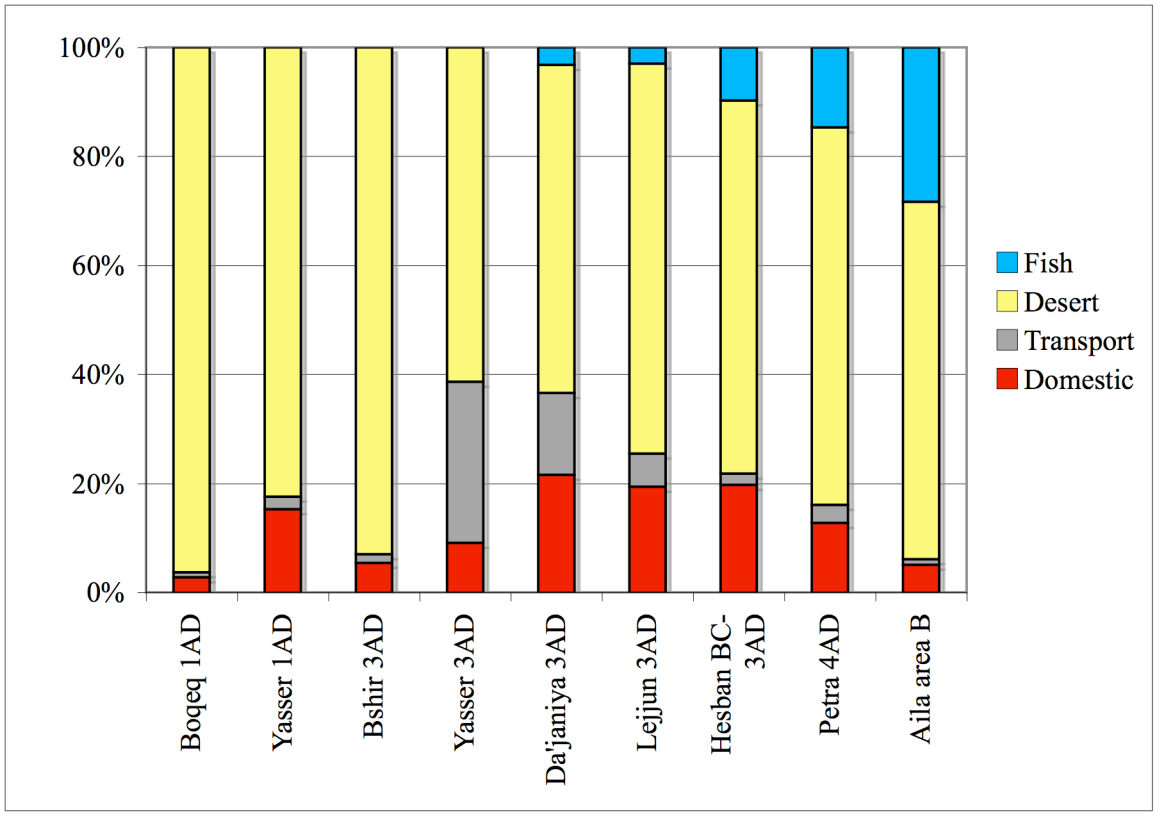


Figure 8.11 Proportion of fauna consumed in Nabataean and Roman sites. Grouped by source environment (data after Desse-Berset & Studer 1996; Lepikscaar 1995; Lernau 1986; Studer 1996, 2002, 2007; Toplyn 1987, 1995, 2006; von den Driesch 1995). Based on data from Appendice 14.8.

Comparisons with other sites suggest that from the second century BC, through to the fourth century AD, diets in Nabataea remained pretty similar. Urban, military and port sites all relied most heavily on desert species. Whilst hunted species were rarely attested, goat and sheep were overwhelmingly the most common species at all sites. Other domesticates were not significant, though cattle, pig and chicken were found in small quantities. It is interesting that general observations about consumption patterns in the Levant have revealed that pig consumption levels remained below 5% through into the late Antiquity at all sites except Tel Anafa but adoption of Roman fish eating grows in prevalence by late Antiquity (Lev-Tov 2003: 13). Camels were also found in small quantities, though generally animals used for transport were also not significant, except perhaps in some of the Roman forts of the third centuries AD onwards. In these cases we have to be cautious and review the evidence of the butchering marks carefully (Toplyn 1995). Fish were also consumed at urban sites such as *Petra* and Hesban (Studer 1994; Bignasca et. al. 1996; Desse-Berset & Studer 1996; Frösén & Fiema 2002; Hesban). In urban sites *allec* fish sauce (Studer 1994) and preserved tuna and parrotfish were consumed (Bignasca et. al. 1996; Desse-Berset & Studer 1996). Indeed some have argued that this is due to Hellenisation of the inhabitants of the Levant over the Hellenistic and Roman periods (Lev-Tov 2003: 16-8), as suggested by importation of fish products such as salted tuna and *allec* fish sauce from the western Mediterranean found at Herodian phases of Masada (Cotton et. al. 1996; Lernau et. al. 1996). Fish

such as tuna appear to have been significant supplement at sites such as Kasarvit, Askelon, Hatoula, Acre and tell Abu Hawan (Lernau et. al. 1996). Fish was absent or rare in late Roman forts with some notable exceptions such as En Boqeq and Tamara, where over 50% of the fish came from the Red Sea (Lernau 1986). From this it would appear then that there was little growth in the consumption of pork during the Roman period and possibly some growth in the consumption of fish products at urban sites and some forts, which may be associated with a more 'Hellenised' diet.

Location	Site type	Diet	Pig	Transport	Hunted	Fish
Aila	Port	Desert 66%	c.1%	c.1%	c.1%	28%
Yasser	Fort	Desert 82%	6%	2%	0%	0%
Tell Hesban	Urban	Desert 68%	4%	2%	2%	10%
Petra Nabataean	Urban	Desert	?	?	?	1%
Petra 3rd AD	Urban	Desert 62%	3%	3%	1%	14%
Petra St Aaron	Monestery	Fish 51%	*	0%	0%	51%
Da'janiya	Roman Fort	Desert 60%	8%	15%	3%	3%
Yasser	Roman Fort	Desert 61%	0%	30%	14%	0%
Lejjun	Roman Fort	Desert 72%	2%	6%	0.6%	3%
Bshir	Roman Fort	Desert 93%	0.3%	2%	0.3%	0%

Table 8.3 Taboos and delicacies. Model of consumption practices for Nabataean towns and forts. Based on data in Appendice 14.8.

The overall pattern of consumption practices in the Nabataean Kingdom and *Arabia Petraea* suggest that all sites relied heavily on goat and sheep (with the exception of the monastery of St Aaron Table 8.3). *Aila* and Nabataean Urban sites consumed fish products, probably with increasing regularity after Roman occupation. Pig consumption was not common, but present in low levels, highest when associated with forts. Transport animals were rarely eaten, though were mostly represented within fort assemblages when presumably other sources of meat were limited. Hunted species are also rare, though found in greater quantities at fort sites. The results would suggest that the greatest difference was between fort sites and urban sites, where self-sufficiency within the forts and presumably limited supplies influenced the diets. Any such interpretations can only be speculative, considering the small values represented and the small sample sizes available (Appendice 14.8). Despite this the diets were not wholly different. Indeed it is suggested by the data that sheep/goat was preferred, transport animals and pig were disliked and that certain fish products were perceived as delicacies.

8.4.1 Tablewares at Aila

Full publication of the ceramics at *Aila* is in progress so the extent of analysis possible here is limited. Some important site wide trends are however present. When we look at the variety of tableware forms published from *Aila* (Table 11.10), we can see that a range of forms are

represented (Figure 8.12). It is also clear that there are two distinct groups of pottery present at *Aila* in the first three centuries AD. Firstly, there are the Nabataean tablewares produced at *Aila* and *Petra*. Secondly, there are the Roman red slipped wares produced in a number of sites around the Mediterranean within Roman territory.

These ceramic traditions are quite different in form, function and decoration (Figure 8.15). Dishes and bowls account for 77% of all Nabataean fine ware forms published from *Aila*, whereas they account for just 41% of the red slip. Service forms however are much more common with the red slip assemblages, accounting for 59% of all published forms. The variety of jugs, platters, craters and cups, suggest that the use of red slip increased variety within the Table services used to eat at *Aila*. Unfortunately quantifiable data is not yet available, though qualified information has been published. Of the forms published only bowls and dishes are described as common. Nabataean fine ware is by far the most common tableware and that all service forms are described as 'rare' (Dolinka 2003: 66-72). This suggests that the advanced Nabataean technology with its distinctive and different service from that of the Roman red slipped wares, was most commonly adopted by the inhabitants of *Aila* and were most suitable for their style of eating. Other service forms were usually limited to jugs and (by the second century AD) cups. red slipped wares where present do however represent a distinctive choice to expand the variety of service forms used that would have been particularly visible within *Aila*'s society as the city produced its own pottery and was clearly in close contact with *Petra* and its pottery workshops.

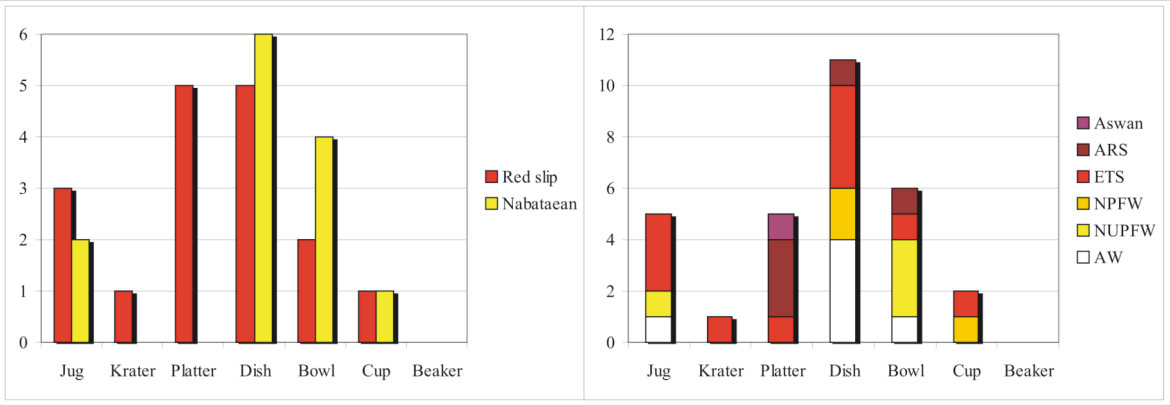


Figure 8.12 Tablewares from *Aila* (data after Dolinka 2003: 125-139).

Some intra-site analysis can be made through comparisons of the quantities of red slip found in each area. Of the 1853 *terra sigillata* sherds found in *Aila* prior to the 2002 season Area M accounted for 44% (821), Area B 17% (315), Area O 15% (276) and other areas 24% (441 mostly from residual deposits, Ward 2001: 144). This rather crude comparison however merely suggests that *terra sigillata* is well attested in these areas, particularly Area M, during their first to second centuries AD. Finer distinctions based on period should however be made in the future.

A number of points can be made. Firstly, that a variety of forms are present, though their distribution differs across time and in different areas of the site. Secondly, that Nabataean fine ware are limited to bowls and dishes with some jugs and vary rare cups that only appear in the second

century AD and is by far the most abundant tableware in *Aila* during the Nabataean period (Ward 2001: 144; Parker 2006: 225). Nabataean wares continue to be popular until the Roman Annexation, after which painted variants rapidly decline in popularity. Roman red slip wares introduce a wider variety of forms, with a wider range of functions. Eastern *terra sigillata* starts to introduce some new forms from the first century BC, though it is rare at this point. The vast majority of eastern *terra sigillata* is Syrian eastern sigillata A, though a few Turkish eastern sigillata B and Cypriot ESC sherds were also found. Eastern *terra sigillata* is adopted widely in the first century AD. The c.1800 *terra sigillata* sherds that had been found up to the 2000 season, account for 0.3% of all sherds found at *Aila*, though indicators were rare (Dolinka 2003: 71). In the second to third centuries there is an increase in the number of Egyptian imports. These include jugs, lamps, cooking wares and kegs (Ward 2001: 144). Egyptian tablewares were rare, with examples from Aswan are attested in third century AD contexts (Retzleff 2003). The use of African red slip in the third century represents a wholesale adoption of Roman red slip forms, including platters. Late Roman red wares (of which African red slip is the majority) was used on the site from the third to the seventh centuries AD. The c.2000 sherds found up to the 2000 season accounted for 0.4% of all sherds. African red slip was not however adopted across whole site. Area M for example produced no example of African red slip in its third century AD deposits (Retzleff 2003: 61).

Other sources of ceramic evidence suggest that wider trading contacts were present in the form of bulk amphorae goods. Pottery from *Gaza* was always popular, though only as coursewares and amphorae. Imported amphorae consisted of *Gaza* (47%), Egyptian (30%), eastern Mediterranean (PW10, 7%), Aegean (PW47) and very rare Tunisian (PW33), North African (PW34) and Spanish (PW35) examples (Ward 2001: 145). These areas are not however represented in the tableware assemblage. Also absent are Indian and Aksumite ceramics. Whilst present in first through third century deposits at *Myos Hormos* and *Berenike*, these ceramics first appear in *Aila* in the early fourth century AD (Ward 2001: 146; Parker 2003b: 13; Tomber 2005). Steatite vessels, evidence for increased contact with South Arabia, also first appear in the fourth century AD. Finally, rare glass finds from the first three centuries AD contrast with their increased prevalence in the fourth century AD. These all suggest an increased role at *Aila* in the Erythraean Sea trade and a resulting economic boom in the fourth century AD (Ward 2001: 146). In conclusion, the tablewares suggest that there was a distinct Nabataean way of eating shared by the inhabitants of *Aila*. Roman red slip wares became increasingly more prevalent, influencing Nabataean production (of cups for example), until a wide variety of services forms were being used by the third century AD. Within the site there is some evidence that red slip wares were being more greatly adopted by some groups of *Laeanitae* society than others, though this can only be confirmed by further research.

8.5 Nabataean identities.

Unlike *Berenike* and *Myos Hormos*, *Aila* is the sole example where its inhabitants are described under a specific group label named after the settlements, that of the *Laeanitae*. What does this

ethnonym mean (if it can be called an ethnonym at all)? It was a distinction made and recognised in Antiquity. From this preliminary study, only limited suggestions can be made due to the absence of data available on the subject, but prior to discussing the evidence put forward in this Chapter, there are further sources on *Aila*'s demography that may be considered.

Site	Stress[1]	Fracture[2]		Health[8]			Occupation	Migrants[7]
	Osteoarthritis	%	#	P	PH	DEH		Strontium
Zabayir	Little class or gender differentiation							
Male	23%	1.55	14	20%	0%	22%	Riding[3]	0%
Female	19%	0.58		20%	57%	0%	Riding[3]	0%
Juvenile				9%	33%			NA
Aila	Significant class, occupation (for males) and gender differentiation							
Male	20%(concentrated)	0.41	5	0%	1%	20%	Labourer/Trades[4]	60%
Female	28%	0.0		0%	29%	28%	Trades[5]	60%
Juvenile				24%	50%			NA
Rehovat	Child labour, no gender differentiation, some class differentiation							
Male	46%	0.94	11	10%	26%	46%	Farming[6]	0%
Female	33%	0.18		4%	28%	33%	Farming	0%
Juvenile	(High)	(High)		55%	28%		Farming	NA

Table 8.4 Summary of the health, occupation and movement of different populations in Roman Arabia (Perry 2002: 266-295, 192, 216, 235).[12]

In Perry's thesis, the different life styles of the inhabitants of three different settlements were explored (Perry 2002: 266-295, 192, 216, 235). Evidence of stress, fracture, diet, disease occupation and migration were measured using osteological data. The results showed quite vivid differences between that of the *Laeanitae* and that of the *Thamudic* nomad burials from Zabayir and the hard farming lives of the inhabitants of Rehovat (Table 8.4). In addition to obvious osteological changes due to occupational factors caused by riding horses or camels, labouring, trades and arid farming, the discrepancy between age groups, the sexes and class was markedly different between settlements. It was noticed that the general health based on diet and disease was very good amongst nomadic populations, although their riding lifestyle did appear to create a number of falling fracture injuries. There was only one example of possible violent trauma – that hardly fits the age-old model of the raiding nomadic tribes of the north that many would have us

[12] Based on human remains from a '*Thamud*ic' nomadic cemetery at Zabayir (late second to mid third-centuries AD), *Aila* (fourth to fifth-centuries AD) and Rehovat a farming community on the *Gaza* road (fifth to sixth-centuries AD). Class suggested by burial goods and context. [1] Stress determined by degenerative joint disease, osteoarthritis. [2] None of the fractures were deemed to be due to violence.[3]Camel or horse riding suggested by femoral buttressing. [4] Stress and fractures concentrated on a few men from *Aila*. [5]Low upper limb stress suggested work on certain trades by both men and women. [6]Maintenance of farming in the region attested by high stress and fractures level. [7]Migration determined by difference between Srontium isotope levels in teeth (ie deposited in childhood) and limb (deposited in adulthood). Sample size was only five adults from each site. [8]Health based on occurrence of periostitis (P-caused by primary or secondary infections and can reflect infectious diseases, though is accentuated in cases of malnutition), porotic hyperostosis (PH – caused by anemic conditions, such as iron deficiency brought on by malnutrition, pregnancy or breast feeding) and dental enamel hypoplasia (DEH-caused by physiological or psychological stress up until 10 years of age).

believe uncritically. Within the Zabayir group there was little or no class or gender differentiation, except where that may be caused by sexual dimorphism (i.e. childbirth and breastfeeding). At Rehovat men, women and children were all clearly involved in hard, intensive agricultural ventures. Health was relatively poor. Some class differentiation was visible based upon proximity to the church. The *Laeanitae* suffered from very rare cases of stress and fracture. What evidence there was of stress and fracture was mostly concentrated on a limited number of males interpreted as labourers. Health was excellent, except for the juveniles who appear to have suffered from bad diet and or disease. In the case of the *Laeanitae*, there appear to have been significant class (or occupation), gender and age differentiation. Significantly the *Laeanitae* showed a high instance of migration in their bone isotope analysis (Perry 2002 summarised in Table 8.4). Clearly *Aila* attracted a significant number of migrants from elsewhere in the Roman Empire or beyond it (Perry 2002: 266-295, 192, 216, 235).

Trench/Phase	Pottery	Fauna	Activities
A first century AD	*Terra sigillata* Nabataean fine ware	Unknown	Metal
A second to third century AD	African red slip		Domestic
J first century AD	Nabataean painted and unpainted fine ware 3a,3b &3c, *terra sigillata*, lamps, juglet, Egyptian & *Gaza* coarse wares	Unknown	Unknown
J third century AD	African red slip 50a, juglets.		'Church'
K first to third century AD	*Terra sigillata* Nabataean fine ware	Unknown	Domestic
B first century BC to AD	Nabataean painted fine ware 2, eastern sigillata A, western *terra sigillata*,	Goat/ Sheep, Fish & Shellfish. Cattle. Camel, pig, chicken, dog and hunted gazelle, birds & small mammal very rare.	Baking, Mill *Garum*? Domestic
B second to third century AD	African red slip, Nabataean fine ware		
O first century BC to early third century AD	Eastern sigillata A, Aila ware	Unknown	Pottery Domestic
M first century BC	Nabataean painted fine ware 2a, 2b, 2c	Goat & Sheep. Few other domesticates. Fish & shellfish. Hunted animals very rare	Pottery, *Garum*, Copper. Domestic
M first century AD	Nabataean painted and unpainted fine ware 3a, *terra sigillata*, eastern sigillata A, B and C. Aila ware		
M second century AD			
M third century AD	Aswan plates Egyptian coarse and Aila wares		

Table 8.5 Summary of diet, ceramics and activities at *Aila*.

This may explain why *Laeanitae* were perceived as quite so different from other *Nabataeans*. Osteological data shows that in addition to different occupations present in *Aila*, profoundly different perceptions towards class, gender and age influenced the distribution of food and work

responsibilities. Their involvement in maritime activities made their lives very different to those of the nomads and sedentary farmers of the region. But their appearance and recognition as a port community parallels that of Nabataean society as a whole. Over the course of Nabataean and subsequently Roman occupation, *Aila* had come to supply demand and indeed represent, the changing tastes of the *Nabataeans* (confirmed by the changing pottery services used to consume them). The wide distribution of *Aila* ware pottery betrays the wide distribution of fish products from *Aila*. The settlement of *Aila* in the first century BC suggests more than just part of the gradual (often presumed linear) progress towards sedentary lifestyle by the *Nabataeans*, it shows that their society demanded maritime specialists. There is no doubt that fish products in the form of tuna pre date *Aila*, but the industry changed form and scale and to do this *Aila* had to change form and scale. The lack of evidence (such as Indian and Adulite pottery) for long distance trade found at *Aila* prior to the fourth century AD and the lack of *Aila* ware found outside of central Nabataea prior to the fourth century AD confirms classical sources who are notably silent on the issue of *Aila* as a port involved in the Erythraean Sea trade. It is not until the third century that such activities occur with regularity enough to attract a mention by Eusibius. It is then the end of the third century, like the beginning of the second century that marks a significant shift in the demography of *Aila* and the role of its inhabitants.

9 Inter-site analysis

The demography of the northern Red Sea ports is intimately related to wider political events in the region. The Augustan era started with the annexation of Egypt in 31BC and the utilisation of the southern Red Sea ports of Egypt, *Myos Hormos* and *Berenike*. During this period the border was stabilised between the Meroitic kingdom to the south and Rome somewhere between *Syene* (Aswan) and *Primis* (Qasr Ibrim), allowing for southern routes to *Berenike* to be protected. This led to a reliance on the west coast of the Red Sea for trade, whilst interests on the eastern coast continued to be controlled by the independent client state of the *Nabataeans*, following Rome's failed expedition by *Aelius Gallus*. The Near Eastern client states of Emesa, Judaea and finally Nabataea had been absorbed by the Rome by AD 106 and a number of important building projects by Trajan opened up the ports of *Clysma* and *Aila* for the trade through the re-excavation of the *Clysma* canal to the Nile and the building of the *Via Nova Traiana* linking *Aila* with northern Jordan. During this period *Berenike* appears to have waned somewhat (Sidebotham & Wendrich 2007), whilst *Myos Hormos* flourished, possibly benefiting from its central position within the Roman Red Sea territories (Peacock & Blue 2006).

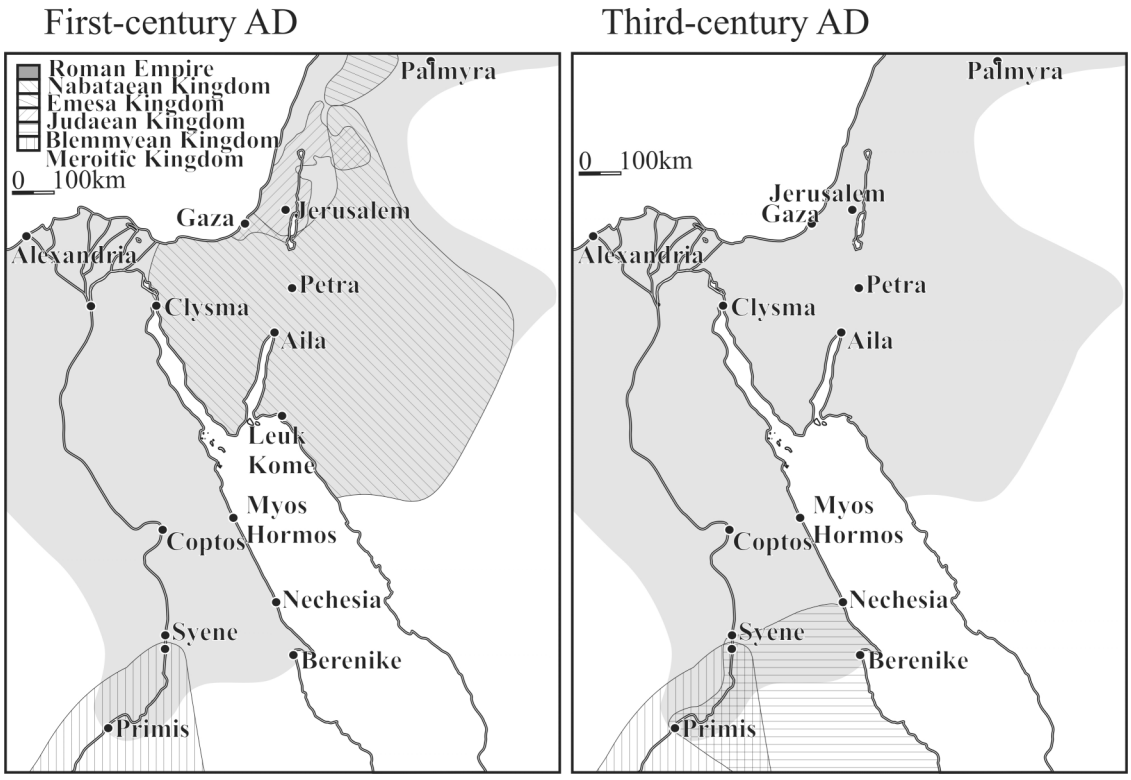


Figure 9.1 Political geography of the northern Red Sea in the first to third centuries AD (after Ball 2000: 33, 48, 61; Kirwan 1974: 45; Anderson et. al. 1979: 128).

Difficulties in policing the roads and settlements of the Eastern Desert of Egypt from disenfranchised indigenous nomadic peoples appear to have started in the second century AD (Cuvigny 2003b; De Romanis 2003), but it was really with the creation of a *Blemmyean* kingdom

in the third century AD that Rome really experienced a formidable power to the south (Adams 1988). Centred on the southern part of the Eastern Desert, the gold mining region of Wadi Allaqi and the fertile region of the *Dodechanos*, the *Blemmyean* kingdom had access to resources and a large population. With financial decline limiting resources, the highly expensive Roman forts were abandoned, with *Berenike* severely reduced in population (Sidebotham & Wendrich 2007: 372). We know from Procopius that the emerald mines to the north of *Berenike* were under the protection of the *Blemmyean* King and we have no reason not to assume the same for *Berenike* at this time. Arrangements made between Rome and the *Blemmyean* king appear to have organised an arrangement where Romans could continue to operate in the region, for a price (Olympiodorus 1.37, *FHN* 309). By the fourth century, with increased stability available new forts were built to the north of *Myos Hormos* at Abu Sha'ar. *Berenike* redeveloped in the Early fourth century AD, though none of the nearby forts were occupied in the late Roman period so it is uncertain how the city was protected or sourced its water in the later period (Sidebotham & Wendrich 2007: 373), (the nearest contemporary fort was Shenshef, 25km to the southwest). It is uncertain how far the *Blemmyean* kingdom reached and was influential in disrupting Roman designs on the region and how much of this was caused by independent brigandage by *Barbaroi* in the area between Coptos and *Myos Hormos*. Either way the abandonment of the forts and the resulting lack of security and supplies made the position of traders at *Berenike* and *Myos Hormos* untenable, or at least it was perceived as untenable (Ward 2007). *Berenike* reduced significantly in size and *Myos Hormos* appears to have been abandoned at some time in the mid third century AD. Secure ports in *Aila* and *Clysma*, now well integrated to the Nile river ways and canals and the road networks of the region, meant that by the third century AD, *Aila* was considered a major port for Indian Ocean trade (Eusebius *Onomastikon*: 6.17-21) resulting in seafaring routes concentrating along the eastern coast of the Red Sea (as far as *Berenike*) by the late Roman (Procopius *Histories*: 19.1).

Wider political events motivated settlement at the Red Sea ports and their subsequent changes in demography. The diverse and changing demography of each site has been identified in the previous Chapters by considering the consumption practices (fauna, ceramics and drink) and actions (maritime activities) undertaken by various distinct groups that made up each sites population. These sources inform us of the movement of people, how they constructed identity and how this changed with the adoption of new cultural features through the processes of hybridisation, acculturation and Romanisation. The practices and actions as represented by the archaeological samples discussed from the port communities of *Aila*, *Berenike* and *Myos Hormos* are compared to those of communities from contemporaneous desert settlements and forts from the same region. In this way how membership to a group identity was displayed or communicated through actions and consumption practices will be explained within its specific context. For example demand was tempered by supply concerns, limited by transport and resources available. For this purpose the results from the Red Sea ports will be compared with those from Roman Eastern Desert forts (*Krokodilô*, *Maximianon*, Abu Sha'ar) and quarries (*Mons Claudianus*), Eastern Desert settlements (Shenshef) and towns (*Petra*, Ez Zantur, Tell Hesban) and forts (Dajania, Lejjan, Beni Yasser,

Bshir) in Nabataea, representative of *limitanei* and auxiliary soldiers, Roman legionaries, Nabataean subjects, traders, sailors, indigenous coastal inhabitants and Eastern Desert dwellers.

9.1 Inter-site analysis on diet

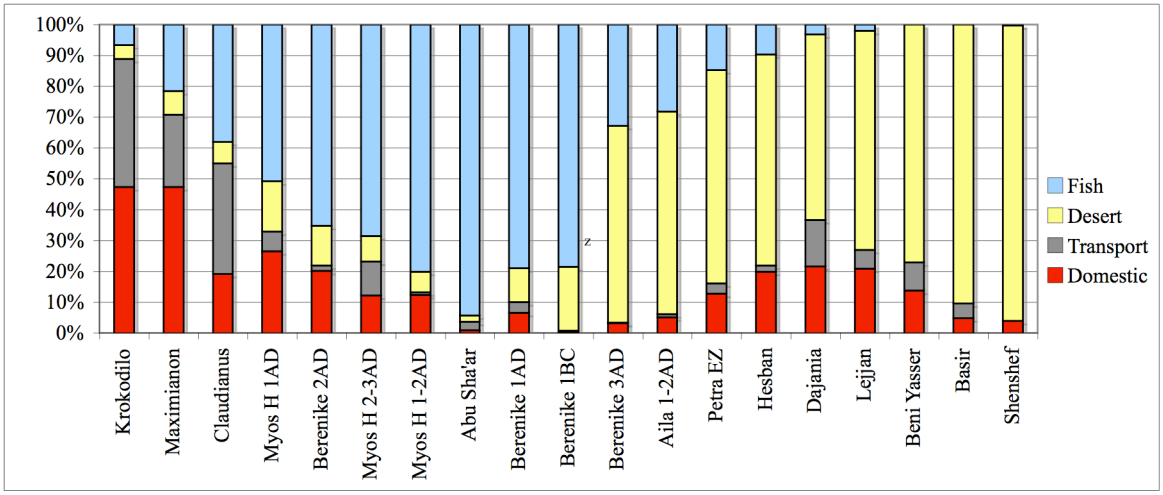


Figure 9.2 Fauna consumed at different Eastern Desert and Nabataean ports, forts and settlement sites. The fauna is categorised as discussed in Chapter 4 and data discussed in Chapters 5, 6 and 7. Based on data in Appendices 14.5, 14.6 and 14.8. Statistical significance tested in Appendice 14.9, Table 14.12.

The fauna consumed in the Red Sea region can be categorised as coming from three different environments as discussed in Chapter 4. Fauna from the Red Sea (fish, turtles and sea mammals) and fauna hunted or raised in the desert (mainly sheep, goat, gazelle and ibex) are the most common and most readily available. The third group required importation (live or butchered) from the Nile or Jordan valley, or extensive supplies from the Nile to keep them alive. These included animals specifically raised or caught for food (pigs, chickens, cattle and freshwater fish) or animals brought for their use as transport animals (donkeys, horses and camels). The distinction between these two groups is important as those brought for food represent high status, expensive imports, whilst those consumed after the natural death of a transport animal no doubt represent much lower status meat.

Displaying the distribution of fauna consumption by environment shows distinct and different diets (figures 9.2 and 9.3). These diets can be categorised into four groups:

- Firstly, diets that used large quantities of domesticated animals from the Nile as well as transport animals (over 40% pig, cattle, chicken, Nile fish, donkey, camel and horse) were common in the Roman forts of the Eastern Desert of the first to second centuries AD, such as *Krokodilô* and *Maximianon*, as well in some areas of *Berenike* and *Myos Hormos*.
- Secondly, diets totally reliant on Red Sea fauna (over 75%) were present in some *Berenike* and *Myos Hormos* deposits dating from the Ptolemaic period to the late Roman period.

- Thirdly, diets totally reliant upon farmed or hunted desert fauna (over 60%) such sheep and goat, gazelle and ibex were found at Eastern Desert settlements and third century AD onwards from *Berenike* as well as all Nabataean and subsequent Roman forts and settlements within the Nabataean Kingdom (Figure 9.3).
- Finally, a mixed diet containing features of all three major groups was found in some deposits dating to the first and second centuries AD at *Myos Hormos* and *Berenike*.

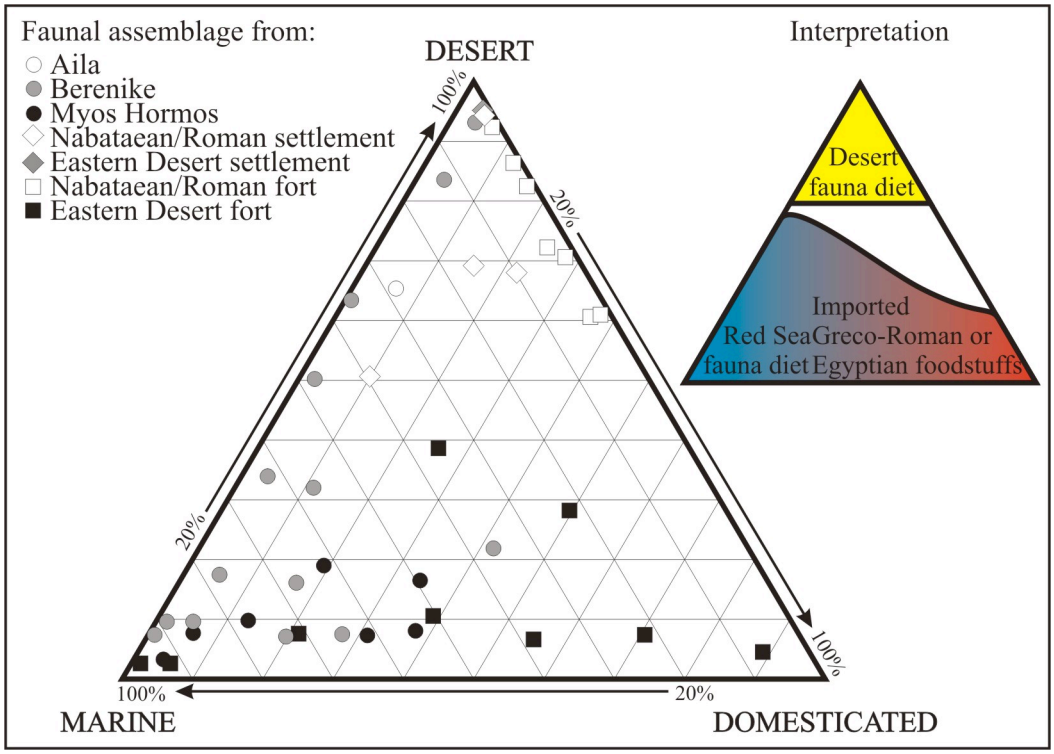


Figure 9.3 Triangular plot[13] displaying the three major diet groups of the northern Red Sea region (desert, marine and domesticates). Points represent samples from all available datasets of the Red Sea ports (circles), Roman and Nabataean forts (squares) and settlements from the ports' hinterlands (diamonds). Data includes desert fauna (sheep, goat, ibex, gazelle), as compared to domesticated (pig, chicken, cattle, horse, donkey, camel) and marine fauna (Red Sea fish, turtle and sea mammal). The interpretation model suggests the social significance of the diet data displayed. Based on data in Appendices 14.5, 14.6 and 14.8. Statistical significance tested in Appendice 14.9, Table 14.14.

The samples used from the Red Sea ports represent different areas and periods of the sites (appendix 11.5-6). This has allowed for intra as well as inter-site analysis, highlighting the great diversity of diets represented in different areas of *Myos Hormos* and *Berenike* (desert, Nile, mixed and Red Sea diets) and their change over time. Doing solely inter-site analysis would have averaged the data, erasing any trace of diversity within the port communities' diets, potentially

[13] Triangular plots are also known as ternary plots, simplex plots or de Finetti diagrams. They display the ratio of three variables that have a sum of 100% in a triangle. This was used effectively in King's study of Roman consumpton of fauna, where he compared sheep, cattle and pig (King 1985).

producing what may erroneously be labelled 'hybrid' consumption patterns. Instead the high resolution of the results suggests different communities that were not in anyway emulating each other. This was only possible because of the excellent practice of sampling, context recording and analysis at both *Berenike* and *Myos Hormos* (whilst similar analysis is expected from the in progress *Aila* report). When each area is plotted separately it is possible to see that there are Nile based diets present in the ports alongside mixed, desert and Red Sea diets. As these often come from large deposits (sample sizes ranging from the hundreds to the thousands of bone fragments) accumulated over some time, this cannot represent seasonal utilisation of food sources but a selection process, evidently carried out at some expense by those sourcing Nile species. With this long period of accumulation one would normally expect a more mixed, or averaged result (that may explain the few mixed results), but instead the majority of areas present distinctly different diets from contemporaneous deposits.

Specifically this shows that the military diet in the Eastern Desert forts was heavily reliant of Nile and transport fauna, at the exclusion of all else. The most varied diets are clearly represented within some areas of *Myos Hormos* and *Berenike*. Some of the inhabitants of *Myos Hormos* and *Berenike* relied heavily if not wholly upon the Red Sea as a source of food, despite the potential to raise sheep and goats in the surrounding environment. The late Roman fort of Abu Sha'ar may have been occupied by local Red Sea inhabitants, as it possessed similar fauna to that found in certain Red Sea based diets from *Myos Hormos* and *Berenike*. It may be significant that *Myos Hormos* was abandoned just prior to the foundation of Abu Sha'ar. These Red Sea diets contrasted with desert based diets that relied upon a sheep and goat herding economy supplemented by wild ibex, gazelle and birds, whilst ignoring almost completely anything from the sea. These two contrasting diets, sea verses desert, are so marked, despite the fact they are the two locally available sources of food. This must represent the significant intention or tradition by both communities not to consume the same food as the other, a relationship that can be defined as communicating cultural difference through the medium of food in the form of taboo and delicacies.

Nabataean settlements, including *Aila* and the late Roman forts of the region were all very similar desert based diets, supplemented with limited but still significant Red Sea fauna. This suggests that *Aila*'s population shared the same diet as other populations from the Nabataean Kingdom and subsequent to annexation, *Provincia Arabia*, as well as the local soldiers (*Limitanei*) that made up the Limes forts in the third and fourth centuries AD. The population of *Aila* certainly did not on the evidence available share any similarities in diet with the various groups that populated *Berenike* and *Myos Hormos*. Whilst the diet of people from Nabataea was heavily reliant on desert species, their taste for fish and fish products influenced by a long period of contact with Greeks was not shared by the Eastern Desert dwellers. It would however, be very difficult to distinguish from between Eastern Desert peoples, *Nabataeans* and *Palmyrenes*, based solely on diet in smaller samples especially if sieving was not undertaken (and the small fish bones were missed).

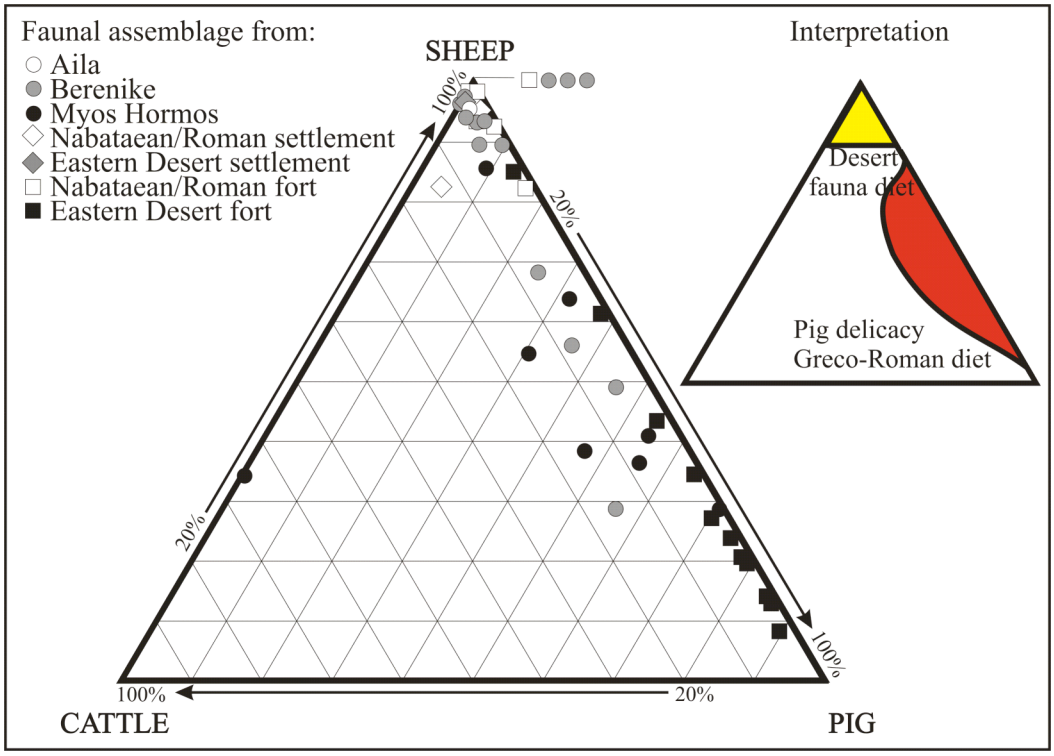


Figure 9.4 Triangular plot displaying the consumption of large domesticates (cattle, pig and sheep). Using the same samples as in Figure 9.3, here only the ratio of sheep/goat, pig and cattle are represented. The purpose of omitting all other fauna is intended to highlight the relative preference of pig to sheep, which in many modern and ancient societies is representative of delicacies or taboos. Based on data in Appendices 14.5, 14.6 and 14.8. Statistical significance tested in Appendice 14.9, Table 14.14.

The subject of delicacies and taboo foods is particularly pertinent to understanding the construction of identity through consumption practices. It is clear from Figure 9.4 that on the whole cattle did not play a significant role in diet in the northern Red Sea region. It is also clear that there is a polarisation in the consumption of pig. Pig was exceptionally popular in the Eastern Desert forts and in a limited number of *Berenike* and *Myos Hormos* deposits of the Imperial period. However, pig was exceptionally unpopular or completely absent from Eastern Desert, Nabataea and some early Red Sea port assemblages. Between the two was a smattering of mixed Red Sea port assemblages. From this it would appear that Red Sea and Nile diets start to merge in the form of mixed (hybridisation caused by emulation?) diets during the first and second centuries AD, whereas Desert diets remain distinct. In this case it is possible that the polarisation concerning pig represents distinction between pig as taboo for Arab groups such as the *Nabataeans* and *Palmyrenes* and the Eastern Desert dwelling populations, whereas it was either an expensive delicacy or military supply for Greco-Roman populations.

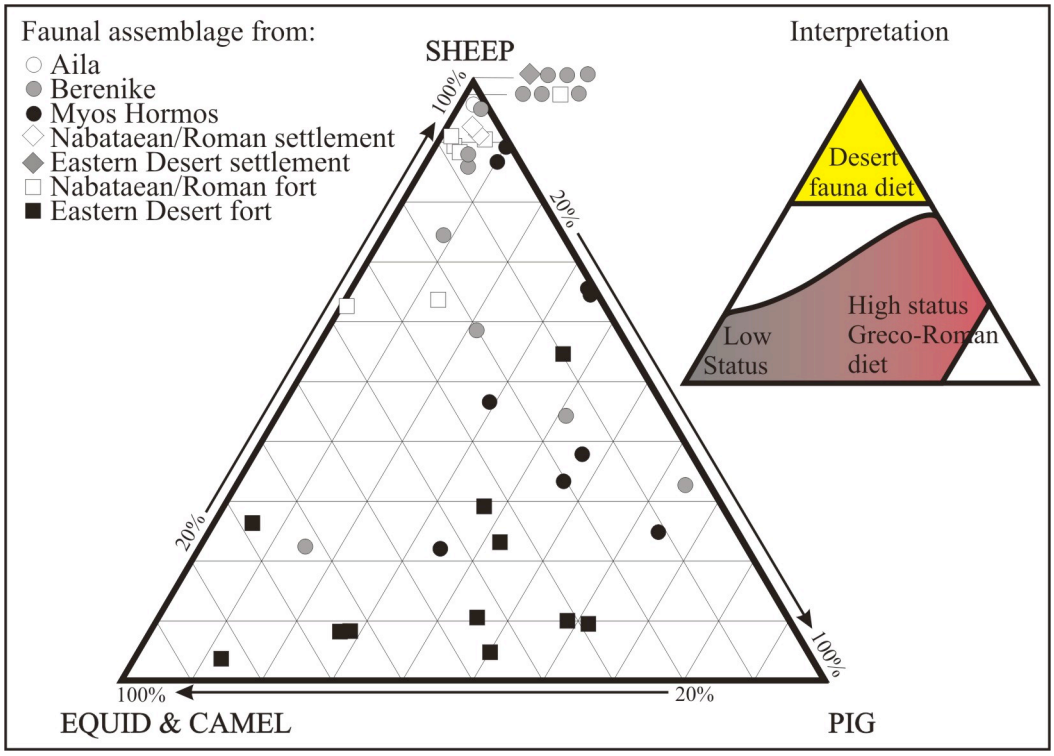


Figure 9.5 Triangular plot displaying the consumption of large domesticates (pig, sheep and transport animals). Using the same samples as in Figure 9.3, here only the ratio of sheep/goat, pig and transport animals (donkey, horse and camel) are represented. The purpose of omitting all other fauna is intended to highlight the relative preference of pig to sheep and transport animals, which in many modern and ancient societies are representative of either delicacies or taboos. Based on data in Appendices 14.5, 14.6 and 14.8. Statistical significance tested in Appendice 14.9, Table 14.14.

The consumption of work animals is in many societies taboo (Chapter 4). The quality of the meat may be poor, or the very work they have undertaken during life may make their meat be seen as socially unacceptable to eat. Also people become attached to work animals and may name them. People often find it difficult to eat something they have named. Access and availability of these animals will also affect their presence in the archaeological record. All these factors have influenced the quantity of donkey, horse, mule and camel in the diet of the various people of the Red Sea region. The polarisation between consumption patterns of transport animals cannot be solely determined by access. It is clear that there were no issues of taboo, with the consumption of these animals to the inhabitants of the early Roman Eastern Desert forts at Badia, *Mons Claudianus*, Abu Sha'ar, *Maximianon* and *Krokodilô*. However, the contemporary Nabataean forts and the Limes forts built in the third century AD normally show very limited or absent evidence of these animals bones, despite a similar function and presumably similar access to transport animals. Whilst the scale of traffic passing the forts in Nabataea may not have been of the same scale as that in the Eastern Desert during this period, this cannot alone account for the exceptionally low numbers of these animals in those assemblages. Consumption of work animals was relatively low in most port assemblages, though often present. There are some notable exceptions in the second and third centuries AD where consumption of donkeys became more common place in Red Sea and hybrid diets, though it is uncertain whether this represent choice (emulation or adoption of diet for

social reasons) or lack of choice (due to availability and status). It is possible that transport animals were consumed because of a reduction in the use of this port, reduction in the transport of goods and a reduction in the use of the work animals over that period. In conclusion, the consumption of transport animals also represents perceptions of taboo meats that distinguished between Arab and Greco-Roman consumption practices.

9.2 Inter-site analysis on tablewares

How people were eating was also important for the construction of group identities in the Red Sea ports. Whilst there were clearly different ceramic wares present within the assemblage (the most common of which were Roman red slipped wares, Egyptian faience wares, Egyptian thin walled wares, Eastern Desert wares and Nabataean tablewares), it is the form, rather than the colour that is the best indicator of how these ceramics were used. A range of service forms (including platters, cups, beakers, jugs and others) as well as bowls and dishes, made within the faience, thin walled and red slipped traditions were used when consuming food either reliant on Nile fauna or with a mixture of Red Sea and Nile fauna (hybrid diets).

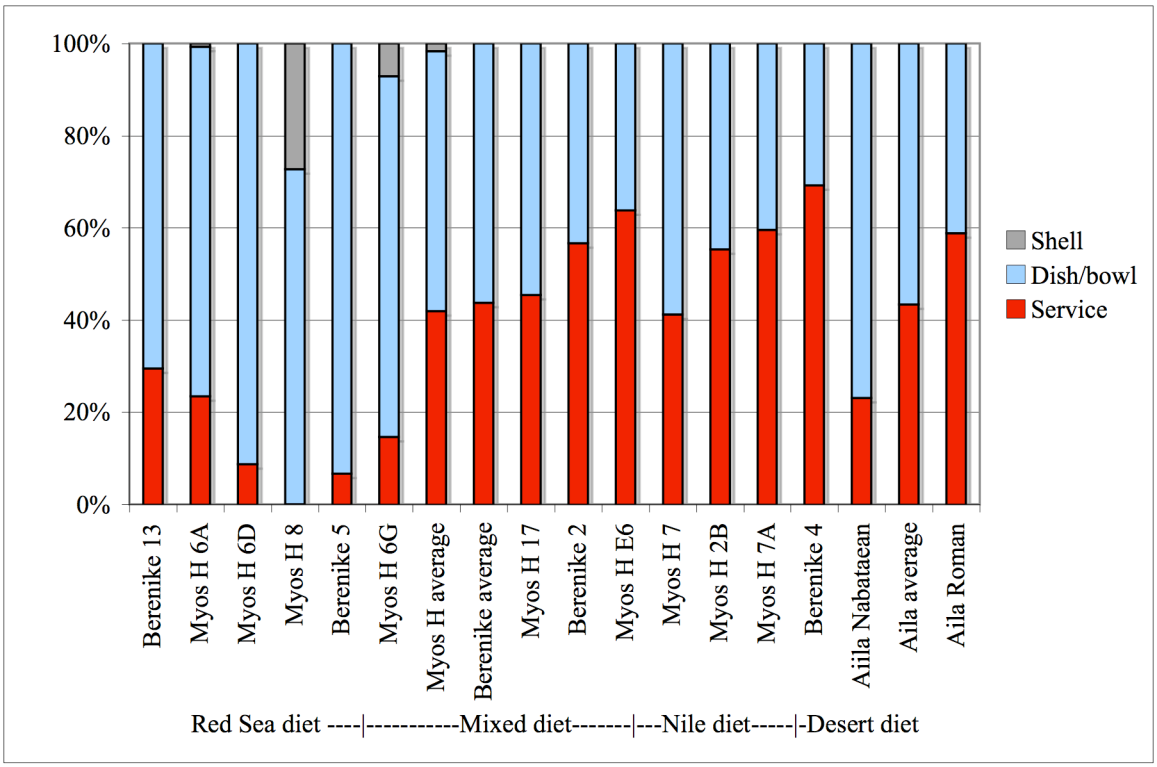


Figure 9.6 Tablewares used in Red Sea ports. Grouped by fauna diet. Based of data in Appendice 14.7. Statistical significance tested in Appendice 14.9, Table 14.12.

Eastern Desert wares, mostly in the form of deep, or hemispherical bowls, were associated with exclusively diet fauna (Chapter 6). In *Aila* during the Nabataean period, desert diets supplemented with a little Red Sea fauna in the form of fish, were consumed out of shallow bowls and dishes, though a small number of cup and jug forms were also used. The adoption of Roman red slipped

wares over the course of the first century AD onwards, represents a shift in interest towards the typical Roman service forms, though there is little evidence of a significant change in diet at this time (Chapter 7). A limited range of bowl or dish forms were utilised in the Egyptian Red Sea ports of *Myos Hormos* and *Berenike*. Some of these bowl and dish forms were made from shell material, whilst others were selected from the services of Greco-Roman or Egyptian ceramic traditions. These were mostly associated with Red Sea diets, though increased consumption of some Nile, transport and desert fauna appears in the latter part of the second and third centuries AD (Chapters 5 and 6). In conclusion how people were eating was socially significant and broadly related to consumption practices suggesting by the fauna (chaper 4).

9.3 Inter-site analysis on consumption practices

Over time social boundaries of what defined self and other changed at the Red Sea ports. The communities present acted differently in the face of Roman political and social influences. Those consuming Red Sea diets continued to use shell bowls and rely mainly upon seafood, however greater adoption of Nile and Transport animal meats appears over the course of the second and third centuries AD (Chapter 5). In Nabataea it would appear that the various 'Arab' tribes that once made up the Nabataean kingdom continued to consume much the same diet, reliant upon sheep and goat with limited seafood and absent or rare transport animals and pig (Chapter 7). The tablewares do appear to have changed towards a more typical adoption of Greco-Roman influenced red slipped wares, though some Nabataean tableware traditions continued after the annexation in less popular and lower quality forms (Dolinka 2003: 58, Chapter 7). There appears to be no discernable change in the consumption or presentation of food of the Eastern Desert dwellers or the Greco-Romans, though understanding is limited by the timeframe as Desert groups in the Eastern Desert are not really present until the third century AD onwards and the Greco-Roman group appears in the Augustan period and disappears towards the end of the second century AD in the areas excavated in both *Myos Hormos* and *Berenike* (both interesting demographic points in them selves).

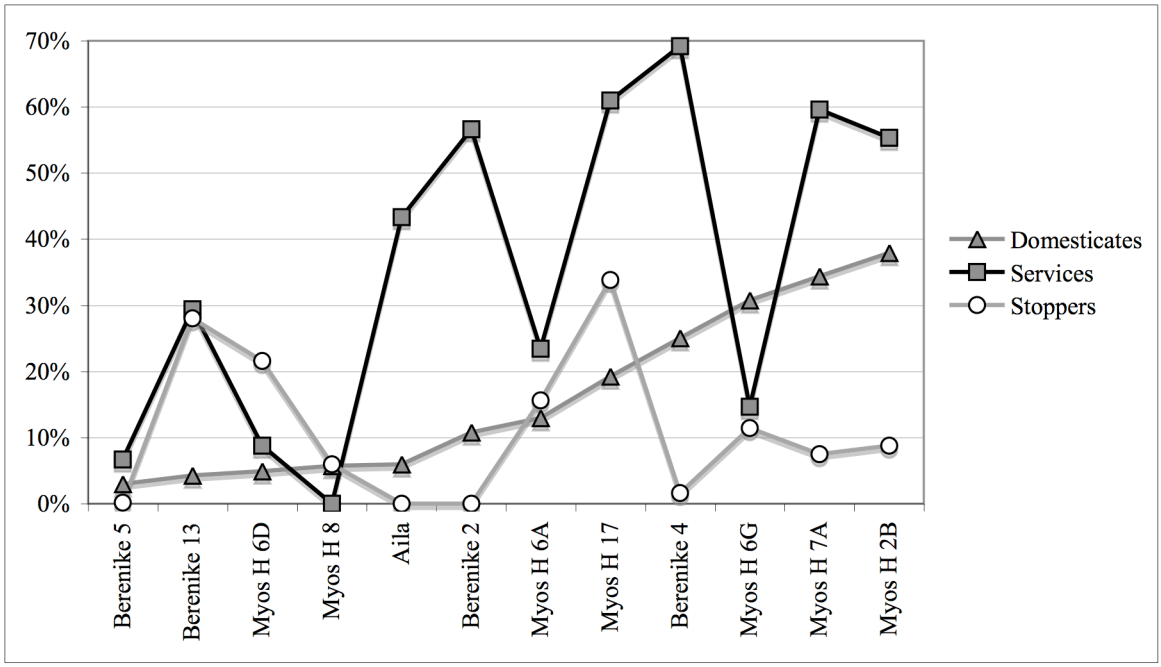


Figure 9.7 Consumption of domesticates, wine and tablewares used. Domesticates represented as % of all fauna, Services as % of all tablewares and Stoppers as % of all small finds. Based on data in Appendices 14.5, 14.6, 14.7 and 14.8, Table 14.10 . Statistical significance tested in Appendice 14.9, Table 14.13.

The relationship between diets reliant upon work animals and Nile fauna, wine consumption (based on stopper assemblages) and the use of Greco-Roman services (explained above), suggests a rough correlation, though clearly influenced by depositional factors. This clear relationship between the three datasets suggests the greatest access to wine, oil, Nile fauna, transport animals and the use of Greco-Roman pottery services was limited to one group within the Red Sea port communities. Access to wine and transport animals relating to vocation is also likely to have been an important factor.

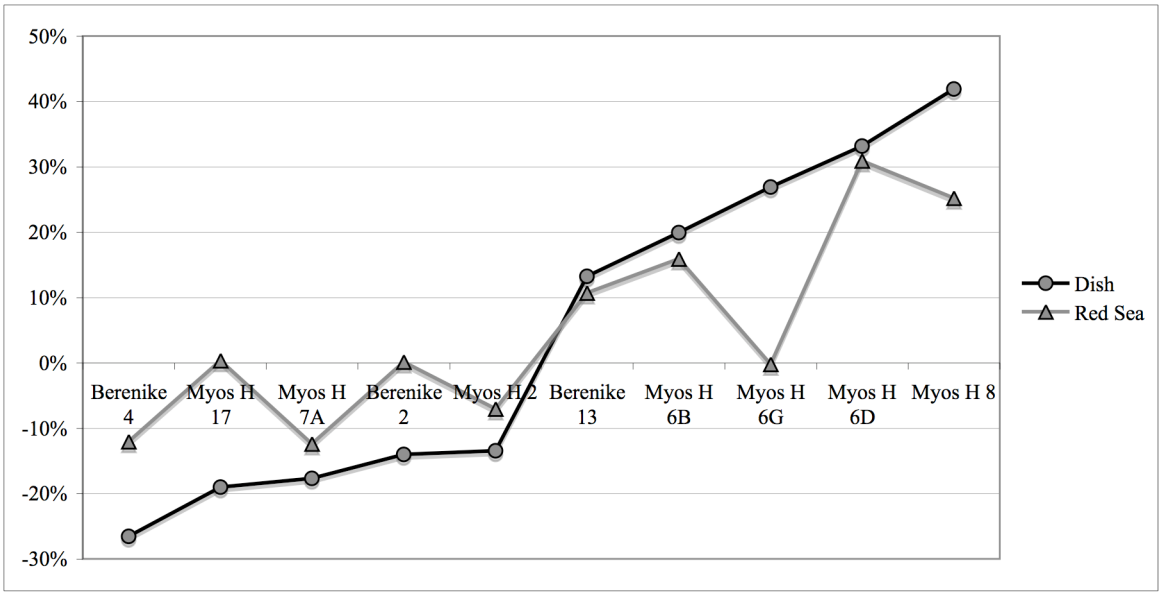


Figure 9.8 Red Sea diets and the use of dishes and bowls. Both represented as deviation from the average of its site. *Berenike* and *Myos Hormos* only.

It may be unfair to compare samples from various sites when considering the use of food in signifying social difference. When one considers the great distance from Coptos to *Berenike* than to *Myos Hormos*, one must recognise that importing food from the Nile would have been more expensive and more difficult at *Berenike*. For this reason, if we consider how much the use of pottery and consumption of fauna varies from the average of each site, a clearer picture emerges (Figure 9.8). Consumption of Red Sea fauna is associated with the use of a limited range of dish and bowl forms and with shell bowls. It appears it was more important to be different from others in the port rather than the same as similar people in other ports.

9.4 Inter-site analysis on maritime activities and consumption practices

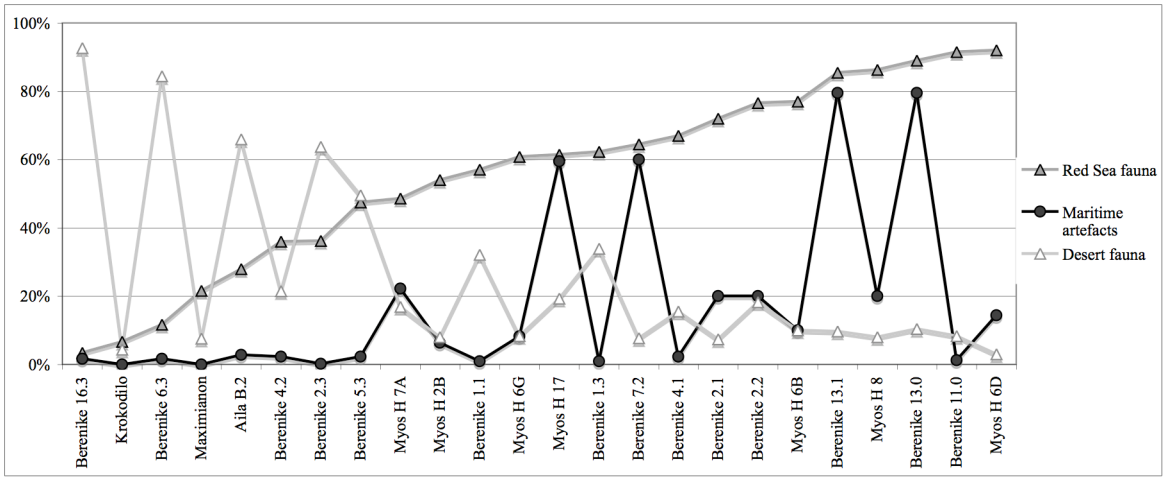


Figure 9.9 Maritime activities and consumption patterns ordered by Red Sea fauna. Based on data in Appendices 14.5, 14.6, 14.7 and 14.8, Tables 14.2, 14.4, 14.9 and 14.10. Statistical significance tested in Appendice 14.9, Table 14.14.

Maritime activities such as ship maintenance and fishing were also associated with specific diets and ways of eating. A high occurrence of maritime artefacts was associated with both Nile and Red Sea diet groups, both of which consumed fish in some quantity (Figure 9.9). Desert based diets were never associated maritime activity (Figure 9.9). These two observations suggest very different construction of identity between two populations at the Red Sea ports, in consumption, presentation and activities undertaken.

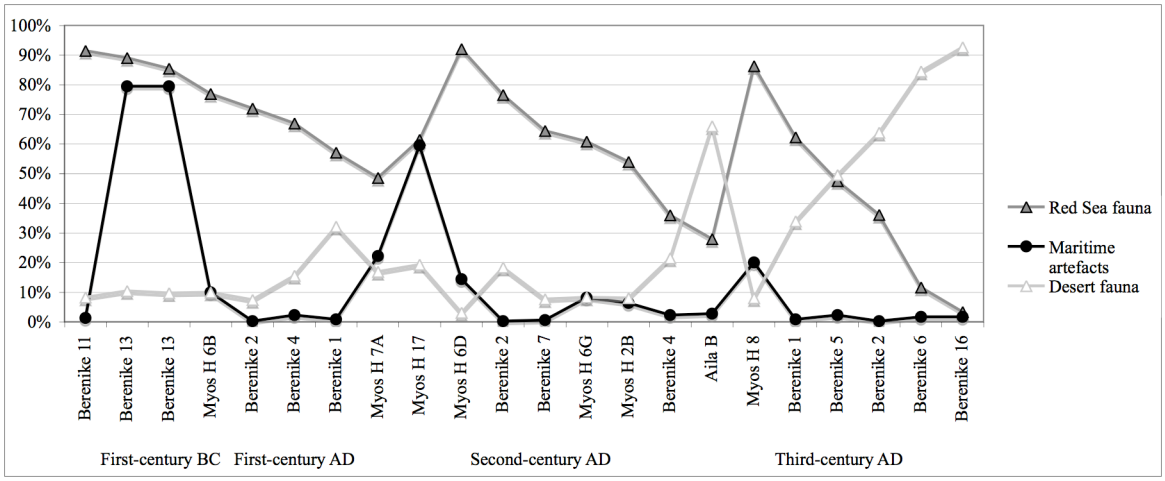


Figure 9.10 Maritime activities and consumption patterns ordered by time. Note increase in Eastern Desert fauna based diets over time, with a peak in the third century AD, whilst the quantity of maritime artefacts appears to dwindle over time. Based on data in Appendices 14.1, 14.2, 14.3, 14.5, 14.6, 14.7 and 14.8, Tables 14.2, 14.4, 14.9 and 14.10. Statistical significance tested in Appendice 14.9, Table 14.14.

Observing changes over time are more problematic as these are quite restricted by sampling strategy and site formation processes. However, the following observations can be made. Firstly, there appears to be a reduction in the level of maritime activity in the Red Sea ports over the course of the second century AD. By the third century AD evidence of maritime activity is both small and limited in range. It is restricted mainly to fishing activity, storage of elements of ship for an unknown or non-maritime reuse such as construction. This coincides with a change in diet in these locations. Reduction in maritime activity coincides specifically in *Berenike* with a change in the diet of the town's demography to that of desert species. Such a significant change in maritime activities, diet and also ceramic assemblage (with the prevalence of Eastern Desert ware), suggests a changing demography for it is unlikely that such a marked change in way of life could be engineered so rapidly or chosen by its inhabitants. Changing demography also suggests changing role for the Red Sea ports that almost certainly relates to a more general economic decline resulting in reduced interest in Red Sea Trade and local political situation with the *Blemmyean* kingdom using its military power to secure mineral wealth in the Eastern Desert. Whilst comparative material from *Aila* is still being studied, early observations suggest a possible increased role in Red Sea trade as a major port from the third century AD, agreeing with documentary sources (Ward 2007: quoting Eusibius), although others disagree (Parker pers. comm.). This involvement in the trade following annexation also is likely to have attracted wider Roman interest in trade. For this reason tableware ceramics started to get a more pan Roman look, with Nabataean forms becoming less popular and Roman styles of eating wore widely adopted. Detailed intra-site analysis of phenomenon would be an interesting area for further study.

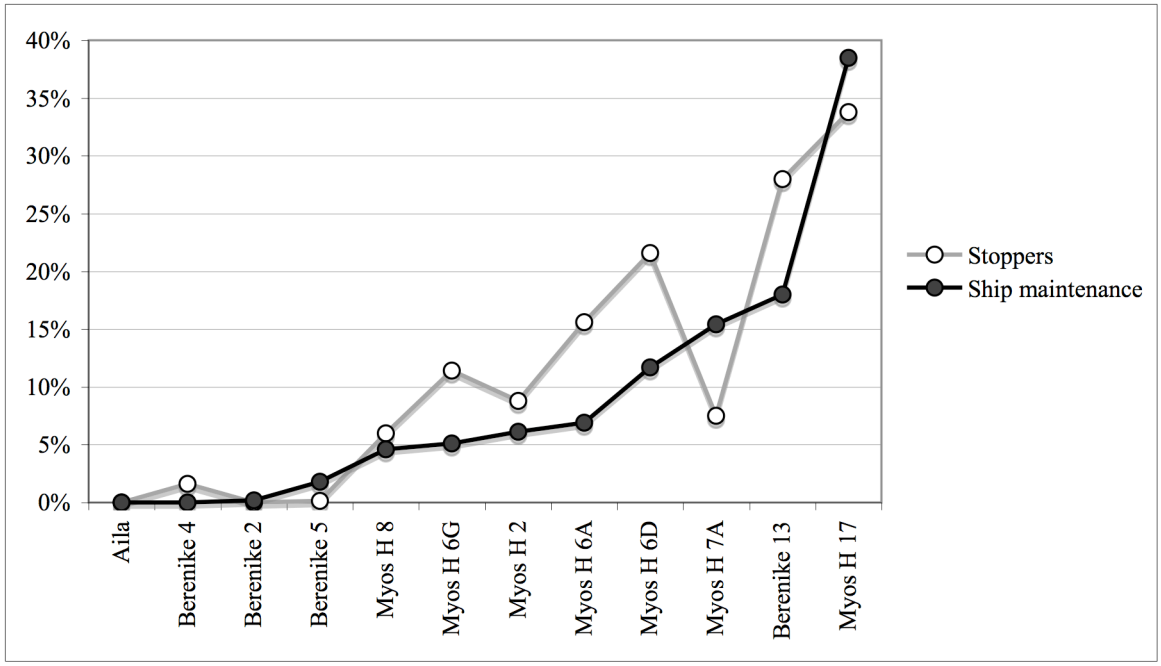


Figure 9.11 Relationship between wine consumption and ship maintenance. Note close relationship between the two, suggests greater access to the wine trade for those involved in ship maintenance. Based on data in Appendices 14.1, 14.2, 14.3, Tables 14.2, 14.4 and 14.9 (and Thomas forthcoming-b). Statistical significance tested in Appendice 14.9, Table 14.14.

The maintenance of ships at *Myos Hormos* and *Berenike* was a crucial and skilled role within those ports. Its decline in the third century AD suggests a lack of the necessary investment and infrastructure. This is not surprising considering all the resources that needed to be imported for such activities; wood, pitch, copper, lead, iron, cordage and textile. There is a close relationship between Nile based diets and ship maintenance (above), but also with wine amphora stoppers (Figure 9.11). At *Berenike* these activities were also associated with documents discussing Maritime subjects about Greeks or Hellenised Egyptians. Significant wine consumption has been discussed by Indian sources on Greeks (*Yavanas*) in southern India and whilst there are social hierarchy, economic and access factors to consider, it is clear that those involved in Red Sea trade look to have had increased access to, or demand for wine.

Whilst fishing equipment is associated with a Red Sea diet, Red Sea diets are not always associated with fishing. The actual level of involvement in fishing is relatively small in most areas of the Red Sea ports. This may be due to the very small signal left by fishing equipment in the archaeological record compared to other activities, such as ship maintenance. Fishing activities rarely account for above 2% of all small finds and when there are significant quantities, they are usually associated with harbour facilities and the foreshore, where other maritime activities are also taking place (such as hull maintenance). Exceptions are present in the sebakhs of trench 6D in *Myos Hormos* and trench 13 at *Berenike*. Despite site formation issues (fishing equipment is unlikely to be lost or discarded except at sea), Some inhabitants of *Berenike* and *Myos Hormos* did consume mainly local seafood and were involved in large-scale fishing activities. However, we must also accept that other activities were occupying individuals eating a more local diet and so the

local coastal inhabitants of the Red Sea, so called *Arabaegypti Ichthyophagi*, are possibly more integrated into the wider functions of the ports. Alternatively non indigenous inhabitants chose to only consume local produce, though this seems less likely when considering the important role diet plays in the construction of identity and the Greek ostraka that suggest that access to fish was intermittent (Leguilloux 2003).

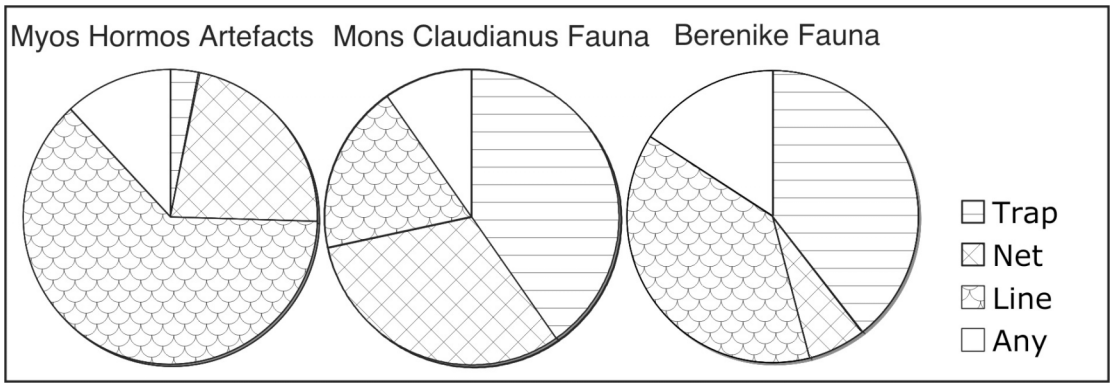


Figure 9.12 Fishing methods as represented by faunal and archaeological data. Based on data in Appendices 14.3, 14.5, Tables 14.2, 14.5 (and Hamilton-Dyer 2001).

The fishing industries at *Myos Hormos*, *Berenike* and *Aila* were each different. At *Aila* the industry appears to have concentrated on open water species such as tuna and mackerels in the early periods, before later concentrating on shore based fishing for fish sauces and parrotfish. In *Berenike* the full range of environments of Foul Bay were utilised. Open water fishing of species such as tuna increased over time, whilst sandy bottom species were targeted less. Parrotfish were not as important here as they were at *Myos Hormos*. At *Myos Hormos* Parrot fish accounted for a huge proportion of the industry. However, like *Aila* and *Berenike* a full range of sandy bottom, open water and reef species were targeted. Net, line and trap fishing were all utilised, often done from small boats or rafts called *Schedia*. This fish was preserved through drying, salting, pickling, rotting into sauces and possibly smoking also (Bülow-Jacobsen 2003), before being marketed across the Eastern Desert, Nile valley and the Levant. In the Eastern Desert the importation of these Red Sea fish species represents a demand by Greco-Roman or Hellenised Egyptians based at the military forts, Quarries and Mines. These fish are not found in significant quantities in the camps or later sites occupied by the users of the Eastern Desert pottery. Without the demand of the Roman bases and run mining industries there was no demand for the fish. Without further evidence from the Hellenistic period it is impossible to tell how much of this demand and the resulting fishing industry was already in place in the Hellenistic period. However, the accounts of ancient geographers based on Agatharchides (whose account is based on that of Simias in the fourth or third century BC), suggest that the fishing economy was not as complicated, diverse and well marketed during that time. This may however be due to Greco-Roman opinion about the indigenous population (the subject of the next section). The marketing was integrated into a larger trade of Nile, Desert and Red Sea foodstuffs with Nile species reaching the Red Sea and vice versa. In the Levant the pattern is a little better understood, with interest within Nabataea in Hellenistic

fish products. Early evidence of fish products implies early demand was for pickled tuna (Lernau et. al. 1996). This may be inspired by demand originally supplied by the Mediterranean. Later *garum* and parrotfish were also transported. By the late Roman period, Parrotfish were the main fish exported from the Gulf of Aqaba.

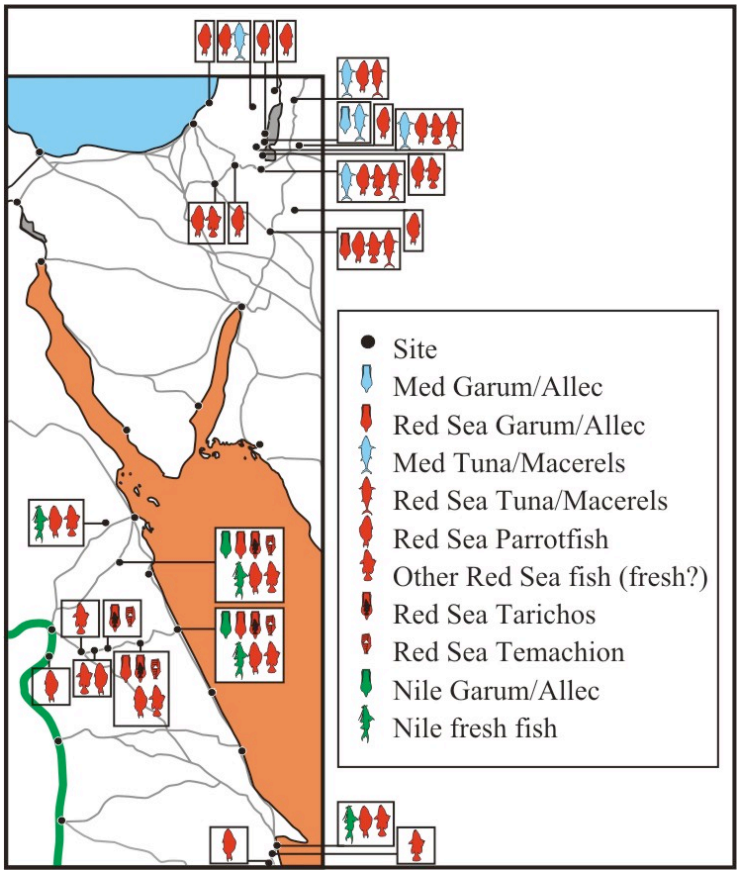


Figure 9.13 Map of fish product distribution.

In conclusion, there is a clear relationship between how and what people were eating and drinking and maritime activities. Desert diets were associated with either Nabataean or Eastern Desert pottery and were not associated with significant levels of maritime activity. Diets based on species from the Nile, transport animals and domesticated mammals, supplemented with some Red Sea fish, were found alongside red slip services, high levels of wine consumption in military contexts or associated with ship maintenance. At *Berenike* they have been found alongside ostraka on maritime subjects that involve individuals with Greek or Hellenised Egyptian names. Diets reliant upon Red Sea fauna were associated with bowl and dish forms, including those made from shell, they were often found alongside a variety of fishing equipment at the Red Sea ports of *Myos Hormos* and *Berenike*, though not exclusively so. In trench 8, these were found alongside ostraka mentioning an *Ichthyophagos* called Pakubis.

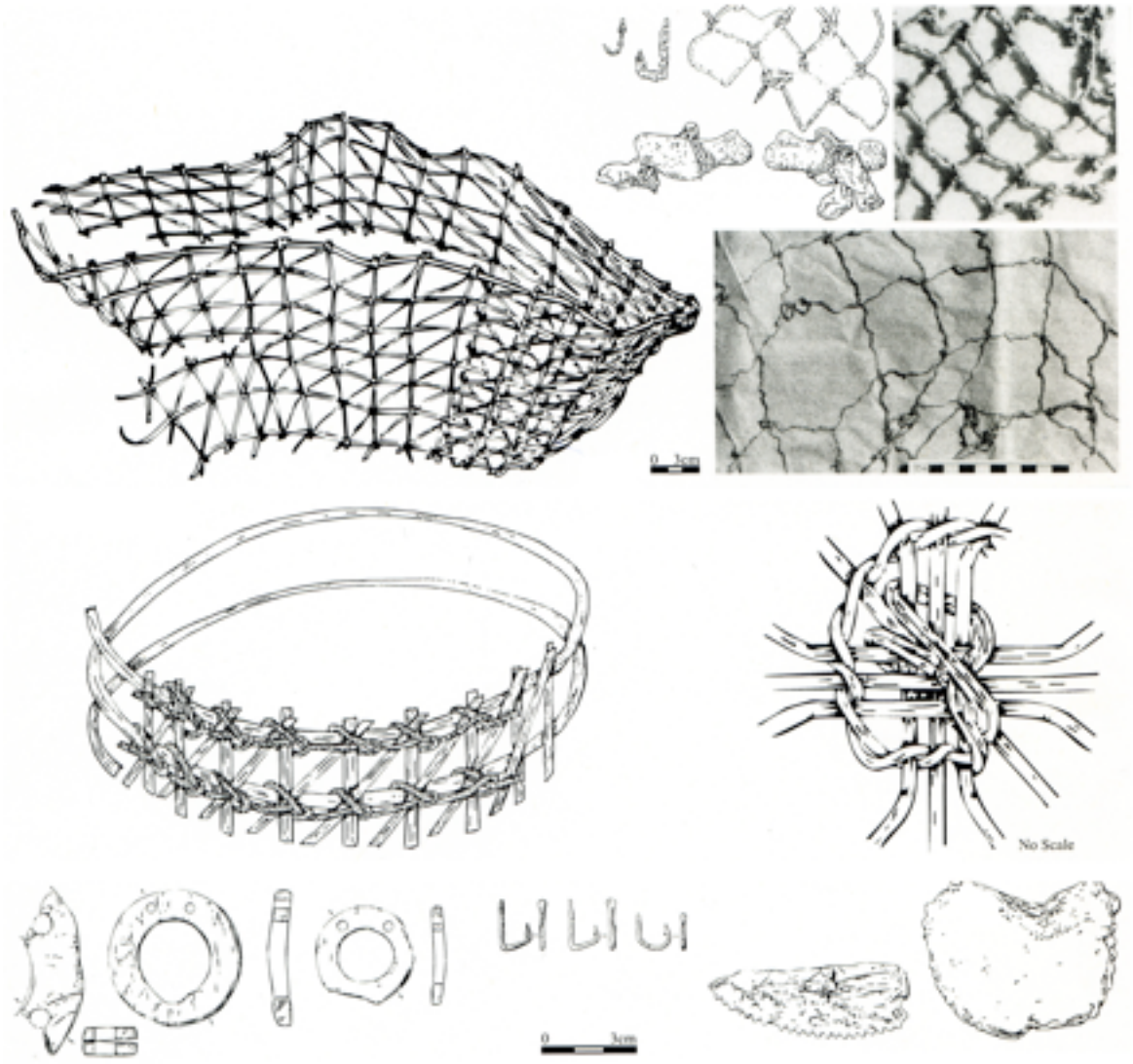


Figure 9.14 Maritime artefacts from Abu Sha'ar and *Mons Claudianus* (after Wendrich & Van Neer 1994 184-7; Hamilton-Dyer 2001: 362; Maxfield 2001: 405).

If one accepts that consumption practices and a sense of place are both important in the definition of self (group) identity, then there are discreet group identities identifiable in the archaeological record. Consumption practices are significant in the maintenance of identity because food, drink and tablewares represented access to resources sourced via networks of people. Specific foodstuffs and preparations are also expected when ascribing to a particular group. Specific foodstuffs may be taboo or delicacies that represented clear distinction from other groups. Similarly shared views on taboo meats, such as pig, may represent shared identities between Arab groups, such as *Nabataeans*, *Palmyrenes* and people from the Eastern Desert. Finally, emulation of other groups may provide grounds for shared views or identities, such as the adoption of meat by indigenous inhabitants (*Ichthyophagi*) over the course of the second and third centuries AD, even when this involves the use of lower status foodstuffs such as donkey and camel.

It was particularly popular in the Greco-Roman geographies to identify people with their economy. However, maritime activities would also have provided important indicators of self-identity based on a sense of place and purpose. Carpentry, shipwrightry, sail making, rigging, antifouling, ship maintenance, navigation, sailing, fishing, construction of fishing equipment,

building of traps, preparation of fish products and the marketing of them would all have been important roles within the port. These different roles made individuals part of a port community. However, to suggest that this port community was a hybrid culture of mixed filiations and ethnicities would ignore extensive evidence to the contrary in this study. What has become clear is how different people were within the Red Sea port community, how they all had their roles and how they were determined to remain different from others. It is almost as if as a reaction to increased cultural contact, self (group) identities had to work harder to remain distinct. This is why despite the increased consumption of Nile foodstuffs, the use of shell bowls increased over time at *Myos Hormos*, by those who were fishing there. This is why those who were involved in ship maintenance, despite the use of various tableware forms, whole services were used, despite its expense (considering its transport) wine and oil was consumed and fish were imported from the Nile!

By the third century AD people eating desert fauna diets were a major community within *Berenike*. These people were not associated with maritime activities, but instead Palmyrene Auxiliaries associated with a shrine and later Eastern Desert dwellers, possibly connected to the *Blemmyean* Kingdom as Rome pulled out of some of the Eastern Desert forts leaving gold and emerald mines to the *Blemmye*s. At *Aila*, very little maritime activity has thus far been identified, with the exception of some fishing and *garum* production activity. With the Roman military strained across the eastern part of the Roman Empire in the third and fourth centuries AD a new policy occupied the Limes forts with indigenous Arab troops. These troops also had similar diets to the Eastern Desert and *Aila* populations. Seafood was rare but consumed possibly as a delicacy. Though the diets of these 'Arab' groups may be similar, it is uncertain to what degree they may have thought of themselves collectively as 'Arabs'.

Consumption practices and maritime activities distinctive as actions performed by individuals involved in vocational specialisation are specific to each context and vary specially and temporally between and within sites. For this reason, whilst acculturation, or hybridisation may appear represented in an archaeological assemblage, the reality in each port explored is that of difference within each port community. Styles of ceramic and ways of eating may change over time, but patterns of difference are maintained between these port communities. To argue for the hybridising influence of ports on their communities is to misunderstand the roles of individuals and groups within a port made up of communities. New peoples may come into a port, but they will have their roles and areas of the port within which they could settle. Because of the extremely skilled jobs required, all ports require specialisation, it's just that in these cases, specialisation also is related to group identity as recognised in the consumption practices. It is only through such specialisation (in this case ethnic specialisation) that such complicated settlements can exist.

10 Greco-Roman theories of ethnicity

The indigenous peoples of the Eastern Desert and Red Sea coast were known as the *Trogodyte*s and the *Ichthyophagi* in Antiquity (Herodotus *History*: 2.29-31,4.183-91; Agatharchides *On the Erythraean Sea*: 31-51, 62-7; Diodorus *Library of History*: 1.30-7, 3.23-53; Strabo *Geography*: 16.4.4-14; Mela *De Chorographia*: 1.22-48; Ptolemy *Geography*: 4.5-7; Plutarch *Lives*: 25.5-28). These exonyms were used to describe culturally distinct groups who covered large geographical areas. For example, the term *Trogodyte* was most commonly used to describe the peoples who populated the area east of the Nile, Egypt and Nubia, whilst the *Ichthyophagi* populated the coast of the Erythraean Sea (modern Red Sea and Indian Ocean). Within these two groups there were distinctions made. Ptolemy for example distinguishes a group known as the *Arabaegypti Ichthyophagi* (Ptolemy *Geography*: 4.5) in the northern Red Sea coast of Egypt, whilst Agatharchides made clear distinctions between the *Ichthyophagi* from various parts of the Red Sea, Persian Gulf and South Arabia (Agatharchides *On the Erythraean Sea*: 3.15-22). Various labels were used for the nomadic peoples of the Eastern Desert including *Blemmye*s, *Trogodyte*, *Beja, Colobi*, *Megabaroi* (Barnard 2005: 23-5) and on occasion Arabs (Pliny *Natural History*: 6.167-9). The classical accounts written on the indigenous peoples of this region are the views of Greek or Latin writers presenting their biased perspectives on the peoples of the Erythraean sphere. For this reason they cannot be uncritically accepted as fact. Neither should archaeological 'facts' be used to assess the accuracy or truthfulness of ancient authors' statements (and so justify their conclusions). Though tainted by bias, these sources are valuable mines of data on the various authors' views on the abstract concept of ethnicity and how it was perceived in Antiquity.

Whilst often directly associated with the modern term 'ethnic group', the Greek term *Ethnos*, represents "a class of beings, not specifically an ethnic group" (Hall 2002: 17). However, though the term ethnicity is a modern one, the concept is a very old (Chapter 2). As ethnicity is an abstract concept, the method and criteria used to characterise ethnic groups can differ greatly. This Chapter outlines how people were characterised in the classical sources, through identifying the *theory of ethnicity* (how the author perceived ethnicity was constructed, Astuti 1995, see also Chapter 2) and the *indicators of ethnicity* (the various specific criteria used in decisions to categorise people) used. Explained within their specific cultural and political context, what these writers and their followers perceived as the most important features that made these people different from themselves will be revealed.

The Greco-Roman literature on the Erythraean Sea leading up to the Imperial Roman period has a Hellenistic background that influenced both the specific knowledge of Red Sea geography and attitudes towards non-Greeks in the wider literature. Also the region possessed a number of Greek colonies and many of the sources for these books were Greek travellers and colonists. However, Greek views of self-identification (a Hellenic identity) and of other ethnic groups changed over time, being influenced by the specific political agendas of the day. By the Archaic period in Greece (c.800-500BC) it has been argued that elite groups in defining their self-

identity used mythical 'Hellenic genealogies'. This produced a form of aggregative Hellenic identity, based upon the ascription to a assumed (fictional) descent from a sub-Hellenic group, such as the Dorians or Ionians (Hall 2002: 179). During this time ascription to a Hellenic identity operated vertically rather than horizontally, allowing for a blurring of ethnic labels between elite groups, creating a simulated peer group (ibid.: 119). At this time there is no evidence of a Pan-Hellenic identity (ibid.: 175). It does represent an early use of a common descent (*Genos*) that becomes an important indicator of ethnicity in Classical Greek literature.

The expulsion of the Persian invasions (490BC and 480-79BC) triggered a redefinition of Hellenic identity, an identity defined through the polarisation between Greek and *Barbarian* (Hall 2002: 175). The term *Barbarian* (βάρβαροι) may have been the product of onomatopoeia (representing the sound of incomprehensible speech Hall 1989: 4) suggesting a priority of linguistic criteria in Greek self-definition. The indicators of ethnicity used to illustrate Greek identity quoted by Herodotus were; blood (descent), language, religion and culture (Herodotus *History*: 8.144.2). These shared criteria set Greeks aside from other groups (*Barbarians*), creating a Pan-Hellenic ideology:

- A common language (*Hellas Glossa*) was important to the Greeks (Herodotus *History*: 2.154.2), though it was itself an abstract reification as variety within the Greek language was significant.
- Common descent (*Genos*).
- Culture (*Paideusis*) was itself subdivided into *Diaitia* (material culture, subsistence and livelihood), *Ethea* (or cultural personality) and *Nomoi* (laws or norms of culture).
- Religion, the Greek pantheon of gods and religious rites, sacrifices and furniture were perceived as common between Greeks.

In order to illustrate the shared Pan-Hellenic identity and the difference between Greeks and *Barbarians*, Herodotus had to tell his reader (or listener) how other peoples were different from the Greeks (Hartog 1988: 259). This was based upon an assumed implicitly shared knowledge of what it was to be Greek. On this basis Herodotus then communicated difference through what Hartog calls the "rhetoric of otherness" (Hartog 1988: 237) using the following communicative tools;

- Inversion; anti-sameness where a is the inverse of b.
- Comparison and analogy; basically a is as b or a is to b what c is to d.
- *Thoma* (*Thomasa*); marvels or curiosities exoticising the difference from the normal and known, often utilising mythic or fantastic elements (Hartog 1988: 344).

In this way Herodotus illustrates the difference between *Barbarians* and Greeks based upon divergences in what he perceives as important *indicators of ethnicity* such as descent, language, religion and culture (Herodotus *History*: 8.144.2 and 5.49.3), supported by geographical explanations that created bounded identities (that ethnic identities were geographically discrete, Hartog 1988: 343). The crossing or blurring of these boundaries (be they boundaries of language, geography or culture) were seen as highly dangerous and reckless, with examples told of the unpleasant fate of individuals who transgressed these boundaries (Herodotus *History*: 332-3). A side effect of these tools is a polarisation, in Herodotus' case the polarisation between the Greek

and the *Barbarian*, that is defined through the "exclusion of the middle" (Hartog 1988: 259). Because of this polarisation, features used to define the other are "divergences from the self". So indicators recorded as representative of an other identity include things that are divergent from what is important to the implied shared identity of the author and his readership, rather than what is important to the self identity of the other (Hartog 1988: 205-6).

The resulting polarisation between *Barbarian* and Greek is the result of a code of power, visible in the repeated portrayal of the *Barbarian* kingdom, in direct opposition to the Greek polis and its politics (Hartog 1988: 323). Similarly the nomadic *Barbarian* is a regular literary theme, in direct opposition to the Greek polis and its way of life. In this way the *Barbarian* is perceived as divergent from the Greek (self) in important fields of Greek identity such as death, perception of space or territory (Hartog 1988: Chapter 4), religion and religious space, ritual and its absence (Hartog 1988: Chapter 5). Often *Barbarian* gods were identified with Greek gods and the presence or absence of Greek gods in the *Barbarian* pantheon were discussed (Hartog 1988: 246). To conclude, Herodotus portrays the Scythians (as nomadic *Barbarians*) as "an accumulation of negatives ... the sum of deficiencies, the opposite of polis and Greeks, i.e. the definition of apolis" (Hartog 1988: 205).

Following Herodotus' History, subsequent Greek literature characterised nomadic populations as synonymous with savage *Barbarians* (Hartog 1988: 206). This polarisation model can be found in other Greek literature and "from Hippocrates ... to Aristotle there is an extensive cross-fertilisation between ethnography and moral or political theory" (Hall 1989: 191). But this Pan-Hellenic ideology from the fifth century BC, characterised these *Barbarian* groups in a very specific (non-Greek) way and often compared them to mythical archetypes (Hall 1989: 54). The use of myth was however a deliberate choice, to gratify the taste for the marvellous and the entertaining (*Thoma* Hartog 1988: 303) despite criticism in Antiquity (Thucydides *History of the Peloponnesian War*: I 20-22, appears to criticised the mythical element of his work, whilst Cicero called him fabulosus 'fond of tall stories'). This myth-system, that included the use of supernatural *Barbarians* (or mythical tribes) was important to Greek self identity and the actions attributed to these mythic tribes illustrate their use in Greek identity as "lawlessness, incest, cannibalism and other deviations from the socially authorised (Greek) way of life are 'discovered' by Greek ethnographers ... in known *Barbarian* communities" (Hall 1989: 53).

By the fifth century BC, culture had become the determinant of a Hellenic identity (Hall 2002: 219). Following the Persian war Atheno-centric definitions of Hellenic identity were espoused by writers such as Isocrates, who defined Hellenic identity as something taught by Athens (ibid. 209). This was a clear use of a Pan-Hellenic identity as a political tool for legitimising the Delian league (ibid. 188-9). Later in the fifth and into the fourth century's BC, discussion of relative merits of cultural (*Nomos*) and environmental (*Physis*) determinants in shaping the Hellenes spelled a shift towards environmental determinism in the literature of Hellenic identity (Hall 2002: 218; Isaac 2006). This can be clearly seen where Aristotle's stated that the difference between the Greeks and *Barbarians* was determined by their nature (on *Physis* see Aristotle 1.1.1252b5-9, Hall 2002: 217, also quotes Euripides). This change in the characterisation of

peoples created a hierarchy of peoples based upon shared physical, mental and moral attitudes, determined by their environment, lineage and inherited characteristics (Isaac 2006). The rationalisation in systematic thought of these assumptions is visible in the writings of Aristotle's (*Politica* 1327b; Isaac 2006: 36). It has been argued that the rationalisation of this prejudice to justify the treatment of other ethnic groups as slaves because it has been determined by their lineage, inherited characteristics and environment is a form of 'proto-racism' (Isaac 2006). Most important politically, these prejudices were perceived as justifying the imperialism of Alexander and later Hellenistic dynasties.

By the Hellenistic period "the sheer numbers of Greeks and Macedonians transplanted from their ancestral homes and resident in '*Barbarian*' territories presented a radically different framework within which self-identification operated" (Hall 2002: 220). The first century BC writer Dionysius of Halikarnassos defined Hellenic identity through language, way of life, religion and laws but omits descent (Hall 2002: 224) and this movement away from descent is also present in the second century AD Athenian ethno-centralism (where Athens is portrayed as the capital of Hellenic identity) writings of Publius Aelius Aristides (Hall 2002: 225). In this way virtue, culture and language, rather than birth became important in ethnic identification as colonial expansion by the Hellenistic empires blurred linguistic and geographical boundaries. Indeed this blurring of geographical boundaries, combined with the perception that the environment influences the mental and moral characteristics of people led Livy to conclude in the during the Augustan period that the movement of Macedonians to Egypt during the Ptolemaic period explained what he saw as their subsequent degeneration (Isaac 2006: 41). But it was this polarisation of Greek and *Barbarian*, with the argument that the formers superiority over the latter's was determined by nature, that was used to justify Hellenistic colonies on the Red Sea.

10.1 Ptolemaic colonial experience

During the Macedonian and Hellenistic periods (323-31 BC) Greek political geography had expanded far outside its original boundaries and so their 'theory of ethnicity' changed to accommodate. A vast acceleration in the exploration of the Erythraean Sea by Greek travellers meant knowledge of these lands became available to geographers of that age. The exploration and colonisation of the African side of the Red Sea was the product of a number of political motivations with social implications. Travellers' ethnographic accounts started with Ptolemy II's Nubian campaign that "marked the beginning of systematic data collection concerning the regions south of Egypt" (Burnstein 1989: 12). Subsequent exploration of the Erythraean Sea coast providing sources of elephants (Casson 1993) and an increasingly lucrative Indian Ocean trade network (Meredith 1957; Murray & Warmington 1967), whilst the Eastern Desert was mined for gold (Meredith 1952). This exploration and exploitation of resources was carefully maintained through the foundation of Greek colonies (for epigraphic evidence of Greek colonists and travellers see Sidebotham 1986; Burnstein 1989: 11-2) dependent of food transported by ship from Egypt.

The literature on the indigenous populations was the product of the accounts available to the author and the cultural bias that they carried. These factors determined how information was remembered and sorted and potentially discounted before being written. A particularly frank admission of this is made by Strabo in his account of the Arabs of the Eastern shore of the Erythraean Sea; "I am not giving most of the names of the tribes because of their insignificance and at the same time because of the oddity of the pronunciation" (Strabo *Geography*: 16.4.18). Also the source accounts were determined by the traveller's embodied experiences within a colonial context. Their perception would be influenced by their situation, potentially including quite difficult circumstances, making the selection of ethnographic data recounted not necessarily rational. The subversion of the rational aims of collecting and disseminating ethnographic knowledge, because of its colonial context, is well illustrated by a more recent study of European anthropological exploration of Africa in the 19th and early 20th century (Fabian 2000). Fabian questions the rationality of data collection and its interpretation following what he describes as the profound effect of 'ecstatic' elements (drugs, fever, sex, fear, fatigue, violence and incomprehension of native languages) on these anthropologists (Fabian 2000: 69, 277-80). With this in mind, the influence of drugs, namely alcohol on the Greek characterisation of people may be significant, as in the Indian Sangam literature the Greeks were "described as indulging in drinking" (Ray 1995a). The Indian Tamil literature also describe the Greeks and "the cool and fragrant wine brought by the *Yavanas* (Greeks) in their good ships" in the same breath. One example describes "having increased the joy by giving to the girls of shining bangles, who every day have taken in hands, vessels beautified by gold, to drink the cool, fragrant wine brought by the *Yavanas* in beautiful bowls". From this some altered state of mind may have influenced the Greek characterization of peoples, however it is in the Greek literature that we can see clear examples of how violence and fear are directly associated with the subsequent characterization of the Indigenous populations of the Red Sea. One example of the role of violence, fear and language barriers is recorded by Agatharchides (*On the Erythraean Sea*: 41b, preserved in Diodorus *History*: *3*.183-6 and Photius *Bibliotheca*: 250.41 450a-b), where he gives the account of Simmias who encounters the *Ichthyophagi* when dispatched by Ptolemy III to explore the Erythraean Sea coast. Simmias described the *Ichthyophagi* as "insensitive *Aethiopians*" and he points out that;

"in general, they do not come into contact with other tribes nor does the strangeness of the appearance of those who visit them influence the natives, but, gazing at them intently, they remain impassive with their senses unmoved as though no one was present. For not even if someone draws a sword and strikes at them, do they flee; nor, if they suffer insult or blows, do they become angry. Further, the people as a whole do not share in the anger of the victims. Some times, even when their children or women are slaughtered before their eyes, they remain unmoved by what has happened, giving no indication of anger or, again, of compassion. In general, even if they experience the most fearful horrors, they remain calm, looking intently at what has happened and nodding their heads to each other. For this reason, people also say that they speak no language, but that they signify everything necessary by imitative gestures of their hands" (Agatharchides *On the Erythraean Sea*: 41b, 78-80).

Such violence perpetrated against or by indigenous populations was a common theme in ancient accounts of this region. One account in the *Periplus* from the first century AD states that the anchorage used by Greco-Roman merchants to reach *Adulis* was relocated from the island of Diodorus to Oreine island, because the "*Barbarians* living there attacked the island" (*Periplus*: 4). In conclusion the characterisation of the indigenous population as *Barbarians*, or sub-human was in part influenced by their preconceptions and fears of the consequences of themselves operating in foreign lands.

10.2 Greco-Roman characterisation of Erythraean peoples

Herodotus' History gives some information on the Geography south and east of Egypt. By this time some of the major geographical terms used in Greco-Roman geographies had been formalised; 'Arabian Bay' (northern Red Sea), 'Erythraean Sea' (Red Sea and Indian Ocean), the 'Gulf of the *Ichthyophagi*' (Foul Bay, south of Ras Banas), 'The straits' (Bab el Mandab), '*Aithiopia*' (East Africa, modern Ethiopia, Eritrea and the surrounding area) and the 'Arabian, Red Mountains' (Eastern Desert, Herodotus *History*: 2.30). Within this geographical framework, the inhabitants of the Red Sea and east coast of Africa were labelled, producing ethnonyms subsequent geographers would continue to use. These labels included the *Trogodyte*s, *Aithiopians*, *Ichthyophagi* and possibly even the *Blemmye*s are mentioned in passing (Herodotus *History*: 2.29-30). These *Trogodyte*s are characterised as a type of cave-dwelling *Aithiopia*n who eat snakes, are faster than any man and speak in high pitched tones (Herodotus *History*: 4.183). The *Ichthyophagi* were characterised as knowing the Ethiopian language and appear to have been in regular contact with Elephantine (Herodotus *History*: 3.19). It should be noted that Herodotus' characterisation of both groups highlights the difference of these groups to Greeks, focusing on fantastic elements. These mythical elements were clearly popular and subsequently influential in the later Greco-Roman and Medieval accounts of the inhabitants of the region.

The peculiar circumstances of the Hellenistic arms race that followed the division of Alexander the Greats Empire into a number of warring states had a profound effect on Greek interest of the Red Sea and East African region. Alexander's General Ptolemy ruled Egypt and his dynasty known as the Ptolemaic dynasty of Egypt had two specific needs. Firstly a good supply of gold was required to fund the military. Secondly by the battle of Raphia (217 BC), Ptolemy IV was using East African forest elephants to combat the Seleucid Kingdom's Indian Elephants on the battlefield (Casson 1993). A new source of Elephants was discovered in East Africa, reached via the Red Sea by boat. To this end a number of ports and colonies were constructed along the Red Sea coast (Figure 10.1) for the hunting of elephants and Red Sea trade (*Arsinoë*, *Myos Hormos*, *Soteira* and *Ptolemais*, Diodorus *Library of History*: 3.39-41). Subsequent accounts of the indigenous peoples of *Trogodyticum* (East Africa) were written, including detailed information on the *Trogodyte*s and *Ichthyophagi* mentioned by Herodotus.



Figure 10.1 Ptolemaic knowledge of the Red Sea region as recorded in geographies from that period (Agatharchides *On the Erythraean Sea*; Diodorus *Library of History*; Eratosthenes and Artemidorus fragments).

Agatharchides late second century BC *On the Erythraean Sea* "used mainly sources from the previous century" and is a "font of information and lore about the people dwelling along the Red Sea littoral and his stories have an anthropological ring to them" (Sidebotham et. al. 2008: 30; Tomber 2008: 22; Burnstein 1989: 13, 22, 29-33). His view of mankind stressed the importance of environmental determinism that became popular in Greek literature following the introduction of mathematical geography. The account of East Africa given by Agatharchides was subsequently referred to by numerous Classical authors (including Diodorus; Strabo; Pliny; Plutarch and Photius). This made his detailed characterisation of the *Ichthyophagi* the most influential source on these peoples. As the ethnonym suggests, how fish were caught and eaten, was central to Greek characterisation of the *Ichthyophagi* and is described in some detail (Agatharchides *On the*

Erythraean Sea: 32-40). They were described as possessing no technical skill, using only basic stone and horn tools (ibid.: 31). They were unable to build rafts, indeed their lack of technology and their occurrence in inaccessible places was seen as proof of their autochthonous nature and pure descent (ibid.: 46). A lack of social complexity is implied by statements concerning the absence of cities, territories, clothing and family structure (ibid.: 31, 37), burial at sea (ibid.: 45) and any form of legal system (ibid.: 49). Any moral attitudes of right and wrong were thought to be absent and they "possessed only a natural sense of pain and pleasure" (ibid.: 31). Distinctions between different tribes of *Ichthyophagi* (The *Ichthyophagi* of the Arabian Gulf, the 'Insensitive *Ichthyophagi*', the *Chelenophagi* and the *Ichthyophagi* 'beyond the straits') were categorised through different methods of catching fish and turtles and different dwellings (ibid.: 41-4). The "insensitive *Ichthyophagi*" were described as possessing no language, no sense of pain, anger or compassion (ibid.: 41). Agatharchides concluded that the indicators of *Ichthyophagi* identity; form of their dwellings, economy, moral and mental attitudes, life expectancy and general health (ibid.: 32-40, 43, 50) were determined by their marine environment, as "Poseidon had assumed the function of Demeter" (ibid.: 34). But their lack of social complexity, lack of cities, laws, mental and moral attitudes meant the *Ichthyophagi* were perceived as sub human, clearly stated in the use of phases such as "they breed like animals" (Diodorus *Library of History*: 31), "drink like cattle", "behave like animals in their dens" (Agatharchides *On the Erythraean Sea*: 35-6, 38). Sub human, physically, mentally and morally, as determined by their environment, put simply the *Ichthyophagi* were perceived as '*Barbarians*' (Diodorus *Library of History*: 3.15.15).

Agatharchides like Nearchus depict the *Ichthyophagi* as primitive fishermen. However, there is a conflict in the Greek representation of the *Ichthyophagi* as "the opinions of Nearchus and Agatharchides were not universally accepted", but usually copied by subsequent authors, becoming a "historical product of the Greek geographical thought" (Nalesini 1996; 2004; forthcoming). Instead earlier accounts represent the "*Ichthyophagi* as the people conducting expeditions on behalf of the rulers of Egypt" (Nalesini forthcoming). The representation of *Ichthyophagi* by both Clearchus of Soli (fragment in Athenaeus *Deipnosophists*: 8.345d-e; Nalesini forthcoming) and Herodous (*History*: 3.17-30) are remnants of a "Greek intellectual tradition", where the two *Ichthyophagi* expeditions are an important part of Psammetichus' and Cambyses' attempts to present themselves as legitimate rulers through "the symbolic language of the Egyptian royal power" (Nalesini forthcoming). Also Eratosthenes' of Cyrene fragment in Strabo (*Geography*: 16.4.4), states the *Ichthyophagi* inhabited the coastal town called Deirē on the important (to Red Sea traders) African promontory that is closest to Arabia, suggesting *Ichthyophagi* society was significantly more complicated than both Agatharchides and Nearchus state.

Agatharchides was also seen as a great authority on the *Trogodyte*s. The *Trogodyte*s were synonymous with nomads and central to this nomadic lifestyle was its herding economy and diet (Agatharchides *On the Erythraean Sea*: 62). The *Trogodyte*s were also described as being ruled by a Tyrant, a common tool used in association with a nomad way of life to characterise *Barbarians*, as is the case in Herodotus' characterisation of the Scythians (Hartog 1988: 205). Agatharchides explains their barbaric political system and nomadic life style as being determined by the nature of

the environment (ibid.: 66). Indeed Agatharchides uses the example of the Scythian way of life as determined by their environment to support his characterisation of the *Trogodyte*s, least "any of our readers does not believe the account because of the strange and extraordinary character of the ways of life that have been described" (ibid.). The burial customs are also described in some detail and to this day are the most visible sign in the desert landscape of these peoples existence (ibid.: 64; Sadr 1994; Sadr et. al. 1994; Sadr et. al. 1995). They are perhaps noted because they show a divergence from Greek practices. Further divergences are noted in the lack of family structure and dress (ibid.: 62). Distinctions between *Trogodyte* tribes are discussed briefly by Agatharchides, (such as the *Megabaroi* and the *Colobi*), although other Ptolemaic writers mention additional tribes such as the *Bolgii* (Diodorus *Library of History*: 1.37.8) and *Blemmye*s (Strabo *Geography*: 17.1.2, after Eratosthenes third century BC account). Difference between these tribes is characterised in the difference between their armament and bodily mutilation and circumcision (Agatharchides *On the Erythraean Sea*: 62), although they are perhaps noted because of their exotic nature rather than a serious attempt to distinguish between different tribes.

Following the annexation of Egypt by Rome in 30BC, there was a flurry of military, political and trading missions significantly changing the political geography of the region (Clarke 1997: 105, 109; Strabo *Geography*: 16.4.22; Mela *De Chorographia*; Pliny *Natural History*: 6.32.160). This resulted in a number of new first and secondhand accounts available to the geographers. Increasingly subdivided geographical areas were listed, such as *Azania* (previously part of *Trogodyticum*), beyond this was the newly labelled Atlantic coast and details of the inhabitants of these trading centres reached the geographies of this age. Despite this the characterisation of peoples of the Erythraean sea region at the beginning of the Roman Imperial period in Egypt, borrows much from the previous Hellenistic writers.

Strabo's early first century AD 17 book *Geography* was based on firsthand experience Egypt, Yemen and Ethiopia, though many "accounts are derived from earlier writers, including Agatharchides" (Tomber 2008: 22). Strabo's description of the *Trogodyte*s and *Ichthyophagi* (Strabo *Geography*: 16.4.5-20) was taken directly from Agatharchides (via Artemidorus). He also adds some details from Eratosthenes at the beginning (Strabo *Geography*: 16.4.1-4), concerning the dimensions of the Arabian Gulf and the diverse ethnic makeup of the inhabitants of *Deirê* (including *Colobi*, *Trogodyte*s and *Ichthyophagi*) and concludes with the tale of *Aelius Gallus'* ill-fated invasion of Arabia Felix (Strabo *Geography*: 16.4.22-24). The characterisation of these people in what criteria were important to their identity was however identical to Agatharchides. Similarly Pomponius Mela's account of the *Trogodyte*s and *Blemmye*s in his *De Chorographia* is lifted directly from Herodotus. The *Trogodyte*s were described as possessing no language, communicating instead with shrill noises, living in caves and eating snakes (Mela *De Chorographia*: 1.44). The *Blemmye*s are described as possessing no heads and living near the mythical satyrs and goat pans (ibid.: 1.48).



Figure 10.2 Imperial Roman knowledge of the Red Sea as present in the geographies of that time (Strabo *Geography*; Pliny *History*; Ptolemy *Geography*; *Periplus*). Map and location of sites based on Ptolemy's *Geography*. Note the huge increase in knowledge of settlements along the Arabian coast by the time Ptolemy wrote his *Geography.*

Pliny's 37 book encyclopaedia was finished in AD 77, compiled from the work of 100 collaborators. "Some of this information was secondary and he failed to reconcile conflicting accounts; thus the volume is uneven in its reliability" (Tomber 2008: 22). His agenda has a "moralising tone (that) bemoans the effect of Eastern trade on Roman society" (Tomber 2008: 22 following Thapar 1997: 15-6; Tchernia 1997: 252). Pliny's characterisation also utilised some of Agatharchides' accounts of the *Trogodyte* country (Pliny *Natural History*: 6.163, via Artemidorus), although much of Agatharchides work is not referred to. Instead a new source, king Juba II of Numidia (d. AD 23-24) was favoured by Pliny. However, his characterisation of the *Trogodyte*s and *Ichthyophagi* is still very similar to earlier accounts with the quotes from Juba including descriptions of the *Ichthyophagi* as sub-human, with animal like abilities to "swim like creatures of

the sea" (Pliny *Natural History*: 6.176). The *Trogodyte*s and *Blemmye*s are referred to in the same manner as Mela and Herodotus suggesting common source (Pliny *Natural History*: 5.44-6). An important divergence from other classical accounts of the inhabitants of the Eastern Desert is that Juba states that the people of the northern part of the Eastern Desert are Arabs not *Trogodyte*s. He states the most northerly tribe are the *Autaei* and just south of them (in the region of *Philotera*s, just north of *Myos Hormos*) the *Assari* tribe, described as the hybrid product of *Trogodyte* and Arab integration (Pliny *Natural History*: 6.167), south and west of them on the road to *Berenike* the *Autaei* and *Gebadaei* tribes (Pliny *Natural History*: 6.167-9). No description of these tribes was made and no explanation as to why they were perceived as 'Arabs' and not *Trogodyte*s is stated. Indeed Pliny appears to have some uncertainty as to the validity of Juba's classification of the inhabitants from *Syene* to *Meroë* on the Nile as Arabs and not *Aithiopians*, where he states he will "leave this point to the reader to form his own opinion on it" (Pliny *Natural History*: 178). It appears that whilst a greater understanding of the geography of the region and the peoples living there was being recorded, no further insights into how these people identified themselves apart from other groups is elaborated upon.

10.3 Characterising the Nabataeans

The Greco-Roman characterisation of the people of the Nabataean Kingdom was the product of a long period of contact with the Roman Republic and Empire that included conflict in 62BC against Marcus Aemilius Scaurus, but mainly peaceful relations as an ally and client state. The people known as the *Nabataeans* were described by various classical authors as either nomadic or sedentary 'Arabs' (Diodorus *Library of History*: 3.43.4). Whilst there is irrefutable evidence that the term Nabataean is an autonym, used by the inhabitants of the kingdom of the same name, there is as yet no evidence that they recognised, let. al.one named, themselves Arabs (Macdonald 1998; Graf 2004).

The label Nabataean first appears in the account of Hieronymus of Cardia (354-250 BC) who was campaigning for Antigonus I against the *Nabataeans* in 312BC (Diodorus *Library of History*: 2.48.2, 19.94.5; Plutarch Pyrrhus; Schmid 2006: 437). This was followed in the 270's BC by naval action by Ptolemy II (286-246BC) against the *Nabataeans* (c.113BC account of Agatharchides *On the Erythraean Sea*: 90; Fraiser 1972: 300; Tarn 1929: 16). The lost works of Hieronymus of Cardia and the Cnidian, Agatharchides were subsequently quoted by the Sicilian, Diodorus (c.60-30BC xix. 94-100, cf. ii. 48-50, iii. 41-43). The *Nabataeans* are also mentioned in the 257BC Zenon papyri (Graf 1990: 69-75), a c.180BC papyrus copy of the early third century BC poetry of Posidippus of Pella (Graf 2005: P.Mil.Vogl.VIII309; Schmid 2006: 438) and the lost geographical works of Eratosthenes of Cyrene (276-194BC) quoted by Strabo.

Hieronymus of Cardia's (312BC) detailed characterisation of the *Nabataeans* described them as Nomadic pastoralist camel and sheep breeders, desert Arab tent dwellers, who wrote with Aramaic characters, did not drink wine, or farm (Agatharchides *On the Erythraean Sea*: 3.43.1-5; Diodorus *Library of History*: 19.94.2-4). They traded in incense (Diodorus *Library of History*:

19.94.4), were involved in brigandage (Diodorus *Library of History*: 2.48.2) and piracy against Ptolemaic shipping in the Red Sea (Diodorus *Library of History*: 3.43.1-5, based on Agatharchides *On the Erythraean Sea*: 90a). The incense trade was clearly significant for the 'Arabs called *Nabataeans*' as their capital, *Petra*, was the centre of trade of the *Gerrhaeans* (from East Arabia), the *Minaeans* (of South Arabia) and 'all the Arabs' (Agatharchides *On the Erythraean Sea*: 90a). Nabataean villages around the Gulf of Aqaba (Diodorus *Library of History*: 3.43.1-5; Agatharchides *On the Erythraean Sea*: 90a) along with accusations of piracy suggest long held economic interests in the Red Sea and contradict the assumed nomadic lifestyle stated elsewhere in the same account (Diodorus *Library of History*: 19.94.2-4).

The Hellenistic Greek characterisation of the *Nabataeans* is brief in as much as it only relates to political relations with Hellenistic states and is simplistic in as much as it labelled all inhabitants of the Nabataean kingdom. The *Nabataeans* were a group (ἔθνος) of Arabs, defined by their specific way of life (βίος), that of the nomadic pastoralists and incense traders. This is borne out of a concept developed by Dicearchus (c.350-285BC) in his work on the chronological development of the Greeks described earlier in this Chapter. In reality this artificially lumped together ethnically distinct peoples.

Early Imperial Roman characterisation of Nabataean society describes a well-governed and wealthy materialistic sedentary urban lifestyle with stone architecture, advanced agriculture and livestock (sheep, cattle and camel) farming, trading and mining (Strabo *Geography*: 16.4.1-4, 18-9, 21-6). Strabo, writing in c.AD 7-23, also details Nabataean drinking bouts (Strabo *Geography*: 16.4.26). Juba (52BC-AD 23) wrote extensively on Arabia and the Arabs in his now lost guide to Arabia, quoted extensively by Pliny, writing in AD 23-79 (Pliny *Natural History*: 5.12; 12.17). Josephus wrote extensively about the relationship between the *Nabataeans* and the Jews in his books the Jewish War and Jewish Antiquities (*Antiquities* 13.1.2; 1.12.4; 13.13.5; 14.5.1; 20.4.1; 1.12.4; *Wars* 1.87; 1.61; 1.363-91). However, his Jewish background clearly motivated a strong bias against the *Nabataeans* present in his accounts of them. The author of the *Periplus Maris Erythraei* mentions the role of Nabataean Red Sea port of *Leuke Kome* in Erythraean Sea trade and the involvement of the Roman military in policing taxation on the trade (Casson 1991: *Periplus*: 19).

Following the annexation of the Nabataean Kingdom in AD 106, the region was renamed *Provincia Arabia* by Trajan (as preserved on the Peutinger Table), although it was incorrectly labelled *Arabia Petraea* by Claudius Ptolemy in his Geography. With the sovereignty of the Nabataean Kingdom gone, the label Nabataean disappears from the Greco-Roman literature (Dionysius *Scholia*, Ptolemy *Geography*, Eusebius *Onomasticon*: 6.17-21) and is replaced with either the broad ethnic label Arab, or small regional or tribal names, significantly this means that Dionysius Periegetes calls the inhabitants of *Aila*, *Elasioi* (Dionysius *Scholia*: 921-6).

The recognition by Greco-Roman sources of regional identities within the Nabataean state is highly variable. The port of *Aila* shared its name with the gulf in which it was situated and its inhabitants. There were two separate naming traditions recognised by Pliny at the time (Pliny *Natural History*: 6.32.156). The tradition preferred by Agatharchides, Diodorus, Juba, Pliny and

Photius has the people labelled *Laeanitae*, the city *Laeana* and the *Laeanitic*, *Leanitic* or *Laeanites* Gulf. In this tradition the city and gulf were named after the *Laeanitae* who had a kingdom with its capital at Agra (Hegra). This is clearly a reference to the Kingdom of Lihyan the fourth to second century BC ally of the Ptolemys (Tarn 1929: 16-25), whose capital and lands were seized by the *Nabataeans* at the end of the second century or early first century BC (Al-Fassi 2007: 25). It would appear from Diodorus that by the mid to late first century BC, the *Nabataeans* occupied the lands around the Gulf of Aqaba (Diodorus *History*: *3*.43.1-5), as this is omitted by Photius copying the second century BC writings of Agatharchides (Photius *Bibliotheca*: 250.89.457b). In this tradition Pliny mentions the presence of *Aila*, whose foundation based on archaeological evidence can be dated between the early first century BC based on residual evidence and the late first century BC on structural and stratigraphic evidence (Parker pers. comm.).

The tradition preferred by Artemidorus, Strabo, Josephus, Ptolemy, Dionysius and Eusebius has the people labelled *Elasioi*, the gulf *Aelanitic, Alaenitic* or *Aelanites* and the city *Aelana, Elana, Ailane, Ailam, Aela*, *Aila* or *Haila*. This nomenclature was influenced by the Hebrew label *Elath* from the Torah (2 Kings 16: 5), which was said to be inhabited by descendents of 'Syrian Edomite' settlers since 742-727BC (Josephus *Antiquities*: 9.12.1). In this tradition, Strabo states that the gulf is named after the city. The gulf was already named *Laeanites* prior to the foundation of Nabataean *Aila*. The fact that there were different labels used in the region for the same purpose may not be simply geographer's error, but representative of the various identities present at the time, constructed from various real or imagined histories. One alternative possibility is that the authors Agatharchides (copied by Diodorus and Photius) and Juba (copied by Pliny) misspelt Laeanitic/Laeanites, confusing the Greek letters Α and Λ. It is quite possible with the copying present in the ancient literature that this stems from one error by Agatharchides, or (as we don't have his original text) a copy of his work. In this case the inhabitants of Aila may have been known as *Aelanitae* rather than *Laeanitae.*

People	*City*	*Gulf*	*Reference*
Laeanitae	Laeana	Laeanitic	*Pliny (AD 23-79)*
		Leanitic	*Juba (52BC-AD 23)*
Nabataean Arabs	*Not present*	Laeanites	Diodorus *(60-39BC)*
Arabs	*Not present*	Laeanites	*Agatharchides (c.113BC)*
		Alaenitic	*Artemidorus (second century BC)*
	Aela/Aelana	Aelanites	*Strabo (c.AD 7-23)*
	Aelana	Aelanitic	*Contra Pliny (AD 23-79)*
Syrians/Edomites	Elath/Aila*ne*		*Josephus after Torah (c.AD 37-100).*
Elasioi	Elana		*Dionysius (Early second century AD)*
	Elana *Kome*		*Ptolemy (c.AD 90-168)*
	Aila/Aila*m=Elath*		*Eusebius (AD 275-339)*
	Haila		*Peutinger Table (second to fourth century AD)*

Table 10.1 The ancinet nomenclature for *Aila*, its inhabitants and the Gulf of Aqaba.

10.4 Being Nabataean

The autonym *Nbtw* (Nabataean) was a label used by people who were from the Nabataean Kingdom (third century BC to AD 106) or *Provincia Arabia* (AD 106 onwards, Al-Fassi 2007: 28, CIS II 3973). There is no evidence that people from the Nabataean Kingdom or *Provincia Arabia* ever adopted the ethnonym Arab during the first three centuries AD. This was a Greco-Roman exonym that is often uncritically applied to the *Nabataeans* because of two assumptions. These assumptions are that the *Nabataeans* spoke and wrote 'Nabataean' and that Nabataean was an Arabic language. The first assumption is flawed because we do not know what the *Nabataeans* (*Nbtw*) called what modern scholars have labelled 'Nabataean' script and that this only appears in the late second century BC, two centuries after these people are first attested in the historical documents (Schmid 2006: 438) and is only commonly found in the central part of the Nabataean Kingdom. Secondly, the 'Nabataean' language was not Arabic, but a form of Aramaic that had adopted a few Arabic words from the neighbouring ancient North Arabic language (Macdonald 2000). Finally we do not know that they felt their language defined them as part of a geographic or ethnic group, be it Arab or Arabian.

Instead the archaeological and epigraphic data suggests that there were distinct chronological and regional differences in the representation of identity in the Nabataean Kingdom.

For example, the distinctive archaeologically visible Nabataean coinage, pottery (and other material culture), is often quoted as representative of the Nabataean territorial state. Yet the pottery does not exist until around 100BC and rapidly declines after annexation in AD 106 (Schmid 2006: 438). Similarly to the east of the Nabataean heartland ancient North Arabic inscriptions have been recorded in large quantities in three main scripts; *Thamudic*, *Hismaic* and *Safaitic*. These scripts are not specific to ancient communities, but instead record numerous tribal affiliations with overlapping linguistic features (Macdonald 1999: 255) often, though not exclusively left by nomadic pastoralists some of whom identified themselves as *Nabataeans* (*Nbtw*). Nabataean society included numerous linguistic groups, religious beliefs and economic interests, causing some to demote a Nabataean identity, merely to that of political allegiance (Graf 2004) during the period of the Nabataean Kingdom. Instead patrilinear, or in rare cases if of higher status the matrilinear, lineage and tribal affiliations were more frequently recorded in the epigraphic record (Al-Fassi 2007: see also broken patrilinear lineages). Despite this the label *Nbtw* was used both for one to ascribe ones self to (in *Safaitic*, Nabataean, Greek and Palmyrene inscriptions) and to define others as (in Greek, Latin, Nabataean and *Safaitic* texts). It encompasses various, though was not limited by, tribal affiliations, patrilinear genealogies religious beliefs and linguistic groups. Whilst political motivation is likely to have been a major reason for ascription to this group, there must be other reasons to explain why ascription to a Nabataean identity persisted at least one generation after annexation, despite Imperial Roman attempts to remove the label from the political geography of the region (Al-Fassi 2007: 28, CIS II 3973).

Identity of both Aramaic and ancient North Arabian speaking peoples of Nabataea were presented primarily in the form of patrilinear genealogies and tribal affiliations. There are also urban contexts where Greek was used instead of Aramaic or Arabic. Whilst "a name does not mean anything except the person who bears it" (Macdonald 1999: 154), specific names do occur more commonly in certain groups and it has been argued that the names of some tribes were derived from the personal names of famous ancestors. Also the political importance of a tribe may cause them to be in charge of a confederation, or rule a kingdom, thus explaining the origin of these labels. In these circumstances the meaning of labels of such groups changes, as it must have done prior to the rise of the Nabataean Kings in the third century BC and after annexation in AD 106. The linear structure in which inscriptions record lineage and political affiliations suggests hierarchy starting with most familiar and daily relevant (family, ancestry, tribe), followed by increasing political significance (confederations and kingdoms). Terms used to rank these group identities varied depending upon context. Some had a variety of uses. The *Safaitic* term *'l* was commonly used for tribal affiliations, though also for whole nations such as the Roman's *'lrm*. In both urban and nomadic contexts terms such as *'l* in *Safaitic* or φυλη in Greek were used to denote tribes. In urban contexts more general terms such the 'people' (δημος) or 'community' (κοινον) were also used in a similar way. Confederations (*hlf*) and Nations ruled by kings (*mlk*), emperors (*qsr*) or governments (*s'ltn*) are also recorded. Also the vocation, religion and language or script recorded what the individuals felt were important elements of their identity. Whilst membership to various groups in the case of the nomadic populations may be better described as overlapping circles rather

than hierarchical categories (Macdonald 1998: 182), the nature of the material and context demanded that the author of each inscription ranked their affiliations in relative importance to their identity.

Examples of how the inhabitants of the Nabataean Kingdom and *Provincia Arabia* recorded their affiliations, illustrate the importance of lineage, tribe, confederation, nation, profession, religion and language to identity. These indicators of identity were important to the individuals themselves., often more important than stating ascription to Nabataean culture. The examples used below include two bilingual Nabataean-Greek inscriptions from the Herodian town of *Si*, two inscriptions by Roman horsemen recruited from *Provincia Arabia* and the *Ethnarch* and *Strategos* (administrative officer) of a group of nomads from *Provincia Arabia*.

Inscriptions in *Safaitic*, Nabataean and Greek give details of the long term sponsoring of the *Ba'al-Shamin* religious community in *Si*, by related members of the *'byst* tribe. Though *Si* was at the time of both inscriptions, both the region and the *'byst* tribe were intermittently under Nabataean control (Al-Fassi 2007: 28). Writing in Nabataean here makes their case particularly significant to this study. It highlights the important relationship between patrilinear genealogy, tribal affiliations and religion to the construction of identity of these people. The national, or wider political affiliations are not mentioned, whilst the scripts used suggest these temple inscriptions were intended not just for members of the *'byst* tribe who could read *Safaitic*, but also those from the tribe and from other groups that could read Greek and Nabataean. In conclusion these inscriptions illustrate the importance of patrilinear descent and religious beliefs in cementing tribal affiliations across sedentary and nomadic elements of their society (Grushevoi 1985: 51-4), though any close relationships between nomadic and sedentary groups is difficult to prove with the epigraphic data available (Macdonald 1993; 1998). The absence of recognition of national affiliations and the wide variety of languages and scripts used suggests that these were not significant in the construction of identity displayed here, either because this was not seen as necessary or important.

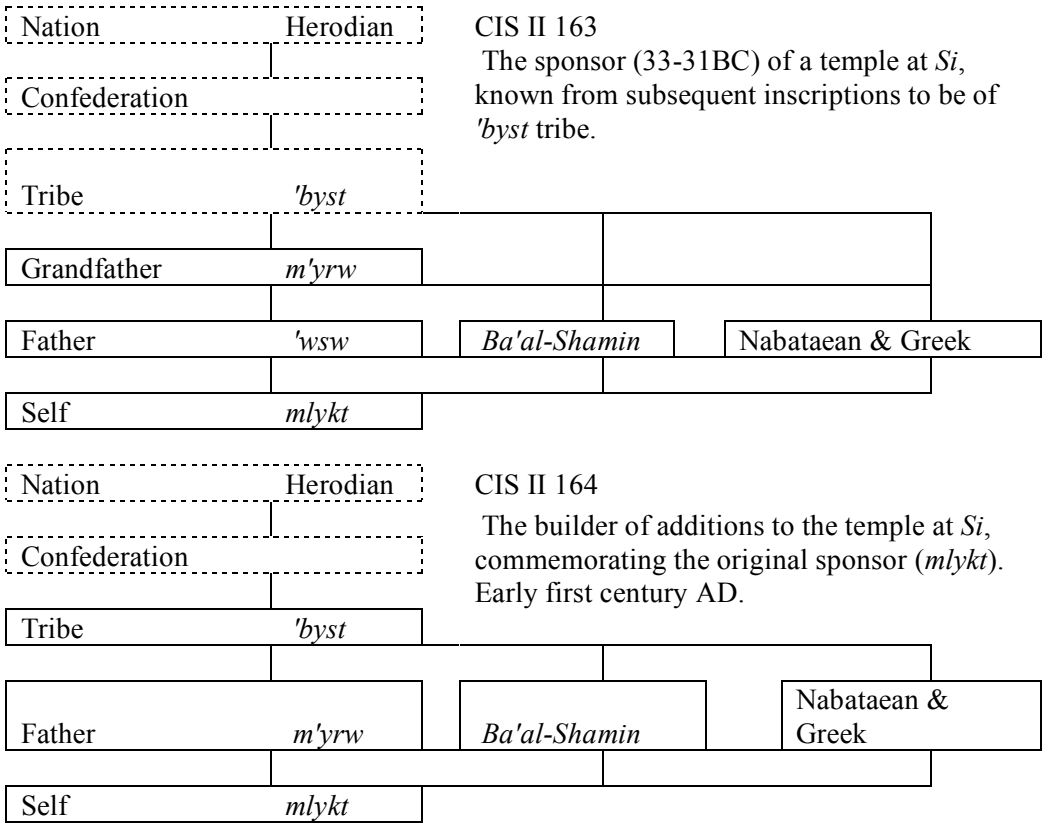


Table 10.2 The identity of the builders of the Ba'al-Shamin temple complex at Si. Note CIS II 164, was possibly sponsored by the grandson of the sponsor of CIS II 163 (Grushevoi 1985: 51-4). However, this interpretation has recently been criticised (Tholbecq forthcoming).

It is difficult to argue that membership to a Nabataean identity is purely politically motivated; especially when the five clear examples of membership to it are from periods or regions outside of the Nabataean domain. Similarly, the very use of the term Nabataean for the variant of Aramaic script used in Jordan and its uncritical use to identify the writers as *Nabataeans* is misleading. Especially when one considers that all these inscriptions by self-professed '*Nabataeans*' are written in Palmyrene Aramaic (Al-Fassi 2007: 19, CIS II 3973), *Safaitic* (MacDonald 1991: fn.39, CIS V 2820, Nehmé 1996: B1-B2) or Greek (MacDonald 1991: 8fn.; 1998: 185-6; Graf 2004: 148). However, there are three implied memberships to the Nabataean community present in the Nabataean tomb inscriptions of Hegra (Al-Fassi 2007: 19, JS1, JS8, JS19). Of particular interest is the Palmyrene Aramaic inscription from Umm al-Jimal written by a horseman in AD 132 who calls himself a Nabataean (Table 10.3). In this text a patrilinear genealogy is outlined going back to his grandfather, his tribe, the *rwhy* is recorded as well as his vocation as a horseman and the camp he is stationed at (*'n'*) and he prays to *Shya' alQawm*. What is unusual is that he calls himself a Nabataean (*nbty'*) despite the fact that the Nabataean Kingdom no longer existed and despite the fact that, based upon the date, context and structure of the text, it is likely that he is in military service for the Romans (Macdonald 1998: 186). As this identity could provide no political benefit for membership and this individual was the member of another tribe, it is likely then to represent some form of ethnic affiliation.

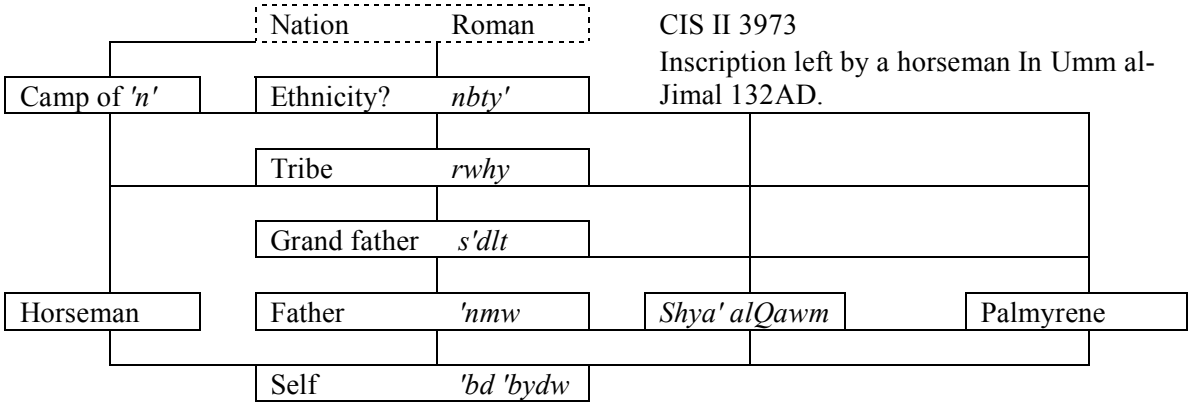


Table 10.3 The identity of a horseman from the tribe of *rwhy*. The date implies that he is from a Roman unit, though continues to use a Nabataean identity regardless of the fact that Nabataea has been annexed (Al-Fassi : 28, CIS II 3973).

Further evidence suggests that individuals from nomadic tribes in *Provincia Arabia* were recruited into Roman units of the same name, in which the individuals' identity was determined through their vocation and unit (Table 10.4). Because their unit shared the same name as their tribe, it was unnecessary to repeat it. Notably the individuals never felt it necessary to identify themselves as Romans (*l'Rm*). The term *l'Rm* was only used in the context of dating events (i.e. when the *l'Rm* attacked….) or as enemies.

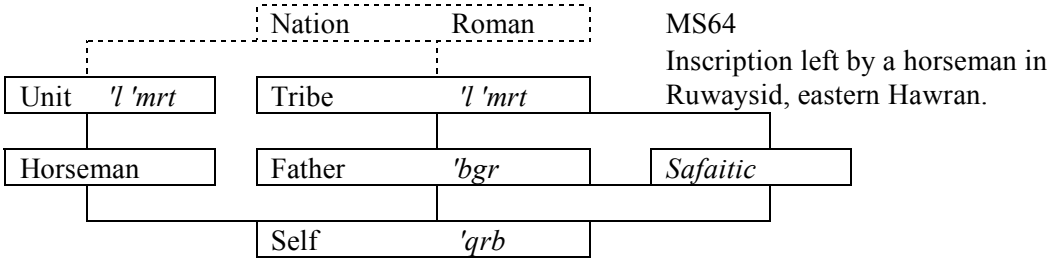


Table10.4 The identity of a horseman from the tribe of *'mrt*. The structure of the text suggests that *'qrb* was recruited from the *'mrt* tribe to a Roman unit of the same name. (Macdonald 1998: 189, MS64).

Previous studies have erroneously thought various Greek inscriptions mentioning a *Phylarch*, *Ethnarch* or *Strategos*, to represent Sheiks of tribes. As these inscriptions describe the ἔθνοσ groups commanded by these individual nomads (νομαδων) and don't mention genealogies or tribal affiliations, this would clearly have been unlikely and most likely perceived as derogatory. It is instead likely that this represents the inscription of the military and administrators in charge of various tribes in the region, or units raised from these tribes. In all but one case, no effort has been made by the writer to distinguish tribal affiliations; instead they are usually labelled nomads. A good example of this is from Malka in the northeast Hawran (Table 10.5) dating to the post annexation Roman Imperial period. *Soaidos* describes himself as both *Ethnarch* and *Strategos* of a group of nomads. Here the term ethnos has been used in the broadest terms, illustrating how the root of our word for ethnicity was used so generally in Antiquity.

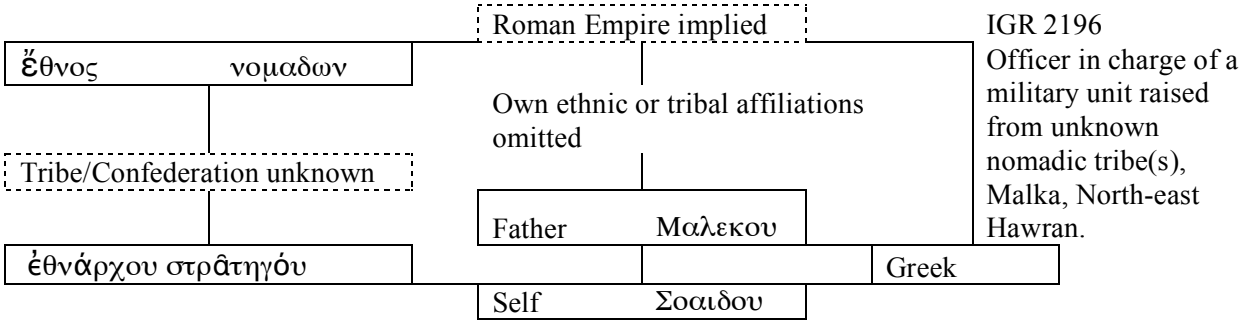


Table 10.5 The identity of a Roman officer (*Ethnarch* and *Strategos*) of an 'ethnic group' of nomads (Waddington 1968: IGR 2196).

In conclusion, the Nabataean Kingdom contained many different groups with a variety of languages, scripts, religions and political affiliations. This makes it impossible to describe the *Nabataeans* as one distinct ethnic group. The core Nabataean territory around *Petra* is marked by numerous Aramaic inscriptions in the Nabataean script, whilst the Sinai possesses a closely related script known as Sinaitic that differs in a number of ways, most notably they generally postdate the Nabataean Kingdom (Macdonald 1998: 185). Various ancient North Arabian scripts are present on the desert fringes to the north and south east of Wadi 'Arabah. Of these *Safaitic*, *Hismaic* and *Thamudic* are contemporaneous with the Nabataean Kingdom and its period of annexation by the Roman Empire and overlap the territory of these geopolitical powers. *Safaitic* is found in southern Syria, northeast Jordan and northern Saudi Arabia, with isolated finds in western Iraq, Lebanon and even Pompeii (Macdonald 2000). *Hismaic* is mostly found in the Hisma Desert of southern Jordan and northwestern Saudi Arabia, though is also found near *Petra* (Macdonald 2000). *Thamudic* represents a number of related languages from the Hidjaz and Nadjad Deserts, though has been found in western Iraq, southern Syria, central Yemen, the Negev Desert and even Upper Egypt (Macdonald 2000). These scripts and languages are always found in graffiti, usually in association with rock art. What the above inscription examples suggest is that the use of Nabataean does not automatically assume membership to a Nabataean identity, but neither does the use of other ancient North Arabian script such as *Safaitic* (MacDonald 1991: fn.39; CIS V 2820; Nehmé 1996: B1-B2) or Greek (MacDonald 1991: fn.8) or Palmyrene Aramaic (CIS II 3973) exclude one from membership of that group. In the majority of cases Nabataean identity was not recorded as it may have been assumed, instead local tribal affiliations were recorded.

These inscriptions are often associated with scenes suggesting nomadic pastoralist lifestyles including depictions of herds of sheep and goats, camels, horses and hunting (Macdonald 2000). It is however the scenes of warfare and raids that attract most attention and have been used to associate disparate groups speaking related languages with the Saracen raiders, *Saraceni*, or 'tent dwelling Arabs' described by classical sources such as Ammianus (Parker 2005: 536-8). A more cautious analysis of the inscriptions reveals that their subject was more frequently about love, family, ancestry and religion than war and that this data provides us with useful information concerning tribal affiliations. What these inscriptions suggest to us is that various ancient North Arabian speaking nomadic tribes lived in the eastern areas of Nabataean control, such as the *'byst*

('Ubaysah), *qayw* (*Qusayy*) and *rwh* (*Rawhu*) in the north of Nabataea, whilst the *'mrt* (*'Amrah*) lived just east of the Dead Sea. The *df* (*Dayf*) and *slmw* (*Salamu*) had a broad sphere of influence, whilst the *thmd* (*Thamud*) and *mznyt* (*Muzaymah*) inhabited the southern region around Hegra (Al-Fassi 2007: 29). The reality is that these tribes negotiated allegiance to various states depending upon socio-political and potentially economic decisions and ties. It was quite possible for example for an individual to be both of the tribe of *Rawhu* and a Nabataean (Al- Fassi 2007: CIS II 3973, RES 285), whilst members of the *Thamud* tribe were clearly operating as Roman soldiers in the fifth century AD (Macdonald & King 1999: 436). It is possible that representatives from these tribes may have inhabited *Aila* at different times, alternatively the population may have been composed of an as yet unknown tribe, or made up of economic immigrants from various different tribes, taking instead a label based on the settlement to which they have moved, the *Elasioi,* or *Laeanitae* as discussed by Pliny and Dionysius (Pliny *Natural History*: 6.32.156; Dionysius *Scholia*: 921-6).

10.5 Imperial entrepreneurs

By the mid to late first century AD the nomenclature of the geography of the Erythraean Sea had been determined, recorded in Ptolemy's *Geography* and the *Periplus Maris Erythraei*. The Eastern Desert was from this point understood to be part of Egypt and descriptions of its inhabitants as *Trogodyte*s ceased in the literature. "*Azania* the…unknown coasts of Ethiopia" described by Pliny (Pliny *Natural History*: 6.34.174) was divided into the Bay of the *Adulites* and the bay of the *Avalites* (Casson 1989b: *Periplus* 7; Ptolemy *Geography*: 4.7), named after the '*Barbarian*' entrepôt of the region. At this time the coast of *Azania* was shifted to the east, used to describe the east coast of Africa south of the horn of Africa. Inland from this coast was newly discovered and simply known as *Barbaria* (Ptolemy: 4.7).

The *Periplus Maris Erythraei* is a "practical guide aimed at merchants" based on "firsthand knowledge" of mid first century AD Red Sea trade (Tomber 2008: 20). Surviving as a Tenth century AD copy, the Periplus is an ongoing subject for debate being an excellent source on "plain commercial information" and sailing times (De Romanis forthcoming), it is accurate on locations, but many trade items were not discussed (Tomber 2008: 21). This source is not "an objective historical truth" as doubt concerning the accounts of Alexander reaching the Ganges, Hippalus' discovery of the route to India and of Augustus' destruction of Aden (*Periplus* 47, 57 and 26 respectively; De Romanis forthcoming; Mazzarino 1997; De Romanis 1997; Seland 2005) prove. The *Periplus Maris Erythraei*, does not give much detail as to the characterisation of the *Ichthyophagi*, as it is not the purpose of this document. Instead it gives a detailed account of their presence at certain places and at times the role their economies (*Periplus*: 4) played in the Erythraean Sea trade. Also the *Trogodyte*s are not mentioned at all. Instead the nomadic population of the desert and the market towns are simply labelled *Barbarians* (*Periplus*: 2, 7).

Ptolemy's mid second century AD *Geography* lists the longitude and latitude of sites for the production of maps. His work miscalculated the circumference of the world, foreshortening or

elongating the continents of the known world. Differences in Ptolemy's account from that of Pliny, Strabo and the *Periplus* "may reflect the evolution in trading patterns and emporia between the first and second centuries" (Tomber 2008: 29-30 after Casson 1995; Groom 1994: 202, contra Seland 2007: 73-4 who argues that Ptolemy's Geography was reworked in the eleventh century AD). Ptolemy's geography lacks any description of the characteristics of the indigenous populations of the Arabian Gulf. They are however labelled and placed within this geography, in which he names the *Arabaegypti Ichthyophagi*, (Ptolemy: 4.5.101), the *Colobi* and *Blemmye*s (Ptolemy: 4.8.108) and gives new ethnonyms to the inhabitants of *Adulis* (*Adulitae*), *Avalites* bay (*Avalitae*), *Mosylum* market place (*Mosyli*). *Trogodyte*s are similarly absent, as they were in the *Periplus*. The accounts of the later first to second century AD then do not go into detail as to what these people were like, but does suggest some differences in the ethnonyms used during that period.

Ostraka since excavated in the Eastern Desert have revealed similar trends in the writings of the Greco-Roman inhabitants of the ports, quarries and forts. 22 different references to *Barbarians* have been identified at *Mons Claudianus* (a Roman quarry, northwest of *Myos Hormos*, Peacock & Maxfield 1997) and *Krokodilô* (a fort on the road between *Myos Hormos* and the Nile, Cuvigny 2003a) dating between AD 108 and AD 189 (Cuvigny 2003b: 351-2). The well-preserved examples of these clearly refer to the *Barbarians* as a threat to the Greco-Roman inhabitants of the Eastern Desert (*O.Krok* 6, 51, 47-58, 60, 87, *O.Claud* 490, 4888, 7218, 7255, 7309, Cuvigny 2003b: 351-2; De Romanis 2003). These *Barbarians* are described as and possessing camels (*O.Claud*.7309) and are interpreted as representing the indigenous nomadic population (Cuvigny 2003b: 346-60). Another references to the nomadic population of the desert is present at *Myos Hormos*, where one ostrakon is labelled *Pet… Trogodyt*. (*O.Myos* 543). Arabs are referred to twice, although both times in conjunction with the purchase of fish (*O.Claud* 529 830 P346). However, as we do not know why these people have been labelled Arabs, we cannot be certain whether these represent members of one of the Arab nomadic tribes mentioned by Pliny (6.167-9) acting as middlemen for the *Ichthyophagi* of the coast, whether they are the fishermen themselves (elsewhere labelled *Ichthyophagi*) trading fish. In *Myos Hormos* another ostrakon (*O.Myos* 512) dated to the second century AD, contains the request to a tax farmer for a permit for *Pakubis Ichthyophgos* for him to move his *Schedia* (small fishing boat, see Chapter 3) to *Philotera* (just north of *Myos Hormos*), implying some form of taxation upon return. The role of these fishing *Schedia* in supplying the Eastern Deserts and quarries with fish are attested in an ostrakon from *Maximianon* (another Roman fort on the road between *Myos Hormos* and the Nile) dated to AD 11 (*O.Max* 175), in which *Ioulius Maximus* was unable to send *Gaius Apoliuanus* fish as the *Schediae* had not returned in time for him to do so (Bülow-Jacobsen et. al. 1994: 30).

During this period there was clearly a shift in the use of the ethnonym *Trogodyte* in the literature from representing a people to representing a region, the ethnonym remained, despite no longer possessing any ethnic value. Also the lack of detail about the characterisation of peoples may have been part of a wider tradition by the geographers during the first two centuries AD, when there was a change in focus in the balance between human and physical geographies (Lawrence 1998: 108). This change in focus can be seen in the work of Ptolemy, for whom it can be said "the

whole of modern cartography has developed from his Atlas … [but made] … little contribution to descriptive geography, noting, as he does the imperfect character of his own information" (Stevenson 1932: xiii).

10.6 Characterisation of peoples

The characterisation of the peoples of the Erythraean Sea in Antiquity was influenced by wider social and political factors. The authors' *theory of ethnicity* was determined by cultural influences on their perception of identity. The criteria that they used as 'indicators of identity' can be summarised as; way of life, their economy, diet, laws, language, political structure, burial practices, dress and descent. The Imperial Roman period accounts were heavily reliant upon Ptolemaic sources and as a result the characterisation of the *Ichthyophagi* and *Trogodyte*s in the literature does not appear to have changed significantly. The characterisation of these peoples stated visible, mental and moral differences from Greeks and Romans, thought to be determined by their environment. The manner in which these characteristics were written implied they were deficient, lacking social complexity, were sub-human or animal-like, thus illustrating the superiority of Greco-Roman culture. In doing so it constructed a picture, utilising fantastic stories with mythical elements that became central to the Greco-Roman characterisation of these peoples. These texts then tell us more about the author and their audience than their subject.



Figure 10.3 Medieval depiction of the Eastern Desert dwellers, the *Trogodyte*s and *Blemmye*s (after the *c.1460 century illuminated manuscript "Le livre des merveilles de ce monde*) were based on classical accounts by Herodotus, Pliny and Strabo.

Later accounts (*Periplus*; Ptolemy *Geography*) were more concerned in the physical geography or trading opportunities of these regions. Despite this the inhabitants were still commonly labelled *Barbarians*, in the ostraka of the Eastern Desert ports, quarries and forts. Though these ethnonyms were in fact derogatory exonyms (i.e. assigned by other people), they were used by those indigenous peoples in contact with the Greco-Roman inhabitants of these colonies (*O.Myos* 512). To give the subaltern a voice however we now need to understand the importance of the Greek

exonyms of *Ichthyophagi*, *Trogodyte* and *Barbarian* in the ports of the Red Sea. To do this the assumptions made in the characterisation of these peoples way of life in the literary texts will be compared with what the epigraphic and the archaeological evidence suggests their daily activities and construction of identity was (as outlined in Chapters 3-5). Similarities and differences may highlight the role exonyms played in the social hierarchy at sites.

11 Discrepant experiences: Characterising peoples of the Red Sea.

This thesis has discussed the range of sources of evidence available on the diverse identities and activities present at the Red Sea port communities. Here the approach to reconcile the quantifiable archaeological data with qualifiable historical accounts discussed in Chapter 2 is applied to these diverse sources. The discrepancy between *etic* (external accounts of others) and *emic* (internal accounts of one self) accounts of group identity will be used to correct erroneous interpretations prevalent amongst those academics who rely excessively on historical sources in their own characterisation of past populations and to explain the relationship between different groups present within the Red Sea port communities. Differences can be identified and compared based on historical, epigraphic and archaeological sources on the criteria used as *indicators of ethnicity*. Classical accounts give us the Greco-Roman explorer, colonist and trader's perspective on indigenous Red Sea groups, whilst in India Tamil literature has its own characterisation of Roman subjects, known there as *Yavanas* (Greeks, Romans and Egyptians, Sircar 1951; Ray 1995).

Approaches using classical terminology for ethnicity have been heavily criticised (Barnard 2007: 23) as it is now generally accept, that group identities are not homogenous, bounded and static as ancient authors describe, but instead multilayered, changing and ascribed to (Jones 1997: 106, 140), with various elements of ones identity expressed or performed openly such as age, gender, ethnicity and status (Saleh 2007: 10). Ethnicity is understood and performed at different scales, including, but not exclusively so, the family, regional and national scales (Saleh 2007: 10). Despite this, we cannot escape the fact that they were *perceived* as homogenous, bounded and static and that mythical histories of descent, though fabricated, were important for defining self-identity (Tilley 2006: 10-12). This thesis has used where possible the various *indicators of ethnicity* applied by the contemporaries of the Red Sea port communities to distinguish between different groups. These indicators and the way they were applied, were a product of their time, heavily influenced by Classical and Hellenistic Greek thought as well as indigenous influences (Chapter 9). They are summarised below along with the influences that both complicate and contextualise the sources used.

- What an individual *thinks* constitutes an ethnic group, their *theory of ethnicity*, is the product of the various influences in their life, what some would call *cultural* or *social* influences. This determines their *perception* of what criteria are used as *indicators of ethnicity* (Chapter 2).
- An individuals *experience* may limit their contact with another group. Knowledge limited to colonial, war or trade *contexts*, produce ignorant and biased characterisation of others (Chapter 5, Andersen 1983).

- Characterisation of others was communicated through *rhetoric of otherness* (Hartog 1988: 237), measuring similarity and difference from ones own *indicators of ethnicity* as *inversion*, *comparison/analogy* and *marvels* (Chapter 2, Hartog 1988: 344).

The *indicators of ethnicity* used in the Greco-Roman world include a range of criteria used for identifying Greeks and others and the relative importance of each was the subject of hot debate in philosophical and geographical works of the time (Chapter 9). The meaning of *indicators of ethnicity* are understood by both the subject and characterising group. *Indicators of ethnicity* are important for understanding the power relationships between the two groups, because they define in what area the two groups differ. This may have bearing on opportunities available and so the success of both groups in question, especially in relationship to livelihood and economy. Some classical authors believed the environment and lineage determined the visual and psychological features of different groups, much in the same way that 'race' was distinguished through what would be labelled racist terminology by modern authors describing colonial and more recent periods (Isaac 2006). Indeed the motives of both ancient 'proto-racist' and modern 'racist' views were to legitimise imbalances in power, wealth, privilege and land. However, race in Antiquity was often conflated with tribal or national identity. However, other authors focussed on cultural, religious or linguistic indicators of ethnic identity. These *indicators of ethnicity* are discussed in full in Chapter 9 and summarised again below.

- Lineage, descent or birth (*Genos*), also discussed as kinship (*Syngeneia*) in some texts.
- Environment (*Physis*).
- Culture (*Paideusis*).
- Way of life (*Diaita*) consisting of material culture, subsistence and livelihood.
- Cultural personality or character (*Ethea*), as represented by common habits and fundamental values.
- Culturally regulated norms or laws (*Nomoi*).
- Education (*Paideia*).
- Religion (*Ta theia/Nomizein*).
- Language (*Glossa*).

Differences between the *indicators of ethnicity* (listed above), in both *etic* and *emic* accounts of ethnic groups, represent the *discrepant experiences* of the Red Sea port communities. They are recognised by comparing historical sources and the archaeological evidence for their lives. Archaeological evidence for activities undertaken in the performance of identity such as consumption practices, or activities that were interpreted as particularly representative of a group, such as consumption practices or specific livelihoods or economies or tasks that represent interaction with a specific environment or territory were used in this thesis. Discrepancies can be explained by understanding the power relationships between different groups within a port community. Differences on subjects may be recognised as omissions or disagreements and

explained by bias or ignorance depending upon the context, where such contextual information is available. The reasons for differences are numerous, but come in three basic forms depending upon what stage of the characterisation process they occurred. Firstly, subconsciously an author's *theory of ethnicity* did not allow them to recognise significant criteria, or erroneously selects criteria that were not culturally significant. Secondly, information from their source (their own experiences or others) was wrong or incomplete, limited by the peculiar circumstances in which they had contact (such as war) that they may or may not be conscious of. Thirdly, for some reason they consciously chose to communicate their knowledge in a style that obfuscates or omits elements of their experience, possibly for a political motive. Comparing these sources one may differentiate between discrepancies and explain them as representative of ignorance, context, political or literary motivations:

- Omission of certain *indicators of ethnicity* that are present in another source may represent a disagreement between authors in the significance of certain *indicators of ethnicity* resulting in a deliberate omission. Alternatively one author's may have only had limited contact or knowledge of a group resulting in an incomplete characterisation.
- Disagreement between authors on how to measure difference in *indicators of ethnicity* using the literary tools of *inversion*, *analogy* or *marvels* (explained in Chapter 9), may relate to the specific context of contact with the said group, or personal bias for political or literary purposes.
- Agreement between authors sometimes equates to conscious borrowing from other texts, or subconscious and uncritical adoption (and repetition) of another's characterisation another group.
- Errors in an authors account, confirmed by contrary archaeological evidence for the performance of identity, imply that the author has omitted or erroneously described a group based on faulty sources, cultural misunderstanding or has purposefully misrepresented others.

More precise understanding may be reconstructed from the historical and specific archaeological contexts from which artefacts or text came and the interrelationship between archaeological and textual data. It is only through the comparison of qualitative and quantitative information such as these and understanding their geographical and social context that the characterisation of ethnic group identities of the 'maritime cultures of the Erythraean Sea' can be understood. For this reason a series of nine questions on the use of ethnonyms and *indicators of ethnicity* are applied to the four major populations of *Aila*, *Berenike* and *Myos Hormos*, namely: the indigenous Red Sea inhabitants, the Eastern Desert nomads, *Aila*'s Nabataean subjects and the Greco-Roman colonists on the Red Sea. The questions were based on *indicators of ethnicity* known to have been used in ancient accounts (Chapter 10). For each question *etic* and *emic* characterisations are given in adjacent columns. This is followed by an explanation of where and why the accounts differed based upon the context in which they were found:

Question on the use of ethnonyms (*exonyms* or *autonyms*) and *indicators of ethnicity*.	
Etic characterisation(s) preserved in an ancient account.	*Emic* characterisation(s) on the same subject preserved in archaeological or epigraphic material.
Explanation of why the *etic* and *emic* accounts were similar or different on different counts.	

This will juxtapose the contradictory nature of ethnicity: the quantitative and qualitative sources, *etic* and *emic* accounts and finally, the descriptions of group identities as homogenous bounded identities, whilst simultaneously also being multi-layered multi-scale identities that are ascribed to by individuals. In this way neither the group, nor the individual is privileged. Only through recognition of such polarisations in the literature, both new and old, in the way identities are constructed, can the various *theories of ethnicity* be understood, without imposing an equally false modern characterisation of these people.

11.1 The indigenous Red Sea coastal population.

There is now substantial archaeological evidence for an indigenous population inhabiting the Red Sea coast of modern Egypt between *Myos Hormos* and *Berenike* (Thomas 2007: 149). The shell middens fish traps and material culture found along the Red Sea coast resembles that described by the authors Agatharchides, Diodorus, Strabo and Pliny. Greco-Roman sources labelled the indigenous coastal populations of the Red Sea and East Africa, *Ichthyophagi*. The earliest attested use of the exonym fish-eater (*Ichthyophagi*) appears in Herodotus, concerning a mission by Cambeses to invade Napatan Kush. It is uncertain however whether these *Ichthyophagi* are from the Red Sea region. The victory stele of the Napatan king Piankhi (727BC) also appears to refer to northern princes as fish-eaters (*FHN* I: 62-112), although this may be a cultural comment on diet rather than use as an exonym. However, the majority of sources on *Ichthyophagi* are written by Greek or Roman authors and based on the accounts of Ptolemaic explorers (Agatharchides, Strabo, Ptolemy and Pliny).

Question 1. How was the ethnonym *Ichthyophagi* used and was it recognised by the indigenous populations of the Red Sea?

The ethnonym *Ichthyophagi* was used to describe the coastal inhabitants of the Red Sea, Indian Ocean and Persian Gulf as far as the Makrãn (*Periplus* 20, 27, Arrian 27-30) as well as the Far East and the west coast of Africa (Nalesini forthcoming). Within this broad category there were 'many nations of *Ichthyophagi*' (Diodorus *History*: *3*.40.1), including the *Ichthyophagi* 'within the Straits' (within the Red Sea Agatharchides 40), the *Arabaegypti Ichthyophagi* of the Egyptian Red Sea coast (Ptolemy *Geography* 4.8.108) and the Aithiopian *Ichthyophagi* (Diodorus *Library of History*: 3.53.6), the *Ichthyophagi* beyond the straits (of East Africa beyond the Red Sea Agatharchides 40), the *Chelenophagi* (turtle eaters Agatharchides *On the Erythraean Sea*: 47), the 'Sacred' Arabic speaking *Ichthyophagi* (*Periplus* 33), the Babylonian *Ichthyophagi* (Agatharchides *On the Erythraean Sea*: 50) and the *Ichthyophagi* of the Makrãn (Arrian 27-30).

The ethnonym *Ichthyophagi* was used for self-identity at *Myos Hormos*. *Pakubis Ichthyophagos* requested a permit to move fishing boats from *Myos Hormos* to the port *Philotera* in the second century AD (*O.Myos* 512). At *Mons Claudianus* fish traders labelled 'Arabs' (*O.Claud* 529, 830) may have been the *Arabaegypti Ichthyophagi* discussed by Ptolemy. Alternatively one of the Arab tribes discussed by Pliny (quoting Juba) such as the *Autaei* or *Assari* may have been acting as middlemen for the *Ichthyophagi* (Pliny *Natural History*: 6).

The meaning of *Ichthyophagi* (fish-eater) betrays its genesis as an exonym. Indeed it had been assumed that it was a derogatory label and never used as an autonym (Phillips 2004; Nalesini forthcoming). The exonym *Ichthyophagi* and the derogatory characterisation of the indigenous Red Sea inhabitants were used by Ptolemaic, Roman and Christian authors for different motives (Nalesini 1996: 198). The genesis of the exonym *Ichthyophagi* is likely to have had an Egyptian origin. In hieroglyphic script fish determinatives were used to denote negative subjects such as abomination, corpse, widow, stink, or discontented (Gardener 1994: 476-7). The victory stele of Piankhi certainly signifies that consumption of fish was culturally distinctive and negative, where the "princes of the Northland … entered not into the king's house, because they were unclean and eaters of fish; which is an abomination for the palace" (*FHN*). The common use of the label *Ichthyophagi* by the Ptolemaic and Roman authorities meant that the indigenous inhabitants of *Myos Hormos* were aware of this exonym and used it as an ethnonym of self-identity when communicating with the Greek speaking authority (*O.Myos* 512). However, this may not be the only ethnonym used by or for them. Fish sellers at *Mons Claudianus* were called Arabs, whilst Ptolemy labels them *Arabaegypti*. The *Ichthyophagi* were listed amongst the Troglodytic peoples, so the exonym *Trogodyt*e may have been used by the indigenous Red Sea inhabitants, though this was more commonly used to described nomadic Eastern Desert populations. Also we do not know what they called themselves, what tribal affiliations they had, other than the few listed by Pliny and Strabo.

Question 2. What is the origin or *descent* of the said population?

The *Ichthyophagi* were listed amongst the indigenous East African *Trogodyt*ic peoples (Pliny *Natural History* 6.176) and the *Ichthyophagi* ancestry was described as being geographically isolated, leading authors to conclude that they were autochthonous (Agatharchides On *the Erythraean Sea*: 5.46). However, other authors suggest diverse Arabian, Egyptian and Aithiopian cultural influences and origins (Diodorus *History*: *3*.53.6, Ptolemy *Geography* 4.5, *Periplus* 33).	We know no genealogies given by self-professed *Ichthyophagi*, Pakubis. The name Pakubis, could be a variant of Pakoibis a name also known from Greek and Demotic texts from *Berenike* and the Nile that means 'he who belongs to Geb' (Egyptian Earth god (Egyptian Earth god, Bagnall, Helms et. al. 2000: *O.Ber* 25), suggesting Egyptian influences and cultural contact.

The historical texts imply an autochthonous origin for the *Ichthyophagi*. Other sources described both Arab and Egyptian cultural influences, resulting in the hybrid ancestry implied by the label *Arabaegypti Ichthyophagi* by Ptolemy (Ptolemy 4.5.101). This is supported by the Egyptian name of *Pakubis Ichthyophagos*. Clearly there was great difficulty faced by Greco-Roman authors and colonists in categorising the *Ichthyophagi* based on their ancestry.

Question 3. In what territory do the said population live?

The *Ichthyophagi* 'possesses neither cities	Settlements, cairns burials, fish traps

nor territories nor any trace of technical skills' (Agatharchides *On the Erythraean Sea*: 5.30a); they were defined as living on the coast (rocky inlets) and catching fish (Agatharchides *On the Erythraean Sea*: 5.30). Juba said *Ichthyophagi* 'swim like creatures of the sea' (Pliny *Natural History*: 6.179) illustrating the strong influence he believed environment had on their identity.	(Rouphel pers. comm.) and shell middens have been found around the rocky inlets, with strong evidence for a fishing economy and fish based diet, just like those described by classical authors.
We do not know to what degree the *Ichthyophagi* thought their environment defined their own identity. However, archaeological sites adjacent to the inlets along the Red Sea coast between *Myos Hormos* and *Berenike* confirm the presence of an indigenous population reliant upon the Red Sea's marine resources.	
Question 4. What distinctive material culture did they use?	
The material culture used by the *Ichthyophagi* was described as possessing no 'trace of technical skill', no boats, rafts or tools (Agatharchides *On the Erythraean Sea*: 5.31-3, 46), no vessels or cutlery (Strabo *Geography*: *16*.4.13). They build stone corals 'just as with weirs' and used 'sharp goats horns and jagged pieces of rock' to bludgeon fish (Agatharchides *On the Erythraean Sea*: 5.32-3b) inside fish traps. Elsewhere woven reed or pit tidal traps with wicker gates were used (Agatharchides *On the Erythraean Sea*: 5.50), as were beach seines (Arrian *Indike*: 27-30). Ropes were used to catch turtles (Agatharchides *On the Erythraean Sea*: 5.47). The *Ichthyophagi* inhabited 'caves, huts built from whale ribs and seaweed, mangrove huts, or excavated seaweed and sand mounds (Agatharchides *On the Erythraean Sea*: 5.43-4). Juba describes love charms, necklaces and bracelets being made from a seaweed called 'hair of Isis' (Pliny *Natural History*: 13.142)	A range of locally made tools and fishing equipment were found at *Myos Hormos* and *Berenike*, some of which were indigenous inventions (including hooks, gorges, nets, creels Thomas in press). Rafts called *Schedia* were commonly used to catch fish exported to Roman subjects (*O.Max* 175, *O.Myos* 512). Stone tidal traps have been identified in *Qalun* between *Myos Hormos* and *Berenike* (Rouphel pers. comm.), as have undated shell middens including crude stone tools (ibid.). Without excavating indigenous sites the architectural habits of the *Ichthyophagi* remains sketchy. At *Myos Hormos* the Pakubis ostrakon (*O.Myos* 512) was associated with mudbrick structures with stone footings, a common building style of the northern Red Sea region (Retzleff 2003). Jewellery made from shells has been found in *Myos Hormos* and *Berenike* (Thomas 2007), whilst dish and bowl forms of Roman and Egyptian style pottery were also used.
Indigenous material culture comes in the form of gorge fishing techniques, shell bowls, cutlery and jewellery made from indigenous materials that were found along side ostraka	

containing the ethnonyms *Trogodyte* and *Ichthyophagi*, almost exclusively Red Sea fauna and occasionally fishing equipment commonly found in the Mediterranean (fishing hooks, nets, weights, floats) made from recycled materials. The material culture of the *Ichthyophagi* was technologically a lot more advanced in *Myos Hormos* and *Berenike* than that discussed by Agatharchides and copied by subsequent Roman authors. Agatharchides information may have been incomplete, out of date or purposefully misleading. Due to the growth in traffic in this area in Early Imperial times, the *Ichthyophagi* of *Myos Hormos* and *Berenike* would have had access to materials and artefacts not previously available to them. Despite this they did possess a distinctive material culture as discussed in Chapter 6.

Question 5. What vocations or economy sustain the said population?

The livelihood of the *Ichthyophagi* is described as subsistence fishing by Agatharchides, where 'the women and children gather up the smaller fish…the men…grasp…the fish which are hard to subdue…they rely on food sources that are unfailing and always at hand, as though Poseidon had assumed the function of Demeter' (Agatharchides *On the Erythraean Sea*: 5.33-34b). This was supplemented by gathering 'mussels, place them in pits and feed them on seaweed' (ibid. 5.35a-36) or 'catch turtles with ropes' (ibid. 5.47). There was some trade in turtle shell with *Adulis* (*Periplus* 4, 33). However, Agatharchides (Diodorus *History*: *3*.20.1) denied the nautical ability of *Ichthyophagi* that was attributed to them by other authors, such as their roles as pilots in the Makrãn (Arian *Indike*: 27.1) as sailors and pirates (Pliny NH 6.176, 12.86-8, 37.107; *Periplus* 4.20; Nalesini: 199), the incense trade at *Deire* (Strabo *Geography*: *16*.4.14), pearl fishing (Pliny *Natural History*: 9.106, 12.2; Athaenaeus 3.93b; Philostratus 3.56; Nalesini 1996: 200).

The artefacts found at *Berenike* and *Myos Hormos* show technologically advanced fishing equipment. This allowed for an economy that produced surplus turned into fish preserves exported to the Eastern Desert settlements and Nile. The artefacts found suggest a range of fine and course meshed nets, basket traps, hooked, multi hooked and gorge line and fishing traps that were used in sandy bottom, reef and open water environments. Fishing was undertaken with a number of fishing boats called *Schedia*, confirmed by Ostraka (*O.Max* 175, *O.Myos* 512). Fish caught were turned into fish products through drying, smoking, pickling and controlled rotting (Thomas 2008). These products provided food for a number of forts and desert sites, possibly traded through specialist merchants that the Roman's labelled 'Arabs' (*O.Claud* 529, 830).

The presence of *Ichthyophagi* at *Myos Hormos* may suggest that the indigenous people may also have been involved in the Erythraean Sea trade.

The *Ichthyophagi* were not merely subsistence fishermen. They were involved in a wider fishing industry in the Eastern Desert that required a number of specialised processes. A diverse range of fishing techniques for specific target species were used to allow for a number

<table>
<tr><td colspan="2">of different fish preserved products to be produced (Thomas in press). Fishing from boats was specialised activity and ownership of numerous Schedia by Pakubis confirms hierarchies within Ichthyophagi society relating to fishing activities (O.Myos 512). Objects made from turtle shell and other marine resources such as pearls (Periplus 36) were traded by the Ichthyophagi. Though their involvement in trade cannot be confirmed independently, their presence at Myos Hormos suggests their role within the Erythraean Sea trade may have gone beyond facilitators as food providers, but also as pilots, sailors, shipwrights, guards, craftsmen and traders.</td></tr>
<tr><td colspan="2">Question 6. On what diet do they rely and how is it prepared?</td></tr>
<tr><td>Of the Ichthyophagi it was said that ‘their nature, being uncorrupted, considers the satisfaction of needs the greatest good since it seeks after none of the imported pleasures’ (Agatharchides On the Erythraean Sea: 5.38b). They eat sun baked fishcakes (ibid. 5.34a/b) as well as turtles and scavenged whales (ibid. 47-8). This diet was substituted with mussels or scavenged fish bones in times of need (ibid. 5.35). They would ‘drink like cattle’ directly from springs (i.e. without cups, ibid. 5.37a).</td><td>Indigenous diets included Red Sea fish and shellfish with some sea mammal (dugong and dolphin and turtle (Van Neer and Ervynck 1999). However, the consumption of some desert fauna (sheep/goat), transport animals (camel, donkey or horse) and occasionally Nile fauna (Chicken, cattle and rarely pig), complicates the picture. Shell bowls and scoops were used to eat with, along with a limited range of imported pottery forms. Imported wine, oil and food were rare if present (Chapter 5).</td></tr>
<tr><td colspan="2">The indigenous diet represented in Ptolemaic Berenike was much less diverse than that of any first and second century AD deposit (Van Neer and Lentacker 1996; Van Neer and Ervynck 1998; Van Neer and Ervynck 1999). It is likely that contact with Greco-Roman colonists slightly influenced the consumption patterns of the indigenous Ichthyophagi consumption patterns, though Red Sea fish remained the vast majority of fauna consumed. Shell bowls and scoops continued to be used into the third century AD, despite the availability of Greco-Roman style pottery, by people who did not use Greco-Roman tableware services. This means that diet changed more than the manner in which food was served in this case.</td></tr>
<tr><td colspan="2">Question 7. What were their cultural norms and laws?</td></tr>
<tr><td>The cultural personality, norms and laws of the Ichthyophagi were described in barbaric terms: (they) ‘their nature, being uncorrupted, considers the satisfaction of needs the greatest good since it seeks after none of the imported pleasures’ (Agatharchides On the Erythraean Sea: 5.38b).‘Of these Barbarians some live completely naked and possess their women and children in common like herds of</td><td>We have no idea what the Ichthyophagi cultural norms and laws were, other than what was imposed upon them by the Greco-Roman colonists, which required permit applications, such as that written by Pakubis Ichthyophagos.</td></tr>
</table>

animals and have only a natural apprehension of pleasure and pain but no thought at all for what is shameful and what is good' (Agatharchides 5.31b/a).	
The devises used by Agatharchides were those of a Greek writer discussing *Barbarians*, expanded upon by descriptions of *Ichthyophagi* of the Straits being castrated (Strabo *Geography*: *16*.4.4-5). Their description as insensitive and mute is based on Greek colonial experience relayed from early Ptolemaic explorers recounting the reaction of the *Ichthyophagi* to violence inflicted upon them.	
Question 8. What religious practices did they follow?	
There is no description of the religious practices that the *Ichthyophagi* followed, though one Arabic speaking group of the *Ichthyophagi* were called 'sacred' (*Periplus* 33), though not why. Concerning burial practices, for the *Ichthyophagi* 'their mind is insensitive to the feelings of pity …For this reason they allow them to lie where they have been cast out until the ebb tide occurs and carries them out to sea to serve as food for the fish' (Agatharchides *On the Erythraean Sea*: 5.45).	The name *Pakubis* could be a variant of Pakoibis (he who belongs to Geb, an Egyptian earth god), suggesting that some may have followed Egyptian religions. Indeed in the Red Sea ports Greco-Egyptian deities were worshipped as represented by figurines and temples (see below on Greco-Roman religion). Along the Red Sea cairn burials have been found associated with shell midden sites, although these cannot be securely identified as *Ichthyophagi* burials (Sidebotham pers. comm.).
Classical authors appear to be telling more fantastic stories about the beliefs of the *Ichthyophagi*. The archaeological evidence suggests that in the first three centuries AD the inhabitants of the Red Sea ports, the *Ichthyophagi* included, were worshipping Greek or Egyptian gods and burying their dead in grave cuts or the standard cairn burials used in the Eastern Desert used by the nomadic *Trogodyte*s. The result of faunal analysis suggests that isotope analysis may provide clear results for the identification of '*Ichthyophagi*' burials (in grave cuts or cairn burials) in the future.	
Question 9. What languages did the indigenous populations of the Red Sea use?	
Herodotus claimed that the *Ichthyophagi* were acquainted with the Egyptian and Ethiopian tongues and were able to converse with the Kushites (in Meriotic, Herodotus 3.19-25; Clearchos of Soli Athaeanaeus VIII 345d-e; Nalesini: 198). Agatharchides prefers Simmias', account, 'confirmed' by merchants; 'they do not possess a common language… [communicating with]	*Pakubis Ichthyophagos* (*O.Myos* 512, Chapter 5) is likely to have written his own permit in Greek to move his *Schedia* to *Philoteras*. We have no evidence of what the *Ichthyophagi* indigenous languages were.

inarticulate sounds and imitative gestures' (Agatharchides *On the Erythraean Sea*: 5. 41). The author of the *Periplus* states that the 'Sacred *Ichthyophagi* of the islands south of Arabia spoke Arabic (*Periplus* 33).	

Greco-Roman accounts disagree on the use of language used by the *Ichthyophagi*. Herodotus suggests that they were able to speak Meroitic and Egyptian, whilst the author of the *Periplus* suggested some *Ichthyophagi* spoke Arabic and individuals must have used Greek where appropriate for legal and trade purposes. The use of prefixing ethnic labels such as Arab, Ethiopian and *Arabaegypti* to *Ichthyophagi* in literary and non-literary texts, suggests that culturally and linguistically the 'many nations of *Ichthyophagi*' (Diodorus *History*: *3*.40.1) were diverse.

Conclusions on the characterisation of the indigenous Red Sea inhabitants.

There is clear archaeological evidence for an indigenous Red Sea population inhabiting the coastal strip between *Myos Hormos* to *Berenike* and beyond, with their own material culture, economy and territory. Both Greco-Roman geographers and colonists had difficulty labelling and characterising these peoples; they were generally called *Ichthyophagi* (Agatharchides, Diodorus, Strabo, Pliny), though Arabs (*O.Claud* 529, 830 and Juba in Pliny *Natural History*: 6.167-9) and *Arabaegypti Ichthyophagi* (Ptolemy) were also used. There is only one example of this ethnonym being used by the local coastal population (*O.Myos* 512) in the context of a Roman permit. There is no evidence of widespread use of this ethnonym being used within their own society, possibly because of the negative characterisation it represents.

The Greco-Roman characterisation of the *Ichthyophagi* was derogatory, especially concerning the discrepancy between different Greco-Roman authors. Agatharchides account of the *Ichthyophagi* differs markedly from that of other authors who credit this diverse group with linguistic ability, more advanced technology and other economic interests, most notably involvement in the trade of high value goods such as incense (Nalesini 1986: 198). The archaeological evidence provides further evidence for the negative light in which Agatharchides and those authors who quote him, place the *Ichthyophagi*. The indigenous people of the Red Sea were indeed involved in fishing, but their economy was not one of subsistence but a major fishing industry that utilised diverse methods to catch a range of products that were subsequently exported as fresh, salted, dried, smoked or fish sauce products to feed the large population of people who were by then living in the Eastern Desert forts, quarries, mines and ports.

11.2 The Eastern Desert nomads

Archaeological evidence for the indigenous Eastern Desert dwelling nomads has now been extensively researched (Barnard 2008). Material culture characterised by its Eastern Desert ware pottery, bead work, ring cairn grave monuments and associated with a nomadic economy is commonly found in the region between the Nile and the Red Sea south of *Myos Hormos* as far as the fourth cataract in modern Sudan. Greco-Roman, Egyptian and Aksumite accounts of the various nomadic tribes who inhabited this region include (though not exclusively) the *Blemmye*s, *Megabaroi*, *Bourgaites*, or collectively as *Trogodyte*s (Barnard 2008). At some point some classical authors miss spelt *Trogodyte*, *Troglodyte* (cave dweller Tomber 2005: 41). Individual tribes or kingdoms were known as the *Blemmye*s, *Megabaroi* or *Colobi*. Collectively the Eastern Desert dwellers were known to the Greco-Roman authors as *Trogodyte*s, Nomads or *Barbaroi*. The earliest account appears to concern an attack on the *Bulahau* tribe by Kush in the seventh century BC (*FHN* 34). A papyrus from 513BC discusses *Blemmye*s as hired guards for the Egyptian state (*FHN* 50). This is followed by the fantastic tales of Herodotus dating to the fifth century BC. Late Ptolemaic (Diodorus) and Early Imperial Roman (Strabo, Pliny) relay detailed accounts on *Trogodyte* life, based on Agatharchides whose sources lived in the third and fourth centuries BC (based on Eratosthenes, Euhemerus, Eudoxus and Simias). After this Roman involvement in the region have preserved further first and secondhand accounts on the *Trogodyte*s

Question 1. How was the ethnonyms *Blemmye* and *Trogodyte* used and were they recognised by the Eastern Desert dwellers?

The fantastic fifth century BC account of the *Trogodyte*s written by Herodotus were extensively quoted (Theocritus 7.111, Heliodorus, Epiphanios, Claudian). The Eastern Desert and East Africa was called the *Trogodyte* country (*Trogodyticum*) after its inhabitants and is recorded in literary texts and inscriptions left by Greek travellers to that place (such as Artemidorus and Akestimos OGIS.I 70-1). Agatharchides detailed accounts of the *Trogodyte*s clearly distinguish them from Meroites or Aithiopians (Agatharchides *On the Erythraean Sea*: 5.61-2) and also distinguished the tribes of the *Colobi*, *Megabaroi* and *Blemmye*s (ibid.: 5.62 also Strabo *Geography*: 17.1.2 after

A 220BC marriage contract survives of the *Blemmye Harmais* son of *Harpaesis* (also known as a *Megabaroi* in other documents) who married the Egyptian *Taese* daughter of *Khahor* (*FHN* 123). This suggests that the terms *Blemmye* and *Megabaroi* may be interchangeable, or used in different contexts.

In a Late second to third century AD ostraka from *Myos Hormos* the fragmentary inscription *Pet[-] Trogodyt[-]* was found (O.Myo 543), confirming the use of this label as an autonym in the context of ownership of a vessel.

By the fifth and sixth centuries AD *Blemmyean* inscriptions and documents

Eratosthenes). The Greeks collectively labelled these tribes '*Nomades*' (Strabo *Geography*: *1*7.1.53-4, Agatharchides *On the Erythraean Sea*: 5.62, Ptolemy *Geography*: 4.7). Greco-Roman explorers, merchants and soldiers are also known to have labelled these nomads *Barbaroi* (*Periplus*). From the third century AD texts refer to the *Blemmye*s as a Kingdom with which the Roman state had border disputes (Procopius *Histories*: 1.19.27-37, Cosmas Indicopleustes *Christian topography* : 11.339).	concerning Kings *Silko* (*FHN* 319), *Kharakhen* (*FHN* 336) and *Barakhia* (*FHN* 339) suggest that the term *Blemmyean* denoted both a kingdom and an ethnic or tribal group.
The ethnonyms used to describe the nomadic peoples of the Eastern Desert and East Africa such as *Trogodyte* and the various tribes, the *Blemmye*s and *Megabaroi*, were clearly used as autonyms as well as exonyms. Early accounts by Greco-Roman geographers were fantastic in their nature, though some accurate detail survives. Etic accounts by Greco-Roman merchants sailors and soldiers in the region prefer the label *Barbaroi* and usually refer to attacks on Romans. By the third century AD the political situation in the *Dodecaschoinos* was such that the term *Blemmye* when used as an autonym referred to the subjects of a powerful kingdom in the Eastern Desert and *Dodecaschoinos* region. Confrontation between *Blemmye*s and the Roman state and monastic communities meant that to many Christian authors the ethnonym *Blemmye* was synonymous with *Barbaria*n and enemy of Christianity (Procopius *Histories*: 19.27-37).	
Question 2. What is the origin or *descent* of the population?	
The *Trogodyte*s were described as indigenous to the desert region beyond *Berenike* (Agatharchides *On the Erythraean Sea*: 5.85). Juba describes the region between *Berenike* and the Sinai as being inhabited by *Asarri* (or 'Wild Arabs') hybrid descendents of the *Trogodyte* and Arab peoples (Pliny *Natural History*: 6.168).	Emic accounts of genealogies and kinship suggest significant intermarriage between *Blemmye*s and Egyptians. A marriage contract between the *Blemmye Harmais* and the Egyptian *Taese* (*FHN* 123) confirm what is suggested by other accounts of integration with Egyptian society dating to the second century BC to the fourth century AD (*FHN* 136, 312).
Emic accounts of lineage and kinship suggest that there was a significant amount of integration between *Trogodyte*s and Egyptians. This is confirmed by the marriage contract between *Harmais* and *Taese* in 220BC (*FHN* 123). Intermarriage between Arab and *Trogodyte* groups was used to explain what was perceived as the hybrid culture of the *Asarri*	

of the Eastern Desert in the Region of *Myos Hormos* and *Berenike* (Juba in Pliny *Natural History*: 6.168).	
Question 3. In what territory do the said population live?	
Agatharchides stated in his book *On the Erythraean Sea* that the *Trogodyte* tribes lived in the region between the Nile and the Red Sea and that this " land … takes charge of a persons life from infancy … in the … style and ways of life and even the people's bodies' (Agatharchides *On the Erythraean Sea*: 5.66-7), basically that the environment determined *Trogodyte* identity and way of life.	Writing bearing the ethnonyms *Blemmye* were found in the Nile valley at *Hibe* in 513BC in the Nile valley in 220BC (along with references to *Megabaroi*) at *Philae* in 180BC, the desert east of the Nile in AD 253, at Qasr Ibrim in AD 450 and at *Gebelein* in the sixth century AD. The ethnonym *Trogodyte* has only been found at *Myos Hormos*.
The political geography of the Eastern Desert Nomads was complicated during the first three centuries AD. Following at least nine centuries of contact and intermarriage within the region, by the third century AD the *Blemmye*s controlled large sections of the *Dodecaschoinos* and also the adjacent Eastern Desert. However, not all Eastern Desert Dwellers were known as *Blemmye*s and in *Myos Hormos* a *Trogodyte* named *Pet[..]*, may have been a local nomad of that region, or equally from anywhere in East Africa (Tomber 2005). A series of conflicts between the Eastern Desert dwellers, known as *Trogodyte*s, *Blemmye*s, *Bourgaites*, *Nomades* or *Barbaroi* and their Roman, Aksumite and Nubian or Meroitic neighbours are discussed in military correspondences and histories (De Romanis 2003). These include confrontations with the Nubians/Meroites in the fifth century BC (*FHN* 71) third to fourth (*FHN* 279-80, 285) and fifth centuries AD (*FHN* 302, 317, 319). With the Meroites in the third century AD (*FHN* 279) Confrontations with the Aksumites in the second to fourth centuries AD (*FHN* 234, 298-9). Confrontations with the Roman's in the first (*FHN* 224), second (*O.Krok* 6,51,47-58,60,87, *O.Claud* 490, 4888, 7218, 7255, 7309) third (*FHN* Historia Augusta Prob 17.2-3, 6, *FHN* 279) and fourth to sixth centuries AD (*FHN* 282, 284, 292, 296, 301, 307, 309, 314, 318, 323, 324, 328), but also alliances with the Romans in the fourth to sixth centuries AD (*FHN* 283, 293, 295, 318, 327). This complicated political geography suggests that there were both pro and anti Roman groups of *Blemmye*s (confirmed by *FHN* 295), until the unification under a dominant king, probably in the third century AD. At this point the *Blemmye* ethnonym becomes the label of a kingdom, including some desert nomad '*Blemmye*s' (*FHN* 303-4) and other '*Blemmye*s' lived on the Nile, with Kalabsha as their cultural centre (Barnard 31, *FHN* 305, 308-9, 311).	
Question 4. What distinctive material culture did they use?	
The *Megabaroi*' clubs and shields and *Trogodyte*s' bows and spears were thought to be representative of specific tribes (Diodorus	Handmade, burnished pottery called 'Eastern Desert Ware' is distinctive of the region from the second to the eight centuries AD. Vast

History: *3*.33.1). Body decoration and modification, was also distinctive such as the circumcision of the *Colobi* (Diodorus *History*: *3*.32.4-33.1). *Trogodyte*s also used vaulted buildings called 'kamara' and byres used for herds covered with palm branches to provide a platform for their families. Agatharchides, quoted by Diodorus saw this material culture as distinctive of the different tribes of *Trogodyte*s.	majority were cup (cereals and vegetables) and bowl (communal meat course) serving vessels (Barnard 2008-a: 113) "vessels associated with a certain foodstuff or food 'ritual' that went in and out of fashion" (Barnard 2008-a: 114). This pottery was often associated with beads and (fourth to sixth centuries AD) small dry-stone walled buildings, usually of 1 or 2 rooms (Sidebotham et. al. 2002: 223).
Material culture of the nomadic groups of the Eastern Desert is not archaeologically visible until the second century AD, when Eastern Desert ware appears in *Myos Hormos*, *Berenike* and a number of other Eastern Desert sites (Barnard 2008-a). It is interesting that it appears at the same time as the ascendancy of the *Blemmyean* Kingdom and that it is associated with an Eastern Desert diet of sheep and goat. However, this pottery is not discussed as distinctive of the *Blemmye*s specifically and could equally represent any other Eastern Desert tribe or group.	
Question 5. What vocations or economy sustain the said population?	
The livelihood of the *Trogodyte*s was dependent upon the care of sheep and cattle (Agatharchides *On the Erythraean Sea*: 5.62). They worked as '*Barbarian*' guards at the gold mines for the Ptolemy's (ibid.: 5.24), that they later controlled in the third to sixth centuries AD (Olympiodorus 1.37, *FHN* 309). Involvement in trade in precious stones (Pliny *Natural History*: 5.34) as well as ivory, horn, shell, hides, apes and slaves with the Ethiopians at *Adulis* (Pliny *Natural History*: 6.173) as well as incense, myrrh, cinnamon and cassia (Pliny *Natural History*: 2,12.69). The *Blemmye*s controlled Emerald mines and traded with Aksum and India via *Adulis* (Olympiodorus 1.37, *FHN* 309; Cosmas Indicopleustes *Christian topography*: 11.339)	The *Trogodyte* way of life is only confirmed by the account of a herdsman (*FHN* 136). Some *Blemmye*s such as *Wahibremer* sought work as guards for Egypt (513BC *FHN* 50). A hierarchy consisting of a range of vocations was present by the fifth century AD, when *Phylarchs*, tribal chieftains (*FHN* 320, 331, 340), slaves (*FHN* 331) priests (*FHN* 315), king (*FHN* 319, 336, 339) and soldiers (*FHN* 327) are mentioned within *Blemmyean* society.
The Eastern Desert dwellers were nomadic pastoralists and occasionally raided merchants. However, the *Trogodyte*s and *Blemmye*s were working as guards, soldiers and mine overseers for the Ptolemy's and later for themselves. They also operated as traders between Aksum,	

Nubia, Egypt and the Red Sea, offering an overland route for the Erythraean Sea trade. By the fifth century AD, the *Blemmyean* Kingdom was a powerful and complicated state that employed numerous specialists to oversee its numerous trade, mining and political interests.	
Question 6. On what diet do they rely and how is it prepared?	
The accounts of Greco-Roman authors on subsistence strategies of the *Trogodyte*s disagree. Herodotus stated, 'the *Troglodyte*s feed on serpents, lizards and other similar reptiles' (Herodotus 4.183). More accurate information appears to come from Agatharchides who states that the *Trogodyte*s consumed "blood and milk which they mix together and boil briefly" and that they eat old or ill sheep and cattle and also drank poor quality wines made from either the Christ's Thorn berry (*Jubjube*) or a flower (Agatharchides *On the Erythraean Sea*: 5.62).	We have no *emic* accounts of the *Trogodyte* or *Blemmyean* way of life concerning food and drink. The archaeological evidence suggests strongly a diet consisting of sheep and goat supplemented with some wild animals (Ibex and gazelle, wild birds and few lizards) predominates in *Berenike* and Shenshef, also associated with Eastern Desert ware. Eastern Desert ware comes in a restricted range of forms, usually bowls, but also cup, jar, miniature, spouted, ladle and dish forms (Barnard & Rose 2007). Residue analysis has discovered that Eastern Desert ware were used for a variety of foodstuffs, not just drinks (Sidebotham et. al. 2005: 26; Barnard & Eerkens 2007).
Greco-Roman characterisation of the *Trogodyte*s and *Blemmye*s concerning consumption practices vary from the fantastic to accurate. The nomadic inhabitants of the Eastern Desert do appear to have relied heavily upon sheep, goat and wild animals such as ibex and wild birds. The consumption of cattle suggested by Agatharchides does not appear to have been significant in the Eastern Desert and may represent groups inhabiting areas closer to the Nile. The extent to which they eat lizards is debatable. They were not significant in the faunal assemblages of the Eastern Desert and so likely an elaboration by Herodotus. The importance of blood, milk and various locally produced wines may be revealed by further residue analysis (Barnard & Rose 2007).	
Question 7. What were their cultural norms and laws?	
Agatharchides described the cultural norms and laws of the *Trogodyte*s in terms that would have been interpreted as barbaric by his readership. They were said to possess a king (tyrant). The women were said to be shared by all, as were their children. Adultery with the king's wife was punishable with a fine in sheep (Agatharchides 5.62). Feuds were settled with violence, unless resolved by	Emic accounts of cultural norms and laws of the *Trogodyte*s mostly come from fourth to sixth century AD documents. Laws were enforced by the King and *Phylarchs* (Chiefs *FHN* 320, 331, 340). Legal documents of the *Blemmye*s include marriage contracts (*FHN* 123), transfers of ownership and freeing of slaves (*FHN* 331), loans (*FHN* 332-3, 335), receipts (*FHN* 337-8), royal orders (*FHN*

their women (ibid.) and all *Trogodyte*s were circumcised, one tribe the *Colobi* near the straits were excessively 'mutilated' (Diodorus *Library of History*: *3*.32; Strabo *Geography*: *16*.4.4-5).	319, 334, 336, 339) and acknowledgement of debt (*FHN* 340-3). Emic accounts come from a period when the *Blemmyean* people had become a Kingdom.
The Greco-Roman accounts of *Trogodyte* and *Blemmyean* cultural norms diverge significantly from what the epigraphic and papayrological record suggests. The presence of marriage and legal documents suggest that kings, chiefs and possibly priests regulated law. Agatharchides account appears to be a literary devise to depict the *Trogodyte* tribes as 'exotic and barbaric' in nature.	
Question 8. What religious practices did they follow?	
Greek writers, who failed to mention their religious views, poorly understood the belief systems of the *Trogodyte*s. Burial practices are precisely detailed discussing the body bound into a contracted position with withies, inside stone cairn mound marked with a goat's horn. Late Roman accounts of *Blemmyean* religion discuss their worship of Isis, Osiris, Priapus and the sun, offering human sacrifice in their rites (Procopius *Histories*: 1.19.35-6). They frequented the Temple of Isis at Philae (Priscus *FHN* 318) and worshipped wooden statues (P.Cair.Masp.I 67004.8 *FHN* 309; Dijkstra 2005).	Archaeologists working in the Eastern Desert and the Sudan hills have identified stone cairn burials with individuals bound into a contracted position with withies (Sadr et. al. 1995). The *Blemmyean* religious community was served in the fourth century AD by the temple of Tafa of the cult society of *Amati* (*FHN* 312), the temple of Kalabsha in the fifth and sixth centuries AD (*FHN* 310-1, 313) of the cult society of *Abene* and the temples of Philae in the fourth and fifth centuries AD of the cult of *Maduluis* and *Ptireus* (*FHN* 306; *FHN* 315).
The classical accounts for *Trogodyte* belief systems closely resemble that recorded in archaeology and epigraphy. The *Blemmye*s were Pagans who worshipped a range of Egyptian gods and other cults, though Christian accounts; especially those of human sacrifice betray clear bias. This religious identity was important to them and the cause of numerous confrontations with Byzantine Egypt in the fourth to sixth centuries AD.	
Question 9. What languages did the indigenous populations of the Red Sea use?	
Classical accounts of *Trogodyte* language include fantastic stories such as 'their language is unlike that of any other people; it sounds like the screeching of bats' (Herodotus 4.183). Other accounts describe them as different from other languages, such	Documents used by *Blemmye*s include a Demotic marriage contract dated to 220BC (*FHN* 123), Greek in the second to third century AD ostrakon from *Myos Hormos* of *Pete[-] Trogodyt[-]*. *Blemmyean* documents and inscriptions of the fifth and sixth

as Plutarch's account of Cleopatra being capable of speaking to *Trogodyte*s (Plutarch 25.5-28.1).	centuries AD were written in Meroitic (*FHN* 300), Greek (*FHN* 310-3, 315, 319, 334-8, 340-3), Coptic (*FHN* 320-1) or both Greek and Coptic (*FHN* 331-3, 339).
We do not know what language *Trogodyte*s and *Blemmye*s spoke. We know it was different to Egyptian and it has been suggested that the *Blemmye*s spoke Meroitic (Barnard 2005 31, *FHN* 317). Documents by or for *Trogodyte*s/*Blemmye*s also include Demotic, Coptic and Greek, suggesting that in certain circumstances these languages were necessary.	
Conclusions on the characterisation of the Eastern Desert dwellers.	
The ethnonyms: *Blemmye*, *Megabaroi* and *Trogodyte* were used as autonyms by the people of the Eastern Desert. However, these ethnonyms do not necessarily represent all the Eastern Desert nomads represented in the archaeological record by their pottery, diet, economy, burial practices and settlements. Recorded uses of *Blemmye* and *Megabaros* as autonym were limited to the Nile valley region dating from the fourth century BC to the sixth century AD and an individual could be both a *Blemmys* and a *Megabaros* and marry an Egyptian (*FHN* 123). This arguably made the ethnic identity of these groups quite fluid. Some *etic* accounts place the *Blemmye*s in the *Berenike* and *Mons Smaragdus* region in the third to sixth centuries AD. The use of the term *Trogodyte* was found in *Myos Hormos* dating to the second or third century AD. The term *Trogodyte* may represent a tribe, or a collective name for the Eastern Desert dwellers (Agatharchides *On the Erythraean Sea*: 5.62) and the *Blemmye*s are just one of many tribes that lived in the Eastern Desert that may be represented by the archaeological evidence of the Eastern Desert dwellers (Barnard 2008: 114). It is likely that the term *Trogodyte* was used in *Myos Hormos*, because it was a term that the Greco-Roman inhabitants recognised and because it was not the derogatory term *barabaroi* that was prefered in military correspondence (De Romanis 2003). The Greco-Roman accounts were derogatory, because contact between the Ptolemaic explorers and these people were within a colonial context. The third century AD saw the *Blemmye*s and Romans at war, whilst subsequent Christian writers used the Pagan *Blemmye*s as literary examples in their fantastical texts as example of godlessness. This makes the Greco-Roman accounts of these people biased for a number of reasons, explaining the often simplistic and derogatory manner in which they are depicted. Despite this, epigraphic material provides us with some of the ethnonyms that were used by the Eastern Desert dwellers, a diverse nomadic group of many tribes, whose material culture is recognised at *Berenike*, *Myos Hormos* as well as in other sites in the Eastern Desert and on the Nile.	

11.3 The Nabataean subjects of Aila

A distinctive style of material culture dating from the second century BC (Schmid 1995: 637-47) to the second century AD labelled Nabataean by modern scholars is well attested in the region ruled by the Nabataean Kings (Chapter 7). The ethnonym Nabataean is attested historically and epigraphically from the fourth century BC to the second century AD and was clearly used by at least some of the inhabitants of that kingdom. However, the relationship between the two cannot be assumed, as it is important for us to recognise the distinction in the Nabataean kingdom between those members of the elite ethnic group *nbtw* and the subjects of the Nabataean state ruled by this ethnic groups head, the King of the *Nabataeans*. This is the distinction between membership to a nationality and to an ethnicity.

Question 1. How was the ethnonym Nabataean (*Nabataei/Nbtw*) or Arab used and was it recognised by the inhabitants of Aila?

The ethnonym Nabataean was used by Greek and Roman authors to describe Arab or Arabian tribe(s) ruled by the Nabataean King (Josephus *Antiquities* 13.387-92, 13.414, 14.14, 14.20-1, 14.32, 14.120-2, 14.370-3; Strabo *Geography*: *16*.4.2; Diodorus *Library of History*: 2.48.1, 19: 94; Pliny *Natural History* 5.12.65). The inhabitants of the gulf of Aqaba are described as being Nabataean Arabs since the first century BC (Diodorus *Library of History*: 2.48.1, 19: 94).

Aila's inhabitants have been described as *Laeanitae* (Pliny *NH* 6.32.156), *Elasioi* (Dionysius *Scholia* 2.48.1, 19: 94) and as descendents of Syrians and *Edomites* (Josephus *Ant* 13.387-92, 13.414, 14.14, 14.20-1, 14.32, 14.120-2, 14.370-3). The *Laeanitae* of *Laeana* (*Aila*, Pliny *NH* 6.32.156) were subjects of the Kingdom of *Lihyan*, whose capital was at Hegra (Tarn 1929: 16) until annexation by the Nabataean Kingdom at the end of the second century BC (Al-Fassi 2007: 25).

Whilst it is likely that some of the inhabitants of the fifth to fourth century '*Edomite*' settlement under Persian administration in *Petra* identified themselves as *Nabataeans* (Browning 1989), the autonym *Nbtw* appears rarely in limited contexts. It is found in inscription relating to the Nabataean king, traditional law and five rare cases of self-identification outside of the geographical or temporal (and often linguistic) boundaries of the Nabataean kingdom (Al-Fassi 2007: 19).

Nabataean identity was not exclusive, as one could also be a member of another tribe, such as *'Abd 'ubaidw* son of *Ganam Nbty* and *Rwhy* (CIS II 3973 *Al-Fassi* 2007: 19). Throughout the Nabataean kingdom, various tribes or confederations are known: *'byst, qsyw, rwh, 'mrt, slmw, df, thmd, slmw* and *mznt.* Tribal conderations such as the *Daif, Masikat* and *Muharib*, were an integral part of the Nabataean realm as they supported or opposed certain members of the Nabataean royal family during rebellion in AD 71 (Graf 1989: 363).

The Nabataean ethnonym is found in Palmyrene, Safaitic and Nabataean-Greek inscription

from Cos, as well as in Italy. It is only found inside the Nabataean kingdom after Roman annexation and so as an ethnonym, it is only used in the context where there are non-*Nabataeans*. The term Nabataean was most commonly used in relation to the Kingdom, the King and the ruling elite and it is possible that this label was an 'aristocratic ethnie' representing the ruling elite, a powerful tribe or class that had a broad geographical influence (Al-Fassi 2007: 22). Instead people would commonly identify their tribal affiliations, with their close familial links. It is possible that some of *Aila*'s inhabitants thought of themselves as *Laeanitae* or *Elasioi*, distinguishing themselves from other *Nabataeans* because of their history as subjects of an independent kingdom, or as descendents of Syrians and/or *Edomites*. However, the evidence for this is speculative at best.

The term Arab or Arabian appears to be an exonym used by Greeks and Romans and whilst the *Nabataeans* were probably aware of this, there is no evidence of them using it themselves. Graf has argued; 'if the *Nabataeans* of North Arabia were known as 'Arabs' to their neighbours and spoke 'Arabic', we should not hesitate any longer to call them 'Arabs' either' (Graf 2004: 151). However, there is no evidence the *Nabataeans* called themselves Arabs and there is doubt whether the Nabataean script represents an ancient North Arabic language or an Aramaic language with Persian origins and limited Arabic loan words (Macdonald 2000: 47).

Question 2. What is the origin or descent of the said population?

The *Nabataeans* are first described in the fourth century BC, where they were described as the indigenous inhabitants of the *Petra* and Gulf of Aqaba region. In the first century AD Josephus quoted from the Torah that states the inhabitants of *Aila* were the descendents of Syrians and *Edomites* (Josephus *Antiquities* 13.387-92, 13.414, 14.14, 14.20-1, 14.32, 14.120-2, 14.370-3).	The *Nabataeans* have tentatively been identified as inhabiting *Petra* since the Fifth or fourth century BC. There is no evidence that the *Nabataeans* saw themselves as anything other than the indigenous inhabitants of the region. The tribal confederations within Nabataean society also trace their long familial patrilinear lineages and links with other tribes as well as affiliations with the *Nabataeans* and the Romans (Chapter 9).

Scholars have argued for Nabataean origins in South and East Arabia as well as the Syrian-Mesopotamian region. However, there is little hard evidence for the movement of the *Nabataeans* (Parr 2003: 30) and the presence of foreign language, technology and nomenclature from both regions can be more easily explained through the long history of Assyrian, Babylonian and Persian rule as well as South and East Arabian trade contacts (Parr 2003: 32). Instead the *Nabataeans* emerged from the ruins of the *Edomite* culture that had been successively intimidated and destroyed by the Assyrians in the eighth century BC, by the Babylonians in the sixth century, to the point that the region was practically devoid of sedentary occupation when it was nominally under Persian control (539-332BC, Parr 2003: 32).

<table>
<tr><td colspan="2">Question 3. In what territory do the said population live?</td></tr>
<tr><td>The Nabataean Kingdom Petra shared borders with Egypt and Judaea (Josephus Ant 13.387-92, 13.414, 14.14, 14.20-1, 14.32, 14.120-2, 14.370-3), exerting control over the Sinai and much of the southern Levant. They controlled the gulf of Aqaba and had overran Syria (Strabo Geography: 16.4.21), occupying Damascus for a spell in the first century AD.</td><td>There is no clear definitive map of the Nabataean polity and there is no evidence that the label Nabataea was used to denote this region by the Nabataeans (Al-Fassi 2007: 22, the term was used by Strabo only). Epigraphic evidence confirms that the Nabataeans controlled Hegra and Dedan to the south (Al-Fassi 2007: 19) and patrolled Wadi Sirhan in Syria to the east (Bowerstock 1971).</td></tr>
<tr><td colspan="2">The Nabataean Kingdom’s borders fluctuated depending upon its fortunes with its neighbours and the meddling of the Roman Empire. At its maximum extent it covered an area from the Sinai in the west to Wadi Sirhan in the east, Hegra and Dedan in the south to Damascus in the north. However, this area contained a diverse range of tribes and confederations and the coherence of the Nabataean state owed much to the involvement of disparate groups whose ‘Nabataean identity’ may have been dependant upon circumstances.

There was no Nabataean term for their territory. The Nabataea label is a modern one, only used in Antiquity by Strabo, and whilst there was a Nabataean core around Petra, there is no evidence that the Nabataean fluctuating territories were seen as a major indicator of self-identity of the Nabataeans (Al-Fassi 2007: 22).</td></tr>
<tr><td colspan="2">Question 4. What distinctive material culture did they use?</td></tr>
<tr><td>Fourth century BC accounts of the Nabataeans credit them with technology limited by their nomadic lifestyle (Diodorus Library of History: 2.48.1, 19: 94). Subsequent late first century BC accounts credit them with the rich rewards of their urban lifestyle and trading ventures; including gold cups, stone houses and coloured girdles and slippers (Strabo Geography: 16.4.25-6).</td><td>There is a material culture style specific to the Nabataean Kingdom manifested in numismatics, painted pottery, art, sculpture, hair styles, dress, architecture and hydraulic technology (Al-Fassi 2007: 21-3 after Mackenzie 1990; Parr 1996: 215). Painted Nabataean tableware pottery was developed in the second century BC, derived from Hellenistic forms (Schmid: 637). This industry continued on a smaller scale after annexation with late Nabataean pottery of the second to third century AD (Schmitt-Korte: 8).</td></tr>
<tr><td colspan="2">Nabataean material culture was clearly influenced by Hellenistic and subsequently Roman culture (Schmid: 637), however Nabataean material culture remained different.</td></tr>
</table>

Strabo describes drinking bouts not dissimilar from Hellenistic and Roman practices (Strabo *Geography*: *16*.4.26). Roman red-slipped wares were used and Nabataean pottery copied some Hellenistic bowl, dish and cup forms. However, Nabataean pottery had its own distinctive style, weight and decoration (Al-Fassi 2007: 21) and platters were very rarely used (Chapter 7) suggesting that it was used differently in a distinctively Nabataean manner.

Question 5. What vocations or economies sustain the said population?

From the fourth to second centuries BC the *Nabataeans* were characterised as nomads, raiders and pirates (Diodorus *Library of History*: 2.48.1, 19: 94). This contrasts severely with the first century BC to second century AD accounts of them as an urban sedentary society consisting of merchants (Strabo *Geography*: *16*.4.25-6). Garden agriculture included fruit and sesame oil (Strabo *Geography*: *16*.4.26). Nabataean society required specialists including soldiers and cavalry to protect the Kingdom (Strabo *Geography*: *16*.4.23), the King and administrators to rule the land and deal with lawsuits (Strabo *Geography*: *16*.4.21).

The *Nabataeans* had a nomadic contingent within its society throughout its history (Graf, MacDonald) that provided livestock for consumption. However, an increasingly settled population was also undertaking animal husbandry, agriculture activities (Parker 2007). Fishing and ship maintenance were also taking place in *Aila* and fish products were being produced there to supply increasing demand within the Nabataean Kingdom (Studer 1994: 191; Van Neer & Parker 2008: 1821). Fishing in the Red Sea was taking place since the settlement of *Aila* (Retzleff 2003: 55) and probably before (see Chapter 7, Lepiksaar 1995)

The classical sources have heavily influenced modern scholars perceptions of the Nabataean economy. The nomads to urbanites processes of sedentarisation and urbanisation have been ascribed to cultural influences Mesopotamia, South Arabia and the northern oasis cities of Tayma, Dedan and Hegra (Parr 2003: 30-5). However, it is now known that there was always a sedentary component to Nabataean society (Graf, Bedal et. al. 2005; Graf, Schmid et. al. 2007) and that there was also always a nomadic component to it also (Macdonald 1993: 303; Al-Fassi 2007: 27).

Question 6. On what diet do they rely and how is it prepared?

The *Nabataeans* kept camels and sheep in the desert and lived on meat, milk and wild plants (Diodorus *Library of History*: 2.48.1, 19.94). Strabo suggests they also eat in groups of thirteen people, drink from cups and eat fruit, beef and lamb (Strabo *Geography*: *16*.4.26)

Faunal remains from *Petra*, Jabal el-Khubta and Avdat suggest a diet reliant upon sheep and goat, supplemented by chicken, partridge pig, cattle, rare hunted animals, snails, shellfish, Red Sea and freshwater fish (Studer 2007: 253-4). Camel and equids were eaten rarely. There was an increase in the consumption of pig and equid and a reduction in camel and cattle consumption over the first century AD (Studer 2007

	: 258-64). This pattern was mirrored at *Aila* (Parker 2007)
The Nabataean diet was reliant upon sheep and goat, however their diet was more diverse than what the Greek and Roman sources suggest. A significant, but small proportion of the diet included various Red Sea fish and shellfish species, including various fish products such as *garum*. The consumption of fish products has been suggested as the adoption of Hellenistic dietary practices (Lev-Tov 2003). However, Nabataean assemblages are not markedly distinct from Iron Age and contemporary Judean assemblages at Tell Hesban, Tel Anafa and Horbat Rimmon (Studer 2007: 258-64). Although Greek and Roman influence on Nabataean diet may have caused the increase consumption of pig (Studer 2007: 258-64) and fish (Lev-Tov 2003: 19) present at many sites in the Levant. The Red Sea was fished, most likely from *Aila*, in the Nabataean period to supply demand for fish products that were part indigenous and part influenced by Hellenistic and Roman fashions.	
Question 7. What were their cultural norms and laws?	
The *Nabataeans* endeavoured to retain their independence, even when a vassal state (Al-Fassi 2007: 21) and possessed few slaves (Strabo *Geography*: *16*.4.26). The kingdom was described as peaceful and without lawsuit between fellow *Nabataeans*, though on occasion with foreigners (Strabo *Geography*: *16*.4.21).	There are no known legal, literary, philosophical or religions documents that can inform us about Nabataean cultural norms or laws (Parr 2003: 37). However, at Hegra it is clear from the inscriptions in mausoleums that Nabataean laws concerning burial were observed and understood (Al-Fassi 2007: 19).
Unfortunately the almost 6000 inscriptions in Arabia, Jordan, Syria, Sinai and Egypt, Greece and Italy, the papyri and plaster and ostraka provide us with no literary, philosophical, scholarly, codes of law, religious liturgies or scriptures, no historical annals or administrative documents (Parr 2003: 37). Despite this it is clear that legal cases did take place and that the Nabataean government was well respected for keeping the kingdom peaceful.	
Question 8. What religious practices did they follow?	
The *Nabataeans* worshiping the sun, using altars on top their houses and were described as not burying their dead (Strabo *Geography*: *16*.4.26).	The *Nabataeans* worshipped many local, regional and national gods and goddesses (Graf 2004: 148-150), including the local *Edomite* god *Qaws* (Parr 2003: 33). However, *Dushara* was particularly important, being exclusive to the *Nabataeans* and worshipped widely in Nabataea and where Nabataean enclaves existed abroad (Al-Fassi 2007: 21). Burial was particularly important to the *Nabataeans*; with huge investment in the great stone cut mausoleums

	of *Petra* and Hegra.
Greek and Roman authors had a poor understanding of Nabataean religion. The *Nabataeans* followed a range of gods and invested heavily in religious and buried architecture. Animal offerings of sheep/goat, chicken, gazelle camel and horse (Studer 2007: 267) were practiced on the alters to their gods and the worship of *Dushara* was probably linked to the royal household (Al-Fassi 2007: 22; Graf 2003: 39).	
Question 9. What languages did the inhabitants of Aila use?	
The *Nabataeans* are described as speaking a form of Aramaic (Diodorus *Library of History*: 2.48.1, 19: 94).	The Nabataean script was used extensively in the heartland of the kingdom, replacing *Edomite* (Parr 2003: 35). A range of Ancient North Arabic languages and scripts were used to the east, including: Safaitic, *Hismaic* and *Thamudic*. Greek, Latin, Safaitic and Palmyrene were also used by people calling themselves Nabataean (Al-Fassi 2007: 21). Greek, Latin and Nabataean ostraka and inscription were found at *Aila*.
Nabataean was a script used to write a dialect of Aramaic a northwest Semitic language that originated in Syria and reached the Levant as the official language of the of the Neo-Babylonian and Persian empires, becoming the *lingua franca* of the region. Nabataean was distinct from contemporary Palmyrene and Jewish-Palestinian and from the earlier Edomite scripts (Negev & Gibson 2001: 45-6). The Greeks recognised the Aramaic language as distinctive of the *Nabataeans*, (Diodorus *Library of History*: 2.48.1, 19: 94), although by the first century AD, Nabataean society included Ancient North Arabic speakers, whilst Greek was also an important language in the region making the language a poor indicator of Nabataean identity (Al-Fassi 2007: 20-1).	
Conclusions of the Nabataean subjects of Aila	
There is distinctive material culture style present in the Nabataean Kingdom, represented by pottery, architecture, art, numismatics, style and dress, language, religion and economy (Al-Fassi 2007: 23). The Greco-Roman writers labelled the people of this kingdom *Nabataeans* and/or Arabs, although the inhabitants of *Aila* were also known specifically as *Laeanitae* or *Elasioi*, the descendants of Syrians and *Edomites* (Chapter 9.3). The population of the Nabataean Kingdom never called themselves Arabs and rarely felt it necessary to call themselves Nabataean, except when outside of the Nabataean territory, or after its annexation to Rome. Instead their self-identity that was recorded in inscriptions, prioritising their tribal affiliations and familial connections, not their nationality or ethnicity. This suggests that many tribal groups made up society within the Nabataean Kingdom and that Nabataean was the autonym of the ruling tribe or elite (and Royal family) and when used, represented ones	

political allegiance to this group and the state that was named after it.

The Greco-Roman characterisation of the '*Nabataeans*' is contradictory, with fourth century BC accounts emphasising their Aramaic language, nomadic lifestyle, diet and economy whilst by the end of the first century BC they emphasise their sedentary and highly Hellenised way of life. The archaeological evidence confirms that Nabataean is an Aramaic dialect script and also suggests a shift towards increasing sedentary lifestyle. However, there is no simplistic nomad to farmer shift as permanent structures have been found in *Petra* dating to the fourth to first centuries BC (Graf 2007) and nomadic pastoralists continued to be an integral part of Nabataean society in the last two centuries of Nabataean rule (Graf 1989). A taste for fish products from the Red Sea and Jordan River (Studer 1994) and the invention and production of tablewares in *Petra* and *Aila* (Dolinka 2003: 46, 79) in the first century BC, represent indigenous answers to local demand for tastes potentially influenced by Hellenistic culture (Al-Fassi 2007: 21).

In *Aila*, no traces of ethnonyms have been preserved, however ample evidence of Nabataean script and artefacts have been found. The ceramic and faunal record suggest that whilst the diet was reliant upon sheep and goat, fish were a significant supplement (Parker 2007) and produced fish sauce in the second century AD (Van Neer & Parker 2008), which agrees with studies from *Petra* and elsewhere in the Nabataean kingdom (Studer 1994). One important note of interest is the ample evidence of a fishing economy at *Aila*, otherwise not associated with the *Nabataeans*.

11.4 Roman subjects as colonists on the Red Sea.

Archaeological research on the Roman Empire has provided extensive evidence of distinctive shared styles of material culture and diet (Huskinson 2000; Hawkes 2002; Eckardt 2005; Moor Morison 2006). However, the Roman Empire encompassed numerous ethnic groups, of which Greeks, Egyptians and Romans were represented in Egypt and the Red Sea ports.

The expansive literature on Egyptian, Greek and Roman identity has provided extensive range of approaches to explain the meaning of shared material culture during this period. Such approaches often focus of the *process* of adoption of culture represented by style. This process has been called Romanisation (Freeman 1993; Keay and Terrenato 2001), Hellenisation (Hall 2002), acculturation (Okun 1989: 130; Mitchel 2000: 117; Lev-Tov 2003: 140), or more recently hybridisation (Falck 2003: 105), though the different approaches have different emphasis on what this process leads to and how linear it is. This section explains what the ethnonym Roman meant to the Romans, their subjects and their trading partners.

Question 1. How were the ethnonyms Greek, Roman or Egyptian used and was it recognised by the inhabitants of the Red Sea ports?

The Roman subjects were labelled *'lrm* by the tribes of North Arabia (Graf 1989: 374) and as *Yavanas* in the South India Tamil literature (Ray 1995: 75). The ethnonym 'lrm is recorded in *Safaitic* inscriptions left by nomadic tribes who were in conflict with the Roman military or administration. The term *Yavana* came from the old Persian *Yauna* for Ionian Greeks and it was subsequently applied to all Greeks and the Romans who succeeded them as the major power in the Mediterranean (Ray 1995: 76). By the first three centuries AD it applied to Greeks, Indo-Greeks and Roman subjects (Ray 1995: 82). These were broad labels, relating to limited contact.

Egyptians have distinguished their ethnic identity from the Asiatic, Nubians and Libyans since the New kingdom (1550-1070BC, Saleh 2007: 3). The elite distinguished Greek identity in the Archaic period (c.800-500BC), though a Pan-Hellenic identity was triggered by the Persian invasions of the fifth century BC (Hall 2002: 175). Roman identity developed over the republican period, borrowing heavily from the Greek myths (such as Virgil's *the Aeneid*). By the end of the first century BC, numerous ethnic groups were represented in Egypt (Bagnall & Frier 1994), distinguished in legal terms into Romans and Latins, Greeks and Alexandrians, Egyptians and Jews (Bowman & Rathbone 1992: 114). Greeks who had settled in India (Indo-Greeks) called themselves *Yavana* in western India at Sanchi and Karle (Boussac & Salles 1995: 80-2).

The Egyptians, Greeks and Romans had a long history of distinguishing themselves from

each other and the rest of the world prior to the annexation of Egypt in 30BC. However, Rome's neighbours in Arabia and trading partners in India did not distinguish between Roman subjects who were Egyptian, Greek or Roman. It is possible that this was because they seemed similar, or because they only had limited contact with the Roman traders and military on which to base their characterisation of these peoples.

Question 2. What is the origin or *descent* of the said population?

Egyptians had a proud three millennia history as a regional power and believed themselves to be the autochnonos inhabitants of the Nile valley, which was the centre of the ordered (Ma'at) world surrounded by a sea of chaos.

The Greeks believed in a Pan-Hellenic genealogy, or common descent (*Genos*) whose seeds started amongst the Greek elites of the Archaic period (c.800-500BC), but whose main catalyst were the Persian invasions of the fifth century BC (Hall 2002: 175-9). The mythical origin for the Romans was written into the Greek stories in the first century BC, with the Trojan prince Aeneas creating the Roman nation from the territory of the autochthonous Latins (Virgil Aeneid: 1).

Individual's familial patrilinear relationships were more commonly recorded and names were known to signify ones ethnicity.

The status associated with an Egyptian identity had diminished by the Roman period, through foreign rule by the Greek Ptolemaic monarchs and subsequently the Roman Emperors. There were cases where Egyptian origins were hidden, usually where more preferable ethnic identity was performed for legal or economic reasons relating to status. In this way an individual could use both Greek and Egyptian ethnicity at different times depending upon the context (Delia 1991: 38). Some Roman citizens were freed slaves who acquired their names and status as a citizen from their master (ibid.)

The origin of an ethnic group was often written into a legend or myth (Hall 2002). However, the reality of day-to-day transactions and legal contracts required individuals to prove their familial connection to an ethnic identity, or earn it through military service. Individuals would sometimes use different ethnic identities in different situations depending upon the benefit it conferred (Rowlandson 2004).

Question 3. In what territory do the said population live?

Many philosophical texts define Greek identity by its geographical position and colonial rule in Egypt was thought to explain what was perceived as the Ptolemy's subsequent degeneration (Livy, Isaac 2006: 41). The Eastern Desert was not seen as part of Egypt, it was described as the Arabian Red Mountains (Herodotus *Histories*: 2.30), on which coast the Ptolemaic kings built colonies along with the East African coast

Despite geographers claims, the soldiers stationed in the Eastern Desert did not see themselves as being in part of Egypt. They discussed in letters visiting Egypt, what they clearly recognise as the Nile valley (Bülow-Jacobsen 2003: 399-426). The soldiers also clearly felt ill at ease being posted in the Eastern Desert and recorded attacks in ostraka (De Romanis 2003: 118). Though the Greek, Egyptian and Roman inhabitants of

named *Trogodyticum*. The Eastern Desert was understood to be part of Egypt by Geographers by the second century AD (Ptolemy 4.7), by which time the Erythraean Sea had been extensively explored (Casson 1989b: *Periplus* 7). Also by AD 106, the Nabataean kingdom had been annexed and was now called either *Arabia Petraea* (Ptolemy 5.16) or *Provincia Arabia* (in the *Peutinger Table*).	the Eastern Desert shared their settlements and ports with members of the same ethnic groups, they clearly did not see this as their territory. In *Provincia Arabia*, many preferred to use their tribal affiliations, despite the status of Roman citizen being conferred upon them through military service or following the AD 212 *Constitutio Antoniniana* that conferred it to all free Roman subjects (Salway 1994: 135).
Territory was a major component of ethnic identity to the philosophers and geographers of Antiquity. However, this was questioned, following conquest and colonial rule by the Ptolemy's and the Romans (Laurence 1998: 95). The expansion of Roman annexed new subjects who did not see or call themselves Roman and stationed those that did (in the military) in places that were perceived as short-term stations in a threatening landscape (De Romanis 2003: 118).	
Question 4. What distinctive material culture did they use?	
The second century AD Tamil poem, the *Kauliliya Arthasastra*, described Greco-Roman merchant ships as 'the good vessels, masterpieces of the *Yavanas*' (Sidebotham 1986: 23). In Egypt vessels introduced by the Ptolemy's to the Nile were labelled *Hellenikon*, after their Greek origins (Lewis 1983: 143). This would suggest that Greco-Roman shipwrightry as being recognisable by both Egyptians and Indians. Though we do not know what the ancient North Arabians and Indians thought of the Roman red slipped pottery services made in Italy and the eastern Mediterranean, Roman sources on the subject include Pliny the Elder: 'Among the table services Samian pottery is still spoken highly of; this reputation is also retained by Arezzo in Italy…and Pergamum in Asia' (Translation of Pliny *Natural History* from Peacock 1982: 115).	Distinctive Mediterranean style ship technology has been found in large quantities at *Berenike* and *Myos Hormos* (Vermeeren 2000; Whitewright 2007) and possibly at *Aila* (Parker 2008). We do not know if this was seen as culturally distinctive. A range of pottery tableware services were used in the Red Sea ports during the first three centuries AD were limited to Roman red slipped wares (Hayes 1972: 9) said to emulating gold vessels (Vickers 1994), Egyptian blue faience wares and Nubian thin walled or barbotine wares. The barbotine wares were also made in Italy to emulated glass forms (Tomber 2006), whilst the faience wares had a glass finish and were widely found across the old Hellenistic states (Tomber 2006). Red slipped wares are widely associated with Roman culture (Perkins 2000) and is found in great quantities throughout the Roman Empire and bordering regions and India (Wheeler et. al. 1946;

	Comfort 1991).
Distinctive Roman red slipped pottery were recognised in Antiquity as distinctive of a particular region and group of people. The use of such material culture may signify ones membership to or emulation of a specific ethnic group. The Tamil literature recognised Mediterranean ship technology as specifically representative of the *Yavana's*. We do not know if the Roman subjects themselves saw this as culturally distinctive.	
Question 5. What vocations or economy sustain this population?	
The *Yavanas* were noted for their trades as rich merchants, guards, craftsmen, carpenters and shipwrights as well as their temperament as 'fierce eyed', decorated heavy drinkers (Boussac & Salles 1995: 79-82). Ancient North Arabian inscriptions mention the *l'rm* in military terms (Graf 1989: 376). From the third century AD onwards the increasing influence of the *Blemmye*s saw control of the southern part of the Eastern Desert shift from Roman control to theirs, resulting in Roman miners paying tax to their *Blemmyean* overlords (*FHN* 336).	Various vocations associated with trade are represented in the archaeological and epigraphic record of the Red Sea ports (traders, agents, captains, sailors, shipwrights, guards, wine traders, couriers). These people were Greeks, Romans, Egyptians and Imperial freedmen (Thomas forthcoming), representing both private and state involvement in the trade (Bagnall 1986; Bagnall, Helms et. al. 2000; Bagnall, Helms et. al. 2005) men and women (Meredith 1956). The Eastern Desert was also populated by miners (Meyer 1995; Maxfield and Peacock 1996; Peacock and Maxfield 1997), customs officials (Bagnall, Helms et. al. 2000), tax farmers (Thomas forthcoming), soldiers and officers (Sidebotham and Zitterkopf 1995; Sidebotham 2002).
A mixture of state and private run operations required numerous different people with different skills from many different vocations to facilitate the full exploitation of the Eastern Desert and Red Sea coast. Roman subjects continued to operate in the area for mining, quarrying and trade after military control of the region shifted to the *Blemmyean* kingdom (Olympiodorus 1.37, *FHN* 309).	
Question 6. On what diet do they rely and how is it prepared?	
We know from Roman accounts of their love of wine, pork and fish preserved in the literature of the Greco-Roman elite and economic texts on military *annona* provisions (Apicius and Columella see Lev-Tov 2003: 2). The Tamil literature from South India states that the *Yavana* traders were heavy drinkers (Boussac & Salles 1995: 79). The	Some contexts at the Red Sea ports provided significant levels of imported foodstuffs from the Nile. These included pig, chickens, cattle, donkey, horse, Nile fish as well as a good mixture of locally available Red Sea fish, shellfish, sheep and goats. A large proportion of wine stoppers were also found in these contexts (Thomas forthcoming). Red Sea fish

difference in diet between pagans and Jews in Roman Palestine is confirmed by Peter's account of a vision in Jaffa (Acts 11: 5-9). To many Egyptians pork and fish were taboo meats, distinguishing them from the Greeks (Herodotus: 2.47; the eighth century BC Piankhy Stele JE 48862, 47086, 47089, *FHN*1, Saleh 2007: 7). We also know it was fashionable to serve this food in red slipped services produced at Arezzo in Italy, Samos and Pergamum in the eastern Mediterranean (Pliny *NH*, Peacock 1982: 115).	preserved dried or as sauce, were produced at *Aila* (Van Neer and Parker 2008) and *Myos Hormos* (Van Neer, Lernau et. al. 2004; Van Neer, Hamilton-Dyer et. al. 2006) and imported by Eastern Desert forts (Leguilloux 2003) as well as Nabataean settlements. In *Myos Hormos* and *Berenike*, the Nile diet was served and consumed out of a range of Roman and Egyptian tableware services that included beaker, cup, bowl, dish, platter and closed forms (Thomas 2007). The contexts within which this consumption pattern was recognised were associated with ship maintenance, warehouses or the military and ostraka written in Greek and Latin (ibid.).
Food was recognised as distinctive indicator of Greco-Roman identity in Antiquity that also distinguished Greeks and Romans from Egyptians. A Greco-Roman diet was well represented in the Eastern Desert forts and also in some, but not all, contexts at *Berenike* and *Myos Hormos* from the late first century BC to second or third centuries AD. At the Red Sea ports, evidence for a Greco-Roman diet were commonly associated with evidence for long distance trade, ship maintenance and the military (Thomas 2007).	
Question 7. What were their cultural norms and laws?	
Ethnicity was entrenched in the Roman legal systems present in Egypt during Roman rule. The mid second century AD copy of the *Gnomon of the Idios Logos* defined ones status within the legal system, determined by ethnic labels such as: Roman, Latin, Greek, Alexandrian and Egyptian. The term *Aigyptioi* (Egyptian) implied 'administrative, fiscal and cultural inferiority…(and) aimed to demarcate a privileged urban-based 'Hellenic' elite through which they (Rome) could rule and exploit the native population (the *Aigyptioi*)' (Bowman & Rathbone 1992: 114). There were no Greco-Egyptians (Goudriaan 1992: 89) in Roman law. Romans and Latins were banned from acquiring	The structure and composition of names on ostraka, papyri, inscriptions and seals betray individuals' ethnic affiliation and status. Greeks and Egyptians listed the individual name followed by their fathers, whilst Roman citizen names were constructed in three parts, the *tria nomina*. Wine traders commonly held Greek names, were Imperial freedmen or rarely Egyptians who adopted Greek names and used Greek script (Thomas forthcoming), whilst those trading in bulk goods often held Egyptian names (Fuks 1951). The *Aigyptoi* wine trader *Satyros* son of *Anubionos*, took a Greek name, possibly because of the social and political advantages it conferred. Indeed the petitions of Hellenised Egyptians survive who wished to change their parents Egyptian

Egyptian land, but had important roles in the military, administration or trade often as direct agents of the Emperor (Bowman and Rathbone 1992: 111).	names for Greek equivalents (Delia 1991: 38).
Both Greek and Egyptian law existed in Egypt during the Roman occupation and both courts would be used by an individual who could claim membership to either ethnic group depending upon what was most beneficial to them. This was particularly visible for women, who found that depending upon the case, certain courts were more beneficial (or at least less detrimental) for women (Rowlandson 2004). The *Gnomon of the Idios Logos* privileged specific ethnic groups in the law of the land, entrenching ethnic identity in the hierarchy of Egypt. This limited the opportunities available to certain people in Egypt and potentially influenced what roles they may take in the Red Sea ports.	
Question 8. What religious practices did they follow?	
It is clear that during the second century AD traditional Roman religion and the Imperial cult had declined in popularity with the rise of oriental mysticism and Christianity in the first century AD onwards (Carcopino 1941: 144-53). In Egypt a variety of religions existed following the process of amalgamation of Egyptian deities with introduced Greek and Roman deities over the Ptolemaic and Roman periods (Roberts 1995; Hart 1986: 185).	Religion at the Red Sea ports is represented in by the temple of *Serapis* and an Imperial cult shrine at *Berenike* (Sidebotham and Wendrich 2007) and a putative church at *Aila* (Thomas, Niemi et. al. 2007). Household religious practices are also represented in the form of numerous ceramic figurines of Greco-Egyptian gods and goddesses (unpublished Quseir al-Qadim archive) and the practice of Mummifying cats, found within structures in *Myos Hormos* (Whitcomb and Johnson 1982; Whitcomb 1996). The *Yavanas* (Indo-Greeks) who had settled in western India at Sanchi and Karle had adopted Buddhism (Boussac & Salles 1995: 80-2).
Berenike possessed an Egyptian temple dedicated to *Serapis* and *Isis* (Meredith 1957: 60-70) as well as a shrine dedicated to the Imperial cult of *Caracalla* and *Julia Domna*, the Palmyrene god *Hierobol/Yarhibol* along with *Isis, Harpocrates* and other Hellenistis deities (Sidebotham and Wendrich 2000: 52-73; Sidebotham and Wendrich 2007: 370), though household worship in the form of god and goddess figurines was also represented. Christianity introduced at the end of the third century AD to *Aila* and in the fourth century in *Berenike*.	
Question 9. What languages did the Greco-Roman inhabitants of the Red Sea ports use?	
The Greek language, or *Hellas Glossa*, was seen as a particularly important indicator of	A mixture of Greek, Latin and Demotic ostraka, papyri and inscriptions have been

Greek identity in the classical Greek literature, where bilingualism was seen as a dangerous transgression of ethnic boundaries rewarded with unpleasant fates (Herodotus: 332-3). The reality of colonial rule blurred linguistic and geographic boundaries, though language remained an important indicator of ethnicity, but also due to the long history of Hellenistic influence in the eastern Mediterranean and the Red Sea meant that the language carried a certain amount of status (Hall 2002: 225). So following Roman annexation, Latin was never a commonly used language in the region. Also Demotic cursive script of the vernacular Egyptian language was used rarely in this site, even by Egyptians (Bagnall, Helms et. al. 2000; Bagnall, Helms et. al. 2005). It is then unsurprising that the author of the *Periplus* wrote the account in Greek (Casson 1989)	found at *Berenike* and *Myos Hormos* (Greek and Latin were found at *Aila*, Parker 1994). Greek was clearly the *lingua franca* in the northern Red Sea region and was used by traders for labelling products as depinto and on seals (Thomas forthcoming-c). It was also the administrative language, commonly used by all applying or giving permits. The languages of other Roman subjects, such as Palmyrene and Hebrew were also found at *Berenike*, though were limited to single cases (Bagnall 2005). The use of these languages did not determine ones ethnicity, as other ethnonyms, such as *Trogodyte* and *Ichthyophagi* were present in Greek documents (Van Rengen 2002: 54), although there did appear to be an attempt to emphasise or adopt a Greek identity for the economic and legal benefits that this entailed (Delia 1991: 38).
There were many occurrences of bilingualism in Egypt as this was beneficial to individuals who wished to project both Greek and Egyptian identities at different times (Delia 1991: 38). This said Greek was by far the most common language used in the ports, suggesting that the Greek language was the *Lingua Franca* of the Erythraean Sea trade.	
Conclusions on the Greco-Roman inhabitants of the Red Sea ports?	
Roman subjects were highly visible colonists at the Red Sea ports, with their distinctive pottery, architecture, art, numismatics, style and dress, language, religion and economy. They were collectively labelled *Yavanas* in the Indian Tamil literature and the *'lrm* in the ancient North Arabian graffiti left by the nomadic tribes of the Nabataean kingdom annexed by Rome. The Roman subjects distinguished each other as: Alexandrians, Greeks, Romans, Latins, Egyptians and Jews, as these ethnic labels also carried legal status. The lack of distinction between Greeks, Romans and Egyptians in the ancient North Arabian and Tamil texts relates to the limited contact between these populations through trade and military operations and suggests that such distinctions were not significant in these circumstances. The Greco-Roman population were characterised as aggressive, violent and militaristic, drinking heavily, eating pork, being skilled carpenters, shipwrights and merchants. These are confirmed by the ample evidence for military activity in the region and the general uneasiness amongst the soldiers concerning their relationship with local nomadic populations (De Romanis 2003). Wine consumption is well represented with the large number of wine	

stoppers (Thomas and Tomber 2006; Thomas forthcoming) as are their pork and fish product consumption (Van Neer and Ervynck 1999; Hamilton-Dyer 2003; Leguilloux 2003; Van Neer, Lernau et. al. 2004; Van Neer, Hamilton-Dyer et. al. 2006; Van Neer and Parker 2008). The activity of shipwrights constructing Mediterranean ships is well represented archaeologically and epigraphically at *Berenike* (Bagnall, Helms et. al. 2005; Sidebotham 2007) and *Myos Hormos* (Whitewright 2007; Whitewright, Blue et. al. forthcoming). Merchants were regularly importing goods to the Red Sea ports for further trade (Fuks 1951; Bagnall, Helms et. al. 2000) and warehouses in the *Berenike* and *Myos Hormos* are generally associated with evidence for ship maintenance and Mediterranean diets and Roman tablewares (Thomas 2007).

Roman subjects had a significant presence in both *Berenike* and *Myos Hormos* in the first century BC through to the second or third century AD. At *Aila* the picture is less clear, though Roman style pottery, Greek and Latin language and coinage becomes more common after annexation in the second century AD.

11.5 Conclusions

This thesis has discussed the theoretical basis for an approach to the construction of identity in Antiquity that is flexible enough to allow for differences in the perception of ethnicity (*theory of ethnicity*) to be understood. Through accepting both the *etic* and *emic* dimensions of identity, the relative nature of ethnic characterisation can be more comprehensively understood. *Emic* accounts, meaningful to ones self-ascription to an *autonym* (ethnonym assigned by self) or *etic* accounts meaningful to an observer's characterisation of an *exonym* (ethnonym assigned by observer) will appear quite different. Self-identity is relative in nature, reliant upon tothers being different. For this reason it is the product of different perspectives. To fully understand the relative nature of ethnic identity a methodology is required that allows for different theories of ethnicity to be understood. An approach using *discrepant experience* is used to understand these multiple perspectives. This *discrepant experience* approach can be used to explain the nature of the difference between relative perceptions of identity, to understand the power relationships that defined the interaction between different groups of people. This thesis has identified where possible the different criteria used in the characterisation of people and shows that *theories of ethnicity* were not static, but changing within their social context. This does not fit the structure commonly used in anthropology and borrowed by archaeology (Astuti 1995). In fact, it would appear that we either have to decide upon whether ethnicity is not common to all human experience (contra Barth 1969), or that it does not always take the form in which we expect.

The archaeological methodology has three main components, applied to understand how material culture can be used to construct identity. Firstly, the distribution of different maritime artefacts, as they are representative of maritime activities, has been applied to understand the importance of these specialist activities in the construction of identity. Secondly, how the consumption of fauna and ceramics is used in the construction of identities is explored through explaining what and how people are eating. Finally, the relationship between the role of maritime activities and consumption practices is explained through contextualising the archaeological deposits with which they are associated. This includes the explanation of the structures and features with which they are associated, epigraphic evidence and supporting material culture. This approach is crucial because 'a static one-to-one correlation between particular monuments or items of material culture and a particular ethnic group is untenable, because the significance of such material culture is continuously reproduced and transformed in changing social and historical contexts by different people occupying varying positions within society' (Jones 1997: 140). But this approach has recognised the changing significance of material culture in the construction of identity through understanding what activities they represented and then in turn how these activities were important for displaying membership to a group.

The approach applied to *Myos Hormos*, *Aila* and *Berenike*, provided clear evidence of the concentration of fishing, hull maintenance and rigging and sail making activities in different areas of the site. The detail provided has greatly increased our knowledge of fishing techniques in the

Red Sea specifically, but also add important new information for those studying fishing in the Mediterranean also, where nets, lines and floats are rarely preserved (Thomas in press). The detail provided by studying all elements of maritime activity, from the construction and maintenance of ships to the subsequent reuse of discarded ships timbers or hull sheathing for floats, weights and building, provides a rich and rewarding mine of information on how port communities interacted. These maritime activities would appear to be significant in the construction of identity as they correlated with one of two consumption patterns. One consumption pattern suggested a Greco-Roman diet utilising a full range of Greco-Egyptian and Roman tableware services and a significant consumption of wine and oil associated with the substantial two storey buildings of the central area and in the redeposited refuse from the harbour construction. Another consumption pattern suggested a more indigenous diet with limited use of wine and oil. Whilst this second consumption pattern used Greco-Egyptian and Roman style tablewares, only bowl and dish forms were used widely, often alongside shell bowls, dishes and scoops. The correlation between Greco-Roman consumption patterns and ship maintenance in the port of *Myos Hormos*, suggests that identity played an important role in the role individuals played in the Erythraean Sea trade. It is clear that the shipping activities were undertaken by people who had a higher status diet of pig, chicken, cattle and fish pickles or sauce imported from the Nile. Similarly the association of indigenous fishing technology with Red Sea diet, shell scoops and bowls highlights a significant difference in the diet, tableware and vocations of different groups within Myos Hormos. One cannot assume that differences in consumption patterns are solely explained by status differentiation as this ignores the supporting evidence of tableware use and epigraphic evidence for ethnonyms, such as the *Ichthyophagi* associated with second century deposits in the western ridge area of *Myos Hormos* (Chapter 5). At *Berenike* in the third century AD onwards a desert fauna based diet became prevalent, with its own specific tablewares known as Eastern Desert ware (Barnard 1002: 53). This diet and material culture associated with the nomadic Eastern Desert dwellers (two tribes of which were known as *Trogodytes* and *Blemmyes*) was associated with a significant drop in maritime activity in *Berenike* at this time (Chapter 6). At *Aila* there appears to be some adoption of Roman tablewares, but the diet remained distinctly Nabataean, like many other Nabataean settlements, heavily reliant upon sheep and goat, but with an increasing interest in fish products (Chapter 7). The three ports have been settled by a variety of distinctly different groups and broad demographic trends can be traced. *Berenike* and *Myos Hormos* were populated by indigenous fishermen, known as *Ichthyophagi*, but also large numbers of Greco-Roman merchants, crews and shipwrights over the first two centuries AD. By the third century *Myos Hormos* was abandoned, but *Berenike* was occupied by Eastern Desert dwellers, with limited interest in maritime activities. *Aila* rose to prominence after the end of the third century AD and into the late Roman period, drawing migrants from outside *Aila's* immediate hinterland (Chapter 9).

Status was to a degree determined by the ethnonym that one used, as recorded in the *Gnomon of the Idios Logos* (Bowman & Rathbone 1992: 110). To understand how this ethnic hierarchy worked at the poly-ethnic social systems present at the Red Sea ports, we have to understand how different groups were characterised as higher or lower in status. Greco-Roman

authors perceived Greco-Roman culture to far surpass that of all indigenous cultures of the Red Sea region (Chapter 5). The characterisation of the *Ichthyophagi* and *Trogodyte*s was thus derogatory because of this bias and the dubious and out of date Ptolemaic colonial sources on which they were based. This subsequently influenced the ethnic hierarchies experienced by those in the ports. The Roman literature and the ostraka of the Eastern Desert illustrate the derogatory manner in which the exonyms *Ichthyophagi*, *Trogodyte* and *Barbaroi* were applied (Chapter 9). Despite this they were indeed used by the coastal and nomadic populations of the Red Sea and Eastern Desert (as illustrated by *Pakubis Ichthyophagos* in *O.Myos* 512). However, the discrepancy between Greco-Roman characterisations of and the archaeological evidence for the so-called *Ichthyophagi* is significant in its self. The characterisation of the *Ichthyophagi* betrays an inequality in the power relations between these groups. The characterisation of the *Ichthyophagi* by Agatharchides, later adopted in the Roman period by Strabo, is derogatory. It is also false, with contemporaneous archaeological evidence providing a different picture. It does however have a purpose. The *Ichthyophagi* are marginalised, though incorporated into the ethnic hierarchy of the Red Sea port of *Myos Hormos* through their use as fishermen. They are characterised as fishermen and that appears to be their trade in *Myos Hormos*. This is unlike the nomadic Eastern Desert dwellers, labelled *Barbaroi* who lived outside this system, constantly monitored by the Roman military (Cuvigny 2003b). These nomads were marginalised in the first two centuries AD, but appear to have had a significant presence in Berenike from the third century AD (Chapter 6).

This research has revealed archaeological evidence of different groups operating within the Red Sea ports that can be distinguished between one another by their diet and consumption practices. This study has revealed the potential for further study and also highlighted the types of information that need to be recorded to make such analysis possible. The consumption practices method developed here has been applied to other classes of pottery, such as cooking and storage wares in Sudan with great effect (Thomas 2009). In some cases these can be positively identified with known ethnic groups because of associated epigraphy, in other cases there is strong contextual information that this material represents an ethnic or tribal group. However, the approach used here cannot account for individuals or small groups that have left little archaeological evidence of their presence, as traces of them are drowned out by larger groups. Instead this study has concentrated on the main demographic groups of the Red Sea ports. The rare or circumstantial evidence for other ethnic groups from India, South Arabia, East Africa, the Jews and *Palmyrenes* that have been described in full elsewhere (Sidebotham 2004).

This study has attempted to provide an honest picture of how ethnic groups lived, were treated by others and were in turn portrayed in documents. The results of this study do not paint a pretty picture of mankind, the different roles and opportunities available to certain ethnic groups were limited, people were characterised in a derogatory manner, brutalised and controlled. This is certainly not the 'archaeology of equality' that some seek to read into the past (Osborne 2007), but then neither is it explained by a simplistic Roman-*Barbaria*n subject polarisation that is so often (often fairly) criticised of post-colonial approaches. Whilst racism is deplorable in all its forms, this must not prevent research from recognising that distinction between groups took this form (Isaac

2006) if we are to understand fully how group identities were distinguished in Antiquity. This form of characterisation was the norm within the port communities of the Red Sea. Finally, the use of ethnicity was fluid at the Red Sea ports. Individuals used numerous ethnonyms depending upon what the circumstances were. This flexible use of ethnic labels conferred economic, legal and political benefits. This was possible because the process of distinguishing ethnic identity enshrined in Roman law was easily manipulated.

11 Glossary

Term		Meaning
Autonym		Ethnonym used by ones self, based on an emic account.
Barbaroi		Greek term applied to all indigenous Eastern Desert nomads.
Blemmyes		Members of the tribe or kingdom of the same name.
Diaita		Greek term for way of life, that includes material culture, subsistence and livelihood.
Discrepant experience		Edward Said's approach to discrepancies between texts and how this is explained by power relations.
Emic		An account of one's self.
Ethea		Greek term for cultural personality or character.
Ethne		Greek term that denotes a distinctive group or population, that may constitute what we understand to be an ethnic group.
Ethnonym		An ethnic label.
Ethnotheory		A groups particular theory of what constitutes ethnicity (Astuti 1995).
Etic		An account of another person.
Exonym		An ethnic label created by people not members of the said group.
Genos		Greek term that represents lineage, decent or birth.
Glossa		Greek term for language.
Ichthyophagi		Greek term for the indigenous coastal population of the Red Sea and Indian ocean, translates as 'fish-eaters'.
Indicators of ethnicity		Criteria used by a population to distinguish ethnic groups from one another.
Nabataea		Modern term for the territory of the Nabataean Kingdom.
Nabataean (people)		Subjects of the Nabataean kingdom
Nabataean (script)		Modern name for the Aramaic dialect script most commonly used in Nabataea.
Nomoi		Greek term for culturally regulated norms or laws.
Paideia		Greek term for education.
Paideusis		Greek term for culture.
Palmyrans		Inhabitants of the near eastern City state of Palmyra.
Palmyrene		Aramaic script commonly used in the region around Palmyra.
Physis		Greek term for environment.
Rhetoric of otherness		Method of measuring difference using literary devises such as inversion, comparison, analogy and marvels (Hartog 1988: 344).
Ta theia or Nomizein		Greek term for religion.
Tamil		South Indian language, whose literature record the arrival of Greco-Roman merchants in the early centuries AD.
Thamudic		Modern terminology for ancient north Arabic script of northeastern Arabia and Jordan, named after the Thamud, a tribe of that region. This is often used uncritically as an ethnonym for those who spoke it.
Trogodyte		Greek term for the indigenous nomadic inhabitants of Eastern Africa, including the Eastern Desert.
Yavanas		Exonym used in the Tamil and Sanskrit literature of the early centuries BC and AD to describe Greeks, Indo-Greeks and Roman subjects.

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14 Appendices

Trench/ location	Deposit	Period
7A Harbour	Secondary deposition of domestic refuse used in construction of amphora surface (Blue & Peacock 2006).	Augustan (late first-century BC to early first AD)
7	Domestic occupation (Blue & Peacock 2006).	Augustan (late first-century BC to early first AD)
Trench 6B (including 6A and C)	Domestic refuse from nearby structures (Van Rengen & Thomas 2006).	Augustan (early first-century AD)
Villa	Domestic occupation of building (Whitcomb & Johnson 1979; Whitcomb & Johnson 1982).	first to second-centuries AD
'central building A' (Trench 17) occupation	Domestic occupation of building (Whitcomb & Johnson 1979; Whitcomb & Johnson 1982; Masser 2006).	first to second-centuries AD
Trench 6D (including 6E and L)	Domestic refuse from nearby structures (Van Rengen & Thomas 2006).	Late first to early second-century AD
'central building A' (Trench 17) sebakh (refuse dump)	Domestic refuse from nearby structures (Whitcomb & Johnson 1979; Whitcomb & Johnson 1982; Masser 2006).	Antonine (late first to second-centuries AD)
'central building B' (Trench 2B) sebakh (refuse dump)	Domestic refuse from nearby structures (Whitcomb & Johnson 1982; Copeland 2006).	Antonine (late first to second-centuries AD)
Trench 6G (including 6H and J)	Domestic refuse from nearby structures, including from Trench 8 (Van Rengen & Thomas 2006).	Antonine (second-century AD)
Trench 8	Domestic occupation of two groups of buildings, last phase of Trench 8 (Thomas & Masser 2006).	Severan (late second to third-century AD)

Table 14.1 Myos Hormos deposits used for comparative analysis of ceramic, fauna and maritime artefacts.

Myos Hormos	Small find #	Fishing	Hull	Rig	Total	% of SF #
Central area						
Trench E6-F10, G8	?	3	2	13	18	
Trench 17	42	0	2	23	25	59.5%
Trench 2B	739	1	0	46	47	6.4%
Trench 2C-D	299	0	0	6	6	2.0%
Harbour						
Trench 7	104	6	1	2	9	8.7%
Trench 7A	266	19	38	2	59	22.2%
Trench 12	202	10	22	0	32	15.8%
Trench 15	19	1	2	0	3	15.8%
Southern area						
Trench S12 Q2 P8	?	1	5	1	7	
Trench 9	37	1	1	0	2	5.4%
Trench 10	132	4	48	0	52	39.4%
Trench 14	19	0	5	0	5	26.3%
Trench 16	59	0	1	0	1	1.7%
Western ridge						
Trench J5	?	1	0	0	1	
Trench 5	352	0	0	4	4	1.1%

Trench 8	210	13	12	17	42	20.0%
Trench 6GHJ	1101	33	15	42	90	8.2%
Trench 6Q	179	8	3	14	25	14.0%
Trench 8A	421	0	0	0	0	0.0%
Northern area						
Trench C4	?	3	1	5	9	
Trench 6ABC	231	9	1	13	23	10.0%
Trench 6DELK	299	14	4	25	43	14.4%
Trench 6PNX	286	17	11	49	77	26.9%

Table 14.2 Distribution of maritime artefacts at Myos Hormos.

Trench/location	Deposit	Period
Western settlement Trenches 35,36,40,45	Industrial area	Ptolemaic to early Roman
Central town Trench 1	Domestic occupation Domestic occupation	First-century AD Third-century AD
Central town Trench 10	Domestic occupation Temple	First-century AD Early second to Late third-centuries AD.
Central town Trenches 6 and 16	Defensive (?) ditch. Palmyran shrine Pagan shrine	First-century AD Second-century AD Third-century AD
Northern dump Trenches 3,13,19,24, 25,29,31,33, 48	Dump Dump	Ptolemaic to Augustan. First-century AD.
Eastern shore Trenches 8,12,22,30,39	Quay and pottery dumps Further pottery dumps	Augustan First-century AD
South eastern shore Trench 2	Seawall Structure Domestic dumps	First-century AD Second-century AD Third-century AD
South eastern shore Trench 5	Seawall Ship maintenance	First-century AD Second to third-century AD.
North eastern shore Trenches 4,7 and 17	Quay and pottery dumps Warehouse structure Warehouse structure Abandonment	Augustan First-century AD Second-century AD Third-century AD

Table 14.3. Berenike deposits used for comparative analysis of ceramic, fauna and maritime artefacts.

Berenike	Small finds	Fishing	Hull	Rig	Other	Total	% SF
Western settlement	1760	2	92	2	0	96	5.5%
Trench 11	468	0	4	2	0	6	1.3%
Trench 36	471	0	84	0	0	84	17.8%
Trench 40	821	2	4	0	0	6	0.7%
Town centre	14469	31	132	12	0	175	1.2%
Trench 1	2256	14	6	0	0	20	0.9%
Trench 10	4630	9	85	3	0	97	2.1%
Trenches 6,16	2019	6	29	0	0	35	1.7%
Northern dump	4015	100	51	108	1	260	6.5%
Trench 3	275	10	1	0	0	11	4.0%
Trench 13	44	27	3	5	0	35	79.5%
Trench 24	60	1	0	0	0	1	1.7%
Trench 19	654	2	4	29	0	35	5.4%

Trench 29	418	6	1	14	0	21	5.0%
Trench 31	574	16	1	20	1	38	6.6%
Trench 33	1022	26	38	11	0	75	7.3%
Trench 48	968	12	3	29	0	44	4.5%
Trenches 8,12	2276	6	1	3	1	11	0.5%
North-eastern shore	1809	21	3	0	0	24	1.3%
Trench 4	434	10	0	0	0	10	2.3%
Trench 7	899	4	1	0	0	5	0.6%
Trench 17	476	7	2	0	0	9	1.9%
South-eastern shore	1861	8	22	0	0	30	1.6%
Trench 2	584	1	0	0	0	1	0.2%
Trench 5	1277	7	22	0	0	29	2.3%

Table 14.4. Distribution of maritime artefacts at Berenike.

Trench and century	Diet.	Variety species	Sandy	Reef	Pelagic	Turtles & Mammals
11.0	Red Sea 92%	20	3%	93%	2%	3%
13.0	Red Sea 89%	15	22%	76%	2%	2%
13.1	Red Sea 94%	22	20%	76%	3%	1%
13.1b	Red Sea 81%	33	18%	75%	7%	0*%
2.2	Mixed	25	4%	91%	5%	0*%
2.1	Mixed	26	4%	91%	5%	0%
1.3	Nile 38%	19	9%	86%	5%	1%
4.1	Nile 33%	30	8%	81%	10%	1%
7.2	Nile 36%	30	6%	87%	6%	1%
1.1	Nile 43%	8	6%	75%	6%	12%
4.2	Nile 64%	15	6%	81%	13%	0%
5.3	Desert 50%	32	8%	82%	9%	2%
2.3	Desert 64%	5	0%	77%	24%	0%
6.3	Desert 84%	16	7%	86%	4%	3%
16.3	Desert 93%	7	9%	65%	9%	16%
All Ptolemaic	Red Sea	15-20	8%	88%	2%	2%
All first AD	Red Sea & Nile	8-33	15%	78%	6%	1%
All second AD	Nile? & Nile	15-30	5%	88%	6%	0*%
All third AD	Nile & Desert	5-32	8%	82%	8%	2%

Table 14.5. Fishing techniques and taste at Berenike. Displaying the number of marine species consumed at each trench, the environment fished. Based on appendice 14.5.

Trench and phase	Diet. % reliance on fauna group.	Pig	Transport	Hunted
11.0	Red Sea 92%	0.0%	0.2%	0.2%
13.0	Red Sea 89%	0.0%	0.0%	0.0%
13.1	Red Sea 94%	0.5%	0.1%	0.3%
13.1b	Red Sea 81%	0.5%	0.9%	0.3%
2.2	Mixed	1.4%	1.7%	0.7%
2.1	Mixed	3.6%	13.9%	0.6%
1.3	Nile 38%	0.9%	0.0%	0.3%
4.1	Nile 33%	5.4%	5.0%	0.5%
7.2	Nile 36%	14.5%	0.7%	0.1%
1.1	Nile 43%	3.6%	3.6%	0.0%
4.2	Nile 64%	20.4%	7.4%	1.2%
5.3	Desert 50%	0.2%	0.0%	0.0%
2.3	Desert 64%	0.0%	0.0%	0.0%
6.3	Desert 84%	0.3%	0.5%	0.5%
16.3	Desert 93%	0.4%	0.5%	2.2%

Table 14.6. Taboos and delicacies at Berenike. Specific species or groups as % of all fauna. Based on appendice 14.5.

Phase	Period	Reign	Areas effected
Nabataean I	Late first BC	Obodas III 30-9BC	M,O,B
Abandonment I	Early first AD	Aretas IV 9BC-AD40	M, O, but only parts of B
Nabataean II	First century AD	Aretas IV, Malichus II and Rabbel II	M,O,B
Abandonment II	Early second AD	Tiberius 106-	M,O,B, J
Roman I	Second century AD	Antonine Dynasty	M
Roman II	Early Third to Mid Third AD	Severan Dynasty, Anarchy	M
Roman III	Mid to Late Third Century AD	Anarchy – Tetrachy	M, J
Early Byzantine	Fourth century AD	Constantine (324AD+)	

Table 14.7 Phases of occupation at Aila, modified from (Dolinka 2003: 29-32).

Trench	Structures	Period	Activities
B1-6	Structures	L first BC–E2AD	Domestic
	Structures, ovens and mill	M/L2AD-4AD	Domestic. Baking. Garum production?
O1-9	Limited occupation	LfirstBC-1AD	Domestic/ encamPeriplus Maris Erythraeint?
	Structures	1AD-E2AD	Domestic
O4	Dump with Kiln wasters	LfirstBC-thirdAD	Kiln nearby
O2,6-9	Structures, ovens.	Msecond-EthirdAD	Domestic
M1-9	Occupation surfaces	LfirstBC-M1AD	EncamPeriplusnt?
M1-9	Structures, ovens, burnt pits, horned altar. Kiln wasters	M1-E2AD	Domestic, fishing. Household cult rituals Kiln nearby
	Structures, Drainage channel. Pithoi, baby burial.	2AD	Domestic, fishing.
	Poor structures, ovens, Industrial structure. Pithos with fish remains,	3AD	Domestic, fishing. Metal working? Garum production?
N1	Stone dam	Nabataean	Clay mine
A8	Occupation debris	Nabataean	Open area
	Structures, oven.	second-thirdAD	Domestic
A9	Structures, pithos	LthirdAD	Domestic
J East	Monumental structure	1AD-E2AD	Administartive/ritual?
	Monumental structure	L3AD	"Church"
K10,11, 14	Fine structures	Late Nabataean	Domestic
	Water trough, channel	E2AD	Pottery production?
	"2-3AD strata"	2-3AD	Unknown

Table 14.8 Trench phases and activities represented in the archaeological record.

Aila	Small find #	Fishing	Fishing?	Hull	Hull?	Total	% of SF #
Area L 4AD+	366	0	7	0	2	0-9	0-2.4%
Area K 4AD+	1311	0	10	1	2	1-12	0.1-0.9%
Area J 4AD+	1622	2	14	3	7	5-25	0.3-1.5%
Area M BC-3AD	838	7	16	10	5	17-36	2-4.1%
Area A 4AD+	672	3	5	1	5	4-14	0.6-2%
Area B BC-3AD	281	5	13	4	16	9-38	2.8-11.9%
Area O BC-3AD	119	0	1	0	3	0-3	0-2.5%

Table 14.9 Maritime artefacts from Aila. 1994-2000 seasons data archive. Due to poor preservation divided into definite and likely maritime artefacts.

Ware	Form	Function	Occurrence
Aila ware1	B3	Flat bottomed dish	1AD (1AD-M2AD)
Aila ware 1b	B2a	Carinated dish	1AD (1BC-E2AD)
Aila ware 1b	B2b	Carinated dish	1AD (1BC-E2AD)
Aila ware 2	B2	Carinated dish	1BC-L1AD
Aila ware 2	B1	Hemispherical bowl	M-L1AD (1AD)
Aila ware 1b	JG1	Jug*	E2AD
Nabataean fine ware	P1	Mini bowl*	M1-E2AD
Nabataean fine ware	P2a	Rouletted, carinated bowl	M1-E2AD
Nabataean fine ware	P2b	Rouletted, carinated bowl	M1-E2AD
Nabataean fine ware	P3	Jug*	E1-E2AD
Nabataean painted fine ware	P4a	Carrinated dish	L1AD
Nabataean painted fine ware	P4b	Carrinated dish	E2AD
Nabataean painted fine ware	P5	Handled cup*	E2AD
Eastern sigillata A	Hayes105	Jug*	E1BC
Eastern sigillata A	Hayes 56	Large dish*	L1-M2AD
Eastern sigillata A	Hayes 29	Dish*	L1BC-M1AD
Eastern sigillata A	Hayes 19a	Hemispherical bowl*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 34	Platter*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 54	Ring based dish*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 58	Ring based dish*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 61	Handled cup*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 104b	Jug*	(L1BC-E/M1AD)
Eastern sigillata A	Hayes 113	Jug*	(L1BC-E/M1AD)
Cypriot sigillata	Hayes P40	Crater *	E2AD
African red slip	Hayes 32	Platter1	E-M 3AD
African red slip	Hayes 44B	Hemispherical bowl	3AD
African red slip	Hayes 50A	Flat bottomed dish	M3-E4AD
African red slip	Hayes 58	Platter1	L3-4AD
African red slip	Hayes 57/8	Platter1	L3-4AD
Aswan plain ware		Plate	3AD

Table 14.10 Tablewares found at Aila. Note * denotes form described as rare by Dolinker (Dolinka 2003). 1 denotes a form reclassified as a platter based upon criteria set out in the methodology (Darling 1994).

Species	Environment	Fishing method	Hesban BC	Hesban Nabataean	Hesban Roman
Tuna	Open water	Trolling line	372	4	79
Parrot fish	Reef	Trawl and cast nets and various traps	0	1	1
Clupeiformes	Open water	Fine meshed casting net	0	0	0

Emperors	Open water, Reef	Line and basket trap	0	0	0
Groupers	Reef	Line and basket trap	0	0	0
Seabreams	Open water, Sandy bottom	Traps, trawl nets and lines	0	0	0
Wrasses	Reef	Line and trawl net	0	0	0
Grunts	Reef	Line, trawl net and basket traps	0	0	0
Rabbitfish	Reef	Shore nets, traps	0	0	0
snappers	Reef	Line, trawl trap	0	0	0
Baracuda	Reef	Line, trawl, cast and trap	0	0	0
Mullet	Sandy bottom	Sein, cast and trap	0	0	0
Trevallies	Reef	Line, net and trap	0	0	0
Scorpionfish	Reef	?	0	0	0

Species	Petra Nabataean	Petra Third AD	Tamara Third AD	Lejjun Late third AD3	Da'janiya Late third AD3	Boqeq Fourth AD	St Aaron Byzantine
Tuna	34	29	17	0	0	0	0
Parrot fish	4	62	189	3	9	150	1873
Clupeiformes	0	1	0	0	0	0	0
Emperors	28	60	7	0	0	4	0
Groupers	13	132	16	0	0	24	358
Seabreams	2	7	0	0	0	0	0
Wrasses	0	1	1	0	0	0	0
Grunts	1	0	0	0	0	0	0
Rabbitfish	0	5	0	0	0	0	0
snappers	3	0	0	0	0	0	0
Baracuda	1	0	0	0	0	0	0
Mullet	0	0	30	0	0	40	0
Trevallies	1	0	0	0	0	0	0
Scorpionfish	0	0	1	0	0	0	0

Table 14.11 Fish remains from Nabataea (after Desse-Berset & Studer 1996; Lepikscaar 1995; Lernau 1986; Toplyn 1987, 1995, 2006).

14.1 Maritime artefacts from Aila

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
AI96D1793	B.1:0-97	2-3AD	Fishing line hook	Copper alloy 32mm	1
AI96D2687	B.2:103-140	2-3AD	Fishing line hook	Copper alloy. Fragmentary 10x12mm	1
AI96D2170	B.4:22-26	2-3AD	Fishing line hook	Copper alloy. 17x12mm	1
AI96D2418	B.6:9-10	2-3AD	Fishing line hook	Copper alloy. 19x12mm	1
AI96D1493	B.1:76-71	BC-3AD	Fishing line hook	Copper alloy. 16x14mm	1
AI94D654	M.1:31-61	BC-1AD	Fishing line barbed hook	Copper alloy. Hook fragments	2
AI98D3639	M.3:69-95	2-3AD	Fishing hook	Copper alloy. Oxidised 19mm	1
AI98D3670	M.3:70-104	2-3AD	Fishing hook	Copper alloy. Oxidised 20x6mm	2
AI98D3858	M.3:70-111	2-3AD	Fishing hook	Copper alloy. Oxidised 9x8mm	1
AI00D4974	M.9:27-56	BC-1AD	Fishing line barbed hook	Copper alloy. 15x9mm	1
AI96D1947	B.1:80-102	2-3AD	Hull sheathing	Lead sheet	1
AI96D2242	B.3:0-129	2-3AD	Hull tack	Copper alloy. Head ∅ 14mm	1
AI96D1634	B.4:11-11	2-3AD	Hull tack	Copper alloy. Flat head, square shaft 27mm	1
AI96D2106	B.4:21-25	2-3AD	Hull tack	Copper alloy. Head ∅ 21mm	1
AI98D3082	M.2:72-182	BC-1AD	Hull tack	Copper alloy. ∅ 9mm	1
AI98D3898	M.2:75-226	BC-1AD	Hull tack	Copper alloy. Oxidised ∅ 10mm	1
AI96D2392	M.3:38-62	2-3AD	Hull tack	Copper alloy tack through sheet. Head ∅ 15mm x 11mm	1
AI96D2463	M.3:40-65	BC-1AD	Hull tack	Copper alloy. Head ∅ 25mm x 13mm	1
AI98D3382	M.3:51-77	BC-1AD	Hull tack	Copper alloy. Oxidised ∅ 13mm	1
AI96D2614	M.6:11-23	2-3AD	Hull tack	Copper alloy. 19mm	1
AI96D2291	M.6:5-12	2-3AD	Hull tack	Copper alloy. Head ∅ 20mm	1

Putative maritime artefacts from Aila and residual or later finds from late Roman and Islamic contexts

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
AI96D2423	B.1:80-102	2-3AD	Hull sheathing?	Lead. 14x11 cyinder	1
AI96D1749	B.2:77-100	2-3AD	Hull sheathing?	Lead. 20-8mm	5
AI96D1649	B.3:74-114	2-3AD	Hull sheathing?	Lead. Strip 23mm	1
AI96D2247	B.3:77-125	2-3AD	Hull sheathing?	Lead. ∅ 7mm	1
AI96D1752	B.2:77-99	2-3AD	Hull tack?	Copper alloy. Nail/tack 7mm	1
AI96D1747	B.4:13-13	2-3AD	Hull tack?	Copper alloy. Fragment 14mm	1
AI96D2310	B.1:59-119	BC-3AD	Hull sheathing?	Lead. ∅ 12mm	1
AI96D1537	B.1:71-73	BC-3AD	Hull sheathing?	Lead. 24x22mm	1
AI96D2553	B.1:98-132	BC-3AD	Hull sheathing?	Lead. ∅ 6mm	1
AI96D2690	B.3:78-137	BC-3AD	Hull sheathing?	Lead. 20mm	1
AI94D502	B.3:10-12	BC-	Hull tack?	Copper alloy. Tack	1

		3AD			
AI00D4766	J.20:70-145	BC-3AD	Hull tack?	Copper alloy. 19mm	1
AI98D3426	M.3:55-81	2-3AD	Hull tack?	Copper alloy. 12mm	1
AI00D5297	M.4:60-118	2-3AD	Hull tack?	Copper alloy. 26mm	1
AI98D3555	M.5:51-110	2-3AD	Hull tack?	Copper alloy. 13mm	1
AI98D3371	M.5:52-103	2-3AD	Hull tack?	Copper alloy. square shaft 28mm	1
AI00D4562	M.5:92-183	BC-1AD	Hull tack?	Copper alloy. 30mm	1
AI00D4749	M.6:60-124	BC-1AD	Hull tack?	Copper alloy. 17mm	1
AI00D4590	M.9:15-24	2-3AD	Hull tack?	Copper alloy. 13-15mm	2
AI00D4162	O.2:22-98	BC-1AD	Hull tack?	Copper alloy. 30mm	1
AI00D4199	O.2:63-100	BC-1AD	Hull tack?	Copper alloy. 31mm	1
AI94D956	S.--:---	?	Fishing weight?	Copper alloy. Fragment	1
AI96D2425	B.3:82-134	2-3AD	Fishing hook?	Iron. Hooks	2
AI96D1649	B.3:74-114	2-3AD	Fishing net weight?	Lead. cylinder 14mm	1
AI96D2032	B.4:17-20	2-3AD	Fishing or eye hook?	Copper alloy. 20-22x10-11mm	2
AI96D2052	B.4:18-21	2-3AD	Fishing or eye hook?	Copper alloy. 14mm & 8mm	2
AI96D1232	B.3:65-103	BC-1AD	Fishing net weight?	Lead sheet. Channel fragment 30mm	1
AI94D267	B.3:22-22	BC-1AD	Fishing weight?	Copper alloy. Spherical weight with hook	1
AI96D2177	B.5:18-15	BC-3AD	Fishing hook or loop?	Iron. Fragment 19mm	1
AI96D2417	B.5:27-24	BC-3AD	Fishing hook or loop?	Copper alloy. 16mm	1
AI94D29	B.2:10-10	BC-3AD	Fishing hook?	Copper alloy. Hook fragment	1
AI98D3295	B.3:99-160	BC-3AD	Fishing or eye hook?	Copper alloy. ∅ 13mmx16mm	1
AI02D5752	K.10:34-60	BC-3AD?	Fishing hook?	Copper alloy. metal hook	1
AI02D6292	K.14:62-109	BC-3AD?	Fishing hook?	Iron. Hook	1
AI94D928	M.2:3-35	BC-1AD	Fishing hook?	Copper alloy. Fragment	1
AI98J3592	M.2:87-214	BC-1AD	Fish figurene	Terracotta. 33x27mm	1
AI98D3949	M.2:94-238	BC-1AD	Fishing hook?	Copper alloy. Incomplete 16x3mm	1
AI96D2606	M.3:21-61	BC-1AD	Fishing hook?	Iron. 48x34mm	1
AI00D4156	M.3:36-134	BC-1AD	Fishing hook or ring?	Copper alloy. 15mm	1
AI98D3562	M.3:69-93	2-3AD	Fishing weight?	Copper alloy. 20x15mm	1
AI98D3638	M.3:69-95	2-3AD	Fishing or suspension hook?	Copper alloy. Oxidised 22x30mm	1
AI96D2385	M.4:31-57	2-3AD	Fishing or eye hook	Iron. 52x36mm	1
AI96D2135	M.4:5-40	2-3AD	Fishing hook?	Copper alloy. 16x12mm	1
AI96D1295	M.5:2-5	2-3AD	Fishing or suspension hook?	Copper alloy. 8x6mm	1
AI98D3705	M.5:75-145	2-3AD	Fishing spear or arrow?	Iron. Oxidised 16x9mm	1

AI00D4355	M.5:92-183	BC-1AD	Fishing or suspension hook?	Copper alloy. 25mm	1
AI98D3232	M.6:3-33	2-3AD	Fishing hook?	Copper alloy. 9x6mm	1
AI98D3109	M.6:3-46	2-3AD	Fishing hook or ring?	Copper alloy. Corroded 22mm	1
AI98D3550	M.7:17-32	2-3AD	Fish processing tool?	Iron tool with fish scales in pithos. 192x81mm tool	1
A102D6119	M.7:59-143	BC-3AD	Fishing hook?	Copper alloy. Bent into a hook shape fragment	1
AI00D4709	M.9:22-42	2-3AD	Fishing or eye hook?	Copper alloy. 19mm	1
AI98D3136	O.2:9-10	2-3AD	Fishing hook or latch?	Copper alloy. 29mm	1
AI94D2	S.--:---	?	Fishing hook?	Iron. Possible hook	1
AI94D599	S.--:---	?	Fishing hook?	Iron. Hook	1
AI96D1574	A.1:57-106	8AD+	Fishing line hook	Copper alloy. 11mm	1
AI00D4769	A.17:12-31	6-7AD	Fishing hook	Copper alloy. 32mm	1
AI96D2409	A.9:38-71	4-5AD	Fishing line hook	Copper alloy. 25x16mm	1
AI97D2833	J.3:0-14	8AD+	Fishing line hook	Copper alloy. 26x11mm	1
AI96D1307	J.9:0-36	8AD+	Fishing line hook	Copper alloy. 13mm	1
AI96D1573	A.1:56-104	6-7AD	Sheet fragment	Lead. 25x17x3mm	1
AI00D4853	J.1:41-132	4-5AD	Hull tack	Copper alloy. ∅ 9mm	1
AI97D2823	J.11:32-99	4-5AD	Hull tack	Copper alloy. 10x7mm	1
AI96D2285	K.7:31-49	8AD+	Hull tack	Copper alloy. Head ∅ 16mm x 24mm	1
AI96D1456	A.10:2-2	8AD+	Fishing net weight?	Lead sheet. Channel fragment 51mm	1
AI98D3394	A.13:4-16	8AD+	Fishing or eye hook?	Copper alloy. ∅ 12mmx25mm	1
AI98D3236	A.13:4-9	8AD+	Fishing hook or loop?	Copper alloy. 18mm	1
AI98D3717	A.13:7-18	4-5AD	Fishing hook?	Copper alloy. Incomplete 14x7mm	1
AI00D5224	A.2:58-126	4-5AD	Fishing hook or ring?	Copper alloy. Fragment ∅ 13mm	1
AI00D4039	J.11:0	4-5AD	Fishing weight?	Copper alloy conical. 21.9x14.4x7.6mm	1
AI97D2913	J.11:26-84	6-7AD	Fishing hook or ornament?	Copper alloy. Hook 20x7mm	1
AI00D4930	J.11:76-301	4-5AD	Fishing hook?	Iron. 37mm	1
A100J4134	J.20:62-123	4-7AD	Fishing or loom weight?	Ceramic. 5x3x0.8cm	1
A100J4228	J.22:16-0	4-5AD	Fishing or loom weight?	Ceramic. 4.2x4.2cm	1
AI00D4380	J.22:21-78	4-5AD	Fishing hook?	Iron. ∅ 10x55mm	1
AI00D4639	J.22:27-88	4-5AD	Fishing hook or clamp?	Iron. 26x100mm	2
AI98B3099	J.23:6-15	8AD+	Fishing weight?	Steatite drilled hole. Resused vessel 65x60mm	1
AI98D3816	J.25:23-42	8AD+	Fishing hook?	Metal. 38x14mm	1
AI97D2857	J.3:24-170	4-5AD	Fishing or suspension hook?	Copper alloy. Hook 19x17mm	1
AI97D2870	J.3:63-173	4-5AD	Fishing hook?	Iron. Hook 25x18mm	1
AI00D4434	J.3:78-227	4-5AD	Fishing or suspension hook or ring?	Copper alloy. 17mm	1
AI96B1411	J.5:53-116	8AD+	Fishing weight?	Steatite drilled hole 36x25mm. Reused steatite vessel	1
AI94D723	K.2:3-8	8AD+	Fishing hook or latch?	Copper alloy. Fragment	1

AI98A3549	K.2:64-132	8AD+	Fishing weight or balista?	Chert. ∅ 53mm	1
AI98D3889	K.2:78-164	6-7AD	Fishing hook?	Iron. Oxidised 43x19mm	1
AI96D1717	K.3:22-72	8AD+	Fishing hook?	Iron. fragmentary, corroded hook 22x10mm	1
AI94D786	K.5:17-58	8AD+	Fishing hook?	Iron. Hook fragment	1
AI96D1770	K.5:38-94	8AD+	Fishing hook or chain?	Copper alloy. 10mm	1
AI96A2379	K.5:47-115	8AD+	Fishing weight?	Sandstone oval ∅181x117mm. Unidentified	1
AI96A2139	K.7:1-1	8AD+	Fishing or loom weight?	Sandstone disk ∅63mm. Loom weight 63mm	1
AI94D917	L.1:5-5	8AD+	Fishing weight?	Copper alloy. Fragment	1
AI96D1509	L.2:40-91	8AD+	Suspension or fishing hook?	Copper alloy. 33mm	1
AI94D337	L.2:4-8	8AD+	Fishing weight?	Copper alloy. Fragment	1
AI96D2454	L.2:70-125	8AD+	Fishing hook or link?	Iron. Hook/link	1
AI94D1185	L.4:2-13	8AD+	Fishing hook?	Copper alloy. Hook fragment	1
AI94D386	L.5:17-32	8AD+	Fishing weight?	Copper alloy. Fragment	2
AI96D1963	A.12:10-10	6-7AD	Hull tack?	Copper alloy. Nail/tack 13mm	1
AI94D1190	A.6:3-5	8AD+	Hull sheathing?	Lead. Melted fragments	4
AI96D1927	B.4:14-17	4-5AD	Hull tack?	Copper alloy. fragment 15mm	1
AI00D4077	J.1:36-90	4-5AD	Hull tack?	Copper alloy. 11mm	1
AI96D2457	J.11:17-60	8AD+	Hull tack?	Copper alloy. Tack/nail 14mm	1
AI00D5117	J.11:91-333	4-5AD	Hull tack?	Copper alloy. 22mm	1
AI96G1860	J.2:13-46	4-5AD	Hull sheathing?	Lead fragment. melted fragment	1
AI00D5325	J.20:81-170	4-5AD	Hull tack?	Copper alloy. 17mm	1
AI00D4632	J.24:45-72	4-5AD	Hull sheathing?	Lead. Unidentified 16x11x4mm	1
AI96D1715	K.5:38-93	8AD+	Hull tack?	Copper alloy. Squared shaft 21mm	1
AI96D1549	L.5:34-86	8AD+	Hull tack?	Copper alloy. Fragment 8mm	1

14.2 Maritime artefacts from Berenike

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
BE96-?	7-60-	1-2AD	Fishing float	Wood	1
BE97-2978-Z	17-60-310	1-2AD	Fishing float?	Pummice	1
BE97-3194-P	13-2-	BC-1AD	fishing gorge?	Wood acacia. 0.7x>3.7cm	1
BE00-1128-D	33-6-8	1AD	Fishing line hook	Copper alloy. Fragments	1
BE00-1159-D	33-5-10	M-L1AD	Fishing line hook	Copper alloy. Fragments	1
BE00-1464-D	33-8-19	1AD	Fishing line hook	Copper alloy. Fragments	1
BE00-5057-D	33-38-64	1AD	Fishing line hook	Copper alloy. Fragments	1
BE01-1413-D-8324	48-5-16	1AD	Fishing line hook	Copper alloy. Fragments	1
BE01-3378-D	48-18-51	1AD	Fishing line hook	Copper alloy. Fragments	1
BE01-3447-D	48-0-42	1AD	Fishing line hook	Copper alloy. Fragments	1
BE94-1167-D	2-45-	M1-E2AD	Fishing line hook	Copper alloy	1
BE94-3491-D	3-5-11	BC-1AD	Fishing line hook	Copper alloy	1
BE95-1442-D	4-16-	2AD	Fishing line hook	Copper alloy	1
BE95-1667-D	4-16-	2AD	Fishing line hook	Copper alloy	1
BE95-1792-D	4-38-	L1-E2AD	Fishing line hook	Copper alloy	1
BE95-2144-D	4-38-	L1-E2AD	Fishing line hook	Copper alloy	1
BE95-2745-D	4-45-	M-L1	Fishing line hook	Copper alloy	1
BE95-2951-D	4-45-	M-L1	Fishing line hook	Copper alloy	1
BE95-3193-D	4-44-	M-L1	Fishing line hook	Copper alloy	1
BE95-684-D-2524	1-95	L2-4AD+	Fishing line hook	Iron	1
BE95-752-D-2973	1-89	L2-4AD	Fishing line hook	Copper alloy	1
BE96-1204-D-3129	7-60-138	L1-2AD	Fishing line hook	Iron	1
BE96-4023-D	6-98-208	3AD+	Fishing line hook	Iron	1
BE97-261-D	13-3-7	BC-1AD	Fishing line hook	Copper alloy. Fragments	1
BE97-3902-D	17-65-134	1-2AD	Fishing line hook	Copper alloy	1
BE98-2122-D	17-99-347	1-2AD	Fishing line hook	Copper alloy	1
BE99-2551-D	31-7-9	L1AD	Fishing line hook	Copper alloy. Fragments	1
BE99-2835-D-6168	31-7-13	1AD	Fishing line hook	Copper alloy	1
BE99-3134-D	31-12-19	M-L1AD	Fishing line hook	Copper alloy. Fragments	1
BE99-4180-D	31-0-38	L1AD	Fishing line hook	Copper alloy. Fragments	1

BE99-4492-D	31-0-0	M-L1AD	Fishing line hook	Copper alloy. Fragments	1
BE99-651-D	10-301-610	L2-5AD	Fishing line hook	Copper alloy. Fragments	1
BE96-3806-D	9-43-102	Res1-2 AD	Fishing line hook?	Copper alloy	1
BE97-3494-D	5-58-228	2-4AD	Fishing line hook?	Copper alloy	1
BE98-2598-D	17-104-356	1AD	Fishing line hook?	Copper alloy. Fragments	1
BE98-5361-D	24-2-2	1AD	Fishing line hook?	Iron. Fragments	1
BE98-7535-D	19-9-21	M1AD	Fishing line hook?	Copper alloy. Fragments	1
BE97-1558-D	13-2-14	BC-1AD	Fishing line large hook	Iron. Fragments	1
BE98-697-D	19-8-22	BC-1AD	Fishing line large hook?	Iron. Fragments	1
BE00-1138-H-	33-5-	1AD	Fishing line weight	Stone and cordage	1
BE00-1646-H-3485	33-018-26	1AD	Fishing net	Flax fibre ply 2mm ∅ mesh knots. 4x6cm	1
BE01-1133-H-7146	48-005-06	1AD	Fishing net	Flax fibre ply 2.1mm ∅ mesh knots 40mm gauge. 12x8cm	7
BE95-0747-H-0470	3-015-39	1AD	Fishing net	Soft fibre ply 2mm ∅ mesh knots 56.8mm gauge. 8x68cm	8
BE95-0958-H-0473	3-0-45	1AD	Fishing net	Soft fibre ply 2.3mm ∅ mesh knots 55.4mm gauge. 14x15cm	1
BE96-0801-H-1807	13-002-10	1AD	Fishing net	Flax fibre ply 0.8mm ∅ mesh knots 60.4mm gauge. 22x34cm	2
BE96-1607-H-2073	13-002-15	1AD	Fishing net	Flax fibre ply 1.6mm ∅ mesh knots 47.8mm gauge. 10c11.5cm	2
BE96-3395-H-2385	13-002-27	1AD	Fishing net	Flax fibre ply 1mm ∅ mesh knots. 1x4cm	1
BE01-1399-H-7205	48-001-15	1AD	Fishing net bag	Grass fibre ply 3.2mm ∅ mesh knots 65mm gauge. 21x30cm	1
BE99-2887-H-3082	31-007-13	1AD	Fishing net bag	Grass fibre ply 3.4mm ∅ mesh knots. 16cm	3
BE99-2887-H-3888	31-007-13	1AD	Fishing net bag	Grass fibre ply 3.3mm ∅ mesh knots 36mm gauge. 58x106cm	1
BE99-3957-H-3891	31-0-33	1AD	Fishing net bag	Grass fibre ply 3.7mm ∅ mesh knots 41mm gauge	3
BE00-1291-H-3643	33-008-23	1AD	Fishing net fine	Ply 1.1mm ∅ mesh knots 13.6mm gauge	4
BE00-1329-H-7277	33-008-16	1AD	Fishing net fine	Flax fibre ply 1.2mm ∅ mesh knots 12.2mm gauge	7
BE01-1133-H-7145	48-005-06	1AD	Fishing net fine	Flax fibre ply 1.2mm ∅ mesh knots 8.8mm gauge. 4x6cm	1
BE96-0736-H-1891	13-002-08	1AD	Fishing net fine	Flax fibre ply 1mm ∅ mesh knots 29.6mm gauge. 3x17cm	1
BE96-0736-H-1892	13-002-08	1AD	Fishing net fine	Flax fibre ply 1mm ∅ mesh knots 23mm gauge. 1.5x17cm	1
BE96-0740-H-1845	13-002-09	1AD	Fishing net fine	Flax fibre ply 1mm ∅ mesh knots 23.4mm gauge. 9x19cm	1
BE96-1527-H-1962	13-002-14	1AD	Fishing net fine	Flax fibre ply 0.5mm ∅ mesh knots 13mm gauge. 6.5x14cm	6
BE96-1527-H-1963	13-002-14	1AD	Fishing net fine	Flax fibre ply 1.3mm ∅ mesh knots 25mm gauge. 10x11cm	2
BE96-1968-H-2498	13-002-16	1AD	Fishing net fine	Flax fibre ply 1.2mm ∅ mesh knots 18.4mm gauge. 20x30cm	1
BE96-2170-H-2111	13-002-16	1AD	Fishing net fine	Flax fibre ply 0.8mm ∅ mesh knots 25.2mm gauge. 5x6cm	1

BE96-2170-H-2112	13-002-16	1AD	Fishing net fine	Flax fibre ply 1.1mm ∅ mesh knots 16mm gauge. 1.5x3cm	1
BE96-2280-H-1977	13-002-21	1AD	Fishing net fine	Flax fibre ply 1.2mm ∅ mesh knots 24mm gauge. 7x13cm	1
BE96-3395-H-2388	13-002-27	1AD	Fishing net fine	Flax fibre ply 0.9mm ∅ mesh knots 22.8mm gauge. 19x23cm	4
BE99-0387-H-7291	29-002-04	1AD	Fishing net fine	Flax fibre ply 1.5mm ∅ mesh knots 20.8mm gauge. 3x6cm	1
BE99-0529-H-3299	29-006-07	1AD	Fishing net fine	Soft fibre ply 1.4mm ∅ mesh knots 34.2mm gauge	2
BE99-0529-H-3395	29-006-07	1AD	Fishing net fine	Soft fibre ply 1.4mm ∅ mesh knots 27mm gauge	1
BE99-0853-H-3339	29-010-13	1AD	Fishing net fine	Soft fibre ply 1.1mm ∅ mesh knots 12.2mm gauge	1
BE99-2465-H-3267	31-007-04	1AD	Fishing net fine	Soft fibre ply 0.6mm ∅ mesh knots 24.2mm gauge	4
BE99-3292-H-3235	31-012-20	1AD	Fishing net fine	Soft fibre ply 1.3mm ∅ mesh knots 18.1mm gauge	6
BE98-4101-D	17-113-386	BC-M1AD	Fishing net weight?	Lead	1
BE99-4814-D	29-0-34	M-L1AD	Fishing weight	Lead	1
BE00-3849-RR	33-33-50	M-L1AD	Fishing weight?	Stone	1
BE00-4521-RR	33-38-61	1AD	Fishing weight?	Stone pierced	1
BE98-2947-RR	20-22-57	Res 1-3AD	Fishing weight?	Stone	1
BE98-5239-RR	20-27-92	Res 1-3AD	Fishing weight?	Stone	1
BE99-3939-RR	31-0-34	M-L1AD	Fishing weight?	Stone	1
BE96-3608-P	13-0-	1AD	Hull dowel	Wood palm. 30x5mm	1
BE97-3544-P	13-2-	BC-1AD	Hull dowel	Wood teak. 1x5cm	1
BE98-2181-P	19-11-23	M1AD	Hull dowel	Wood teak. 60x15	1
BE98-5658-P-12e	10-72-500	1AD	Hull dowel	Wood teak. 20x5mm	1
BE98-730-P	19-9-	M1AD	Hull dowels	Wood acacia. 35x10mm	1
BE99-2381-PP	31-7-3	M-L1AD	Hull dowels	Wood	1
BE96-3630-PP	10-	2-3AD	Hull plank fragment	Wood. Re-used Ships plank	1
BE96-4596-P	13-1-2	BC-1AD	Hull plank fragment	Wood acacia. Re-used Ships plank?	1
BE96-580-Q	9-3-8	Res1-2 AD	Hull plank fragment	Wood teak. Re-used Ships plank?	1
BE97-P-	5-16-	Res1-2 AD	Hull plank fragment	Wood. Re-used Ships plank?	1
BE97-P-	5-28-	Res1-2 AD	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-3630-PP	10-237-780	2-3AD	Hull plank fragment	Wood. Re-used Ships plank, 2.33x0.035x0.04+0.25 x0.02x0.02m	1
BE98-3709-P	10-0	BC-4AD	Hull plank fragment	Wood teak. Re-used Ships plank? With dowel	1
BE98-4093.7-P	10-72-425	1AD	Hull plank fragment	Wood teak. Re-used Ships plank?	1
BE98-5357-P	20-0-0	Res 1-3AD	Hull plank fragment	Wood. Re-used Ships plank?	1

BE98-5658-P	10-72-500	1AD	Hull plank fragment	Wood teak with resin. Re used Ships plank, resin and iron nail, 1.44x0.03-4m/ 1x0.15m	1
BE98-5658-P	10-72-500	1AD	Hull plank fragment	Wood teak. Re used Ships plank, 2 nails, 1.35x0.03-4m/ 0.8x?x0.25	1
BE98-5664-P	10-237-506	2-3AD	Hull plank fragment	Wood. Re-used Ships plank, >1x?x0.02m	1
BE98-576-P	10-0-283	BC-4AD	Hull plank fragment	Wood teak. Re-used Ships plank, >0.3x>0.06x0.025	1
BE98-664-P	10-237-506	2-3AD	Hull plank fragment?	Wood. Re-used Ships plank? 0.6mlong	1
BE00-1036-qq-	33-3-3	1AD	Hull sealant	Resin	1
BE00-1338-qq-	33-8-16	1AD	Hull sealant	Resin	1
BE00-1486-qq-	33-17-22	1AD	Hull sealant	Resin	1
BE00-1651-qq-	33-18-26	1AD	Hull sealant	Resin	1
BE00-1793-qq-	33-13-28	1AD	Hull sealant	Resin	1
BE00-1994-qq-	33-13-29	1AD	Hull sealant	Resin	1
BE00-2152-qq-	33-13-31	1AD	Hull sealant	Resin	1
BE00-2290-qq-	33-11-32	1AD	Hull sealant	Resin	1
BE00-2654-qq-	33-26-37	1AD	Hull sealant	Resin	1
BE00-2838-qq-	33-29-40	1AD	Hull sealant	Resin	1
BE00-3019-qq-	33-25-43	1AD	Hull sealant	Resin	1
BE00-3151-qq-	33-25-44	1AD	Hull sealant	Resin	1
BE00-3338-qq-	33-25-45	1AD	Hull sealant	Resin	1
BE00-3518-qq-	33-25-48	1AD	Hull sealant	Resin	1
BE00-3832-qq-	33-33-50	1AD	Hull sealant	Resin	1
BE00-3842-qq-	33-25-49	1AD	Hull sealant	Resin	1
BE00-3862-qq-	33-33-54	1AD	Hull sealant	Resin	1
BE00-4126-qq-	33-37-55	1AD	Hull sealant	Resin	1
BE00-4152-qq-	33-33-56	1AD	Hull sealant	Resin	1
BE00-4153-qq-	33-36-57	1AD	Hull sealant	Resin	1
BE00-4320-qq-	33-36-58	1AD	Hull sealant	Resin	1
BE00-4321-qq-	33-39-59	1AD	Hull sealant	Resin	1
BE00-4499-qq-	33-39-60	1AD	Hull sealant	Resin	1
BE00-4504-qq-	33-38-61	1AD	Hull sealant	Resin?	1
BE00-4698-qq-	33-38-62	1AD	Hull sealant	Resin	1
BE00-5019-qq-	33-38-63	1AD	Hull sealant	Resin	1

BE00-5062-qq-	33-41-66	1AD	Hull sealant	Resin	1
BE00-5082-qq-	33-40-69	1AD	Hull sealant	Resin	1
BE00-5087-qq-	33-41-67	1AD	Hull sealant	Resin	1
BE00-5295-qq-	33-40-70	1AD	Hull sealant	Resin	1
BE00-5303-qq-	33-0-71	1AD	Hull sealant	Resin	1
BE00-5464-qq-	33-0-73	1AD	Hull sealant	Resin	1
BE00-5611-qq-	33-0-76	1AD	Hull sealant	Resin	1
BE00-5615-qq-	33-0-75	1AD	Hull sealant	Resin	1
BE00-5801-qq-	33-0-77	1AD	Hull sealant	Resin	1
BE94-854-O-	1-28-44	3-4AD	Hull sealant	Resin?	1
BE94-857-O-	1-29-45	3-4AD	Hull sealant	Resin?	1
BE94-876-O-	1-35-49	3-4AD	Hull sealant	Resin	1
BE95-945-O-	3-16-46	1AD	Hull sealant	Resin	1
BE97-1556-O-	10-0-183	BC-4AD	Hull sealant	Resin?	1
BE97-1633-O-	5-139-369	1-3AD	Hull sealant	Resin?	1
BE97-225-O-	5-89-299	1-3AD	Hull sealant	Resin?	1
BE97-2647-O-	5-152-393	BC-E1AD	Hull sealant	Resin	1
BE97-382-O-	5-105-306	3AD+	Hull sealant	Resin?	1
BE97-386-O-	5-108-313	1-4AD	Hull sealant	Resin?	1
BE97-508-O-	5-108-317	1-4AD	Hull sealant	Resin?	1
BE99-1124-qq-	10-316-643	ER	Hull sealant	Resin	1
BE99-120-qq-	10-0-581	BC-4AD	Hull sealant	Resin	1
BE99-1298-qq-	10-337-656	ER	Hull sealant	Resin	1
BE99-1846-qq-	10-358-688	ER	Hull sealant	Resin	1
BE99-2004-qq-	10-372-702	ER	Hull sealant	Resin	1
BE99-2128-qq-	10-374-708	ER	Hull sealant	Resin	1
BE99-252-qq-	10-0-582	BC-4AD	Hull sealant	Resin	1
BE99-2590-qq-	10-393-744	1-2AD	Hull sealant	Resin	1
BE99-2863-qq-	10-408-755	BC-1AD	Hull sealant	Resin	1
BE99-2866-qq-	10-392-753	BC-1AD	Hull sealant	Resin	1
BE99-3287-qq-	10-0-763	BC-4AD	Hull sealant	Resin	1
BE99-3733-qq-	10-429-787	ER	Hull sealant	Resin	1
BE99-377-qq-	10-0-590	BC-4AD	Hull sealant	Resin	1
BE99-378-qq-	10-290-594	2-3AD	Hull sealant	Resin	1
BE99-379-qq-	10-287-596	ER	Hull sealant	Resin	1

BE99-3952-qq-	10-431-790	ER	Hull sealant	Resin	1
BE99-4249-qq-	10-435-797	ER	Hull sealant	Resin	1
BE99-4573-qq-	10-0-812	BC-4AD	Hull sealant	Resin	1
BE99-4597-qq-	10-0-813	BC-4AD	Hull sealant	Resin	1
BE99-526-qq-	10-0-601	BC-4AD	Hull sealant	Resin	1
BE99-831-qq-	10-310-618	ER	Hull sealant	Resin	1
BE99-965-qq-	10-317-632	ER	Hull sealant	Resin	1
BE99-966-qq-	10-316-630	ER	Hull sealant	Resin	1
BE98-1909-R	10-141	2-3AD	Hull sealant?	Dead Sea bitumen	1
BE98-1935-R	19-6	1AD	Hull sealant?	Bitumen	1
BE98-2117-R	10-374	ER	Hull sealant?	Bitumen	1
BE98-2999-R	19-9	1AD	Hull sealant?	Bitumen	1
BE00-1129-D-	33-5-9	1AD	Hull sheathing?	Lead fragments	1
BE00-2316-D-	33-22-34	1AD	Hull sheathing?	Lead fragments	1
BE00-3025-D-	33-25-43	1AD	Hull sheathing?	Lead fragments	1
BE01-1979-D-	48-17-28	1AD	Hull sheathing?	Lead fragments	1
BE01-2548-D-	48-19-41	1AD	Hull sheathing?	Lead fragments	1
BE01-3423-D-	48-5-45	1AD	Hull sheathing?	Lead fragments	1
BE97-1078-D-	5-127-351	1-3AD	Hull sheathing?	Lead fragments	1
BE97-1384-D-	5-134-357	1-3AD	Hull sheathing?	Lead fragments	1
BE97-1575-D-	5-136-362	1-3AD	Hull sheathing?	Lead fragments	1
BE97-1604-D-	5-139-369	1-3AD	Hull sheathing?	Lead large lumps	1
BE97-2060-D-	5-150-388	BC-E1AD	Hull sheathing?	Lead fragments. 7grams	1
BE97-475-D-	5-116-325	1-3AD	Hull sheathing?	Lead strips	1
BE97-959-D-	5-126-345	BC-E1AD	Hull sheathing?	Lead fragments	1
BE98-4101-D-	17-113-386	BC-M1AD	Hull sheathing?	Lead fragments	1
BE98-514-D-	12-295-503	M1AD	Hull sheathing?	Lead fragments	1
BE99-2440-D-	10-393-741	1-2AD	Hull sheathing?	Lead fragments	1
BE99-4814-D-	29-0-34	1AD	Hull sheathing?	Lead fragments	1
BE97-UD-D	6-0-	3AD+?	Hull tacks	Copper alloy	1
BE98-5658-P-11e	10-72-500	1AD	Hull tenon	Wood teak. 70x5mm	1
BE98-5658-P	10-72-500	1AD	Hull tenons and dowels	Wood teak with resin. Re used Ships plank, 1x6-7x0.5cm tenon 2mm thick resin	4

BE99-4376-PP	31-0-0	M-L1AD	Oar	Wood	1
BE00-1672-LL	33-18-26	M1AD	Rig brail ring	Horn (bone) external∅ 77.2mm. 100% preserved	1
BE00-1672-LL	33-18-26	M1AD	Rig brail ring	Horn (bone) external∅ 63.4mm. 50% preserved	1
BE00-1999-PP	33-13-29	1AD	Rig brail ring	Wood external∅ 57.9mm	1
BE00-2154-PP	33-13-31	1AD	Rig brail ring	Wood. 25% preserved	1
BE00-2852-PP	33-25-41	M-L1AD	Rig brail ring	Wood. Part	1
BE00-5929-LL	33-25-45	M-L1AD	Rig brail ring	Horn (bone). brailing ring, worked bone, hoof/horn?	1
BE01-1134-PP	48-5-6	1AD	Rig brail ring	Wood. parts of rings	2
BE01-1270-PP	48-1-13	1AD	Rig brail ring	Wood. 50% preserved	1
BE01-1270-PP	48-1-13	1AD	Rig brail ring	Wood. 50% preserved	1
BE01-1789-PP	48-8-23	1AD	Rig brail ring	Wood. 100% preserved	1
BE01-1789-PP	48-8-23	1AD	Rig brail ring	Wood. parts of rings	2
BE01-1991-PP	48-18-30	1AD	Rig brail ring	Wood. 75% preserved	1
BE01-2005-PP	48-17-28	1AD	Rig brail ring	Wood external∅ 63.3mm	1
BE01-2329-PP	48-19-39	1AD	Rig brail ring	Wood external∅ 64.8mm	1
BE01-2559-PP	48-19-41	1AD	Rig brail ring	Wood external∅ 65.6mm, 2 holes	1
BE01-3466-PP	48-20-44	1AD	Rig brail ring	Wood external∅ 68mm	1
BE98-7278-L	19-8-19	M1AD	Rig brail ring	Horn (bone) internal∅ 35mm, external∅ 55mm. 100% preserved	1
BE98-7278-L	19-8-19	M1AD	Rig brail ring	Horn (bone) internal∅ 25mm, external∅ 45mm. 100% preserved	1
BE98-7279-L	19-6-8	M1AD	Rig brail ring	Horn (bone) external∅ 64mm. 50% preserved	1
BE99-256-LL	29-2-1	1AD	Rig brail ring	Horn (bone). 50% preserved	1
BE99-256-LL	29-2-1	1AD	Rig brail ring	Horn (bone). 25% preserved	1
BE99-256-LL	29-2-1	1AD	Rig brail ring	Horn (bone), 1 hole. 50% preserved	1
BE99-2601-LL	31-7-9	L1AD	Rig brail ring	Horn (bone). 50% preserved	1
BE99-2809-LL	31-7-13	L1AD	Rig brail ring	Horn (bone). Part	1
BE99-3074-LL	31-6-16	L1AD	Rig brail ring	Horn (bone)	1
BE99-3448-PP	31-17-27	M-L1AD	Rig brail ring	Wood	1
BE99-3597-PP	31-18-29	M-L1AD	Rig brail ring	Wood. Fragments of brailing rings	2
BE99-3634-PP	31-6-23	M-L1AD	Rig brail ring	Wood 1 hole. Fragment	1
BE99-3769-PP	31-18-30	M-L1AD	Rig brail ring	Wood. Fragments of brailing rings	2
BE99-4201-PP	31-0-38	L1AD	Rig brail ring	Wood. 50% preserved	1

BE99-551-LL	29-2-5	1AD	Rig brail ring	Horn (bone) external∅ 65mm, thickness 13mm. 50% preserved	1
BE00-1076-PP	33-3-4	BC-1AD	Rig brail ring?	Wood ring. part of ring	1
BE00-1080-PP	33-4-5	E-M1AD	Rig brail ring?	Wood external∅ 36.4mm. 50% preserved	1
BE00-1457-PP	33-8-16	1AD	Rig brail ring?	Wood. fragment of wooden ring	1
BE01-1396-PP	48-1-15	1AD	Rig brail ring?	Wood. Small ring	1
BE01-2120-PP	48-0-33	1AD	Rig brail ring?	Wood. small part of ring	1
BE01-3424-PP	48-5-45	1AD	Rig brail ring?	Wood. part of ring?	1
BE96-516-D	11-8-14	BC-ER	Rig brail ring?	Lead external∅ 68mm, thickness 10mm. 100% preserved	1
BE98-2181-PP	19-11-23	M1AD	Rig brail ring?	Wood external∅ 100mm thickness 15mm	1
BE00-2509	33-26-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE97-106	13-2-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE97-106	13-2-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-724	19-6-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-758	19-6-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-827	19-8-	1AD	Rig sail reinforcement strip	Indian cotton textile	1
BE98-829	19-8-	1AD	Rig sail reinforcement strip?	Indian cotton textile	1
BE98-895	19-8-	1AD	Rig sail reinforcement strip?	Indian cotton textile	1
BE98-895	19-8-	1AD	Rig sail reinforcement strip?	Indian cotton textile	1
BE00-2357	33-17-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2762	48-5-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2802	48-5-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2848	48-8-	1AD	Rig sail webbing	Indian cotton textile	1
BE01-2849	48-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2851	48-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2887	48-8-	1AD	Rig sail webbing	Egyptian flax textile	1

BE01-2907	48-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2920	48-9-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2921	48-9-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2923	48-9-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-2988	48-19-	1AD	Rig sail webbing	Indian cotton textile	1
BE01-2990	48-19-	1AD	Rig sail webbing	Egyptian flax textile	1
BE01-3081	48-0-	1AD	Rig sail webbing	Egyptian flax textile	1
BE97-107	13-2-	1AD	Rig sail webbing	Indian cotton textile	1
BE97-115	13-2-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-1372	19-9-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-759	19-6-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-797	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-798	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-799	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-838	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-839	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-869	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-888	19-8-	1AD	Rig sail webbing	Indian cotton textile	1
BE98-890	19-8-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1414	29-1-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1465	29-2-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1480	29-6-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1508	29-6-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1509	29-6-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1510	29-6-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1511	29-6-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1512	29-6-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1539	29-6-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1599	29-0-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1686	31-6-	1AD	Rig sail webbing	Indian cotton textile	1
BE99-1788	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1818	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1875	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1876	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1952	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-1953	31-7-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-3174	31-0-	1AD	Rig sail webbing	Egyptian flax textile	1
BE99-3238	31-0-	1AD	Rig sail webbing	Egyptian flax textile	1
BE98-2192-P	19-8-19	M1AD	Rig sheave pulley	Wood ∅ 72mm	1
BE01-4144-PP	48-27-72	1AD	Rig sheave pulley?	Wood	1
BE97-3544-Q	13-2-23	BC-1AD	Rig sheave pulley?	Wood	1
BE99-2877-PP	31-7-13	M-L1AD	Rig sheave pulley?	Wood	1

Martitime artefacts from Late Ptolemaic or later deposits

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
BE00-1386-D-7267	40-2-2	2BC	Fishing line hook	Metal	1
BE00-1588-RR	40-3-8	2BC+	Fishing weight?	Stone	1
BE00-Not in database	36-79-	2BC+	Hull sheathing	Lead sheets large, nail holes. 2Kg	3
BE00-1213-D-	36-21-49	2BC+	Hull sheathing?	Lead fragments	1

BE00-1356-D-	36-0-51	2BC+	Hull sheathing?	Lead fragments	1
BE00-1686-D-	36-0-55	2BC+	Hull sheathing?	Lead fragments	1
BE00-2057-D-	36-21-61	2BC+	Hull sheathing?	Lead fragments	1
BE00-2063-D-	36-26-59	2BC+	Hull sheathing?	Lead fragments	1
BE00-2068-D-	36-35-62	2BC+	Hull sheathing?	Lead fragments	1
BE00-2238-D-	36-33-64	2BC+	Hull sheathing?	Lead fragments	1
BE00-2241-D-	36-34-63	2BC+	Hull sheathing?	Lead fragments	1
BE00-2392-D-	36-38-67	2BC+	Hull sheathing?	Lead fragments	1
BE00-2394-D-	36-36-65	2BC+	Hull sheathing?	Lead fragments	1
BE00-2556-D-	36-46-72	2BC+	Hull sheathing?	Lead fragments	1
BE00-2557-D-	36-33-68	2BC+	Hull sheathing?	Lead fragments	1
BE00-2692-D-	36-46-73	2BC+	Hull sheathing?	Lead fragments	1
BE00-2697-D-	36-50-77	2BC+	Hull sheathing?	Lead fragments	1
BE00-2908-D-	36-50-78	2BC+	Hull sheathing?	Lead fragments	1
BE00-2919-D-	36-51-80	2BC+	Hull sheathing?	Lead fragments	1
BE00-2921-D-	36-43-79	2BC+	Hull sheathing?	Lead fragments	1
BE00-297-D-	36-7-18	2BC+	Hull sheathing?	Lead fragments	1
BE00-3050-D-	36-41-82	2BC+	Hull sheathing?	Lead fragments	1
BE00-3051-D-	36-39-83	2BC+	Hull sheathing?	Lead fragments	1
BE00-3054-D-	36-52-86	2BC+	Hull sheathing?	Lead fragments	1
BE00-3055-D-	36-54-85	2BC+	Hull sheathing?	Lead fragments	1
BE00-3056-D-	36-53-84	2BC+	Hull sheathing?	Lead fragments	1
BE00-3063-D-	36-51-81	2BC+	Hull sheathing?	Lead fragments	1
BE00-3244-D-	36-37-89	2BC+	Hull sheathing?	Lead fragments	1
BE00-3246-D-	36-33-88	2BC+	Hull sheathing?	Lead fragments	1
BE00-3247-D-	36-52-87	2BC+	Hull sheathing?	Lead fragments	1
BE00-326-D-	36-10-16	2BC+	Hull sheathing?	Lead fragments	1
BE00-332-D-	36-8-10	2BC+	Hull sheathing?	Lead fragments	1
BE00-337-D-	36-1-1	2BC+	Hull sheathing?	Lead fragments	1
BE00-338-D-	36-16-21	2BC+	Hull sheathing?	Lead fragments	1
BE00-3433-D-	36-56-91	2BC+	Hull sheathing?	Lead fragments	1

BE00-3435-D-	36-0-93	2BC+	Hull sheathing?	Lead fragments	1
BE00-3443-D-	36-55-90	2BC+	Hull sheathing?	Lead fragments	1
BE00-349-D-	36-15-20	2BC+	Hull sheathing?	Lead fragments	1
BE00-353-D-	36-4-2	2BC+	Hull sheathing?	Lead fragments	1
BE00-354-D-	36-6-9	2BC+	Hull sheathing?	Lead fragments	1
BE00-3608-D-	36-57-99	2BC+	Hull sheathing?	Lead fragments	1
BE00-3610-D-	36-58-98	2BC+	Hull sheathing?	Lead fragments	1
BE00-3612-D-	36-33-97	2BC+	Hull sheathing?	Lead fragments	1
BE00-3617-D-	36-0-94	2BC+	Hull sheathing?	Lead fragments	1
BE00-362-D-	36-7-26	2BC+	Hull sheathing?	Lead fragments	1
BE00-387-D-	36-18-27	2BC+	Hull sheathing?	Lead fragments	1
BE00-3888-D-	36-37-103	2BC+	Hull sheathing?	Lead fragments	1
BE00-388-D-	36-17-24	2BC+	Hull sheathing?	Lead fragments	1
BE00-389-D-	36-16-22	2BC+	Hull sheathing?	Lead fragments	1
BE00-3958-D-	36-0-104	2BC+	Hull sheathing?	Lead fragments	1
BE00-3962-D-	36-31-105	2BC+	Hull sheathing?	Lead fragments	1
BE00-415-D-	36-20-33	2BC+	Hull sheathing?	Lead fragments	1
BE00-4179-D-	36-58-108	2BC+	Hull sheathing?	Lead fragments	1
BE00-4181-D-	36-33A-106	2BC+	Hull sheathing?	Lead fragments	1
BE00-4188-D-	36-57-109	2BC+	Hull sheathing?	Lead fragments	1
BE00-4242-D-	40-79-90	2BC+	Hull sheathing?	Lead fragments	1
BE00-4367-D-	36-57-111	2BC+	Hull sheathing?	Lead fragments	1
BE00-4368-D-	36-59-112	2BC+	Hull sheathing?	Lead fragments	1
BE00-4369-D-	36-60-113	2BC+	Hull sheathing?	Lead fragments	1
BE00-4443-D-	40-14-92	2BC+	Hull sheathing?	Lead fragments	1
BE00-4578-D-	36-67-122	2BC+	Hull sheathing?	Lead fragments	1
BE00-4579-D-	36-60-116	2BC+	Hull sheathing?	Lead fragments	1
BE00-4589-D-	36-63-120	2BC+	Hull sheathing?	Lead fragments	1
BE00-4593-D-	36-66-121	2BC+	Hull sheathing?	Lead fragments	1
BE00-4796-D-	36-68-123	2BC+	Hull sheathing?	Lead fragments	1
BE00-4805-D-	36-65-127	2BC+	Hull sheathing?	Lead fragments	1
BE00-4809-D-	36-56-126	2BC+	Hull sheathing?	Lead fragments	1

BE00-4812-D-	36-66-125	2BC+	Hull sheathing?	Lead fragments	1
BE00-4821-D-	36-66-128	2BC+	Hull sheathing?	Lead fragments	1
BE00-5156-D-	36-31-130	2BC+	Hull sheathing?	Lead fragments	1
BE00-5158-D-	36-70-133	2BC+	Hull sheathing?	Lead fragments	1
BE00-5233-D-	40-95-123	2BC+	Hull sheathing?	Lead fragments	1
BE00-5259-D-	36-73-136	2BC+	Hull sheathing?	Lead fragments	1
BE00-5264-D-	36-71-137	2BC+	Hull sheathing?	Lead fragments	1
BE00-5265-D-	36-66-135	2BC+	Hull sheathing?	Lead fragments	1
BE00-5352-D-	36-72-141	2BC+	Hull sheathing?	Lead fragments	1
BE00-5354-D-	36-65-143	2BC+	Hull sheathing?	Lead fragments	1
BE00-5356-D-	36-63-142	2BC+	Hull sheathing?	Lead fragments	1
BE00-5363-D-	36-71-140	2BC+	Hull sheathing?	Lead fragments	1
BE00-5364-D-	36-74-139	2BC+	Hull sheathing?	Lead fragments	1
BE00-5511-D-	36-72-148	2BC+	Hull sheathing?	Lead fragments	1
BE00-5512-D-	36-31-146	2BC+	Hull sheathing?	Lead fragments	1
BE00-5519-D-	36-63-145	2BC+	Hull sheathing?	Lead fragments	1
BE00-5663-D-	36-70-149	2BC+	Hull sheathing?	Lead fragments	1
BE00-5667-D-	36-0-152	2BC+	Hull sheathing?	Lead fragments	1
BE00-5677-D-	36-72-150	2BC+	Hull sheathing?	Lead fragments	1
BE00-6049-D-	40-7-163	2BC+	Hull sheathing?	Lead fragments	1
BE00-973-D-	36-17-46	2BC+	Hull sheathing?	Lead fragments	1
BE96-2653-D-3346	11-0-72	2BC+	Hull sheathing?	Lead fragments	1
BE96-3030-D-3398	11-42-82	2BC+	Hull sheathing?	Lead fragments	1
BE96-3501-D-3439	11-53-93	2BC+	Hull sheathing?	Lead and copper alloy	1
BE96-77-D-3011	11-2-1	2BC+	Hull sheathing?	Lead fragments	1
BE96-3637-D	11-64-104	2BC+	Rig brail ring	Lead external∅ 72mm, thickness 10mm. 100% preserved	1

Martitime artefacts from late Roman contexts of the fourth to sixth-centuries AD

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
BE01-4537-D	50-14-16	5AD+	Anchor weight	Iron. 70-80cm x ∅70x100mm, 30 kg	1
BE00-?	39-	4AD?+	Fishing line hook	Metal	1
BE01-?	43-	4AD?+	Fishing line hook	Metal	1
BE94-18-D	1-2-	5AD	Fishing line hook	Copper alloy	1
BE94-209-	0-0-0	4AD+	Fishing line hook	Copper alloy	1

D					
BE94-254-D	0-0-0	4AD+	Fishing line hook	Metal	1
BE94-260-D	0-0-0	4AD+	Fishing line hook	Metal	1
BE94-274-D	0-0-0	4AD+	Fishing line hook	Metal	1
BE94-52-D	1-20-	5AD+	Fishing line hook	Copper alloy	1
BE94-D-	1-20-	5-6AD	Fishing line hook	Copper alloy	1
BE94-D-	1-2-	5AD	Fishing line hook	Copper alloy	1
BE95-558-D	4-13-	5AD+	Fishing line hook	Copper alloy	1
BE95-774-D	4-19-23	4-5AD	Fishing line hook	Copper alloy	1
BE95-783-D	4-4-	5AD+	Fishing line hook	Copper alloy	1
BE96-?	8-	4AD?+	Fishing line hook	Metal	1
BE97-1776-D	5-3-42	4-5AD	Fishing line hook	Copper alloy	1
BE97-1876-D	5-3-	4-5AD	Fishing line hook	Copper alloy	1
BE97-2469-D	5-3-63	4-5AD	Fishing line hook	Copper alloy	1
BE97-3228-D	5-15-	4-5AD	Fishing line hook	Copper alloy	1
BE97-323-D	5-2-4	4-5AD	Fishing line hook	Copper alloy	1
BE98-?	10-179	4AD+	Fishing line hook	Metal	1
BE98-2345-D	10-165-359	4AD?+	Fishing line hook	Iron. Fragments	1
BE98-2600-D	16-107-366	4AD+	Fishing line hook	Copper alloy. Fragments	1
BE98-3851-D	16-105-412	4AD+	Fishing line hook	Copper alloy. Fragments	1
BE98-4453-D	16-152-433	4AD+	Fishing line hook	Copper alloy. Fragments	1
BE98-4911-D	10-100-276	4AD?+	Fishing line hook	Copper alloy. Fragments	1
BE98-578-D	17-79-311	4-5AD	Fishing line hook	Copper alloy	1
BE99-6254-D	18-209-416	4-5AD?	Fishing line hook	Copper alloy	1
BE99-6683-D	22-76-90	4-5AD	Fishing line hook	Copper alloy. Fragments	2
BE94-2348-D	1-4-4	5-6AD	Fishing line hook?	Copper alloy. Fragments	1
BE95-3495-D	7-22C-193	4AD+	Fishing line hook?	Iron	1
BE95-3665-D	7-22C-215	4AD+	Fishing line hook?	Copper alloy	1
BE97-1895-D	17-32-61	4-5AD	Fishing line hook?	Copper alloy. Fragments 4 g	1
BE97-2030-D	12-167-191	4AD+	Fishing line hook?	Copper alloy. Fragments 7 g	1
BE98-3692-D	22-15-31	4-5AD	Fishing line hook?	Copper alloy. Fragments	1
BE98-3700-D	10-101-251	4AD?+	Fishing line hook?	Iron. Fragments	1
BE94-5431-D	0-0-0	4AD+	Fishing line weight	Copper alloy	1
BE97-4922-D	6-0-231	4AD+	Fishing line weight	Lead	1

BE96-0466-H-9035	1-31-52	4-6AD	Fishing net bag	Flax fibre ply 2.7mm ∅ mesh knots 55.2mm gauge. 27x37cm	1
BE94-0443-H-0848	1-26-42	5-6AD	Fishing net fine	Soft fibre ply 1.5mm ∅ mesh knots 34.8mm gauge. 9X11cm	1
BE94-0451-H-9029	1-29-45	5-6AD	Fishing net fine	Flax fibre ply 1mm ∅ mesh knots 39mm gauge	1
BE96-1587-H-1597	10-6-21	5-6AD	Fishing net fine	Flax fibre ply 0.9mm ∅ mesh knots 25.6mm gauge. 6.5x8cm	2
BE96-2294-H-1123	10-13-37	5-6AD	Fishing net fine	Flax fibre ply 0.9mm ∅ mesh knots 33.6mm gauge. 8x11cm	1
BE96-2495-H-1245	10-8-38	5-6AD	Fishing net fine	Flax fibre ply 1mm ∅ mesh knots 36.4mm gauge. 5x11cm	1
BE96-2053-M	5-0-188	4AD+	Fishing net weight	Coral pierced. 12x10x5 cm	1
BE98-2835-D	21-4-15	4-5AD	Fishing net weight? or brail ring	Lead ring. 10g for a net?	1
BE98-1881-RR	16-82-324	4-5AD	Fishing weight	Stone pierced	1
BE00-5741-RR	37-26-116	L4-5AD	Fishing weight?	Stone	1
BE94-1939-G	1-0-156	4AD+	Fishing weight?	Ceramic	1
BE97-3418-Q-58	16-41-	4AD+	Hull dowel	Wood cordia. 30x5mm	1
BE97-3833-Q-61	16-41-	4AD+	Hull dowel	Wood acacia. 55x5mm	1
BE97-3833-Q-62	16-41-	4AD+	Hull dowel	Wood palm. 65x7mm	1
BE98-2808-Q-13	10-73-372	4AD?+	Hull dowel	Wood teak. 35x25x10-15mm	1
BE98-3503-P	10-193-398	4AD?+	Hull dowel	Wood teak. 20x14-20mm	1
BE96-5077-Q	10-0-91	4AD?+	Hull dowel?	Wood acacia. 1x6cm	1
BE96-5208-Q	10-1-2	4AD?+	Hull dowel?	Wood acacia. 1x4cm	1
BE98-1150-P	21-11-11	4-5AD	Hull dowel?	Wood mangrove. 30x35x10	1
BE96-3192-Q-12	10-15-	4AD?+	Hull dowels	Wood teak. 20x5mm	4
BE98-3414-Q-56	16-15-135	4AD+	Hull dowels	Wood pine. 20x5mm	1
BE98-5356-P-159	23-12-27	4-5AD	Hull dowels	Wood teak. 5x20cm	2
BE95-15-P	7-28B-89	4AD+	Hull plank fragment	Wood Jerusalem/umbrella pine. Re-used Ships plank?	1
BE96-0000-P-11	10-15-77	4AD+	Hull plank fragment	Wood acacia. Re-used Ships plank? with iron nail 92x22x3cm	1
BE96-3192-q-11	10-15-	4AD+	Hull plank fragment	Wood teak with mortices. Re-used Ships plank, 4 dowels, 990x650x35mm	1
BE97-0005-Q-48	16-4-	5-6AD	Hull plank fragment	Wood teak with mortices. Re used Ships plank, 0.4x0.11x0.11m	1
BE97-185-Q	16-4-	5-6AD	Hull plank fragment	Wood teak. Re-used Ships plank? 25x5x1cm	1
BE97-1887-Q-64	16-0-	4AD+	Hull plank fragment	Wood teak with mortices. Re used Ships plank, 1x0.04x0.05m	1
BE97-2712-Q-65	16-0-	4AD+	Hull plank fragment	Wood teak with mortices. Re used Ships plank	1
BE97-2717-Q-66	16-0-	4AD+	Hull plank fragment	Wood acacia. Re-used Ships plank?	1
BE97-3415-Q	16-47-133	4AD+	Hull plank fragment	Wood. Re-used Ships plank? 700x5x2cm	1

BE97-3415-Q	16-47-133	4AD+	Hull plank fragment	Wood. Re-used Ships plank?	1
BE97-3416-Q	16-7-	4AD+	Hull plank fragment	Wood. Re-used Ships plank? 341xc40x<600mm	1
BE97-3416-Q	16-7-	4AD+	Hull plank fragment	Wood. Re-used Ships plank? 409xc40x<600mm	1
BE97-3416-Q	16-7-	4AD+	Hull plank fragment	Wood. Re-used Ships plank? 818xc40x<600mm	1
BE97-3416-Q	16-7-	4AD+	Hull plank fragment	Wood. Re-used Ships plank? 795xc40x<600mm	1
BE97-3416-Q-54	16-7-136	4AD+	Hull plank fragment	Wood teak. Re-used Ships plank? 40x10cm	1
BE97-6-Q	16-4-	5-6AD	Hull plank fragment	Wood acacia. Re-used Ships plank? 45x4x1cm	1
BE98-2425-P	10-164-358	4AD?+	Hull plank fragment	Wood coniferous. Re-used Ships plank?, 19g	1
BE98-2678-P	10-157-347	4AD?+	Hull plank fragment	Wood coniferous Re-used Ships plank? >0.4x>0.09x0.04m	1
BE98-3115-Q	10-94-	4AD?+	Hull plank fragment	Wood teak. Re-used Ships plank? 80x60x5mm	1
BE98-3414-Q	16-15-	4AD+	Hull plank fragment	Wood with mortices. Re-used Ships plank? 991x39x<600mm	1
BE98-3414-Q-55	16-15-135	4AD+	Hull plank fragment	Wood pine with mortices. Re-used Ships plank? 701x39x<600mm	1
BE98-3929-P-36	16-91-402	4AD+	Hull plank fragment	Wood pine. Re-used Ships plank? 8 nails, >1.3x0.15m	2
BE98-4100-P	10-160-423	4AD?+	Hull plank fragment	Wood coniferous. Re-used Ships plank? 0.76x0.03x0.2m	1
BE98-4129.18-P	10-151-421	4AD?+	Hull plank fragment	Wood teak. Re-used Ships plank? >0.2x>0.05x>0.01m	1
BE98-4486-Q	10-98-	4AD?+	Hull plank fragment	Wood teak with mortices. 50x50x20cm	1
BE98-5356-p-159	23-12-27	4-5AD	Hull plank fragment	Wood teak. Re used Ships plank, Dowels attached, 240x130mm	1
BE98-5356-p-162	23-12-27	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? 330x50x10mm	1
BE98-5356-p-166	23-12-27	4-5AD	Hull plank fragment	Wood coniferous. Re-used Ships plank? 180x50mm	1
BE98-5356-p-168	23-12-27	4-5AD	Hull plank fragment	Wood pine. Re-used Ships plank? 600x170x19mm	1
BE98-5356-p-169	23-12-27	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? 210x50x10mm	1
BE98-5356-p-170	23-12-27	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 140x90mm	1
BE98-5356-p-172	23-12-27	4-5AD	Hull plank fragment	Wood oak. Re-used Ships plank? 280x90x20mm	1
BE98-5356-p-175	23-12-27	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 1340x350x20mm	1
BE98-5356-p-176	23-12-27	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 200x70x20mm	1
BE98-5356-p-178	23-12-27	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? >110x100mm	1
BE98-5356-p-179	23-12-27	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? >210x110x20mm	1
BE98-5356-p-180	23-12-27	4-5AD	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-5356-p-181	23-12-27	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 300x80mm	1
BE98-5356-p-182	23-12-27	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? >400x100x40mm	1
BE98-5356-p-183	23-12-27	4-5AD	Hull plank fragment	Wood coniferous. Re-used Ships plank?	1

BE98-5356-p-185	23-12-27	4-5AD	Hull plank fragment	Wood. Re-used Ships plank? 900x40x>20mm	1
BE98-5613-P	10-241-493	4AD+	Hull plank fragment	Wood teak. Re-used Ships plank, 0.58x0.12x0.02m	1
BE98-5660-P	10-178-502	4AD+	Hull plank fragment	Wood teak. Re-used Ships plank? 0.13x0.08m	1
BE98-5660-P	10-178-502	4AD+	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-5660-P	10-178-502	4AD+	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-5662.5-P	10-15-504	4AD+	Hull plank fragment	Wood teak. Re-used Ships plank?	1
BE98-5663-P	10-222-505	4AD?+	Hull plank fragment	Wood pine. Re-used Ships plank? 0.4x0.05m	1
BE98-5663-P	10-222-505	4AD+	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-5665-P	10-192-507	4AD?+	Hull plank fragment	Wood teak. Re used Ships plank, groove, 0.05m	1
BE98-5665-P	10-192-507	4AD?+	Hull plank fragment	Wood umbrella pine. Re-used Ships plank?	1
BE98-5665-P	10-192-507	4AD?+	Hull plank fragment	Wood. Re-used Ships plank?	1
BE98-5776.1-P	10-3-511	4AD?+	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 1.1x0.10x0.03m	1
BE98-5776.2-P	10-3-511	4AD?+	Hull plank fragment	Wood umbrella pine. Re used Ships plank, 2 holes, 1.35x0.1x0.3m	1
BE98-5776.3-P	10-3-511	4AD?+	Hull plank fragment	Wood umbrella pine. Re used Ships plank, 2 holes and groove.	1
BE98-5776.4-P	10-3-511	4AD?+	Hull plank fragment	Wood teak. Re-used Ships plank? >2.3x0.2x0.05m	1
BE98-5990-p-189	23-12-46	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 250x100x15	1
BE98-5990-p-192	23-12-46	4-5AD	Hull plank fragment	Wood coniferous. Re-used Ships plank? 210x100x>10	1
BE98-5990-p-192	23-12-46	4-5AD	Hull plank fragment	Wood umbrella pine. Re-used Ships plank? 400x120x>20	1
BE98-5990-p-193	23-12-46	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? With dowels attached 310x85x25	1
BE98-5990-p-194	23-12-46	4-5AD	Hull plank fragment	Wood palm. Re-used Ships plank? dowels attached 25x6	1
BE98-5990-p-b	23-12-46	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? 410x70x90	1
BE98-6356-p-186	23-12-27	4-5AD	Hull plank fragment	Wood coniferous. Re-used Ships plank? 600x170x>20	1
BE98-6772-p-147	21-0-60	4-5AD	Hull plank fragment	Wood coniferous. Re-used Ships plank? 100x50x20mm	1
BE98-6775-p-147	21-0-59	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank?	1
BE98-6784-p-149	21-0-61	4-5AD	Hull plank fragment	Wood teak. Re-used Ships plank? 60x60x15	1
BE98-5659-P	10-205-501	4AD+	Hull plank fragment?	Wood. Re-used Ships plank?	1
BE98-5659-P	10-205-501	4AD+	Hull plank fragment?	Wood. Re-used Ships plank?	1
BE00-5373-qq-	39-3-23	4AD?+	Hull sealant	Resin	1
BE00-5409-qq-	41-32-46	4-6AD	Hull sealant	Resin?	1
BE94-888-O-	1-0-58	4-6AD	Hull sealant	Resin	1
BE95-1028-O-	1-0-113	4AD?+	Hull sealant	Resin	1

BE96-5576-O-	10-1-4	4AD?+	Hull sealant	Resin	1
BE97-219-O-	5-0-302	4AD+	Hull sealant	Resin?	1
BE97-224-O-	5-80-304	4-5AD	Hull sealant	Resin?	1
BE97-2481-O-	5-0-397	4AD+	Hull sealant	Resin	1
BE97-2488-O-	5-0-398	4AD+	Hull sealant	Resin	1
BE97-2517-O-	5-0-399	4AD+	Hull sealant	Resin	1
BE97-3446-O-	17-54-107	4AD	Hull sealant	Resin	1
BE97-3449-O-	16-41-126	4AD+	Hull sealant	Resin	1
BE97-376-O-	5-80-310	4-5AD	Hull sealant	Resin?	1
BE97-4530-O-	16-55-196	4AD+	Hull sealant	Resin	1
BE98-1477-qq-	20-342-663	4-6AD	Hull sealant	Resin	1
BE99-2492-qq-	28-28-37	4-6AD	Hull sealant	Resin	1
BE99-3280-qq-	28-36-48	4-6AD	Hull sealant	Resin?	1
BE99-4275-qq-	27-26-57	4-6AD	Hull sealant	Resin	1
BE99-4384-qq-	27-35-66	4-6AD	Hull sealant	Resin?	1
BE99-674-qq-	10-153-616	4AD?+	Hull sealant	Resin	1
BE99-675-qq-	10-175-609	4AD+	Hull sealant	Resin	1
BE99-830-qq-	27-5-10	4-6AD	Hull sealant	Resin?	1
BE99-967-qq-	10-175-627	4AD+	Hull sealant	Resin	1
BE98-3320-R	10-158	4AD	Hull sealant?	Dead Sea bitumen	1
BE98-3325-R	10-184	4AD	Hull sealant?	Dead Sea bitumen?	1
BE98-6350-R	10-256	4-6AD	Hull sealant?	Bitumen	1
BE98-6484-R	10-222	4AD+	Hull sealant?	Dead Sea bitumen?	1
BE94-1303-D	1-8-9	5-6AD	Hull sheathing	Lead and copper alloy	1
BE01-4525-D-	37-22-129	4-6AD	Hull sheathing?	Lead fragments	1
BE97-1093-D-	5-0-350	4AD+	Hull sheathing?	Lead fragments	1
BE98-4445-D-	18-126-286	4-6AD	Hull sheathing?	Lead fragments	1
BE98-4803-D-	16-153-444	4AD+	Hull sheathing?	Lead fragments	1
BE98-513-D-	16-59-310	4AD+	Hull sheathing?	Lead fragments	1
BE98-6760-D-	16-194-500	4AD+	Hull sheathing?	Lead fragments	1
BE98-6763-D-	16-0-499	4AD+	Hull sheathing?	Lead fragments	1
BE98-915-D-	16-87-332	4AD+	Hull sheathing?	Lead fragments	1

BE98-916-D-	10-134-315	4AD?+	Hull sheathing?	Lead fragments	1
BE99-4567-D-	28-38-74	4-6AD	Hull sheathing?	Lead fragments	1
BE96-2240-Q	10-26-	4AD?+	Hull tenon	Wood teak. 50x30x15mm	1
BE96-402-Q	10-40-	4AD?+	Hull tenon	Wood teak. 50x20x10mm	1
BE98-2183-L	21-5-14	4-5AD	Rig brail ring	Horn (bone) internal∅ 30mm, external∅ 45mm	1
BE98-2202-P-16	10-137-321	4AD?+	Rig brail ring	Wood. 50% preserved 20g	1
BE98-3486-L	21-23-30	4-5AD	Rig brail ring	Horn (bone) external∅ 39mm. 50% preserved	1
BE00-3200-LL	37-23-74	L4-5AD	Rig brail ring?	Horn (bone). 6g	1
BE00-3452-LL	38-16-20	5AD+	Rig brail ring?	Horn (bone) ring-like object. ring-like object	1
BE00-6447-LL	37-26-102	L4-5AD	Rig brail ring?	Horn. 1 fragment, w/ perforation	1
BE01-1514-LL	47-12-9	5AD+	Rig brail ring?	Horn (bone) external∅ 34.4mm ring	1
BE01-3279-LL	50-4-8	5AD+	Rig brail ring?	Horn (bone). 50% preserved ring	1
BE01-4012-LL	51-8-13	5AD+	Rig brail ring?	Horn (bone). ring-like object	1
BE01-4528-LL	51-23-21	5AD+	Rig brail ring?	Horn (bone) external∅ 39.9mm ring	1
BE96-1062-Q	10-2-13	4AD?+	Rig brail ring?	Wood. Fragment	1
BE98-4548-P	21-32-42	4-5AD	Rig brail ring?	Wood. 50% preserved	1
BE98-4548-P	21-32-42	4-5AD	Rig brail ring?	Wood. 50% preserved	1
BE98-2468-P	10-81-220	4AD?+	Rig sheave pulley?	Wood teak ∅ 85mm 15mm thickness	1
BE98-2809-P	21-19-24	4-5AD	Rig sheave pulley?	Wood teak	1

14.3 Maritime artefacts from Myos Hormos

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
MH00M0014	7-5024	L1BC-E1AD	Fighing line hook	Copper alloy	1
MH00M0017	6H-4035	M2AD	Fighing line hook	Copper alloy	1
MH00M0019	6E-4015	L1AD	Fighing line hook	Copper alloy	1
MH00M0020	7-5024	L1BC-E1AD	Fighing line hook	Copper alloy	1
MH00M0023	6D-4014	L1-E2AD	Fighing line hook	Copper alloy	1
MH00W0559	7-5001	L1BC-E1AD	Fishing float	Cork	1
MH01W0275	8-8003	Res ER	Fishing float	Wood. Modiefied sheave?	1
MH01W0280	8-8000	Res M2-M3AD	Fishing float	Wood	2
MH02W0317	6L-4075	1-2AD	Fishing float	Wood	1
MH02W0404	8-8301	M-L2AD+	Fishing float	Wood	1
MH02W0448N	6P-4105	M1AD	Fishing float	Wood	1
MH02W0467	8-8343	M2AD	Fishing float	Wood	1
MH02W0477	8-8351	2AD	Fishing float	Cork	1
MH03W0583	6Q-4165	M1-E2AD	Fishing float	Cork	1
MH03W0590	6Q-4165	M1-E2AD	Fishing float	Cork	1
MH00W0113B	6E-4015	L1AD	Fishing float?	Wood	1
MH00W0158	6H-4020	2AD	Fishing float?	Wood	1
MH03W0514	6PX-4110	E1AD	Fishing float?	Wood	1
MH03W0515	6PX-4110	E1AD	Fishing float?	Wood	1
MH00M0025	6H-4030	M2AD	Fishing line barbed hook	Copper alloy	4
MH00M0051	6J-4040	Res1AD in E3AD	Fishing line barbed hook	Copper alloy	1
MH01M0085	6HX-4085	E2AD	Fishing line barbed hook	Copper alloy	8
MH02M0084	10A-3703	1-2AD	Fishing line barbed hook	Copper alloy	1
MH02M0245	6GH-4095	2AD	Fishing line barbed hook	Copper alloy	1
MH03M0231	6PX-4110	E1AD	Fishing line barbed hook	Copper alloy	5
MH78RN429W	S12A-13	Res 1-2AD	Fishing line barbed hook	Copper alloy	1
MH78RN430AA	C4C-3	1-2AD	Fishing line barbed hook	Bronze	1
MH78RN430BB	J5-0	1-2AD?	Fishing line barbed hook	Copper alloy	1
MH78RN430V	C4C-4	1-2AD	Fishing line barbed hook	Bronze	1

MH78RN430X	C4C-3	1-2AD	Fishing line barbed hook	Bronze	1
MH80RN384	F7A-6	1-2AD	Fishing line barbed hook	Copper alloy	1
MH00W0100	6D-4014	L1-E2AD	Fishing line gorge	Wood	2
MH00W0113	6E-4015	L1AD	Fishing line gorge	Wood (Tectona grandis)	1
MH00W0145	6B-4008	E1AD	Fishing line gorge	Wood	1
MH00W0153A	6H-4030	M2AD	Fishing line gorge	Wood (Cupressaceae)	1
MH00W0153B	6H-4030	M2AD	Fishing line gorge	Wood (Tamarix sp.)	1
MH01W0267	6J-4040	Res1AD in E3AD	Fishing line gorge	Wood (Tamarix sp.)	1
MH00W0111B	6E-4015	L1AD	Fishing line gourge?	Wood. Broken	1
MH01W0311	8-8000	Res M2-M3AD	Fishing line gourge?	Wood. Large	1
MH02W0318	6L-4075	1-2AD	Fishing line gourge?	Wood. Broken	1
MH02W0469	8-8356	Res M2-E3AD	Fishing line gourge?	Wood. Broken	1
MH00M0035	7-5019	L1BC-E1AD	Fishing line hook	Copper alloy	1
MH00M0038	7-5022	L1BC-E1AD	Fishing line hook	Copper alloy	1
MH00M0040	6E-4015	L1AD	Fishing line hook	Copper alloy	3
MH00M0042	6A-4001	E1AD	Fishing line hook	Copper alloy	1
MH00M0045	7A-10003	1-M2AD	Fishing line hook	Copper alloy	1
MH01M0059	8-8000	Res M2-M3AD	Fishing line hook	Copper alloy	1
MH01M0063	7A-10023	BC-1AD+	Fishing line hook	Copper alloy	1
MH01M0064	7A-10014	BC-E1AD	Fishing line hook	Copper alloy	2
MH01M0069	7A-10031	BC-M1AD	Fishing line hook	Copper alloy	1
MH01M0075	7A-10026	BC-E1AD	Fishing line hook	Copper alloy	1
MH01M0081	6HX-4080	E2AD	Fishing line hook	Copper alloy	1
MH01M0298	7A-10023	BC-1AD+	Fishing line hook	Copper alloy	1
MH01M0310	7A-10011	BC-1AD	Fishing line hook	Iron	1
MH01M0311	7A-10011	BC-1AD	Fishing line hook	Iron	1
MH01M0314	7A-10027	BC-1AD+	Fishing line hook	Copper alloy	1
MH02M0098	8-8319	Res M2-M3AD	Fishing line hook	Copper alloy	1
MH02M0104	10C-3814	1-2AD	Fishing line hook	Copper alloy	1
MH02M0123	6P-4100	L1-E2AD	Fishing line hook	Copper alloy	1
MH02M0130	12-7302	L1-E2AD	Fishing line hook	Copper alloy	1

MH02M0240	10A-3778	BC/AD	Fishing line hook	Copper alloy	1
MH02M0260	12-7374	M1-2AD	Fishing line hook	Copper alloy	1
MH02M0264	8-8324	M2-3AD	Fishing line hook	Iron	1
MH02M0282	12-7301	M2AD	Fishing line hook	Copper alloy	1
MH02M0284	12-7316	M-L1AD	Fishing line hook	Iron	1
MH02M0291	8-8262	Res ER	Fishing line hook	Copper alloy	1
MH02M0400	12-7340	M-L1AD	Fishing line hook	Copper alloy	1
MH02M0476	12-7332	M-L1AD	Fishing line hook	Copper alloy	1
MH03M0369	6Q-4165	M1-E2AD	Fishing line hook	Copper alloy	1
MH78RN128U	F10A-11	1-2AD	Fishing line hook mould	Mould	1
MH02M0173	12-7327	M1-2AD	Fishing line large hook?	Copper alloy	4
MH00C073	6C-4015	E1AD	Fishing line weight	Clam shell on bast line	1
MH01CB0156	6HX-4080	E2AD	Fishing line weight	Stone	1
MH01L0115	7A-10012	BC-1AD+	Fishing line weight	Stone	1
MH01M0072	6D-4070	L1-2AD	Fishing line weight	Lead folded sheet. Reused hull sheathing	1
MH01M0433	7A-10015	BC-1AD+	Fishing line weight	Lead folded sheet. Reused hull sheathing	1
MH01M0463	7A-10012	BC-1AD+	Fishing line weight	Lead folded sheet. Reused hull sheathing	1
MH02CB0149	6P-4105	M1AD	Fishing line weight	Stone encased in grass mesh. 6x2x1cm	1
MH02M0090	10A-3798	1AD	Fishing line weight	Lead folded sheet. Reused hull sheathing	1
MH01M0057	7A-10013	BC-E1AD	Fishing line weight lead	Lead folded sheet. Reused hull sheathing	1
MH00C060	6A-4005	E1AD	Fishing net	Bast ply mesh knots 50.5mm gauge	1
MH00C072	6B-4007	E1AD	Fishing net	Bast ply mesh knots 51.5mm gauge	1
MH00C093	6C-4015	E1AD	Fishing net	Bast ply mesh knots 56mm gauge	1
MH00C101	6C-4012	E1AD	Fishing net	Bast ply mesh knots 49.5mm gauge	1
MH00C130	6H-4030	M2AD	Fishing net	Bast ply mesh knots 56.5mm gauge. 120x20cm	1
MH00C148	6G-4025	M2AD	Fishing net	Bast ply mesh knots	1
MH00C175	7-5002	L1BC-E1AD	Fishing net	Bast ply 3mm ∅ mesh knots 54mm gauge	1
MH00C183	6H-4030	M2AD	Fishing net	Bast ply mesh knots	1
MH00C184	6C-4015	E1AD	Fishing net	Bast ply mesh knots	1
MH02CB0154	8-8356	Res M2-E3AD	Fishing net	Bast ply 3mm ∅ mesh knots 80mm gauge. 74x54cm	1
MH02CB0155	6P-4105	M1AD	Fishing net	Bast ply 0.1mm ∅ mesh knots 41mm gauge. 12x3cm. Made into shoe	1
MH03CB0304	6G-4161	M2AD	Fishing net	Bast ply 3.5mm ∅ mesh knots 66mm gauge. Made into shoe	1
MH03CB0411	6Q-4170	M1-E2AD	Fishing net	Bast ply mesh knots. 4x6cm	1
MH03CB0442	6JH-4155	2AD	Fishing net	Ply 4mm ∅ mesh knots 87.5mm gauge. Robust	1

MH03CB0443	6JH-4155	2AD	Fishing net	Palm ply mesh knots	1
MH03CB0444	6JH-4155	2AD	Fishing net	Bast ply 4mm ∅ mesh knots 73mm gauge	1
MH03CB0446	6G-4160	M2AD	Fishing net	Bast ply mesh knots	1
MH03CB0448	6PX-4110	E1AD	Fishing net	Bast ply mesh knots	1
MH03CB0449	6PX-4110	E1AD	Fishing net	Bast ply mesh knots	1
MH03CB0450	6PN-4120	L1-E2AD	Fishing net	Bast ply mesh knots	1
MH03CB0451	6Q-4165	M1-E2AD	Fishing net	Bast ply mesh knots	1
MH03CB0452	6Q-4166	M1-E2AD	Fishing net	Bast ply mesh knots	1
MH03CB0459	6Q-4166	M1-E2AD	Fishing net	Robust ply 5mm ∅ mesh knots 57mm gauge	1
MH80FN8RN641	E6B-29	1-2AD	Fishing net	Cordage	1
MH00C099	6B-4007	E1AD	Fishing net fine	Bast ply mesh knots 24mm gauge	1
MH00C103	6H-4030	M2AD	Fishing net fine	Bast ply mesh knots 24mm gauge	1
MH00C104	6H-4030	M2AD	Fishing net fine	Bast ply mesh knots 25mm gauge	1
MH00C186	2B-2112	Res L1-M2AD	Fishing net fine	Bast ply 1mm ∅ mesh knots 12.3mm gauge	1
MH03CB0457	6PN-4120	L1-E2AD	Fishing net fine	Fine ply	1
MH03CB0458	6PN-4120	L1-E2AD	Fishing net fine	Fine ply 0.9mm ∅ mesh knots 13mm gauge	1
MH03CB0460	6Q-4170	M1-E2AD	Fishing net fine	Fine ply 1mm ∅ mesh knots 27mm gauge	1
MH01CB0142	6HX-4080	E2AD	Fishing net pot	Bast ply 3mm ∅ mesh knots 36mm gauge. 47x24cm	1
MH01CB0162	6HX-4080	E2AD	Fishing net pot	Bast ply 0.4mm ∅ mesh knots 80mm gauge. 37x35cm	1
MH03W0518	6PX-4110	E1AD	Fishing net repairing tool	Wood	1
MH00W0111A	6E-4015	L1AD	Fishing net repairing tool?	Wood. Broken	1
MH00C0046	7A-10003	1-M2AD	Fishing net weight	Ceramic	1
MH00C0063	7A-10003	1-M2AD	Fishing net weight	Ceramic	1
MH00M0045	7A-10003	1-M2AD	Fishing net weight	Lead rolled sheet	1
MH01M0302A	7A-10031	BC-M1AD	Fishing net weight	Lead rolled sheet. Reused hull sheathing	1
MH01M0320	9-7040	M1AD	Fishing net weight	Lead rolled sheet. Reused hull sheathing	1
MH03M0353	15-15017	1AD	Fishing net weight or hull sheathing	Lead rolled sheet. Reused hull sheathing	1
MH02MH02EF0478-9	10A-	BC-M2AD	Hull antifouling	Acorn barnacles. Wood impressions	1
MH02MH02EF0485-7	10B-	BC-2AD	Hull antifouling	Acorn barnacles. Wood impressions	3
MH02MH02EF0488-9	10A-	BC-M2AD	Hull antifouling	Acorn barnacles. Wood impressions and pitch	2
MH03MH03EF	14-	1-2AD	Hull antifouling	Acorn barnacles. Wood impressions	?

MH02W0384	6HX-4075	2AD	Hull cleat	Wood	1
MH00C115	6H-4030	M2AD	Hull fender	Rough grass wrapping. 16x14x3.5cm	1
MH01W0333	8-8181	M1-L2AD	Hull plank	Wood mortice and tenon	1
MH02W0383	8-8308	M-L2AD+	Hull plank	Wood mortice and tenon	1
MH03W0637	17-17028	L1-2AD	Hull plank	Wood mortice and tenon	1
MH00M0021	6B-4007	E1AD	Hull sheathing	Lead sheet	1
MH01M0050	8-8011	Res 1AD	Hull sheathing	Lead sheet	2
MH01M0053	7A-10013	BC-E1AD	Hull sheathing	Lead sheet	1
MH01M0057	7A-10013	BC-E1AD	Hull sheathing	Lead sheet	1
MH01M0079	7A-10014	BC-E1AD	Hull sheathing	Lead sheet	1
MH01M0318	7A-10027	BC-1AD+	Hull sheathing	Lead sheet	1
MH01M0483	7A-10024	BC-1AD+	Hull sheathing	Lead sheet	1
MH02M0091	6P-4100	L1-E2AD	Hull sheathing	Lead sheet	1
MH02M0122	6P-4100	L1-E2AD	Hull sheathing	Lead sheet	1
MH02M0491	8-8308	M-L2AD+	Hull sheathing	Lead sheet	4
MH03M0362	14A-14000	1-2AD	Hull sheathing	Lead sheet	1
MH03M0378	6PX-4110	E1AD	Hull sheathing	Lead sheet	1
MH02M0317	12-7374	M1-2AD	Hull sheathing or fishing weight	Lead folded sheet	1
MH01M0066	7A-10026	BC-E1AD	Hull sheathing?	Lead fragment	5
MH01M0074	7A-10023	BC-1AD+	Hull sheathing?	Lead fragments	1
MH01M0321	7A-10021	E1AD	Hull sheathing?	Lead fragments	1
MH01M0461	7A-10012	BC-1AD+	Hull sheathing?	Lead fragments	1
MH01M0472	7A-10025	BC-E1AD	Hull sheathing?	Lead fragments	1
MH01M0474	10-3507	1-M2AD	Hull sheathing?	Lead sheet. Oxidised	1
MH02M0099	8-8356	Res M2-E3AD	Hull sheathing?	Lead sheet. Melted?	1
MH00M0013	7A-10003	1-M2AD	Hull tack	Copper alloy	17
MH00M0026	6H-4030	M2AD	Hull tack	Copper alloy	1
MH00M0034	7-5024	L1BC-E1AD	Hull tack	Copper alloy	1
MH01M0117	6D-4070	L1-2AD	Hull tack	Iron	1
MH01M0236	7A-10028	BC-E1AD	Hull tack	Copper alloy	1
MH01M0238	9A-7125	1AD	Hull tack	Copper alloy	1

MH01M0299	7A-10023	BC-1AD+	Hull tack	Copper alloy	1
MH01M0306	7A-10027	BC-1AD+	Hull tack	Copper alloy	1
MH01M0312	7A-10027	BC-1AD+	Hull tack	Copper alloy	1
MH01M0315	7A-10027	BC-1AD+	Hull tack	Copper alloy	2
MH01M0323	10-3526	BC-M2AD	Hull tack	Copper alloy	1
MH01M0432	7A-10011	BC-1AD	Hull tack	Copper alloy	1
MH01M0446	6HX-4085	E2AD	Hull tack	Copper alloy	1
MH02M0093	6P-4105	M1AD	Hull tack	Iron	1
MH02M0103	10A-3801	1AD	Hull tack	Copper alloy	1
MH02M0124	6P-4100	L1-E2AD	Hull tack	Copper alloy	4
MH02M0125	6P-4100	L1-E2AD	Hull tack	Copper alloy	1
MH02M0131	12-7302	L1-E2AD	Hull tack	Copper alloy	3
MH02M0139	10C-3708	1-2AD	Hull tack	Copper alloy	1
MH02M0141	12-7327	M1-2AD	Hull tack	Copper alloy	1
MH02M0142	12-7327	M1-2AD	Hull tack	Copper alloy	1
MH02M0145	10A-3832	1AD	Hull tack	Copper alloy	1
MH02M0185	10-3761	ER	Hull tack	Copper alloy	1
MH02M0190	6L-4075	1-2AD	Hull tack	Copper alloy	3
MH02M0193	10A-3816	E-M1AD	Hull tack	Copper alloy	1
MH02M0195	10C-3827	1AD	Hull tack	Copper alloy	1
MH02M0210	10A-3785	ER	Hull tack	Copper alloy	1
MH02M0234	10A-3722	BC-2AD	Hull tack	Copper alloy	1
MH02M0235	10A-3727	BC-2AD	Hull tack	Copper alloy	2
MH02M0237	10A-3729	L1AD	Hull tack	Copper alloy	1
MH02M0239	10A-3731	BC-1AD	Hull tack	Copper alloy	2
MH02M0241	12-7321	M1-2AD	Hull tack	Copper alloy	1
MH02M0242	10A-3776	1AD	Hull tack	Copper alloy	1
MH02M0249	10A-3729	L1AD	Hull tack	Copper alloy	1
MH02M0250	10C-3703	1-2AD	Hull tack	Copper alloy	2
MH02M0253	10B-3763	E1-M2AD	Hull tack	Copper alloy	1
MH02M0254	6JH-4090	2AD	Hull tack	Copper alloy	2

MH02M0266	12-7342	2AD	Hull tack	Copper alloy	1
MH02M0270	6GH-4095	2AD	Hull tack	Copper alloy	1
MH02M0273	12-7321	M1-2AD	Hull tack	Copper alloy	1
MH02M0276	10A-3732	1AD	Hull tack	Copper alloy	1
MH02M0278	8-8361	2AD	Hull tack	Copper alloy	2
MH02M0279	10A-3752	E-M1AD	Hull tack	Copper alloy	1
MH02M0280	10A-3775	BC-2AD	Hull tack	Copper alloy	1
MH02M0285	12-7351	L1-E2AD	Hull tack	Copper alloy	1
MH02M0286	12-7348	M-L1AD	Hull tack	Copper alloy	1
MH02M0289	8-8399	L2-3AD	Hull tack	Copper alloy	1
MH02M0292	10-3745	L1AD	Hull tack	Copper alloy	1
MH02M0390	10-3745	L1AD	Hull tack	Copper alloy	1
MH02M0403B	12-7349	M1-2AD	Hull tack	Copper alloy	2
MH02M0422	12-7321	M1-2AD	Hull tack	Copper alloy	1
MH02M0423A	10A-3752	E-M1AD	Hull tack	Copper alloy	1
MH02M0423B	10A-3717	L1AD	Hull tack	Copper alloy	1
MH02M0426	10B-3714	BC-1AD	Hull tack	Copper alloy	1
MH02M0428	10A-3703	1-2AD	Hull tack	Copper alloy	1
MH02M0429	10A-3703	1-2AD	Hull tack	Copper alloy	1
MH02M0448	6HX-4085	E2AD	Hull tack	Copper alloy	2
MH02M0449	6HX-4080	E2AD	Hull tack	Copper alloy	2
MH02M0466	12-7351	L1-E2AD	Hull tack	Copper alloy	1
MH03M0348	6Q-4170	M1-E2AD	Hull tack	Copper alloy	2
MH03M0356	6J-4155	2AD	Hull tack	Copper alloy	1
MH03M0372	6Q-4165	M1-E2AD	Hull tack	Copper alloy	1
MH03M0379	6PX-4110	E1AD	Hull tack	Copper alloy	1
MH03M0392	14B-14514	1AD	Hull tack	Copper alloy	1
MH03M0393	16-16011	Res ER	Hull tack	Copper alloy	1
MH03M0401	15D-15111	L1-E2AD	Hull tack	Copper alloy	1
MH03M0415	17-17001	1-2AD	Hull tack	Copper alloy	1
MH03M0421	15-15068	L1-E2AD	Hull tack	Copper alloy	1

MH78RN431FF	Q2B-8	Res 1-2AD	Hull tack	Copper alloy	1
MH78RN431GG	G8D-1	1-2AD	Hull tack	Copper alloy	1
MH78RN431HH	S12A-14	Res 1-2AD	Hull tack	Copper alloy	1
MH78RN431KK	F9C-1	1-2AD	Hull tack	Copper alloy	1
MH78RN431LL	P8A-1	Res 1-2AD	Hull tack	Copper alloy	1
MH78RN431MM	P8A-9	Res 1-2AD	Hull tack	Copper alloy	1
MH78RN431NN	C4C-5	1-2AD	Hull tack	Bronze	1
MH78RN431OO	S12A-4	Res 1-2AD	Hull tack	Copper alloy	1
MH02M0138	12-7321	M1-2AD	Hull tack and sheathing	Copper and lead	1
MH02M0194	10C-3806	1-2AD	Hull tack?	Copper alloy	1
MH02M0197	12-7327	M1-2AD	Hull tack?	Copper alloy	1
MH02M0256	10A-3725	L1AD	Hull tack?	Copper alloy	1
MH02M0267	12-7342	2AD	Hull tack?	Copper alloy	4
MH02M0088	10A-3716	BC-1AD	Hull tacks	Copper alloy. In ceramic pot	10
MH02W0386	6H-4075	2AD	Hull tenon	Wood tenon	1
MH02W0423	6GH-4095	2AD	Hull tenon	Wood tenon	1
MH02W0443	6P-4100	L1-E2AD	Hull tenon	Wood tenon	1
MH01FR0234	7A-10023	BC-E1AD	Net counter or measure	Turtle bone	1
MH02V0032	12-7327	M1-2AD	Pitch	Pitch	1
MH01V0024	6J-4040	Res1AD in E3AD	Pitch	Pitch	1
MH02W0471	8-8319	Res M2-M3AD	Rig block puley	Wood	1
MH80PL53-30	E6B-24	1-2AD	Rig block puley	Wood	1
MH00FR0035	6B-4007	E1AD	Rig brail ring	Ibex? Horn internal∅ 40mm, external∅ 70mm, thickness 7.5mm. 15% preserved	1
MH00FR0051	6E-4015	L1AD	Rig brail ring	Cattle or Ibex? Horn internal∅ 36mm, external∅ 68mm, thickness 8.5mm. 55% preserved	1
MH00FR0052	2B-2051	L1-M2AD	Rig brail ring	Horn internal∅ 36mm, external∅ 72mm, thickness 7.5mm, hole 1 @ 5mm. 31% preserved, broken at hole	1
MH00FR0053	2B-2051	L1-M2AD	Rig brail ring	Horn internal∅ 37mm, external∅ 66mm, thickness 10mm. 60% preserved	1
MH00FR0054	2B-2051	L1-M2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 76mm	1
MH00FR0055	6A-4001	E1AD	Rig brail ring	Horn internal∅ 40mm, external∅ 67mm, thickness 8.7mm. 46% preserved	1

MH00FR0056	6A-4001	E1AD	Rig brail ring	Horn internal∅ 39mm, external∅ 68mm, thickness 9.2mm, holes 2 @ 4.5mm, 29.6mm apart. 100% preserved, broken at hole	1
MH00FR0057	6E-4015	L1AD	Rig brail ring	Horn internal∅ 36mm, external∅ 64mm, thickness 8.9mm. 47% preserved	1
MH00FR0058	6E-4015	L1AD	Rig brail ring	Horn internal∅ 40mm, external∅ 69mm, thickness 8mm, holes 2 @ 4.9mm, 30.5mm apart. 100% preserved	1
MH00FR0059	6E-4015	L1AD	Rig brail ring	Horn internal∅ 34 mm, external∅ 64mm, thickness 6mm, holes 2 @4.5mm, 21.1mm apart. 100% preserved	1
MH00FR0060	2B-2030	L1-M2AD	Rig brail ring	Horn internal∅ 31mm, external∅ 54mm, thickness 6mm, hole 1 @ c.4mm. 63% preserved, broken at hole	1
MH00FR0061	2B-2051	L1-M2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 62mm, thickness 8.7mm, hole 1 @ c.4mm. 26% preserved, broken at hole	1
MH00FR0062	7-5012	L1BC-E1AD	Rig brail ring	Horn internal∅ 35mm, external∅ 63mm, thickness. 35-7% preserved very poor condition	1
MH00FR0063	2B-2045	Res L1-M2AD	Rig brail ring	Horn internal∅ 37mm, external∅ 67mm, thickness 8.3-9mm. 50% preserved	1
MH00FR0064	2B-2046	L1-M2AD	Rig brail ring	Horn internal∅ 41mm, external∅ 72mm, thickness 10.3-11mm. 67% preserved	1
MH00FR0065	6B-4008	E1AD	Rig brail ring	Horn internal∅ 28mm, external∅ 54mm, hole 1 @ c.4mm, broken at hole. 35% preserved rounded section	1
MH00FR0131	5-3024	Res 1-2AD	Rig brail ring	Horn internal∅ 33mm, external∅ 61mm, thickness c8.4mm, holes 1 @ 5.8mm. 80% preserved broken at hole	1
MH00FR0132	6E-4014	L1AD	Rig brail ring	Horn internal∅ 48mm, external∅ 70mm, thickness >7.5mm, hole 1 @ 4.8mm. 48% preserved, broken at hole	1
MH00FR0134	6E-4015	L1AD	Rig brail ring	Horn internal∅ 45mm, external∅ 78mm, thickness 12.5-13mm, holes 1 @ 8mm 85% preserved, broken at hole	1
MH00FR0135	6E-4015	L1AD	Rig brail ring	Horn internal∅ 30mm, external∅ 48mm, thickness 11.2-12.3mm, holes 2 @ 3.6mm, 22mm apart. 84% preserved, broken at hole	1
MH00FR0136	6H-4030	M2AD	Rig brail ring	Horn internal∅ 29.2mm, external∅ 49mm, thickness 6.7-7.7mm, holes 2 @ 5.8mm, 17mm apart. 89% preserved, broken at hole	1
MH00FR0137	6H-4035	M2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 61mm, thickness 10.5mm 45% preserved	1
MH00FR0138	5-3033	Res 1-2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 61mm, thickness 9.7mm. 40% preserved	1

MH00FR0139	6E-4015	L1AD	Rig brail ring	Horn internal∅ 41mm, external∅ 68mm, thickness 7.7mm. 67% preserved, degraded	1
MH00FR0140	6E-4015	L1AD	Rig brail ring	Horn internal∅ 42.8mm, external∅ 69.5mm, thickness 8.6-10.2mm, holes 2 @ 5.6mm, 30mm apart. 100% preserved	1
MH00FR0144	5-3079	Res 1-2AD	Rig brail ring	Horn internal∅ 36mm, external∅ 59mm, thickness 7.8mm, holes 1 @ 5.1mm. 43% preserved broken at hole	1
MH00FR0145	2B-1502	Res L1-M2AD	Rig brail ring	Horn internal∅ 34mm, external∅ 54mm, thickness 8.3mm, hole 1 @ 4.6mm. 35% preserved, broken at hole	1
MH00W0069	6B-4008	E1AD	Rig brail ring	Wood internal∅ 42mm, external∅ 80mm, thickness 19mm, holes 2 @c4.5mm, 23mm apart. 50% preserved, broken at hole	1
MH00W0069.2	6B-4008	E1AD	Rig brail ring	Wood internal∅ 36mm, external∅ 62.3mm, thickness 13.3mm, holes 2 @ 4.3mm, 23mm apart. 100% preserved	1
MH00W0072	6C-4017	E1AD	Rig brail ring	Wood internal∅ 35mm, external∅ 75mm, thickness 11.8mm, holes 2 @ c.5mm 23mm apart, broken at hole. 50% preserved, twine attached	1
MH00W0102	2B-2076	L1-M2AD	Rig brail ring	Wood internal∅ 30mm, external∅ 60mm, thickness 12mm. 15% preserved	1
MH00W0110	6D-4015	L1-E2AD	Rig brail ring	Wood internal∅ 50mm, external∅ 88mm, thickness 10mm, holes 1 @c5mm. 35% preserved, broken at hole	1
MH00W0117	2B-1586	Res L1-M2AD	Rig brail ring	Wood internal∅ 40mm, external∅ 68mm, thickness 14mm, holes 2 @ c5mm, 22mm apart. 75% preserved	1
MH00W0142	6C-4025	E1AD	Rig brail ring	Wood internal∅ 18mm, external∅ 36.3mm, thickness 5.8mm, holes 1 @ c.4mm.90% preserved	1
MH00W0174	6E-4015	L1AD	Rig brail ring	Wood internal∅ 26mm, external∅ 60mm, thickness 6.7mm. 35% preserved	1
MH00W0176	5-3033	Res1-2AD	Rig brail ring	Wood internal∅ 40mm, external∅ 65mm, thickness 9.8mm. 30% preserved	1
MH00W0199	6H-4030	M2AD	Rig brail ring	Wood internal∅ 27mm, external∅ 48.7mm, thickness 6.7mm, holes 2 @ 4.8mm. 100% preserved, broken at hole	1
MH00W0200A	6H-4035	M2AD	Rig brail ring	Wood internal∅ 41mm, external∅ 61.9mm, thickness 10mm. 50% preserved, degraded	1
MH00W0200B	6H-4035	M2AD	Rig brail ring	Wood external∅ 37mm, thickness 4mm. degraded	1
MH00W0200C	6H-4035	M2AD	Rig brail ring	Wood	1
MH01FR0171	6J-4040	Res1AD in E3AD	Rig brail ring	Horn internal∅ 41.1mm, external∅ 65.6mm, thickness 8.4mm, holes 2 @ c4mm, 35mm apart. 80% preserved, broken at hole	1
MH01FR0172	6J-4040	Res1AD in E3AD	Rig brail ring	Horn internal∅ 39mm, external∅ 73mm, thickness 7mm. 65%	1

				preserved, degraded	
MH01FR0173	6J-4040	Res1AD in E3AD	Rig brail ring	Horn internal∅ 35.2mm, external∅ 56mm, thickness 8-10mm, holes 2 @ 5.8mm, 25mm apart. 100% preserved	1
MH01FR0174	8-8000	Res M2-M3AD	Rig brail ring	Horn internal∅ 21mm, external∅ 36.7mm, thickness 7.7mm, holes 2 @ 3.8mm 13mm apart. 100% preserved	1
MH01FR0175	8-8000	Res M2-M3AD	Rig brail ring	Horn internal∅ 24.5mm, external∅ 42.3mm, thickness 12.3mm, holes 2 @ 4mm 19mm apart. 75% preserved broken at hole	1
MH01FR0176	8-8000	Res M2-M3AD	Rig brail ring	Horn internal∅ 18.8mm, external∅ 38.3mm, thickness 9mm. 55% preserved	1
MH01FR0176B	8-8000	Res M2-M3AD	Rig brail ring	Horn internal∅ 20mm, external∅ 38mm, thickness 8.8mm. 37% preserved	1
MH01FR0184	6H-4030	M2AD	Rig brail ring	Horn internal∅ 44.4mm, external∅ 61.2mm, thickness 10mm, holes 2 @ 5mm, 26mm apart. 100% preserved	1
MH01FR0185A	6G-4025	M2AD	Rig brail ring	Horn internal∅ 36.8mm, external∅ 47mm, thickness 12mm	1
MH01FR0185B	6G-4025	M2AD	Rig brail ring	Horn internal∅ 47mm, external∅ 70mm, thickness 9.4mm	1
MH01FR0227	6L-4075	1-2AD	Rig brail ring	Horn internal∅ 20mm, external∅ 32mm	1
MH01FR0228	6HX-4080	E2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 72mm	1
MH01W0245	2B-2113	Res L1-M2AD	Rig brail ring	Wood internal∅ 45mm, external∅ 75mm, thickness 17mm, holes 2 @ 5.8mm, 24mm apart	1
MH01W0254	6J-4040	Res1AD in E3AD	Rig brail ring	Wood internal∅ 28.8mm, external∅ 52.3mm, hole 1 @ 3.8mm. 100% preserved	1
MH01W0258	8-8000	Res M2-M3AD	Rig brail ring	Wood internal∅ 33.4mm, external∅ 76.7mm, thickness 14.1mm, holes 1 @ c5mm. 60% preserved broken at hole	1
MH01W0282	7A-10003	BC-E1AD	Rig brail ring	Wood internal∅ 28mm, external∅ 60mm, thickness 11.5mm, holes 1 @ c4mm. 30% preserved broken at hole	1
MH01W0303	6D-4070	L1-2AD	Rig brail ring	Wood internal∅ 45mm, external∅ 80mm, thickness 11.8mm, holes 1 @ c 5mm. 20% preserved, broken at hole	1
MH01W0320	2B-2300	L1-M2AD	Rig brail ring	Wood internal∅ 43mm, external∅ 80mm, thickness 13.9mm, hole 1 @ c 5mm. 10% preserved, broken at hole	1
MH01W0334	6K-4060	L1AD	Rig brail ring	Wood external∅ 60mm. 20% preserved	1
MH02FR0230	6D-4070	L1-2AD	Rig brail ring	Horn internal∅ 26mm, external∅ 41mm	1
MH02FR0257	8-8319	Res M2-M3AD	Rig brail ring	Horn internal∅ 40mm, external∅ 70mm	1
MH02FR0260	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 29mm, external∅ 57mm	1
MH02FR0262	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 26mm, external∅ 50mm	1

MH02FR0263	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 43mm, external∅∅71mm	1
MH02FR0264	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 43mm, external∅ 75mm	1
MH02FR0265	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 44mm, external∅ 73mm	1
MH02FR0268	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 45mm, external∅ 67mm	1
MH02FR0269	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 44mm, external∅ 75mm	1
MH02FR0270	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 70mm	1
MH02FR0271	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 64mm	1
MH02FR0275	6P-4100	L1-E2AD	Rig brail ring	Horn internal∅ 33mm, external∅ 57mm	1
MH02FR0276	6P-4105	M1AD	Rig brail ring	Horn internal∅ 30mm, external∅ 49mm	1
MH02FR0277	6P-4105	M1AD	Rig brail ring	Horn internal∅ 42mm, external∅ 67mm	1
MH02FR0279	6P-4105	M1AD	Rig brail ring	Horn internal∅∅37mm, external∅ 58mm	1
MH02FR0281	6P-4105	M1AD	Rig brail ring	Horn internal∅ 18mm, external∅ 27mm	1
MH02FR0284	8-8390	Res M2-M3AD	Rig brail ring	Horn internal∅ 32mm, external∅ 55mm	1
MH02W0361	6HX-4085	E2AD	Rig brail ring	Wood internal∅ 22mm, external∅ 40mm	1
MH02W0402	7A-0	BC-2AD	Rig brail ring	Wood internal∅ 34mm, external∅ 58mm	1
MH02W0417	0-0	BC-3AD	Rig brail ring	Wood internal∅ 37mm, external∅ 61mm	1
MH02W0417	0-0	BC-3AD	Rig brail ring	Wood	1
MH02W0418	6P-4105	M1AD	Rig brail ring	Wood internal∅ 27mm, external∅ 48mm	1
MH02W0419	6P-4105	M1AD	Rig brail ring	Wood internal∅ 31mm, external∅ 62mm	1
MH02W0420	6P-4105	M1AD	Rig brail ring	Wood internal∅ 32mm, external∅ 65mm	1
MH02W0421	8-8390	Res M2-M3AD	Rig brail ring	Wood internal∅ 35mm, external∅∅70mm	1
MH02W0424	2C-1033	Res 1-2AD	Rig brail ring	Wood internal∅ 46mm, external∅ 70mm	1
MH02W0442	2B-1589	L1-M2AD	Rig brail ring	Wood internal∅ 40mm, external∅ 70mm	1
MH02W0452	6P-4100	L1-E2AD	Rig brail ring	Wood internal∅ 27mm, external∅ 60mm	1
MH02W0455	6P-4100	L1-E2AD	Rig brail ring	Wood internal∅ 50mm, external∅ 80mm	1
MH02W0456	6P-4100	L1-E2AD	Rig brail ring	Wood internal∅ 40mm, external∅ 70mm	1
MH02W0482	2B-2076	L1-M2AD	Rig brail ring	Wood internal∅ 44mm, external∅ 75mm	1
MH03FR0319	6Q-4170	M1-E2AD	Rig brail ring	Horn external∅ 70mm, thickness 9mm	1
MH03FR0320	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 65mm, thickness 12mm, holes 2. 100% preserved	1
MH03FR0321	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 43mm, external∅∅75mm, thickness 10mm, holes 2. 100% preserved	1

MH03FR0321	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 55mm, external∅ 70mm, thickness 13mm	1
MH03FR0322	17-17003	L1-2AD	Rig brail ring	Horn internal∅ 39mm, external∅ 65mm, thickness 8mm	1
MH03FR0323	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 43mm, external∅ 77mm, thickness 16mm, holes 2. 95% preserved	1
MH03FR0324	6Q-4166	M1-E2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 70mm, thickness 12mm	1
MH03FR0325	17-17027	L1-2AD	Rig brail ring	Horn internal∅ 26mm, external∅ 50mm, thickness 5mm	1
MH03FR0326	6PN-4120	L1-E2AD	Rig brail ring	Horn internal∅ 32mm, external∅ 58mm, thickness 11mm, hole 1. 99% preserved	1
MH03FR0327	6G-4160	M2AD	Rig brail ring	Horn internal∅ 32mm, external∅ 64mm, thickness 10mm, holes 2. 100% preserved, worn	1
MH03FR0328	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 45mm, external∅ 73mm, thickness 10mm, holes 1	1
MH03FR0329	17-17036	1-2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 63mm, thickness 9mm	1
MH03FR0330	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 62mm, thickness 7mm, holes 1	1
MH03FR0332	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 44mm, external∅ 80mm, thickness 12mm	1
MH03FR0333	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 45mm, external∅ 77mm, thickness 10mm, holes 2	1
MH03FR0334	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 51mm, external∅ 83mm, thickness 16mm	1
MH03FR0335	17-17012	L1-2AD	Rig brail ring	Horn internal∅ 23mm, external∅ 45mm, thickness 9mm	1
MH03FR0336	17-17027	L1-2AD	Rig brail ring	Horn internal∅ 26mm, external∅ 40mm, thickness 8mm	1
MH03FR0337	17-17012	L1-2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 67mm, thickness 10mm, holes 1	1
MH03FR0338	6P-4115	L1-E2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 60mm, thickness 11mm	1
MH03FR0339	17-17012	L1-2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 70mm, thickness 6mm	1
MH03FR0340	17-17027	L1-2AD	Rig brail ring	Horn internal∅ 36mm, external∅ 60mm, thickness 10mm	1
MH03FR0341	6P-4115	L1-E2AD	Rig brail ring	Horn internal∅ 32mm, external∅ 52mm, thickness 10mm, holes 2	1
MH03FR0342	6Q-4165	M1-E2AD	Rig brail ring	Horn internal∅ 18mm, external∅ 36mm, thickness 7mm, hole 1	1
MH03FR0343	6P-4115	L1-E2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 70mm, thickness 10mm	1
MH03FR0344	6Q-4165	M1-E2AD	Rig brail ring	Horn internal∅ 42mm, external∅ 75mm, thickness 11mm	1
MH03FR0345	6Q-4170	M1-E2AD	Rig brail ring	Horn internal∅ 49mm, external∅ 83mm, thickness 12mm	1
MH03FR0346	17-17027	L1-2AD	Rig brail ring	Horn internal∅ 38mm,external∅ 62mm, thickness 9mm	1
MH03FR0347	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 41mm, external∅ 65mm, thickness 4mm, holes 2	1
MH03FR0348	17-17019	L1-2AD	Rig brail ring	Horn internal∅ 52mm, external∅ 80mm, thickness 12mm	1
MH03FR0349	6PX-4110	E1AD	Rig brail ring	Horn internal∅ 38mm, external∅ 70mm, thickness 7mm	1
MH03FR0350	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 57mm, thickness 10mm	1
MH03FR0351	6PX-4110	E1AD	Rig brail ring	Horn internal∅ 38mm, external∅ 70mm, thickness 11mm, holes 2	1

MH03FR0352	6G-4161	M2AD	Rig brail ring	Horn internal∅ 54mm, external∅ 88mm, thickness 6mm, hole 1	1
MH03FR0353	6P-4115	L1-E2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 60mm, thickness 8mm	1
MH03FR0354	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 43mm, external∅ 75mm, thickness 6mm, holes 1	1
MH03FR0355	17-17032	1-2AD	Rig brail ring	Horn internal∅ 34mm, external∅ 60mm, thickness 12mm	1
MH03FR0357	17-17035	L1-2AD	Rig brail ring	Horn internal∅ 38mm, external∅ 60mm, thickness 9mm	1
MH03FR0357	6Q-4165	M1-E2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 70mm, thickness 8.5mm	1
MH03W0509	6PX-4110	E1AD	Rig brail ring	Wood internal∅ 35mm, external∅ 55mm, thickness 12.25mm. 50% preserved	1
MH03W0521	6P-4115	L1-E2AD	Rig brail ring	Wood internal∅ 30mm, external∅ 60mm, thickness 12.62mm, hole 1	1
MH03W0522	6P-4115	L1-E2AD	Rig brail ring	Wood internal∅ 30mm, external∅ 60mm, thickness 13.59mm	1
MH03W0538	2B-2119	Res1-3AD+	Rig brail ring	Wood internal∅ 30mm, external∅ 60mm, thickness 14.73mm	1
MH03W0562	6C-4012	E1AD	Rig brail ring	Wood internal∅ 40mm, external∅∅70mm, thickness 14.54mm	1
MH03W0584	6H-4162	M2AD	Rig brail ring	Wood internal∅ 35mm, external∅ 65mm, holes 2 @ 4.42mm, 26.57mm apart	1
MH03W0592	17-17012	L1-2AD	Rig brail ring	Wood internal∅ 30mm,external∅ 70mm, thickness 9.92mm	1
MH03W0593	17-17012	L1-2AD	Rig brail ring	Wood internal∅ 40mm, external∅ 70mm, thickness 10.23mm, holes 1	1
MH03W0594	17-17	1-2AD	Rig brail ring	Wood internal∅ 30mm, external∅ 60mm, thickness 9.78mm, holes 2 @ 4.08, 14.74mm apart	1
MH79RN085P	F8-D-2	1-2AD	Rig brail ring	Wood internal∅ 32mm, external∅ 56mm, thickness 7mm, holes 2, 18mm apart. 100% preserved	1
MH79RN085P	F8-D-34	1-2AD	Rig brail ring	Horn. "several examples"3+	3
MH79RN085P	F8-D-34	1-2AD	Rig brail ring	Wood external∅ 60mm, holes 2. 100% preserved	1
MH79RN572K	C4-C-10	1-2AD	Rig brail ring	Wood internal∅ 20mm, external∅ 43mm, thickness 5mm, holes 2, 20mm apart. 100% preserved, rope wear	1
MH79RN572O	C4-C-9	1-2AD	Rig brail ring	Wood internal∅ 35mm, external∅ 77mm, thickness 10mm, holes 2, 25mm apart. 100% preserved	1
MH79RN572S	B4-A-3	1-2AD	Rig brail ring	Wood or horn internal∅ 45mm, external∅ 77mm, thickness 15mm, holes 2, 32mm apart. 100% preserved, sail wear	1
MH79RN572T	B4-A-4	1-2AD	Rig brail ring	Wood internal∅ 35mm, external∅ 76mm, thickness 10mm, holes 2, 25mm apart. 100% preserved	1
MH79RN573L	D4-B-2	1-2AD	Rig brail ring	Horn internal∅ 20mm, external∅ 40mm, thickness 5mm, holes 2, 12mm apart. 100% preserved	1
MH82RN474	0-0	BC-3AD	Rig brail ring	Wood, holes 2. 100% preserved	1
MH82RN489	G8A-27	1-2AD	Rig brail ring	Wood external∅ 71mm, holes 2. 100% preserved, wear	1

MH82RN505	F8D-32	1-2AD	Rig brail ring	Dalbergia sp. wood, external∅ 80mm. 50% preserved	1
MH82RN506	J8D-10	1-2AD	Rig brail ring	Wood, external∅ 80mm, holes 2. 100% preserved	1
MH99FR0003	2B-1004	Res L1-M2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 64mm, thickness 7mm, holes 1 @ 5mm. 33% preserved, broken at hole, worn	1
MH99FR0004	2B-1004	Res L1-M2AD	Rig brail ring	Horn internal∅ 50mm, external∅ 82mm, thickness 6mm, holes 2 @ 7mm, 35mm apart. 27% preserved, broken at hole worn between holes	1
MH99FR0005	2B-1004	Res L1-M2AD	Rig brail ring	Horn internal∅ 60mm, external∅ 88mm, holes 2 @ 5mm, 25mm apart. 14% preserved, broken at hole	1
MH99FR0006	2B-1004	Res L1-M2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 63mm, holes 1 @ c3.5mm. 33% preserved, broken at hole	1
MH99FR0009	2D-1265	L1-M2AD	Rig brail ring	Horn internal∅ 47mm, external∅ 78mm, thickness 9mm, holes 2 @ 5.5mm, 30mm apart. 100% preserved	1
MH99FR0010	2D-1265	L1-M2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 70mm, thickness 8mm, holes 2 @ c5.5mm 26mm apart. 17% preserved, broken at hole	1
MH99FR0023	2B-1536	L1-M2AD	Rig brail ring	Ibex? Horn internal∅ 38mm, external∅ 65mm, thickness 10.3mm. 49% preserved	1
MH99FR0024	2B-1515	Res L1-M2AD	Rig brail ring	Ibex? Horn internal∅ 44mm, external∅ 80mm, thickness 11.4mm. 39% preserved	1
MH99FR0025	2D-1265	L1-M2AD	Rig brail ring	Ibex? Horn internal∅ 50mm, external∅ 72mm, thickness 12mm. 42% preserved	1
MH99FR0026	2B-1519	Res L1-M2AD	Rig brail ring	Ibex? Horn internal∅ 38mm, external∅ 70mm, thickness 7.2mm, holes 1 @ 6mm. 32% preserved, broken at hole	1
MH99FR0092	2B-1515	Res L1-M2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 70mm, thickness 7.9mm. 30% preserved	1
MH99FR0093	2B-1570	Res L1-M2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 64mm,48% preserved	1
MH99FR0094	2B-1502	Res L1-M2AD	Rig brail ring	Horn internal∅ 39mm, external∅ 74mm, thickness 7.5mm, hole 1 @ 4.9mm. 38% preserved	1
MH99FR0095	2B-1519	Res L1-M2AD	Rig brail ring	Horn internal∅ 30mm, external∅ 60mm, thickness 7.7mm. 30% preserved	1
MH99FR0103	2B-0	Res L1-M2AD	Rig brail ring	Horn internal∅ 48mm, external∅ 82mm, thickness 14.7mm. 57% preserved	1
MH99FR0104	2B-0	Res L1-M2AD	Rig brail ring	Horn internal∅ 35mm, external∅ 60mm, thickness 5.6mm, holes 2 @ 5mm 20.5mm apart. 25% preserved broken at hole	1
MH99FR0105	2B-0	Res L1-M2AD	Rig brail ring	Horn internal∅ 45mm, external∅ 83mm, thickness 11.5mm. 47% preserved	2
MH99FR0105B	2B-0	Res L1-M2AD	Rig brail ring	Horn internal∅ 60mm, external∅ 90mm	1

MH99FR0106	2B-0	Res L1-M2AD	Rig brail ring	Horn internal∅ 45mm, external∅ 85mm, thickness 13.9mm. 27% preserved, degraded	1
MH99FR0107A	2B-1008	Res L1-M2AD	Rig brail ring	Horn internal∅ 40mm, external∅ 64mm, thickness 7.5mm, holes 1 @ 4.5mm. 45% preserved, broken at hole	1
MH99FR0107B	2B-1008	Res L1-M2AD	Rig brail ring	Horn internal∅ 30mm, external∅ 55mm, thickness 8mm. 25% preserved, degraded	1
MH99FR0107C	2B-1008	Res L1-M2AD	Rig brail ring	Horn internal∅ 27mm, external∅ 47mm, thickness 7.8mm, holes 2 @ 4mm, 20.8mm apart. 65% preserved, broken at hole	1
MH99FR0125	2B-1560	Res L1-M2AD	Rig brail ring	Horn internal∅ 36mm, external∅ 66mm, thickness 8.2mm. 68% preserved	1
MH99FR0126	2B-1525	Res L1-M2AD	Rig brail ring	Horn internal∅ 32mm, external∅∅65mm. 70% preserved, degraded	2
MH99FR0126B	2B-1525	Res L1-M2AD	Rig brail ring	Horn internal∅ 32mm, external∅ 60mm	1
MH99FR0127	2B-1561	L1-M2AD	Rig brail ring	Horn internal∅ 43mm, external∅ 68mm, thickness 13.3mm, hole 1 @ 4.5mm. 70% preserved, degraded	1
MH99W0023	2B-1586	Res L1-M2AD	Rig brail ring	Wood internal∅ 35mm, external∅ 75mm, thickness 12.5mm, holes 2 @ c.5.5mm. 50% preserved, broken at hole	1
MH99W0040A	2B-1553	L1-M2AD	Rig brail ring	Wood internal∅ 30mm, external∅ 55mm, thickness 18.1mm, holes 2 @ c 4mm. 70% preserved, broken at hole	1
MH99W0040B	2B-1553	L1-M2AD	Rig brail ring	Wood	1
MH99W0040C	2B-1553	L1-M2AD	Rig brail ring	Wood internal∅ 34mm, external∅ 65mm, thickness 14mm. 25% preserved	1
MH99W0046	2B-1521	Res L1-M2AD	Rig brail ring	Wood internal∅ 46mm, external∅ 80mm, thickness 17.2mm. 22% preserved	1
MH99W0058	2B-1553	L1-M2AD	Rig brail ring	Wood internal∅ 46mm, external∅ 74mm, thickness 15.3mm, hole 1 @ c 5.5mm. 35% preserved, broken at hole	1
MH03W0519/TX60/T0331	6P-4115	L1-E2AD	Rig brail ring sail	Wood internal∅ 30mm, external∅ 60mm, thickness 9.55mm, holes 2, sail and webbing. Attached to sail	1
MH01W0294	8-8007	ER	Rig deadeye block	Wood	1
MH80FN13	G8B-4	1-2AD	Rig length of cable	Cordage	1
MH02T0027	6GH-4095	2AD	Rig sail	Sail, webbing, brail attachment	1
MH00T0039	6C-4012	E1AD	Rig sail webbing	Webbing textile	1
MH00T0123	6E-4015	L1AD	Rig sail webbing	Webbing textile	1
MH00T0414	6D-4015	L1-E2AD	Rig sail webbing	Webbing textile	1
MH01T0196	6J-4040	Res1AD in E3AD	Rig sail webbing	Sail, webbing, brail attachment	1
MH03T0392	17-17027	L1-2AD	Rig sail webbing	Sail, webbing, brail attachment	1
MH00TX	6B-4007-8	E1AD	Rig sail/	Sail/webbing textile	1

			webbing		
MH00TX	6C-	E1AD	Rig sail/ webbing	Sail/webbing textile	2
MH00TX	6D/E-	L1-2AD	Rig sail/ webbing	Sail/webbing textile	7
MH00TX	7-	L1BC-E1AD	Rig sail/ webbing	Sail/webbing textile	1
MH01TX	6GHJ-	2AD	Rig sail/ webbing	Sail/webbing textile	22
MH02TX	6Q-	M1-E2AD	Rig sail/ webbing	Sail/webbing textile	1
MH03TX	17-	1-2AD	Rig sail/ webbing	Sail/webbing textile	2
MH03TX	6P-	L1-E2AD	Rig sail/ webbing	Sail/webbing textile	18
MH99TX	2D-	Res 1-2AD	Rig sail/ webbing	Sail/webbing textile	2
MH00W0167	6D-4014	L1-E2AD	Rig sheave from block	Wood	1
MH00W0198	6B-4008	E1AD	Rig sheave from block	Wood	1
MH01W0270	8-8000	Res M2-M3AD	Rig sheave from block	Wood	1
MH01W0321	8-8089	M-L2AD+	Rig sheave from block	Wood	1
MH02W0409	8-8309	M2AD+	Rig sheave from block	Wood	1
MH02W0453	8-8293	Res ER	Rig sheave from block	Wood	1
MH02W0454	8-8293	Res ER	Rig sheave from block	Wood	1
MH02W0458	8-8353	M-L2AD	Rig sheave from block	Wood	1
MH78PL70U	S11B-3	1-2AD	Rig sheave from block	Wood	1
MH80FN15	E6B-44	1-2AD	Rig sheave from block	Wood	1
MH80FN16	E6B-44	1-2AD	Rig sheave from block	Wood	1
MH02W0493	8-8372	L2-3AD	Rig toggle	Wood	1

14.4 Maritime artefacts from Abu Sha'ar

Inventory #	Context	Date	Use	Material contruction, re-use and condition	#
AS94FIG6	Fort	4-7AD	Fishing line barbed hook	Copper alloy	3
AS94FIG4	Reoocupation	5-7AD	Fishing net	Flax ply 0.5-0.9mm ∅ mesh knots 25.5-70mm gauge	?
AS94FIGS2-3	Fort	4AD	Fishing net fine	Flax ply 1.3-2mm ∅ mesh knots 12.7-16.6mm gauge	22
AS94	Fort	4AD	Fishing net weight	Lead	1
AS94FIG5	Reoocupation	5-7AD	Fishing net weight	Ceramic, stone and coral. 22-75.5g	6
AS94FIG7	Fort	4AD	Fishing trap	Rush basketry twinned construction 12mm gauge	1
AS94FIG8-9	Fort	4AD	Fishing trap	Rush basketry 'four-systems' construction 26.2mm gauge	1

14.5 Faunal remains from Berenike (after Van Neer 1994, 1996, 1998, 1999, 2004, 2006, 2008) . Detail on the fish species is published in those articles.

Date	1AD?	3-4AD	1AD	1-2AD	2-3AD	BC/AD	1AD	1-2AD
Trench	1	1	2	2	2	2	4	4
Ovicaprid	9	107	35	178	30	11	167	73
Camel	1	0	79	16	0	0	43	24
Equid	0	0	9	1	0	0	12	1
Cattle	0	3	5	7	0	0	17	8
Pig	1	3	23	14	0	0	60	69
Chicken	1	6	16	13	0	0	58	42
Wild bird	0	1	4	2	0	0	1	9
Hunted	0	2	2	6	0	0	5	0
Reptiles	0	0	0	0	0	0	0	0
NILE FISH	0	0	0	0	0	0	3	0
Turtle	2	1	0	3	0	0	8	0
FISH	14	198	458	765	17	2	732	113

Date	ER-LR	3AD+	L1-3AD	BC	BC	BC/AD	ER	3AD+
Trench	5	6	7	11	13	13	13	16
Ovicaprid	1420	541	128	41	19	40	231	1170
Camel	0	1	7	0	0	1	16	7
Equid	0	2	4	1	0	0	6	0
Cattle	48	12	64	0	0	0	3	38
Pig	6	2	244	0	0	5	13	5
Chicken	31	7	149	0	1	7	86	0
Wild bird	3	3	6	2	1	18	7	1
Hunted	7	3	2	1	0	1	4	29
Reptiles	3	0	0	0	1	1	1	0
NILE FISH	0	1	1	0	0	0	2	0
Turtle	25	2	6	13	1	7	5	7
FISH	1343	70	1075	448	169	881	1533	36

14.6 Faunal remains from Myos Hormos (after Wattenmaker 1979, 1882; Hamilton-Dyer 2002, 2002, in progress)

Trench	1978	1980	2B	6B	6DE	6GH	7A	7	8	17
Ovicaprid	16	163	5	8	8	32	7	206	14	22
Camel	0	6	2	4		57		8	0	12
Equid	0	1			1	6	1	72	0	1
Cattle	4	9		3	15	7		82	1	2
Pig	9	18	12	5		50		253	7	30
fowl	3		10	1		2		11	2	10
Wild bird	0			1				5	1	0
Gazel/ibex/ostrich	0			2	2	1		4	0	0
Turtle/dogon	1		5	3		7		15	10	3
Unidentified fish			16	15	18	28		48	45	
Baracuda								2	0	
Boxfish					1				0	
Elasmo				0	24	5		64	30	
Emperors			8	4	18	5		39	1	
Gerres					5				0	
Goatfish						1		4	0	
Grouper			1	3	16	12		28	15	
Grouper/snapper				4					0	
Grunters									0	
Jacks				1	1	7		10	9	
Moray								5	0	
Mullets					5				15	
Needlefish								1	0	
Parrot fish	35		28	52	164	169		341	34	
Perciforms								39	0	
Porcupine fish					2	5		12	0	
Pufferfish						1			1	
Sardine									1	
Snapper	9		2	4	9			2	2	
Sparidae	3			2	31	4		27	10	
Squirrel fish								1	0	
Stingray	4								0	
Surgeon fish					2			2	2	
Surgeon/unicorn fish				1					0	
Triggerfishes			2		11	4		2	7	
Unicorn fish					4	16		1	13	
Wrasse			1	2	7	5		3	1	

14.7 Ceramics from Berenike and Myos Hormos (after Hayes 1995, 1996; Tomber 1998, 1999, 2000, forthcoming).

Myos Hormos							
Trench 2B	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	2	5.5	2		2.5	3	
Faience					3	3	
Thin walled				6		1	
Other							
Trench 6A	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	5	11	18	0.5	39	22.5	
Faience					22.5	27.5	
Thin walled							

Other							1
Trench 6D	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	1		1		1		
Faience					25	44	
Thin walled	1			4		3	
Other							
Trench 6G	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	2	8	1		5	2	
Faience					79	53	
Thin walled	3			6		5	
Other	2		5				13
Trench 7A	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	7	141	148		133.5	46.5	
Faience							
Thin walled	7		2	1		13	
Other	9	3.5	3	2	25.5	1	
Trench 7	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	2	25.5			17.5	25	
Faience					2		
Thin walled				4		1	
Other				1		1	
Trench 8	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip						1	
Faience					1	12	
Thin walled						2	
Other			2		2	18	6
Trench E6 (Villa)	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip	2	19	4.5		4.5	13	
Faience	3			1	1	1	
Thin walled	4			**6**		1	
Other						2	
Trench 17 (CB A)	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip		3				4	
Faience	1					1	
Thin walled	1					1	
Other							
Berenike							
Trench 1	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip		1				1	
Faience							
Thin walled							
Other							
Trench 2	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip		11	5		2	8	
Faience							
Thin walled				1		1	
Other							
Trench 3	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip		1	1				
Faience							
Thin walled						1	
Other							
Trench 4	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip		6	3		3		
Faience						1	
Thin walled							
Other							

Trench 5	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip					3.5	2.5	
Faience							
Thin walled							
Other			1		3.5	4.5	
Trench 13	Other	Platter	Cup	Beaker	Dish	Bowl	Shell
Red slip							
Faience			1				
Thin walled	1						
Other	2			1	3.5	7.5	

14.8 Faunal remains from Aila and Nabataea

Species	Lejjun 3AD	Lejjun 4AD	Rujm Beni Yasser 1AD	Rujm Beni Yasser 3AD	Rujm Beni Yasser 4AD
cattle	51	29			
Aurock?					
Pig	54	55	8		
Chicken	337	281	12	4	1
Camel	92	46	1		
Horse		4		1	
Donkey	47	47	2	12	1
Equid					
Gazelle	9	8		4	
Goat	113	51	18	2	
Sheep	120	119	13	3	
Sheep/Goat	1298	877	77	16	1
Wild goat/sheep					
Ibex					
Onager					
Wild deer					
Wild boar					
Hare	4	5		2	
Bird	94	63			
Lion					
bear	0	2	0	0	0
Jackal		1			
Fox					
Dog		1			
Small carnivore					
CAT					
Rodent		1			
Fresh Crab	65	6			
Fish	3	3		0	0

Species	Hesban BC	Hesban Nabataean	Hesban Roman	Petra Nabataean	Petra Third AD
Tuna	372	4	79	34	29
Parrot fish	0	1	1	4	62
Clupeiformes	0	0	0	0	1
Emperors	0	0	0	28	60
Groupers	0	0	0	13	132
Seabreams	0	0	0	2	7
Wrasses	0	0	0	0	1
Grunts	0	0	0	1	0
Rabbitfish	0	0	0	0	5

snappers	0	0	0	3	0
Baracuda	0	0	0	1	0
Mullet	0	0	0	0	0
Trevallies	0	0	0	1	0
Scorpionfish	0	0	0	0	0
Other Red Sea	0	0	0	0	0
Red Sea Total	372	5	80	87	297
River	1	2	2	7	0
Mediterranean	0	62	0	0	0
Total fish	373	69	82	94	297

Species	Qasr Bshir 3AD	Qasr Bshir 4AD	Da'janiya 3-4AD	Aqaba area B	Hesban BC-3AD	Petra Ez Zantur 3AD
cattle	3	1		3%	553	15
Aurock?					3	
Pig	1	3	23	1%	232	60
Chicken	12	6	37		186	181
Camel	2	10	41	1%	39	36
Horse	2	1			0	32
Donkey	1	10	1		0	
Equid					72	
Gazelle		7	2		86	5
Goat	24	21	6		0	
Sheep	20	40	8		0	
Sheep/Goat	224	147	99	61%	3551	1390
Wild goat/sheep					10	5
Ibex					3	1
Onager					3	
Wild deer					37	
Wild boar					24	
Hare	1		7		1	2
Bird	8	1	46			
Lion					1	
bear	0	2	2			8
Jackal					0	
Fox					6	
Dog				1%	32	1
Small carnivore					34	
CAT					3	
Rodent		2	2		0	41
Fresh Crab					0	
Fish	0	0	9	28%	0	297

Species	Tamara Third AD	Lejjun Late third AD	Da'janiya Late third AD	Boqeq Fourth AD	St Aaron Byzantine
Tuna	17	0	0	0	0
Parrot fish	189	3	9	150	1873
Clupeiformes	0	0	0	0	0
Emperors	7	0	0	4	0
Groupers	16	0	0	24	358
Seabreams	0	0	0	0	0
Wrasses	1	0	0	0	0
Grunts	0	0	0	0	0

Rabbitfish	0	0	0	0	0
snappers	0	0	0	0	0
Baracuda	0	0	0	0	0
Mullet	30	0	0	40	0
Trevallies	0	0	0	0	0
Scorpionfish	1	0	0	0	0
Other Red Sea	0	0	0	0	157
Red Sea Total	261	3	9	218	2388
River	60	0	0	135	0
Mediterranean	30	0	0	7	0
Total fish	351	3	9	360	2388

14.9 Statistical significance and testing

Table 14.12. *Chi*-square tests. Tests to measure significant differences not being produced by chance. For details on calculating the complex *chi*-square test see Clegg (1982: 175-9).

Hypothesis	Results
Fauna consumption differs significantly depending upon context at Myos Hormos.	(χ^2=371.708, df= 18 significance <0.001) Significant difference with <0.01% chance that differences in fauna composition across Myos Hormos were random.
Fauna consumption differs significantly depending upon context at Berenike.	(χ^2=1084.072, df= 15 significance <0.001) Significant difference with <0.01% chance that differences in fauna composition across Berenike were random.
The use of just bowl/dish forms and the use of complete services differs significantly depending upon context at Myos Hormos and Berenike.	(χ^2=238.877/ 242.404 with Yates correction, df= 11 significance <0.001) Significant difference with <0.01% chance that differences in tableware forms across the Red Sea ports were random.
Evidence for the scale/frequency of maritime activity differs significantly depending upon context at Myos Hormos.	(χ^2=403.324, df= 15 significance <0.001). Significant difference (<0.01% chance random) in the occurrence of maritime artifacts across Myos Hormos.
Evidence for the scale/frequency of maritime activity differs significantly depending upon context at Berenike.	(χ^2=721.902, df= 19 significance <0.001) Significant difference (<0.01% chance random) in the occurrence of maritime artifacts across Berenike.
Evidence for the scale/frequency of maritime activity differs significantly depending upon context at Aila.	(χ^2=721.9, df= 6 significance <0.001) Significant difference (<0.01% chance random) in the occurrence of maritime artifacts across Aila.
The types of Maritime activity differed significantly depending upon context.	Not possible because expected values frequently fell below 5
Where tests were undertaken on the raw nisp data, significant differences were recognized in the fauna, maritime artifacts and ceramic data sets. In all cases the chance of these differences being the product of chance were less than 0.001, or 0.1%.	

Table 14.13 T test for related samples and correlation. For details on calculating the T test for related samples see Clegg (1982: 167-70).

Hypothesis	Results
The reliance on only dish/bowl pottery forms is directionally proportional to the consumption of a Red Sea fauna diet.	(t=1.416, df=9, >0.05) Not significant. However when deviation from the site average was plotted a clear positive

	correlation was seen (Figure 14.1), suggesting that the longer distance of Berenike from the Nile made its inhabitants more reliant on Red Sea or Eastern Desert fauna.
The consumption of Red Sea fauna is directly proportional to the use of maritime artifacts.	(t=7.746, df=21, <0.0005). Significant relationship between Red Sea fauna consumption and occurrence of maritime artifacts.
Stoppers directly proportional to ship maintenance.	(t=1.329, df=11, >0.05). When plotted a clear positive correlation was seen (Figure 14.2), though one value from trench 7A at Myos Hormos was outside of the trend.
Stoppers directly proportional to ship maintenance (after outlier from Myos Hormos trench 7A was removed).	(t=2.077, df=10, <0.05) suggests a possible correlation (<5% chance that the correlation is random).

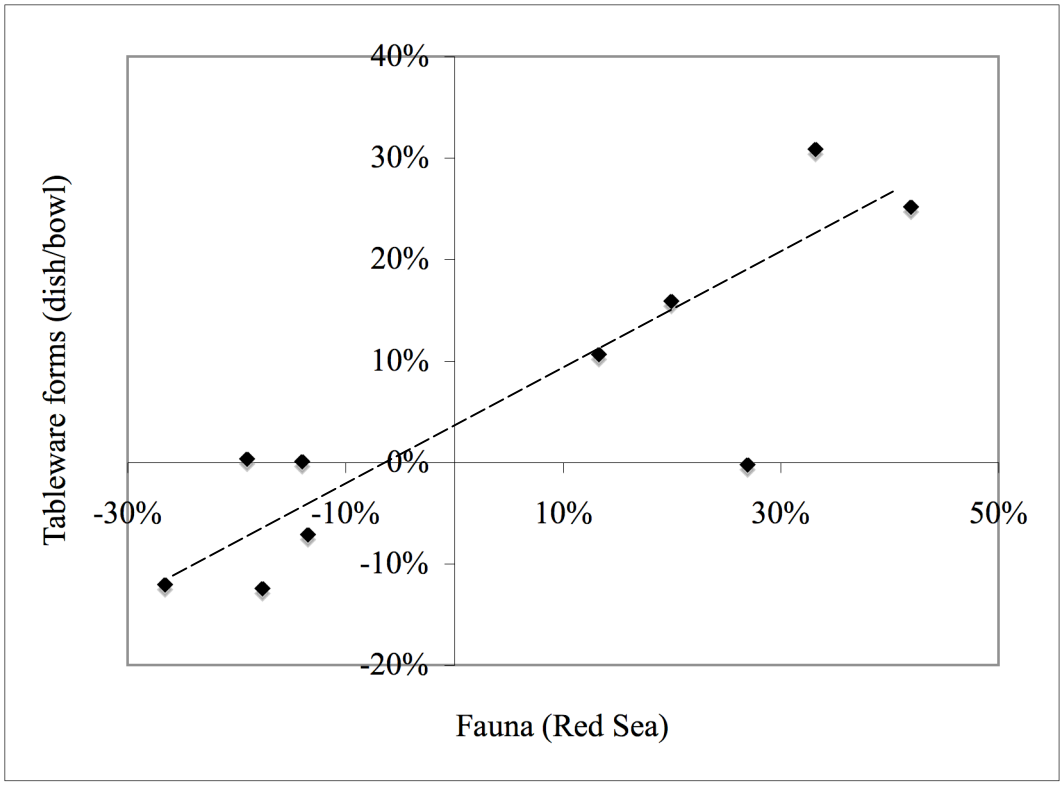


Figure 14.1. The reliance on only dish/bowl pottery forms has a positive correlation with the consumption of a Red Sea fauna diet once deviation from the site average was plotted (calculated by value for trench – site average).

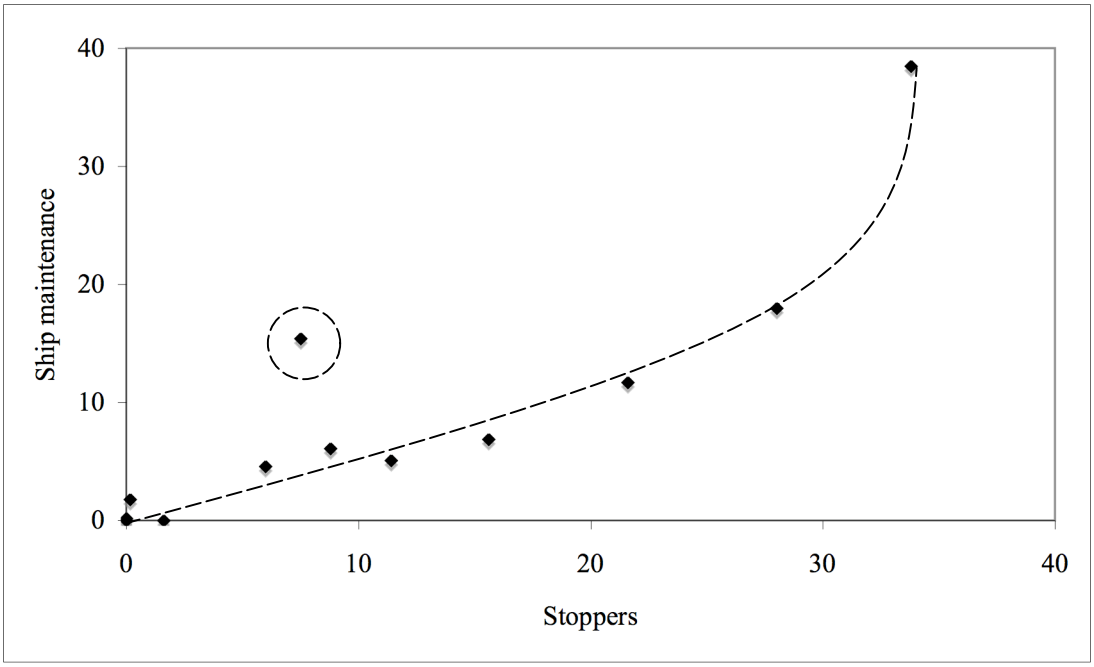


Figure 14.2. The occurrence of amphora stoppers (representing consumption of wine and oil) has a positive curvilinear correlation with the presence of artefacts of ship maintenance (note outlier from Myos Hormos trench 7A on top left, circled).

Table 14.14 T test for unrelated samples. For details on calculating the T test for unrelated samples see Clegg (1982: 170-3).	
Hypothesis	Result
Consumption of Red Sea fauna in the Red sea ports decreased between the first and third centuries AD.	(t=2.567 df=12. <0.025). Significant difference (<2.5% chance reduction of Red Sea fauna was random).
Consumption of Red Sea fauna in the Red sea ports decreased between the second and third centuries AD.	(t=1.304 df=12. >0.05). No significant difference (>5% chance reduction of Red Sea fauna was random).
Consumption of Domestic imported fauna in the red Sea ports decreased between the first and the third centuries AD.	(t=1.953 df=12. <0.05). Unlikely significant difference (<5% chance reduction of Domestic imported fauna was random).
Consumption of Domestic imported fauna in the Red Sea ports decreased between the second and the third centuries AD.	(t=2.915 df=12. <0.01). Significant difference (<1% chance reduction of Domestic imported fauna was random).
Consumption of Desert fauna in the Red Sea ports increased between the first and third centuries AD.	(t=3.596 df=12. <0.005). Significant difference (<0.5% chance increase of Eastern Desert fauna was random).
Consumption of Desert fauna in the Red Sea ports increased between the second and third centuries AD.	(t=2.63 df=12. <0.025). Significant difference (<2.5% chance increase of Eastern Desert fauna was random).
Maritime artifacts decreased in frequency between the first and third centuries AD.	(t=1.374 df=12. >0.05). No significant difference (>5% chance decrease in Maritime artifacts was random).
Out of just the Pig/Cattle/Sheep ratio's, ED forts have significantly higher consumption of pig than Nabataean settlements.	(t=7.856 df=17. <0.0005). Significant difference (<0.05% chance difference in diet was random).
Out of just the Pig/Cattle/Sheep ratio's, Nabataean settlements have significantly higher consumption of sheep/goat than Roman Eastern Desert forts.	(t=7.513 df=17. <0.0005). Significant difference (<0.05% chance difference in diet was random).
Out of just the Pig/Cattle/Sheep ratio's, Nabataean settlements have significantly	(t=10.875 df=34. <0.0005). Significant difference (<0.05% chance difference in diet

higher consumption of sheep/goat than Red Sea ports.	was random).
ED forts greater reliance on domesticated fauna than at Red Sea ports	(t=2.523 df=26, <0.01) significant difference (<1% chance difference in diet was random).