Centro Interdipartimentale di Servizi per L'Archeologia

Attività Archeologiche dell'UNIVERSITA' DEGLI STUDI DI NAPOLI "L'ORIENTALE"

Direttore Responsabile
Bruno Genito

ISSN 2036-6353

Volume 5, anno 2014

Bruno Genito
Editor in chief

Rosario Valentini
Typesetting and Layout

Newsletter di Archeologia, Volume 5, anno 2014

Estratti/Abstracts

Indice

Newsletter di Archeologia CISA, Volume 5, 2014, pp. 507-590

THE CONTRIBUTION OF THE UNIVERSITÀ DEGLI STUDI DI NAPOLI "L'ORIENTALE" TO THE 2013-2014 ERITREAN-ITALIAN ARCHAEOLOGICAL FIELD SEASON AT ADULIS

Chiara Zazzaro, Enzo Cocca, Alfredo Carannante, Anna Filigenzi, Romolo Loreto, Andrea Manzo, Valentina Perna (Università degli Studi di Napoli "L'Orientale")
Caroline Durand (Institut français du Proche-Orient, Amman)
Serena Massa, Chiara Mandelli, Rosanna Nardi (Università Cattolica del Sacro Cuore, Milano)
Dario Nappo (Università degli Studi di Torino)

Preface (by Alfredo and Angelo Castiglioni Directors of the Adulis Project)

The Eritrean-Italian Archaeological Project at the site of the ancient Adulis started in 2011, following the meeting of Alfredo and Angelo Castiglioni, Research Centre of the Eastern Desert (hereafter CeRDO), with the Eritrean Authorities. That meeting with an institution internationally known - especially thanks to the research carried out by CeRDO in Sudan - had as its purpose the promotion of culture and tourism in Eritrea through the valorization of the archaeological heritage.

The choice of CeRDO to engage in Adulis was motivated by the abandonment of excavations at the site after those carried out by Francis Anfray in the 1960s.

Following preliminary meetings of Alfredo and Angelo Castiglioni with the partner institutions the strategic objectives of the project have been designed to:

1. unearth the main monuments of the town, some of which already known and investigated since the late 19th century, to create an archaeological park;
2. guarantee the conservation of the monuments by appropriate restoration and by the training of the local staff, also to ensure a planned conservation;
3. reconstruct the history of the port-town in relation to its territorial area, both inland and overseas, with the help of advanced technologies such as remote sensing;
4. investigate the settlement chronological sequence through stratigraphic excavations;

5. offer training opportunities to the young Eritrean archaeologists and conservators;
6. involve the local communities and inform the public on the results of the archaeological research.

The partner Institutions of the CeRDO include the Università degli Studi di Napoli "L'Orientale" (hereafer UNO),[1] Università Cattolica, Milano,[2] Politecnico Milano,[3] Archeologia Viva[4] and Rovereto Museum[5] web tv for communication. The scientific coordination is entrusted by the CeRDO to Serena Massa, Università Cattolica. The Italian team collaborates with the National Museum of Eritrea (Yosief Liebsekal), with the Northern Red Sea Museum of Massawa (Johannes Gebreyesus), with the Topography Department of Asmara. The project is funded by the Eritrean government, by the CeRDO, by private sponsors (Gruppo Piccini, Perugia) and by the Universities.

Introduction (by C. Zazzaro)

The site of Adulis is located in the bay of Zula, on the Eritrean coast, 56km South of Massawa and it is currently circa 5km far from the coast, on the northern edge of the Haddas river; the two modern villages of Afta and Zula are respectively distant circa 1.5km to the North and to the South of the site (Fig.1).

Adulis was the most important port for trade in the northern Horn of Africa during antiquity: it was the port of the early urban settlements of the Eritrean and Ethiopian highlands and of the coastal and island peoples. Literary sources and material finds refer to direct trade contacts with peoples from the Mediterranean and of the western Indian Ocean, since the latest centuries BC to the early 7th c. AD. As a port with a long time life, Adulis has been the gateway for main historical events that had a relevant

[1]Responsible Andrea Manzo, Chiara Zazzaro, Enzo Cocca

[2]Responsible Caterina Giostra, Serena Massa

[3]Responsible Susanna Bortolotto

[4]www.archeologiaviva.tv

[5]www.sperimentarea.tv

impact on the history of the northern Horn of Africa, particularly the introduction of Christianity and Islam.

Literary sources suggest that Adulis was a port for trading natural products coming from the coastal lowlands and the islands and for trans shipping goods from India, particularly in the later periods. Excavations conducted in Adulis confirmed the presence of obsidian and ivory, mentioned in the sources. Despite the absence of turtle shells and rhinoceros horns, other local products, not mentioned in the written sources, were certainly used both for the local and the international market such as various species of shells, worked and unworked, and red coral found during recent excavations. Unlike the Egyptian ports of Berenike and Myos Hormos, Adulis offers limited opportunities to find archaeological evidence of trading in aroma, spices and other perishable products, because of its particular environmental conditions which affect the preservation of some organic materials. This has been so far compensated by other finds, particularly ceramic and stone remains originated from central Italy, North East Africa, Eastern Mediterranean, South Arabia, the Gulf area, and from the territories of the Nabatean Kingdom, the Byzantine and the Indian Empire of Gupta. These finds have enlarged our understanding of Adulis trade contacts, further research will certainly reveal more details also on the cultural implications of these contacts.

Archaeological research of UNO at Adulis has had as a goal, during the 2014 field season, to continue the setting of the chronological sequence started in 2011 (Zazzaro, Cocca and Manzo 2014), to better understand the connection among the town, the river and the sea, to investigate the local economy and trade networks through archaeological finds. At this aim, excavations started in 2011 in sectors 1 and 3 have been pursued. A new trench, sector 5, was opened to the South of the town, on the river edge, and a short - few hours survey - was conducted towards the coast for recording new archaeological evidence uncovered by the flood in November 2013.

The most interesting result of excavations in sector 1 was the finding of a new and, so far, the most ancient phase of occupation at the site dating, according to preliminary pottery and stratified deposits analysis, to the 1st-2nd c. AD. This occupation level was characterised by a concentration of pottery, bones, lithics and stone tools that can be referred to a domestic use of the area; associated with it, is the remains of a massive wall. Imported

materials from this earlier phase include Nabatean fine ware and Egyptian amphorae (AE3).

Archaeological investigations in Sector 3 focused on the examination of room "C" originally sealed by a compact layer of collapsed basalt stones. Room "C" delivered an occupation level ascribable to a domestic context characterised by local and imported potsherds - particularly Glazed Ware and Ayla Ware - and a blue beads bracelet, a hook of a steelyard, hundreds of *cypraea moneta* specie of shells and an anthropomorphic ceramic figurine that can be ascribed to the 'Gupta' art of the 4th - 6th c. AD (see *infra*).

Sector 5 was opened in the southern limit of the town, on the edge of the river Haddas. Excavations in this area revealed the presence of an intense and continue building sequence in a period comprised between the 5th and early 7th c. AD. The rooms investigated during this field season revealed the presence of a possible workshop area for the manufacture of the mother of pearl, ostrich shells and red coral, a food processing area with the evidence of three ovens similar to the contemporary *tannur*, still in use by the people inhabiting the Eritrean and south-Arabian coasts, and a domestic area characterised by fireplaces and by fragments of cooking pots and jars. It is worth to note the finding of a gold coin to which the inscription around was cut out in antiquity. Radiocarbon analysis of the charcoal found in the *tannur* dated this area to the second half of the 5th - end of the 6th c. AD (Zazzaro, Cocca and Manzo 2014).

Archaeological investigation at Adulis have been conducted using scientific methods of excavation of stratified deposits - indicated with four numbers in the present report - and producing standard photographic and written documentation. Plans and elevations have been produced using 3D photogrammetry (SfM) and the total station provided by Centro Iinterdipartimentale di Servizi di Archeologia (UNO). Archaeological finds have been described, photographed, inventoried on the site itself, selected for analysis and then stored in the Regional Museum of Massawa. For dating archaeological contexts in sectors 1 and 5, charcoal and shell samples have been sent to Beta Analytics Laboratory for analysis. Some potsherds, selected on the basis of their fabric are in course of analysis in the Department of Geology of the University of Naples "Federico II" for determining their composition and provenance.

Historical Background (by D. Nappo)

First mentions of Adulis date back to the 1st century AD. Pliny the Elder, when describing the eastern coast of Africa, mentions an *oppidum Aduliton* (NH 6.34). He also offers an etymological explanation for the name of the settlement, mistakenly relating the name Adulis to the Greek word for slave (*doulos*), and therefore assuming the city to have been founded by escaped Egyptian slaves (*Aegyptiorum hoc servi profugi a dominis condidere*). The importance of the site in the international trade is also clearly attested by Pliny in the following lines of his works, when he defines Adulis the most important emporium for the people of Trogodytica and Aethiopia (*maximum hic emporium Trogodytarum, etiam Aethiopum*).

Not surprisingly, also the *Periplus of the Red Sea* refers to the settlement as an emporium too, mainly for the ivory, obsidian and turtle shells (PME, 4-5).

Therefore, the importance of Adulis as port of trade (emporium) during the first centuries AD is safely assessed by our sources. Archaeological and documentary evidence prove this to be true throughout the early imperial age. It is after the 4th c. AD that the western sources seem to refer to Adulis as a military - and not just economic - power in the region. This rise in power ought to be at least partially related to the loosening of the Roman control over the western side of the Red Sea, due to the long period of political and military turmoil occurred during the 3th c. AD. Such period of weakening of the Roman Empire favoured the rise of a regional power in the Horn of Africa.

This is clearly reflected in the available sources dated to this period. The main author for the late antiquity is Cosmas Indicopleustes, whose Topographia Christiana is dated to the 6th c. AD. Cosmas records two inscriptions he observed in Adulis in his days. The first one, dated to the age of Ptolemy III the Euergetes (247 - 222 BC), states that the Hellenistic ruler used to capture wild elephants in the region of Adulis to supply his army. The second is better known as the *Monumentum Adulitanum*. According to Cosmas, it was inscribed in the 27th year of an unnamed king of Aksum, reporting his victories to the north and south of Aksum. Unfortunately, since the name of the ruler is not provided by Cosmas, one cannot date the inscription, not even approximately.

In the same century as Cosmas, it is reported an interesting episode very significant about the importance of Adulis in the international military and political *scenario* of the Red Sea area. In fact, since the reign of Anastasius I, the Byzantine Empire tried to gain control of the southern branch of the Red Sea, imposing its control over the local rulers. The turning point for such policy was in AD 517 when the south Arabian Hymyarite kingdom fell under the control of a Jewish leader, Dhu Nuwas.

The Ethiopian king Ella Asbeha, backed by the Byzantine Empire, decided to attack him, but his campaign was not successful, and Dhu Nuwas also tried to gain the Persian support in order to completely defeat his Ethiopian enemy. Nevertheless, the Persian king Kavadh did not heed Dhu Nuwas' request and the Hymyarite king started a campaign against Najran, killing thousands of Christians dwelling in the area. Justin decided to put an end to Dhu Nuwas' desire of conquest and in the winter of 524-25 sent a flotilla of Byzantine merchantmen from the Red Sea fleet mustered at the port of Adulis and carried an Aksumite army across to Yemen. This last detail is worth stressing: although the decision of attacking Dhu Nuwas' was taken by the Byzantine emperor, it was an Aksumite army to take care of the operations, and it was Adulis to be chosen as main hub for the fleet.

In two campaigns the Himyarite king was defeated and, as a consequence of these wars, South Arabia fell again under the control of the Aksumites, who put on the Himyarite throne a malleable king (Vasiliev 1950, 291-293; Greatrex 1998, 228-230; Haarer 2006, 41-42). The main ancient source on the events is the *Martyrium Sancti Arethae* (*Acta Sanctorum*, *Octobris*, vol. 10, 747).

This affaire marks the rise of Adulis as main port in the Red Sea area, and its strategic role for both trade and military campaigns, both oriented to completely control the southern Red Sea.

This quick and necessarily cursory overview of the historical evidence on Adulis shows clearly that the city was always a prominent port of trade for all its long history, spanning from the last centuries BC to the 7th AD. Alongside to this, it also played a significant role in the international policy in the Red Sea area, especially from the late 3rd to the 7th century AD.

A short survey to the coast (by C. Zazzaro)[6]

During the 2014 field season the team of the Massawa Museum was told by the local inhabitants that some scattered archaeological evidence were brought to light after the flood in November 2013, few kilometres to the East of Adulis. According to one of the informants, evidence of walls similar to those visible on the site were exposed along the sides of the Haddas river canals running towards the sea.

During the survey the informant was not able to identify the wall portions he had seen before but instead the team had the chance to observe other interesting evidence. Several scattered small mounds of pebbles and basalt stones associated with ribbed amphora potsherds and local pottery were observed on the edges of the river channels. One of these mounds had a decorative marble pillar associated to it, similar to Byzantine ecclesiastic furniture imported to Adulis and recorded by Paribeni (1907, 477, fig. 15; Heldman 1994, figs. 1-2) (Fig. 2).

An almost complete amphora was also found in a section of the river edge cut by the flood. The amphora was laying in an horizontal position in the sandy sediment, circa a couple of metres below the top of the river edge and circa 50cm above the river bed (Fig. 3). The amphora can be identified as a Gaza type (Majcherek 1995), produced on the Palestinian coast and probably containing a type of wine popular in the Byzantine period - perhaps connected to the Christian rite - or also used for carrying olive-oil and sesame-oil[7]. This type of amphora occurs on the Levantine coast and Egypt starting from the early 2nd c. AD (Peacock & Williams Class 48, Majcherek 2004) and in the western Mediterranean starting from the late 4th c. AD until the 7th c. AD.

[6]The short survey was conducted with Johannes Gebreyesus, director of the Regional Museum of Massawa.

[7]The author wishes to tank C. Durand for confirming the identification. For a general description of the amphora type and its variation see: http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/details.cfm?id=16&CFID=63428&CFTOKEN=5609BBDB-D06F-4817-8ECEBA0A0CD13890

Sector 1 (by V. Perna and C. Zazzaro)[8]

Sector 1 is located in the south-western sector of the site - the location of the most ancient phases of occupation, according to previous excavations conducted by Paribeni (1907) (Fig. 4). First excavations in sector 1 started in 2011; in November 2013 the trench was affected by a flood: some walls were damaged by the water infiltration and a thick stratum of river sediment covered the whole trench. Exposed stratified deposits were cleaned and the damaged walls secured before starting the new excavation. Archaeological investigations in 2014 has focused on the westernmost squares of the trench, A5-607, 608, B5-7, 8, B5-32, 33. Excavation started in the southernmost squares A5-607, 608, until reaching the same level of the northernmost squares excavated during the 2012-2013 field season. In squares A5-607, 608 the stratigraphy showed a high level of disturbance due to floods and to the stream activities: a number of stone collapses alternated to abandonment strata and concentrations of mixed materials.

Period 1, phase 1 - Period 1, phase 2

The surface layer consisted in a sandy and semi-sterile *stratum*, which covered the whole area (1004). This stratum was circa 30cm in thickness and it included only few potsherds. Below it a layer of collapsed basalt stones (1003) sloping southwards from the adjacent squares excavated in 2013, was found. The collapse concentrated in the S-W corner of squares A5-607, 608.

Period 1, phase 2

Below 1003, to the south, a fireplace (1073) was found and, below it, another collapse (1072). It probably was the continuation of 1003 which penetrated in the occupation layer on the top of which the fireplace was arranged. The collapse 1072 was characterised by concentration of mixed pottery and it covered, and partially cut 1074, a sandy, compact *stratum* catheterised by small charcoal spots scattered all over the *stratum*. Pottery

[8]The team of UNO was assisted by the team of the Regional Museum of Massawa and of the National Museum of Asmara both in the excavation procedures and in some documentation.

finds in this layer are very rare. Below the collapse and the fireplace a level of abandonment, very rich in pottery (1075), was found.

Period 2, phase 1

Layer 1075 extended both in squares A5-607 and 608. The excavation of this layer delivered five shells, of two different species, similar to those found during the 2013 field season in the adjacent squares and dated by C14 to the early 2nd - late 4th c. AD. Pottery finds in 1075 include a fragment of cauldron and several fragments of jars with applied and incised decoration between the neck and the shoulder, basins, with or without incised decoration on the rim, bowls with vertical profile and some fragments of burnished black ware. The removing of this stratum, in A5-607 revealed the presence of another collapse (1077) sloping very deeply in the south-western corner of this square. Another fireplace was found within this layer (1076). The fireplace was probably earlier than the collapse and it was disturbed by it. The fireplace consisted in shallow traces of red and burnt soil. The collapse 1077 was ca. 30-35cm in thickness and it included basalt stones and several fragments of pottery, including thin-walled restricted bowls and several basins' rim.

Period 2, phase 2

The collapse 1077 covered an abandonment silty clay soil *stratum* (1078-1089) identified as the same abandonment *stratum* found in the adjacent squares in 2013 (1056). In order to homogeneously investigate this layer, the team decided to remove a wall portion, 1048, uncovered during the 2013 field season and North-South oriented. Layers 1089/1056 were very rich in pottery and bones. The pottery assemblage here was particularly interesting because of the presence of some almost complete pots, especially concentrated at the base of the wall 1048, including a rim of a possible jar, with thin walls and incised decoration, a handled pot, with fire clouds at the base, fragments of jars with applied and incised decoration, thin walled potsherds with incised decoration and slipped treated surface, beakers with thin walls and incised and painted geometric decoration, fragments belonging to cooking pots with red slip and incised decoration on the rim and on the handle attachments. It is worth to mention the fact that this layer did not delivered ribbed Ayla amphora potsherds if not in few disturbed spots, confirming a date for this stratum earlier than the 4th c. AD. It is also

interesting to note that some potsherds belonged to the same pots whose fragments were found during the previous field season. Layers 1089/1056 was ca. 20cm thick. Below it a softer soil including big mammals bones (1078) was identified in squares B5-7, 8, 32, 33. The pottery assemblage included a small jar with preserved neck and handles and impressed, incised and painted decoration, perhaps imported. In squares A5-607, 608 the excavation of the collapse (1077) and of the abandonment layer (1075), revealed another abandonment layer 1079 contemporary to 1078, SU 1089 and 1056. This layer was characterised by a compact and plastic soil, on the top of which were few potsherds, and two fireplaces (1083 and 1091), cutting also 1082, a layer found underneath 1079/78/89. The two fireplaces were characterised by burnt soil, red traces of fire and pottery, in particular basins and bowls with fire clouds. The removing of 1078/1089/1079 revealed an uniform layer, 1082, which covered the whole excavated area. Layer 1082 was ca. 20-25cm thick and it was characterised by a sandy soil and some scattered basalt stones. The pottery assemblage included jars with applied and incised decoration, some fragments of thin walled beakers with incised and red painted decoration, two atypical handles with impressed dots decoration and fabric rich in large white mineral inclusions. In the north-eastern area of square B5-33, a hole (1080) cutting (1081) layer 1082, was found.

Period 2, phase 3

The removing of 1082 revealed the presence of a wall alignment running roughly East-West in squares B5-7, 8. This wall (1086) is the continuation of a wall (1026) excavated during previous field seasons. The wall, South-West-North-East oriented, is 6.20m long and ca. 0.90m wide consists in basalt stones and few pebbles, roughly squared, 25×30cm on the sides and 17-20cm in the centre. A portion of wall (1094) forms a corner on the N side of 1086. This wall is circa 0.90m wide and 0.90m long (Figs. 5 6). The two walls 1086/1026 and 1094 consist in only one row and they reach maximum 20cm in elevation. The layers exposed below 1082, on the opposite sides of wall 1086, were distinguished (1084 and 1090, in B5-7, 8, and 1085, in A5-607). Layers 1084/1090/1085 were characterised by a sandy, silty and compact *stratum*, abundant pottery, including jars with applied and incised decoration, some fragments of bowls restricted and unrestricted, potsherds belonging to small cups or bowls with thin walls, a

potsherd of cauldron, the most ancient type identified so far in the classification, showing an applied and incised button on the body, and some black topped potsherds showing a red slip on their bottom part. Below this layers an occupation layer, 1087/1093, and a fireplace (1088) near the western end of wall 1086, was found. The fireplace consisted in traces of red soil, with some black spots, the occupation layer 1087/1093 was characterised by a concentration of pottery disposed in horizontal position (1092) bones, horns, purple pigment and lithic instruments at different phases of working. Layer 1092 included whole pots, comparable with well-known types of Aksumite production dating to the 1st - 2nd c. AD. 1092 covered a new un-excavated layer (1095). Very notable are bowls and cups with burnished treatment on the surface and unrestricted bowls with red slip, foot-ring and thin walls. It is worth to note the presence of "bag shaped" restricted bowls, the fabric of which is similar to that of the beakers with incised and painted decoration and a strainer which presents the same typological characteristics of the beakers. Further investigations in the Sector 1 will be aimed at exposing a larger portion of this earlier phase of occupation and the wall associated to it (1086-1094).

Sector 3 (by E. Cocca)[9]

Sector 3 is located few meters South of a basalt and schist mound and few meters North of a monumental building showing a basilica plan. The building was excavated in 1868 by William West Goodfellow, Captain of the Royal Engineers, with the patronage of the British Museum during the British military expedition led by Lord Napier against King Theodore of Abyssinia (Holland - Hozier 1870; Markham 1869) (Fig. 4).

Excavations in sector 3 started in 2011: up to 2 metres of river sediment sealed the walls and their collapses providing almost intact evidence of the abandonment of the town. At the starting of the 2014 field season, prior to begin the excavation in the sector, it was necessary to clean the whole area because it was affected by a flood during the rainy season. The trench was then extended 4m northward, 2m eastward and 2m westward, making a rectangular trench 16×10m in dimension. The south

[9]The team of UNO was assisted by the team of the Regional Museum of Massawa and of the National Museum of Asmara both in the excavation procedures and in some documentation.

edge of the trench was extended of about 1m and excavated in order to form a 50cm step. The extension of the excavation area permitted to show the continuations of walls and structures adjacent to those exposed in the previous field season. The head of walls 3059-3060 delimiting room "D" together with walls 3055-3054-3053 came to light. The eastern side of Room "D" is characterised by a small entrance (3061), ca. 1m wide. About 0.20m of the collapse (3057) filling room "D" was removed highlighting the perimeter of the exposed walls. Moreover, the northern walls of room "C" and "A" have also been identified. Due to the decaying state of the walls, it was impossible to excavate the interior of the rooms, with exception of a small selected area in the south-west corner of room "C" where the walls appeared more solid and stable. A test-pit measuring 1.50×1.50m was carried out with the aim to find both the pavement of the room and the foundation of the building (Fig. 7). The portion of the room was excavated until reaching a depth of 1.50m from the head of the wall 3035. The stratified deposit consisted in collapsed basalt stones (3040) covering a clay-silt stratum (3058) including different layers that will be described more in detail in the final report. The occupation layer 3058 is ascribable to the *Period 1, phase 2* (5th - late 6th c. AD) of the site chronological sequence, it included imported potsherds of Ayla type and Glazed Ware, local pottery fragments - some forming almost complete pots - many *cypraea moneta* specie of shells - some of which burnt - few fish and animal bones, fragments of glass vessels and ostrich eggs, one blue beads bracelet, one bronze coin - not readable - polished stones, iron fragments and a bronze steelyard hook, and a double-flared plug for body piercing. After a preliminary analysis it is suggested that the plug is in glass, the surface is yellow-whitish iridescent, flares outward at both ends, and is thinner towards the middle[10]. The most outstanding find from room "C" consisted in an anthropomorphic ceramic figurine showing oriental features ascribable to the Indian 'Gupta' art of the 4th - 6th c. AD (see *infra*).

At the bottom of these layers a concentration of pebbles (1×0.20m) running parallel to the wall 3034 was found. Further investigations in this sector will be aimed at extending the area of excavation in Room "C" and in the other rooms.

[10]A similar object is shown in the Anfray's report on excavations at Dongour (Aksum) (Anfray 2012 Pl. LXXI).

Sector 5 (by C. Zazzaro)[11]

Sector 5 is a new excavation sector opened at the southern limit of the town, on the edge of the river Haddas (Fig. 4). The area was selected because portions of walls were partially exposed during a flood in 2009. Structures and stratified deposits were recorded before they are further damaged by external agents such as the passage of animals and water infiltration.

A small portion of a housing and workshop quarter was brought to light. Excavations revealed that it extended further South the limit of the trench, suggesting that the border of the town exceeded the current limit traced by the river and that it was larger than it appears today, being partially buried under the river deposit. Several walls and rooms were uncovered and test excavations were conducted in three rooms suggesting an intense and continue building sequence perhaps since the 5th to the early 7th c. AD (Fig. 8).

The different rooms were used one as a workshop for the manufacture of the mother of pearl and red coral and for the opening of ostrich shells, one for domestic purpose, and another for food processing for the presence of three ovens similar to the contemporary *tannur*, still in use by the peoples inhabiting the Eritrean and the South-Arabian coasts. It is worth to note the finding of a gold coin in one of the rooms.

The investigated area in Sector 5 extends 34m East-West and 10m North-South, is delimited to the North by a wall of river sediments including remains of partially collapsed buildings with walls North-South and East-West oriented, and to the South by an elongated, shallow mound of river sediments on the top of which are scattered bushes. To the East and to the west the surface is flat and open, clearly showing the direction taken by the river during the flood. Before starting the excavations the area appeared covered by an irregular sandy silty surface layer (5002), with some walls emerging from the sand indicating the presence of at least four rooms, scattered basalt stones (5003) and potsherds, particularly ribbed amphorae. In the western sector of the trench two roughly square rooms adjacent to each other were identified, Room 1 and Room 2. Room 3 abut on the

[11] The team of UNO was assisted by the team of the Regional Museum of Massawa and of the National Museum of Asmara both in the excavation procedures and in some documentation.

northern edge of the river formed after the 2009 flood and it extends towards south; room 4 is located at the eastern limit of the trench, it also abuts on the river edge and extends towards south. Room 5 abuts on the southern mound, extends to the centre of the trench and it is East-West and North-South oriented.

The walls are made with the typical rubble-work masonry with shapeless basalt stones in the middle, and sub-rectangular or sub-trapezoidal basalt stones (showing four or five sides on the external face) and rectangular schist slabs on the sides, bonded with earth mortar. Basalt stones have smooth external faces and are sometimes alternate with row of rectangular schist slabs or wedged with small schist to provide cohesion and stability to the wall structure.

Room 1

Room 1 is 1.44×1.67m and it is delimited by four walls (5005, 5006, 5007 and 5008) apparently without entrance. A 1m deep test pit was excavated in order to investigate the building and occupation sequence. The different arrangement of the walls were identified each as a distinct building period (Periods 1, 2 and 3) to which several occupation phases, identified by the presence of living floor, were associated (Phases 1 to 3).

Period 1, phase 1. The northernmost wall (5005) runs parallel to another wall (5004) to which it is separated by a small gap, while the southern wall (5007) is in common with room 2, another wall (5008) delimited the west side of the room. The first stratified deposit excavated is an abandonment layer of yellow silty soil, circa 0.25m thick, including charcoal, potsherds, particularly cooking pots, ribbed amphorae, one bead, one disk bone one fragment of a knife and a spearhead, a glass fragment of an *unguentarium* and a gold coin (5000). This level can be ascribed to phase 1 of occupation inherent to the last building period (Period 1) in Sector 5. The series of occupation levels which preceded level 5000 were inherent to two previous building periods during which the room was larger.

Period 2, Phase 1. Below 5000 traces of fireplaces were identified (5015), associated to them there was an occupation layer characterised by charcoal, bones, potsherds and glass fragments (5016). The southern wall (5007), the

eastern wall (5006) and the northern wall (5005) were inherent to this occupation period.

Period 2, Phase 2. Below this layer another occupation layer, circa 0.15m in thickness, was found (5027). It was characterised by the presence of an oval grinding stone, a small fireplace, concentration of potsherds disposed in an horizontal position, two nails, a glass fragment and several bone fragments.

Period 2, Phase 3. Below this layer another occupation layer, circa 0.20m in thickness, was found (5029). It was characterised by a concentration of pottery and a small fireplace (5030) 0.43×0.40m and 0.04m in thickness located next to the west section.

Period 3, Phase 1. Below 5029 an occupation or abandonment layer, ca. 0.10m in thickness, was found (5031) and to the bottom of it, a fireplace (5036) ca. 0.10×0.15m associated to another occupation layer, 5037. The eastern wall (5006) and the northern wall (5005) were inherent to this occupation period.

Period 3, Phase 2. 5042, 5043 are small fireplaces above 5039 associated to 5037 level II.

Period 3, Phase 3. An oval fireplace (5039), continuing in the section, was found below 5037, associated to a concentration of charcoal (5040) laying on a living floor, 5041.

Room 2

Room 2 is roughly 1.63×1.30m and it is delimited by four partially preserved walls alignments, the southern (5009) and the northern one were better preserved (5007) than the other two. Wall 5007 is in common with Room 1, the entrances were not detected and the room was not excavated. Surface collection included mainly ribbed amphora potsherds (5001).

Room 3

Room 3 is circa 3m in width and it is delimited by two visible walls forming the north-west corner, a North-South oriented wall (5010) and an East-West

oriented (5011) wall, another wall (5012) abut on the northern wall (5011) and to its collapse extending 0.70×0.50m and 0.65m in height (5017).

After the removing of the surface layer which extended in the whole area with irregular thickness (5002), a layer of sandy silty soil with charcoal (5013) and a compact clay soil (5014) alternated, covering the whole surface of the excavated portion of the room. Within this layer three cylindrical ceramic ovens, 0.48-0.50m in diameter, were found, very close one to the other. This ovens were named *tannur* because of their close similarity to the traditional ovens employed by the local people in the region and also by people inhabiting the Yemeni coast. *Tannur* 1 (5019) is the northernmost oven, located in the N-E corner at an higher elevation than the other two, *Tannur* 2 (5020) is located South of *Tannur* 1 while *Tannur* 3 (5022) is located S-W of *Tannur* 2 They were all filled by sediment (respectively 5018, 5021 and 5023). To the west of *Tannur* 3 the soil is compact and rich in charcoal and particularly in bovine bones (5028).

Tannur 3 was the better preserved and it was selected for a better examination (Fig. 9). The excavation of the sediment inside the oven revealed the presence of 3 layers: a charcoal layer ca. 11-12cm in thickness, a layer of ashes ca. 3.5cm in thickness and a red burnt soil at the bottom, ca. 4cm in thickness. The content of *Tannur* 3 was sampled, and the oven was removed from its original position, documented and stored in the Museum in Massawa. This *Tannur* measures 50cm in diameter, it is ca. 10cm high and it has an opening 9cm wide, the thickness at the bottom is 4cm and 0.6cm at the top. The bottom part is burnt and friable while the external and internal surfaces are characterised by wiping. The charcoal found at the bottom of the *tannur* was analysed and dated by C-14 to the 5th - late 6th c. AD (Zazzaro, Cocca and Manzo *in press*).

Tannur 1 was only partially exposed because of its fragile state of conservation, the oven wall was reinforced with a fragment of ribbed amphora and a stone. Its original diameter was ca. 50cm. The content, ca. 30m thick, included ca. 4cm of ashes and 3cm of burnt soil at the bottom.
The ceramic cylinder forming *Tannur* 2 was partially preserved only on one side, its original diameter was ca. 50cm.

Room 4

Room 4 was initially delimited by two visible walls forming a North-East corner, a East-West oriented wall (5044) 2 metres long, and a North-South oriented wall (5045) extending over 2 metres long. A mound of compact sandy silty soil was accumulated in the north-eastern corner (5025/5038) while the rest of the area was covered by a silty soil of loosed sand. 5025 included charcoal fragments, an amphora lid, shell fragments and some local and imported potsherds, mainly amphorae. A fragment of plastic bag was found within this layer, testifying the fact that this was an occupation level disturbed by the flood and by the river activity.

Excavation focused on a selected area 4×2 metres delimited by the northern, eastern and western walls of Room 4 and by the square of the trench to the South. A layer of loosed sand (5025) alternated with a stratum of compact clay (5026) which formed a sort of veins in the sandy stratum. Below the sandy (5025) and clay soil (5026), a compact layer of river sediment including small pebbles was found (5035).

The occupation layer in this room was clearly disturbed by the river activity, despite that, the team was able to identify the bottom of the occupation level recording the evidence of a possible workshop and the full elevation of the preserved part of the walls. Pottery finds in this room were very limited compering to the other rooms, most of the potsherds consist in ribbed Ayla type of amphorae. Other finds include mother of pearl shell portions, intentionally cut, and associated debris, oyster shells, several red coral fragments, glass beads and a Byzantine type of lead weight (see *infra*). These findings point to an interpretation of the room as a workshop and a shell manufacturing area for the production of mother of pearl inlay, perhaps for exportation as manufactured product. The presence of shell manufacturing areas and workshops seems to be recurrent at the site considering that also Paribeni (1907, 485- 486) has recorded the same evidence.

The northern wall (5044) is 1.42m high and 2m long, the elevation of the wall is characterised by a step 0.82m high and 15-18cm wide. A thick layer of plaster extends 0.25m in high from the step. The recorded width of the eastern wall is 0.61m, while the recorded length is 2.15m, the preserved elevation is 1.17m. It is worth to note that the wall is characterized by larger stones at the bottom and smaller stone at the top, some schist and some plaster fragments. The recorded width of the western wall is 0.88m, while

the recorded length is 2.15m, it is preserved for 0.40m in elevation. The wall is characterised by large stones at the bottom, 0.22×0.27×0.22m.

Room 5

Room 5 is a rectangular room 4.60×3m, it is delimited to the South by a wall which abut on a mound of river sediment (5047), to the East by a continuous wall (5049) extending 4.40m towards North, to the West by a 3m wall (5048) and to the North by a 2.57m wall (5046) which interrupts to make an entrance in the north-eastern corner of the room. These walls are ca. 0.70m in thickness. A further wall was found to the North (5050) after removing part of the collapse (5032). The surface layer is consistent with the same sandy soil scattered in the whole area, 5002, below it a layer of basalt stone, collapsed and dispersed by the flood, was found (5032).

Local pottery (by V. Perna)

Three main ceramic groups have been identified and related to the chronological sequence of stratified deposits, on the basis of their morphological features, fabric composition and manufacture (Zazzaro, Cocca, Manzo *in press*). Typical of the later phases, 5th - early 7th c. AD, are coarse ware globular bowls and basins with ledge rim and incised crossed decorations on the lip, globular jars with conical neck, sometimes with a handle incised with geometric motifs, and globular shaped - flat bottomed cauldrons with incised decoration on the handle and at the joint. Fine ware bowls and cups with incised or impressed Christian cross also occur in the later phases, the type of fabric may point to a non-local provenance for these types. Similar vessels start to appear in stratified deposits at Aksum in the early 6th c. AD or before. Typical of an intermediate phase (4th - 5th century AD) are ovoidal cauldrons with squared handle and ledge rim, bag-shaped jars with moulded and incised decoration among the neck and the shoulder and bowls and cups on foot rings. Very common of the earliest phases (1st - 3rd century AD) are restricted cups with moulded decoration and vertical handle, thin-walled beakers with incised and painted geometric motifs, basins with moulded decorations, ovoidal cauldrons with upright handles, jars and amphorae with cylindrical neck and globular or bag-shaped body.

Fabrics are very variable, rich in mica and mineral inclusions, vegetal inclusions occur in basins and storage jars. In the later phases vegetal inclusions and large mineral inclusions, grey and white in colour, often with angular shape, are common. Typical of the earliest phases are fine and compact fabrics with fine-grained inclusions.

The distribution of the different pottery types collected during the 2013-2014 field season has not been entirely quantified as it will be matter of further studies so as distribution analysis.

Sector 1

The pottery from sector 1 is very abundant and various. 992 diagnostic potsherds have been found in the overall. This assemblage has permitted to elaborate a pottery sequence which goes from to the 1st to 7th century AD. The stratigraphic contexts are partially disturbed by the stream activity, which has caused the mixing of materials in some layers, particularly in 1004 and 1082, and in the collapses 1072 and 1077. Potsherds coming from these layers are dating to different phases. We also have undisturbed stratigraphic contexts, in which pottery assemblages are very coherent, both chronologically and typologically, such as 1092. Pottery types are described from the most recent to the most ancient.

Sectors 2, 3, 4 and 5

During the 2014 field season sector 2 has delivered 171 potsherds. Sector 2 has a pottery assemblage very different from the one of sector 1. In fact the stratigraphic context in which potsherds have been found is in part the refilling following excavation conducted by R. Paribeni in 1907 and in part the stratified deposit inside the church and the monumental substructure named “Ara del Sole” by R. Paribeni. A part for few unknown fragments, most of the potsherds can be dated to the last phase of the town, between the 5th and the 7th century AD on the basis of comparisons with better preserved stratified deposits of the other Sectors.

Sector 3 gave 150 diagnostic potsherds, all of them can be ascribable to the period between 5th to 6th century AD. The stratified deposit in which potsherds of local pottery have been found is undisturbed and it represents the last phase of occupation of Adulis.

The ceramic assemblage from sector 4 is very limited because the unique stratified deposit in which local potsherds have been found is the

result of a refilling following the excavation conducted in 1907 by R. Paribeni. In total six diagnostic fragments have been found during the 2014 field season, all possibly dating to the 5th - 7th century AD on the basis of typological comparisons with similar types found elsewhere on the site.

Stratified deposits in sector 5 are inherent to the abandonment and to the last phase of occupation of the town. The surface layer delivered some mixed materials washed away by the flood, but it also includes more consistent pottery assemblages coherent with the other occupation levels excavated in less disturbed contexts of this sector.

Sector 1 (Figs. 10-21):

1. fine bowl with incised line below the rounded rim, horizontal grip, foot ring. Diameter 14cm. Local micaceous fabric, with mineral temper, white and grey inclusions up to 1mm, the white ones <1mm. Red slipped surface, the core is red too. External surface is burnished. Probably a local version of an imported type. Circa. 1st century AD;
2. fine bowl with incised line under the rounded rim, horizontal grip with stylized rope motif, foot ring. Diameter 11.8cm. Very fine fabric, with small inclusions, both grey and white, <1mm. Red slipped surfaces, the core is light orange. The external surface is burnished. The applied grip is also a decorative motif. It is probably a type of vessel imported from the highlands. Circa 1st century AD;
3. unrestricted fine bowl, with pointed rim. Diameter is 120mm. Local fabric with mineral temper, rich in mica and rounded white inclusions. Brown reddish surfaces, the core is grey. Circa 1st - 2nd century AD;
4. unrestricted fine bowl, with thin rim. Diameter 120mm. Local fabric with mineral temper, rich in mica and rounded white inclusions. Surfaces are brown reddish, the core is grey. Circa 1st - 2nd century AD;
5. unrestricted fine bowl, with thin rim, incised line under the rim. Diameter 300mm. Fabric is micaceous, with small white inclusions, <1mm. Red slipped and burnished surfaces. The core is dark red. The incised line is not regular. Circa 1st - 2nd century AD;
6. unrestricted fine bowl, with thin rim. Diameter 180mm. Fabric with mineral temper, micaceous, small inclusions white and grey. Surfaces are red slipped. A fire cloud is present on the internal surface. Circa 1st - 2nd century AD;

7. unrestricted bowl, with rounded slightly everted rim and incised line under the rim. Diameter more than 380mm. Fabric with both mineral and vegetal temper, white inclusions up to 1 mm and pores <1mm. Brown surfaces, the core is brown-grey. Circa 1st - 2nd century AD;
8. unrestricted bowl or possible jar neck, with slightly everted rounded rim. Diameter 140mm. Fabric with mineral temper, rich in grey inclusions, up to 1mm. Surfaces are brown, the core is light grey. Circa 1st - 2nd century AD;
9. fine bowl with rounded rim. Diameter is not determined. Fabric is very fine, with small inclusions. <1mm. Both surfaces are red slipped and burnished. The core is light orange. Circa 1st - 2nd c. AD;
10. small and fine jar, with a possible applied decoration and incised line under the rim. Diameter 40mm. The fabric is mineral tempered, inclusions are white and grey, <1mm. External surface is red slipped and also the area near the rim on the internal surface. Internal surface is smoothed. The core is brown-grey. Circa 1st - 2nd century AD;
11. fine bowl or jar neck with an incised line under the pointed rim. Diameter 180mm. Fabric with mineral temper, rich in quartz. Small inclusions, both white and grey and vacuoles. Surfaces are brown, as the core. Circa 1st - 2nd century AD;
12. fine small jar with incised line under the rim. Diameter is ca. 120mm, fabric is micaceous, with small white inclusions, up to 1mm. Surfaces are smoothed, both brown, the core is brown-grey. Circa 1st - 2nd century AD;
13. fine small jar with a vertical rounded handle and a horizontal grip, very thin rim and incised line under the rim. Diameter is 60mm. Fabric is very micaceous, with mineral inclusions up to 1mm. The core is brown and grey. Surfaces are brown and burnished. Circa 1st century AD;
14. globular bowl, with a vertical rounded handle and two applied buttons. Diameter 70mm. Fabric is very micaceous, with small white and grey inclusions <1mm. External surface is light brown and smoothed, internal one is grey. The core is grey. On the internal surface, finger impressions are present. Traces of fire clouds. Circa 1St - 2nd AD;
15. bowl with rounded base. Diameter ca. 80mm. The fabric is very rich in mica and angular quartz inclusions. The external surface is red slipped, the internal one is smoothed. The upper part of the pot is not preserved. Circa 1st - 2nd century AD;
16. jar neck with incised and painted decoration, similar to the beakers type (no 17). Diameter 140mm. The fabric is mineral,

with inclusions up to 3mm, rich in mica. External surface is smoothed, red and light brown, the internal one is light orange. On the external surface bands of incised lines, with some red painted circles. The part between the neck and the shoulder shows a wavy incised pattern. The internal surface is scraped. Circa 1st - 2nd century AD;

17. beaker with incised and painted decoration, everted angular rim. Diameter 120mm. Fabric is mineral tempered, with small inclusions, up to 2mm. Surfaces are light brown, smoothed, the core is grey. On the external surface bands of incised lines are alternated with incised and red painted triangles. A red painted band is present on the internal part of the rim. Circa 1st - 2nd century AD;
18. beaker with incised and impressed decoration, rounded rim. Diameter 220mm. Fabric is micaceous, with small rounded mineral inclusions, up to 1mm. Surfaces are red slipped. On the external surface a geometric pattern of incised lines, with impressed dots is present. Circa 1st - 2nd century AD;
19. strainer or filter, incised and painted decoration. Diameter 650mm. Similar to the beakers type (Nos 16, 17, 18). Fabric is fine, mineral tempered with small inclusions. Surfaces are light brown, smoothed. The core is light orange. The body is covered by incised lines, alternated with painted triangles. The internal part of the rim is red painted too. Possible part of a bottle. Circa 1st century AD;
20. small cup with one rounded vertical handle and incised line under the rounded rim. Diameter 50mm. Fabric is with mineral temper, rich in small inclusions, both white and grey, up to 1mm. Surfaces are red slipped, but very eroded. Mica is visible on the external surface. The core is grey. Circa 1st - 2nd century AD;
21. small cup with one vertical handle, incised line under the rounded and slightly thin rim. Diameter is not determined. Fabric is rich in mineral inclusions, white and <2mm. Surfaces are red slipped. Vegetal impressions are visible on the external surfaces. Circa 1st - 2nd century AD;
22. unrestricted bowl with applied decoration and incised line under the rounded and thin rim. Diameter 240mm. Fabric is mineral tempered, rich in inclusions, up to 3mm white and grey. Surfaces are red slipped and burnished. The core is dark red. The decoration consists in an horizontal sort of grip, rope shaped, applied below the rim. Circa 2nd - 3rd AD;
23. unrestricted bowl with applied decoration, black topped. Diameter 220mm. Fabric is mineral tempered, rich in

inclusions up to 1.5mm, grey and angular, the core has a laminar structure. The external surface is red slipped and burnished, the internal one black and burnished. Decoration is applied and it consists in a sort of moulded rope. Circa 2nd - 3rd AD;

24. unrestricted bowl, black topped and slightly thin rim. Diameter 220mm. The fabric is mineral tempered, rich in inclusions up to 1.5mm. grey and angular, the core has a laminar structure. External surface is red slipped and burnished, the internal one black and burnished. Circa 2nd - 3rd AD;
25. globular bowl with incised cross and rounded rim. Diameter 140mm. The fabric is mineral tempered, inclusions are up to 2mm, grey and white. Surfaces are light red slipped, the core is grey. The cross, incised below the rim, is not entirely preserved. Circa 5th - early 7th century AD;
26. unrestricted bowl, with everted and thin rim, flat base. Diameter 120mm. Fabric is mineral tempered and micaceous, small inclusions <2mm. The internal surface is red slipped, the external one is smoothed, with traces of fire clouds. Circa 2nd - 3rd AD;
27. unrestricted bowl with impressed cross, incised line under the rim. Diameter 140mm. The fabric is mineral tempered, micaceous with small mineral inclusions, <2mm. Surfaces red slipped and burnished, the core is grey. The cross is impressed, under the incised line, below the rim. Circa 5th - early 7th century AD;
28. small double handled jar, with globular body, painted, incised and impressed decoration. Diameter 50mm. The fabric is mineral temper, micaceous, inclusions up to 2mm, grey and white. The white ones are quartz. Surfaces are smoothed. On the external surface, a light brown slip. The core is light grey. The decoration consists in impressed motives of dots, between the neck and the shoulder, in a double line. Red painted bands form a geometric pattern, with circles and squares. Three incised and wavy lines go from the neck to the body of the pot, in a combed motif. The handles have a rounded section. Circa 2nd - 4th century AD;
29. small double handled jar, with impressed and incised decoration, traces of painted motives. The diameter is 50mm. The fabric is mineral tempered, micaceous with inclusions up to 2mm, grey and white. The external surface is red slipped, but very eroded, the internal one is grey in the lower part, red in the upper one. The core is grey. The decoration consists in a thin band of impressed motives, between the neck and the

shoulder, and vertical impressed lines. Traces of red paint are visible on the body of the pot. Circa 2nd - 4th century AD;

30. foot ring with black and red slip treatments. Diameter is 50mm. The fabric is very micaceous and rich in mineral inclusions, white and grey <1mm. The external surface of the foot ring is red slipped and burnished, the base of the pot is black and burnished. Very small pores are visible in the section. Circa 2nd - 4th century AD;
31. small bowl with irregular shape. Diameter 60mm. The fabric is very micaceous and mineral tempered, small inclusions up to 2mm. Surfaces and core are brown-reddish. Fire clouds on the external surface. Circa 2nd - 4th century AD;
32. pottery disk with central hole. Diameter 54mm. The fabric is micaceous and mineral tempered, with small inclusions. Surfaces are orange-reddish, the core is grey. The shape is slightly concave, probably is a lid for a small jar. Circa 2nd - 4th century AD;
33. pottery disk with central hole. Diameter 60mm. Fabric is micaceous and mineral tempered. Small inclusions up to 2mm. Surfaces are smoothed, the core is brown. Vegetal impressions on the surfaces. Circa 2nd - 3rd century AD;
34. handle with impressed decoration. Diameter is not available. Fabric is very micaceous, with small inclusions of quartz. Surfaces are red slipped and burnished. The core is grey. The impressed decoration is an irregular pattern of dots. Traces of burnt on the upper part of the handle. Circa 2nd - 4th century AD;
35. handle with impressed decoration. Diameter is not available. Fabric is very rich in calcareous inclusions >3mm clearly visible in the section. Surfaces are smoothed. The core is grey. The impressed decoration consists in few irregular dots, scattered on the handle surface. Traces of fire. Circa 2nd - 4th century AD;
36. basin, or possible cauldron, with flat everted rim, incised and impressed decoration, incised line under the rim. Diameter 240mm. The fabric is very micaceous and mineral tempered, with a lot of pores and mineral inclusions up to 2mm. The external surface is red slipped, the internal one is brown reddish. Incised motives are close to the handle attachment. On the flattened surface of the rim a geometric motif of crossed lines is present. Circa 2nd - 3rd century AD;
37. basin, or possible cauldron, with flat everted rim, incised decoration. Diameter 240mm. The fabric is very micaceous and mineral tempered, with mineral inclusions up to 2mm.

The external surface is red slipped, the internal one is brown reddish. Incised motives are close to the handle attachment. On the flattened surface of the rim a geometric motif of crossed lines is present. Circa 2nd - 3rd century AD;

38. basin with pinched rim and scraped surfaces. Diameter 280mm. The fabric is mineral tempered, with small inclusions and vacuoles, ca. 1.5mm. up to 3mm. Surfaces are scraped and red slipped. The core is grey. Quartz is visible. Circa 2nd - 3rd century AD;
39. jar with slightly incised line under the squared rim. Diameter 160mm. Fabric is micaceous, with small white and mineral inclusions <2mm. Surfaces are light orange, smoothed. The preserved part is the neck. Circa 1st - 2nd century AD;
40. cooking pot with handle and incised decoration. The rim is not preserved. Fabric is mineral tempered, rich in inclusions up to 2mm, grey and white. Surfaces are brown-reddish, smoothed. The core is dark red. Fire clouds on the external surface. Incised segments around the handles attachment. Circa 2nd - 3rd century AD;
41. cooking pot with applied and incised button, incised line under the rim. The fabric is mineral tempered, rich in inclusions up to 2mm, grey and white. Surfaces are brown-reddish, smoothed. The core is dark red, fire clouds are present on the external surface. The applied decoration consists in a button, with incised decoration, below the rim. Circa 2nd - 3rd century AD;
42. cooking pot, with cross impression at the handle attachment. The rim is not preserved. Fabric is very micaceous, with small mineral inclusions <1mm. The external surface is red and smoothed, the internal one is orange and burnished. Traces of burning on the lower part of the external surface. Two incised and parallel lines are present close to the handle attachment. A small button applied shows a cross impressions. Circa 2nd - 4th century AD;
43. horizontal handle of cooking pot, quadrangular shape. Fabric is very micaceous, with mineral temper and yellow and white inclusions. Surface are smoothed and red. The section is ovoid, but irregular. Circa 2nd - 4th century AD;
44. jar with one vertical handle from rim to shoulder, cylindrical neck and slightly everted rim. Possibly used as a cooking pot, fire clouds are present on the whole surface. Diameter is 140mm. Mineral tempered fabric with big white inclusions, up to 3mm, and small elongated pores. Surfaces are brown-reddish, slipped and burnished. The core is grey. Vegetal

impressions on the external surface. Circa 2nd - 3rd century AD;

45. cooking pot, with rounded neck and possible globular body, incised line under the rim, incisions near the handle attachments. The fabric is rough, mineral tempered, with white inclusions, <1.5mm and micaceous. Surfaces are orange-reddish, smoothed. Fire clouds and vegetal impressions are present on the external surface. Incised lines around the handles attachment. Circa 2nd - 4th century AD;
46. horizontal handle of cooking pot. The fabric is very micaceous, mineral tempered and yellow and white inclusions. Surfaces are smoothed and red. The section is ovoid. Circa 2nd - 4th century AD;
47. globular *dolium* with deep incised line under the rim. Diameter 280mm. The fabric is micaceous, with mineral inclusions up to 1mm. Surfaces are orange-brown and smoothed, the core is brown. Two light lines are incised below the rim. This fragment was found during the cleaning of the Sector 1;
48. zoomorphic handle. Fabric is mixed, vegetal and mineral. Vegetal impressions are present on both surfaces and section. The surface is orange, the core is grey. This fragment was found during the cleaning of the Sector 1.

Sector 2 (Fig. 22):

49. small unrestricted bowl with impressed cross and one horizontal grip. Diameter 100mm. The fabric is micaceous, with small mineral inclusions white and grey. The surfaces are slipped and burnished, the core is light brown. Near the horizontal grip there is a light incised vertical groove. Impressed cross below the rim. Circa 5th - early 7th century AD;
50. restricted globular bowl with impressed cross and vertical incised grooves. Diameter 180mm. The fabric is very fine, with mineral temper and small inclusions, <1mm. Surfaces are red slipped. The cross is only partially preserved below the rim. Vertical grooves are slightly incised. Circa 5th - early 7th century AD;
51. foot ring with impressed decoration. Diameter 80mm. The fabric is mineral tempered, with small white inclusions <1mm. The external surface is red slipped, the internal one is only smoothed. The core is grey-brown. Circa 5th - early 7th century AD;

52. unrestricted bowl with incised cross and vertical grooves. Diameter 200mm. The fabric is mineral tempered, with small inclusions <1.5mm. Surfaces are red slipped and burnished. The core is brown. The incised cross, below the rim, is very elaborated, vertical and slightly incised grooves on the body. Circa 5th - early 7th century AD;
53. basin with large and flattened everted rim. Diameter 140mm. The fabric is fine and rich in mica and small mineral inclusions <1mm. Surfaces are red slipped, the internal one, partially preserved, is only smoothed. A sort of applied decoration is over the ledge. Possible imported. Circa 5th - early 7th century AD;

Sector 3 (Fig. 23)

54. bowl with incised decoration and rounded rim. Diameter is not available. The fabric is very compact, mineral tempered, small inclusions grey and white, <1mm. The external surface is red slipped and burnished, the internal is brown and smoothed. The decoration is incised and, probably, also impressed with horizontal wavy line and vertical grooves. Circa 5th - early 7th century AD;
55. bowl with everted flattened rim, horizontal grip and incised decoration. Diameter 120mm. The fabric is mineral tempered, with white inclusions up to 1mm. Small pores are visible in the section. Surfaces are brown-reddish. The core is grey. Incised parallel lines go oblique, from the rim to the grip and under it. On the horizontal grip crossed motives of incised lines are present. The decoration is also present on the flattened rim. Circa 5th - early 7th century AD;
56. bowl with rounded rim and vertical incised grooves. Diameter 220mm. The fabric is very fine, with small mineral inclusions, <1mm. The external surface is red slipped and burnished, the internal is smoothed. The core is brown. Slightly incised grooves on the body. Circa 5th - early 7th century AD;
57. unrestricted bowl with impressed decoration on the rounded rim. Diameter 320mm. The fabric is mineral tempered, inclusions are up to 2mm. Surfaces and core are black-grey. An impressed decoration of triangle is present on the rim. Circa 5th - early 7th century AD;
58. bowl with internal flattened rim, pinched. Diameter is 120mm. The fabric has mineral inclusions, up to 2mm grey and white. Surfaces are only smoothed, brown. The core is grey. Fire

clouds are present on the external surface. Circa 5th - early 7th century AD.

Sector 4 (Fig. 24):

59. basin with incised line under the rim. Diameter 380mm. The fabric is very coarse, micaceous and rich in white mineral inclusions. Pores are abundant. The external surface shows traces of red slip but is very eroded. The core is light brown. Circa 5th - early 7th century AD.

Sector 5 (Fig. 25):

60. small jar with one vertical handle, incised line below the rim. Diameter is ca. 60mm. Fabric is very micaceous, with black, white and yellow inclusions, up to 1mm. Surfaces red-orange. The core is grey. Circa 5th - early 7th century AD;
61. basin with partially preserved both squared rim and foot ring. Diameter 200mm. The fabric is very compact, micaceous and rich in small inclusions, <1mm. The external surface is smoothed, brown-reddish. The internal surface is brown and shows traces of plaster, very eroded. The core is grey. Circa 5th - early 7th century AD;
62. pottery disk, not entirely preserved. Diameter 80mm. The fabric is very micaceous, mineral and vegetal tempered, small inclusions. Surfaces are orange, the core is grey. Vegetal impressions on the external surface. Circa 5th - early 7th century AD;
63. basin with incised line below the flattened rim. Diameter is 360mm. The fabric is mixed tempered, vegetal and mineral, rich also in pores, elongated and rounded. The external surface is red, the internal one is brown. The core is grey-brown. Traces of red slip are visible on the external surface. Circa 5th - early 7th century AD;
64. basin with flat rim and thin walls. Diameter is more than 380mm. The fabric is mineral tempered, with rounded white and angular grey inclusions. Surfaces are brown-reddish. The core is grey. Circa 5th - early 7th century AD;
60. basin with flat rim. Diameter is 240mm ca. Coarse fabric, mineral tempered, with white inclusions up to 3 mm. Surfaces are brown-reddish. The core is grey. Circa 5th - early 7th century AD.

A ceramic lamp from sector 2 (by C. Zazzaro)

A fragmentary ceramic lamp was found in the monumental building named "Ara del Sole" after Paribeni (1907) on the top of which a Christian church with basilica plan has been identified (*Adulis Fieldwork Report 2011, 2012 and 2013*).

The lamp has an open oil basin, piriform in shape with a spout and small pointed elements protruding from the rim edge, the footrest is almond-shaped. The fabric seems to be of a common type in the Ethiopian-Eritrean region, rich in mica and mineral inclusions, a mark of burning runs across the body.

Ceramic open-body lamps are common in Adulis and in other settlements of the Ethiopian-Eritrean highlands but the shape of the body and the moulded decoration is comparable only to a particular type of bronze lamp, the well-known lamps with leaping ibex found in Maṭarā, in Shabwa and in other South-Arabian contexts. These lamps are very characteristic and they have been variously interpreted and dated because they all come from the black market, except the one from Maṭarā. A lamp from the Musée du Louvre is dated to the 3rd century BC - 1st century AD; another from the British Museum (ME 139621) is tentatively dated to the 5th - 4th century BC. Another lamp from the same museum is dated to the 1st - 3rd century AD or 5th - 6th century AD[12]. The lamp form Shabwa, now in the Kunsthistorisches Museum, presents also the "Herakles knot" and it is dated to the 1st - 3rd century AD so as the one from San'a (Ali 'Aqil, 'Azza and Antonini 2007, 187). The bronze oil lamp with a dog hunting an ibex, from Maṭarā (Anfray 2012, 44), now in the National Museum of Addis Abeba, is tentatively dated to the same period.

Amphorae and Ayla ware (by C. Mandelli)

Simply walking along the area of the ancient Adulis, a number of imported and local pottery is visible on the surface. In particular, the high concentration of potsherds belonging to storage vessels (or containers),

[12]See the respective online museum catalogues for the dating and Ali 'Aqil, 'Azza and Antonini 200, 186.

especially amphorae, testifies the strong trading vocation of the ancient settlement of Adulis' archaeological site.

Starting from 2011 excavations, numerous amphora fragments were found; unfortunately, as it is often true for the study of large sized vessels, not all potsherds can be easily identified. In fact, the great percentage of them does not belong to morphologically relevant part of the vessel. Diagnostic potsherds such as rims, bottoms and handles, have been classified, drawn and photographed. This allowed the typological distinction of pottery shapes and the identification of several types of amphora.

Besides the morphological analysis, a macroscopic analysis of fabrics has been carried out also allowing the identification of some type of amphora. The different types of fabrics have been sampled for future archeometrical analysis.

The largest amphorae assemblage at the site of Adulis comes from sector 1, in stratified deposits dating from the 4th to the 7th century AD, coinciding with the period of major expansion of Adulis in the Indo-Roman trade. The Ayla-Aksum amphorae, dating to the 4th - 7th century AD, reflect the direct link of Adulis with the northern Red Sea ports of Ayla and Clysma. At the same time, but in much lower quantity, also Late Roman amphorae are found in Adulis, in particular LRA 1, 2 and 5. In the earliest occupation phases the number of amphora sherds drastically reduce and the Egyptienne 3 amphora type seems to be predominant.

Ayla-Aksum

Most fragments of amphorae belong to the Ayla-Aksum type; Adulis is actually without doubt the most prolific site of this type of amphora excepted for Ayla itself (Peacock *et alii* 2007, 103).

These amphorae are among the most widespread vessels for trading products in the Red Sea region between the 4th and 7th century AD. The area of origin of the Ayla-Aksum amphorae is set to be Jordan as several kilns have been found in the Ayla settlement (currently Aqaba) (Whitcomb 1994). From here they were traded all around the Red Sea regions, they occur in the ports of Berenike and Myos Hormos, at Aksum and Maṭarā, on the highland, and at Elephantine Island, elsewhere in the Mediterranean they are found in Turkey, Spain and Carthage (Pedersen 2008, 83-84). Evidence of Ayla-Aksum amphorae have been found also in India (Tomber 2005). Some

scholars, due to the great number of findings, have theorized a production in Aksum as well but no evidence of this has been given so far.

The Ayla-Aksum amphorae are characterized by a conical or carrot shape with slight shoulders, button base and ribbed body. The neck is short, with vertical and rounded rim in the upper part and in most cases there is an internal ledge below the rim for receiving the lid. The ovoid or elliptical in section handles start to form the neck and go to the shoulders. The surface of these amphorae is often covered with a light coloured slip.

There is still no certainty about the content associated to these amphorae. Melkawi (*et alii* 1994) was the first to suggest that, according to their peculiar shape, the Ayla-Aksum amphorae contained agricultural products from the Palestinian area. More recently Parker offered a different option suggesting that they carried Red Sea *garum* while Dolinka (2003) stated that such amphorae might have carried also dates or wine in addition to *garum* (Peacock *et alii* 2007, 103). Probably a hypothesis does not exclude the other as very often a single type of amphora might have used to transport different sorts of products.

All Ayla-Aksum amphorae from Adulis are characterised by a pink, beige and reddish fabric with visible quartz grains 0.5 up to 1mm in size, few grey grains and few strands of mica. Similar characteristics of the fabrics are common to other Ayla-Aksum found in other sites[13]. One sample (Fig. 26) features a slightly different fabric, yellow in colour inside and green outside, this is more granulated and richer in transparent white and pink quartz grains, white grains are 1mm in size, few black smaller grains and few strands of mica. Future archeometrical analysis will be able to give more details about the fabric of these amphorae and to compare them with similar analysis carried out on samples from other sites.

Most items from Adulis site belong to the standard shape described by Whitcomb (1994, 460, 10e) characterized by a vertical and rounded rim and an internal ledge below the rim for receiving the lid (Fig. 27). Some samples present a variously deep grooving in the outer part between the rim and the neck. The diameter ranges from 8 to 13cm (Fig. 28). Only two samples belong to the variant described by Whitcomb (Whitcomb 1994:

[13] http://archaeologydataservice.ac.uk/archives/view/amphora_ahrb_2005/petrology.cfm?id=35

460, 10d) characterised by a shortened turned-out rim, the diameter varies from 11 to 12cm (Fig. 29).

During the 2014 field season button base fragments typical of these type of amphorae were also found; it is worth to mention a sample presenting a hole close to the base, made after firing (Fig. 30). Some samples still bear hints of pitch thus confirming the assumption that amphorae were watertight and might have been used to carry wine. Many handle fragments coming from different excavation sectors can be related to Ayla-Aksum amphora for their shape and fabric.

Some lids fragments present fabric and diameter dimension that seem to match to this type of amphora (Fig. 31); they are flat or very slightly concave disks which rest precisely on the amphora rim ledge.

Ayla Ware

Fragments of small-size vessels characterized by a pink in color fabric, visible quartz grains ca. 0.5mm, few grey grains and few strands of mica are very similar to the type of fabric of the Ayla-Aksum amphorae but more depurated. The external surface of these vessels is also covered with a light coloured slip.

Two fragments of a basin with flanged rim, found in sector 5, can be compared with one basin described by Whitcomb (1994, 457, 8k) (Fig. 32); two other fragments of flat base and ribbed body from sectors 3 and 5 can be associate with this same shape (Whitcomb 2001, 301) (Fig. 33).

Late Roman 1[14]

During the 2014 field season[15] three rim fragments and one base belonging to Late Roman 1 type of amphora were found. They are slightly flared and rounded rim fragments characterized by a ledge placed at the neck joint

[14] LRA1 are cylindrical in shape and are characterized by large ribs on the body, gently rounded rim, cylindrical neck, a noticeably present shoulder and rounded or button-shape base. These amphorae, diffused from the 5th to the 7th century AD, were produced along the coasts of Syria and of Cilicia, in Caria and in some Greek Islands as Cyprus and Rhodes. The distribution area is very wide and includes also a several western Mediterranean sites; samples of LRA1 were also found in England. It has been hypothesized that these amphorae carried wine or oil (Pieri 1998, 98-99).

[15] Sector 3 (SU 3058 II level) and sector 5 (SU 5002 and SU 5003 Room 2).

(Fig. 34), the base is rounded and smooth, the rims vary from 11 to 12cm in diameter. Samples from Adulis have a hard, sandy fabric, beige or brown in color with frequent 0.1mm white, brown and dark grey grains.

Late Roman 2[16]
No diagnostic fragments of LRA2 were found but wall fragments with narrow comb-like grooves and with a depurated hard fabric orange in color and less than 0.5mm white and black grains. The outside is covered by a light colored slip[17].

Late Roman 5[18]
In sector 5 (5002 e 5016) two wall fragments probably belonging to LRA5 were found. They are characterized by few ribs and a rather depurated brown fabric with quartz inclusions 0.5mm in dimension and smaller white and grey inclusions.

Unidentified amphorae
From sector 3 (3040) comes a fragment of handle of amphora characterized by a deep groove in the upper part. The fabric is depurated and beige in color with white grains minor than 1mm, rare grey grains and strands of mica. The surface is smoothed and covered with white slip. These potsherds are characterized by a hard, granulated and mainly pinkish in color fabric with white grains (0.5-2mm) and frequent strands of mica. The surface is smoothed and covered by a white slip.

[16]LRA2 amphorae are characterized by a globular body ending with a little button, the neck is conic, the handles are elliptic in section; the body has narrow horizontal ribs. These vessels were produced in the Aegean area; their spreading goes from 4th to the 7th century AD (Pieri 1998, 99-100).

[17] Fragment of LRA2 were found in sectors 1, 2, 3 and 5.

[18] LRA5 were produced in the Palestinian area and were widespread in the Eastern and Western Mediterranean up to the coasts of England from the 3rd to the 5th century AD. These vessels have ribbed bag-shape body, cylindrical neck with a very short rim. The handles are generally smaller than the “curved” handles, forming a small semi-circular profile and they are attached on the shoulder (Pieri 1998, 102-103).

AE 3

Imported amphorae from the earlier-intermediate phases (particularly Periods 2.2 and 2.3 of Sector 1) were identified by Roberta Tomber (British Museum) and discussed by C. Zazzaro. Amphora fragments, brown in colour, with vegetal and rare black inclusions >0.5mm and mica include two almond shape rims, parts of a shoulder and a handle, two parts of body and two conical bases. These were identified by Tomber as amphorae Egyptienne 3 (Invs 60, 267, 268, 269, 270, 1023 and probably 197), dating to the mid-1st - 2nd c. AD (Tomber 2007) (Figs. 35-36). Similar amphorae are found in a number of other Red Sea ports, including Berenike (Tomber 1999, 132-133; Hayes 1996, 157)[19] and Myos Hormos (Tomber 2012: 203), Ras Hafun (Smith and Wright 1988, 120 and fig. 5, a-b; Tomber 2007, 97), Moscha Limen and Qana' and also in India (Tomber 2012, 206). According to Tomber they were probably used for the export of wine and also water supply for the ships, according to Peacock and Blue (Tomber 2012, 206).

Imported pottery from North Africa and the Mediterranean (by S. Massa and R. Nardi)

The mortar (by R. Nardi)

The fragment of clay mortar 30 ×10.5cm ca. (Fig. 37) with a stamp was found in Sector 1 (1015) during the 2012-13 field season. The fragment retains part of the rim, part of the vessel and part of the spout which allow the reconstruction of the form. The internal diameter is about 37cm, the wide everted rim measure approx. 7.5cm. The inner wall, 3cm approx. Under the attack with the rim, is covered by irregular inclusions (dm average 2mm approx.) making an abrasive surface, functional to the scope of the vessel.

The fabric is rather thick, beige in color, slightly pink inside, the section is quite compact, slightly rough and a bit porous; at the macroscopic examination of the clay blackish inclusions are visible (dm average 1.5mm approx., augite?), whitish quartz inclusions and reddish inclusions (dm average 2mm approx.), likely degreaser. It is also possible to see brilliant micrometric inclusions. There are rare and very small rounded vacuoles.

[19]According to Hayes (1996, 157) circa 40-75% of potsherds from all the 1st to the 3rd century layers come from Egyptian brown-bodied Nile valley amphorae in Berenike.

The shape seems to belong to the Dramont D2 type (= Hartley 2) (Joncheray, 1972, 11-34; Hartley 1973a, 55-57; Parker 1992, 167-168), which refers to the cargo coming from a ship wrecked around the half of the 1st century AD in the South of the French coast, known for loading *mortaria*. These type of *mortaria* bear the stamps of the workshops of the Rome region (i.e. the Tiber valley), generally considered a center-Italic production (Campania and Lazio) (Pallecchi 2002, 45 and *passim*) and with a high incidence of production from the Rome region. The typology is generally dated to a period between 50 and 160 AD (Hartley 1973a, 58; Pallecchi 2002, 57), although there are center-Italic exemplars, even if sporadically, dating from the age of Tiberius until the beginning of the 3rd c. AD (Pallecchi, 2002, 57, 61 and *passim*), local productions are also attested in peripheral workshops, which succeeded the first widespread of the typology from the original area (Arslan 2002, 311; Pallecchi 2002, 57).

The stamp is in a rectangular frame (<63 x <30mm) with rounded angles, in capital letters in relief (h 13mm approx.), arranged in two lines and with peaks; it is lacking in the initial part because of the fracture of the rim. The mould has been impressed with greater strength at the bottom and it is not possible to see the top of the frame; to the left, it is not possible to see the top of the frame and the initial letters of the first and the second lines which are missing, and requires an integration. Line 1 is much damaged in the central part and does not allow a sure reading. The last sign, looking like a V letter, is probably an arrowhead (*sagitta*), a decorative element sometimes present on *mortaria* stamps; to sustain this hypothesis it can be noticed, for example, that the end point goes below the line, something that does not happen to the V of the line 2.

These characteristics of the frame and of the letters drive us to insert it into the B2c group of Pallecchi's catalogue (Pallecchi, 2002, 60-61), whose stamps, each on Dramont D2 *mortaria*, fit mainly in a chronological period included between the 2nd half of the 1st c. AD and the 1st half of the 2nd century AD.

With many precautions, the following reading hypothesis is proposed

[D]OL(iare) +++D(iae) (*sagitta*) / [F]AVSTINA(e).

The marking of *mortaria* seems in a certain way similar to that of the *opus doliare* (building materials and coarse ceramic), as suggested by the

first letter of line 1, which, if the integration is correct, would be referred to *opus doliare*.

In general stamps on *opus doliare* may contain information about the owner of the plot on which the clay caves were located, the name of the people responsible for the production, the name of the factories, and the typology of the artifact (Steinby 1975; 1981; Pallecchi 2002, 267).

In this case, in the absence of the AVG title, it seems unlikely that this FAVSTINA could be connected to the imperial family; therefore it should be assumed that this woman is a private individual, owning the clay caves, or the plot on which the factory was, or the owner of the factory, and it is only possible to say that in the stamp, after [D] OL (---), there was a shortened family name, no more decipherable, ending with a D.

The discovery or the publication of new stamps and more detailed prosopographical studies may perhaps bring new elements to the interpretation of this female figure.

The distribution of Dramont D2 *mortaria*, although with a prevalence for the western part, is widely attested in all areas of the Empire (Pallecchi, 2002, 49-53; Hartley 1973b), where the pieces came mainly waterways through two main commercial tracks, directed towards the North-West and South-East, sea routes, part associated with overland and river tracks, linking the coasts of the countries bordering the Mediterranean with the hinterland. In this case, the route, starting from Rome, or from other harbors, proceeded to South along the coast of Italy, touching various sites on the coast and continuing, after sailing along Sicily, towards Carthage and the coast of North Africa or reaching Greece and, hence, going north, toward the hinterland, the Danube area. Alternatively, the route passed by Anatolia and continued toward south reaching the Nile delta, from which some internal sites could be reached, and Libya, Tunisia and Algeria.

It is very likely that *mortaria* were often transported on ships as secondary products, to balance the cargo on the return journey after selling goods loaded in the port of origin, as well as return cargo, *mortaria* could be part of the shipboard equipment, where they were used as on the mainland to crush corn seeds and for the maceration of ingredients for spices or sauces.

On the African continent stamped *mortaria* have been found, sometimes in single items, especially on the north coast, in Skikda and

Arzew (Algeria), Berenice (Benghazi - Libya), in Carthage (Tunisia) and in internal areas, such Antinoe (High Egypt) (Pallecchi, 2002, 49-53). In almost all cases, these are *mortaria* Dramont D2 typology, almost always manufactured in Rome region and dated mostly between the half of 1st c. AD and the first three decades of the 2nd century AD. The largest number of records comes from the city of Berenice (Libya), where there are eight items, four of which dated to the early decades of the 3rd century AD; for three of these it must be beard in mind that dating is based on the context of findings and not on the date of the mortar manufacturing, while only for one the dating is based on the period of activity of the person mentioned in the stamp. The item closer to Adulis is surely from Antinoe in upper Egypt and it is a *mortarium* Dramont D2, stamped with the name of L. Lurius Crescens, and dated at the first half of the 2nd century AD both on the basis of the discovery context and on the basis of consular dating present on building materials stamped by the same person (Pallecchi 2002, 190-191).

It seems evident that these findings, even when not isolated, rather than the existence of a *opus doliare* trade, primary or secondary, bear witness to the existence of trades between Rome and the place of destination. At the moment, in the absence of laboratory analysis, it is not possible to be sure of the production of the Adulitan artifact, even if the *mortarium* typology, the characteristics of the stamp and some textural characteristics would lean towards a production coming from the Roman region and for a dating between the end of the 1st and the beginning of the 2nd century AD, but it could not certainly be excluded the possibility that further researches will lead to lower these chronological limits.

African Red Slip Ware (by S. Massa)

A fragment recovered in sector 3, 3044, during the 2012-13 field season, is pertinent to the form Hayes 104, type C (= Atlante I tav. XLII, 7; 95). The slip, a late version of the D^2 production, tends to be quite thin, covering the inside and the rim (Hayes 2008, 81). The rim is rounded and small, at the internal junction with the wall, a shallow concavity is present and, below, a groove (Fig. 38).

It is the latest type of the dish of form 104, dated between the 2nd half of the 6th and the first quarter of the 7th century AD.

Imported pottery from Arabia (by C. Durand and R. Loreto)

During the 2013 and 2014 excavation seasons at Adulis, circa ten potsherds related to Arabian contexts came to light.

The 2012-2013 assemblage (by C. Durand)

Three "Nabataean" painted potsherds, found in the Phase 2.2 of sector 1, most probably belong to the same pot, a typical "Nabataean" (or Petraean) painted bowl produced in the Petra area (today in centre Jordan), between the late 2nd c. BC and the 5th or 6th century AD (Fig. 39).[20]

The fabric is light red to orange, with small white inclusions. The painted decoration, rather coarse, is black, forming plain triangles and triangles of dots. This decoration pattern allows us to establish that these sherds belong to Schmid's phase 3c or 4 (Schmid 1996, 209, figs. 702-704; Schmid 2000, figs. 378-381). They can thus be dated after the 2nd century AD, during the time of the Roman *Provincia Arabia*. Based on the pictures, the fabric seems to be rather fine, which could indicate that these potsherds most probably belong to the phase 3c, rather than to the Phase 4. A date in the 2nd century AD, or maybe in the 3rd century AD, is assumed.

These potsherds are the first "Nabataean"/Petraean productions found on the African coast of the Southern Red Sea so far. Some Nabataean painted potsherds have already been found, always in small quantities, in Egyptian ports of the Red Sea in Myos Hormos (Whitcomb and Johnson 1982, 59-60, 67-68, fig. 21d et 21e; Schmid 2004, 418, n°10 = 2007, 66, n°10), Berenike (Hayes 1995, 38; 1996, 150; Schmid 2004, 418, n°11 = 2007, 66, n°11) and, on the eastern side, on Farasan Islands (Zarins *et alii* 1981, 27, n. 20, Pl. 28, 6; Wenning 1987, 126, n°2; Gatier and Salles 1988, 180; Schmid 2004, 418, n°6 = 2007a, 65, n°6) and on the coasts of Yemen and Oman in Kanê (Sedov 1992, 122, fig. 10; 2007, 78, figs. 4.11, 1-2; Schmid 2004, 418, n°8 = 2007, 65, n°8) Khor Rori (Yule 1993, 265, figs. 6, 10-11; Yule and Kervran 1993, 81, fig. 3, 8-9; Schmid 2004, 418, n°9 = 2007, 65, n°9). They are also present on a few inland sites of southern Arabia in bigger quantities in Marib (Stucky 1983, 7, figs. 10-11; Wenning

[20] See the general typology of the Nabataean painted fine ware established by Stephan G. Schmid (1996 and 2000). See also 'Amr 1986, 'Amr 1991 and Amr' and Al-Momani 1999 about the Late Roman/Early Byzantine pottery kilns excavated in Wadi Musa.

1987, 126, n°3; Krautwurst 1989, 329ff.; Schmid 2004, 418, n° 7 = 2007, 65, n°7) Qaryat al-Fau (Al-Ansary 1982, 22, 63, figs. 2-4; Schmitt-Korte 1984, 11; Wenning 1987, 126, n°1; Gatier and Salles 1988, 180; Schmid 2004, 417-418, n°5 = 2007, 65, n°5).

It is difficult to say if these finds result from the trade activities of the Nabataeans, or if they just can be interpreted as "souvenirs" brought back by individuals who travelled in the Petra area. Nevertheless, they constitute an evidence of contacts between the Petra area and the Eastern African coast during Roman times, probably linked to the intensive maritime trade linking Adulis to the Northern Red Sea during this period.

The 2013-2014 assemblage (by R. Loreto)

During the 2013-2014 field season three potsherds were identified of possible Arabian origin. The most certain identification is for a fragment of a typical Nabataean so called "egg shell" ware, 1 to 3mm thick, or "painted fine ware" (Gunneweg *et alii* 1991; Schmid 1996; 2000). The fragment belongs to a semi-globular bowl, black painted and wheel made (Fig. 40). Fabric and surface are red/reddish, a distinctive characteristic of clay rich in iron minerals, suggesting that the potsherd belongs to an imported bowl from Petra, a probable source for this type of clay is 'Ayn at-Tinah area in as-Sharah mountain ('Amr 1997; 'Amr and Mason 1992).

The black[21] painted decoration is on the inner surface of the vessel and it consists in a Y shape suggesting a date between the second half of the 1st century BC - first half of the 2nd century AD (Schmidt 1996).

The presence of this type of pottery at Adulis is not surprising. Nabataean "painted fine ware" - the most exported product from Nabataea - is attested not only in Nabataea *strictu sensu*, but also from Bosra to the south (Bresenham 1985; Dentzer 1985), in the major North Arabian oasis from Hejra to Dūmat al-Jandal (Loreto 2012), in the Gulf Area, to the East, and along the major South Arabian caravan cities, from Qaryat al-Faw, through Mārib, to Qāna and Khōr Rōri. It is also attested along the Egypt Red Sea coast between Leukos Limen and Berenike (Schmid 1996).

Another pottery fragment finds a parallel with South Arabian big *dolia* dated to the 4th century BC and the 1st century AD, particularly with

[21] Brown painted decoration also occurs within the *repertoire* of this pottery type.

the common ware from the private houses in Tamna‘, House B/H and B/E (Loreto 2008/2009, fig. 375, 383 House B/H, figs. 489, 498 House B/E), in Hajar bin Humayd (van Beek 1969) and Shabwa (Badre 1992)). Although the reddish/pink ware differs in color - those from Tamna‘ are red ware - and for the lack of medium and big vegetal inclusion, the handmade manufacture, the small to medium grits included in the fabric, the surface treatment - hand smoothed and slipped - and the shape - cylindrical with thick rim and thin, vertical to slightly inverted wall, seem to be similar.

Imported pottery from the Gulf (by C. Zazzaro)[22]

During the 2014 field season Glazed Ware has been found for the first time in stratified deposits of Sector 3 at Adulis (Room “C”, 3058). This assemblage includes fragments of two unrestricted bowls and one jar (Fig. 41). The fabric is porous sandy, the texture is soft, the colour varies from pale yellow to yellow. The surface varies from deteriorated golden-yellow to withish-yellow and to green-pale turquoise glaze.

This type of pottery is thought to be produced in Mesopotamia starting from the 3rd century BC to the early Islamic period. Recent works have attested also an independent production outside of Mesopotamia (Shenk 2007). Turquoise-blue glazed pottery has been found in coastal sites around the Arabian Peninsula, and they were diffused also in South and Southeast Asia ports involved in the Red Sea - Indian Ocean trade such as Barygaza and Pattanam (Muziris). The finding of Glazed Ware at Adulis has to be placed in relation with this trade network. Our current knowledge of contacts among the northern Horn of Africa and the region of modern Iran is limited to historical accounts about the competition among the Sasanian, the Byzantine and the Aksumite for the control of the South Arabian ports and of the silk trade route in the 6th century AD, and to traditional accounts about the “Furs” which inhabited the Eritrean coast and islands, and built cisterns and stone structures (Zazzaro 2013, 30). It is hoped that further research in Adulis will help in better understanding the dynamics of contacts among these two regions during antiquity.

[22] The identification of the potsherds provenance has been confirmed by Giulio Maresca (UNO) who is also conducting further investigations on these potsherds.

An Indian terracotta figurine (by A. Filigenzi)

Among the small finds from Adulis, there is one that deserves special attention: an Indian terracotta figurine, which can conventionally be labelled as a 'Gupta' artefact and accordingly dated between the 4th and the 6th century AD[23]. The figurine, of the flat single-moulded type, represents a male character (Fig. 42). Only the upper part of the body is preserved, recomposed from two fragments. The legs, the right arm and the left forearm are missing. Part of the right hand is preserved and it seems to rest on the hip, the latter slightly leaning forwards. Together with the slight inclination of the head, this suggests the *ābhaṅga* posture (characterised by slight bend either side). The figure, with naked torso, possibly wears a *dhotī* (the traditional Indian lower garment, consisting of an unstitched piece of cloth) fastened by a belt. The hair is arranged in a loose mass of symmetric curls partly tied in a small top knot.

Any precise identification of the subject is impossible. However, there are details that give some hints. In particular, the fleshy face with bulky features, and the plain flat disc-like ear-rings (known as *cakrakuṇḍala*, *tātaṅka* or *cakriśalāka*; cfr. Ayyar 1987, 114) might be indicative of an attendant figure.

In spite of its modesty, this object is of great documentary value, since it adds confirmation to the relationship between Africa and India and to the role played in it by the coastal Eritrean sites. Moreover, this figurine can now be filed together with another piece of evidence, i.e. the small inscribed carnelian gem from Adulis first published by R. Paribeni (1907, 529, fig. 49). The un-deciphered script, which Paribeni describes as unknown, was later commented by E. Littman (1926, 410), who remarked its similarity to the Indian *brāhmī* of the first four centuries AD and conjectured that the text may contain the name of an Indian trader.

One wonders whether these easily travelling objects might have belonged to Indian people, who temporarily settled in Adulis for business. Although the presence of Indian settlers in African maritime sites is mentioned in literary sources, the relevant archaeological evidence is still meagre. However, it is perhaps not too unrealistic to expect these finds to be

[23] The figurine has been found in a stratified deposit (3058) in Sector 3, in a room named Room "C".

the forerunners of further advances in our knowledge of the Indian-African contacts, especially after the discovery of *brāhmī* inscriptions made at Socotra (Strauch, Bukharin 2004; Strauch 2012) started bringing into focus the human dimension of international trade.

Glass Finds from Sector 1 and Sector 3 (by S. Massa)

During the November 2012-January 2013 field season, some diagnostic glass items have been recovered from sectors 1 and 3, among the overall limited quantity of glass finds coming from excavations started in 2011. Generally, they are in very fragmentary and bad conditions, mostly with strong surface alterations that make difficult the definition of the colours and the manufacturing techniques. Such deterioration of glass material is mainly related to its chemical composition and to the depositional environment. Small differences in the chemical composition, together with crucial parameters like temperature and humidity, may result in very different aspects of the glass finds (Verità 2006), as showed macroscopically (Fig. 44).

From some contexts related to the phase of abandonment of the building structures identified in sector 1, such as the collapses of walls (1002 and 1043; 1003 and 1035), and from the living floor possibly associated to these walls (1044), two fragments can be attributed to beakers or lamps (Figs. 43.1, 44.1). They show a bluish tinge, strongly encrusted with a white film, traces of fire exposure, probable streaks hardly visible. The lack of the largest portion of the body and of the bottom does not allow to precise the attribution to a conical beaker of form Isings 106a, b or c, or to the form Isings 109 (Crowfoot, Harden 1931, Group 1, type A, pl. XVIII, 1-3; Uboldi 1995 type II). The everted, plain-cut rim, with light internal groove, does not exclude a function as table drinking vessel (Uboldi 1995, p. 114), which also apparently fits better with the non-ritual function of the building excavated in sector 1.

Numerous fragments, very similar to ours, were found in Aksum, in disturbed funerary contexts, dated between the 4th and the 6th c. (Morrison 1985, fig. 5.2; Id. 1989, fig. 14.113, 208). Drinking vessels and lamps represent the commonest glass forms in the East as well in the West, in contexts dated from the 4th century onwards (Uboldi 1995; Stern 1999; Foy

2005; Drauschke, Keller 2010). These fragments were found associated to pottery dated between the 5th and the 7th ccentury, among which the latest identifiable fragments are of the end of the 5th-beginning of the 7th century AD (Perna *infra*).

From the same collapse context (1035), a fragment for which it has not been found yet a satisfying parallel, and therefore a unique interpretation, is that illustrated (Figs. 43.2, 44.2); its profile, slightly narrowing in the upper portion, does not fit with the normal form of the type of lamps on a plain, hollow stem, tapering to a point or to a rounded butt (Crowfoot, Harden 1931, Type B.2, Pl. XXIX, 24-26; Harden 1936, pl. XVI, n. 466). On the other side, it neither corresponds completely to the characteristics of the toilet vessels, particularly for its thickness[24], while the morphological aspects are close to examples found in Aksum (Morrison 1989, fig. 14.104, 107, 208) (contexts of 1st - 3rd century AD). The context suggests a chronology of 6th - 7th century AD, which is better in accordance with the chronology of the stemmed lamps.

A fragment coming from the interface between the collapse 1035 and 1015 could be pertinent to a conical lamp with solid-pointed base, similar to examples from Karanis (Harden 1936, pl XVI, 436; 159), widely diffused between the second half of the 4th and the 7th c. AD (Uboldi 1995; Stern 1999, 479-480), or to a solid stem[25]. Its colour is very dark blue (Fig. 44.3).

From a living floor dated between the second and the 4th century AD. a fragment of greenish glass can be assigned to a bowl Isings type 80, dated from the 2nd half of the 1st to the 3rd quarter of the 3rd century AD, in accordance with the stratigraphic assemblage (Figs. 43.3, 44.4).

From Sector 3, the fragment illustrated (Figs. 43.4, 44.5), belongs to a type of lamp with a long, hollow stem, not cylindrical nor conical, terminating in a flat seat. The fabric is the same of the fragments from Sector 1. It is a type widespread in the 6th and 7th century (Crowfoot, Harden 1931, Type B.2, Pl. XXIX, 24-26.), probably created in Palestine (Antonaras 2008, 26). This fragment comes from a stratigraphic assemblage where ceramics dated between the 5th and the 7th century are present, and

[24] I thank the colleague Marina Uboldi for this indication.

[25] Similar, for example, to that already presented (Foy 2005, pl. 43, n. 28).

also a coin dated to the second half of the 6th - beginning of the 7th century AD (*Adulis Fieldwork Report 2013*, unpublished).

The compositional elements of ancient glass vessels and objects are of great importance regarding their provenance, and knowledge is constantly on progress thanks to the archaeometric investigations. Some recent works are to be considered as reference points in the general issue concerning the relationship between eastern and western production centres in the period here considered, mainly between the 2nd and the 6th- beginning of the 7th century (Picon, Vichy 2003; Drauschke, Keller 2010). The similarities identified for Aksum already revealed a strong connection with the eastern regions of the Mediterranean and Egypt (Morrison 1989, 208-209), starting at least from the 4th century BC. onwards (Manzo 2005, 54), and referring to Adulis and the Eritrean coast the sources mention imports of glass from Diospolis (Casson 1989, 53, par. 6). The role of the Aksumite commercial network in the distribution of row materials and finished objects in eastern Africa and India has been underlined (Meyer 1992), as well as the possibility of a local production (Manzo 2005, 59-60), but the question must remain open, for the glass from Adulis, until the results of the chemical analysis in programme.

Lithics (by E. Cocca)

During the 2014 field season, the lithic assemblage from sectors 1-2-3-5, was added to the already rich amount of lithic collected in previous years. This class of material has been divided into two main groups. In the first group were included all kinds of ornamental, household and indeterminate stone tools. In the second group were classified lithic tools showing intentional knapping. Graph 1 (Fig. 45) shows the quantitative distribution of the two groups. As you can see from the graph the majority of lithic materials comes from Sector 1 and are included in Group 2. In this report some general considerations on these two groups are presented.

The first group includes local raw materials and some imported, such as alabaster. Stone tools such as grinders for household use, pestles, abrasive stones, are made of local stone such as basalt, quartzite, pumice, while stones used for ornamental purpose, such as alabaster and marble, are imported. So far, evidence of imported stone manufacturing has not been

found, as a consequence, it is assumed that these objects arrived at the site as finished products and not as a raw material. Some artefacts were classified as indeterminate, this means that it was impossible to classify the object's typology and function. More detailed studies and analysis of traces of use will help in the identification of them.

The second group shows different problems: the use of knapped lithic - which from now on the author will refer to as "lithic industry" - is in fact well documented in Prehistory, while for the historical period it opens very different reflections. Approximately 98 % of the lithic industry is made of obsidian and the remaining 2% in translucent flint and quartz. The first field seasons gave a complex lithic generally found in disturbed contexts such as collapse of walls or flood levels. The *débitage* showed not be produced by exploitation of the raw material in a sequential manner or according to particular patterns of the raw material economy. In fact, the *débitage* consisted of shapeless fragments with irregular profiles and thicknesses. They were not even found cores fragments which could have indicated the exploitation of raw materials on site, instead, some well-defined tools such as very small crescent-shaped testifies the presence of specialized artisans at the site.

During the last field season, the most ancient deposits excavated in Sector 1 has delivered a much better defined lithic industry, including laminar and lamellar artefacts which indicate that the exploitation of the raw material according to well-known patterns of *chaine opérative*. Fragments and residues of cores that indicate the exploitation of the raw material on site, were also found. Many blade *débitage* show retouches on the edges that indicate a further refinement of the object.

Metal (by D. Nappo)

Various copper, lead, bronze and iron objects have been found at Adulis during the 2013-2014 field season. Among them are 22 iron fragments, 9 iron nails, 2 iron pins, 1 bronze nail, 1 copper fragment, 1 lead weight, 1 iron spearhead, 1 copper balance, 1 copper spatula probe. These last four items listed above will be object of a more detailed description.

The lead weight is of particular interest: it is a lead parallelepiped measuring 28×29×9mm which bears engraved marks on one surface

indicating its weight: the reversed L, a central cross, and a lateral vertical line. This type of weights were found in other highland contexts and in north-eastern Africa in the Byzantine period being used for weighing coins and precious commodities (Zazzaro 2013, 77).

The spearhead has a central pivot and it measures: L 67mm, W max 21mm and 6mm in thickness; L 36mm, W 20mm, thickness 4mm. Similar spearhead were found also in Aksum (Munro-Hay 1989, fig. 15.133-134) (Fig. 46).

The spatula probe is fragmentary and it measures L 43mm, max W 21mm, min W 6mm. It probably originally had a bend shape, of which only part survive. These types of objects were used for medical purpose and for unguents since the Roman period and are widespread in north-eastern Africa contexts in the later periods (Fig. 47).

Finally, the most striking metal find is part of a portable steelyard balance, of the type commonly used for trade, for weighing bulky commodities. The surviving part is the hook. It consists in an open ring with two vertical extensions. The shorter one ends in a circular element with a hole, to hang the chain, the other ends with a leaf-like element. Attached to the hook is also a small ring, possibly to hang more weight. The steelyard hook measures L 160 mm, W 80 mm; the arm is 10 mm in thickness (Fig. 48).

Coins (by A. Manzo)

The following coins from the collections of the 2012 and 2014 field seasons could be ascribed to known Aksumite types:

ADU 2012 S2 US 2056
Dimensions: not available

Badly oxidized copper coin. On one side the outline of a human head and shoulders likely to face right can be perceived. The representation of a royal bust is a well-known feature in several Aksumite series. The fact that only the shoulders seem to be represented, that the bust is laying almost directly on the edge of the coin, the high relief of the representation, as well as the proportions between the bust and the coin itself may suggest that the coin could be ascribed to the earlier series bearing this iconography, such as

the ones of Endubis or Aphilas (Hahn 1995, M 7, 24; Munro-Hay and Juel-Jensen 1995, AE3, AE13, 84, 95-97; Pedroni 1997, n. 28-29, 92).

ADU 2012 S2 SU 2081

Dimensions: not available

Badly oxidized copper coin. On one side a square is visible, most likely a part of a composite complex cross similar to the ones characterizing the coins of Hataz (Munro-Hay and Juel-Jensen 1995, AE 141, 251-253; Pedroni 1997, n. 404-408, 139).

ADU 2014 S5 Room 1 SU 5000

Dimensions: diam. 11mm, th. 0.5mm

Gold coin, good conditions of preservation, the outer edge of the coin was abraded so that the legend of the coin is not preserved. On the obverse the king is crowned with a tiara composed of four oval elements topped with discs resting on three arches and wears a draped robe and earrings. The royal bust is framed by two wheat stalks which incurve to meet above the head. On the reverse, the king is wearing the usual head cloth and the royal bust is framed between two wheat stalks which incurve to meet above the head. The king wears a draped robe and holds a branch with at least three strands whose termination is not preserved. These iconographies combined on the obverse and on the reverse of the gold coins widely occur from the reign of Aphilas to the one of Kaleb as well as on anonymous coins and - but without the branch - even later (Munro-Hay and Juel-Jensen 1995, AV 4, AV 15, AV 20-23, AV 35-36, AV 47-49, AV 59-63, AV 71-73, AV 81, AV 85-87, AV 89-110, 85-87, 98-99, 103-105, 119-121, 134-139, 152-158, 166-172, 184-185, 189-193, 194-207). Nevertheless, some details may help to sharpen this dating: some pointed elements are visible between the rounded elements of the tiara, the "V" shaped collar and a rounded element occurring over the royal head with tiara between the stalks on the obverse and the dot visible at the base of the neck of the king under the earring on the reverse. All these elements seem to occur together only on a type going back to the pagan period of the reign of king Ezana (Munro-Hay and Juel-Jensen 1995, AV 36, 119-120; Pedroni 1997, n. 70, 97-98, Tavv. 9-10). As far as the abrasion of the legend is concerned, this may have been intended to debase the weight of the coin in order to use it also many years after its minting, when the amount of average gold occurrence in the newly minted coins was lower than at the time of

Ezana. In the meantime when the edge of the coin was abraded also the legend with the pagan symbol of the disc and of the crescent was conveniently eliminated.

ADU 2014 Mound at NE
Dimensions: diam.19mm, th.2mm

Badly oxidized bronze or copper coin. On one side a central circular sector with the bust of a king facing right and wearing the headcloth is still visible. The background of the bust is gilded. A circular band with an inscription surrounds the royal bust. This type is occurring in the time of Ezana and of Ouazebas (Munro-Hay and Juel-Jensen 1995, AE 39-40, AE 54-58, 123-125, 147-152; Pedroni, n. 88, 101-130, 100, 103-105). Given the number of the letters forming the legend, the coin can be identified with a type going back to the reign of Ouazebas (Hahn 1995, M 19, 27; Munro-Hay and Juel-Jensen 1995, AE 54-58, 147-152; Pedroni 1997, n. 101-130, 103-105). The other side is too oxidized to propose an interpretation.

Archaeomalacological remains: a preliminary report (by A. Carannante)

Shells of molluscs and other invertebrates recovered in archaeological sites supply a double sequence of information. Shells taphonomy may suggest their uses and their role in ancient economies and cultures, while the ecology of the species may supply palaeoecological information about the evolution of the local environment, climate and landscape. Molluscs represent, in fact, important climatic and ecological guides more than mammals, birds and fish, for the high degree of sensibility to the conditions that characterizes them.

In this perspective, on April 2014, an archaeomalacological analyses program has begun on shell and other invertebrates remains from Adulis archaeological sites. The present report represents the first step of the program and it is the result of the very first observations made on the pictures the archaeomalacological assemblage.

The shell samples have been taxonomically identified, their ecology has been verified and taphonomical analyses have been carried on in order to check out marine erosion, bioerosion, biofouling and anthropic marks on them.

The taphonomical analyses have allowed in many cases to define the use of the molluscs or of their shells in the site.

The archaeomalacological assemblage from Adulis consists of 1062 mollusc shell remains and 49 coral skeleton fragments.

The 93.9% of the mollusc shell assemblage (997 remains) has been identified at least at Genus level. It pertain to 40 *taxa* (Tab.1).

GASTROPODA	**NR**	**BIVALVIA**	**NR**
Cypraea spp.	759	*Pinctada* spp.	122
Polinices mammilla	17	*Anadara* spp.	22
Oliva bulbosa	12	*Asaphis violacescens*	8
Nerita spp.	5	*Tridacna* sp.	5
Volema sp.	5	*Ostrea* sp.	2
Hexaplex sp.	4	*Acrosterigma* sp.	1
Strombus tricornis	4	*Atactodea glabrata*	1
Tibia insulaechorab	4	*Caecella horfieldi*	1
Cymatium sp.	3	*Circenita callipyga*	1
Ancilla lineolata	1	*Mactra lilacea*	1
Conus sp.	1	*Marcia marmorata*	1
Engina mendicaria	1	*Periglypta reticulata*	1
Lambis truncata	1	*Perna picta*	1
Littoraria intermedia	1	*Plagiocardium pseudolima*	1
Littorina scabra	1	*Scapharca* sp.	1
Modulus tectum	1	*Spondylus marisrubri*	1
Nassa situla	1		
Rapana rapiformis	1		
Rhinoclavis fasciata	1		
Strombus (*Conomurex*) *fasciatus*	1		
Terebra sp.	1		
Terebralia palustris	1		
Thais sp.	1		
Trochus sp.	1		

Tab. 1. List of the identified shell remains.

Gastropods markedly prevail with 830 remains while bivalves are less represented in the assemblage with only 167 remains. Neither tusk shell (Scaphopoda) and chitons (Polyplacophora) nor cuttlefish (Cephalopoda) remains have been found in Adulis sites.

Most of the shells shows a bad state of conservation due to the erosive action of water in the vadose zone of the archaeological deposit and a consequent medium degree of fragmentation.

Evidences of predation bores, bioerosion and biofouling are instead very rare.

Among the gastropods, *Cypraea* (cowries) is significantly the Genus most represented with 759 remains (76.1% of the identified mollusc specimens) attributable to several species (*e.g. Cypraea annulus*, *Cypraea caurica*, *Cypraea moneta*, *Cypraea tigris*).

The 67.2% of the cowrie shells shows one or more holes. It is not possible by a simple indirect observation to estimate how many of such holes are anthropic but many of the cowries show a pair of holes on the opposite sides of the shell last whorl. Such pattern is characteristic of the cowries bored to fix them on textiles or leather objects.

At least 18 cowries show the typical pattern described by archaeomalacologists as "cowrie lips" ornament. This was obtained by abrading the last whorl of the shell leaving only the inner and outer lips around the aperture. Cowrie lips are a widespread ornament in the Eastern Africa cultures.

The described cowries' ornaments are generally fixed to expose permanently the aperture whose symbolism is associated to female sexuality and/or to an apotropaic role.

Other 11 cowrie objects from Adulis are more enigmatic. They consist of a simple small "cup" obtained from last whorl of the shell abrading the lips and the columella.

Polinices mammilla is second gastropod *taxon* most represented with 17 remains. Ten shells show an anthropic bore on the last whorl suggesting an ornamental use.

The same use as bead/pendant is attributable to the 12 *Oliva bulbosa* shells all showing an artificial bore obtained grinding the apex.

Ancilla sp., *Tibia* sp., *Conus* sp., *Engina mendicaria*, *Ancilla lineolata*, *Nerita* spp., *Strombus* (*Conomurex*) *fasciatus* shells were also used as ornament at Adulis.

The use of gastropod in the diet at Adulis is less evident. Just few Muricidae, Potamididae, Terebridae and Littorinidae shells may be attributed to alimentary consumption.

Among the bivalves, *Pinctada* (pearl oyster) is significantly the Genus most represented with 122 remains (12.2% of the identified mollusc specimens) due however to the high degree of fragmentation of the remains. Some entire valves have been reconstructed from several fragments found in single stratigraphic units suggesting a post-depositional breakage of the shells.

Pinctada shells are the most important source of mother-of-pearl and pearls but neither pearls nor working marks are attested in the Adulis assemblage.

Anadara spp. (mainly *Anadara antiquata*) is the second bivalve *taxon* most represented with 22 remains (2.2% of the identified specimens). Its abundance in the contexts is probably the evidence of alimentary consumption even though 4 valves show an artificial bore in the centre whose meaning/purpose is to investigate.

Asaphis violacescens, *Perna picta*, *Ostrea* sp. *Atactodea glabrata*, *Cicernita callipyga*, *Mactra lilacea*, *Marcia marmorata*, *Caecella horsfieldi* and *Acrosterigma* sp. were likely also part of the diet at Adulis.

Further direct analyses on Adulis shell will allow to define the real role of the different mollusc *taxa* in the diet the seasonality of their collecting as well as their role in ornamentation.

The archaeomalacological assemblage from Adulis is completed by 49 fragments of *Corallium rubrum* (?) branches. The characteristic red color is well preserved in all the remains as well as the dense longitudinal *striae* pattern. Further analyses will allow to define their origin and if they can be surely attributed to Mediterranean precious coral.

Acknowledgements

The authors wish to acknowledge the Eritrean Government, Gruppo Piccini (Perugia), CeRDO (Varese), the National Museum of Asmara, the Regional Museum of Massawa, the Department of Topography of Asmara, the workers from Zula and Afta villages, the CISA (Università degli Studi di Napoli "L'Orientale"), the Università Cattolica del Sacro Cuore (Milano), and the Politecnico of Milano.

REFERENCES

Primary sources

Periplus Maris Erythraei, L. Casson (ed. and tr.) (1989) *The Periplus Maris Erythraei. Text with introduction, translation and commentary*. Princeton: Princeton University Press.

Gaio Plinio Secondo, G.B. Conte (ed. and tr.) (1982) *Storia Naturale.* Torino: Giulio Enaudi Editore.

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Adulis Fieldwork Report 2011 (unpublished report). The National Museum of Eritrea (ed.).

Adulis Fieldwork Report 2011 (unpublished report). Ce.R.D.O (ed.).

Adulis Fieldwork Report 2012 (unpublished report). Ce.R.D.O (ed.).

Adulis Fieldwork Report 2013 (unpublished report). Ce.R.D.O (ed.).

Al-Ansary, A. (1982) *Qaryat al-Fau: a Portrait of Pre-Islamic Civilisation in Saudi Arabia*, Riyadh: University of Riyadh.

Ali ʻAqil, ʻAzza and Antonini, S. (2007) *I bronzi sudarabici di periodo pre-islamico*. IsIAO. Roma.

ʻAmr, K. (1997) The Changing Landscape of the Clay Deposits at ʻAyn at-Tinah, Wadi Musa, in *Studies in the History and Archaeology of Jordan* 6, 121-126, Department of Antiquities. Amman.

ʻAmr, K., (1986) Instrumental Neutron Activation Analysis of Pottery and Clay from the Zurrabah Kiln Complex, *Annual of the Department of the Antiquities of Jordan*, 30, 319-328.

ʻAmr, K. and Mason, J. (1992) Remaking Nabataean Fine-Ware Bowls, *Ceramic Review*, 134, 11-12.

Anfray, F. (2012) Maṭarā. The Archaeological Investigation of a City of Ancient Eritrea. *Palethnology,* 4, 13-45.

Anfray, F. (1968) La poterie de Maṭarā. Esquisse typologique, *Rassegna di Studi Etiopici* 22, 5-19.

Anfray, F. (2012) *Le site de Dongour. Axoum, Ethiopie. Recherches archeologiques*. Herstellung und Verlag. Hambourg.

Arslan, E. (2002) I mortaria, Rossi, F. (ed.) *Nuove ricerche sul Capitolium di Brescia. Scavi, studi, restauri*, 309-21, Milano.

Atlante delle forme ceramiche I. Ceramica fine romana nel bacino mediterraneo (medio e tardo impero), Roma 1981.

Ayyar, S. (1987) *Costumes and Ornaments as Depicted in the Sculptures of Gwalior Museum*. Delhi.

Badre, L. (1992) Le sondage stratigraphique de Shabwa, 1976-1981, Breton, J.-F. (ed.), *Fouilles de Shabwa. II. Rapports preliminaires*, 229-314. Paris.

van Beek, G. (1969) *Hajar Bin Humaid: Investigations at a PreIslamic Site in South Arabia*, Johns Hopkins Univ. Press. Baltimore.

Bigliardi, G., Cappelli, S., Cocca, E. (2014) Tecnologie digitali integrate per lo studio del sito archeologico di Adulis (Eritrea), *Archeologia e Calcolatori,* 24, 139-162.

Bresenham, M.F. with editorial collaboration by G. Chimienti (1985) Descriptive and Experimental Study of Contemporary and Ancient Pottery Techniques at Busra, *Berytus* 33, 89-101.

Crowfoot, G.M., Harden D.B. (1931) Early Byzantine and Later Glass Lamps, *Journal of Egyptian Archaeology*, XVII, 196-208.

Dentzer, J.-M. (1985) Céramique et environment naturel: la céramique nabatéene du Bosrà. *Studies in the History and Archaeology of Jordan* 2. Amman: Department of Antiquities, and London: Routledge & Kegan Paul, 149-153. Amman- London.

De Romanis, F. (1996) *Cassia, cinnamomo, ossidiana. Uomini e merci tra Oceano indiano e Mediterraneo,* Erma di Bretschneider. Rome.

Dolinka, B. J. (2003) *Nabataean Aila (Aqaba, Jordan) from a Ceramic Perspective. Local and intra-regional trade in Aqaba Ware during the first and second centuries AD. Evidence from the Roman Aqaba*, BAR Series 1116, Archaeopress. Oxford.

Drauschke J., Keller D. (eds.) (2010) *Glass in Byzantium - Production, Usage, Analyses*, International Workshop Mainz 17th-18th January 2008. Mainz.

Foy, D. (2005) *Lampes en verre coniques et à pied tubulaire*, Chrzanovski L. (ed.), *Lychnological Acts* 1, Nyon-Genève 29.IX-4.X.2003, 107-113. Montagnac.

Gunneweg, J., Perlman, I. and Asaro, F. (1988) The Origin, Classification and Chronology of Nabataean Painted Fine Ware, *Jahrbuch des Römisch-Germanischen Zentramuseums Mainz* 35.1: 315-345.

Greatrex, G. (1998) *Rome and Persia at War, 502-532*, Francis Caim Publications, Liverpool.

Hahn, W. (1995) *Āthiopien. Kunsthandwerk und Münzen aus Österreichischen Sammlungen*, Schloßmuseum. Linz.

Harden, D.B. (1936) *Roman Glass from Karanis*, Ann Arbor.

Hareer, F.E. (2006) *Anastasius I*, Cambridge.

Hartley, K. F. (1973a) La diffusion des mortiers, tuiles et autres produits en provenance des fabriques italiennes, *Cahiers d'archéologie subaquatique*, 2, 49-60.

Hartley, K. F. (1973b) The Marketing and Distribution of Mortaria, *Britannia*, 4, 39-43.

Hayes, J.W. (1996) *The Pottery*, Sidebotham, S.S. and Wendrich, W.Z. (eds.) *Berenike 1996.* Center for Non-Western Studies. Leiden.

Hayes, J.W. (2008) *Roman Pottery. Fine-Ware Imports, The Athenian Agora. Results of Excavations conducted by the American School of Classical Studies at Athens*, vol. XXXII, Princeton.

Heldman, M. E. (1994) Early Byzantine Sculptural Fragments from Adulis, *Etudes Ethiopiennes* 1, 239- 259.

Joncheray, J.P. (1972) Contribution à l'étude de l'epave Dramont D, dite des pelvis, *Cahiers d'archéologie subaquatique*, 1, 11-34.

Littman, E. (1926) Indien und Abessinien, Kierfeld, W. (ed.) *Beiträge zur Literaturwissenschaft und Geistesgeschchte Indiens. Festgabe Hermann Jacoby zum 75. Geburtstag (11. Februar 1925) dargebracht von Freunde, Kollegen und Scülern*, 406-417. Bonn-Berlin.

Loreto, R. (2008/2009) *L'architettura domestica sudarabica di epoca pre-islamica (VII sec. a.C. - VI sec. d.C.)*. Tesi di Dottorato di Ricerca. Università degli Studi di Napoli "L'Orientale". Napoli.

Loreto, R. (2012) The Saudi-Italian-French Archaeological Mission at Dūmat al-Jandal (ancient Adumatu). A first relative chronological sequence for Dūmat al-Jandal. Architecture and pottery, *Proceedings of the Seminar for Arabian Studies*, 42, 165-182.

Mjcherek, G. (1995) Gazan amphorae: Typology reconsidered, *Hellenistic and Roman Pottery in the Eastern Mediterranean. Advances in Scientific Studies, Acts of the II Nieborów Pottery Workshop*, 163-178.

Meyer, C. (1992) *Glass from Quseir Al-Qadim and the Indian Ocean Trade*, *Studies in Ancient Oriental Civilization*, 53, Chicago.

Melkawi, A., 'Amr, K., Whitcomb, D. (1994) The Excavation of two Seventh Century Pottery Kilns at Aqaba, *Annual Dept. Ant. Jordan*, 38, 447-468.

Morrison, H. (1985) Glass and Trade of the Ancient Aksumite Kingdom, *Annales du Congres- Association Internationale pour l'Histoire du Verre*, 113-126.

Morrison, H. (1989) *The Glass*, Munro Hay S.C. (ed.), *Excavations at Aksum: an account of research at the ancient Ethiopian capital directed in 1972-4 by the late Dr. Neville Chittick*, Memoirs of British Institute in Eastern Africa, 10, London, 188-209.

Munro-Hay, S., and Juel-Jensen, Bent (1995) *Aksumite Coinage*, Spink. London.

Nappo, D. (2009) Roman Policy in the Red Sea between Anastasius and Justinian, Blue, L. Cooper, J., Thomas, R. and J. Whitewright (eds.), *Connected Hinterlands: Proceedings of Red Sea IV, 25-26 September 2008*, pp. 71-77. *Society for Arabian Studies Monographs 8; BAR International Series 2052*. Oxford.

Pallecchi, S. (2002) *I mortaria di produzione centro-italica. Corpus dei bolli.* Rome.

Parker, A. J. (1992) *Ancient Shipwrekcs of the Mediterranean & Roman Provinces*, *BAR International Series*. Oxford.

Paribeni, R. (1907) Ricerche sul luogo dell'antica Adulis (Colonia Eritrea), *Monumenti Antichi* 18, 437-572.

Passi, S. *et alii* (1981) An Application of High Performance Liquid Chromathography to Analysis of Lipids in Archaeological Samples, *Journal of Lipid Research*, 22, 778-784.

Peacock, D.P.S. and Blue, L. (eds.) (2007) *The Ancient Red Sea Port of Adulis, Eritrea Report of the Eritro-British Expedition, 2004-5.* Oxbow Books. Oxford.

Peacock, D.P.S. & Williams, D.F. (1986) *Amphorae and the Roman Economy. An Introductory Guide*. Longman: London and New York.

Pedersen, R. K. (2008) The Byzantine-Aksumite Period Shipwreck at Black Assarca Island, Eritrea, *Azania*, 63, 77-94.

Pedroni, L., (1997) Una collezione di monete aksumite, *Bollettino di Numismatica*, 28, 9, 7-147.

Picon, M., Vichy, M. (2003) *D'Orient en Occident: l'origin du verre à l'époque romaine et durant le haut Moyen Âge,* Foy D., Nenna M.-D. (eds.) *Échange et commerce du verre dans le monde antique, Actes du colloque de l'Association Française pour l'Archéologie du Verre*, Aix-en-Provence et Marseille 7-9 juin 2001, 17-31. Montagnac.

Peacock, D. *et alii* (2007) Pottery from the Survey, Peacock D., Blue L. (eds.) *The Ancient Red Sea Port of Adulis, Eritrea. Results of the Eritro-British Expedition 2004-2005*, Oxbow Books, 79-108. Oxford.

Pieri, D. (1998) Les importations d'amphorae orientales en gaule meridionale durant l'antiquité tardive et le haut-moyen age (IV-VII siecles après J.C.), *Importations d'amphores en Gaule du Sud, du règne d'Auguste à l'Antiquité tardive, Actes du Congrès d'Istres (21-24 mai 1998), SFECAG*, 97-106. Marseille.

Rothschild-Boros, M. C. (1981) The Determination of Amphora Contents, Barker, G. and Hodges, R. (eds.) *Archaeology and Italian Society*, *BAR Int. Series*, 102, 79-89.

Schenk, H. (2007) Parthian Glazed Pottery from Sri Lanka and the Indian Ocean trade, *Zeitschrift für Archäologie Außereuropäischer Kulturen* 2, 57-90.

Schmid, S.G. (1996) Die Feinkeramik, Bignasca, A. *et alii* (eds.) *Petra - Ez Zantur I. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen 1988-1922*. Phillipp von Zabern. Mainz.

Schmid, S.G. (2000) *Petra ez-Zantur II. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen, Teil I: Die Feinkeramik der Nabatäer: Typologie, Chronologie und kulturhistorische Hintergründe*. Mainz: Philipp von Zabern.

Sidebotham, S.S. and Wendrich, W.Z. (eds.) (1996) *Berenike 1996.* Center Non Western Studies. Leiden.

Sidebotham, S.S. and Wendrich, W.Z. (eds.) (1999) *Berenike 1997.* Center Non Western Studies. Leiden.

Smith, M. and Wright, H. (1988) The Ceramics from Ras Hafun in Somalia: Notes on a Classical maritime site, *Azania* 23, 115-42.

Steinby, E.M. (1975) La cronologia delle "figlinae" doliari urbane dalla fine dell'età repubblicana fino all'inizio del III sec., *Bull. Comm. Arch,* 84, 7-132.

Steinby, E.M. (1981) La diffusione dell'opus doliare urbano, Giardina, A. (ed.) *Società romana e produzione schiavistica*, 237-42. Bari.

Stern M. (1999) Roman Glassblowing in a Cultural Context, *American Journal of Archaeology*, 103, 441-484.

Strauch, I., Bukharin, M.D. (2004) Indian Inscriptions from the Cave Ḥoq on Suquṭrā (Yemen), *Annali dell'Università degli Studi di Napoli "L'Orientale"*, 64, 121-138.

Strauch, I. (2012) *Foreign Sailors on Socotra. The Inscriptions and Drawings from the Cave Hoq* (Vergleichende Studien zu Antike und Orient, 3). Bremen.

Tomber, R. (1999) The Pottery, Sidebotham, S.S. and Wendrich, W.Z. (eds.) *Berenike 1997*. Center for Non-Western Studies: 123-156. Leiden.

Tomber, R. (2005) Aksumite and other Imported Ceramics from Early Historic Kamrej, *Journal of Indian Archeology*, 2, 99-102.

Tomber, R. (2008) *Indo-Roman Trade. From pots to pepper*. Duckworth. London.

Tomber, R. (2007) Early Roman Egyptian Amphorae from the Eastern Desert of Egypt: a Chronological Sequence. Marchand, S. and Marangou, A. (eds.) *Amphoraes d'Egypte de la Basse Epoque à l'époque arabe. Cahiers de la Céramique Egyptienne* 8.1, 525-538.

Tomber, R. (2012) From the Roman Red Sea to beyond the Empire: Egyptian Ports and their Trading Partners, *the British Museum Studies in Ancient Egypt and Sudan*, 18, 201-215.

Uboldi, M. (1995) Diffusione delle lampade vitree in età tardoantica e altomedievale e spunti per una tipologia, *Archeologia Medievale*, XXII, 93-145.

Vasiliev, A.A. (1950) *Justin the First*. Cambridge.

Verità, M. (2006) Modern and Ancient Glass: Nature, Composition and Deterioration Mechanisms, Lefèvre, R. (a cura di) *Scienze e materiali del patrimonio culturale 8, The materials of cultural heritage in their environment*, Edipuglia, 119-132. Bari.

Withcomb, D. (1994) *Ayla: Art and Industry in the Islamic Port of Aqaba*, Oriental Institute Museum. Chicago.

Zazzaro, C. (2013) *The Ancient Red Sea Port of Adulis and the Eritrean Coastal Region. Previous investigations and museum collection*, BAR Int. Series 2569.

Zazzaro, C. Cocca, E., Manzo, A. (2014) Towards a Chronology of the Eritrean Red Sea port of Adulis (1st - 7th century AD), *Journal of African Archaeology*, 12.3, 43-73.

FIGURES

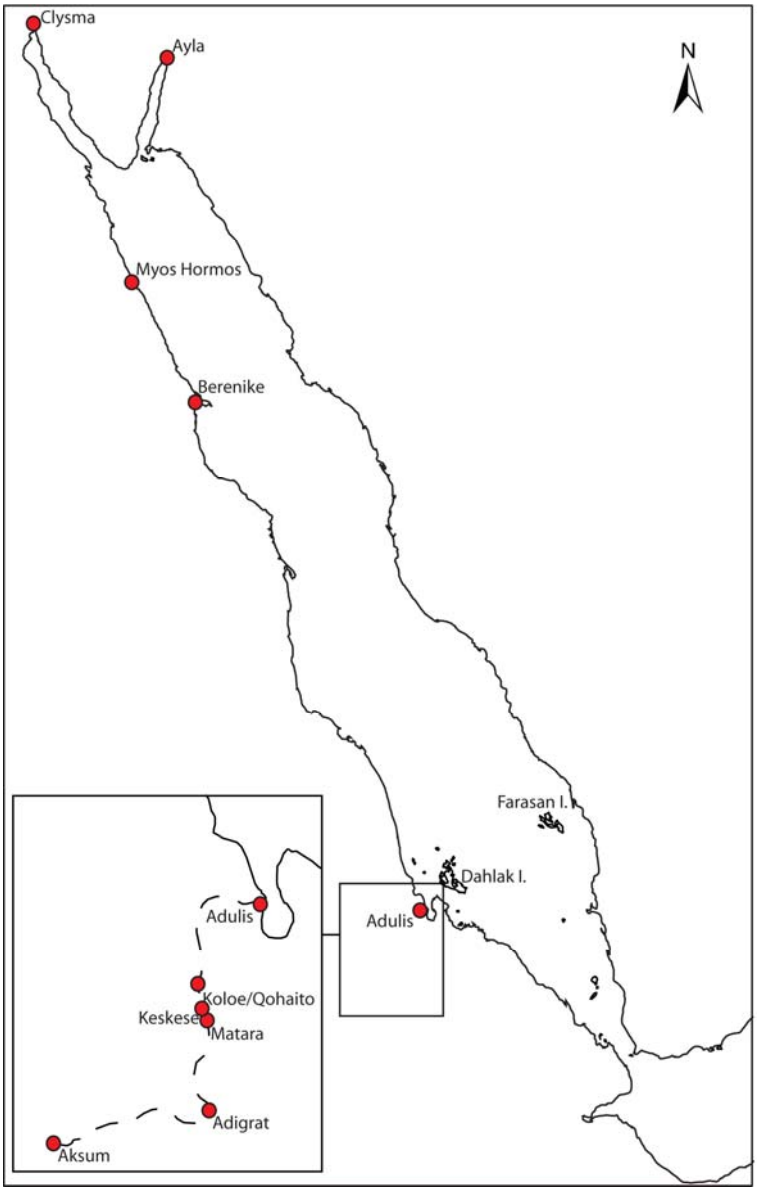

Fig. 1 - The location of Adulis (Map by Zazzaro)

Fig. 2 - Marble pillar found few kilometres away from the site (Photo by Zazzaro)

Fig. 3 - Palestinian Gaza type of amphora found few kilometres away from the site (Photo by Zazzaro)

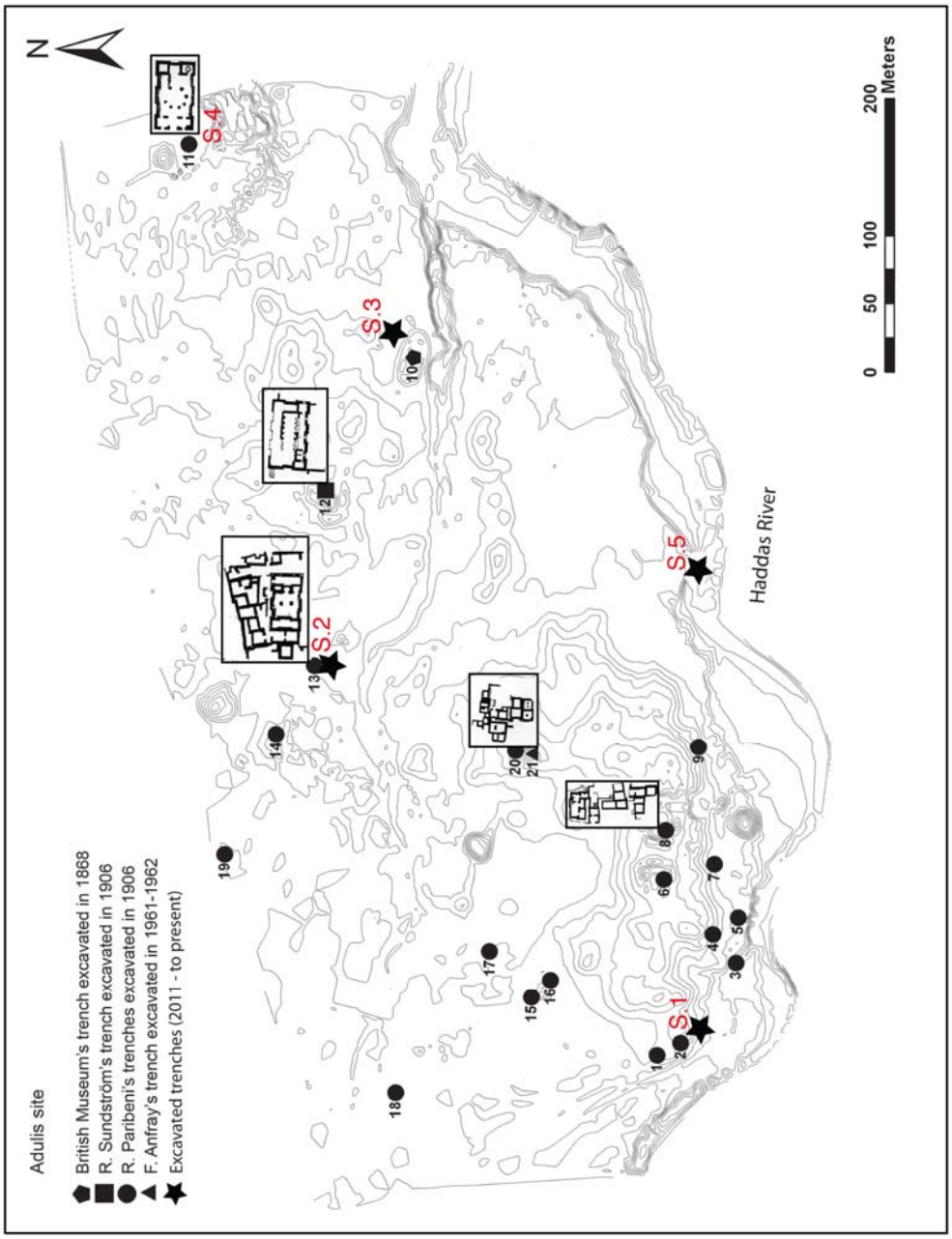

Fig. 4 - Topographic map of the site (modified from Bigliardi, Cappelli, Cocca 2014)

Fig. 5 - Sector 1, the wall SU 1086/1026. Period 2, phase 3 (Photo by Perna/Zazzaro)

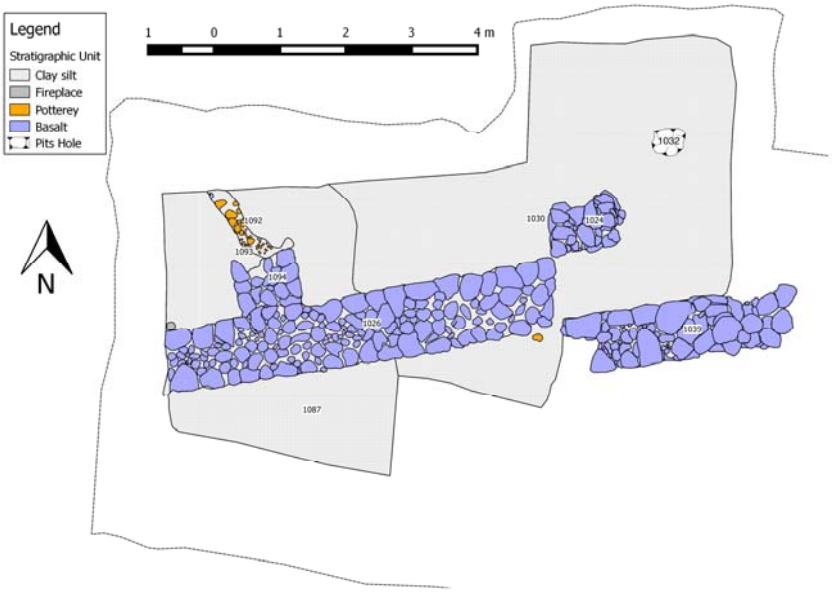

Fig. 6 - Sector 1, plan of living floor 1092-1093. Period 2, phase 3 (ca. 1st - 2nd c. AD) (Map by Cocca)

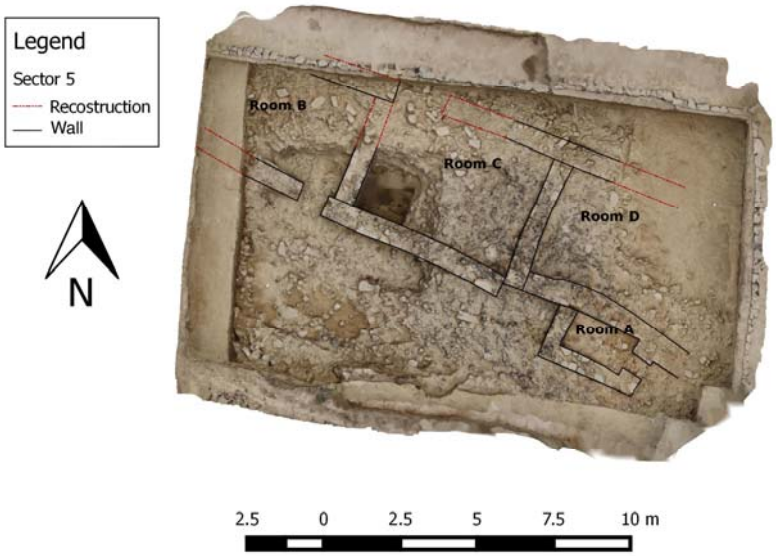

Fig. 7 - Sector 3, general view showing the location of room "C". Period 1, phase 2 (Map by Cocca)

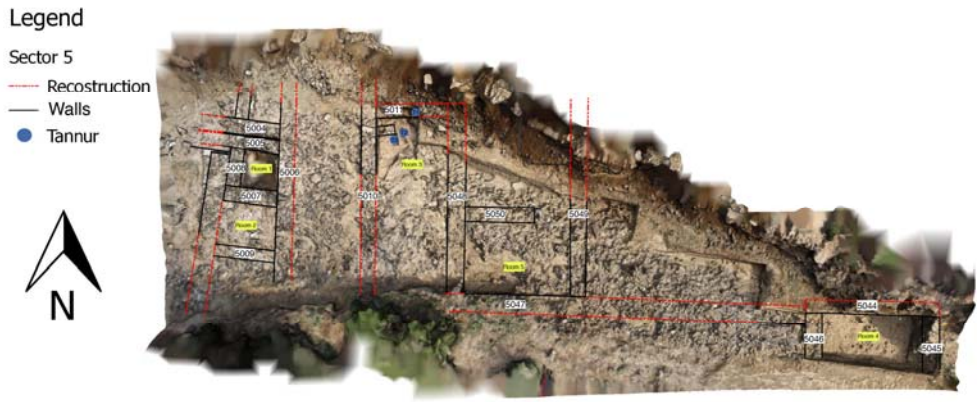

Fig. 8 - Sector 5, general view showing the location of the rooms. Period 1, phase 2 (Map by Cocca)

Fig. 9 - Sector 5, Period 1, phase 2, *Tannur* 3 dated by C-14 to the 5th - 6th c. AD (Photo by Zazzaro)

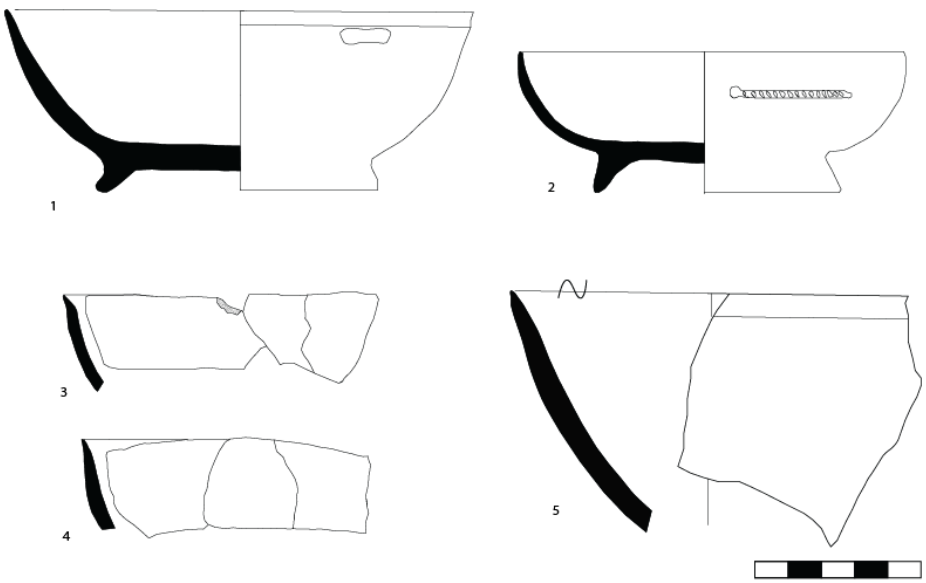

Fig. 10 - Pottery from SU 1092 (Drawing by Perna)

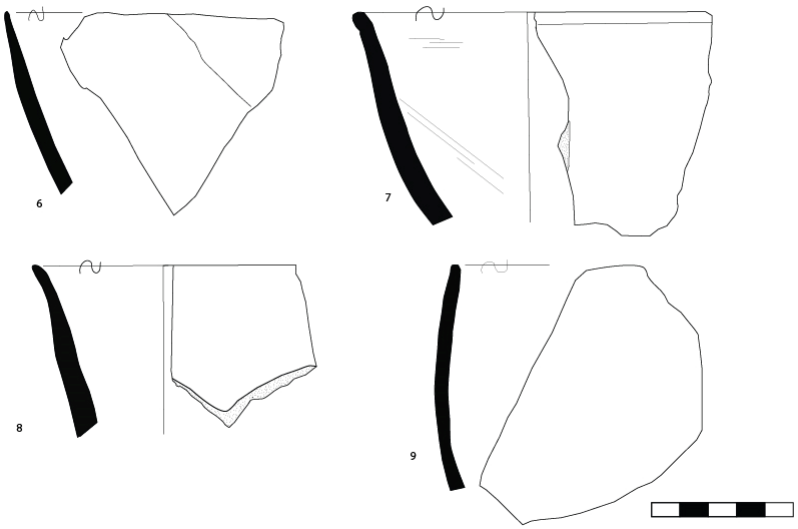

Fig. 11 - Pottery from SU 1092 (nos 6, 7 and 8) and from SU 1078 (no 9) (Drawing by Perna)

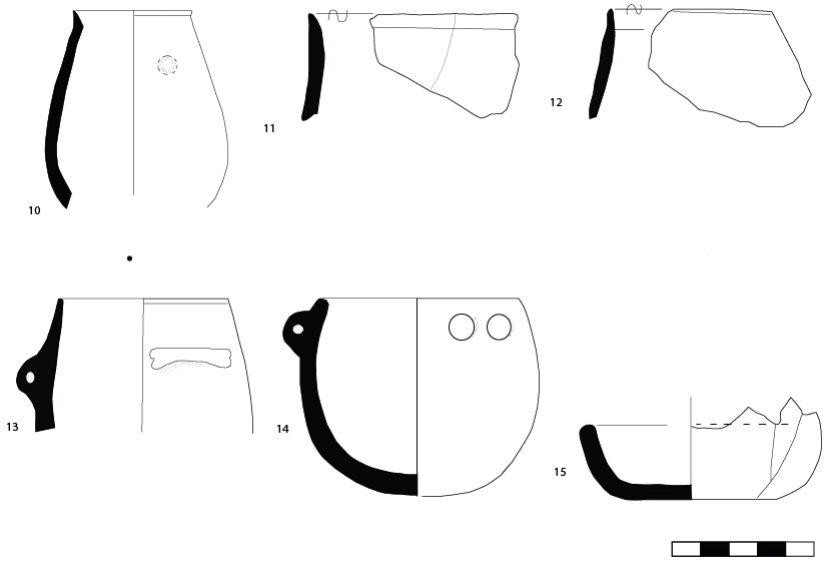

Fig. 12 - Pottery from SU 1092 (Drawing by Perna)

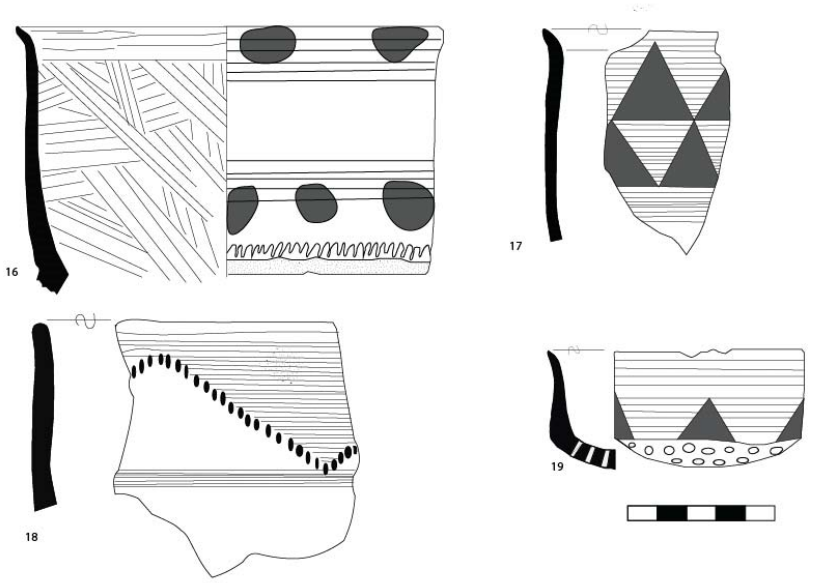

Fig. 13 - Pottery from SU 1056 (nos 16, 17 and 18) and from SU 1092 (no 19) (Drawing by Perna)

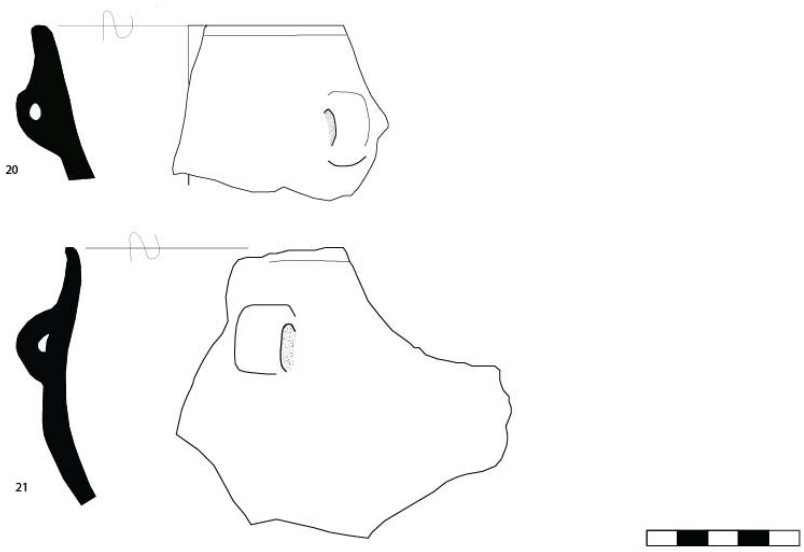

Fig. 14 - Pottery from SU 1092 (no 20) and from SU 1084 (no 21) (Drawing by Perna)

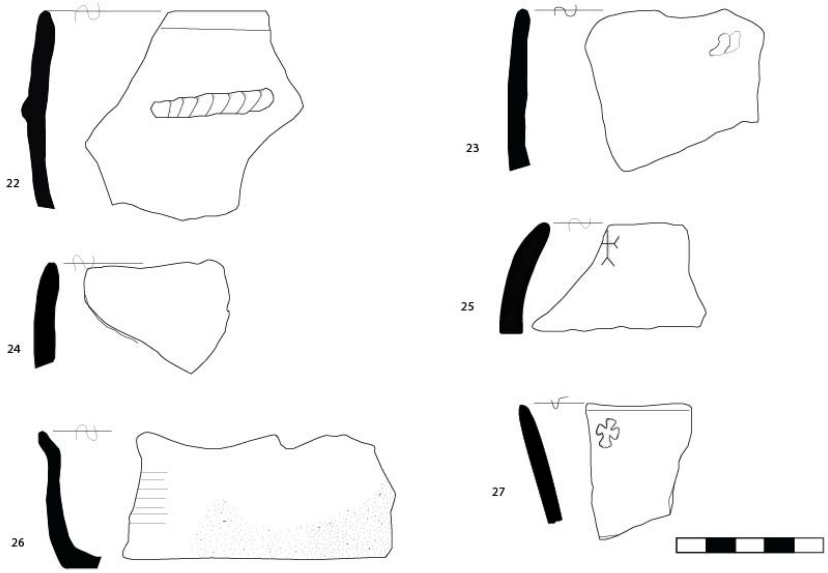

Fig. 15 - Pottery from SU 1056 (nos 22 and 26), SU 1085 (nos 23 and 24), SU 1082 (nos 25 and 27) (Drawing by Perna)

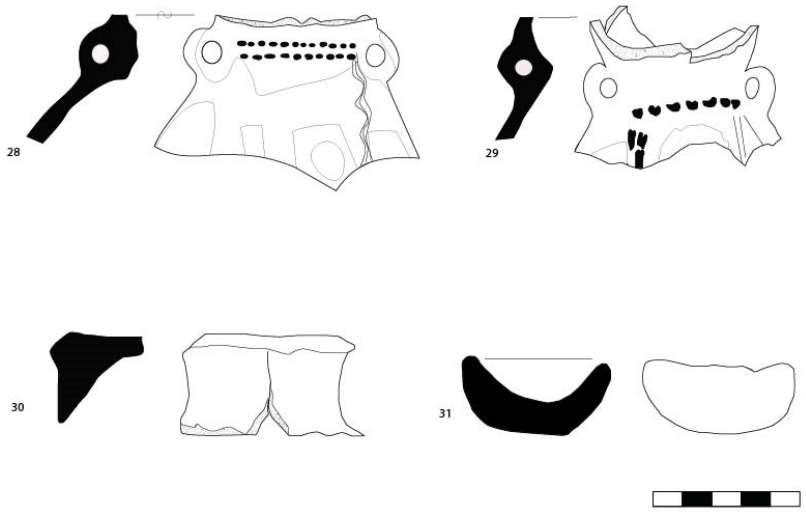

Fig. 16 - Pottery from SU 1078 (no 29) and SU 1082 (nos 28, 30 and 31) (Drawing by Perna)

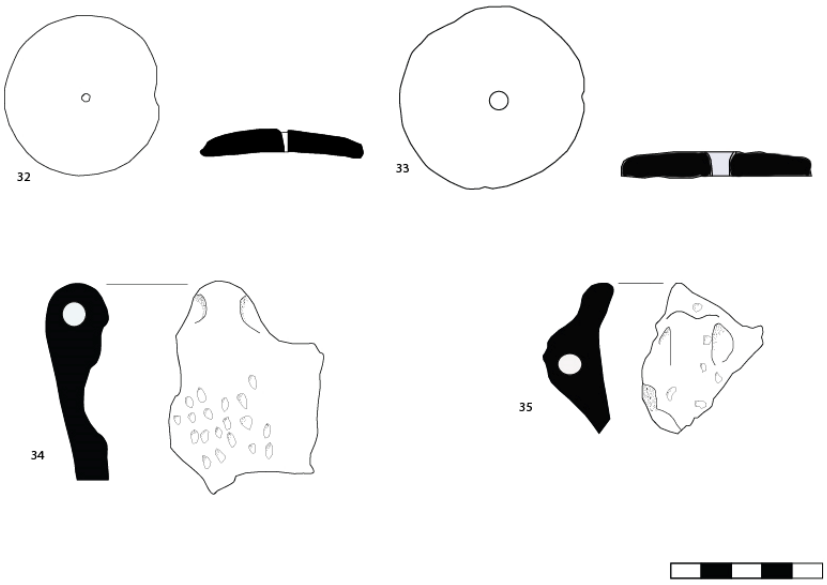

Fig. 17 - Pottery from SU 1056 (no 33) and SU 1082 (nos 32, 34 and 35) (Drawing by Perna)

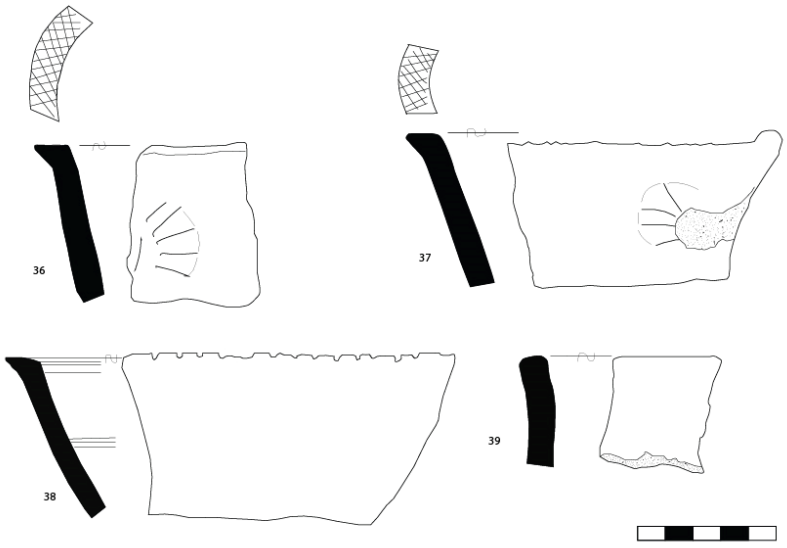

Fig. 18 - Pottery from SU 1089 (no 36), SU 1056 (nos 37 and 38) and SU 1092 (no 39) (Drawing by Perna)

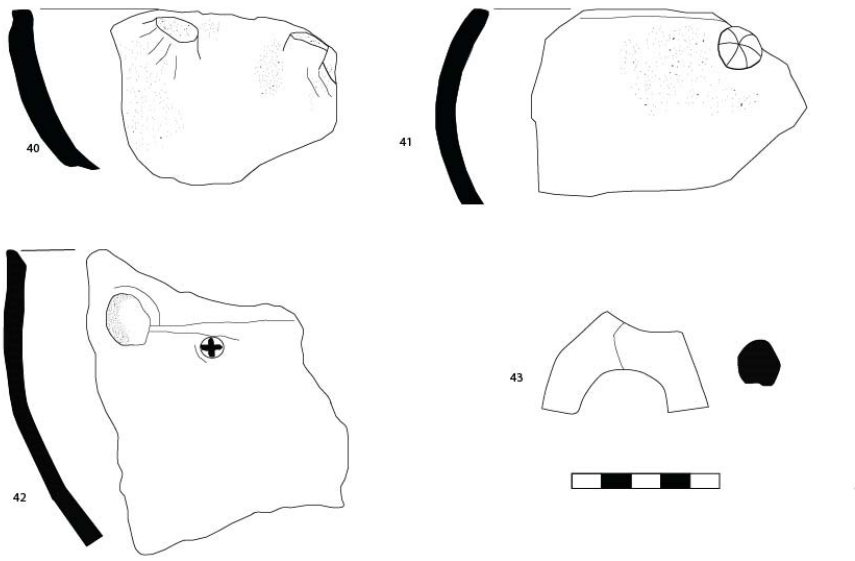

Fig. 19 - Pottery from SU 1084 (nos 40 and 41), SU 1082 (no 42) and SU 1092 (no 43) (Drawing by Perna)

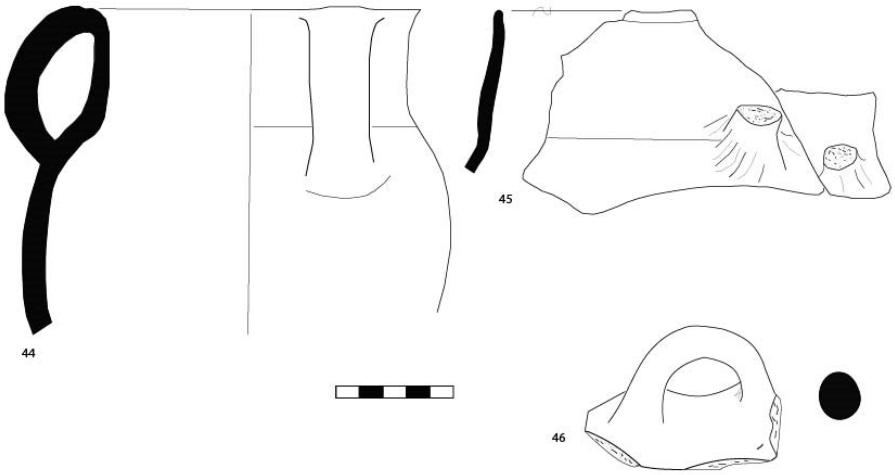

Fig. 20 - Pottery from SU 1056 (no 44), SU 1075 (no 45) and SU 1092 (no 46) (Drawing by Perna)

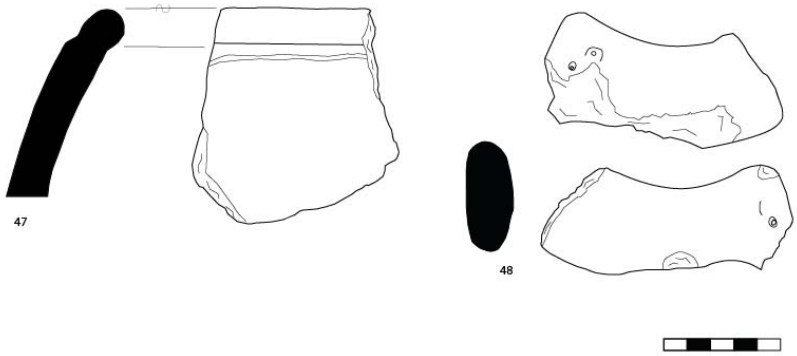

Fig. 21 - Pottery from the cleaning of sector 1(Drawing by Perna)

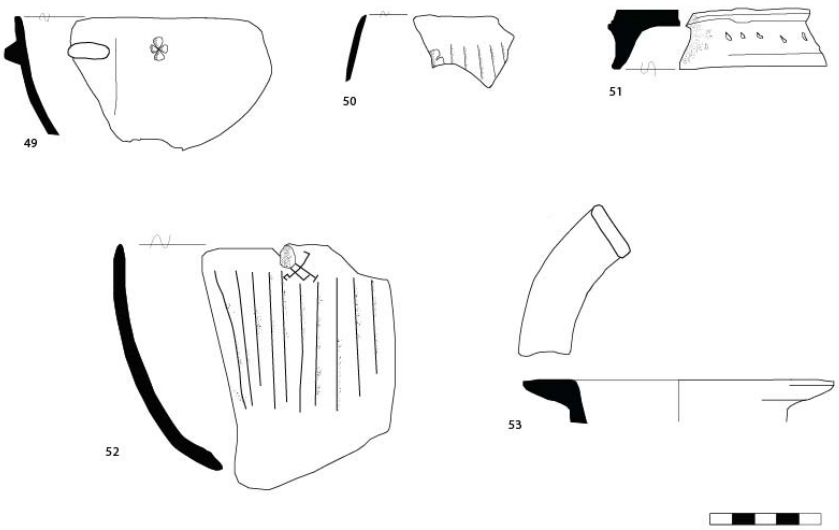

Fig. 22 - Pottery from SU 2131 (nos 49, 50 and 51) and SU 2132 (no 53) (Drawing by Perna)

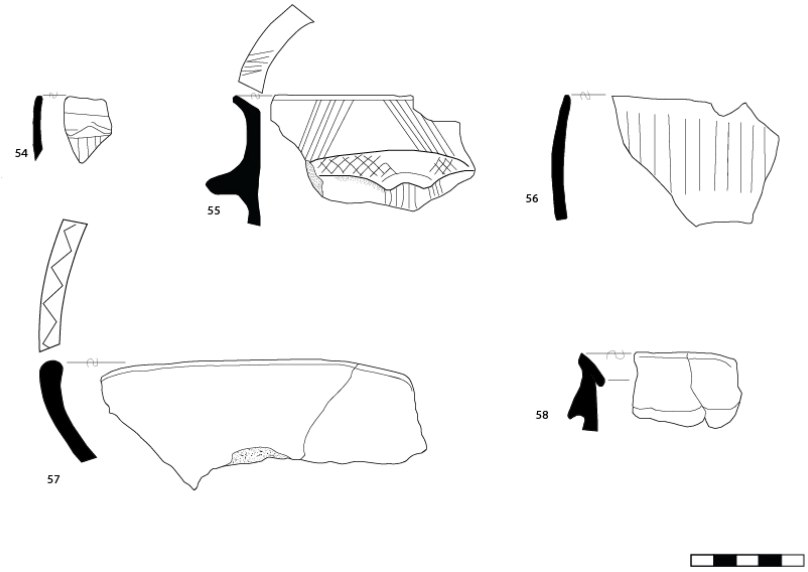

Fig. 23 - Pottery from SU 3058 (Drawing by Perna)

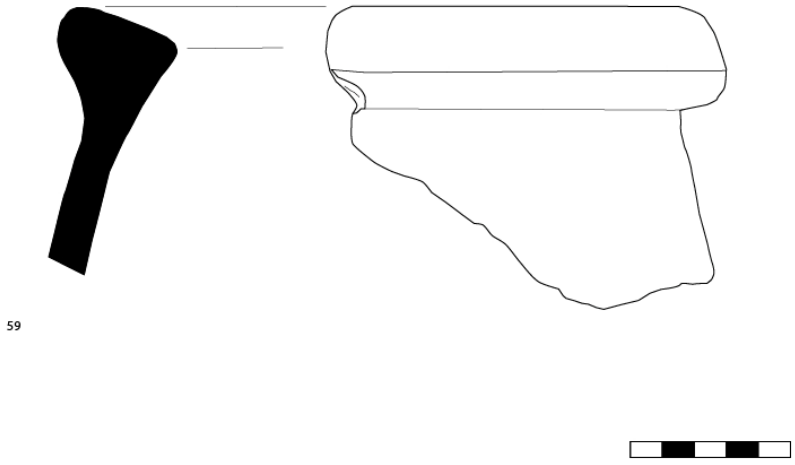

Fig. 24 - Pottery from sector 4 (Drawing by Perna)

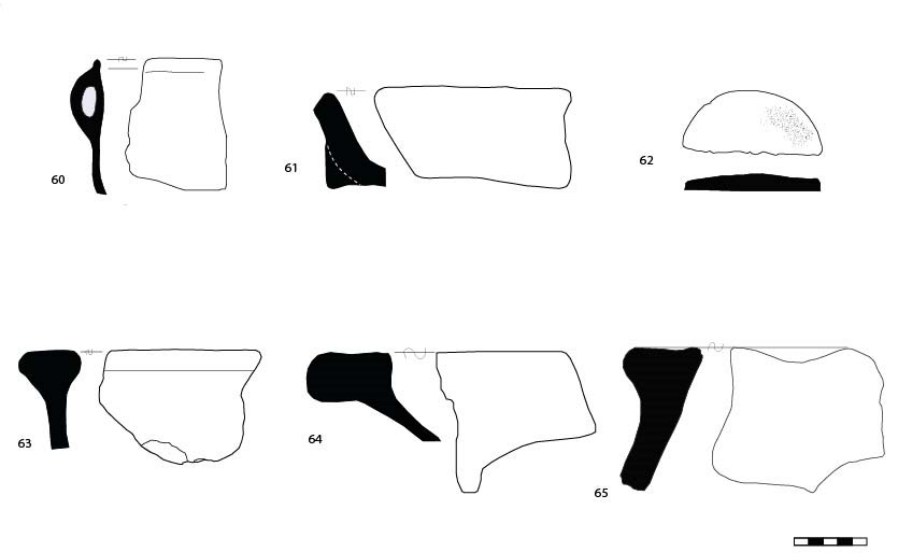

Fig. 25 - Pottery from SU 5017 (no 60), SU 5027 (nos 61 and 63), SU 5029 (no 62), SU 5037 (nos 64 and 65) (Drawing by Perna)

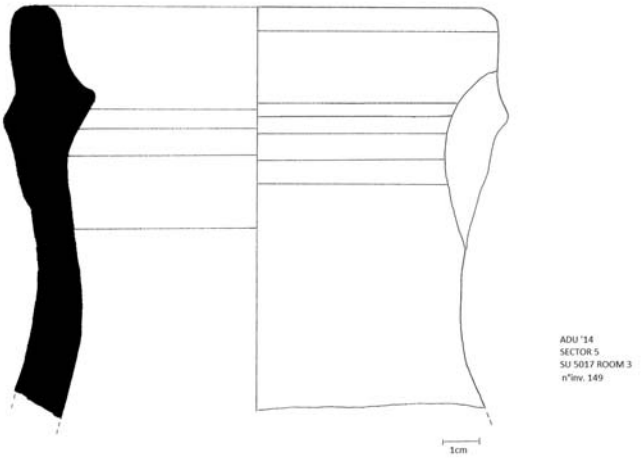

Fig. 26 - Ayla-Aksum amphora (Drawing by Mandelli)

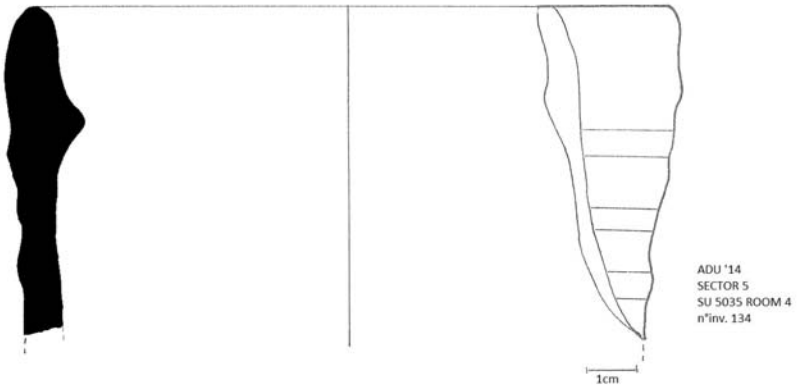

Fig. 27 - Ayla-Aksum amphora (Drawing by Mandelli)

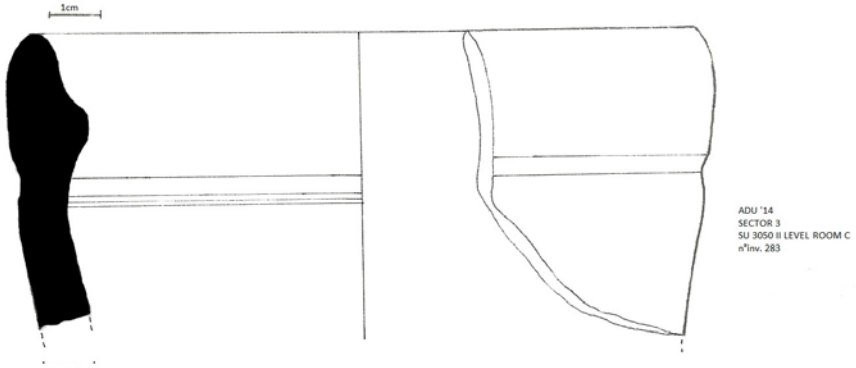

Fig. 28 - Ayla-Aksum amphora (Drawing by Mandelli)

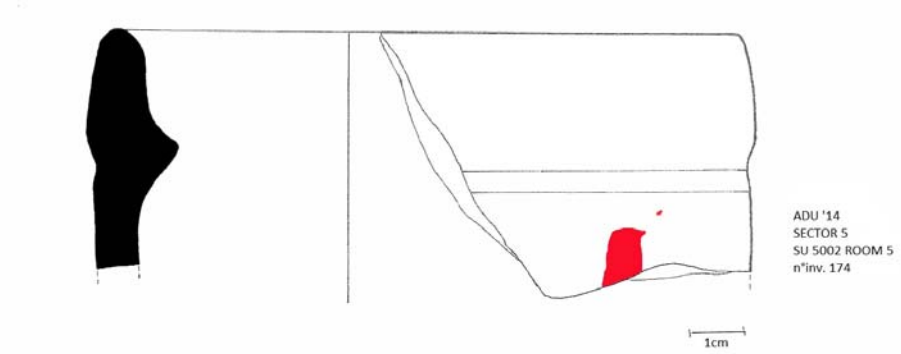

Fig. 29 - Ayla-Aksum amphora (Drawing by Mandelli)

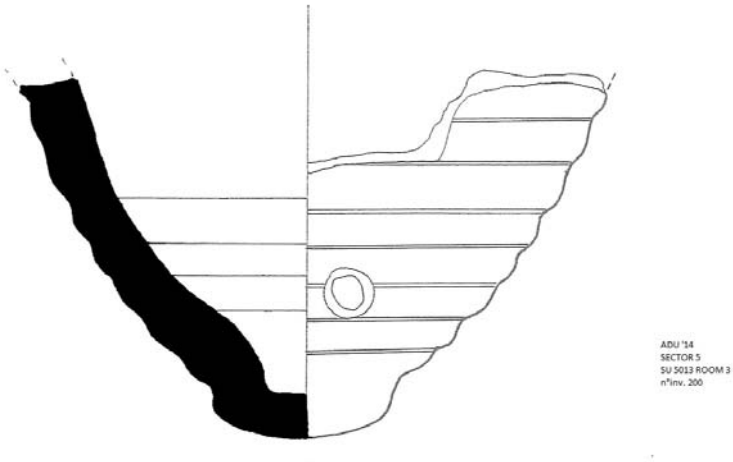

Fig. 30 - Ayla-Aksum button base fragment (Drawing by Mandelli)

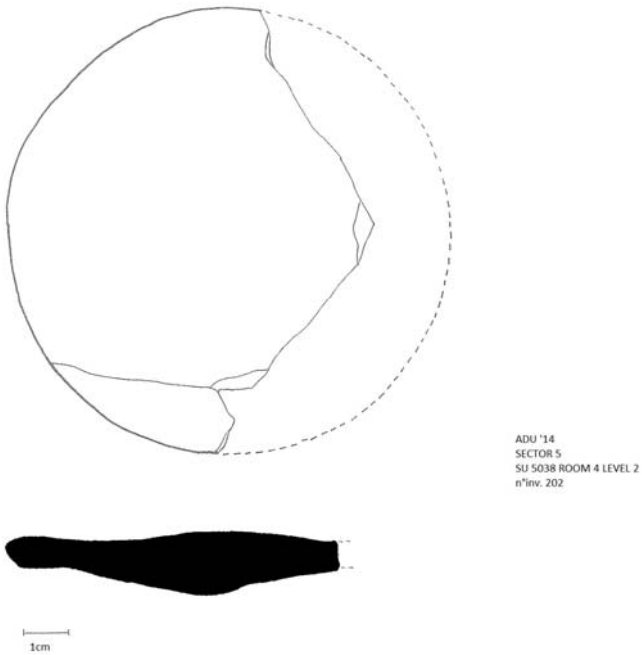

Fig. 31 - Ayla-Aksum amphora lid (Drawing by Mandelli)

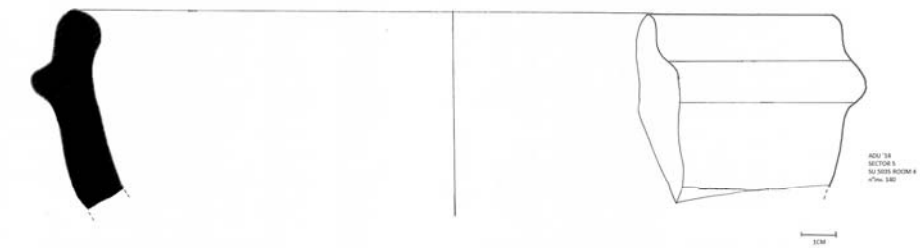

Fig. 32 - Ayla Ware basin fragment (Drawing by Mandelli)

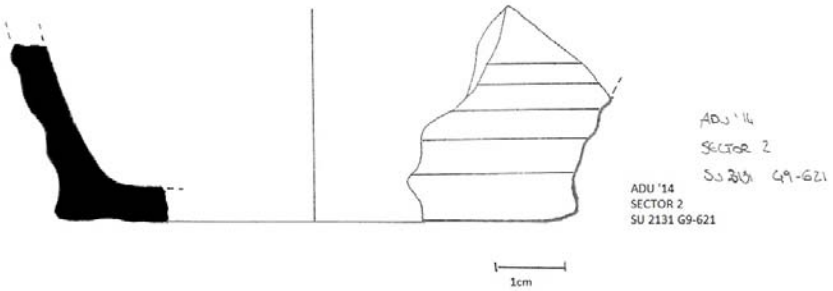

Fig. 33 - Ayla Ware base fragment (Drawing by Mandelli)

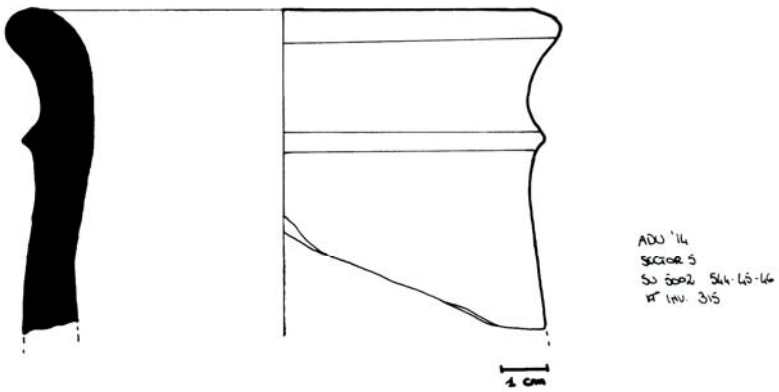

Fig. 34 - Later Roman 1 amphora (Drawing by Mandelli)

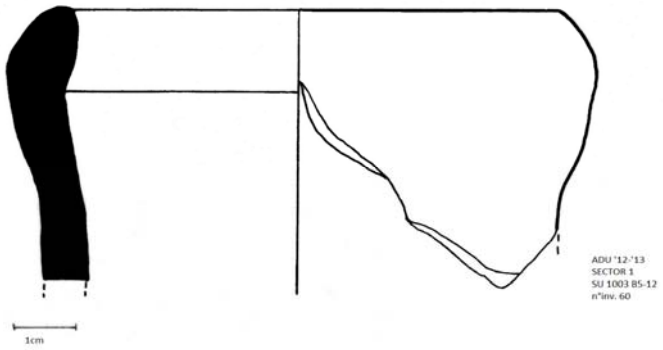

Fig. 35 - Egyptienne 3 amphora (Drawing by Mandelli)

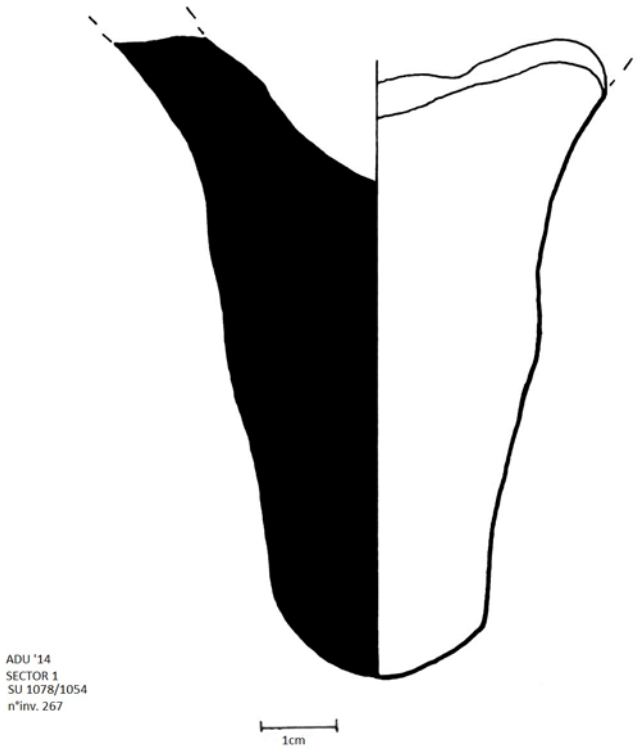

Fig. 36 - Egyptienne 3 amphora (Drawing by Mandelli.

Fig. 37 - Mortar with stamp (Photo by Zazzaro)

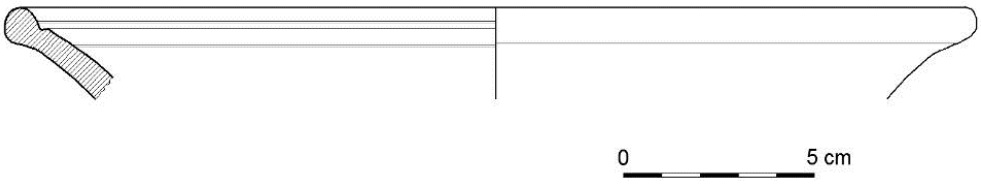

Fig. 38 - African Red Slip Ware (Hayes 104 C) (Drawing by Massa)

Fig. 39 - “Nabataean” painted potsherd (Photo by Castiglioni)

Fig. 40 - "Nabataean" painted potsherd (Photo by Nappo)

Fig. 41 - Turquoise-blue Glazed Ware (Photo by Nappo/Zazzaro)

Fig. 42 - Indian terracotta figurine (Photo by Nappo)

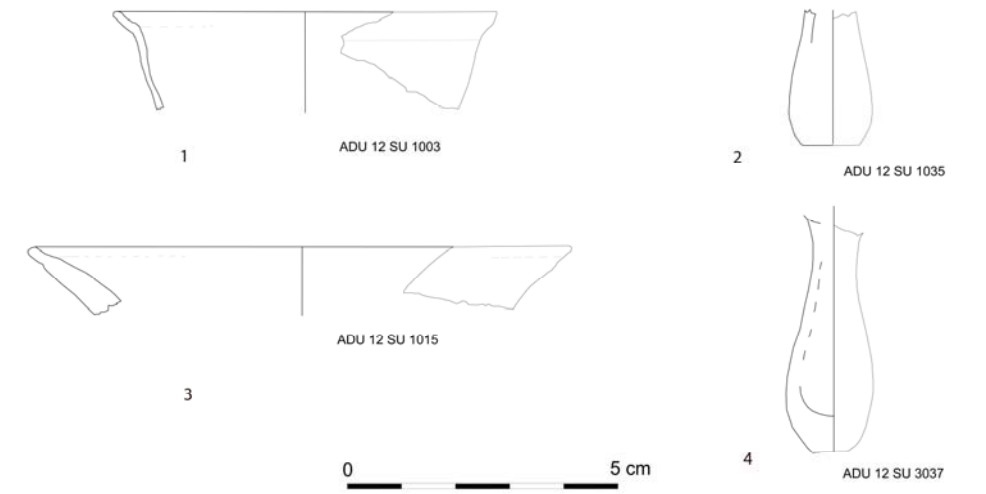

Fig. 43 - Glass - drawings (Drawing by Massa)

Fig. 44 - Glass - pictures (Photo by Cocca/Zazzaro)

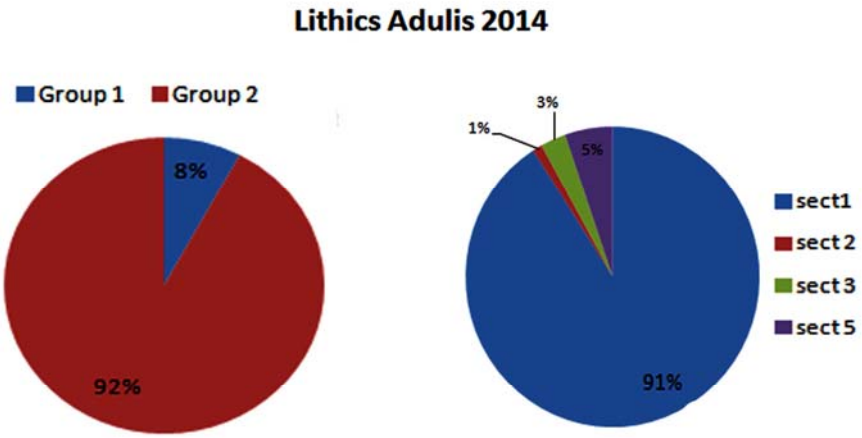

Fig. 45 - Graph showing the quantitative distribution of two lithic groups (Graph by Cocca)

Fig. 46 - Spearhead (Photo by Nappo)

Fig. 47 - Spatula probe (Photo by Nappo)


Fig. 48 - Hook of a steelyard balance (Photo by Nappo)