

EXCAVATIONS AT ADICHCHANALLUR



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प्रत्नकीर्तिमपावृणु

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FOREWORD

Iron Age and megalithic culture is a very interesting chapter in the history of South Indian archaeology. A wide range of sites encompassing the southern states have been extensively explored and a good number of excavations have also been conducted. Each excavation has thrown up new results and hence the challenges.

Scientific and systematic documentation of the process of excavation and the material unearthed has changed considerably with the availability of various scientific techniques and processes for the micro analysis of the objects and for dating purposes. Many a site has been re excavated bearing this aspect in mind. Re visiting the Iron Age site of Adichchanallur in Tamil Nadu, became crucial because the large number of objects and pottery unearthed earlier had to be studied in a proper context. It had to be further examined in the light of Sangam literature which reflects on the customs and practices of the times.

A small area within the protected limits of Adichchanallur was selected for excavation. A whole gamut of new evidence has emerged in the form of urn burials – both red ware and black and red ware. 178 burials were exposed within a 600 sq m area. A large number of skeletal remains were also found in the urns. The anthropological study of the skeletal remains by Dr Raghavan Pathmanathan and the detailed documentation of the excavated remains by Dr.Sathyabhama Badhreenath, Jt DG (Retd) ASI in the form of this report have opened up new vistas for research in Iron Age/Megalithic studies.

I congratulate Shri T.Satyamurthy, Superintending Archaeologist, (Retd) ASI, Chennai Circle and his team for having meticulously excavated the site in 2004 and 2005. I also appreciate the efforts taken by Dr Sathyabhama Badhreenath for bringing out this report.

New Delhi

Smt. V.Vidyavathi IAS
Director General
Archaeological Survey of India

PREFACE

The Iron Age site of Adichchanallur is continuing to attract the interest of the archaeologists since its discovery nearly 140 years ago. The rich haul of antiquities reported by Rea and the anthropological studies undertaken from time to time culminated in the re excavation of the site at Adichchanallur.

The earlier excavation by A. Rea was done sporadically at nearly most of the places at the 114 acre protected site and he has elaborately documented all his findings including bronze, iron, gold objects and pottery. The crucial issue is that he has not substantiated with as many plans regarding the exact area of his excavation. As a result it is difficult to gauge from which point of the site the objects were recovered as he himself states that different areas yielded different types of objects.

To overcome this issue the site was re excavated in 2004 and 2005. A large number of potteries were retrieved from this excavation. As far as the antiquities are concerned only iron objects were found in larger numbers and copper objects were less in number. No bronze or gold objects were found.

Some aspects of the site like the burial practices have now been better understood based on the location of the skeleton in the burial. The anthropological studies infer that the site was occupied by different races and the recent studies by the bio anthropologist have added to our knowledge.

Earlier metallurgical studies on the objects have highlighted the composition of the metals etc. The geo archaeological survey carried out by NIOT has established that Adichchanallur and adjoining areas were mining sites and that the technology of melting, casting and metal working was prevalent in this period.

The large quantity of pottery unearthed from this and the earlier excavation needs to be studied in detail to understand the various types of pottery – their indigenous evolution or the intrusion of types from other areas. Moreover, the pottery of the adjoining sites needs to be also collaborated with.

Comprehensive studies of the material unearthed so far would probably establish whether iron and urn burials have a link which was established before the advent of the other types of megalithic burials.

New Delhi
30/11/2019

Dr. SATHYABHAMA BADHREENATH

ACKNOWLEDGEMENTS

The excavation at the protected prehistoric site at Adichchanallur was directed by Shri T. Satyamurthy the then Superintending Archaeologist of Chennai Circle for two seasons during the years 2004 and 2005. The other participants in the excavation included S/Shri M. Nambirajan, Jt DG, G. Thirumurthy (now Associate Prof in Central University, Tiruvarur), Arun Malik Dy.SA, Anil Kumar Dy.SA, Smt C.R. Gayathri AA, Aravazhi AA and myself. The Surveyors involved were Shri R.Vinayagam and J.Kuppusami. The draughtsmen associated with the work were Shri Sarangadharan, H. Raghavendra, Manickam and Smt Lakshmi. The photographer was Shri Ravikumar.

I am grateful to the Director General Smt V. Vidyavathi IAS for having reposed faith in me for compiling the excavation report of a very important site in South India. This has given me an opportunity to study once again the complex site and the pottery and antiquities of the prehistoric site. The site was excavated nearly 15 years ago and efforts have been taken to include all the details observed during the excavation.

The writing of this report would not have been possible without the logistic support of Dr A.M.V. Subramanyam, Superintending Archaeologist, Vadodara Circle and Shri P.S. Sriraman Superintending Archaeologist, Chennai Circle.

Dr C. R. Gayathri worked tirelessly and coordinated with me at every stage during the report writing work. The others who also worked towards the completion of the report include Smt S. Vetriselvi AA, Shri V. Muthukumar AA, Shri H. Raghavendra Draughtsman, Smt Girly Suguna Photographer, Shri S. Arul Xavier and Shri S. Venkatesh – Research Scholars.

The financial assistance rendered by the Department of Archaeology, Government of Tamil Nadu facilitated in the dating of the site from BETA Analytic Inc, USA. The metal objects were studied by Dr Vijayan of the Institute of Physics, Bhubaneshwar and the pottery was analysed by Dr Raj Kishore Gartia of Manipur University. The bones unearthed in the excavation were studied by Dr A.K. Sharma former Superintending Archaeologist, Archaeological Survey of India and Dr Raghavan Pathmanathan, a forensic anthropologist from Australian National University, Canberra, Australia. The Archaeological Survey of India is indebted to the Government of Tamil Nadu and the experts mentioned above.

I would also like to thank the Publication team of the Survey, especially Dr T.R. Sharma Jt. DG, Dr K. Lourdusamy, Director, Ms Neha Pande Asst Archaeologist for doing the required editing work and getting the book ready for printing.

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ABBREVIATIONS

ARASI – Annual Report of the Archaeological Survey of India

ARADM&C – Annual Report of the Archaeological Department
Southern Circle Madras & Coorg

IJHS – Indian Journal of the History of Science

CHAPTER I

INTRODUCTION

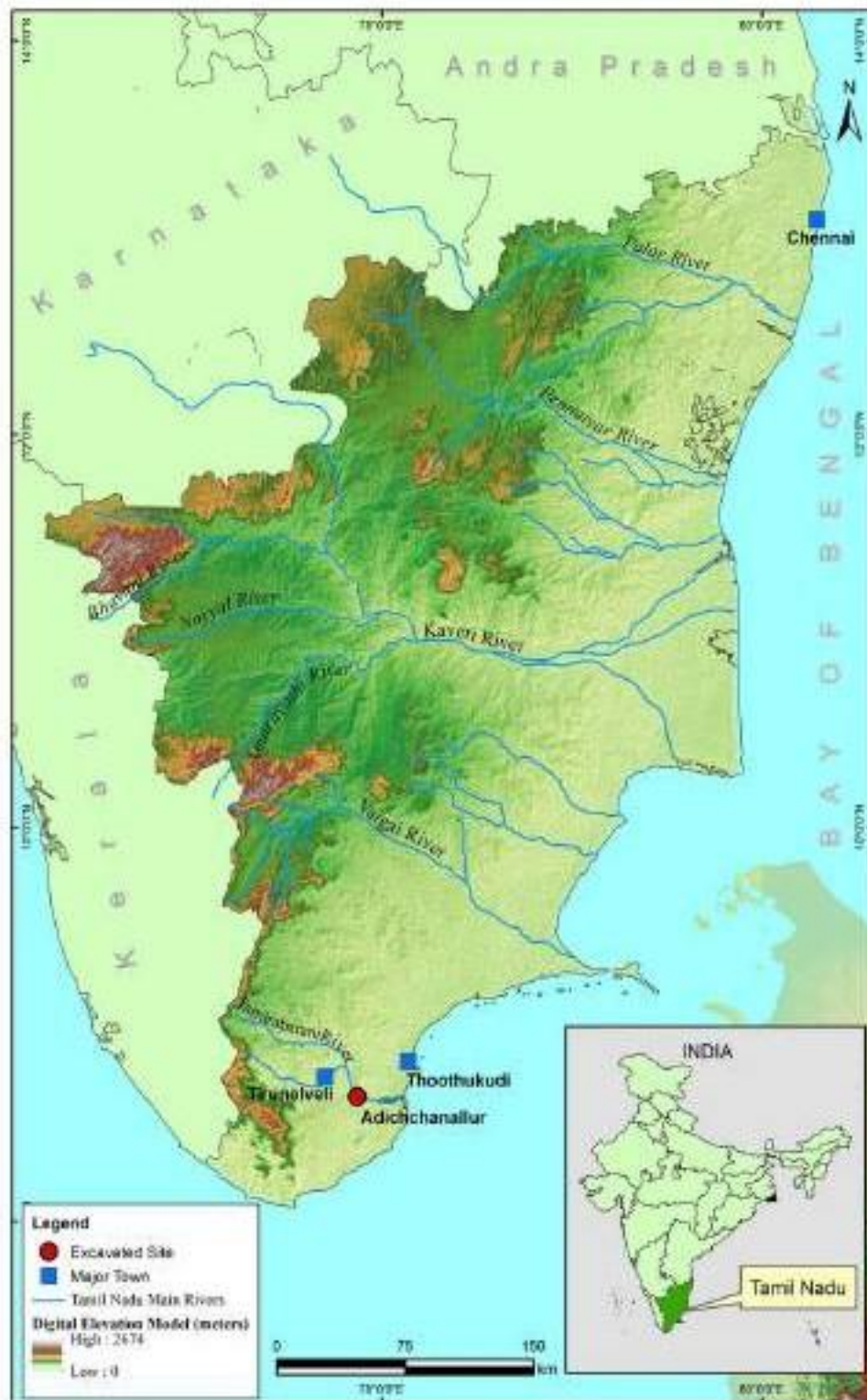
Revering the dead was and is a very important concept in the psyche of the human race. Inhumation or cremation was and is two of the common most ways of disposing the dead. While literature gives a lot of references regarding the ritualistic and also the types of burial, the tangible aspects of the burials is seen in the large number of funerary monuments which have been discovered all over India. This is associated with the Iron Age/Megalithic culture. This culture constitutes one of the important areas of study in South India. The burial landscape becomes very distinctive in the Iron Age and Early Historic period in Tamil Nadu.

Amongst all the types of burials noticed in the present day geographical area of Tamil Nadu, the urn burial type appears to be the most common and widespread. Urns, a major type of burial is found in isolation without any lithic assemblage and also in other burial types like cists, cairns etc.

As per the view of Gururaja Rao(1972) , the other burial types like the sarcophagus, cists, dolmenoid cists, cairn circles, menhirs was mostly the result of influences from adjoining and outlying areas. Explorations have been undertaken in most parts of Tamil Nadu in the documentation of Iron Age /Megalithic sites and a good number of excavations have also taken place which has placed the Iron age/Megalithic culture in between the Neolithic and the Early Historic phases.

The Iron Age burials of the Tirunelveli area especially Adichchanallur, has attracted the attention of scholars since its initial discovery in 1876 by F. Jagor. The site was excavated by Alexander Rea of the Archaeological Survey of India in 1905 and was revisited by T. Satyamurthy of the same organization in 2004-05.

Adichchanallur is one of the best preserved sites in the Tamiraparani valley, and the excavation reports of Rea (1903, 1904, 2002) enumerate that the site yielded a large number of artifacts and pottery. Rea states that in previous years, excavation was confined to the remains on the south side in the limits of Kalvai and that a greater part of this ground was also explored. So excavations were carried out not only in these limits, but in several other parts of the preserved ground (ARADM&C: 1902-03: 1903:19). To understand the burial site in relation to the habitation one was an important objective of the excavation. This prompted and necessitated a revisit of the site.



LOCATION OF ADICHCHANALLUR

EARLIER INVESTIGATIONS

The site was first discovered by F. Jagor of Berlin in 1876. He was accompanied by Mr. Stuart, the then acting Collector of Tirunelveli and the District Engineer. A lot of objects like earthen utensils, considerable iron implements besides skeletal remains from the pits dug for mining gravel were collected by him. The findings were informed to the Government and the artefacts were taken by Dr. Jagor and deposited in Berlin Museum.

Alexander Rea's researches

Dr. Alexander Rea of the Archaeological Survey of India took notice of the findings and visited the site in 1899-1900 to study the nature of the site. During this period he undertook limited digging. Subsequently, he carried out large scale excavation till 1903-04, mainly around the pits dug for gravel. M. Louis Lapicque of Paris explored the site in 1903-04 which resulted in additional collections. All these collections were later shifted to Government Museum, Egmore, Madras (now Chennai) where they are now preserved.

Rea (1877;1903, 1904,1998) reported his initial findings in the journal *Indian Antiquary* (Vol. VI) and in detail in the Annual report of the Archaeological Survey of India, 1902-03, Annual reports of the Archaeological Department, Southern Circle Madras and Coorg 1902-03, 1903-04 and 'Catalogue of the Prehistoric Antiquities from Adichchanallur and Perumbair', Government Museum, Chennai. 1998(reprint).

Rea undertook extensive exploration of the sites along the course of the Tamiraparini River from Palayamkottah to the sea shore. A total number of 38 sites were identified by him, which included urn burial sites similar to Adichchanallur (ARASI 1902-03:2002:111). The habitation site

associated with the burial site was identified at Kongarayankuruchi on the northern bank of the river. This study revealed pottery which was quite different from those found in the tombs. From this it appears that some of the burial pottery were made specially for the purpose and are fairly fragile. (ARASI 1902-03:2002:113). Rea further postulates that Adichchanallur might have been the early seat of trade, and when the sea receded Korkai may have been founded as its seaport. (ARASI 1902-03:2002:114)

The comprehensive and extensive survey of Rea resulted in the protection of the prehistoric site of Adichchanallur. Encompassing an area of 114 acres, he opined that the burial urns were found, at some places close together, and others more widely apart. He also observed that the burials were distinct because of their contents. (ARADM&C1902- 03:1903:19). So intrasite variations had existed in the artefact assemblage of the urns.

The area taken up for excavation by Rea as per his report was in the centre of the present protected site covering an area of about five acres. Two types of internments were observed by him—

1. Large wells or pits were sunk in loose quartz rock in rows and these contained the urns. Walls of rock are left in between. The wells ranged in size from 4 – 9 feet in diameter and 6 – 12 or 15 feet in depth. The bottom was concave with a small hole in the centre in which the leg of the urn is placed. The wells were subsequently filled up with gravel, small or big stones. There was no surface indication of their presence.
2. Outside rocky ground, the wells were found in hard ground. The urns here were not placed in regular lines like the above. Here also no surface indications were visible.

The urns as per his report were placed on an average distance of 6 feet apart and at a depth of 3 – 12 feet or more below the surface. Some were found placed over the other ones.

Rea during the excavations unearthed nearly 1872 objects during the first season and over 4000 objects in the second season. (ARASI 1902-03:2002:117)

The burial site yielded finely made pottery of various kinds, iron implements and weapons, vessels and personal ornaments in bronze (found in rarity so must have been highly valued and probably used by the higher classes), few gold ornaments (found in the tombs as diadems), few stone beads, bones and some household stone implements used for grinding. Traces of cloth and wood preserved by rust or oxidation in contact with metals were found. In a number of urns there were quantities of mica in pieces. Husks of rice and millet were found in quite a large number of pots inside the urns.

The funeral urns unearthed by Rea were large, one legged, elongated, globular pots of thick red earthen ware, averaging less than a yard in diameter by a slightly greater height. The rims were plain and some were impressed with thumb nail or incised with triangular and dotted designs. One was made of a thin finer material and showed traces of black colour polish around the rim. All were closed with flat conical lids. When the lids were damaged, the urns were filled with stones and soil which was not the feature at the time of burial.

Very few urns appeared on the surface and these did not yield much deposit and they were usually cracked because of expansion and contraction of the surrounding ground. Only in a few instances, the urns contained the complete bones of the skeleton and in such cases the urns were of large size and nearly 3 feet in diameter and also devoid of earth. In these urns, the position of the bones (leg and arm bones fell over and rested against one side of the urn, while the skull, ribs and vertebrae dropped down to the bottom) indicated that the body was placed inside in a squatting position.

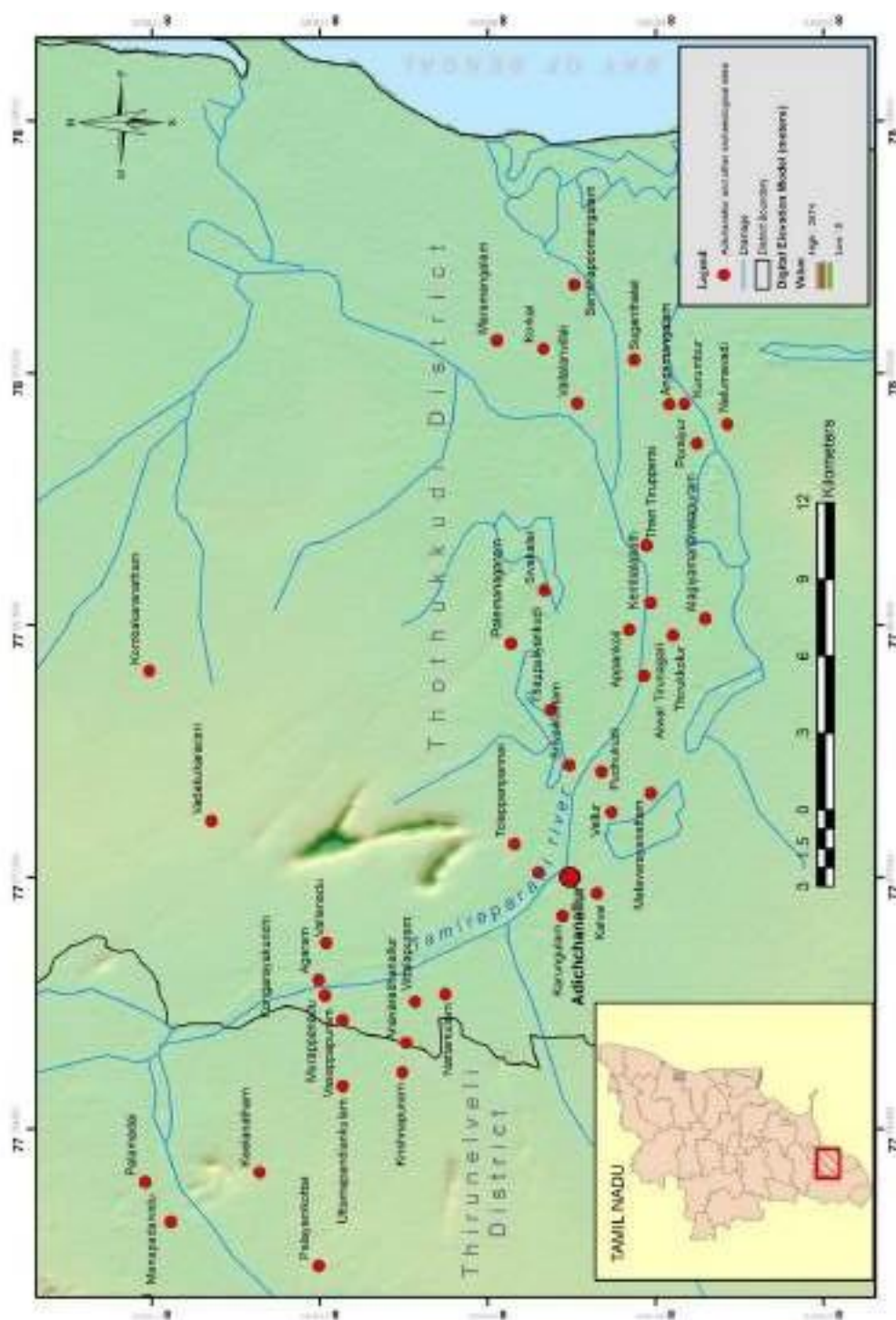
Some urns contained skull or few bone parts while some had no traces of bones (could be due to decay or because none were buried). None of the bones were calcined. Earthen ware pots associated with the burial were found either inside or outside the urn or in both places.

The bronzes and iron implements exhibited high workmanship. Both were found either inside or outside the urns. The iron objects like swords, arrows, spears, etc found around the urn were always found point downwards, as if they had been thrust into the surrounding earth by the attendant mourners. Gold diadems were found only in some urns which were generally large, placed about 10 – 15 feet deep and had considerable deposits in the form of pottery, bronze vessels and iron implements. Such types could have been limited to persons of importance.

The pottery assemblage recovered by Rea exhibited variations in shape and size. Some of the repetitive and uniform types include miniature bowls, hemispherical bowls, carinated bowl with beaded rim, vertical bowl with projecting rim, cup, flat based oviform vase, miniature jar with wide neck, jar with cylindrical neck and globular body and lid with finials. The pottery was mainly of Black-and- Red ware and the ring stands were of black ware.

A detailed list of the objects/pottery was published in the Annual Report of the ASI 1902-03.

IRON AGE SITES IN AND AROUND ADICHCHANALLUR



Further studies on Rea's collection

Two aspects of his collection that invited further studies by scientists are the skeletal remains and the bronze objects. The skeletal remains collected from the site were studied by Mr. Thurston of the Madras Museum and Mr. Zuckerman and later in 1970's by K. A. R. Kennedy. The physical measurements and their interpretation revolved around the kind of population, mostly in terms of the theories of race then popular among the scholars. K. A. R. Kennedy was of the opinion that the population was more varied and cannot be pin pointed to one group and their physical similarities to skeletal remains from Harappa (K.A.R.Kennedy:1986:257-296). Their reinterpretation in the framework of modern genetic concepts of human populations and their migration is yet to undertaken.

Second aspect that attracted the scientists' attention was the bronze objects. Some of the bronze objects found from the earlier excavations have been subjected to archaeo- metallurgical research to understand the knowledge of metal crafting technology adopted by the inhabitants of Adichchanallur. Dr.Sharada Srinivasan of National Institute of Advanced Studies, Bangalore analysed some bronze vessels from Adichchanallur in the year 1998. Her analysis indicated that the pieces consist of wrought and quench high tin bronzes with 23 – 25 % tin. Microstructural analysis done over a jug from Adichchanallur showed 22.9% tin quenched around 680° C. She observes that: Metallurgical investigations on fragments from six bowls and vessels from Nilgiri megaliths and Adichchanallur burials (courtesy of Government Museum, Madras) indicated that the pieces consist of wrought and quenched high-tin bronzes with 23– 25% tin,

wrought to extreme thinness of 1–0.2 mm. Typically the microstructure of a jug with 22.9% tin from Adichchanallur (c. 800 B.C.) shows an $\alpha + \beta$ structure with α predominant β phase from quenching around 680°C and a hardness around 290–300 Vicker's hardness number (VPN). The well-formed and elongated needles of β martensite and the lack of dendritic patterns in α phase with prominent annealing twins indicate fairly extensive working and annealing in the plastic β temperature range. The artefacts are relatively well preserved due to the retention of a high temperature intermetallic compound phase. The Adichchanallur high-tin bronze vessels include thin, well-rounded vessels; 5 thicker, higher jugs; and extraordinary wafer-thin strainers no more than 0.2 mm thick with patterns of tiny perforations probably made by the diamond drilling technique practiced in Indian prehistory.

Literary References

The assumption is that literature reflects the traditions of contemporary society. The Sangam literature portrays the customs and practices which were most probably prevalent during the times and as such this information can be corroborated with the material evidence found in the excavations.

The earliest collection of anthologies of different poets in Tamil language is referred to as Sangam literature. The poems of the Sangam age are generally realistic and trustworthy literary sources as they portray a Tamil civilization of highly advanced customs and manners, and relate anecdotes of the kings, their wars and their patronage of literary men. The literature is generally accepted to have been compiled around 3rd century BCE – 3rd century CE. The two epics, *Manimekhalai* and *Silappadikaram*, belong to a slightly later date.

Various expressions have been used in Sangam literature to denote the cemetery area like *kadu* or *purangadu*(Srinivasan K.R.:1946:11) which means a waste-land set apart for burial in the wilds near the village; *mudukadu* or *mudur* (*Akananuru*129.275; *Purananuru*356) which means the place for the ancients or old men after death; *idukadu*, (burial-ground) (*Akananuru*29,49,55; *Kuruntokai*393), and *sudukadu*, (‘cremation-ground). In some places the term *imam* or *imakkadu* is also used, where *imam* refers to funeral rituals. The literature has many references to burial practices, both to internment and cremation.

While the different types of burial practices are not to be found in the early Sangam literature, the *Manimekhalai* (a later epic) mentions different modes of disposal of the dead.

Suduvor-iduvor-todukulippaduppor
Talvayinadaippor-,taliyilkavippor. (Ch. 6, 11,66-67.)

While describing the great grave-yard at the famous Cola capital, Puhar or Kaverippattinam situated outside the city on the seashore, the poem enumerates the different sets of people who came there for disposing of the dead, viz. those who cremated(*suduvor*), those who cast away or exposed the dead to the elements or animals, (*iduvor*), those who laid the body in pits which they dug into the ground (*todukuli-paduppor*), those who interred the dead body in subterranean cellars or vaults (*tal- vayin-adaippor*), and those who placed the body inside a burial-urn and inverted a lid over it (*taliyir-kavippor*). Of all the burial practices prevalent at that point of time, the urn burial has the largest number of references.

Such references to the burial urn or *tali* is noticed in the (Narrinai 271:11-12)

mayirum-tali-kavippa
ta inru-kalika-ver -ko!!a-k-kurre.

‘.....my body may be entombed in a big dark urn (*tali*) and covered over by an inverted lid’.

In the Padirrupattu, a verse (44.11.22-23) describes in one context that the graveyard (*kadu*), 'where lay the burial-urn (*tali*) that entombed the king, was the vast expanse below the *vanni* (Prosopisspicigera) tree'. While eulogising the Cola king Killi Valavan, who died in Kulamurram, the poet Aiyur Mudavanar addresses the potter who has to make the urn for his burial and pities his plight as follows:

Kalamjey- kove- kalamjey- kove

Kodi- nudangu- yanai-

nedu- ma valavan De var

- ulakam - e y dinan -

ada!inAnnor-kavikkum-

kannakanra- taliVanaidal-

vettanaiyayinenaiyadu-um

Iruni lam- tikiri y il-p-

perumalai

Mannaka-vanaidal-ollumo-ninakke. (Purananuru228:1, 10 -15)

‘.....You, perforce, need make a large, wide-mouthed urn for entombing such an exalted monarch. Could you do less than use the great earth as your wheel and the great mountain as the clod of clay?’

Peruncattanar, another poet, feels that he should not survive his patron Veliman, and sings:

. *Kavi-sen-tali-k-kuvi-purattirunda*

.....

Kadu-munninane. (Purananuru: 238, 1, 5.)

'He has reached the burial-ground (*kadu*) where the 'red-eared' cock and the *pokuval* (bird) sit on the heap of stones (cairn) raised over the inverted the lid that covered the red burial urn, the strong-billed crow in company with the owl revels with the female of the species of demons.....'

The poet Tumbiser Kiranar laments in the guise of a bereaved wife appealing to the potter who makes the burial-urns and pottery. Oh potter and condescend to make the burial-urn large enough to include her too.' (*Purananuru: 256: 1-7.*). Again another poet, Kukaikkoliyar, sings of the 'great burial-ground (*kadu*) that is full of buried urns, where the owl and the wild-fowl hoot -and the crow caws without pause from their roost in a hole in an ancient tree'

nilam-paka-

vilndaalanger pal

vermudu-mara-p-

pokadumenaiyambumkuka

i-k-kolittinangat

taliyaperunkkadueydiyananre. (Purananuru364: 10-13).

References to cremation are found in the *Purananuru* 231: 1-4; 240: 7-10; 244: 1-7; 246 and 363.



GENERAL VIEW OF THE SITE

OBJECTIVES OF THE EXCAVATION

As already discussed above the significant investigations of Rea and the earlier excavators, was primarily based on the methodology of excavation followed at that time. As establishing a chronometric date was considered essential for such an important site, it was proposed to be re visited.

Detailed documentation of the burials and their assemblage vis a vis the habitation site could be studied with greater clarity. Moreover, the burial practices also required to be compared with those mentioned in the famed Sangam literature. Accordingly a portion of the site was taken up for excavation for further study and analysis.

In order to understand if a habitation site also existed alongside the burial site, another probe was considered with the following aims

- The main aim of the excavation was to study the intra site distribution and settlement pattern and material culture of the people who inhabited this area.
- It was also aimed to study the cultural sequence of the site and to relate the urn burial site with the habitation one.

The primary aim of the excavation was to undertake the study on the contemporary scientific and established principles of excavation, collect as many samples for dating and also to understand the socio economic aspects of urn burials.

CHAPTER II

SITE AND ENVIRONS

Adichchanallur is a small decrepit village (8° 37' 47.6" N; 77° 52' 34.9"E), situated on the right bank of the Tambiraparani River, in Srivaikuntam taluk in Thoothukudi district of Tamil Nadu. It is situated at about 680 kms, south of Chennai and about four kms west of Srivaikuntam. It is located 24 kms south east of Tirunelveli and 9kms north of Korkai. It lies on the Tirunelveli - Tirucchendur road, which runs parallel to the river;and cuts through the mound at the base of the hill. The Iron Age site extends on either side of the road in the villages of Karungulam, Kalvoy and Adichchanallur. The site encompassing an area of 114 acres on both sides of the road (Tirunelveli to Srivaikuntam) has been protected by the Archaeological Survey of India in 1921 under the Monuments & Preservation Act of 1904. However, the archaeological remains extend beyond the protected area.

The areas near the course of the river were extensively surveyed by A. Rea and around 38 sites situated on gravelly mounds were identified by him. Of the many Iron Age sites, along the course of the river, the site at Adichchanallur appears to be the most extensive and also the best preserved.

Mnemonics has played a very crucial role in the preservation of the Iron Age burial sites are concerned in this part of Tamil Nadu. The site is locally referred to as 'parambu' meaning dry ground, ridge or mound (long stretch of high land) in Tamil. The word *parambu* is so entrenched in the minds of the locals that they immediately correlate the word with the Iron Age protected site at Adichchanallur. The locals associate the site with two imagery tools – where spirits reside and where the gusty winds that blow across the site everyday with singular punctuality which the locals call as 'peikathu' – ghostly winds. Though

some of the urns have been disturbed, most of them are in fairly good state of preservation.

Geology and Environment

The districts of Tirunelveli and Thoothukudi are drained by the perennial river Tambararani which flows over a distance of 120kms and with a width varying between 20 – 85 kms. This river basin lies between geographic co-ordinates N. lat. $8^{\circ} 26' 40''$ to $9^{\circ} 12' 01''$ and E. long $77^{\circ} 09' 02''$ to $78^{\circ} 08' 32''$. The entire basin covers an area of about 5717.08 sq. km. (Tamirabarani River Basin Report 2001) The Iron Age site of Adichchanallur lies in this river basin. As per the District Survey Report of Thoothukudi district of 2019, the district largely comprises of rocks of the Archaean Age comprising predominantly of the khondalite and charnockite groups.



SITE PLAN OF ADICHCHANALLUR (AFTER REA)

Most conspicuous of the geological features are the numerous masses of granular quartz occurring in the eastern and central part of the district. This feature is noticeable in the Kazhugumalai ridge near Kovilpatti, the ridges to the south and north-east of Kovilpatti, to the west of Ottapidaram, at Pudukkottai, and more importantly the Vallanad hill, which rises to a height of over a thousand feet. Other conspicuous outcrops forming considerable ridges occur to the northeast, east and south of Palayamkottai, and west of the town of Tirunelveli. Inter-bedded with the granular bands are bands of granitic gneiss.

The crystalline rock series, occurring to the south and west of the region of the granular quartz bands is pre-eminently granitoid, the prevalent variety being a pale- grey quartzo-felspathic banded rock, with black mica, pale red or pink garnets.

The soils of the district are divided between the black and red series and clay or sand predominates in their composition, Along the foot of the hills lies a stretch of red sandy loam, extending across the Sankaranainarkoil taluk, whole of Tenkasi and Ambasamudram taluk, the south and middle of Tirunelveli, west Srivaikuntam, north-western Tiruchendur, and the northern and central parts of Nanguneri taluk. In the greater part of the Kovilpatti taluk and northwestern part of Srivaikuntam, black soil is found. The western side of the Kovilpatti taluk is mostly red, a wedge of black earth intervening on the west to separate it from the red soils of western Sankaranainarkoil. Smaller pockets of black soil are found here and there throughout the district. Outside the two main series is the belt of grey sand, varying greatly in width the text ends throughout the length of the sea coast.

The district is not rich in minerals. Iron slag is found fairly extensively in many places along the foot of the hills, and large deposits of slag may still be seen at Vasudevanallur, Kadaiyanallur and Vallam. Graphite, of good quality is found in the Singampatti hills.

Gneissic rock, with outcrops at many places in the centre and west of the district, is used largely for building purposes. Limestone is found in abundance in parts of the black soil country. The coral excavated from the bed of the sea, off Tuticorin develops, after long exposure to rain and sun, into a serviceable building-stone of a rough kind and is extensively used.

The rock types exposed are of quartzite, calc granulite, quartzo-feldspathic gneiss etc. Quartzite is the most abundantly available mineral in the District (Census of Tamil Nadu 2011, Geology and Mineral Resources of the states of India Part VI, Tamil Nadu and Pondicherry 2006)



SITE PLAN OF ADICHCHANALLUR

SITE GEOLOGY

The area forming the mound is seen to be a highly sheared and fractured reef quartz. Most of the amphibolites rocks found appear to be metamorphosed. Rea mentions that wherever the quartz veins were found, the wells were dug to place the urns. (Rea 1906). In some areas, the quartz veins are interspersed with hard murram which has been dug to place the urns.

AREA OF EXCAVATION

The site of Adichchanallur is situated on high ground and is a lateritic ridge running north – south and well cemented gravel with a maximum height of 10m from present day road level. It is sloping towards the south. The site is surrounded by the river in the north and water bodies in the east and south.

The site under excavation has north south oriented quartz formations. Both shear fracture and shear joints are noticed. Quartz veins were also noticed and in the excavation of Rea, he mentions that the wells were dug for the burial wherever the quartz vein was noticed. Gravelly soil is also met with. The site is basically waste land with sparse vegetation. Large quantities of iron slag were seen strewn all over the site. The site has been disturbed and reduced for the laying of the roads on the north, east and west. The high point of the ridge was chosen as the area to be excavated.



GENERAL VIEW OF THE SITE

CHAPTER III

EXCAVATION

I. INTRODUCTION

The present protected limits of the Adichchanallur site was studied by A. Rea. In his report it has been mentioned that the ground towards the south west contains urns with skulls and bones, whereas the ground on the east contains urns at a depth of 10-15 feet with several articles of pottery. The excavation was conducted at the middle of the ground, which yielded a variety of artefacts. In general the urns here contained gold diadems. In the southern portion he had retrieved bronze, iron and gold articles. (ARADM&C1903- 04:19). He also mentions that he excavated at various parts of the site. However, his excavations have been substantiated with only one plan. When this plan was compared on the ground the exact area where the excavation was carried out could not be identified with certainty.. This maybe due to later natural transformations.

(a)BURIALSITE

The entire protected area of 114 acres was surveyed before the area to be excavated was chosen. The site is a low wide gravelly ridge and is interspersed with loose quartz rock.

On a close study, it was seen that the north eastern side was the least disturbed portion of the site. It was also overlooking the big lake in Adichchanallur village and it was also the highest point on the ridge at 10m. Hence the north eastern portion in Adichchanallur village sloping towards east was identified for excavation. The area was relatively free of rock formations except towards the slopes and was hard gravelly lateritic soil.

The soil was hard and compact and the colour of the top layer varied from yellowish brown to brown. At places the soil was mixed with small pieces of quartz and murrum. The site did not reveal any surface indications of the burials.

(b) CUTTINGS

As the urn field of 114 acres was too large for normal numbering of the trenches, the axis was divided in to two segments, viz. (A to Z; and 2A to 2Z). The segment 2Z was chosen for the excavation as it was the highest point on the ridge. A total number of 6 trenches were laid numbering 2ZB15, 2ZB16, 2Z B17, 2Z C15, 2Z C16 and 2Z C17. These trenches were on the south eastern slopes of the urn field covering an area of 600 sq m. Each trench measured 10x10m. (Site plan in Annexure)

The average depth of the layers noticed in the trenches was as follows.

1. Humus – 0 to 0.06m
2. Layer 1 – 0.11m to 0.65m
3. Layer 2 – 0.12m to 0.78m
4. Layer 3 – 0.17m to 1m
5. Layer 4 – 0.17 to 0.23 (noticed only in trenches B15 and 17)

Trench No.2ZB15:

The trench was on the south-eastern slope of the site and maximum depth reached was 0.57 m. Below humus (0.5m) a layer of brownish compact soil with small fragments of quartz was found. Very few potshards were found in this level. Below this layer another layer (2) yellowish in colour, compact but devoid of quartz fragments was observed. Patches of murrum were also found in this level. Average maximum depth reached was 0.57m. A steep slope was observed on the southern side.

Trench No.2Z B16:

The trench was laid to the north of trench no 2Z B15 and west of trench no 2Z C16. The soil was loose and yielded large quantity of red ware shreds. It was noticed upto a depth of 0.25m. Below this the colour of the soil was pale yellow and texture was compact. The eastern side both to the north and south was found filled with of red murram. The urns were found in the murram area. A big boulder was noticed on the northern half on the surface itself. Most of the burial pits were cut deep into bedrock in this trench like urn nos. 54, 58, 118, 140 and 143.

Trench No.2Z B17:

The trench was laid to the north of trench no 2Z B16 and west of trench no 2Z C17. Layer 1 was loose in texture and intermixed with some quartz pieces and ashy soil and it was seen up to a maximum depth of 0.45m. The loose ashy soil probably represents well levigated degenerated clay which might have dumped. The next layer was more compact and mixed with murram. Portions of this trench had a mixture of quartz stones of different sizes. Very few burials were noticed here.

Trench No.2ZC15:

The trench was on the southern side and sloping gently further south. There is a depression towards the north of the trench which continues in trench no 2Z C16 as well. Beneath the depression was noticed a thin layer of silt with small quartz stones. The plan of the trench is undulating and the south-eastern corner is almost lined with bedrock that is quartzite. This phenomenon further continues towards the north and big rocks are visible in the north-eastern corner adjacent to the section facing west. The layer below the humus was brownish in

colour. Layer 2 was compact with a mixture of murram. The burials were noticed from this level. Natural soil was reached at a depth of 0.40m. The western half of this trench was dotted with burials. All the burials found here were in murram and laterite deposit. The pits were cut into bedrock.

2Z C16:

Trench no 2ZC16 was situated to the south of trench no 2Z C17 and north of trench no 2Z C15. This is the highest point of the excavated area. The cutting revealed four layers of cultural deposit. The top most was the humus layer which approx. 0.5m. The second layer was brownish in colour and had many urn burials, stone pieces and potshards. The third layer was grey to brown in colour and also contained urn burials. Layers 2 and 3 were filled with murram and burials were noticed at this level. Layer 4 and was compact with murram and had urn burials in it. Depression seen in trench no 2ZC15 (north western) continued in this trench in the south western corner. This area is barren and the burials are confined to the centre of the trench only. The burial pits were noticed cut into the bedrock and also just within the murram level.

2Z C17:

The trench no 2ZC17 was to the north of trench no 2Z C16 and to the east of trench no 2Z B17. The maximum depth reached in this trench is 1.10m. It had four layers. The layer below the humus was loose and ashy upto an average depth of 0.60m. It contained large quantity of potshards and quartz pieces. Layer 2 was compact in texture with a mixture of small sized quartz stones and murram. Burials were noticed from this level. The northern half of this trench contained ash and fine levigated clay deposit and nothing was found here. However in the southern half there were a good number of urn burials within the

murrum. The burial pits were cut into bedrock and some of them like as in urn nos 116, 117 were quite deep.

(c)STRATIGRAPHY:

The trenches were laid in the south eastern slopes of the urn field. The entire area is strewn with quartz stones of varied sizes and outcrops. They are in highly deteriorated state and were in a developed stage of laterization. The lowest level in the area under study is laterite. In keeping with the natural slope of the low hill from north to south, the laterite formation was also sloping towards south. The laterite soil is dusky yellow. At the lower level the laterite has fewer quartz materials than the one at the upper level. Wherever bed rock was found the ancient man has cut the bed rock to intern the urn burials. The laterite formation was generally superimposed by layers 1 & 2.

Layer 1: The colour of the soil was yellowish brown, the texture loose and noticed mixed with tiny stones and potshards. Little or no quartz fragments were noticed. The slope of the stratum was running from west to east. The maximum thickness of this layer was 0.18m and humus was overlying it. It was not found continuously in the excavated area.

Layer 2: The colour of the soil was brown, the texture loose and the major difference between this and layer 1 was that the stones found here were of bigger size. They were found mixed with the soil. The maximum thickness of this layer was 0.37m. The slope of the layer was running from west to east. It was not seen continuously in the area of the excavation.

Layer 3: The colour of the soil was red, the texture compact and the soil was noticed mixed with murrum. Most of the burials were placed by digging the pit from this layer and hence it was the working layer.

(d) OBSERVATIONS – Preparation of the Pit for Burial

The excavation of the burial site was a challenge. No surface indications of the pits could be seen. As no clue of the outline of the pit was obtainable the top soil was carefully removed. No layers were discernable. In fact it was very difficult to mark the pit line. Only after the soil became slightly loose after further digging, the pit line could be identified.

Once the pit line became apparent, the soil was scooped out. Pottery assemblage was noticed both inside and outside the urn. When placed outside, the size and shape of the pit determined the location of the grave pots. The pots inside were generally placed after the burial was done. At times the bones and the pottery were placed together. In some instances no bones were placed in the urn and only grave pottery was found.

On a study of the burials that were exposed, it was seen that the pit for burial was very carefully dug. The pit itself was dug to the extent required prior to the placing of the urn. Obviously the hard rocky surface was not touched. The size of the urn also determined the pit size and vice versa. However, in some instances the pit was much bigger. All precautions were taken to place the urn in upright position. Once the urn was placed and the burial of the bones and the pottery associated with it was placed, the area was packed with murram and small size quartz stones. Support to the bottom of the urn was given using the same quartz blocks wherever required. Otherwise the urn was wedged between the rocky soils. The urn was carefully closed with a lid to prevent any intrusion of soil or breakage. The lids extended to the body of the urn and appeared as if they were half urns. The urns were mostly globular, a flat base, conical and rarely egg shaped. Black-and- Red ware urns were also closed with red ware lids.

Sometimes urns were exposed with double lids. Most of the lids were damaged and were found broken and some pieces were also collected from inside the urn.

The urns had both bones and grave goods only and in some instances it was packed with murrum and small sized stones. Though at times the urns were placed one above the other, instances were rare when the earlier urn was disturbed or broken. The damage caused to some of the urns was more due earth pressure and subsequent activity.

In the Primary burials, as studied from the position of the bones, the body was lowered into the urn in a crouched position. Hence the skull was generally noticed in the centre, the upper limbs on either side near the walls of the urn and the lower limbs above the skull. At times the vertebral bones had fallen on one side. The grave goods were placed very carefully amidst the bones. Some of them were placed upright while other were kept facing down. In some urns iron objects were also placed inside the urn.

In the Secondary burials, only some of the bones were interned along with the grave goods. The pits were dug quite close to each other, from a distance of a few metres to a few metres. In some instances the same pit was used to intern more than one burial. In most of the cases, the pit contained burials of the same phase and in only two instances, they were of different phases. The concentration of 178 burials within a 600 sq m area indicates that the practice of interning the dead in urns was a predominant feature which might have been meticulously followed.

(e) BURIAL URNS

Burials of two types were noticed –

1. Primary – when most of the skeletal remains were found and
2. Secondary – when only a few bones were interned in the urn symbolically.

A total number of 178 burials were exposed within an area of 600 sq m and they were assigned to three different phases in a single cultural period. The urns were noticed on the surface and up to a depth of 2.2 m. The urns have been numbered serially based on their discovery. The urns were of two types – red ware and black and red ware. Generally the larger urns were of red ware and were found in the lowest level. They were handmade and of coarse variety. The middle and upper levels had both black and red ware and red ware urns. They were relatively smaller in size mostly wheel made and of finer quality.

The red ware urns were hand-made, of coarse variety with thick section having both pyriform and globular shapes. Most of primary burials were noticed associated with only red ware. These urns were bigger in size at the lowest level and at the middle level they became smaller. These type of urns were noticed abundantly only in lower and middle level and very few in the upper level.

The Black-and- Red ware urn which occurred in the lower part of middle level continued up to upper level. The Black-and- Red ware urns which were noticed in the lowest part of middle phase were bigger in size and when it came to the upper level, it was smaller. Black-and- Red ware urns were mostly of pyriform shape with conical or round base. Few exceptions were with globular profile. These types of urns were wheel made with medium fabric. In some Black-and- Red ware urns black slip was prominent over the black portion which was probably applied before firing.

Both Primary and Secondary burials were noticed in this place. Primary burials were reported mostly in the bigger urns where the body of the adult or child was kept in crouched position along with grave goods both inside and outside the urn. In secondary burials some bones were interned in the urn along with other grave goods. In other instances no bones were noticed in the urn. Iron objects and a few copper objects were the only pieces of antiquity which was documented. The copper objects were all found within the urn while the iron objects were found both in the urn and in the pit. Most of these iron objects seemed to have been placed vertically. Due to disturbances some of these objects have now fallen down. Totally 178 urns were noticed in three different levels numbering from 1 to 168 and as some of the urns were found adjacent to each other in the same pit, they were given the same number.

In lowest level (Early Phase) 29 urns were noticed, of which 16 were Primary and 13 were Secondary burials. This Phase had red ware urns exclusively. The Middle Phase had 123 urns (70 Red ware and 53 Black-and- Red ware urns) of which 13 were Primary burials and 110 were Secondary burials. Only one Black-and- Red ware was noticed with Primary burial, the others being of the red ware category. In the top level or Late Phase 19 urns were noticed of which 3 were Red ware and 16 were Black-and red ware category respectively. A total number of 7 urns were completely damaged and it could not be categorized both urn wise and phase wise. They were urns numbered 40, 57, 59, 97, 122, 129 and 156.

2.HABITATION SITE

- A. Rea had noticed ash deposit at the northern extremity of the site in Adichchanallur village and surmised that the site could also hold a habitation area.

To identify if there was a habitation site within the protected area, trenches were laid on the north and north-eastern slope of the mound adjoining to the Tirunelveli- Tiruchendur High way and Puliyaikulam road.

The main aim of the excavation was

1. To study the intra site distribution and settlement pattern and material culture of the people who inhabited this area.
2. It was also aimed to see the cultural sequence of the site and to relate the urn burial site with the habitation none.

After an extensive study of the materials found from the surface the area proposed for the present excavation falls in the Z-axis of the quadrant of the site and the huge rampart falls in the X&Yaxis. The trenches selected wereZA7,ZC10,ZQ24,YL1andYM1.



General view of Habitation site

Layout of the Trenches

The area taken for excavation measured 10 x 10 m, which was further divided into four quadrants measuring 4.25 x 4.25m.

Cuttings

ZA7

The trench was located on the northern part of the mound. The slope of the mound was running from south towards north. The highest point was noticed on the southern end. From the surface, few potsherds and a few pieces of Iron slag were collected indicating some sort of human activity.

Layer Description

Humus:

The colour of the soil was darkish brown, the soil was semi compact and noticed mixed with potsherds, stones and lateritic murram, which was less in percentage.

Layer -1:

The colour of the soil was reddish brown; the soil was more compact compared to that of the humus. It was noticed mixed with potsherd, bones, stones and kankar.

Layer- 2:

The slope was same as the previous layer the soil was loose and the colour was light brown. The soil was noticed mixed with potsherds, stones, kankar and this stratum.

Layer- 3:

The strata were sloping from south to north, and the soil was ashy brown in color. The texture of the soil was loose and was noticed mixed with potsherds and tiny stones.

Layer -4:

This stratum was completely of murram, which was the natural soil over which the human settlement started occurring in this area. This was exposed on all the four quadrants.

General Description:

All the four quadrants were exposed till the bedrock; only on quadrant no 3; two pits were noticed on the section facing north. The pit was cut in the murram. The bedrock was also sloping from south to north.

From this trench various antiquities were unearthed, hopscotch of various sizes, disc, toy cart wheel and gamesmen. Beads were of couex (organic seed used as beads), paste, etched carnelian, faience and bone. Few unidentified iron object, iron chisel, fragments of iron spearhead, a fragmentary copper ring and an interesting finding was a copper bangle. Microlithic flakes were also unearthed from this trench.

From the aforesaid data, primarily one thing is clear that antiquities indicate that a variety of human activities had taken place but to support these findings, no structure or any other kind of working area was found. Secondly from the pottery, unearthed from this trench, the top level revealed mixed variety of pottery and in the lower level a gradual change was noticed regarding the fabric and the quality of the wares. As the pottery was very badly preserved, full shapes were not found.

Trench No ZC10

The trench was laid at central portion of north eastern slope.

Layer Description

Humus: The soil was yellowish brown in colour and contained few potsherds.

Layer-1

The soil was brown in colour, contained nodules of quartz, large amount of potsherds were found.

Layer-2

The soil was light pale yellow in colour, a thin layer, of fine texture, and contained potsherds and few animal bones. Pottery included black and redware, red slip and redware(finevariety).

Layer-3

This layer was brownish red in colour, contained less number of potsherds and good number of quartz stone nodules. It seemed to be weathered murrum layer. At the eastern corner of the quadrant a small pit was noticed and three postholes were also seen in the Quardant 4.

The pit which was filled with rubble stones was rectangular in plan and measured 2.50 X 2 m and at the depth of 0.35m. It was sealed by the layer 2. This pit contained fair amount of black and red ware, red slip ware and brown slip potsherds. Soil was brown in colour and of fine texture. A circular pit was noticed in the quardant-3 measuring 1.35 m diameter at a depth of 0. 38m was found at the north eastern corner. It contained light brown colour soil and potsherds. In this quadrant some of the important antiquities were also unearthed and they included mass agate core, flake polished stone and muller at a depth of 0.35m.

Pit –1 and 2 was noticed at the central part of the quadrant and a stone dump was traced adjacent to the pit in the quadrant-1A pair of postholes was noticed in between pit 1 and 2, which had a diameter of 0.8m. the diameter of the pit –1 is 1m and stone dump is 0.70m.

Trench No. ZQ24

The trench was laid in the north eastern slope of the site.

Humus: it was a thin deposit, light grayish brown in colour, with loose silt deposit and contained few potsherds and stone nodules. The thickness of the humus varies from 1cm to 3cms.

Layer -1

The soil mixed with gravel and was light brown in colour. Loose silt and few potsherds were also found.

Layer-2

The layer was slightly compact, light brown in colour, and had few potsherds of black and red ware, red ware and red slipped ware. The shapes included vase, lid and bowl. Few animal bones were found.

Layer-3

It was a very thin layer, light ashy brown in colour and disturbed by lime dump. It contained few potsherds and bones.

Dump

The dump filled with murram soil was found sealed by humus in the eastern half portion- disturbing layer 3 in quadrant -1 and 2.

Floor-I – or- working level – sealed by layer 3 and lime dump

The floor made of reddish clay, lime nodules was found in the western side of the quadrant at a depth of 0.55m and chula 1 or kiln (potter's kiln) like structure was found near by the section facing east in this level which showed evidence of murram surface along with potsherds. This floor continued in the western part of quadrant 4.

Stone alignment

Two stone alignments on the north west corner for 0.21m and in the eastern part for 0.35m was noticed.

Floor 1 and 2

Two floor levels were noticed - the one with hearth was sealed by layer 1. This continued in quadrant 4 also. The floor was made of reddish color clay and lime nodules and another was sealed by layer-3. The lower floor level was thick reddish in colour and was finished with cow dung.



Floor with hearth Trench No ZQ24



View of excavated trench ZQ24

Trench No YL1

The trench was located almost on the western half of the archaeological mound of the Prehistoric site Adichchanallur. The surface feature suggested that a huge wall was running in the NW-SE direction, dividing the archaeological mound in roughly two equal halves. The surface was littered with mixed pottery ranging from Urn burial pottery to the Early Historical pottery. The pottery included black and red ware, red ware, black slipped ware and red slipped ware. The shapes were everted rim bowl, rim less bowl, cannoid (lid), vase with beaded rim, jars etc.

The soil on the eastern side of the wall had accumulated and the western side was low lying. This was the view from the surface level. The purpose of laying the trench over here was to determine the structural pattern and dimension besides ascertaining the chronological affiliation with Urn burial culture.

In YL1 the structure was running in the NNW-SSE direction across the trench and the width of the wall or ramp was about 9.10 meters. The ramp was partially exposed here because of less working area available in the north eastern corner. The upper most layers were humus which was overgrown with roots and some wild plants. Some fragmentary pottery was also found.

The Layer No.1 consisted of murrum, potsherds, some antiquities and quartzite stone fragments. It was brownish red in colour and compact in nature. Structure was made of three layers; the central part was ashy in colour and comparatively looser than the outer layer. The outer layer was of murrum and clay material that was very hard and seemed to have formed the main core of the wall. The outer layer was then provided with stone veneering.

Trench No.YM1

To trace the length and width of the wall, the very adjacent trench in the west of YL1 was opened. Here at a depth of 0.7m from the surface a stone veneering was encountered. The width of the stone veneering was 2.18m which was running in the NNW-SSE direction. In the YM1/1 the structure was exposed up to 0.34m., which was still continuing further. Huge amount of loose stones were recovered in the process of excavation.



View of the Trench YLI and YM1 showing Mud wall

Potter's Kiln

A well rammed clayey –red murrum floor which extended all over the trench ZQ24 on the north eastern part of the mound was unearthed along with some pits, which were identified as Potter's kiln. These four pits were found cutting in to the well rammed murrum and contained loose ashy soil mixed with charcoal, burnt clay lumps, potsherd both well and ill fired of red ware, black and red ware and brown slipped ware.



The shapes included ring stand, storage jars, dish and bowl. These pits were made cutting the floor level and murram and were filled with clay and were probably used as kiln for firing pots. This kiln also yielded some couex beads and some charred grains.



Pit found in the trench ZQ24 identified with Potter's Kiln



Broken Pots found in inverted position- Trench no ZQ24



Section of Potter's Kiln

Couex Bead industry

Adjoining the Potter's kiln on the southern side there was an extension of similar floor and two Iron axes placed horizontally (Iron bars) within the stone and murram alignment arranged in a circular manner was found. A good number of finished and unfinished couex beads were found scattered inside the alignment along with two Iron bars and couex beads was identified with bead making industry.



View of stone and murram alignment- Couex bead industry -Trench ZQ24



View of Couex beads found scattered on the floor level Mud Wall

A Mud wall running in the north-west-south east direction across the trench YMI on the central part of the mound was exposed up to 1.10m and its width was 9.10m. It was further noticed that it was resting on the floor of red murrum and clay. Similar floor levels were also noticed in the Potter's Kiln area.



View of Mud wall running in the trench YM1 and YL1

The conspicuous absence of any material associated with the burial assemblage of the previous season and the discovery of the Potter's kiln might indicate that this portion of the site could be a habitation one. This is also corroborated with the type of antiquities found here.

CHAPTER IV

OTHER FINDS

(a) BURIAL SITE

The Iron Age Urn burial site of Adichchanallur yielded comparatively less quantity of antiquities. A great majority of them were copper and iron objects in the burial site. But, earlier excavations carried out by Rea had brought out large number of bronze objects and some gold objects. The iron objects were mostly found at the bottom most part of the inner side of the Urn. Even outside the Urn, within the burial context, the iron objects were found at the bottom of the Urn within the pit. In general the iron objects were placed vertically as seen in the Urn burials bearing nos. 116, 118 142, 158. It appears that those laying flat are fallen ones in other burials.. Rea suggested that the iron implements and weapons found were always placed point downwards, as if they had been thrust into the surrounding earth by the attendant mourners (. Rea, 1915).

The technique of manufacture of these objects reflects high workmanship. The smelting of both copper and iron was also known to the inhabitants of this site. A geo archaeological study conducted by the National Institute of Ocean Technology, Chennai postulates that the metals were extracted from the ore available at the site and in the neighboring areas. They state that the technology of melting, casting and metal working was prevalent in this period at Adichchanallur. A large quantity of iron slag, from the smelting process (Sasisekar et al 2010) was seen strewn around the entire site.

The copper objects retrieved from the burial site are ornaments for personal use. Only three burials yielded copper objects. The iron objects unearthed from the excavation were agricultural implements and weapons. The iron and copper objects retrieved from this excavation were analysed by the Institute of Physics, Bhubaneswar and the report on the metallic composition is appended in this report (Appendix II –A).

A few beads of different materials were also found. The antiquities retrieved from the burial site were classified as - metal objects (further classified in to copper and iron) and terracotta objects.

Copper Objects

A very few copper objects (ornaments) were found inside the Urn. Slight patina was noticed on these objects due to corrosion. However, they were in good condition

Copper Bangles

Three copper bangles were noticed inside the Urn no 88 (Black-and red ware) placed in south east direction. It was found at a depth of 1.06m. One of the bangles was found in broken condition. The bangles were round in shape, thick in section. It is a single piece of ring which has been shaped round and the edges are overlapping. The ends are blunted so that it will not injure the user.



Copper rings

Circular small thick copper rings with no joints was noticed inside the Urn no 161 (Red ware Urn) belonging to the Early phase. The object is in good condition. It



Copper rings

Two copper thin oval shaped rings were noticed inside the Urn no 119(Black-and- Red ware Urn) belonging to Middle phase. The Urn burial was associated with a child (?) and it can be surmised that the ring may belong a child.



Iron Objects

Excavations at Adichchanallur had yielded a good number of iron objects which were found both inside and outside the urns. Due to the weathering and climatic conditions the iron objects retrieved from this site were highly corroded. Eighty six iron objects and their types have been recorded. The types have been classified as under

Chisels – 30 nos

Double sided chisels – 10 nos

Arrow heads - long and short – 8 nos







Celt – 8 nos







Spear heads – 7 nos








Swords in fragments – 5 nos







Knives – (one long) – 6 nos







Detailed documentation of the above objects is as follows:-






1		Round slender Antimony rod in broken condition - Urn no 82.
2		Arrow head with sharp edge and in broken condition - Urn no 60.
3		Broken arrow head with sharp edge having husk impression - Urn no 142.
4	  	<p>Broken arrow head with sharp edge – Urn no60</p> <p>Triangular shaped arrow head with broken shaft – Urn no 60</p> <p>Elongated shaped arrow head - Urn no 60.</p>






5		Triangular arrow head with sharp edge and broken shaft – Urn no 46.
6		Broken triangular arrow head with sharp edge and shaft - Urn no155.
7		Elongated arrow head with shaft in broken condition - Urn no 149.
8		Broken pieces (7) of iron bangles - Urn no.154.
9		Iron bangle pieces (6) round in profile - Urn 130.
10		Iron celt (2 nos.) - one is broken another one is intact - Urn 18.






11		Broken Iron celt – Urn no 30.
12		Broken Iron celt with handle - Urn155.
13		Chisel (fragile in condition) with sharp edge - Urn no 135.
14		Chisel with concave edges (broken) – Urn no48
15		Highly corroded chisel with sharp edge - Urn no117.
16		Broken chisel - Urn 42B
17		Iron chisel - Urn no 30.






18		Chisel with concave edge – Urn no 119.
19		Chisel with sharp edge having impression of husk - Urn no50.
20		Sharp edged small chisel - Urn no 104.
21		Chisel with concave edge – Urn no 154.
22		Flat chisel with sharp edge – Urn no 86.
23		Broken chisel with concave edges –Urn no 99.







24		Long Iron chisel with concave top and sharp edge, broken into two pieces - Urn92.
25		Chisel with concave top and sharp edge - Urn no 54.
26		Chisel with sharp edge - Urn no 118
27		Iron chisel with sharp edge – Urn no 113.
28		Broken chisel with sharp edge - Urn no 92.
29		Chisel with sharp edge - Urn no 47.






30		Broken Iron chisel - Urn no 78.
31		Broken Iron chisel - Urn no 156.
32		Broken small chisel - Urn no 154.
33		Long chisel with sharp end – Urn no19.
34		Long chisel with sharp end - Urn no 130.






35		Chisel with sharp edge in broken condition - Urn no 18.
36		Chisel with sharp edge broken into two – Urn no 135.
37		Chisel with sharp edge in broken condition – Urn no135.
38		Iron chisel - Urn no 114.
39		Broken chisel - Urn no 146.






40		Long chisel with sharp edge - Urn no 56.
41		Broken Iron dagger in rusted condition - Urn no 135.
42		Iron dagger with broken handle – Urn no 18.
43		Rusted Double sided chisel (broken) - Urn no 85.
44		Double sided chisel (broken) – Urn no 49.






45		Double sided chisel (broken) – Urn no105.
46		Double sided chisel (broken) - Urn no 16.
47		Double sided chisel (broken) – Urn no 83 A.
48		Double sided chisel (broken) - Urn no36.
49		Double sided chisel (broken) – Urn no19.

50		Double sided chisel (broken) - Urn no 18.
51		Double sided chisel (broken) – Urn no144.
52		Javelin with sharp edge (broken) - Urn no58.
53		Javelin (broken) - Urn 58.
54		Iron knife (broken) - Urn no 155.
55		Iron knife (broken) – Urn no135.

56		Iron knife with sharp point Fragile in nature - Urn no 36.
57		Iron knife (broken) - Urn no155.
58		Iron knife (broken) – Urn no135.
59		Iron knife (broken) -Urn no30.
60		Iron sword with central spine (broken) - Urn no139.

61		A big iron sword (broken) - Urn no 107.
62		Iron sword (broken) - Urn no 158.
63		Iron spear head along with husk impression (broken) - Urn no 54.
64		Iron spear head (broken) with sharp edge - Urn no 65.
65		Iron spear head (broken) - Urn no 86.

66		Tip of spear head – Urn no 60
67		Tip of Iron spear head (broken) - Urn no 138
68		Iron spear head in rusted condition (broken) - Urn no 30.
69		Iron lance (broken) -Urn no 19.
Beads		
70		Oval shaped couex bead – Urn no 75.

71		Circular stone bead with hole in the centre – Surface collection
72		Circular terracotta bead with hole in the centre – Surface collection
73		Circular terracotta bead (broken) – Surface collection in trench no 2ZB15
74		Circular terracotta bead with hole in the centre – Surface collection in trench no 2ZB17
75		A circular black ware games man – 2ZC17 surface collection

Decorated Potsherd

Urn no 54 was filled with earth. On removing the earth, a broken lid with appliqué carving was noticed. The scene depicted was that of a stylized lean figure of a female wearing a thin garment which is prominently seen below the knee. The hands and legs (partially broken) are slim and the fingers of both the hands are stretched out. The breasts and face are depicted prominently by small protuberances. To her right is shown a plant (paddy?) which has five sheaves emerging and the leaves are depicting standing erect and also drooping on either side. A crane is shown seated on this plant and holding a fish. To the left of the figure is shown a deer and below it an alligator. All the figurines are angular and designed in rope design. The marine life depicted through the fish and alligator might indicate that the scene is depicted nearby a river.



Decorated Potsherd

(b) Habitation site

The habitation site yielded a large number of antiquities which included a large quantity of couex beads, copper objects like antimony rod, broken bangles, iron objects like knife, chisel, axe, arrow head etc. Terracotta objects included a piece of perforated jar, bead, hopscotch, disc, wheel of toy cart, gamesman, part of animal figurine, and cake. Beads of semi precious stones like jasper and quartz and bone implements were also noticed.



Couex beads from habitation site – Trench no ZQ24



Couex bead in trench no ZQ24



Copper Bangle pieces from the habitation site – Trench ZA7



Copper Antimony rod from the habitation site – Trench no ZA7



Jasper bead from the habitationsite-Trench2Q24



Quartz bead from habitation site-Trench noZQ24



Etched carnelian bead from the habitation site – Trench no ZA7



Shard of perforated ware – Trench no ZA7



Terracotta bead from Habitation site – Trench no ZQ24



Iron chisel from habitation site – Trench no ZA7



Wheel of Toy cart from habitation site – Trench ZA7



Iron axe – Trench ZQ24



Broken part of terracotta object (animal figurine?) – Trench ZA7

CHAPTER V

POTTERY

1. BURIAL SITE

The site yielded a large quantity of pottery. Apart from the urns, pottery was also placed as grave goods either inside the urns or in the area outside the urns and within the pit at various levels. While inside the urns they were placed either below the bones and at times after the burial of the body was done. In the pit area, the size of the pit determined the placement of the pottery. Only the required area depending on the size of the urn was scooped out and the pottery was very skillfully space managed within its confines. Generally the grave goods were placed at the rim level, belly level or near the bottom of the urn. In some instances it appears that they were also placed to support the urn in position. Some of the pottery was filled with husk.

The wares retrieved from the excavation are as follows

1. Redware
2. Red slipped ware
3. Black-and- Red ware with and without white dotted painting
4. Blackware
5. Black polished ware with or without white dotted painting

Red ware

In this burial site, the urns and vases were noticed in red ware .The urns are of coarse variety and handmade. The shape of the urn like pyriform or globular was moulded by hand. It is noticed that the surface of the urn was smoothened by various layers of levigated clay. The smoothening of the surface continued till the requisite shape was achieved. However some of the urns exhibit uneven shape and rough

outer surface. Finger impressions were also noticed on the body of the urn which probably occurred during the shaping process. The rims were mostly independently made and clubbed onto the urn. To hide the clubbing marks on the neck of the urn, some of the urns bear finger impression or pinching design around the neck. The base of the urn was either flat, ring based or conical. The ring base provided at the bottom of the urn was prepared separately and then attached to the body of the urn. The shapes of the urn were mostly pyriform or globular with truncated or flat base. Not much ornamentation was seen on the urn. In rare cases pinching, incised or appliqué designs were noticed in the shoulder portion of the urn.

In the Early phase urns were big in size. On an average measurements of the height of the urn were between 70cms – 1.15m and the diameter at the rim varied between 34 – 86cms. All these urns were classified as Primary burials. There was not much change in the size of the Primary burial urns in the Middle phase and the dimensions on an average varied between a height of 86-98cms and a diameter of 47-74cms. A single Black-and- Red ware urn was noticed with a Primary burial – Urn no 119 with a height of 0.65m and diameter of 0.37m. Amongst the Secondary burials, the red ware urns of the Early phase measured between 58 -98 cms in height and 36 – 80cms in diameter. The red ware urns of the Middle phase having Secondary burials measured between 40cms – 1.04m and the diameter was between 32 – 85cms. The urns were covered with red ware lids which were also handmade having a ring base or conical base with flaring mouth and featureless thick rim. Most of the lids were broken. At times the Black-and- Red ware urn was also covered by a lid of red ware.

Apart from this red ware vase or jar with high cylindrical or slightly flaring neck, globular body and slightly conical bottom and externally beaded rim and sometimes with round base were noticed both inside and outside the urn. They were wheel made and of thinner fabric. Such vases which are noticed inside are comparatively smaller than that placed outside the urn.

Red slipped ware

Some of the red ware vases were noticed with red slip which was applied before firing. These vases are medium to smaller in size but the shapes are like those of red ware vases only. These potteries were wheel made and of medium fabric. The slip which was applied over the vase was mostly worn out. Two medium size red slipped ware vases with flaring rim and conical bottom are best example of having good slip. – Urn no 137 and 142 (fig 11B)

Black-and- Red ware with or without paintings

Black-and- Red ware was used in this place not only for making grave pots but also for making urns. Black-and- Red ware urns were noticed in the Middle and Late phases. These urns were wheel made and of medium fabric. On rare occasions they were handmade also. The shapes of the urns were mostly pyriform or globular with conical or round base. Though the urns exhibited medium fabric, the weight of the Black-and- Red ware urn was not very heavy. Very few cases of urns of this variety have been reported by Rea. He reports that such an urn follows the ordinary form of the red ware urn, but is of a finer material and shows traces of black colour polish around the rim. (A.Rea:1915:39). The rim was thick and was either straight sided or slightly incurved. Black-and red ware lids were also noticed having conical top and incurved featureless rim.

Apart from the urn and lid grave goods like, bowls, beakers, shallow lid cum dish, globular vase, miniature vases, lota type vase and cup on stand were also noticed in black and red ware. The pots are wheel made, of medium to fine fabric and thin in section indicating that well levigated clay without impurities was used for making them. In many cases the red slip noticed over the pottery was worn out unlike the black portion which was not lost.

List of Figures

Figure-1: Showing Red ware Urns (15, 35,36,62,94,98,107,152 and 154)

Figure-2: Showing Red ware Urns (12,20,60,101,113,133,138,157 and 161)

Figure-3: Showing Red ware Urns (1,39,78,91,131,136,142 and 158)

Figure-4: Showing Red ware Urns (29,55,65, 75,86,102,135 and144)

Figure-5: Showing Red ware Urns (16,18,19,41,140,141,153 ,159 and 168)

Figure-6: Showing Red ware Urns (64,66,70,89,99,105,111,119,123,124 and 145)

Figure-7 (a and b): Showing Red ware and Black-and Red ware lids

Figure-8: Black polished ware Ring stands (Type-1)

Figure-9:(a and b):Black polished ware Ring stands (Type-1a and 1b)

Figure-10 (a to f) :Black polished ware Ring stands (Type-2 to 5)

Figure-11(a and b) :Red ware and Red slipped vase(Type-1 and 2)

Figure-12(a and b) :Black -and-Red ware and black ware vases (Type-3 and5)

Figure-13 :Black –and-Red ware lota type (Type-5)

Figure-14 : Black-and -Red ware miniature vase(Type-6)

Figure-15: Black-and -Red ware Bowls (Type-1)

Figure-16 : Black-and -Red ware Bowls (Type-2)

Figure-17 : Black-and -Red ware Bowls (Type-3)

Figure-18 : Black-and -Red ware Bowls (Type-4)

Figure-19: Black-and -Red ware Bowls (Type-5)

Figure-20 :Black-and -Red ware Bowls (Type-6-9)

Figure-21: Black-and -Red ware Shallow dish cum lid

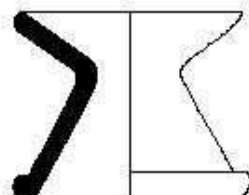
Figure -22:Black-and- Red ware beaker

Figure-23: Black ware Miniature Lid cum bowl

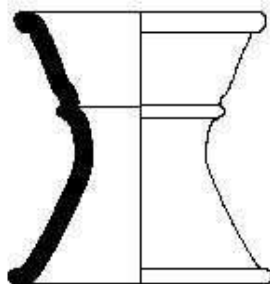
Figure-24:Black polished ware cannoid lids(Type-1)

Figure-25:Black polished ware cannoid lids(Type-2)

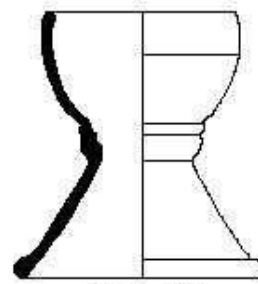
Ring stand



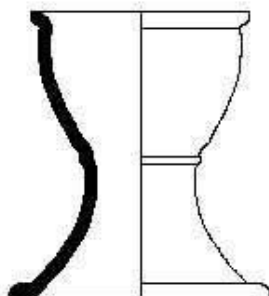
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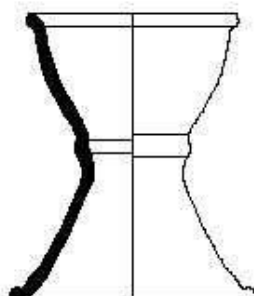
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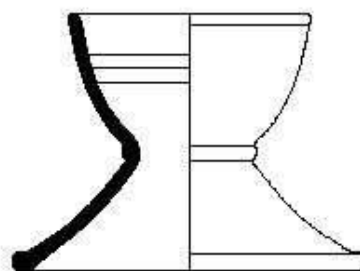
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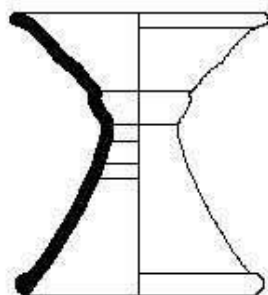
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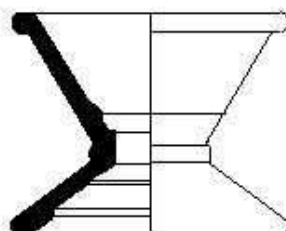
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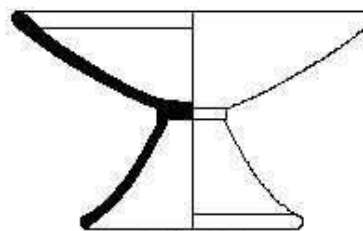
U-157 - 10f



U-164 - 10g



U-168 - 10h



U-143 - 10i

Figure-10

0 5 10cm

RED WARE

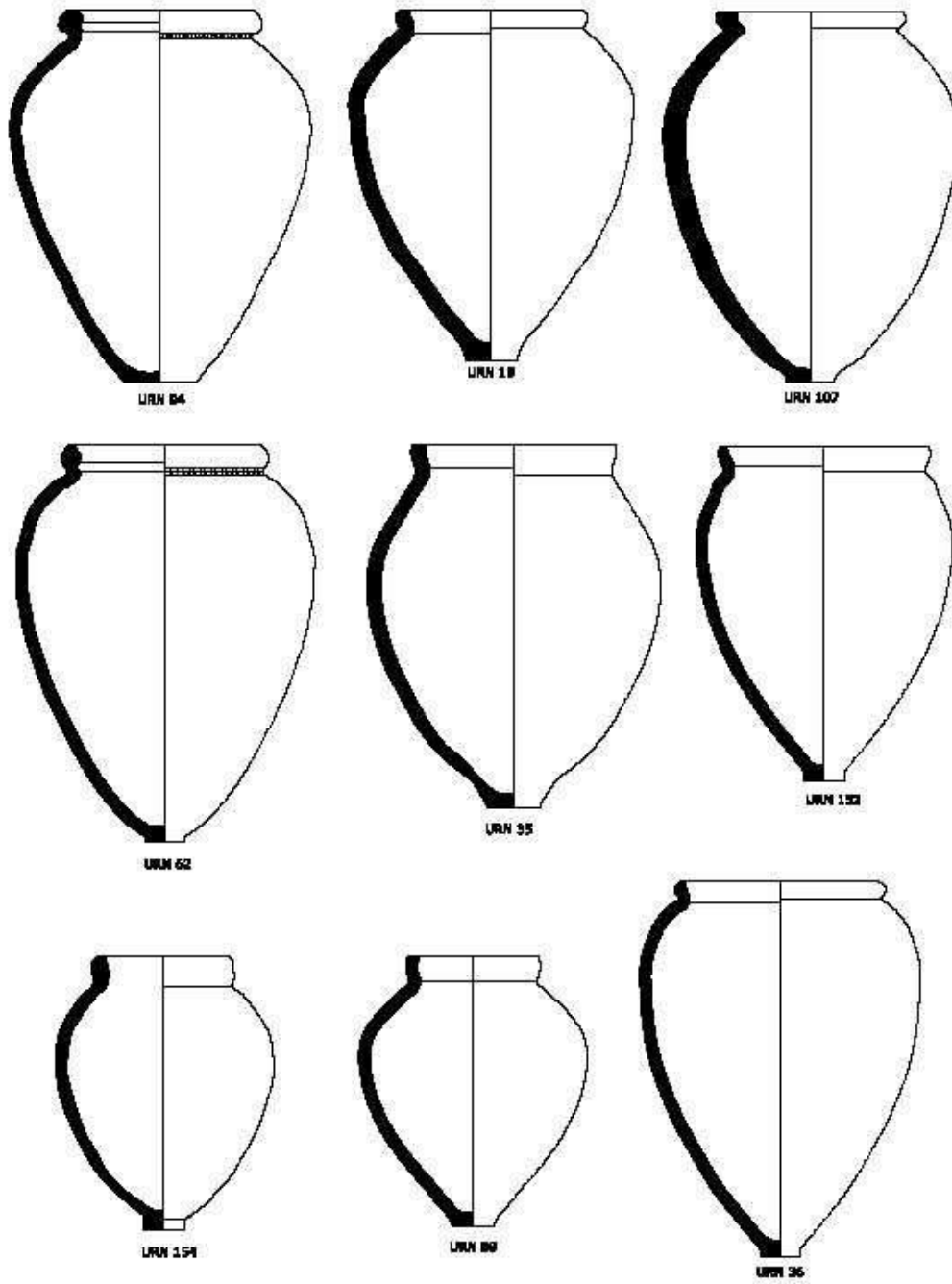


Figure-1



RED WARE

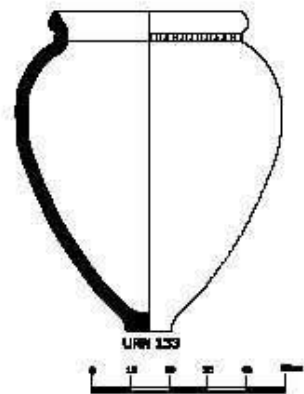
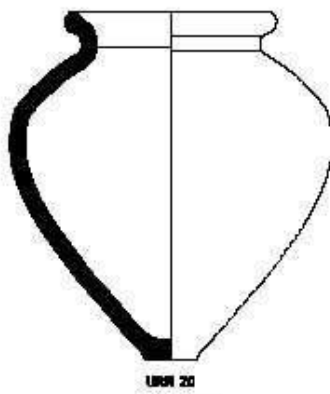
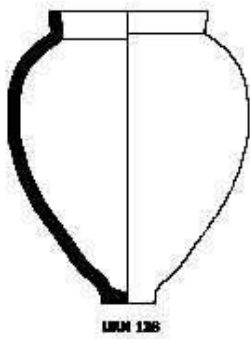
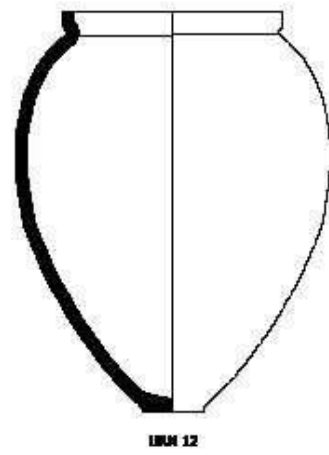
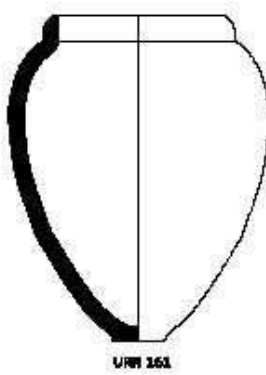
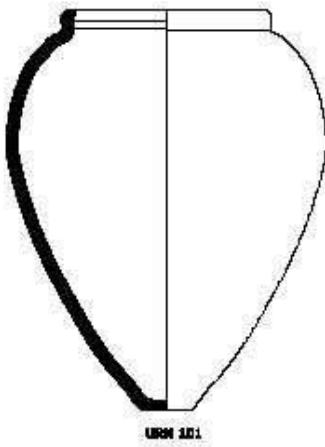
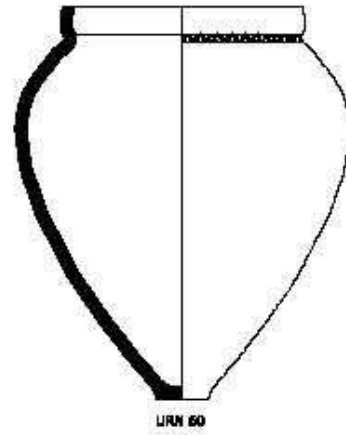
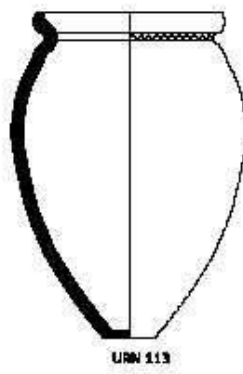
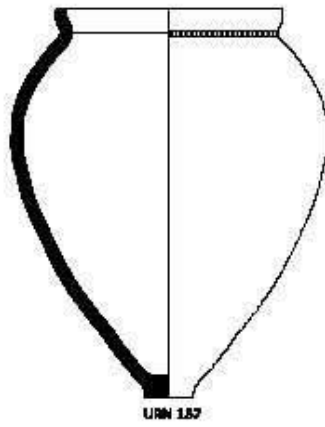
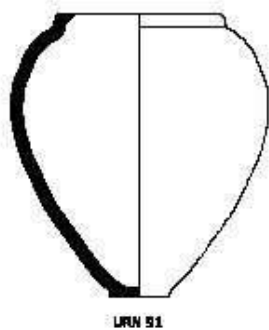
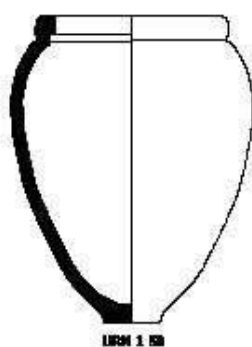


Figure-2

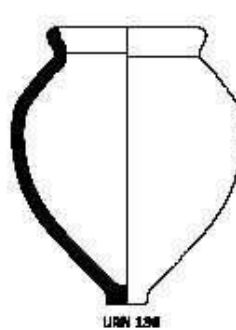
RED WARE



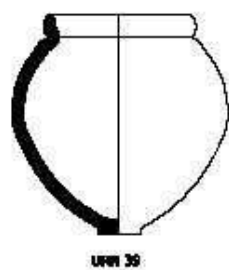
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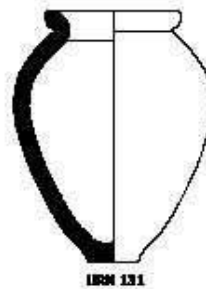
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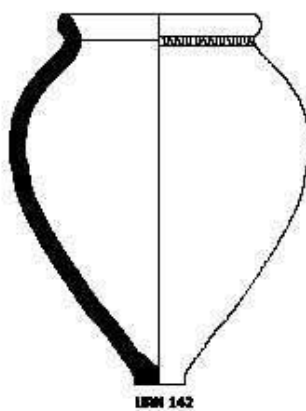
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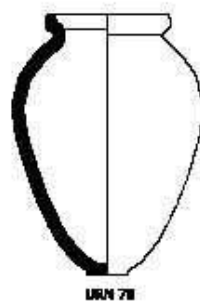
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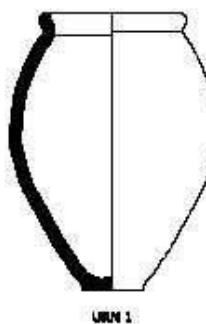
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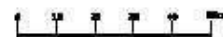


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URN 1

Figure-3



RED WARE

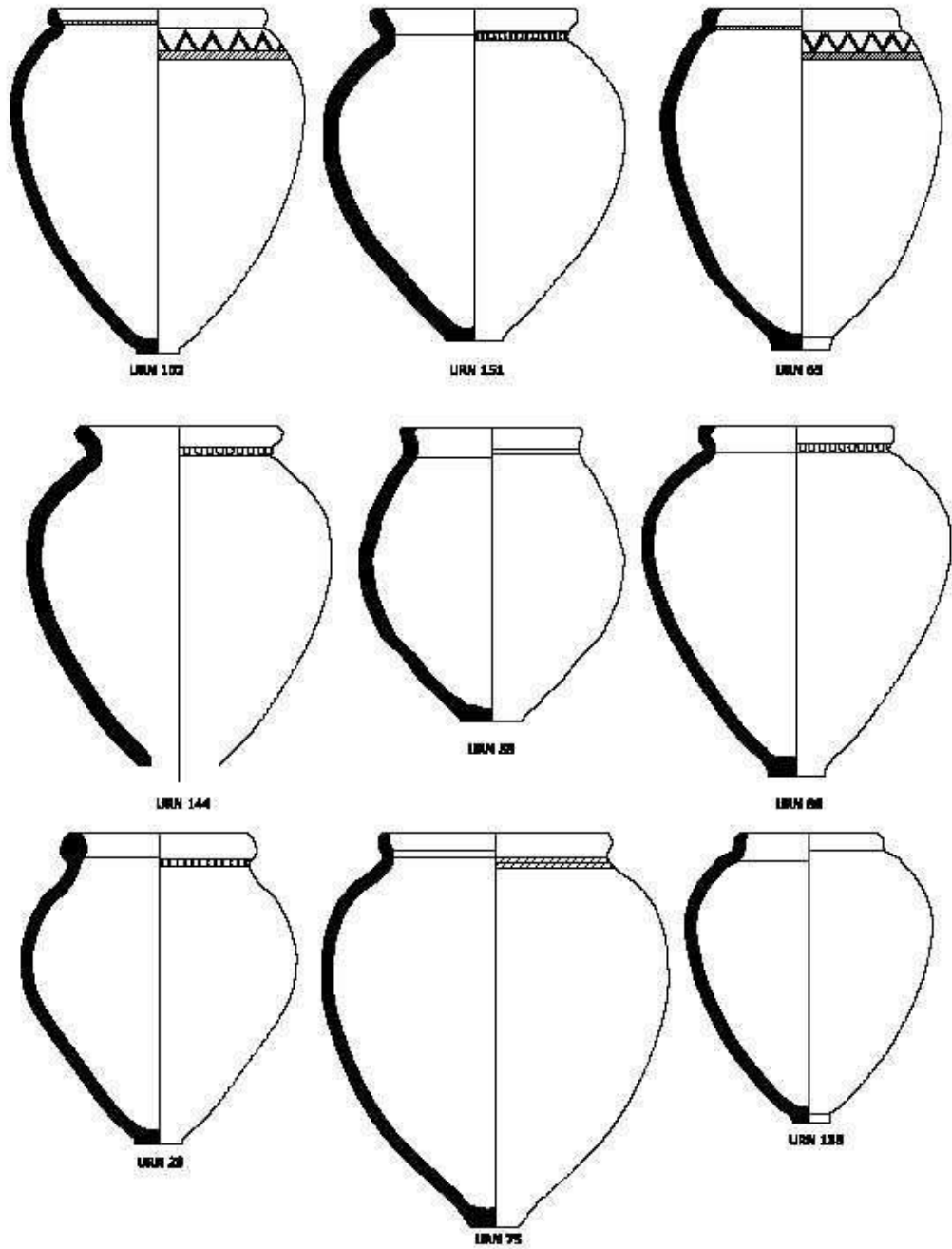


Figure-4



RED WARE

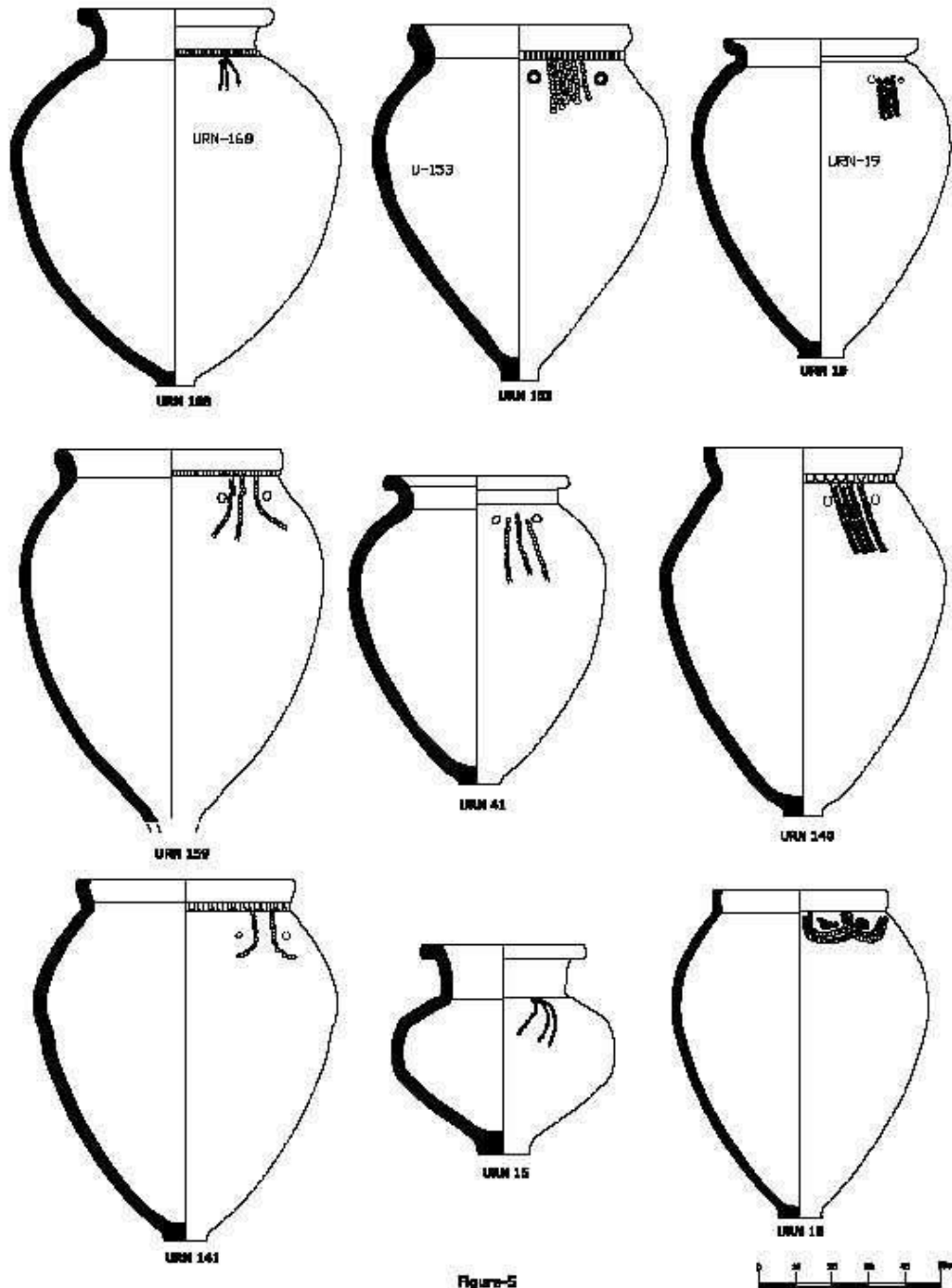


Figure-5

BLACK & RED WARE

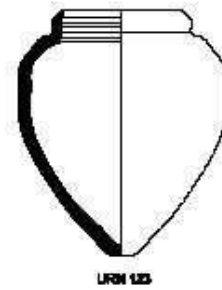
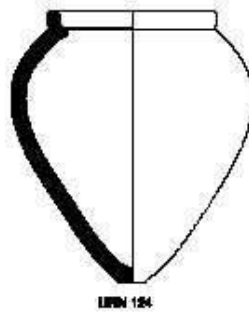
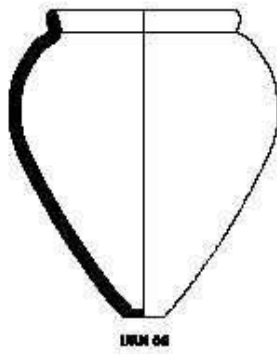
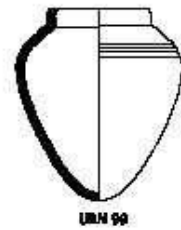
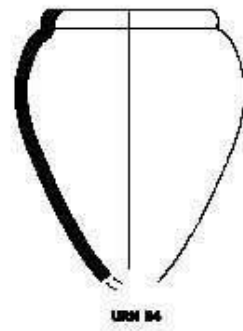
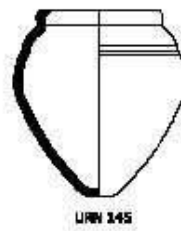
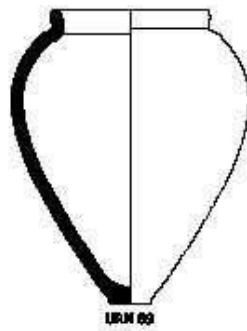
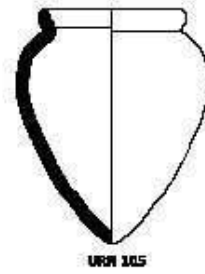
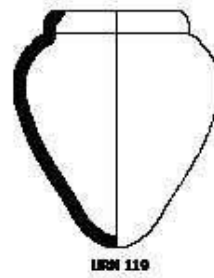
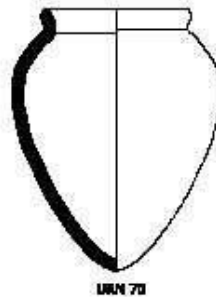
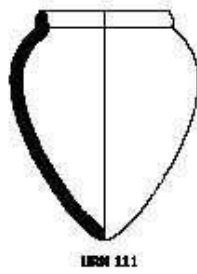
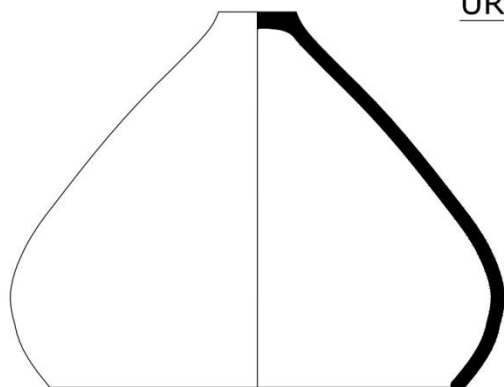


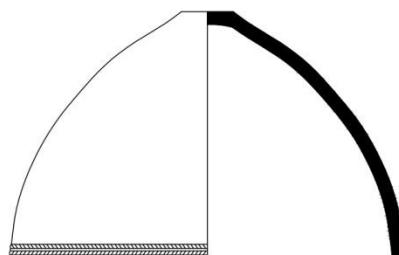
Figure-6



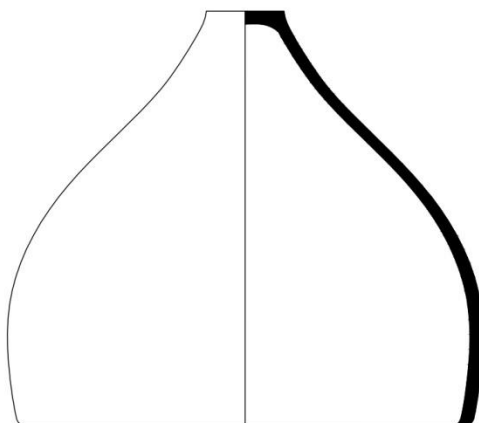
URN Lids



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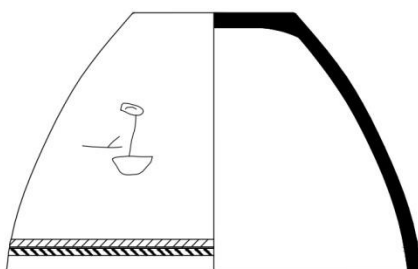


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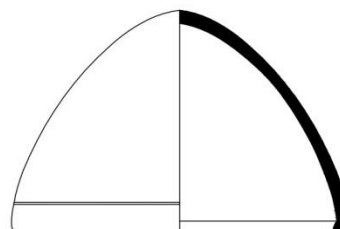


U-159

7a



U-54



U-119

7b

Figure-7

0 10 20cm

Ring stand

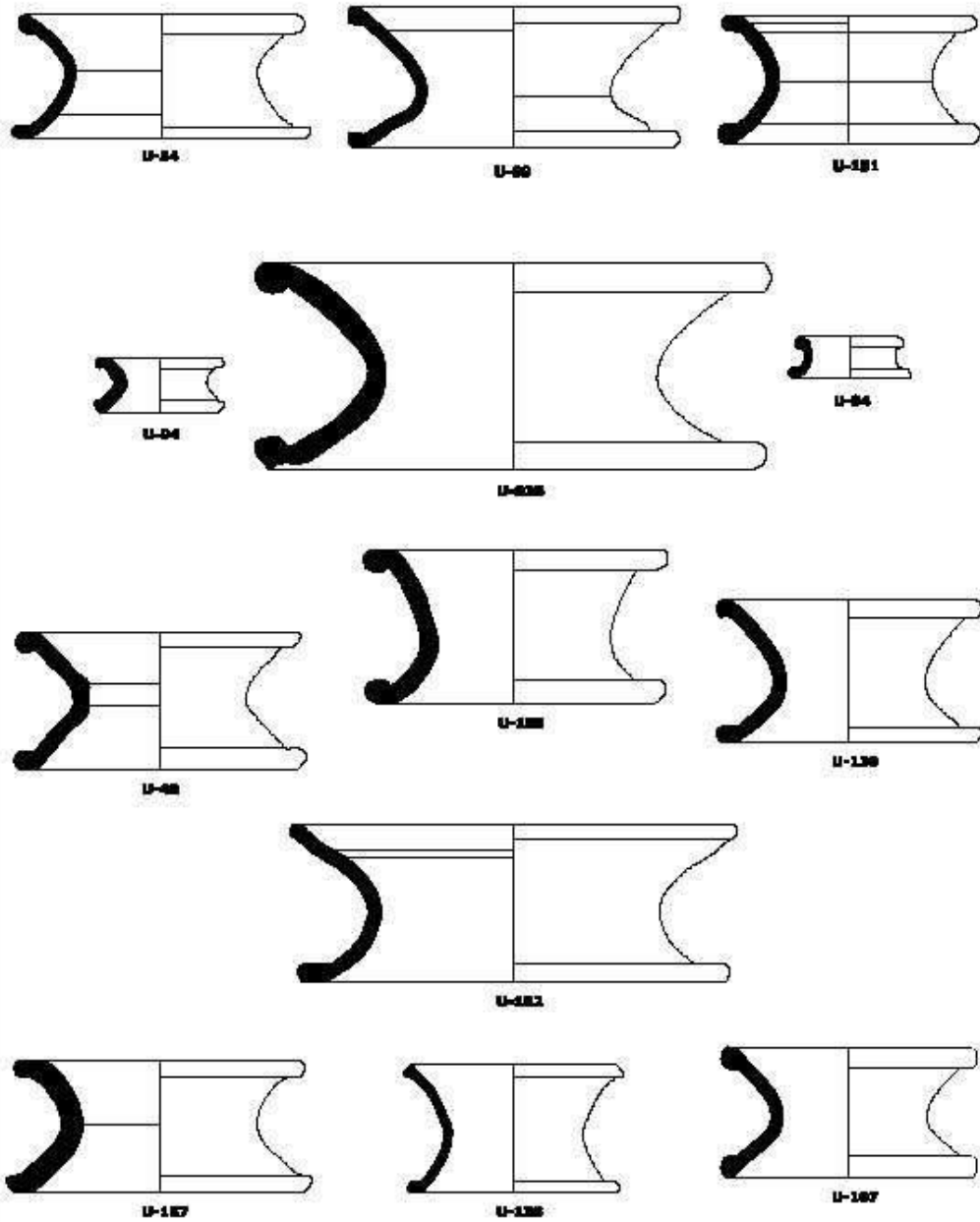
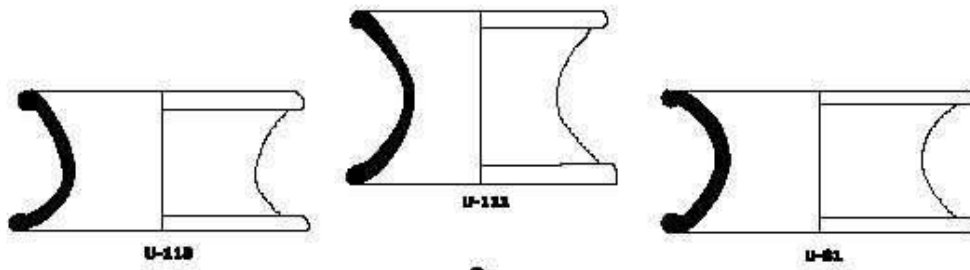
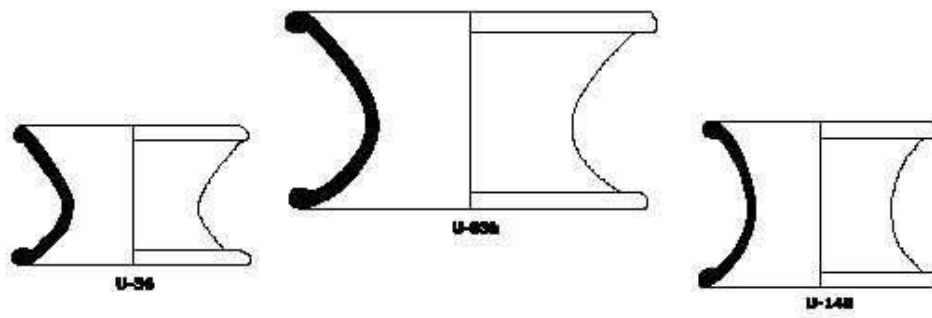
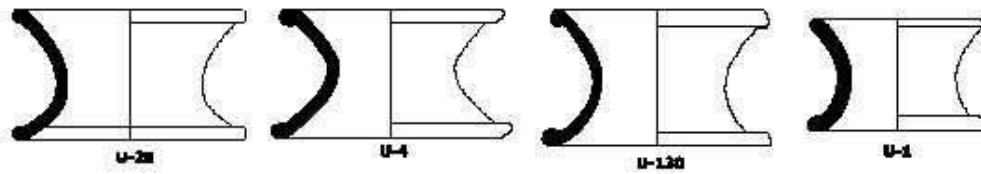


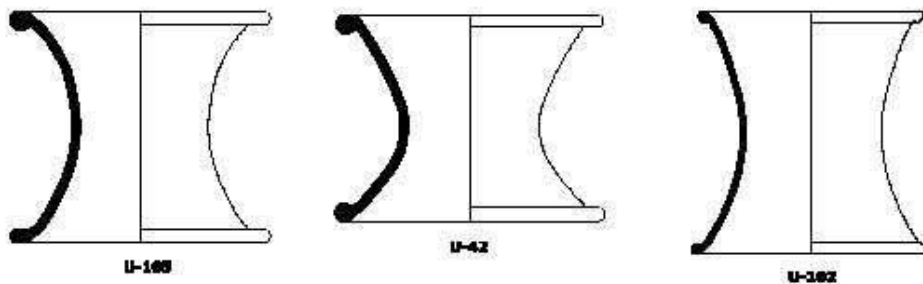
Figure-8

0 5 10cm

Ring stand



9a



9b

Figure-9



The Black-and- Red ware was found both with and without white dotted paintings .Even though such white paintings were noticed in some of the site like Hallur and Maski, the uniqueness in the paintings here is the dotted design. Such dotted white paintings were reported from T.Kallupatti. The pigments used for such painting might have been taken from white ochre (?). It is very important to note that the dots have been painted in a uniform order. Mostly oblique designs around the rim were noticed, however very interesting shapes were noticed in black and red ware vases and black polished ware lids. Such paintings were done before firing and the lustre and gloss of the black portion of Black-and- Red ware on the exterior side is shining. The glossy surface still retains the shine.

Vases

Vase is another type of grave pot that was noticed along with the burial both inside and outside the urn. Vases can be differentiated on the basis of ware, shape and size. Most of the vases were red ware, sometime with red slip. Some of the Black-and- Red ware vases were with lustre or glossy look of black colour are also noticed with external grooves and white dotted paintings around the shoulder. Another type of vase was the miniature type with the height varying from 4cm to 8cm. Such types were usually noticed mostly inside the urn and rarely outside. The detailed account of types of vase retrieved in the Adichchanallur excavation are furnished below

Type -1: (Figure 11a) Red ware vases or jar with high cylindrical or slightly flaring neck, globular body and slightly conical bottom and externality beaded rim like in Amirthamangalam. Sometimes it has round base also. Most of the vases are bigger in shape and placed outside the urn around the urn. The medium size vase of this type was also noticed inside the urn especially in the primary burial and was placed above the skeleton remains. Some of these vases were noticed with red slip applied over the surface before firing. This type of vases are noticed in the urn no 1, 8, 16, 17 29, 44, 105, 49, 63, 83B 85, 85B, 116, 117, 121, 125, 138, 142, 143 and 154. The urns which were noticed with red slip are 3, 10, 15, 16, 43, 47, 60, 103, 104, 118, 124, 135, 139, 147 and 158.

Type-2 (Figure 11b) Red slipped ware of medium size with funnel shaped neck, flaring mouth out turned rim, conical base and long sloping sides and sometimes with round or sager base was found. These type vases were found in urn 137 and 142.

Type-3 (Figure 12 a) Black-and- Red ware vase with globular or heart shaped shoulder having sager, round or flat base. Groove lines were noticed around the shoulder. In most of the vases the rims were noticed broken and in few cases the rim was slender or without any neck. In one or two vases, slightly high neck flaring rim was noticed. Almost all these types of urns were noticed with white dotted painted designs around the shoulder in oblique manner or as four to five horizontal lines shown in regular interval as in the urn nos 15, 33, 65, 83B, 98, 106, 107, 124, 131, 139, 146, 147, 153, 159, 161, 163 and 167.

Type-4 (Figure-12b) Type of all black globular ware with small neck and slightly beaded rim was noticed in urn no 141. Row of white dotted oblique design was noticed around the shoulder.

Type- 5 (Figure-13): Black-and- Red ware with high oviform vases with a flat bottom. Such vases were noticed in urn nos 83A, 83B, 86, 116, 152, and 161. Some vases were noticed with straight collar like flaring rim such as in Urn 86 (**Figure-13a**) or slightly flaring rim as in 83B (**Figure 13b**) Some vases have neck - less externally rolled rim as in Urn 116 (**Figure-13c**) . All the vases of this type were characterised by a set of grooves on the upper part of the body without any painting design. Only one piece in urn no 116 was having white dotted oblique paintings above the groove (**Figure13c**).

Type 6: Miniature vase or pot except one piece all are of black-and red ware were having different shapes.

Type 6a (**Figure 14a**): Miniature vase with long straight neck sloping shoulder and sager base was noticed in urn no 14, 54, 71, 85, 92, and 163. One placed in urn no 158 had flaring beaded rim and those vases in urn nos 49, 80, 115 and 154 have a conical base.

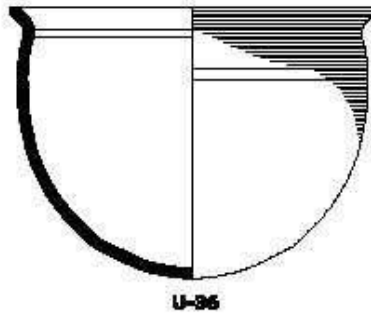
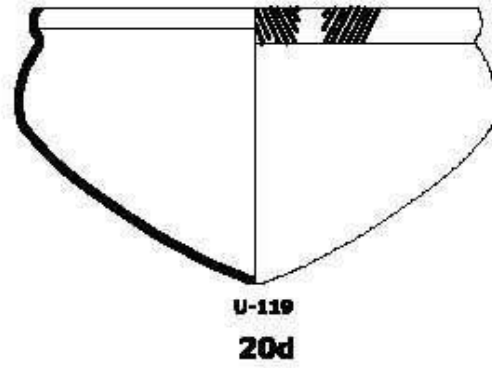
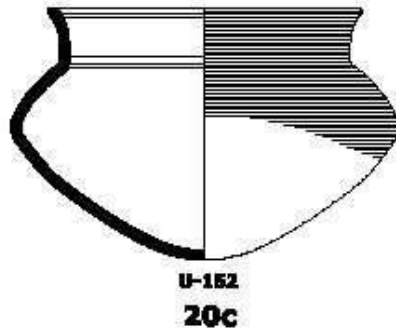
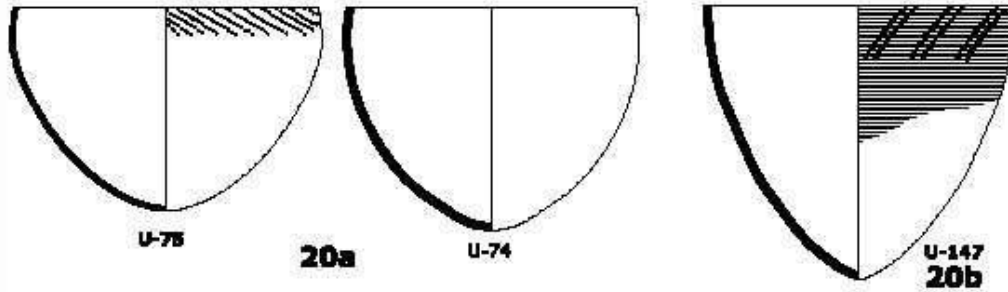
Type 6b (**Figure 14 b**): Miniature jar with cylindrical neck, bluntly carinated body and conical bottom - noticed in the urn 16, 83B, 104 and 138. Another vase in urn no 138 had slightly flaring neck and sager body. In urn no64 it had long slightly flaring neck.

Type 6c (**Figure 14c**):Miniature vase with long neck, a lightly out turned rim sloping shoulders, broad body with sager base was noticed in urn nos 85B,123B, 123C, and 143.

Type 6d (**Figure 14d**): Miniature vase with wide mouth ,short neck, squat bulging body slightly turned beaded rim and sager base was noticed in urn no 83B only. The miniature vase in urn no 159 has slight variation having out turned neck and rim. White dotted paintings were noticed around the shoulder.

Type 6e (**Figure 14 e**): Miniature vase with flaring neck with sloping shoulder and slightly conical bottom. This type was noticed in the urn no 42, 48, 87, 123A and 145. The vase in urn no 123 A is of red ware. In case of vases in urn no 10, 88 and 124, carniated shoulder was noticed with round base. Another variant of this type was also noticed with squat shape in few urns like in 21, 105, 106, 114 and 149.

Bowls



20e

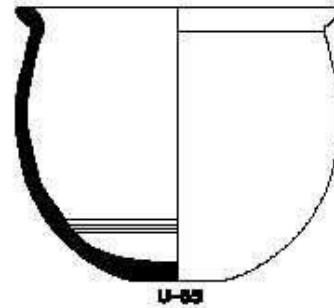
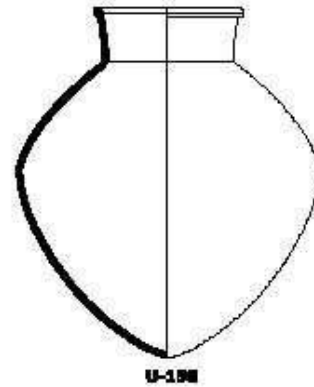
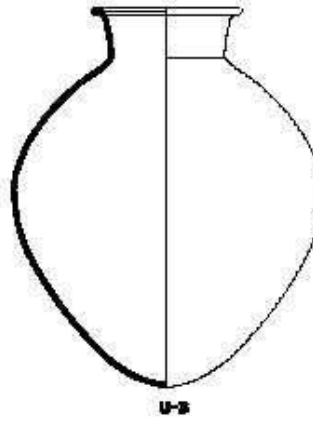
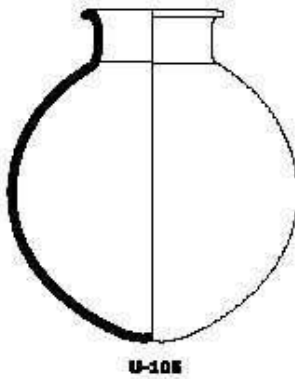
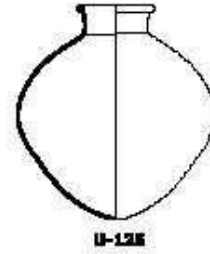
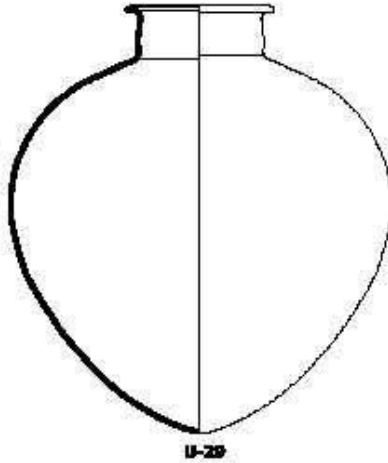
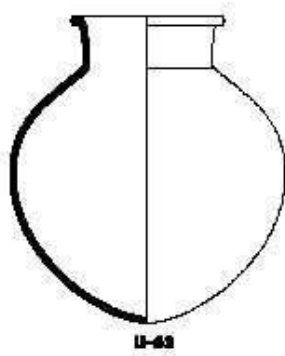


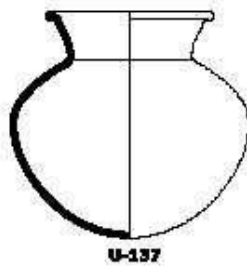
Figure-20

0 5 10cm

Red & Red slip Vase



11 a



11 b

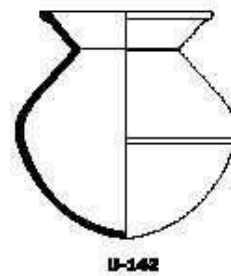


Figure-11



Black-and- Red ware and All Black ware

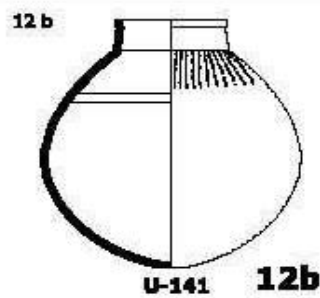
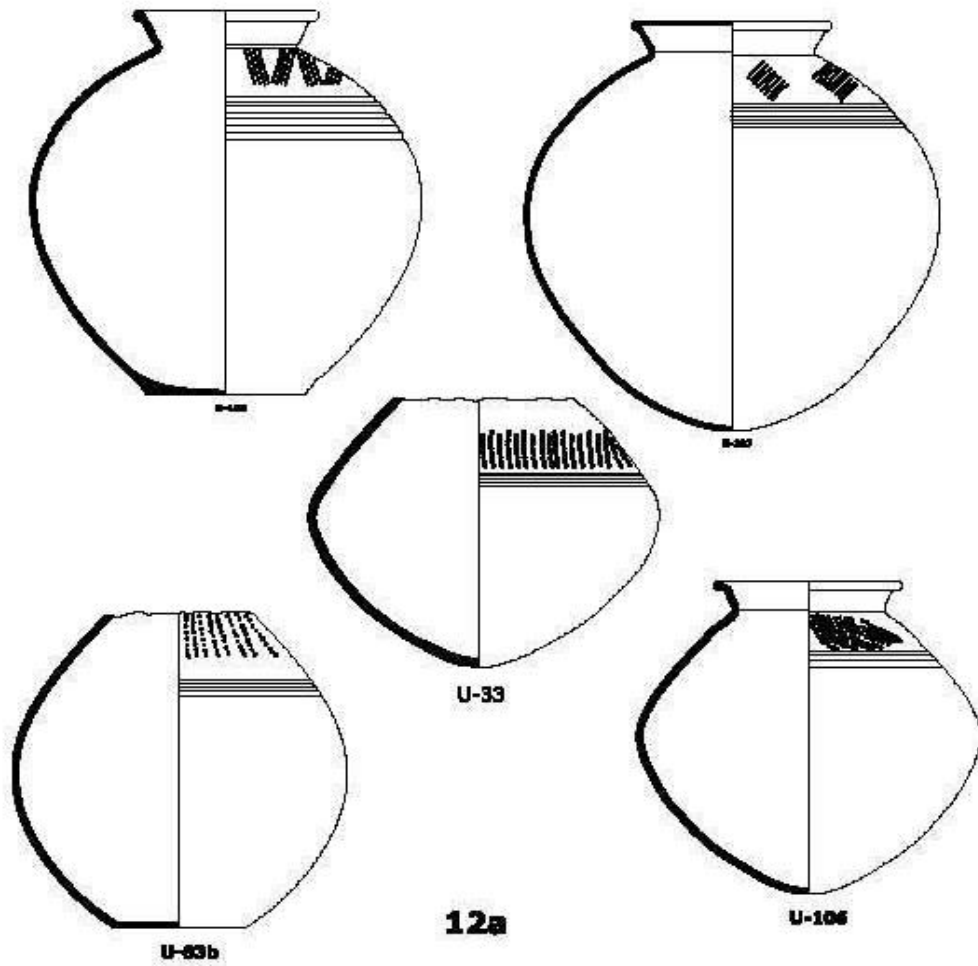


Figure-12

0 5 10cm

Vase

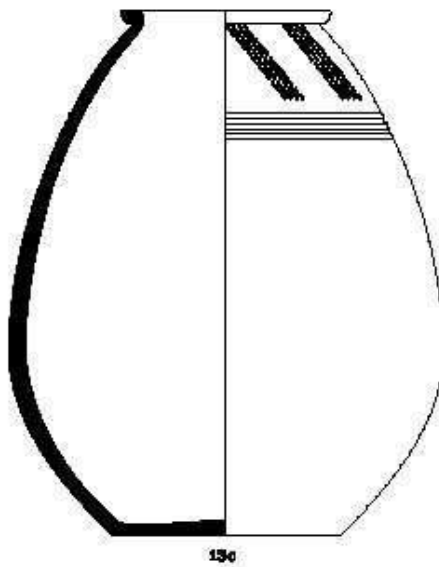
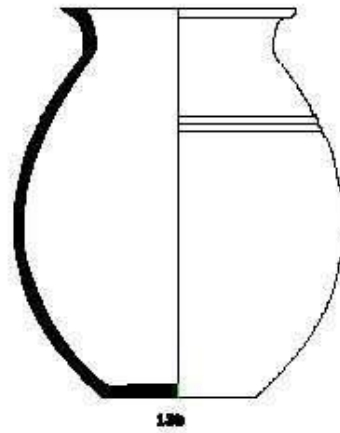
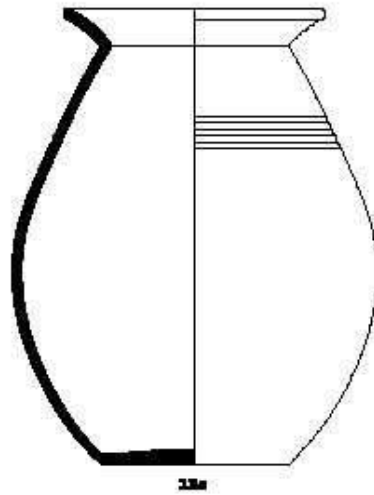
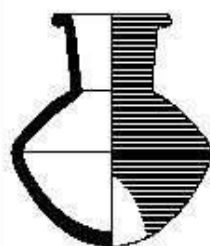


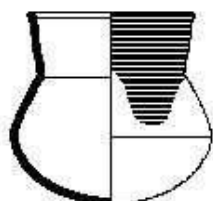
Figure-13



Miniature vase

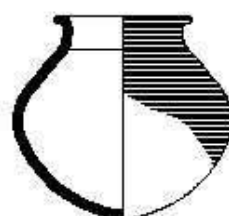


U-183



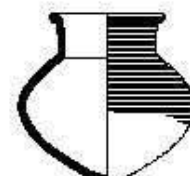
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14a

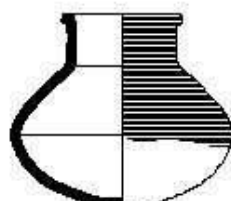


U-44

14b

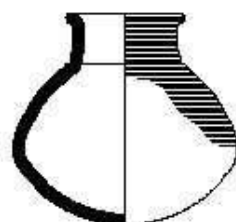


U-16

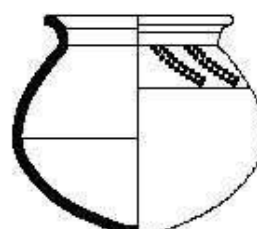


U-123b

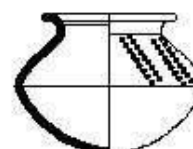
14c



U-148

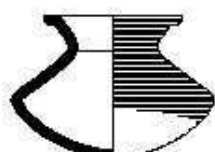


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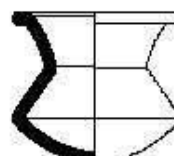


U-159

14d

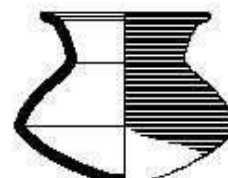


U-87



U-123a

14e



U-48

Figure-14

0 5 10cm

Bowls

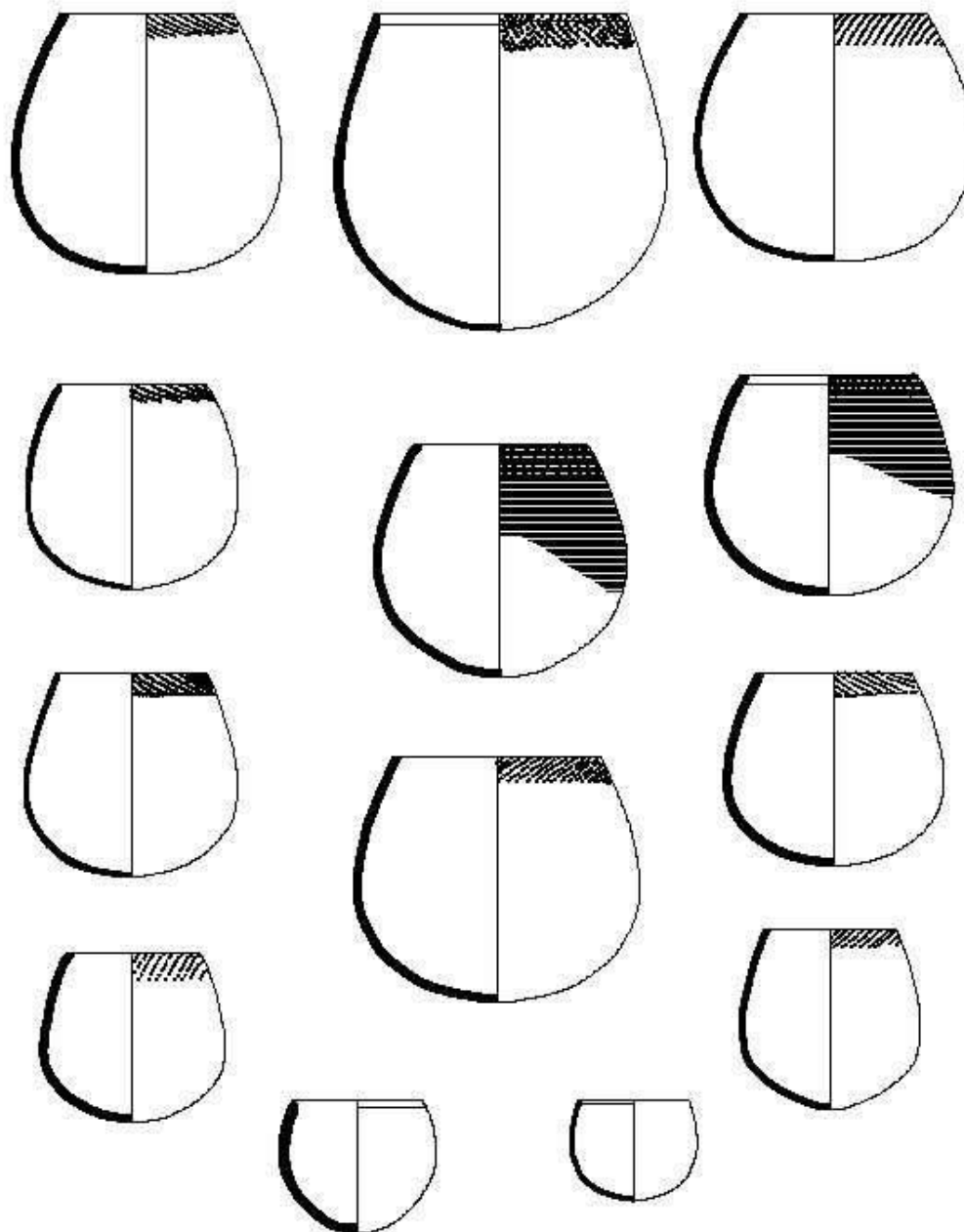


Figure-15

0 5 10cm

Bowls

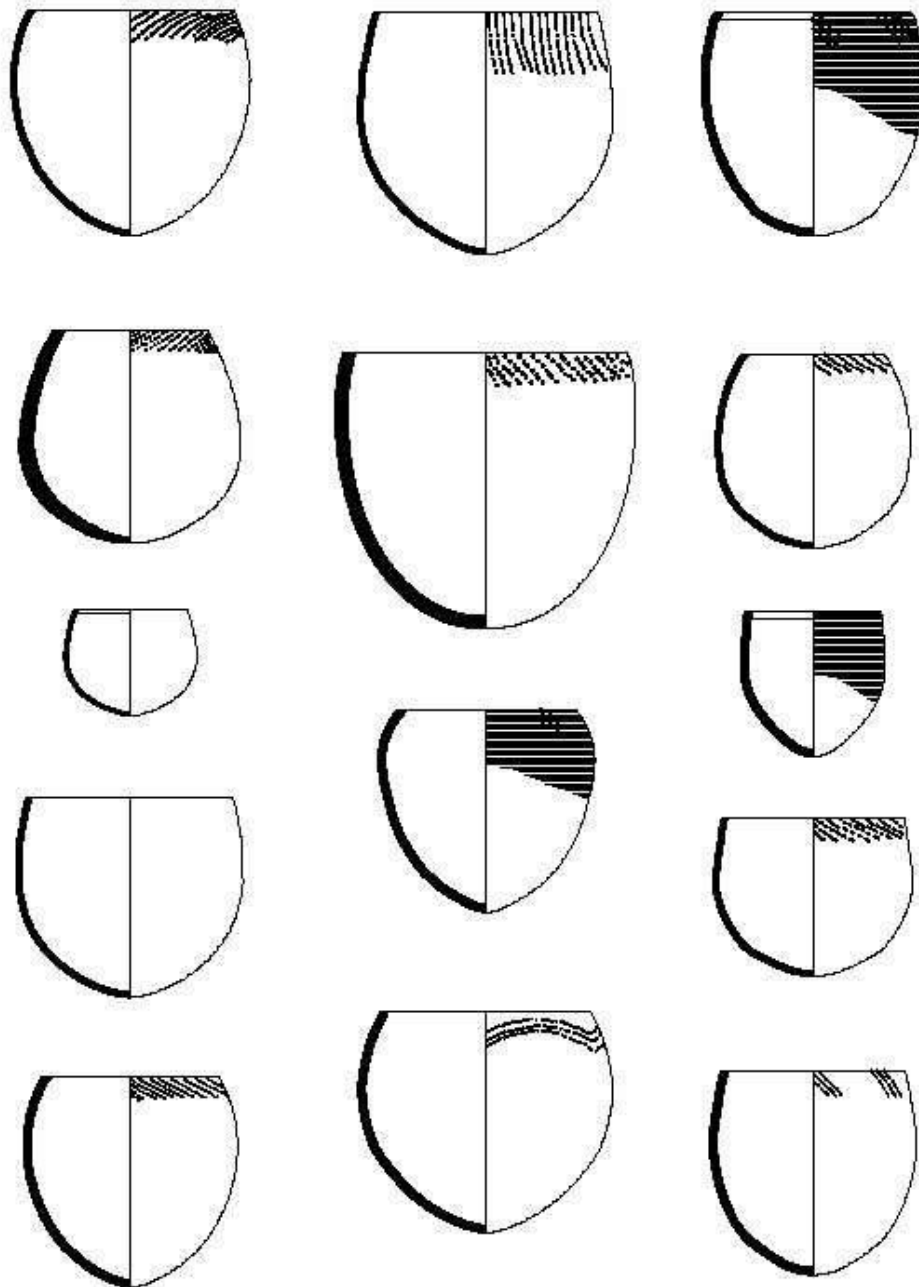


Figure-16



Bowls

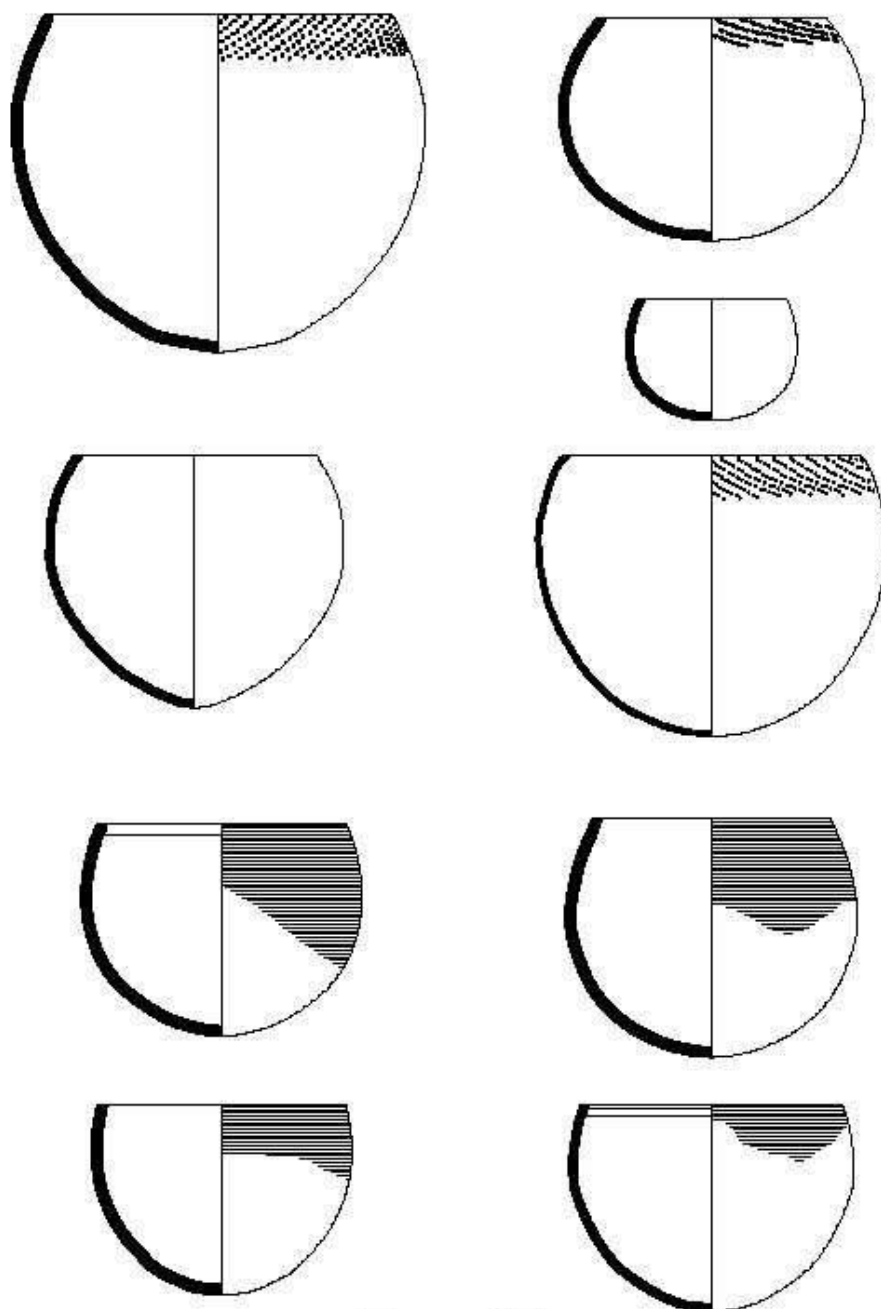


Figure-17

0 5 10cm

Bowls

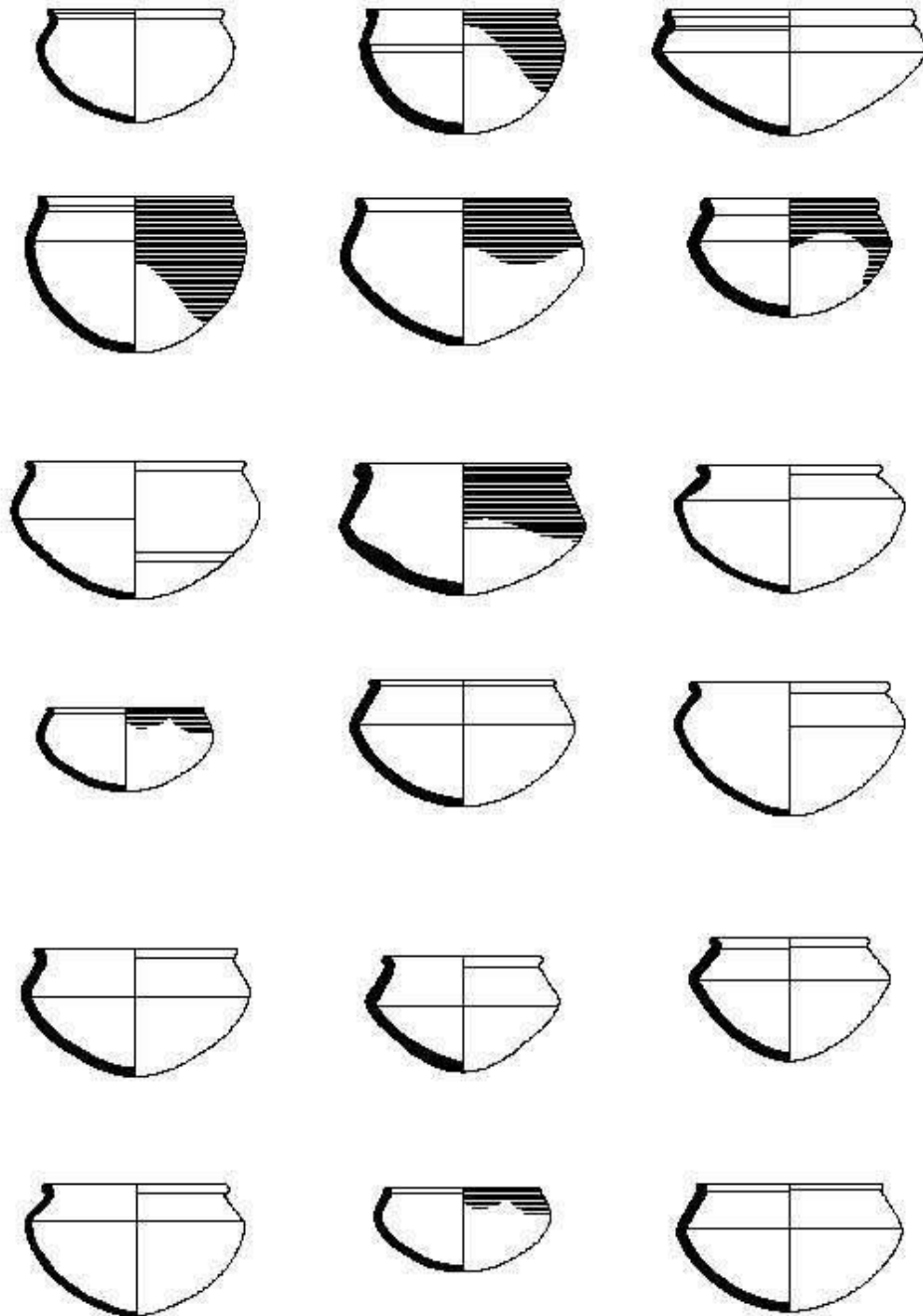


Figure-18

0 5 10cm

Bowls

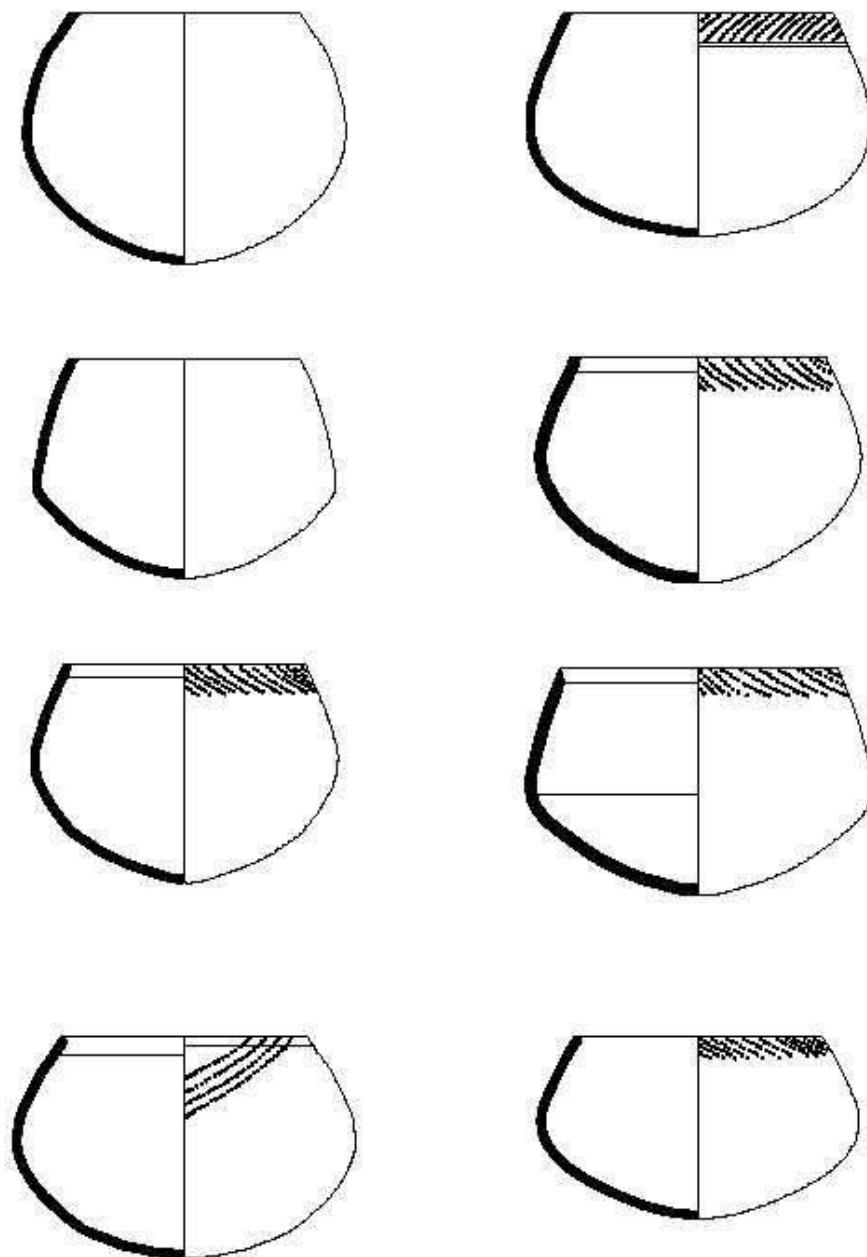


Figure-19



Bowls

Black-and- Red ware bowls were noticed at all levels of the site in all the phases. The percentage is very high in middle phase and very low in later phase. The bowls were of Black-and- Red ware with or without paintings. These bowls were classified on the basis of shapes. All are of wheel made, thin medium to fine fabric. Most of the bowls were noticed with white dotted paintings around the rim portion mostly of oblique design and in uniformity. Only one black ware bowl was noticed with a different shape. It was deeper with a slightly pointed base. (fig.20b) some of the bowls have groove design below the painting. The bowls are classified as follows

Type-1(Figure 15):

Deep bowl of Black-and- Red ware and the shape resembles the cognac glass, slightly narrow towards mouth, sager base and featureless rim with or without white painting. The size of the bowl varies from small size to big size. Some bowls have straight sides. Some of the bowls have a globular body.

Type-I bowls were noticed in the urn 13, 14, 21 ,29, 35, 38, 45, 47,49, 51, 54,55,58,62, 63,71,74, 75, 85, 88, 92, 93, 102, 104, 107, 111, 113, 114,124,130,131,134,135,136, 140, 141,143, 145, 151, 154 157, 158, 161 164 and 166.

Type-2 (Figure-16):

Bowl with straight side or slightly incurved sides with featureless rim with conical bottom, similar to the shape of cognac glass. These bowls were also noticed with white dotted paintings except in few bowls. The design was oblique in both clock wise and anti clock

wise manner. Such bowls were noticed in the urn nos 15, 29, 36, 87, 102, 106, 107, 121, 130, 137, 140, 142 and 168.

Type -3(Figure 17)

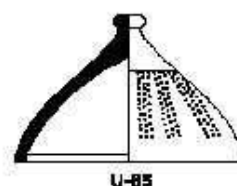
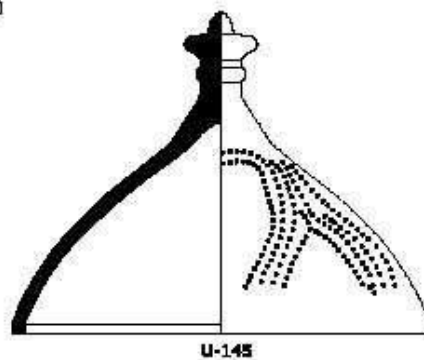
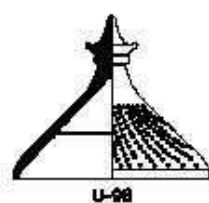
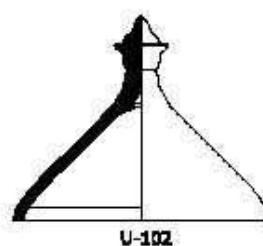
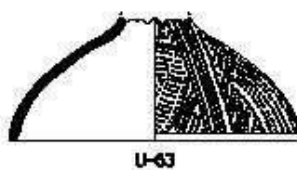
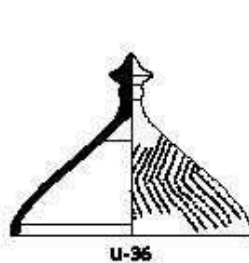
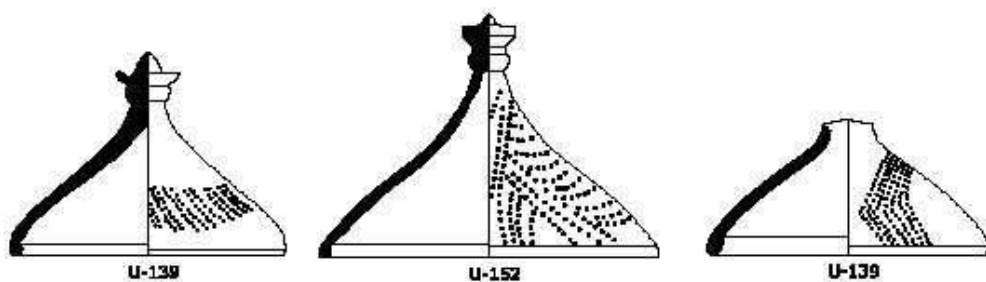
Simple bowl with slightly incurved rim and roundish body and sager base were identified. This type were noticed with and without white dotted painting designs around the rim portion. Such types were noticed in urn nos 9, 12, 33, 36, 45, 48, 49, 54, 58, 60, 65, 67, 75, 81, 83A, 85, 87, 91, 92, 104, 106, 125, 131, 161 and 163. A bowl in urn 74 had a beaded rim and the one in urn 84A had flat base. A miniature bowl was found in urn no 74.

Type 4 (Figure-18)

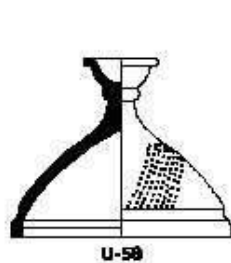
Bowl with the rim marked by an external roll or beading, sides sloping inwards and a sharp carination were noticed in urn nos 12, 14, 36, 49, 74, 78, 102, 131, 141, 148, 153, 158, 164 and 168. No white dotted paintings were noticed in this type.

Type 5 (Figure-19) Bowl with sloping sides with blunt carination, sager base and features rim with or without white dotted paintings around rim. This type of bowl was noticed in the urn 11, 36, 45, 48, 54, 55, 63, 64, 101, 117, 152, 154, 157 and 161.

Cannold Lid



25a



25b

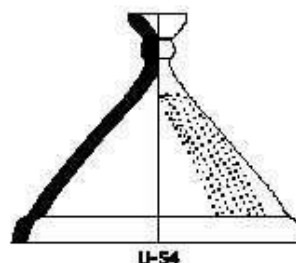


Figure-25

0 5 10cm

Shallow Bowl

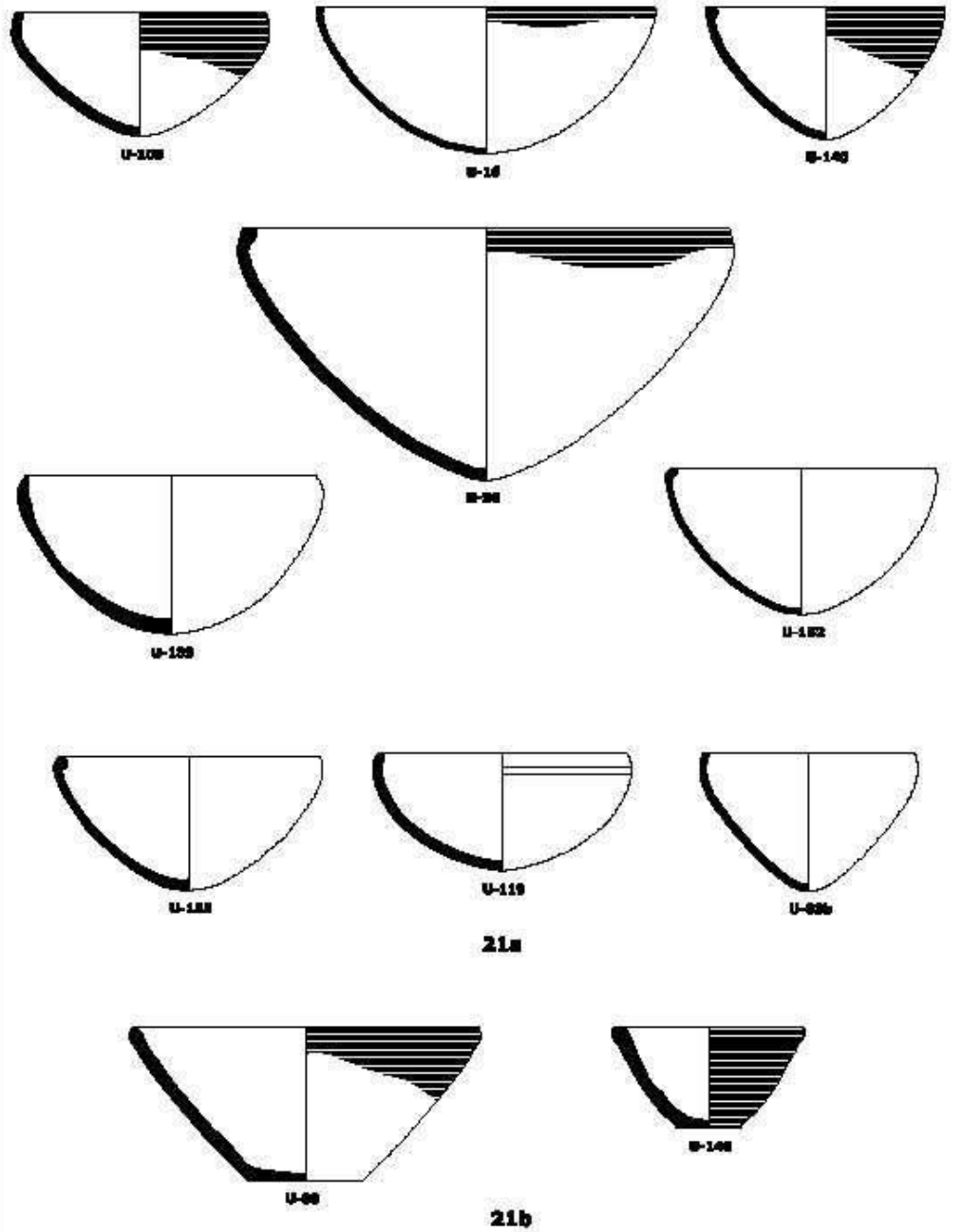


Figure-21



Beaker

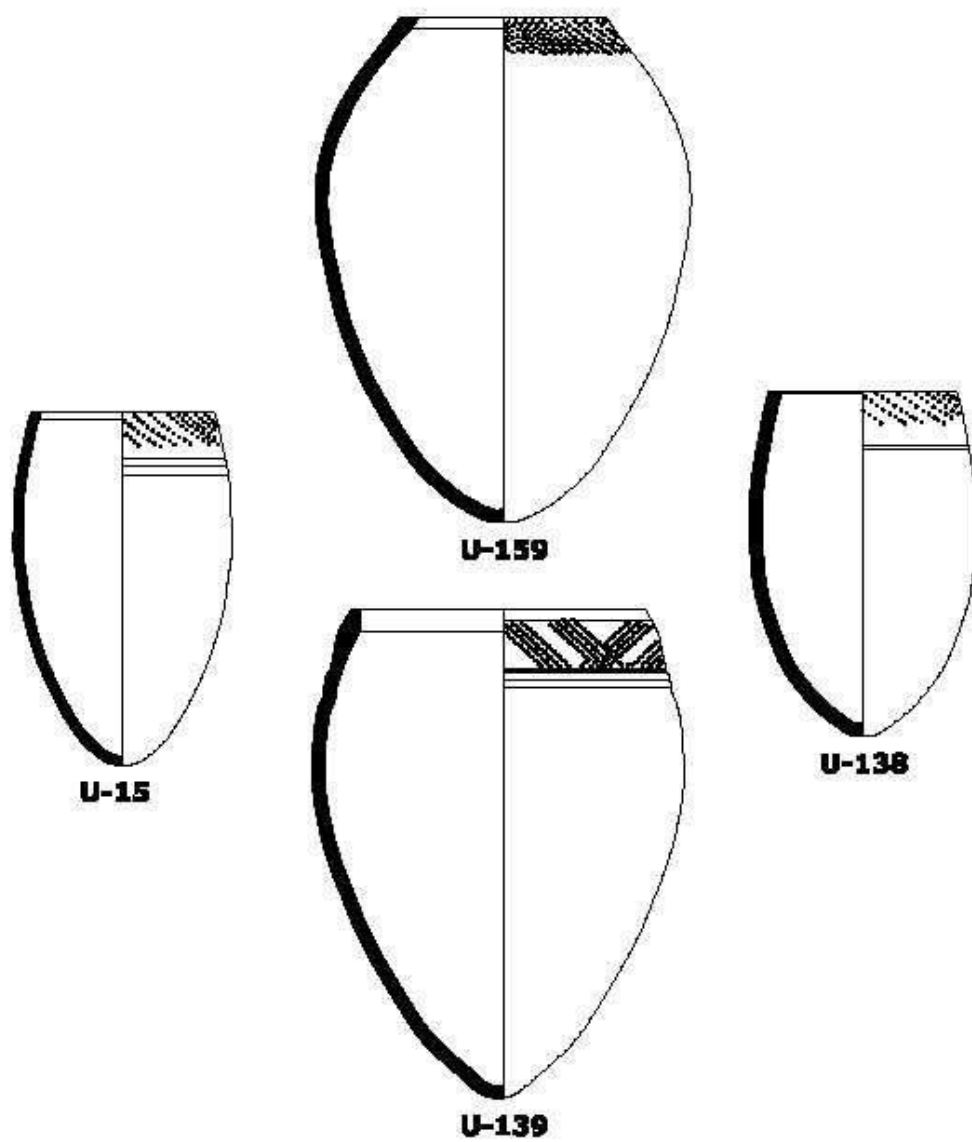
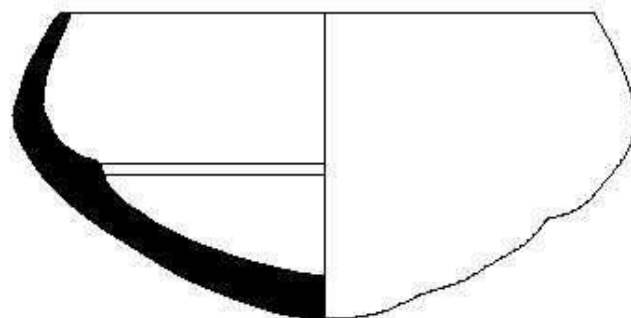


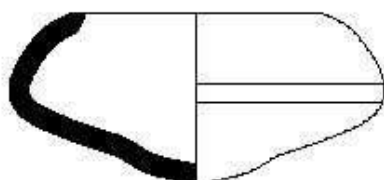
Figure-22



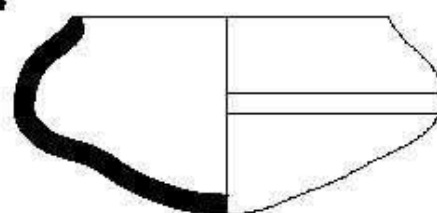
Lid cum Bowl



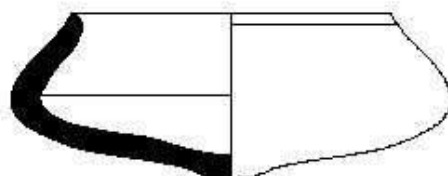
U-104



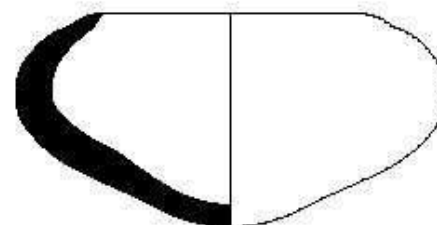
U-124



U-123c



U-123a



U-167



U-152

Figure-23



Cannoid Lid

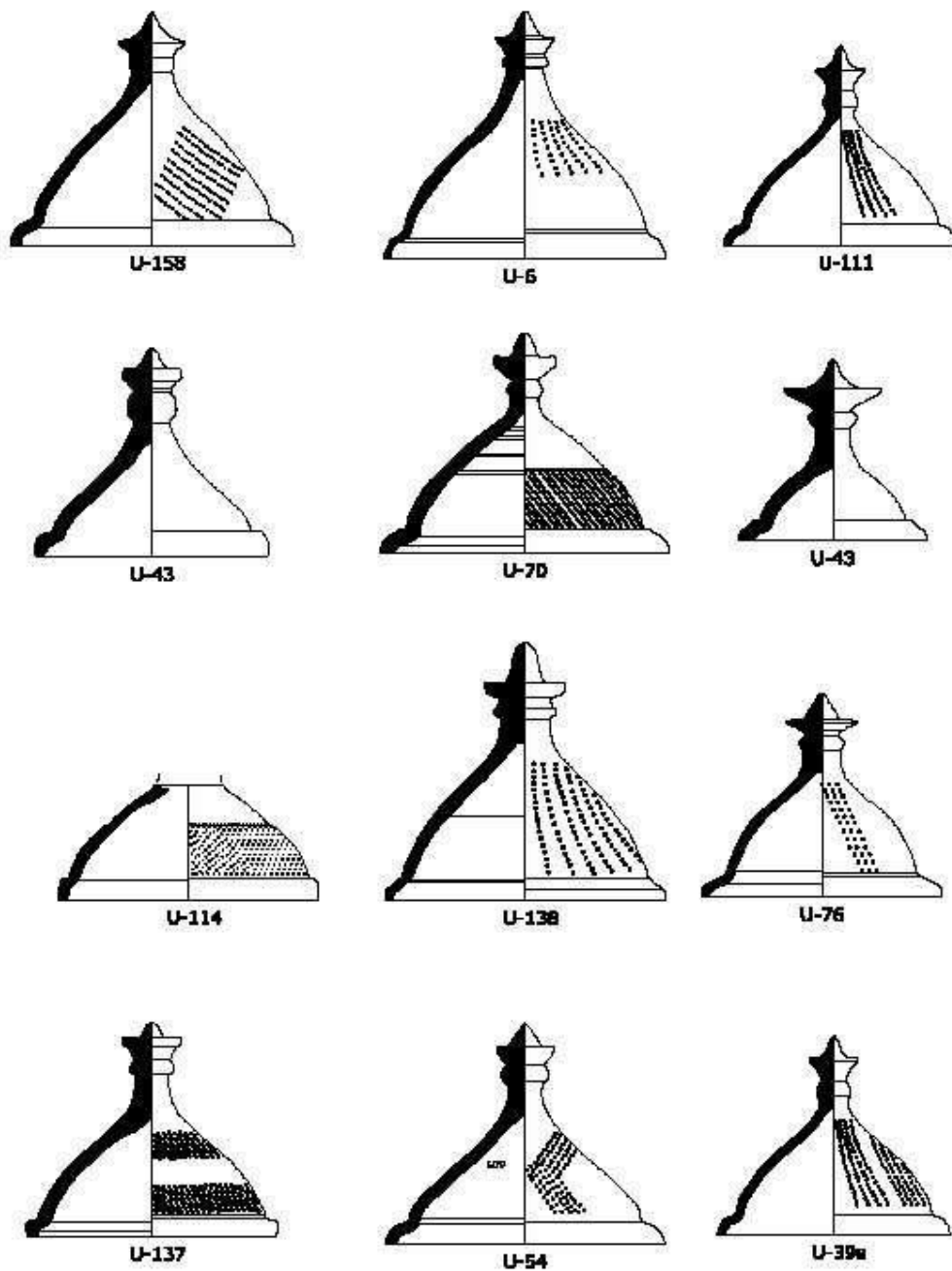


Figure-24



Type -6 (Figure -20a)

Hemispherical bowl with softly incurved rim, sager or conical base, sloping sides almost looks like shallow dish was noticed in urn nos 74 and 75.

Type-7(Figure 20b)

Bowl with wide flaring mouth, featureless rim and conical bottom - only one piece noticed in the urn147.

Type-8

Bowl or chatti having blunt conical bottom, short sloping shoulder and carination on the body with short thin rim as in 152 (**Figure 20c**). Same type of bowl with blunt carination and straight thin rim was noticed in urn nos 119 and 151. **Figure 20d**). Straight lines drawn in white paint were seen running from the rim to the shoulder of the bowl.

Type-9

Bowl with thick fabric, conical or round base having out turned beaded rim was noticed in urn no 44 and another in urn no 152 having a conical base. Such type of bowl with beaded rim was noticed in the urn 36, 65, 119 and 133(**Figure-20e**).

Shallow dish cum lid

A typical variety of shallow dish or bowl or a shallow dish cum lid was noticed in the urns of Adichchanallur. It has conical body sloping sides and thick incurved rim. This type was noticed mostly in the Middle phase and very few in Early phase (about 6) and no such type was reported in Late phase. This type of dishes were noticed in the urn nos10,16,29,31,36,47,48,83B,86,99,104,105,118,119,135,136,138,139 ,148,151,152, 154 and 157. (Figure 21a). In urn no 88 a peculiar type

of bowl cum lid was noticed which had a flat base, sloping sides, flaring mouth and featureless thick rim. Same type of bowl with little difference and smaller in size was noticed in the urn no 140 (Figure 21B). The pieces in the urn 154 and 159 were very big in size and were retrieved from outside the urn.

Beakers (Figure 22)

Black-and- Red ware beakers (lota like) with and without white dotted paintings around the rim were noticed in a few urns. Slight differences in shape and size were noticed. The beaker in urn no 159 was a bigger one with globular body, conical base, narrow mouth and feature less rim having white dotted paintings, while that in urn nos 15 and 138 had slender, straight sided featureless rim and grooved lines below the white dotted oblique design. A miniature beaker in Black-and- Red ware was noticed in urn 85B. Apart from this few more beakers were also noticed in urns which were broken. The Early and Middle phases only yielded this type.

All black ware

Miniature lid cum bowl were noticed in this ware. They are mostly handmade and no glossiness was noticed over the surface.

Black polished ware with or without painting

Black polished ware was exclusively used in the preparation of ring stand and cannoid lids of various shapes and sizes. These were found both inside and outside the urn. Such grave goods were made and polished with black pigments. The process was carried out before firing so that the black induced glossiness has not vanished. In case of cannoid lids, the polish was applied or burnished very strongly, and is brighter than the ring stand. The cannoid lids were noticed with white dotted painting in various designs or decoration but with uniformity.

Both the types are wheel made with medium to fine fabric.

Ring stand

The ring stands which were noticed in the Adichchanallur excavation are of black polished ware. Polish was applied before firing and it gives a lustre and glossy look. One black and red ware cup on stand was noticed. The ring stand types noticed are as follows

Type-1: (Figure-8) Ring stands with concave sides and beaded rim. This type of ring stand was noticed in urn nos- 29, 33, 41, 45, 47, 48, 54, 58, 60, 61, 63, 64, 74, 78, 83B, 86, 87, 88, 89, 90, 92, 94 (miniature), 99, 106, 107, 114, 116, 117, 121, 130, 131, 133, 136, 137, 138, 139, 140, 141, 142, 151, 152, 154, 157, 158, 159, 161 and 168.

Type-1a: (Figure-9A) Ring stands with slightly elongated concave sides and beaded rim like in Sanur. This type was noticed in urn nos 1, 4, 14, 25, 36, 51, 81, 83B, 99, 111, 118, 125, 130, 146, 148 and 150.

Type -1b: (Figure-9B) Ring stand with high neck and deep concave sides and beaded rim. This type was noticed in urn nos 42, 102, 105 and 149.

Type-2: (Figure-10a) Ring stands with wide base, beaded rim, narrow neck and flaring upper rim was noticed in urn nos-65, 102, 157.

Type -3: Ring stand with central roll, egg cup shaped top and beaded rim. This type was noticed in the urn nos-166 (Figure-10b), 159 (Figure-10C and d) 78, 146, 163, 166 and 167. (Figure 10e), and 149. The ring stand found in the 157 (Figure-10F) varies little from this type having broad base and short neck.

Type-4: Ring stand with elongated neck with central roll, wide base with beaded rim and flaring mouth noticed only in the urn 94 (**Figure-10g**). The same shape was noticed in the urn no 153(**Figure 10h**) but it has short neck.

Type -5: It is black-and -red ware dish-on stand partially broken at the top, having central roll and beaded rim. It is unique type only one such variety is found inside the urn 143(**Figure-10i**).

Miniature Lid cum bowl (Figure 23)

All black ware miniature lids cum bowl were noticed mostly with a flat base but with a knob like projection with an incurved rim. It must have served only as a lid and not as a bowl because the knob like projection at the bottom would prevent proper seating. Such lid cum bowls were noticed in urn nos 104, 123A, 123B, 124, 147, 151,152 and 167. Most of the pieces were noticed in the Middle phase only with very few pieces in the Early phase and no such pieces were reported in the Late phase.

Cannoid lid

All black polished ware cannoid lids were noticed both inside and outside the urn. Most of them were having white dotted painting design on the surface of the body. The lids are classified according to its shapes.

Type-1(Figure 24)

Lid with a profiled knob handle, bell shaped body and collared rim. This type was noticed in urn nos 36, 39A, 43, 49, 54, 58, 65, 83B, 85, 87, 89, 91, 92, 106, 111, 114,130, 135, 137, 138, 145, 147(miniature), 154, 158 159, 167(miniature) and 168(miniature).

Type-2 (Figure 25a) Lid with bell shaped body and profiled knob handle and incurved rim was noticed in urn nos 15, 36, 42, 45, 48, 63, 83, 85, 94, 98, 102, 107, 113, 114, 116, 118, 131, 139, 141, 145, 152, 157 and 159.

Type-2a (Figure 25B) Lid with flaring top portion, bell shaped body and collared rim. This type was noticed in urn nos 54 and 58.

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Adichchanallur

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Plate 15: Cannoid Lids, Adichchanallur (Type-1)

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Plate 1: Ring stands from Adichchanallur (Type 1, 1a and 1b)



Plate 2: Ring stands from Adichchanallur (Type 2 to 5)



Plate 3: Red ware and Red slip Vases, Adichchanallur (Type 1 and 2)



Plate 4: Black-and- Red ware Vases, Adichchanallur (Type 3 and 4)



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Plate 7: Black and Red ware Bowls, Adichchanallur (Type 1)



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Plate 9: Black-and- Red ware Bowls, Adichchanallur (Type 3)



Plate 10: Black-and- Red ware carinated Bowls, Adichchanallur (Type 4 and 5)



Plate 11: Black-and- Red ware Bowls, Adichchanallur (Type 6 to 9)



Plate 12: Black-and- Red ware Shallow dish cum bowl, Adichchanallur



Plate 13: Black-and- Red ware Beakers, Adichchanallur



Plate14: Black ware Miniature Shallow dish cum Lid, Adichchanallur



Plate15:Cannoid Lids, Adichchanallur(Type1)



Plate16: Cannoid Lids, Adichchanallur (Type2)

(b) HABITATION SITE

Mixed variety of pottery was noticed in the habitation area. The potsherds were not very well preserved and hence it was difficult to identify the shapes.

Layer 1

Generally yielded degenerated potsherds mixed with the soil. Red ware sherds dominated this layer.

Layer 2

Most of the potsherds were found in layer 2. The quality of the pottery in these levels was of finer quality. Red ware (fine variety), red slipped ware, black ware, black slipped ware, brown slipped ware (from pit) and black and red ware were unearthed. Majority of the wares was turned on wheel and well fired. The dominant ware noticed at this level was red ware and the types were mostly vase and basin. black and red ware bowls (rim less and with a variety of rims), miniature vases and cannoid lids were noticed. A preliminary observation of the black and ware, it appears that this is a degenerated quality of black and red ware. Few decorated sherds, sherds with graffiti marks and painting were also found, and a perforated sherd of a miniature bowl was also noticed.






Layer 3







Black and red ware, red slipped ware and brown slipped ware were noticed. The quality of the shards was finer. Ring stands and lids were the types found.








A potter's kiln was discovered as reported earlier and shards of ill fired and well fired red. Black and red and brown slipped ware were found. The shapes included ring stand, storage jars, dish and bowl.






Graffiti

The habitation site yielded a number of graffiti bearing potsherds. A few of these occur repeatedly from different localities and levels. The more common graffiti marks are star, bow and arrow, ladder, fish, sign like Asokan - Brahmi 'ma' etc.

Gr. No	Description	Ware	
1	An upward pointed arrow.	Black & red ware	
2	An arrow mark added at the base of the central vertical line.	Black & red ware	
3	A fork like sign. Two oblique lines meeting a central vertical line at the top with a flag-shaped sign on its right in a slanting position.	Red ware	
4	Five oblique lines placed on either side (three on left and two on right side) meeting at the central vertical line.	Red ware	
5	Two vertical lines and three tilted lines with loops at the lower part.	Red ware	

6	Five vertical lines hanging from a horizontal line. It is below the rim portion of the bowl.	Black & red ware	
7	There are two lines. One is vertical with loop and another one tilted line with three loops on the right side.	Red ware	
8	Asokan –Brahmi ‘ma’ like sign shown upside down.	Black & red ware	
9	A triangle placed inside the square.	Black & red ware	
10	A fork like sign. Two oblique lines meeting a central vertical line at a top with three additional oblique stroke added at base of the extreme right oblique line	Red ware	
11	A fish symbol with a vertical stroke on the right.	Red ware	

12	A fish like sign with a tilted stroke on the top of the right.	Black & red ware	
13	An arrow sign placed on the horizontal stroke in vertical position.	Black & red ware	
14	A standing fish like sign.	Black & red ware	
15	Asokan-Brahmi 'ma' like a stroke.	Black & red ware	
16	A ladder like sign with Asokan-Brahmi 'ma' like sign on its right. Top of the 'ma' sign is broken.	Red ware	
17	A star like symbol. A plus-mark is superimposed with two diagonal strokes (X mark)	Red ware	
18	U-shaped semi circle with a horizontal line is placed at the centre. (Tamil-Brahmi 'ma' like sign)	Black & red ware	

19	Two oblique lines placed on either side meeting at the top of the vertical line.	Black & red ware	
20	Two vertical lines with a horizontal stroke at the middle on the left.	Black & red ware	
21	A standing fish like sign with a tilted stroke in the bottom on the right.	Black & red ware	
22	May be possible Asokan-Brahmi 'ma' like sign? Tilted in clock wise direction.	Black & red ware	
23	A star like symbol. A plus-mark is Super imposed with one diagonal stroke.	Red ware	

CHAPTER VI

CHRONOLOGY

The chronology of Adichchanallur was derived at on the basis of Radio carbon dating and Thermo Luminescence /Optically Stimulated Luminescence dating (OSL) of the samples

1. BETA ANALYTIC LAB, FLORIDA – AMS DATING

The Radio carbon dating of Organic material (Husk) from Adichchanallur was sent to Beta Analytic Laboratory, USA for Accelerated Mass Spectrometry date (AMS date). Burials were noticed in three distinct phases at Adichchanallur. The early phase contained Red ware urns with Primary burials and the Middle phase had both Red ware and Black-and- Red ware having both Primary and Secondary burial and Late phase had only Secondary burial in both Black-and- Red ware and Red ware urns. To understand the time range between these cultural phases, the organic samples were carefully chosen to date the material.

The radiometric dates for the two samples were received from the Beta Analytic laboratory, USA. The sample (Beta-5199500) belonging to the Early cultural phase provided a conventional midrange date of 750BCE and calibrated midrange date of 850BC. The sample(Beta 519499) belongs to Middle phase provided a conventional midrange date of 610 BCE and calibrated midrange date of 650BCE. No organic samples were dated from Late phase. In archaeological studies of recent years, the calibrated dates are generally taken for consideration. Taking in to the probability of 95.4% of sample, the date can be placed between 850 BCE and 650 BCE. This is one of the earliest AMS dates obtained for urn burials in Tamil Nadu.

Sl.No	Beta Analytic No	Sample	Conventional date	Calibrated date
1	Beta 519499	Urn no 58 Organic material paddy	601BCE (2510±30 BP)	696-540BCE (67.7%) 791-701 BCE (27.7%) 640-650BCE
2	Beta 519500	Urn no 105 Organic material Paddy	750 BCE(2700±30BP) 750BCE	905-806BCE (95.4%) 850BCE

2. INTER UNIVERSITY ACCELERATOR CENTRE, DELHI – AMS DATING

¹⁴C Analysis of the Samples from Adichchanallur

S. No.	Sample Name	Sample ID	pMC value	Radiocarbon Age (BP)	Comment
1.	ADC-URN NO.58	IUACD#19C2840	72.598 ± 0.253	2572 ± 28	
2	ADC-URN NO.107	IUACD#19C2841	71.858 ± 0.245	2654 ± 27	
3	ADC-URN NO.83B	IUACD#19C2842	71.769 ± 0.275	2664 ± 30	
4	ADC-URN NO.113	IUACD#19C2843	Collagen from the bones samples could not be extracted for radiocarbon dating		
5	ADC-URN NO.157	IUACD#19C2844			
6	ADC-URN NO.152	IUACD#19C2845			
7	ADC-URN NIO.17	IUACD#19C2846			

Note:

- Measured results for all the samples are normalised to the standard sample OX II.
- AMS delta ¹³C values are used for the isotopic fractionation correction.
- Background value during the measurement was (0.754 ± 0.015) pMC (Percentage modern carbon) and that corresponds to ¹⁴C/¹²C ratio (7.5378 ± 0.1492) × 10⁻¹⁵.
- Data quality is monitored with secondary standard sample (IAEA-C8). Its consensus values (pMC = 15.03 ± 0.17) was matching with its experimental result (pMC= 15.05 ± 0.09) within the error.

3. MANIPUR UNIVERSITY – OSL DATING

The OSL/TL dating of Adichchanallur pottery was carried out by Dr.Raj Kishore Gartia of Manipur University.

The un-calibrated dates furnished are as follows. All dates furnished below are from the Middle phase.

Sl.No	Sample No	Trench No	Urn No	Age(Ka)(BP)
1	1	2ZB16	U-52	3000 \pm 700
2	4	2ZC16	U-21	2700 \pm 600
3	8	2ZB17	U-104	3160 \pm 600
4	13	2ZC15	U-10	3400 \pm 700
5	16	2ZB17	U-93	2600 \pm 500
6	Thin pottery	2ZB17/2		2500 \pm 530
7	Thin Pottery	2ZC16Q2-Layer		1920 \pm 350

The TL dates from Manipur University has a large variation from ± 350 to ± 700 and hence has to be viewed with abundant caution. In overall assessment, therefore the Iron Age urn burials at Adichchanallur may be placed broadly between 850-650BCE.

CHAPTER VII

OBSERVATION

Adichchanallur as on date is the largest well preserved urn burial site in Tamilnadu. The primary aim of the excavation was to find out the distribution of urn burials, to fix the chronological sequence of these materials, to study the intra-site distribution, settlement pattern and material culture of the people who inhabited this area during Iron Age period. It was also aimed to study the cultural sequence of the site and to relate the urn burial with the habitation site. Technological analysis of the samples collected were also to be analysed for arriving at a chronometric date.

Before summing up the results of the excavation at Adichchanallur in the light of the above, it is important to give an outline of life of Iron Age people in Adichchanallur through material evidences.

The study can be undertaken on the three major aspects of the material evidence unearthed

1. Pottery
2. Antiquity
3. Skeleton remains

The pottery at this site was both handmade and wheel made based on the purpose for which it was used. The big urns and red ware lids were handmade and Black-and- Red ware lids, small and miniature vases were wheel turned on the slow wheel. The grave goods of various types in Black- and-Red ware, black ware indicate that they were fully conversant with wheel making technology.

The evidence of full skeleton remains throws light on the burial system which prevailed in this region. Both Primary burial and Secondary burial were noticed. The Primary burials were noticed in red ware except only in a stray case in Black-and- Red ware urn. Secondary burials were confined to black and red and red ware. The body of the dead was placed in a crouched position along with grave goods and grave pots both inside and outside the urn has now been established.

The other objects unearthed during this excavation were mostly confined to iron objects and a few copper objects. Couex beads also formed a large component in the habitation site. The largest urn burial site revealed the following important aspects during this excavation

The place chosen for the burials was compact red murrum and fractured quartz veins unlike that of Rea.

1. Intra site variations were noticed in the type and shape of the urn and also in the contents of the urn. Urns with full skeletal remains, with fragmentary remains and burials with no bones were noticed. This was also reported by Rea earlier.
2. The pit was also dug in hard murrum or was cut into the bedrock. The space was just sufficient to place the urn. In a few cases as in urn nos. 58 and 140, the pit was dug deep and the urn was placed at the bottom and the top half was filled with murrum. The well type of pits reported by Rea was not found.
3. The distance between the urns measured from less than a metre to several metres. A total number of 178 burials were exposed in an area of 600 sqm. Superimposition of two burials was noticed in the same pit. Generally the earlier urn was not disturbed.

4. Black-and- Red ware urns were used for burial purposes. This appears to be the first time as it has not been reported till now. Rea has mentioned that Black-and-Red ware urn which resembles the red ware one in all respects except that it is made of finer material and shows traces of black colour polish at the rim. (Rea:1915). Rea(1901) had reported Black-and-Red ware urns from Kayal. It has also been reported that a Black-and-Red ware lid was used to cover a red ware urn in Mangadu, Kerala. While red ware lids closed the red ware urns in the Early phase, Black-and- Red ware urns were closed with both red and black and red ware lids.
5. Double burials like, male and female, mother and child were reported in the urn burial context.
6. Copper objects were noticed in few numbers whereas the Iron objects are in large quantity. The iron objects included both agricultural implements and weapons. Rea.(1903,1904,1915) also reported the same. The composition analysis of the elements in the metal objects is given in the Annexure.
7. The present excavation has not yielded some of the objects like gold diadems and other rich bronze and copper objects Rea (1903, 1904, 1915).
8. Charred bones and ashes were noticed inside the urns indicating the secondary burial. However, it was totally mixed with murram.

9. White dotted paintings were noticed on the Black-and-Red ware bowls, beakers, globular vases and black polished ware cannoid lids. The designs were mostly oblique in nature and were noticed around rim portion or in shoulder portion. Such white dotted paintings were reported from T.Kallupatti in Madurai district.

The white paintings in Hallur differ slightly from these paintings as here only dotted design was executed whereas in other sites the white lines were painted.

10. The anthropological study of Adichchanallur skeletons revealed some interesting aspects of Adichchanallur people - they were of medium height, and of strong build. In some bones calcium deficiency was noticed. The holes noticed in the head of skull of Adichchanallur people were identified with sinus diseases which occurs due to regular pearl fishing.
11. The excavation of habitation site revealed floor level, potter's kiln and bead industry which indicate a settled life. The archaeological study of the study material that rice and green gram was cultivated.
12. The earliest date for Urn burials has been reported at this site – 850 -650 BCE providing a datum line for Iron Age Urn culture in Tamil Nadu in particular and South India in general. The relationship of the burial and habitation site could not be clearly established because of insufficient data.

The prevalence of red ware urns for burials in the Early Phase and the dominance of Black-and- Red ware urns in the Middle Phase need to be further studied. The degeneration of the urns in the form of size and workmanship especially in the last phase also needs close scrutiny.

The excavation at Adichchanallur undertaken twice within a hundred years highlights that. Further studies and field work needs to be intensified to establish the links if any this site had with neighbouring areas.

APPENDIX I- CATALOGUE OF URNS

URN No. 1- Secondary burial

The pyriform urn of medium size was noticed at a depth of 0.65m from the surface in trench no 2ZC15. (Fig 3) It is a red ware urn with flaring rim having beaded edge and discoid base. The rim of the urn was made separately and attached with the body of the handmade urn. A half broken conical lid of poorly fired red ware covered this urn. The urn was filled with soil and small stones due to breakage of the lid.

Two Black-and- Red ware deep bowls (one having oblique white dot painting), Black-and- Red ware vase and one red ware vase were placed inside the urn. A broken high neck globular vase was noticed on the northern side of the urn at the neck level. A ring stand of black polished ware, one red ware vase and few potshards were also noticed outside the urn.



Urn no 1 and grave goods

Height of urn – 0.70m
Diameter of urn – 0.56m
Depth of pit – 1.15m
Width of pit – 1.15m

URN No. 2- Secondary burial

A red ware totally damaged urn having a secondary burial. No grave goods were found.



General view of Urn no
2

URN No. 3 - Primary burial

The burial urn was disturbed and broken. It was a coarse handmade red ware urn, pyriform in shape and was found at a depth of 0.77m from the surface in trench 2ZC16. It had a beaded rim and broken shards of the red ware lid were noticed on the sides of the urn. The maximum

available height of the urn during excavation was 0.80m. Stone packing was provided around the urn and also between the urn and the bed rock.

A primary burial, it contained almost all the human skeletal remains. The bones were noticed in fragile and broken condition. Skull was observed near the northern wall of the jar at the bottom.

No pottery was found inside the urn. On the south- eastern corner of the urn, a vase was noticed.



Grave pottery of Urn no 3

URN No. 4 -Secondary burial

The red ware broken urn was wheel made and of medium fabric and was found at a depth of 0.62m in trench no 2ZC15. It was globular in shape with thick rim. No lid was noticed.

The skeletal remains were very fragile and very fragmentary.

Grave goods were noticed beneath the skeletal remains inside the urn. A miniature vase was placed inside a bowl. On the northern side of the urn and outside, a vase was noticed. Further towards the east were noticed two Black-and- Red ware beakers in broken condition and two polished black ware ring stands.

Grave goods of urn no 4



URN No. 5 - Secondary burial

It was a Black-and- Red ware urn broken up to the shoulder. It was a wheel made and of medium fabric and in fragile condition. The whole urn was filled with soil. This urn was surrounded by two other small urns (Urn nos. 6 and 7).

While no grave goods or skeletal remains were noticed inside the urn, some grave goods in fragile and broken condition were collected from outside the urn.



Urn no 5 in situ

URN No. 6 - Secondary burial

A Black-and- Red ware urn of medium size with conical base was found close to urn 5. The upper portion of the urn was broken and filled with soil. It was wheel made and of medium fabric. The pit was cut into the murram soil.

Grave goods of urn no 6



The urn was devoid of any skeleton remains.

The grave goods found inside were three Black-and- Red ware bowls including one painted bowl, two small vases (broken) and a white painted (dotted design) black polished ware lid.

URN No. 7 - Secondary burial

The globular Black-and- Red ware urn was broken up to neck portion, and had a conical base. It was wheel made of medium fabric. The urn was filled with soil and stones. The lid was missing.

No skeletal remains were noticed. Grave goods inside the urn were two Black-and- Red ware vases and two bowls also of the same ware.



Urn no 7 – in situ

URN No. 8 - Secondary Burial

A medium sized hand - made coarse red ware urn was noticed at a depth of 0.98m in trench no 2ZC15. It has a slightly in-turned beaded rim and truncated round base. The rim was separately made and amalgamated with the body of the urn. The urn was filled with loose soil mixed with silt and small stones.

Inside the urn few skeleton remains were noticed and the skull was missing. Some grave goods were noticed kept around the urn which included two Black-and- Red ware bowls, one of which is partially broken, one black polished ware lid with profiled knob and a ring stand.



Urn no. 8
Height of urn – 0.72m
Diameter of urn–0.46m

Urn No. 9 -Secondary burial

A Black-and- Red ware urn completely filled with soil and broken up to belly level was found in trench 2ZB15.



Broken urn no 9




URN No. 10 - Secondary Burial




This smaller size urn was of red ware, handmade and of coarse fabric. A red ware broken lid with flat base covered the urn. It contained very fragile and wet bones including skull and limb bones. Inside the urn the grave goods were in broken condition. A red ware globular vase, miniature Black-and-Red ware vase (neck and rim portion broken) and a shallow dish were noticed outside the urn on the northern side.

Height of urn – 0.65m
Diameter of urn –0.54m
(bottom ken)
Depth of pit – 1.4m
Width of pit – 1m

Grave goods of urn no 10



<p>URN No.11 - Secondary burial</p>	<p>General view of urn no 11</p>
<p>It was a red ware globular shaped urn with out-turned beaded rim. It was of coarse fabric and handmade. A broken lid covered the urn. The pit was cut in to the murram soil and a small slab had been provided below the urn for support. The urn was placed at the depth of 0.59m in trench no 2ZC15. Urn was in disturbed condition and filled with loose soil and silt.</p> <p>Few bones were noticed inside the urn.</p> <p>Two broken Black-and- Red ware deep bowls were noticed inside the urn. The broken grave goods noticed on the south side of the urn included three deep Black-and- Red ware bowls (one with white dotted painting in oblique design), one broken black polished ware lid and one small lid which was intact.</p>	 <p>Height of urn – 0.74m Diameter of urn – 0.46m Depth of pit – 1.50m Width of pit – 1.20m</p> <p>Grave goods of Urn no 11</p> 
<p>URN No. 12 - Secondary burial</p> <p>It was a big coarse red ware hand-made urn with flaring beaded rim with a vertical crack subsequently mended. (Fig. 2). It had a truncated base. It was covered with double lid. This urn was noticed few metres south of urn 11 in trench no2ZC15.</p> <p>Few limb bones were noticed inside the urn.</p>	<p>General view of urn no 12</p> 

<p>Few broken grave goods were collected from outside the urn. One broken Black-and- Red ware bowl was noticed inside the urn.</p>	<p>Height of urn – 1.04m Diameter of urn – 0.76m Depth of pit – 1.30m Width of pit – 1.00m</p> 
	<p>Inner view of urn no 12</p>
<p>URN No. 13 - Secondary Burial</p> <p>This thin red ware small sized urn was noticed just few m south of the urn no 12 at the shoulder level. It was handmade and of coarse variety. It was found at a depth of 0.15m from the surface in trench no2ZC15.</p> <p>The urn contained six teeth.</p> <p>The urn was noticed with the two black-and red ware deep bowls with white dotted paintings, one Black-and- Red ware big bowl inside the urn which was partially broken.</p>	<p>Urn broken Depth of pit – 0.54m Width of pit –0.50m</p> <p>Grave pottery from urn no 13</p> 
<p>URN No. 14 - Secondary burial</p> <p>The medium sized urn of Black-and- Red ware was found in broken condition. (Fig.5)</p> <p>Some grave goods of Black-and- Red ware which included deep bowl, deep bowl with tapering mouth, miniature vases (one broken) and a black ware ring stand were noticed.</p>	 <p>Pottery retrieved from urn no 14</p>

URN No. 15 - Secondary burial

In a deep pit measuring 1.90m urn no 15 was noticed along with urn no 155 in trench no. 2ZC16 (Fig. 1). A deep pit was cut into murram soil in which urn no 155 was placed at the depth of 1.20m. The lid of urn no 155 might have broken while placing urn no. 15. Urn no 15 was big globular shaped red ware urn with beaded rim. The rim was naturally attached with the body of the urn. The base of the urn is flat. The urn was partially broken and mended. It is handmade, and of coarse variety. Burial had a cairn packing of medium and small sized stones.

Inside the urn grave goods like red ware high neck vase, Black-and- Red ware miniature vase, Black-and- Red ware deep bowl, two Black-and- Red ware bowls and a black polished ware lid were noticed.

Urn no 15 and associated pottery



Height of urn – 1m
Diameter of urn – 0.49m
Depth of pit – 1.90m
Width of pit – 1.30m

URN No. 16 - Secondary burial

It is a unique type of urn resembling the vase model or Jorwe type pot. It was a hand-made red ware urn of coarse variety, well fired one with globular body, high long neck and outturned flaring rim. It has conical shaped body portion and truncated base. Two dots and three thick lines of appliqué of incised design run from the bottom of the dots in clock wise direction with slight turn. This urn was noticed at the depth of 1.18m from the top surface in trench 2ZC16. The urn was kept in position by stone packing inside the pit. The urn was slightly jammed and broken and it was mended.

Height of urn – 0.56m
Diameter of urn – 0.40m
Depth of pit – 0.70m
Width of pit – 1.05m

Only ten teeth were found inside the urn which clearly indicates that it was a secondary burial.

It contained a well levigated Black-and- Red ware bowl. The grave goods included, vase of red slipped ware and red ware, Black-and-Red ware miniature pots and bowls of medium fabric and wellfired.

One double edged iron chisel and iron celt (both in broken condition) were found.



Urn no 16 and associated pottery

URN No. 18 - Secondary burial

A medium sized pyriform shaped red ware urn with clubbed beaded rim and flat base was noticed at a depth of 0.90m in trench no 2ZC16. Appliqué decoration encircled a circular dot (dot missed) and a crescent shape design was noticed on the body portion in two rows like garland (semicircular fashion). The dot and crescent shape may indicate the sun and the moon.

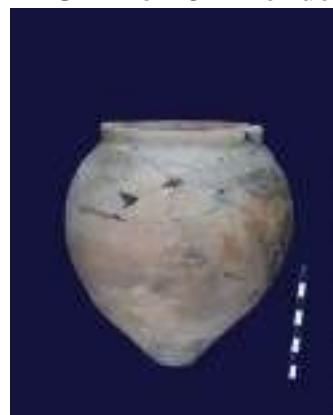
Fragmentary bones were found in the urn.

A double sided chisel and dagger (placed vertically) was noticed at a depth of 1.68m outside the urn.

Urn no 21 was noticed to the north of this urn.

Height of urn – 0.80m
Diameter of urn – 0.54m
Depth of pit – 0.80m
Width of pit – 0.75m

Urn no 18 - mended




URN No. 19 - Secondary burial



A medium sized handmade coarse variety red ware urn with slight globular body and flaring out-turned rim and flat base was noticed at the depth of 1.10m in trench no 2ZC16. (Fig 5). Two dots like protuberances and three pinching design lines starting in-between these dots and running few cms in clock wise direction was noticed. The design was similar to that found on urn no 41.




<p>The urn contained few fragile bones. A red ware conical vase was noticed as grave goods.</p> <p>A lance, celt and double sided chisel of iron were noticed in this urn.</p>	<p>General view of urn no 19</p> <p>Height of urn – 0.87m</p> <p>Diameter of urn –0.56m</p> <p>depth of pit – 0.80m</p> <p>width of pit–0.95m</p>
<p>URN No. 20 - Secondary burial</p> <p>At the depth of 0.7588m a red ware urn in damaged condition was noticed in trench no 2ZC16. It was a big globular urn with beaded rim and truncated base. The cracks in the body of the urn were mended. The urn was placed after cutting into the bedrock. Urn no 22 was noticed few meters west of this urn.</p> <p>Grave goods placed outside the urn included bowl of black and red ware, ring stand of black polished ware and vase of redware.</p>	<div data-bbox="1068 426 1390 905" data-label="Image"> </div> <p>Urn no 20 and grave goods</p> <p>Height of urn – 0.85m</p> <p>Diameter of urn –0.54m</p> <p>Depth of pit – 0.75m</p> <p>Width of pit – 0.95m</p>
<p>URN No. 21- Secondary burial</p> <p>An ill fired pyriform urn of Black-and- Red ware with upright rim was noticed at a depth of 1.05m in trench no 2ZC16. The pit was filled with murram soil. The body of the urn was cracked and the oval shaped lid kept above the urn was broken. Urn no 42 was noticed 2.15m south of this urn. Few fragmentary bones were collected from the urn.</p>	<div data-bbox="966 1308 1417 1589" data-label="Image"> </div> <p>Grave goods of urn no. 21</p>

<p>To the south of the urn a vase of red ware was noticed at the belly level. Grave goods found inside the urn were two bowls, a shallow dish (partially broken), a miniature pot – all of Black-and- Red ware and a miniature ring stand of polished black ware. All of them were placed in inverted position.</p>	<div data-bbox="1036 212 1365 682" data-label="Image"> </div> <p>General view of urn no 21</p> <p>Height of urn – 0.80m Diameter of urn – 0.50m Depth of pit – 1m Width of pit – 0.90m</p>
<p>URN No. 22 - Secondary burial</p> <p>A red ware urn of medium size, globular shaped, of medium fabric with rim missing (broken) was noticed at the depth of 1.05 m. in disturbed condition from trench no 22C16. The urn was supported with stone packing and a stone cushion was also provided at the bottom. Few fragmentary bones were found inside the urn. The urn contained few broken potshards.</p>	
<p>URN No. 23 - Secondary burial</p> <p>This urn was noticed in the disturbed condition and only the base was noticed. It was a red ware urn. No grave goods were found.</p>	

<p>URN No. 24 - Secondary burial</p> <p>It was a Black-and- Red ware urn in broken condition. Only conical base was noticed. Grave pots were found neither outside nor inside the urn.</p>	
<p>Two broken iron pieces (probably knives) were noticed beneath the urn in fragile condition which crumbled totally.</p>	
<p>URN No. 25 - Secondary burial</p> <p>A handmade red ware urn was noticed at the depth of 0.53m from the surface in trench no 2ZC16. It was globular in shape, with flaring out turned beaded rim with flat ring base. The urn was disturbed and the body of the urn on one side was missing. Dot like protuberances with three finger impression or appliqué pinching design running from these dots for few m in curving manner in the clockwise direction was noticed. The design was executed on the north eastern side of the urn only It is similar to the appliqué design in urn nos. 16, 19 and 39A. The urn was filled with loose soil, silt and small stones.</p> <p>Few potshards including a ring stand and lid of black polished ware and a vase of Black-and- Red ware was noticed.</p>	 <p>Grave goods of urn no 25</p> <p>Height of urn – 0.80m Diameter of urn – neck broken Depth of pit –0.85m Width of pit –0.95m</p>
<p>URN No. 26 - Secondary burial</p> <p>To the north of urn no 25 at the distance of 0.35m in the same trench a base of Black-and- Red ware urn was noticed having a conical base.</p>	
<p>URN No. 27 - Secondary burial</p> <p>It was a Black-and- Red ware urn with egg shaped base and was totally damaged.</p>	

<p>URN No. 28 - Secondary burial</p> <p>A base of Black-and- Red ware urn was noticed.</p>	
<p>URN No. 29 - Primary burial</p> <p>It was a red ware urn, handmade globular jar tapering down. The bottom is flat (Fig 4). It has thick beaded rim which was made independently and attached to the urn. Finger pinching or incised design was noticed around the neck.</p> <p>Full skeleton remains have been noticed inside the urn and it was primary burial.</p> <p>The grave goods included two deep bowls of Black-and- Red ware with white dotted paintings, vase of red slipped (?) ware, lid of all black ware, and ring stand and deep basin of black and red ware.</p>	 <p>Urn no 29 and associated grave goods</p> <p>Height of urn – 0.90m Diameter of urn – 0.74m Depth of pit – 1.30m Width of pit – 1.05m</p>
<p>URN No. 30 - Secondary burial</p> <p>The hand-made red ware urn closed with a lid was noticed at the depth of 1.18m in trench no 2ZC16. This urn was located just 0.20m east of urn 29. It was partially disturbed and lid was broken in to pieces. The urn was filled with soil and stones. Two appliqué designs were noticed on the body of the urn facing east. Urn 31 was located just 0.30m east of urn no 30.</p> <p>The lower mandible with intact teeth was found inside the urn.</p>	 <p>Grave pot of urn no 30</p> <p>Height of urn – 0.88m (now broken) Diameter of urn- 0.74m (now broken)</p>

<p>A beaker was noticed inside the urn.</p> <p>Iron implements included broken chisel, celt, knife and spearhead. Husk samples were collected from the black- and -red ware beaker.</p>	<p>Depth of pit – 1.50m Width of pit – 1m</p>
<p>URN No. 31 - Secondary burial</p> <p>In the same trench of urn no 30, small Black-and- Red ware urn covered with Black-and- Red ware lid was noticed. It was globular in shape with wide mouth neckless light beaded rim. 7 concentric grooved lines were noticed around the shoulder.</p>	 <p>Urn no 31</p>
<p>A small shallow dish cum bowl of Black-and- Red ware was noticed outside the urn at the body level.</p>	<p>Height of urn – 0.32m Diameter of urn – 0.10m Depth of pit – 0.50m Width of pit – 1m</p>

URN No. 32 - Secondary burial

A red ware urn having globular body was noticed at a depth of 0.49m in disturbed condition in trench no 2ZC16. It was filled with soil and mixed with silt, stones and potshards.

Bones in fragile condition was noticed inside the urn.

A broken rim was noticed inside the urn which had incised decoration on the neck portion. A deep bowl of Black-and- Red ware with white painting was noticed inside the urn. Fragile iron implement was noticed.



Grave goods of urn no 32

Height of urn – 0.80m

(now broken)

Diameter of urn – 0.75m

(now broken)

Depth of pit – 0.95m

Width of pit - 1.55m

URN No. 33 - Secondary burial

Pyriform shaped red ware urn closed with red ware lid was noticed in trench no 2ZC16. The pit was cut into the bedrock. The lid had a wide mouth and was tapering towards the top which was flat and ring like (appeared like a half cut big red ware urn). The lid was of bigger size and not properly fitting the urn. Further the rim fragments of the lid fallen into the urn lead one to believe that the urn originally had another lid. At a later date the earlier lid was replaced for some unknown reasons by another lid.

A few fragments of bones were noticed inside the urn. A shallow dish of Black-and- Red ware was noticed on the left side of the lid which was broken into pieces. A unique type of vase of Black-and- Red ware with broken rim and white dotted oblique paintings around shoulder portion was noticed. Black slip applied over the vase was shimmering. A deep bowl of black and red ware with white dotted paintings in an oblique design was also noticed along with this urn.



Grave goods of urn no 33

<p>URN No. 34 -Secondary burial</p> <p>Towards north of urn no 33, a disturbed and damaged</p>	
<p>Black-and- Red ware urn with only bottom portion intact was found. It was Black-and-Red ware urn of small size. No grave goods were found.</p>	
<p>URN No. 35 - Primary Burial</p> <p>At a depth of 1.15m a handmade red ware urn of coarse fabric having globular body, straight sided neck and slightly out turned flaring rim was noticed inside the pit cutting into the bed rock in trench no 2ZC16. The pit was filled with murrum. It had a conical shaped truncated base. (Fig 1). The lid was broken and missing and could probably be of red ware, as few shards were noticed. It was super imposed by another urn of late phase (urn no33).</p> <p>The urn contained skeletal remains like vertebrae exposed at the southern end of the urn. On the east above the neck of the jar was a long bone. Towards the south was seen the skull and beyond it the 2 limbs. The legs have been placed in extended position.</p> <p>In the centre was a globular jar of red ware and it was filled with small quantity of disintegrated paddy. The grave goods were obviously placed after the body was interned. Above this were a ring stand and a small beaker with featureless rim of Black-and- Red ware which was closed with a lid. At about half way from the rim of urn, four grave pots were seen adhering to the wall of the urn. They were a lid (canoed) on north west, a bowl of Black-and- Red ware on the north, a ring stand of black ware on the east and a lid (canoed) on the south.</p>	<div data-bbox="964 499 1399 1020" data-label="Image"> </div> <p>Urn no. 35 and associated grave goods</p> <p>Height of urn – 1.10m Diameter of urn 0.75m Depth of pit - 1.70m Width of pit – 2.15m</p>

The grave goods kept outside at the belly portion of the urn was a shallow bowl with wide mouth placed on the south eastern side and another bowl kept in a bowl of black and red ware.

Iron dagger was noticed at a depth of 0.83m.




URN No. 36 - Secondary burial

Urn of red ware urn with globular body and out turned beaded rim and truncated base was noticed at the depth of 1.46m in trench no 2ZC16. (Fig 1). The urn was closed by a lid of red ware of unique type with flat bottom, out turned beaded rim. The top was broken. The pit was a large one and it was packed with stones/murram. At the bottom of the pit, the earth was rocky and the urn has been accommodated very skillfully.

Few pieces of long bone was kept adhering to the eastern wall and western wall of the urn inside the urn. The grave goods inside the urn were carinated bowl (black and red ware) bowl of black and red ware, three bowls of white dot painted black and red ware, two vases of red ware, and one vase of black- and- red ware, two black ware ring stand and shallow bowl of Black-and-Red ware containing the skull fragments. A ring stand of black ware was also noticed at the bottom of urn. A small beaker or lota like small vessel and a vase of red ware was noticed on the western side near the rim of the urn. A ring stand of black ware on the south at the base and deep bowl or basin was noticed on the south western side. Adhering to the rim at the top were 3 bowls of black and red ware. Two jars were noticed outside at the level of rim of the lid. Apart from this the other grave goods found



Urn no 36 in situ
Height of the urn – 0.96m
Diameter of the urn – 0.60m
Depth of pit –1.35m
Width of pit –1.15m

<p>outside the urn were beaker, shallow bowls of Black-and- Red ware and lid of black ware. Paddy husk was noticed in this urn.</p> <p>Iron spear head was collected from the eastern side of the urn.</p>	
<p>URN No. 37 - Secondary burial</p> <p>A broken pyriform shaped red ware urn with flat base was placed by cutting into the murram soil. Noticed at a depth of 1.25m in trench 2ZC16, it had a partially broken out turned beaded rim. The urn was in disturbed condition. Few fragmentary bones were collected from this urn. Few grave goods were noticed inside the urn of which</p>	 <p>Grave goods of Urn No37</p> <p>Height of urn – 0.82m (broken) Diameter of urn –0.60m (broken)</p>
<p>only two deep bowls with white dotted paintings was intact.</p>	<p>Depth of pit –0.95m Width of pit –1.45m</p>
<p>Urn No. 38 - Secondary burial</p> <p>At a depth of 1.10 m a base of Black-and-Red ware urn was noticed in trench no2ZC16. The urn contained broken grave goods. A broken iron chisel (knife?) was noticed inside the urn.</p>	 <p>Mended Urn No.38</p>
<p>URN No. 39 - Secondary burial</p> <p>A red ware urn was noticed at the depth of 1.00m in trench no 2ZC16 having a globular body, truncated base and with out-turned rolled rim and short neck. (Fig 3). The lid was broken. The urn was intact, handmade and coarse variety.</p> <p>Few grave pots were removed from the eastern side of the urn in fragile condition.</p>	<p>General view of Urn no 39</p>  <p>Height of urn – 1.15m Diameter of urn -0.57m</p>

URN No. 39A - Secondary burial

A medium sized red ware urn was noticed near to urn no 39 at the depth of 0.66m in trench no 2ZC16 almost in broken condition. The urn was mended. It was having out turned flaring beaded rim, which was subsequently attached with the body of the handmade urn. Finger incised impressions was noticed on the entire neck portion. Interestingly a neck portion was unearthed from inside the urn which carried appliqué decoration on it. The decoration noticed was, a series of finger incisions made in a semi circular fashion (only a part of the decoration was retrieved). In the centre an appliqué decoration was made in crescent fashion. A similar decoration was noticed in the urn no 18.

Some bones were noticed inside the urn.

A small lid of black ware with white dotted paintings was also noticed inside the urn. 8 lines of white dotted design in regular interval from the neck to base of the lid were noticed.

Height of urn – 0.58m
Diameter of urn – 0.30m
Depth of pit – 0.60m
Width of pit – 0.50m



General view of Urn no 39A

Urn No 40 The urn was totally damaged.



URN No. 41- Secondary Burial

A well fired red ware globular urn with out-turned flaring beaded rim, handmade of coarse variety having a truncated base (bottom has mat impression) was found in trench 2ZC16 at a depth of 1.20m from the surface. Appliqué design was seen on the body surface of the urn indicating two dots and 3 lines between these dots running for a few cms in clock wise direction as in urn 19. (Fig 5) On the southern side of the urn stone packing was given. The soil was mixed with few potshards and stones were noticed inside the urn.

Height of urn – 0.85m
Diameter of urn – 0.54m
Depth of pit – 1m
Width of pit – 0.95m



General view of urn no 41

<p>The grave goods included a bowl of black and red ware with white dotted paintings (rim portion broken), ring stand of black polished ware (partially broken) and vase of black-and red ware with concentric grooves around the neck (broken and mended).</p>	
<p>URN No. 42 - Secondary Burial</p> <p>A pyriform Black-and- Red ware urn was placed inside loose murram soil. The base was broken. Rim was noticed broken up to shoulders and three concentric grooves were noticed on the shoulder portion of the urn.</p> <p>A broken vase was noticed on the northern side of the urn. The urn contained one ring stand of black ware and small size vase of black and red ware. The grave goods found outside the urn included a partially broken lid of black polished ware and a vase of red ware (rim portion damaged).</p>	 <p>Urn no.42 in situ</p> <p>Height of urn – 0.40m Diameter of urn – 0.30m Depth of pit – 0.60m Width of pit – 0.60m</p>
<p>URN No. 42B - Secondary burial</p> <p>A Black-and- Red ware urn was noticed nearby urn no42. It was completely damaged. Traces of skeletal bones and two small teeth were found inside the urn. At the bottom of the urn were found bowls and dish of black and red ware. Outside the urn to the south and near the bottom were found black ware lid, bowl of black and red ware, and small globular vessels in broken condition.</p>	 <p>View of fragmentary bones and iron chisel found in situ in Urn no.42B</p>

A fine iron chisel has been found. It was not much corroded. It measured a length of 10.5 m.

URN No. 43 - Primary burial

An urn of red ware broken up to the base was noticed at a depth of 0.34m in trench no 2ZC17. Cairn packing in the pit firmly held the urn in place. It was noticed in the western, south eastern and south western portions of the pit. The burial was disturbed and filled with stones, soil and pottery shards. One more black and red ware urn in broken condition was recorded nearby this urn probably urn 43B.

The partially broken skull had fallen at the bottom of the urn in a south east – north west orientation. Most of the other bones like mandible, limb and shoulder bones were also noticed. Ash mixed earth inside the urn was traced in the middle level.

A grave pot of Black-and- Red ware was noticed inside the urn. The associated grave goods included two bowls (one with white dot painted oblique design) and a vase (with white painting) of black and red ware, vase of red ware and lid of black polished ware with white painting.

Urn nos. 43A and 43B were found adjacent to urn 43 and were completely damaged.



Grave goods of urn 43

URN No. 44 - Secondary burial

A black-and red ware urn with packing of small sized cairns along with murrum was noticed in the same trench. The urn was filled with soil and small rubble stone. Bones in fragile condition was noticed.

A red ware vase was noticed inside the urn. Grave goods outside the urn included globular beaker, globular bowl and small beaker all of Black-and- Red ware and white dotted paintings and black and red ware bowl with beaded rim.



Grave goods of Urn no.44

Urn No. 45 - Secondary burial

This black- and- red ware urn was cut into the burial urn no 46 in trench no 2ZC17. Below the urn stone cushion was noticed. The urn of pyriform shape had a conical base and broken rim.



Bones found inside were in totally disintegrated condition and almost powdered. The grave goods found inside the urn included a big deep bowl with white dotted paintings, five medium sized bowls, globular beaker with white dotted paintings, small beaker with white dotted painting all of black and red ware. The grave goods placed outside the urn included a vase of Black-and- Red ware with white dotted paintings around shoulder, big all black ring stand and three lids (one broken) with white dotted painting around the body.

A badly damaged iron chisel was noticed inside the urn.



Inner view of urn no.45

Urn broken
Depth of pit – 0.90s Width
of pit – 1.65m

<p>URN No. 46 - Secondary burial</p> <p>It was big ware red ware urn disturbed by placing urn no 45 in later period. The bottom portion of the urn was only available. Grave goods inside the urn were a Black-and- Red ware vase, and bowls. All were broken.</p>	 <p>Urn no.46 in situ</p> <p>Urn – broken Depth of pit – 0.90m Width of pit – 1.65m</p>
<p>URN No. 47 - Secondary burial</p> <p>At a depth of 1.25m in trench no 2ZC17, a Black-and- Red ware urn covered with lid was noticed. It was pyriform in shape.</p> <p>Grave goods were noticed outside the urn on the north western side which included two vases of red ware and a shallow dish of black and red ware near the belly portion, one vase of red ware near the top of the</p>	<p>Grave goods of Urn no. 47</p> <p>Height of urn – 0.70m Diameter of urn – 0.46m Depth of pit – 1.10m</p>
<p>lid and a ring stand of black ware.</p>	<p>Width of pit – 0.90m</p>
<p>URN No. 48 - Secondary burial</p> <p>The damaged pyriform shaped urn of Black-and- Red ware was noticed placed on the bedrock in trench no 2ZC16. It had a conical base.</p> <p>The grave goods noticed inside the urn were all of Black-and- Red ware - miniature vase and beaker (slightly broken), shallow dish cum bowl, two bowls with white dotted oblique design around rim. A broken vase of black and red ware was noticed outside the urn near the belly portion.</p>	 <p>Urn no.48 in situ</p> <p>Height of urn – 0.51m Diameter of urn – Neck broken</p>

URN No. 49 - Secondary burial

The urn of red ware with a broken lid was placed at a depth of 1.50m from the surface in trench no 2ZC17.

The grave goods noticed inside the urn were bowls, miniature vase and cannoid lid, all of Black-and- Red ware and lid of black ware. Grave goods were also arranged outside the urn at rim level and they were two high neck vases of red ware, shallow basin or dish and 2 bowls of black and red ware.



Urn no.49 in situ

URN No. 50 - Secondary burial

It was a red ware urn, globular in shape, with finger impression design around the neck portion. It was noticed at a depth of 0.99m in trench no 2ZC17 and was packed with stones at top level. The urn was probably deliberately filled with loose grey colour soil and mixed with few potshards and rubble stone. This is very rare. Mostly the urns were filled with soil and stones because they were damaged. At depth of 0.47ms some small stones were closely packed in the urn.

Bones and teeth of an animal (unidentifiable) were found inside the urn with few long human bones. A neck portion of a globular red ware pot was found inside the urn. A vase closed by a bowl both of Black-and- Red ware was noticed outside the urn. At a depth of 0.72m from the rim of the urn a small



Inner view of Urn no.50

Height of urn – 0.94m
Diameter of urn – 0.50m
Depth of pit – 1.2m
Width of pit – 1.15m

<p>iron knife (broken in 2 parts) measuring 4m and an iron chisel were found inside the urn.</p>	
<p>URN No. 51- Secondary burial</p> <p>It was a Black-and- Red ware urn with conical base and thick rounded rim and was placed over murrum. A stitch like mark is found from neck of the urn and extending inside. This urn was noticed at the depth of 1.05m in trench no2ZC17.</p> <p>The grave goods found inside urn were two bowls of Black-and- Red ware (one having white dotted oblique design), and a ring stand of black ware.</p>	<div data-bbox="1029 359 1360 785" data-label="Image"> </div> <p>Urn no.51 and its grave goods</p> <p>Height of urn – 0.65m Diameter of urn – 0.42m Depth of pit – 0.70m Width of pit – 0.60m</p>
<p>URN No. 52 - Secondary burial</p> <p>This urn was noticed few meters east of urn no 53. It was a red ware urn of medium size, disturbed and damaged. Only base portion was noticed at the depth of 0.45m in trench no2ZB15.</p>	
<p>URN No. 53 - Secondary burial</p> <p>It was a red war urn noticed only up to base and adjacent to urn no 52 in trench no2ZB15.</p>	<div data-bbox="997 1419 1344 1917" data-label="Image"> </div>

<p>URN No.54 - Primary burial</p> <p>A red ware urn with thick flaring broken rim, globular body and truncated base was found at the depth of 1.10m in trench no 2ZB15 and was closed with a lid of red ware. It was ill fired, coarse variety handmade urn having pinching or groove design around the neck portion. Two hooks 0.32m apart were seen in the inner surface of the urn. Lid was observed with flat top and flaring sides. Lid was in damaged condition and it was mended. A graffiti mark drawn (like a pot and hoisted flag) has been noticed on the lid near the rim on the exterior surface. Leaf impression was noticed inside the lid. The pit was cut through bed rock and filled</p>	<p>Urn no 54 with lid</p>
<p>with murrum.</p> <p>It can be presumed that this urn burial could have been a joint burial as there were two skulls one in the south western and another in north eastern sides of the urn. The skull on the south west was that of an adult human and that on the north east was of a younger person.</p> <p>The urn was filled with earth. On removing the soil a broken lid of red ware lid with appliqué design was noticed. The decoration depicts the figure of a female and to right of this there is a paddy or some other plant, on which a crane is shown seated and to the left of the female figure, a deer is depicted with upright tail and an alligator or a reptile is seen below the deer.</p> <p>As the present lid was intact and the urn was completely sealed, the occurrence of this lid well below in the urn is unique and it is possibly that the original lid may have been replaced later by their family member or community or it is also possible that this rare piece of art which they owned must have been kept along with the dead. Husk</p>	<p>Height of urn – 1.10m Diameter of urn – 0.64m Depth of pit – 1.60m Width of pit – 1.30m</p>

sample was collected from southern and northern end of the urn.

The grave goods inside consisted of a miniature vase and seven bowls of Black-and- Red ware (one broken), two ring stands of black ware (one broken), five cannoid lids of black ware (one broken).

The grave goods found outside the urn were two bowls, deep bowl and bowl all of black and red ware, high necked vase of red ware and five cannoid lids of black ware. (4 broken).

An iron chisel was noticed inside the urn.

URN No. 55 - Primary burial

It was a red ware urn with thick straight flaring rim, globular body and flat base. It was a handmade coarse variety urn and the base was damaged. (Fig 4) It had thumb impression design around the neck portion. Noticed at a depth of 1.30 m, the pit was cut into the bedrock in trench no 2ZB15. It was noticed few meters south of urn no56.

Bones of the skull and the limbs were collected from inside the urn.

A vase of red ware (broken) and three bowls of Black-and- Red ware with white dotted painting around the rim were found inside the urn.



Urn no 55 with grave pottery

Height of urn – 0.80m
Diameter of urn – 0.52m
Depth of urn – 1.60m
Width of urn – 1.20m

URN No. 56 - Primary burial

It was a handmade red ware pyriform urn, and noticed

west of urn no 52 at a depth of 1.92m in trench no 2ZB15. Lid was found broken. The urn was deliberately filled with big stones, soil and silt.

It was a primary burial but the skeletal remains had crumbled as water had entered the urn and the remains were in damp condition.

Grave goods inside the urn included two Black-and- Red ware bowls and a red ware vase. They were also damaged.



General view of urn no 56

Height of urn – 1.10m
Diameter of urn – 0.86m
Depth of pit – 1.55m Width of pit – 1.20m

URN No. 57 - Secondary burial

This urn was noticed a few meters north of urn no 58. It was completely damaged.

URN No. 58 - Primary Burial

A globular red ware urn with out-turned rim and short neck (with pinched designs around it) was noticed at the depth of 1.45m in trench 2ZB15. It was found in damaged condition and deliberately filled with stones and soil. The red ware lid was also broken.

Skeletal remains and few grave goods were found in damaged condition. The grave goods included a red ware shallow dish (broken in to pieces), three black ware lids (partially broken) and one with white dotted paintings, and Black-and- Red ware deep beaker and vase. Apart from the lids and vase, the others were broken. The goods found around the urn are two small vases one found near neck of the urn on the southern side and another on the western side near the shoulder portion of the urn. The other goods outside the urn were of black and red ware - bowls (8 in number of different sizes - some with white paintings), beaker, shallow dish, ring stand and red ware shallow dish and black ware lids and ring stand. Most of them were found in damaged condition.

Rice husk and very small quantity of charred grains were found from south east corner outside the urn at depth of 2.76 m. Husk samples were collected from outside the urn in good quantity. Two javelins and one sword of iron were found outside the urn in three corners.



Urn – broken Depth of pit – 2m
Width of pit – 1.60m

URN No. 59

A damaged Black-and- Red ware urn filled with murrum was found with a broken Black-and- Red ware lid.



General view of urn no 59

URN No. 60 - Primary burial

A red ware urn with globular body, out turned beaded rim, conical bottom with truncated base was noticed in trench no 2ZB15. (Fig 2) Row of vertical thumb impression was noticed around the neck. The rim and body of the urn was partially broken. Urn was completely disturbed due to quarrying.

The accumulated soil inside the urn was removed and remains of the skeleton including skull were noticed at the bottom of the urn. The bones inside the urn were fragile and it was very hard to remove. The position of the skeletal remains indicated that the body must have been placed in squatting position. The bones were noticed in the west –east direction and the skull was noticed in the south western end.


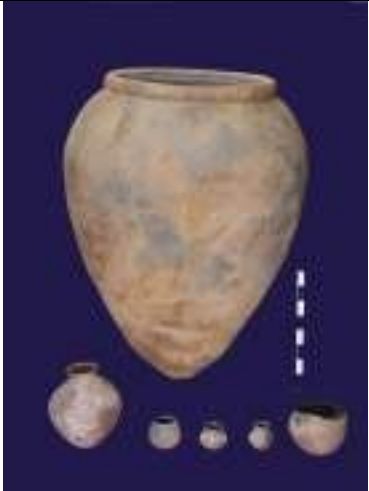
No grave goods were found inside the urn, only potshards were collected. The associated ware found outside the urn were Black-and- Red ware round shape bowls (partially broken), conical bowl (broken up to rim) two red ware vase (one intact with red slip) and three all black ware lid (one partially broken).

Three iron arrow heads and two spear heads were noticed placed vertically on south eastern side of the urn at the depth of 1.98m.



Urn no 60 and associated pottery

Height of urn – 1.02m
Diameter of urn – 0.63m

<p>Husk samples were also collected outside the urn.</p>	
<p>URN No 61: Secondary burial</p> <p>A red ware broken urn pyriform in shape with out- turned beaded rim, conical bottom and truncated base was found at a depth of 1.92m in trench no 2ZB15. Traces of lid were also found.</p> <p>Few fragile bones were noticed on the western side of the urn. The associated grave goods which were noticed outside the urn (in the south eastern portion of the pit) were two black polished ring stands, black ware lid and beaker. Except ring stand the others were fragile and broken.</p>	 <p>Grave pottery associated with urn no 61</p> <p>Height of urn – 0.76m Diameter of urn – 0.42m Depth of pit – 1.10m Width of pit – 1.10m</p>
<p>URN No. 62 -Primary burial</p> <p>It was red ware urn having pyriform shape urn with thick rim. (Fig 1). Incised thumb impression was noticed around the neck. It was a handmade, coarse fabric urn found at a depth of 1.50m in trench no 2ZB15. The lid was broken.</p> <p>The skull was found in the centre while the upper limbs were on either side of the skull. The lower limbs were noticed at the other end.</p> <p>The grave goods were found above the bones so they must have been placed after the body was interned. They included two Black-and- Red ware miniature vases, one high necked red ware vase and one black and red ware bowl with white dotted paintings.</p>	 <p>Height of urn – 1.04m Diameter of urn – 0.59m Depth of pit – 2.20m Width of pit – 1.20m</p>

URN No. 63 – Secondary burial

In a pit cut into the natural rock at a depth of 1.05m in trench 2ZZB15 was found a light red ware large urn with short neck and thick beaded rim. A medium sized pyriform shaped urn, it had a flat base with pinching design around neck portion on the outer surface and wavy or zigzag design made out of knife or a sharp instrument on the body of the urn. One broken hook was noticed inside the urn.

Skeletal remains were noticed inside the urn. Two of the long bones have horizontal cuts on one end. Skull was broken into several pieces and most of the fragments were concentrated at the bottom towards the south eastern side. Vertebral bones and bones of the rib were seen resting on the wall of the urn on the north eastern side suggesting the dead were placed facing towards the west or south west. The bones of the lower limbs were found on the wall on south western side while those of the upper arms were found near the northern wall of the urn.

After the removal of skeletal remains a black soil or ash has been observed thereby indicating that it was most probably a secondary burial.

The grave goods inside included all black ware lid



Urn no 63 and associated grave goods

Height of urn – 0.99m

Diameter of urn – 0.60m

Depth of pit – 1.25m

Width of pit – 1m

<p>(broken) with white dotted paintings, and ring stand, three Black-and- Red ware bowls of which one is broken. Black-and- Red ware bowl was also found outside the urn.</p>	
<p>URN No. 64 - Secondary burial</p> <p>It was Black-and- Red ware urn with globular body and conical base distinguished by a thin wall incurved thick clubbed rim and found at a depth of 0.92m in trench no 2ZB16. (Fig 6) It was wheel made and of medium fabric. The urn was provided with a stone cushion. Vertical crack was noticed on the body of the urn. The urn was closed with a red ware thick handmade lid which was broken and only few shards were found. The fine loose soil found inside the urn was light grayish brown in colour.</p> <p>The grave goods which were found inside the urn were Black-and- Red ware medium sized bowls and two deep bowls, of which two have white dotted paintings around the rim portion, two black ware cannoid lids with white dotted paintings on its body. A ring stand and broken bowl were found near the urn on the western side.</p>	<div data-bbox="964 478 1331 762" data-label="Image"> </div> <p data-bbox="1068 762 1325 798">Urn no 64 in situ</p> <div data-bbox="964 804 1331 1035" data-label="Image"> </div> <p data-bbox="954 1035 1331 1071">Grave goods of urn no 64</p> <p data-bbox="954 1077 1279 1113">Height of urn - 0.70m</p> <p data-bbox="954 1119 1325 1155">Diameter of urn – 0.41m</p>

URN No. 65 - Secondary burial

At a depth of 1.21m in trench no 2ZB16 was placed in a slanting position, a red ware flat based handmade globular urn (of coarse fabric) with thick rolled clubbed rim. (Fig 4). Just below the rim is seen a row of wave like design with a border on the lower side (probably etched by a sharp tool - knife?) It has graffiti mark near the shoulder on the exterior surface. It was covered with a red ware lid with flat based moulded rim.

Bones of the limbs and other fragmentary bones were collected. The grave goods noticed inside the urn were medium sized Black-and- Red ware bowl , one all black ware ring stand slightly broken at rim, two black polished ware ring stands - one smaller in size and partially broken and another one is broken at the knob and has white dotted paintings on its body. The goods outside the urn include Black-and-Red ware vase closed by a bowl of same variety. They were found at the level of rim of red ware lid closing the urn. A miniature black



Urn no 65 and associated grave pottery



and red ware bowl and shallow dish was also noticed (broken). A broken spear head was found inside the urn.



Urn no 65 – Pit cut into bedrock/quartz vein?

Height of urn – 0.90m
Diameter of urn – 0.52m

URN No.66 - Secondary burial

A smaller Black-and- Red ware pyriform shaped urn with broken rim and conical base was unearthed at a depth of 0.91m in trench no 2ZB16. (Fig 6). The urn was noticed few meters south of urn no 65 and very close to urn no 67. The urn was filled with loose soil which was light brown in colour along with small stones.




Urn no 66 and associated pottery



At a depth of 0.54m inside the urn, grave goods like a Black-and- Red ware vase (rim broken) and bowl with beaded rim (broken in to pieces) and fragile bones were found.


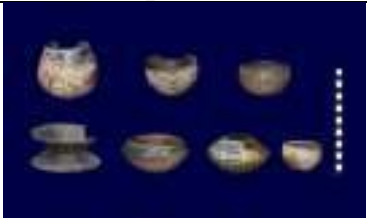
URN No. 67 - Secondary burial

A broken flat based pyriform shaped red ware urn filled with loose brown soil and small stones was noticed in trench no 2ZB16. Some parts of the lid were also found inside the urn. Few bones were collected from the lower levels of the urn.

Grave goods of urn no

<p>A Black-and- Red ware bowl and globular vase (rim</p>	<p>67 Height of urn – 0.80m</p>
<p>broken) with white dotted painting design around the rim and below which four concentric grooves were found outside the urn in the south eastern corner of the pit.</p>	<p>Diameter of urn – 0.48m Depth of pit – 1m Width of pit –0. 90m</p>
<p>URN No. 68 - Secondary burial</p> <p>A globular shaped red ware urn was noticed to the east of urn 67 at the depth of 0.85m in trench no 2ZB16. It was completely broken. The urn was filled with medium sized stones and earth. Few bone fragments and broken pottery shards were noticed inside the urn.</p>	 <p>Urn no 68 in situ</p>
<p>URN No. 69 - Secondary burial</p> <p>To the west of urn no 67, at a depth of 1.06m in trench no 2Zb16 a totally damaged Black-and- Red ware urn with conical bottom was noticed. It contained fragmentary bones.</p>	

<p>URN No. 70 - Secondary burial</p> <p>At a depth of 0.77m a pyriform shaped Black-and- Red ware wheel made ill fired urn of medium fabric with conical base and thick rim was noticed in trench no 2ZB16. (Fig 6) It has three concentric lines around the shoulder. It was filled with soil and stone. The pit was cut into the natural rock and stone packing and stone cushion was provided.</p> <p>Few broken grave goods were noticed on the northern side of the urn while a ring stand was found on the eastern side of the body of the urn in the pit.</p>	<p>Height of urn – 0.64m Diameter of urn – 0.40m Depth of pit – 0.75m Width of pit 0.75m</p> <p>Urn no 70</p> 
<p>URN No. 71 - Secondary burial</p> <p>A small size Black-and- Red ware urn of thin fabric and sager base was found a few meters north west of urn no72. No bone fragments were noticed inside the urn.</p> <p>The grave goods found inside the urn were Black-and- Red ware bowl with white dotted paintings around rim (partially broken) and a miniature pot (broken upto shoulder was noticed)</p>	 <p>Grave goods of urn no 71</p>
<p>URN No.72 – Secondary burial</p> <p>In the same trench to the south east of urn no 71 a black-and red ware urn in damaged condition was noticed. No grave pots were recorded.</p>	

<p>URN No. 73 - Secondary burial</p> <p>It was a small red slipped, globular shaped, half broken urn with thin fabric and filled with very loose soil and fine red earth. It was noticed a few meters east of urn no71. No bones or grave goods were retrieved.</p>	 <p>General view of urn no 73</p> <p>Urn broken Depth of pit – 1m Width of pit – 0.80m</p>
<p>URN No. 74 - Secondary burial</p> <p>At a depth of 0.97m in trench no 2ZB16, a black and red ware globular urn in broken condition was noticed.</p> <p>While no bones were found, a few grave goods were collected from inside the urn. They included Black-and- Red ware - miniature vase – 2 nos (one broken up to shoulder), a carinated bowl, small bowls – 2 nos (one with beaded rim and another with featureless rim - partially broken), a deep bowl with white dotted paintings around rim and a vase (broken condition).</p>	 <p>Grave goods of urn no 74</p>
<p>On the southern side of the urn a black ware ring stand (partially broken) and miniature Black-and- Red ware bowl were noticed.</p>	

URN No. 75 - Secondary burial



It was a red ware urn distinguished with globular body, narrow neck and everted flaring rim. (Fig 4). Base is slightly damaged and body does not have proper shape. It was handmade coarse fabric. This urn was noticed few meters north east of urn no 76 at a depth of 0.95m in trench no 2ZB16. The urn was filled with soil mixed with stones of different sizes.



The grave goods found inside the urn included red ware vases – 3 (one completely broken), black and red ware- four deep bowls (partially damaged), a bowl with white dotted hanging designs on all the sides, two shallow bowls, and black ware - lid. All around the urn few grave goods were found and many of them were damaged. However, on the northern side of the pit were placed two ring stands. Their position suggested that they might have been used for stabilizing the position of the urn. A couex bead was noticed inside the urn.





Urn no 75 and associated

pottery Height of urn – 0.85m
Diameter of urn – 0.49m
Depth of pit – 1.10m
Width of pit – 1m

<p>URN No. 76 - Secondary burial</p> <p>A black-and- red ware globular urn with thick, short neck with traces of shards of the lid was found in trench no 2ZB16. Four concentric lines were noticed around the body.</p> <p>Teeth (8 nos.) were noticed inside the urn.</p> <p>Black ware ring stand – 3 nos, lids 2 nos, Black-and- Red ware - small cups – 3 nos, bowls – 3 nos (all broken), a vase (broken) and a red ware vase were found inside the urn.</p>	 <p>Urn no 76 Height of urn – 0.50 m Diameter of urn – 0.27 m</p> 
	<p>Inner view of urn no 76 – in situ</p>
<p>URN No. 77 - Secondary burial</p> <p>The urn 77 was noticed few metres south of urn no 74. It was a Black-and- Red ware urn having only the base portion. It was conical in shape. Few fragmentary bones and small skull (child?) has been noticed inside the urn. No grave goods were documented.</p>	

<p>URN No. 78 - Secondary burial</p> <p>A comparatively smaller pyriform shaped red ware urn with out-turned flaring thick beaded rim and truncated base was noticed in trench 2ZB16 at a depth of 0.30 m from the surface. (Fig3).No bones were found.</p> <p>The grave goods included a Black-and- Red ware vase with white dotted paintings on the shoulder (rim broken), carinated bowl, two black polished ware ring stands (partially broken).An iron chisel was noticed outside the urn.</p>	 <p>Urn no 78 and associated grave goods</p> <p>Height of urn – 0.65m Diameter of urn – 0.50m Depth of pit – 0.85m Width of pit – 1.10m</p>
<p>URN No. 79 - Secondary burial</p> <p>This was a broken red ware urn of medium size and round base. The lid was missing. No grave goods and skeletal remains were found.</p>	
<p>URN No. 80 - Secondary burial</p> <p>A black-and red ware urn with conical base was noticed nearby urn no 81 at a depth of 0.80m in trench no 2ZB17. The shoulder portion of the urn was partially broken.</p> <p>The urn was noticed filled with soil, stones and silt deliberately. Fragmentary bone pieces were collected.</p> <p>The grave goods included two vases and two</p>	 <p>General view of urn 80</p> <p>Height of urn – 0.68m Diameter of urn – 0.44m</p>

<p>miniature vases of black and red ware, and small bowls also of the same ware, two lids of black ware and also a few broken shards.</p> <p>An interesting point to be noted that the distance between urn nos. 81 and 82 was only 0.31m, and both were placed in the same pit. It can be surmised that the individuals who were buried might have been related to each other or were buried around the same time.</p>	<p>Depth of pit – 0.70m Width of pit – 0.80m</p>
<p>URN No. 81 -Secondary burial –</p> <p>A black-and red ware urn, pyriform shaped with conical base and thick in-turned rim was noticed at a depth of 0.75m in trench no 2ZB16. It was deliberately filled with loose soil, stones and which affected the urn leading to its breakage. Lid was missing.</p> <p>Skeletal remains inside the urn were long bones at one end and on the sides, vertebrae seen in a curve, skull fragments in the centre. The other bones were fragmentary. Grave goods unearthed both inside and outside the urn were in broken condition. A black polished ring stand was noticed near the base of the urn outside.</p>	 <p>Urn no 81 - mended Height of urn – 0.65m Diameter of urn – 0.43m</p>
<p>URN No. 82 - Secondary burial</p> <p>A red ware pyriform shaped urn with broken rim was noticed at a depth of 1.00m in trench no 2ZB16. It was located few meters south of urn no 85A. The urn was filled with soil mixed with potshards and bones.</p> <p>A skull and a tooth were found at the bottom of the urn.</p>	 <p>Urn no 82 in situ</p>

<p>Antimony rod was noticed at the depth of 1.39m inside the urn.</p>	
<p>URN No 83A – Secondary burial</p> <p>A pyriform shaped broken conical based thin red ware urn was found close to urn no 83B in trench no 2ZB16 at a depth of 0.95m. The urn contained loose brownish coloured soil on top and red murram below.</p>	
<p>Grave goods such as black and ware bowls – 4 nos., lids – 2 nos. and flat based vase covered with black lid were found at the bottom of the urn along with traces of bones. Placed beneath the urn in the pit was a big conical lid (?) of black ware whose rim alone was broken.</p> <p>The grave goods found to the north of the urn in the pit were also of Black-and- Red ware – globular pot, bowls and shallow dish. Only the pot was intact.</p>	<div data-bbox="997 617 1380 995" data-label="Image"> </div> <p>Inner view of urn no 83A</p> <p>Urn - Broken</p> <p>Depth of pit – 0.60m</p> <p>Width of pit – 0.45m</p>

URN No. 83B - Primary burial

It was a light reddish globular jar with flat base. It has thick beaded rim. A projected thumb impression was noticed around the neck portion. The urn was covered with red ware lid with flaring mouth featureless rim and flat ring base. It was partially broken and mended. It was a handmade coarse fabric urn. This urn was positioned few meters south of 83A at a depth of 1.38m in trench no 2ZB16 and cutting into the natural rock.

It was a primary burial having two skeletal remains. A skull was exposed on the western side with the mandible facing towards south.

The following points were observed during excavation:

Skeleton no .1 bones of the lower limbs, shoulder, ribcage vertebral column were found adhering to the wall of the urn in north west direction; pelvic girdle right at the center at the bottom and over it bones of the lower limbs were was placed thus suggesting that the body was placed inside the urn in a sitting posture facing towards the south-east. The skull was detached and rolled down further towards the eastern direction (fragmentary skull has been recovered).

A lower limb especially femur of burial no.1 was lying beneath the skull and it was adhering to the wall of urn in the south eastern side.



Urn no 83B

Height of urn – 0.95m
Diameter of urn – 0.60m
Depth of pit – 1.40m
Width of pit – 1m



Inner view of urn no 83B

Skeletal no: 2 Though it was fragile and in bad shape but the skull was fairly intact and found near the ribcage region of the burial no.1; fragmentary pelvic girdle was recovered from the bottom in the southern direction. It can be presumed that it was facing towards the north as per the relative position of the few fragmentary bones recovered.

Interestingly all the major bones of the limbs for eg. (femur, tibia fibula) were found adhering to the wall in the southeast direction parallel to each other. On the north-eastern side one more skull was noticed. Most probably it could be a joint burial.

This double burial could indicate that it might have been a couple – (male and female?), but it definitely seems to be that the both were buried simultaneously.

The grave goods which were noticed inside were 6 Black-and- Red ware bowls with white dotted paintings around the rim including one deep bowl and three bowls were damaged near rim portion. Two Black-and- Red ware carinated bowl, one lota type jar with broken body and out turned flaring rim, one small shallow bowl cum dish, one vase with broken rim, globular body and flat base having white dotted paintings on its shoulder, two miniature Black-and- Red ware vases one of which has white dotted paintings around the shoulder, five black polished ware ring stand in various sizes, three black polished ware lids on which two has white dotted painting around the body, one red ware vase with high neck, thick out turned rim and conical base were also collected.



Double burial in urn no 83B



Grave goods of urn no 83B

<p>The goods noticed outside the urn included two all black ware ring stand (rim portion broken), and black ware lid (rim totally damaged). Husk sample was collected from the miniature vase.</p>	
<p>URN No. 84 A Completely damaged.</p>	
<p>URN No. 84 B Completely damaged.</p>	
<p>URN No. 85 - Primary burial</p> <p>A well like pit was cut into the natural rock. The red ware globular shaped urn was placed at a depth of 1.38m in trench no2ZB17.</p> <p>The body was lowered into the urn in a squatting position as can be surmised from the position of the</p>	

bones in the urn. The skull was found in the centre of the urn while the bones of the lower limbs were seen near the western side and the vertebral bones on the northern side. Other bones like the ribs and mandible were also collected.

The grave goods which were noticed inside the urn were mostly of Black-and- Red ware - two deep black- and red ware bowls with white dotted painting around the rim, small bowl without any paintings, one carinated bowl broken up to body, small shallow dish cum bowl with incurved thick rim, one miniature vase and one black ware miniature lid and two polished black ware lids with white dotted paintings around the body. The associated pottery found outside the urn were two broken Black-and- Red ware medium size vases, two Black-and-Red ware medium sized bowl (one totally broken and one has white dotted painting). An iron double sided chisel was noticed inside the urn.

URN No 85A

A totally damaged red ware urn with sager base and cutting through the murram was found. Nothing could be retrieved from it.



Inner view of urn no 85



Grave goods of urn no 85

URN No. 85B - Primary burial

It was a red ware urn with out- turned thick rim and of coarse fabric in trench no 2ZB16. The urn with skeletal remains was filled with soil and was patinated. It was difficult to expose the skeletal remains, since it was little wet and compact.

The grave pots were placed above the skeleton



Inner view of urn no 85B

remains and it was noticed that red ware vase was closed tightly with a Black-and-Red ware bowl with beaded rim (broken) and kept in horizontal position. The other pots were miniature Black-and- Red ware vase with globular body and flaring rim, miniature globular bowl tapering towards the mouth and few grave pots in broken condition. The grave goods found outside the urn included red ware vases, bowls (one carinated) of black and red ware.



Grave pottery of urn 85B

URN No. 86 - Primary burial

At a depth of 1.62m in trench no 2ZB17, a big light red ware urn of red ware with pyriform shaped body thick beaded rim, flat base was noticed. A pattern based on thumb impression was made around the neck portion. Inside the urn the skeletal remains were noticed in damaged condition.

The grave goods found outside the urn were of Black-and- Red ware - shallow dish cum bowl with conical base and thickened rim, bowl with broken rim sager base, small shallow dish cum bowl with broken rim, two partially polished black ring stands.

A broken vase was found on the eastern side of the urn at its rim level. Husk was collected from the shallow dish and bowl inside the urn and also from the pit on its southern and eastern sides.

Iron spear head and chisel were noticed outside the urn at a depth of 2.12 m in the eastern corner.



Urn no 86 with grave goods

Height of urn – 0.98m
Diameter of urn – 0.55m
Depth of pit – 1.6m
Width of pit – 1.10m

URN No. 87 - Secondary burial

A wheel made Black-and- Red ware urn of medium fabric with globular body (decorated with three concentric lines around the shoulder) with in-turned rim and round base was noticed at a depth of 1.23m in trench no 2ZB17. It was placed in a pit dug into the murram. The pit was rocky on three sides while the south eastern side was loose soil as this burial was placed over an earlier one (urn no 105) which was

placed deeper. The pit was filled with sandy soil and a sandy cushion of 0.10m was provided beneath the urn to place it in position. This urn was capped with two lids, the upper one being shallow like a bowl with beaded rim (depth of 0.24m) and the lower one of similar type but bigger (depth of 0.25m).

The grave goods found outside the urn were placed at 2 levels. The upper level had black and red ware bowls (one big and one small - broken), Black-and- Red ware miniature vase and black polished ware ring stand (partially broken). The lower level had black ware dishes – 2 nos., black ware ring stand and two Black-and- Red ware bowls one inside the other and closed with a black ware lid and a red ware bowl.



Urn no 87 with lid –
in situ



Urn no 87 and grave goods

Height of urn – 0.55m
Diameter of urn – 0.35m
Depth of pit – 0.90m
Width of pit – 0.80m

URN No. 88 – Secondary burial

This urn was located 0.60m north of urn no 89, at a depth of 1.06m in trench no 2ZB17 and was provided with stone packing and stone cushion. The urn was of Black-and-Red ware with flat base and egg shaped body. The lid was of red ware with beaded rim was damaged.

The grave goods noticed inside the urn were four Black-and- Red ware bowls including one deep bowl (three partially broken), Black-and- Red ware lid cum bowl with flat base and flaring mouth and a miniature vase. The grave goods noticed outside the urn were two black ware ring stands (partially broken) and two miniature bowls. A lota type jar and bowl was noticed on the right side of the urn at body level(broken). Three tiny copper bangles were placed to the south east inside the urn.



Inner view of urn no 88



Urn no 88 and associated

pottery Urn - broken
Depth of pit –
0.65m Width of pit
– 0.75m

URN No. 89 - Secondary burial

It was a Black-and- Red ware urn with globular body and round base found at a depth of 1m in trench no 2ZB17. It was wheel made, of medium fabric with three rows of incised lines found around the body surface. The rim was broken. Parallel horizontal bands were found at the edges of the Black-and- Red ware lid which was broken. The position of the urn and lid was not disturbed. No soil was found inside the urn.

The pit was cut through the bed rock and filled by murrum. The grave pots included Black-and- Red ware bowl with white dotted paintings in oblique design around the rim portion, black ware ring stand (partially broken) and one vase of black polished ware with white dotted paintings around the body was noticed.



Urn no 89

Height of urn – 0.45m
Diameter of urn – 0.32m
Depth of pit – 0.80m
Width of pit – 0.75m



Inner view of Urn no 89

URN No. 90 - Secondary burial

This pyriform shaped conical based black and red ware urn was noticed at a depth of 1.92m in trench no 2ZB15. A faint concentric line was noticed around shoulder portion.

No skeletal remains were recorded from this urn. The urn contained grave goods like two black polished ring stands (partially broken), two Black-and- Red ware bowls one of which one was deep with white dotted painting around rim (both partially broken), one Black-and- Red ware beaker (broken up to body) and a Black-and- Red ware miniature vase with high neck and beaded rim. A red ware vase to the north of the urn at the body level and a bowl on the south side slightly above the urn were noticed in the pit.



Urn No 90 and associated pottery

Height of urn -0.50m
Diameter of Urn – 0.43 m

URN No. 91 -Primary burial

A medium sized red ware urn of pyriform shape and flat base having slightly beaded rim was noticed at the depth of 0.72m in trench no 2ZB17. This urn was placed inside the same pit as urn no 146 (urn no 91 is positioned above urn no 146). Probably urn no 91 was placed inside without knowing the presence of other urn 0.10m.below.

It was an intact urn having full skeleton remains. The bones were termite affected and were calcified. The skull has two eyes sockets and one more socket near the right eye (skull with three sockets?) perhaps an abnormality.



General view of urn 91

No grave pots were encountered inside the urn. Two black and reds ware bowls, one of which was covered with lid, was noticed beneath the urn (it was placed before urn was placed inside the pit). A vase was noticed near the lid of the urn on western side.

Height of urn – 0.78m
Diameter of urn – 0.47m
Depth of pit – 1.25m
Width of pit – 1.30m

URN No. 92 - Secondary burial

A broken Black-and- Red ware urn was found in the same pit dug for urn no 146 at a depth of 0.70m. It was egg shaped (oval) urn with beaded rim. Three horizontal lines were noticed running around the shoulder of the urn. The lid was partially broken. Urn no 92 was noticed placed 0.45m west of urn no 90 and 40m north of urn no91.

The grave goods inside the urn included two Black-and- Red ware miniature vases (rim broken), two deep Black-and- Red ware bowls with white dotted oblique paintings, two black ware lids (one broken) and a small black and red ware bowl. The associated pottery found outside the urn was one black polished ring stand and lid and one Black-and- Red ware bowl and a vase placed west of the urn at the level of body of the lid in broken condition.

Iron knife (?) broken into 2 pieces was noticed inside the urn.



Urn no 92 and associated pottery

URN No. 92 - Secondary burial

A broken Black-and- Red ware urn was found in the same pit dug for urn 146 at a depth of 0.70m. It was egg shaped (oval) urn with beaded rim. Three horizontal lines were noticed running around the shoulder of the urn. The lid was partially broken. Urn 92 was notice placed 0.45m west of urn 90 and 0.40m north of urn 91.

The grave goods inside the urn included two Black-and- Red ware miniature vases (rim broken), two deep Black-and- Red ware bowls with white dotted oblique paintings, two black ware lids (one broken) and a small black and red ware bowl.

The associated pottery found outside the urn was one black polished ring stand and lid and one Black-and- Red ware bowl and a vase placed west of the urn at the level of body of the lid in broken condition. Iron knife (?) broken into 2 pieces was noticed inside the urn.



Urn no 92 and associated pottery

URN No. 93 - Secondary burial

This red ware urn was noticed 0.50m west of urn no 94 at a depth of 0.80m in trench no ZB17. It was a medium sized pyriform shaped urn with beaded rim, and flat base. The lid was broken and missing. The pit was cut into the bedrock. A modern glass piece was noticed inside the urn at the depth of 0.30m hence it was presumed that it was deliberately filled with soil in recent times. One Black-and- Red ware bowl with white dotted paintings was noticed inside the urn. Beneath the urn one Black-and- Red ware lid cum bowl was noticed (broken).



Urn no 93

Height of urn – 0.74m
Diameter of urn – 0.8m
Depth of pit – 0.90m
Width of pit – 0.80m

URN No. 94 - Secondary Burial



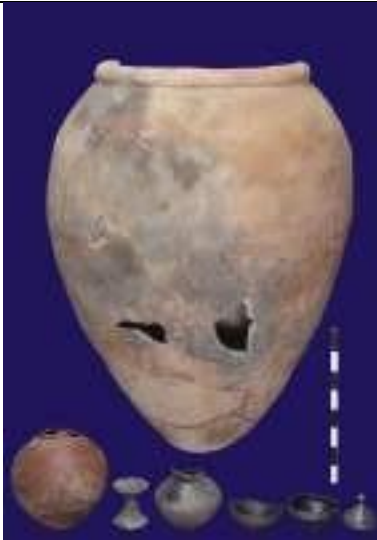
It was red ware urn placed 0.50m east of urn no 93 in trench no 2ZB17. The urn was noticed with large number of cracks and partly broken up to shoulder level. It was of coarse fabric, handmade, with globular body, thick rimmed with flat base. It is ornamented with row of incised or pinching design below the rim on the outer surface. It has internal groove design on the rim.

The grave goods found inside the urn were high necked black polished ring stand, black polished ware lid with white dotted paintings around the body, one Black-and-Red ware vase (rim partially broken) and white dotted paintings around the shoulder and two bowls of Black-and- Red ware (one carinated and another shallow). A red slipped vase broken up to neck was noticed outside the urn.



Urn no 94 – in situ

Height of urn – 1m?
Diameter of urn – 0.52m
Depth of pit – 1.2m
Width of pit – 1.15m

<p>URN No. 95 – Secondary burial</p> <p>A red ware urn with globular body and thick beaded rim with hardly any neck. This urn was noticed at a depth of 0.68m. It has several cracks on the body and broken in to pieces. The urn was filled with greyish loose soil. A big stone was noticed placed inside the urn (deliberately kept?).</p>	 <p>Grave goods of urn no 95</p>
<p>A few grave goods were noticed inside the urn of which one Black-and- Red ware medium size bowl was intact. A red ware vase was noticed outside the urn (rim broken)</p>	
<p>URN No. 96</p> <p>A base of large sized red ware urn was noticed at a depth of 15ms in trench no 2ZB16. It was completely damaged.</p>	
<p>URN No. 97</p> <p>The urn was completely damaged.</p>	 <p>General view of Urn No 97</p>
<p>URN No. 98 Secondary burial</p> <p>A medium sized red ware urn having pyriform shape and thick beaded rim was noticed at a depth of 1m in trench no 2ZC15. The pit was leveled by murrum. The urn was covered by a lid and no soil was noticed inside the urn.</p> <p>A few skeletal remains were noticed inside the urn. The grave goods inside the urn were a Black-and- Red ware vase with broken rim and white dotted oblique design around shoulders, a Black-and- Red ware miniature bowl, black polished ware lid with white dotted paintings around the body. Two Black-and- Red ware bowls (partially</p>	 <p>Height of urn – 0.75m Diameter of urn – 0.42m Depth of pit – 1.5m Width of pit – 1.10m</p>

broken) with white dotted paintings around the rim, two black and red ware bowls (partially broken) were noticed on the south eastern side outside the urn.

URN No. 99 – Secondary burial

Urn no 99 was a big globular shaped black-and red ware urn with round base and thick rim. The lid was broken. The urn was partially filled with loose soil and silt. It was found in trench no 2ZC17 at a depth of 1.75m.

No bones were found in this burial. The grave goods found inside the urn were Black-and- Red ware big bowl with white dotted oblique design and small black ware ring stand. Grave goods were noticed outside the urn placed near its rim portion. It included red ware vase, small and Black-and- Red ware shallow lid cum dish (rim broken), two bowls of Black-and- Red ware (one small and the other deep with traces of white dotted paintings), black and red ware vase and a big black polished ware ring stand (partially broken), An iron chisel was noticed inside the urn in broken condition.



Urn 99 and associated pottery

Height of urn – 0.50m

Diameter of urn – 0.27m

Depth of pit – 1.55m

Width of pit – 1.30m

URN No. 100 - Secondary burial

At a depth of 0.94m in trench no 2ZB17, a damaged red ware urn was noticed with lot of vertical cracks.

It was globular in shape with broken rim. One portion of the urn was fully disturbed. The urn was filled with brown soil having small stones and silt. A few fragile bones were found inside the urn. Few potshards were also seen.



General view of urn no 100

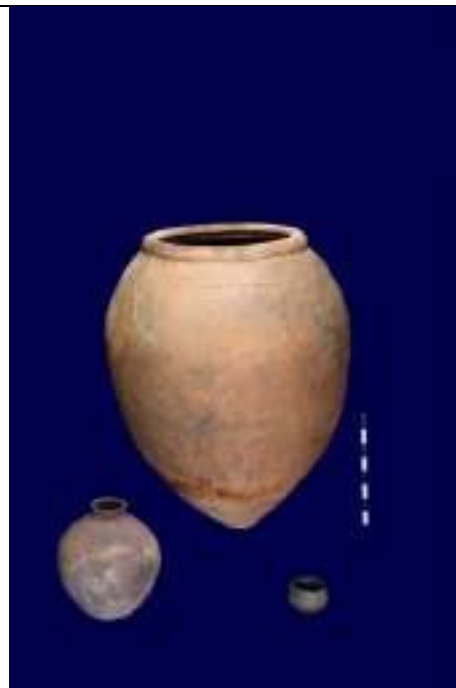
Urn – broken
Depth of pit – 0.80m
Width of pit – 0.90m

URN No. 101 - Secondary burial

A globular shaped big sized red ware urn distinguished by incurved thick rim and truncated base was noticed at a depth of 0.35m in trench no 2ZC15. (Fig 2). It was placed in a pit cutting into the bed rock. It was handmade and of coarse fabric urn having one vertical crack from the rim to the bottom. The lid of this urn had fallen inside by some external pressure and due to this skeletal remains have been shattered and found over the broken shards of lid.

Skeletal remains were fragile and found in several pieces. Husk was collected from inside the urn.

The grave goods inside the urn were a deep bowl of Black-and- Red ware with white dotted paintings in the centre and two more bowls placed slightly away in the south eastern direction. Only one is intact. A red ware vase was found in the pit near the shoulder of the urn on the southern side.



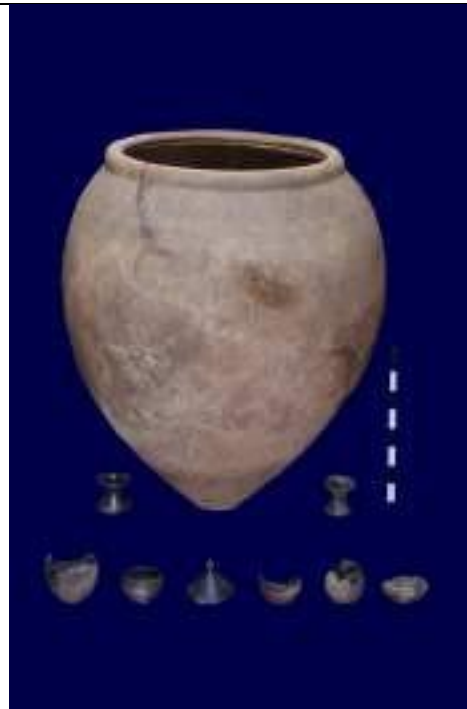
Urn no 101

Height of urn – 1m
Diameter of urn – 0.54m
Depth of pit – 1.25m
Width of pit – 1.05m

URN No. 102 - Primary burial

This is a light red ware urn with thick rolled rim and globular body with flat base with a row of wave designs with border on one side on the outer surface of the urn near the shoulder. (Fig 4). A groove was noticed inside the urn in the rim portion. It was handmade and of coarse fabric. It was found in trench no2ZB17. It was a primary burial having full skeleton remains but they were highly calcified.

The urn contained grave goods including four small Black-and- Red ware bowls - one with white dotted painting design and another carinated (all were partially broken) and two black polished high neck ring stand. Pottery found outside the urn to the south east was black polished ring stand, lid and Black-and- Red ware bowl (all broken). Below the urn was a Black-and- Red ware bowl with white dotted paintings (partially broken) and black polished ware lid (both kept upside down).



Urn no 102

Height of urn – 0.92m
Diameter of urn – 0.52m
Depth of pit – 1.3m
Width of pit – 1.2m

URN No.103 - Secondary burial

In the trench no 2ZB17, a red ware urn, pyriform shaped with flat base and beaded rim was noticed 2 m east of urn no 102 at a depth of 0.80m. It was a handmade coarse fabric urn. After scooping out the bedrock, the surface was rendered even by providing stone cushion and then the urn was placed. This was apparent in this burial. The uneven surface was packed with stone chips using quartz. The urn was filled with murram soil up to the neck portion.

A few bones were noticed inside the urn and it was a secondary burial. No grave goods were noticed inside the urn. The associated pottery noticed on the north side of the urn was a high neck globular red ware vase near the shoulder level.



Urn no 103 and associated vase

Height of urn – 1m

Diameter of urn – 0.73m

Depth of pit – 1.10m

	Width of pit – 1.30m
<p>URN No. 104 - Secondary burial</p> <p>A medium sized Black-and- Red ware with globular body, thin rim and round base noticed in the trench no 2ZB17 at a depth of 1.17m and placed 0.90m north west of urn no 105. No soil was found inside the urn. The black slip applied up to shoulder has luster look. It has 3 concentric groove-like lines around the shoulder in the black portion.</p> <p>A few fragile small limb bones collected from the urn indicate that it was that of a child. (?).</p> <p>The grave goods found inside the urn were two Black-and- Red ware miniature vases (rim broken) and two miniature bowls of black and red ware. The grave goods placed outside, occur at the top on the western half, 3 bowls in Black-and- Red ware (two intact and one has white dotted oblique design around the rim), red ware vase with inverted bowl as a lid. To the west of the urn few more grave pots were noticed (all broken) and beneath the urn were a shallow bowl, shallow dish cum bowl and one bowl (broken) – all of black and red ware. An iron chisel was noticed inside the urn.</p>	<div data-bbox="964 443 1429 1100" data-label="Image"> </div> <div data-bbox="958 1178 1450 1541" data-label="Image"> </div> <p>Urn no 104 and associated pottery</p> <p>Height of urn – 0.42m Diameter of urn – 0.34m Depth of pit – 0.70m Width of pit – 0.65m</p>

URN No. 105 - Secondary burial

A Black-and- Red ware urn with thick rim and conical base was noticed at a depth of 1.86m in trench no 2ZB17. (Fig 6). The depth of the working level for the urn was 1.40m and from working level the urn was about 0.46m below in the pit. The pit is cut through the bed rock. Stone cushion was provided to the urn. On the north west little above there is another urn with elaborate grave goods outside the urn (urn no 87). Chronologically urn no 87 was later than urn no 105 but they both belong to the same phase. The lid of the urn was broken and the urn was filled with murram soil.

The urn had only few charred fragmentary teeth which were small in size could be a burial of a child? Husk placed in the north western side of the urn (inside) was collected. The grave goods inside the urn were a globular shaped

General view of urn no105

Height of urn – 0.60m

Diameter of urn –0.37m

red ware vase with high neck profile, four miniature Black-and- Red ware vases (partially broken up to rim), one Black-and- Red ware carinated bowl, one Black-and- Red ware deep bowl with tapering mouth and sager base with white dotted oblique paintings and a miniature black and red ware bowl.

The urn was surrounded with grave goods - two shallow bowls of Black-and- Red ware (rim broken) one each on the north and north east, a Black-and- Red ware bowl with black polished ware ring stand on the north west at the bottom level, a globular vase kept upright and closed by a bowl of Black-and- Red ware (like a lid) on the west and a big bowl with flat base on the north. Beneath the urn was found a black ware ring stand. Paddy husk was collected from below the red ware vase kept at the shoulder level of the urn. An iron chisel was noticed beneath the urn.

URN No. 106 - Secondary burial

Red ware urn with globular body in a pit cutting into bed rock was noticed south west of urn no 86 (1.10m). It was a handmade urn of coarse fabric. This urn was located in the trench 2ZB17 at a depth of 1.40m. Urn was in very bad and damaged condition. The urn was filled with loose ashy deposit, stones etc.

Few skeletal remains liked the bones of the limbs and fragmentary skull was noticed.



Grave goods of urn no 106

The grave goods included a Black-and- Red ware vase with white dotted painting around the shoulder (rim partially broken), three Black-and- Red ware bowls – one with white dotted oblique design (one totally broken and one partially broken) miniature vase of black-and red ware, one black polished small lid. The associated pottery found below the urn was one small bowl of Black-and- Red ware and a black polished ring stand (partially broken). To the east was noticed broken black ware vase.

Height of urn – 1m

Diameter of urn – 0.85m

Depth of pit – 2m

Width of pit – 1.30m

URN No. 107 - Primary burial

A handmade red ware pyriform urn of coarse fabric with out-turned rolled clubbed rim and round base was found at a depth of 1m in trench no 2ZC17. (Fig 1). It was closed by a red ware lid which broke into pieces on exposure. The base was also broken.



Full skeleton remains were noticed inside the urn. The skull was seen to one side and the upper limbs have fallen beside it. The knee portion of the lower limbs was seen away from the skull and the vertebrae were on one side. This clearly indicates that the body was placed in a crouched position.

Urn no107 and grave goods

Height of urn – 0.70m

Diameter of urn – 0.32 m



Depth of pit – 1.15m

Width of pit – 2m

Two black-and red ware bowl with white dotted oblique paintings, one Black-and-Red ware carinated bowl (partially broken), one black polished ring stand, one black-and red ware vase (with 8 rows of oblique design in regular intervals around the shoulder with 8 concentric grooves) and one black polished lid with broken knob having white dotted oblique design in 7 rows in regular intervals was found inside the urn.



Skeletal remains found in urn
107 – in situ

<p>One iron sword was found to the left of the remains inside the urn.</p>	
<p>URN No. 108 - Secondary burial</p> <p>A wheel made Black-and- Red ware globular urn of medium to thick fabric with short neck, beaded rim and round base was noticed at the depth 0.85m in trench no 2ZC17. Rim was broken up to shoulder. A broken lid was noticed closing the urn. Husk was found in two Black-and- Red ware bowls (broken) placed in the urn.</p>	 <p>Urn no 108 in situ</p>
<p>URN No. 109 - Secondary burial</p> <p>A black-and red ware urn was noticed in same trench 70m south west of urn 108 at the depth of 1.10m. It was a globular jar with damaged rim. The lid of Black-and- Red ware had broken and a portion of the same had fallen in the urn. The urn was filled with loose murram soil, silt and small stones.</p>	
<p>URN No. 110 - Secondary burial</p> <p>In the trench no 2ZC17 at the depth of 0.80m a Black-and- Red ware urn with short neck was noticed 0.60m north east of urn no 111. A few skeleton remains were noticed inside the urn. Grave goods noticed inside the urn were three Black-and- Red ware bowls (one big). A black-and –red ware lota or beaker was noticed on the western side of the urn (all retrieved in broken condition).</p>	 <p>General view of urn nos 109 and 110 – in situ</p>

URN No. 111 - Secondary burial

A urn of Black-and- Red ware having pyriform shape and distinguished with internally turned rim and round base was noticed at the depth of 1.53m in trench no 2ZC17. The urn was slightly damaged at rim and shoulder portion. The lid also of Black-and- Red ware was conical in shape and broken. Both the urn and the lid were wheel made of medium thick fabric. At a depth of 1.86m inside the pit, few charcoal and husk samples were collected. This urn was not filled with any soil or stones.

The grave pots which were noticed inside were of Black-and- Red ware - small bowl black and red ware, conical bowl (broken), beaker type bowl (broken up to body) and bowl with white dotted painting around the rim, a globular pot (broken) and black polished lid with white dotted painting around the body. The grave goods placed in the north eastern side of the urn consisted of a red ware globular vase (broken up to shoulder) and a black polished ware ring stand.



Urn no 111 and grave pottery

Height of urn – 0.60m
Diameter of urn – 0.33m
Depth of pit – 1.30m
Diameter of pit – 1.05m

URN No. 112 - Secondary burial

In the trench no 2ZC17 at a depth of 1.50 m a red ware urn of pyriform shape and conical base has been noticed in damaged condition along with broken lid. The urn has some skeletal remains and could be that of a child (?) Only lower base of the urn was noticed placed below urn no 111 (by disturbing urn no 111 in the same pit). Broken pieces of the urn had fallen into this urn along with the small stones, silt and sand.



General view of urn nos 111 and 112

URN No. 113 - Primary burial

Skeletal remains in this red ware urn indicated that the body was placed in crouched position. (Fig 2). The urn was a big red ware pyriform shaped and distinguished by out turned rolled rim. The urn had a ring base. It was noticed in the trench 2ZC17 at a depth of 0.90m. It was hand-made and of coarse fabric. One side of the urn was broken. It has finger pinching design around the neck.

The bones of the skull and the upper limbs were found on one side and the bones of the lower limbs were seen stretched out. The vertebrae (?) were seen between the limbs.

The grave goods inside the urn were placed above the skeleton remains. The grave pots which were noticed inside the urn were three Black-and- Red ware bowls (one deep bowl with white dotted painting), one polished black ware lid with white dotted painting on the body surface.

The grave pots outside was noticed on the eastern side – two bowls of Black-and- Red ware with featureless rim with white dotted paintings around the rim (partially broken), a partially broken Black-and- Red ware vase with white dotted oblique painting around the shoulder and four concentric grooves on the shoulder. A black ware ring stand and a broken bowl of Black-and- Red ware were noticed below the urn. An iron chisel was noticed inside the urn at the lowest level.



Urn no 113 and associated pottery Height of urn – 0.86m
Diameter of urn – 0.47m
Depth of pit – 1.25m
Width of pit – 0.70m

URN No. 114 - Primary burial

A red ware urn with globular profile, flaring beaded rim having finger impression around the neck was noticed in trench no 22C17 at a depth of 1.45m having full skeleton remains of an adult. The pit was cut into the bed rock. The urn was closed with red ware lid having flat top, flaring sides and having mat impression on the top. Both are handmade and of coarse fabric. Both the urn and lid were having several cracks on its body and damaged at several places.

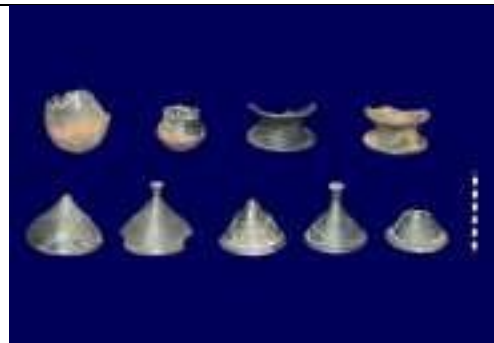
The human skeleton inside the urn was placed in crouched position and the grave pots were placed above the skeleton remains. The skull has fallen on the grave pots. There was almost all part of a human skeleton inside the urn. The bones of the lower limbs

were placed on the west and those of the upper limbs on the east, all of them adhering to the inner body of the urn. The skull was recovered from the centre and beneath the skull was the broken mandible and further below were the bones of the back. Interestingly the pelvic girdle was lying adhering to the urn on the east.

The grave pots inside the urn included four bowls of Black-and- Red ware with white dotted paintings around rim (one totally broken and two partially broken), four vases of black-and red ware -2 miniature vase, globular vase and a squat vase and a globular red ware vase, five partially broken lids of black ware with white dotted paintings on the body surface, and two polished black ware ring stand. In the pit were noticed two black ware ring stands to the north near the belly of the urn, two shallow bowls on the north and south respectively, black ware ring stand at the bottom and a Black-and- Red ware bowl



General view of urn no 114



Grave goods of urn no 114

Urn - broken

Depth of pit – 1.20m

Width of pit – 0.90m

full of husk also at the bottom. Most of the wares kept in the pit were broken.

Iron object noticed in the pit on the south east at belly level.

URN No.115 – Secondary burial

A red ware urn was found at a depth of 0.80m in trench no 2ZC17. The pit also had urns nos. 45 and 46 at the same level. It was in damaged condition and lid was broken. Two Black-and- Red ware miniature vases were noticed in this burial.

No bones were noticed.



Grave goods from urn no 115

Urn - broken

Depth of pit – 0.90m

Width of pit – 1.65m

URN No. 116 - Secondary burial

It was a small red ware urn of pyriform shape with out-turned flaring rim and featureless neck. It has flat ring base, rim is clubbed with the body of the urn. It was a handmade coarse fabric urn. This urn was noticed in the trench no 2ZC16 at a depth of 1m and the pit was cut into the bedrock.

Fragmentary and fragile bone pieces were found mixed with the soil.

A Black-and- Red ware vase (lota type) with white dotted painting around shoulder, one black polished ring stand (partially broken) and one lid with white dotted painting on its outer surface were noticed inside the urn. The grave goods noticed outside the urn to its south were a red ware vase and deep bowl (broken), shallow dish and black ware ring stand.

An iron knife placed in upright position was also found outside the urn in the pit.



Urn no 116 and grave pottery

Height of urn – 0.65m

Diameter of urn – 0.43m

Depth of pit – 1.20m

Width of pit – 0.83m

URN No. 117 - Primary burial

A red ware urn was noticed in the trench no 2ZC16 at the depth of 1.65m. It was placed by cutting the bed rock. This urn was globular in shape with beaded rim. Finger impression was noticed under the rim around the neck.

It was a primary burial having full skeleton remains of an adult. The skull was lying in the centre at the bottom and is visible from the top, the lower and upper limbs had adhered almost vertically in the north eastern and south eastern portions of the urn respectively. The bones of the ribs were seen on the eastern side of the urn.

Paddy husk was collected from one vase which was kept outside the urn.

All the grave goods were noticed to the west of the urn. At the rim level were three black polished ware ring stands (one intact), two Black-and- Red ware bowls of which one has white dotted painting(both partially broken), a short neck red ware vase (broken). At the shoulder level were one red ware vase with husk (rim partially broken),three bowls (one miniature) and two

big ring stands (one partially broken).

One iron sword and one small chisel kept along with the skeletal remains were noticed. They were placed together and adhering to the urn wall on the northern side.



Grave goods of urn no 117

Height of urn – 0.80m

Diameter of urn – 0.54m

Depth of pit – 1.6m

Width of pit – 1.15m

URN No. 118 - Primary burial

A red ware urn containing primary burial of an adult was noticed in the trench no 2ZB16 at the depth of 1.40m. It was a big red ware urn, pyriform in shape with out-turned beaded rim and closed with egg shaped slightly elongated lid having thumb impression inside the lid portion.

Bones of the skull, limbs, mandible and teeth and some fragmentary bones were found. Husk was noticed outside the urn below the ring stand.

The grave pots inside the urn included Black-and- Red ware vase with white dotted paintings on the shoulder level (unique patches design) over it a black ware lid noticed placed upside down with white dotted paintings on its body surface and it was partially broken.

The grave pots placed outside the urn include red ware globular vase with out-turned rim and elongated neck (broken). On the eastern side a small shallow dish was noticed (partially broken) wedged between the urn and the section of the pit. A ring stand was noticed on the southern side below which was some husk. An iron chisel was noticed on the north eastern side of the urn in vertical position at a depth of 1.84 m.



General view of urn 118 – in situ

Height of urn – 0.71m

Diameter of urn – 0.34m

Depth of pit – 1.55m

Width of pit -1.5m



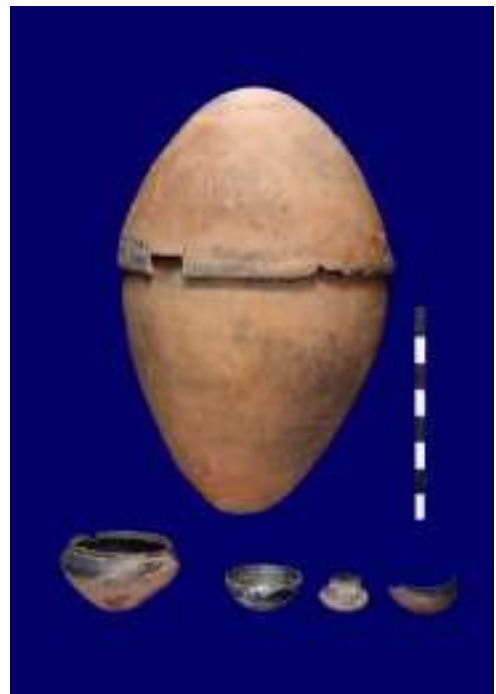
Grave goods of urn no 118

URN No. 119 - primary burial - child burial (?)

It was a wheel made thin to medium fabric pyriform shaped Black-and- Red ware big urn with wide mouth and thick rim and round base. (Fig 6). The urn was noticed with intact Black-and- Red ware lid. This urn was noticed in the trench no 2ZB16 at the depth of 0.68m.

As bones noticed in the urn like the skull, ribs etc were of small size it can be presumed that it was a burial of a child.

The grave pots found inside the urn were of Black-and- Red ware which included partially broken shallow dish cum bowl – one small and one big (with conical base and straight thin rim), one shallow bowl with incurved rim and a miniature vase. Two small copper rings (ear rings?) and an iron chisel were noticed inside the urn.



Urn no 119 and associated pottery

Height of urn – 0.65m
Diameter of urn – 0.37m

URN No. 120 - Secondary burial

It was a Black-and- Red ware urn small in size with broken rim. It was devoid of any grave goods.

URN No. 121 - Secondary Burial

A red ware urn having globular body was noticed in broken condition in the trench no 2ZC17 at a depth of 1.72m. The Black-and-Red ware lid which was covering this urn was also in damaged condition.

A few bones were noticed inside the urn which was also damaged since the urn was deliberately filled with reddish brown murram soil and small stones.

No grave pots were recorded inside the urn and the associated ware noticed outside the urn were two red ware vases one placed on northern side and another on eastern side of the urn at the level of body of the urn (one partially broken and another totally broken). On the south eastern side were seen deep bowls of Black-and- Red ware with and without white dotted paintings, bowl of Black-and- Red ware with beaded rim and two black polished ring stand (partially broken).



Grave goods of Urn no

121 Urn - broken

Depth of pit – 1.25m

Width of pit – 1.15m

<p>Urn-122 Urn completely damaged.</p>	
<p>URN No. 123 A, B and C – Secondary burial</p> <p>Three wheel-made Black-and- Red ware urns of medium fabric were noticed altogether in a group in trench no 2ZC15 at the depth of 1.92m. (Fig 6). All these three burials are secondary in type. All these three urns were noticed partially broken and was filled with loose soil.</p> <p>Urn no 123 A was pyriform shaped with round base, it was broken and mended.</p> <p>No bones were found inside the urn, but only three Black-and- Red ware miniature pieces – two vases (one with flaring mouth) and bowl.</p> <p>The rim of Urn no 123 B was broken and missing and it was also pyriform urn with round base. Inside this urn number of miniature grave pots were noticed including two black and red ware miniature vase (rim were partially damaged in two) one black and red ware miniature bowl and one miniature beaker (partially broken) two miniature black ware lid cum-bowl, and one miniature black ware ring stand (partially broken at rim) . Both urn nos. 123A and B have concentric groove design around the shoulder.</p> <p>Urn 123 C was retrieved in total broken condition.Few skeleton remains were noticed inside this urn along with few grave pots like one black-and-and red ware miniature vase covered with black ware lid cum bowl and black ware ring stand.</p>	<div data-bbox="964 384 1308 898" data-label="Image"> </div> <p>Urn no 123A and grave goods</p> <p>Height of urn – 0.62m Diameter of urn – 0.37m</p> <div data-bbox="980 1087 1325 1497" data-label="Image"> </div> <p>Urn no 123B and grave pottery</p> <p>Height of urn – 0.44m Diameter of urn – Mouth broken</p>

URN No. 124 - Secondary burial

In trench no 2ZC15 at a depth of 1.25m a big wheel- made pyriform shaped Black-and- Red ware urn of medium fabric with conical base and thick rim was found. (Fig 6). The fragile rim was of very coarse fabric. This urn was covered with Black-and- Red ware lid.

A miniature bowl with ash and tiny bones (burnt skull and teeth) were noticed which indicates that it was a secondary burial.

The grave goods found inside the urn included two red slipped (high necked – 0.30m in height and 0.11m diameter at the mouth) vases, one each on the north and western sides respectively at the level of the lid of the urn. While one was intact the other was broken. A big ring stand was noticed. The grave pots noticed outside were one Black-and- Red ware bowl with narrow mouth and sager base having white dotted paintings around the rim, one Black-and- Red ware miniature vase with sharp carination and flaring rim and sager base, one Black-and- Red ware globular vase with broken rim and 4 concentric groove designs around the shoulder and placed in inverted position, three cannoid lid (one intact) with white dotted painting, black ware miniature bowl cum dish.



Urn no 124 and associated
pottery Height of urn – 0.64m
Diameter of urn – 0.40m
Depth of pit – 1.30m
Width of pit – 0.90m

URN No. 125 - Primary burial

A big red ware urn in broken condition was noticed in trench no 2ZC15. Urn was globular in shape with beaded rim. It was covered with broken red ware lid which was mended. The lid has flat base, flaring mouth and out turned rim with two rope like design around rim on the external portion. This urn was filled with thick hard soil and the full skeleton remains like skull, long ones which were found were damaged. It seems to be affected by termite.

The grave pots inside the urn were in broken condition. On the outside of the urn were two red ware vases placed on the northern side and eastern side at lid level (one was totally broken and other was broken and mended), one Black-and- Red ware bowl and two black polished ring stands.



Grave goods of Urn no 125

URN No. 126 – Secondary burial


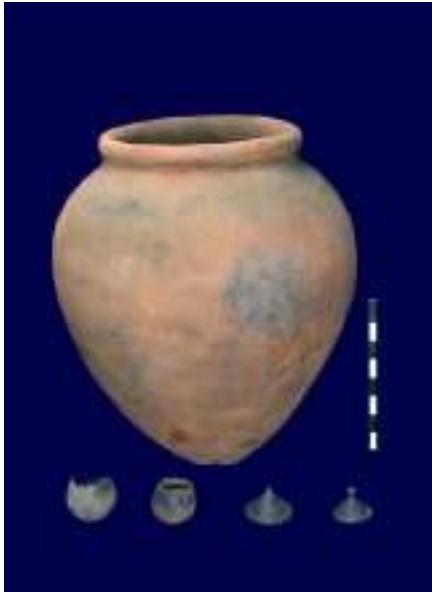
This urn was noticed in the trench no 2ZB15 in broken condition and only lower half was retrieved. An interesting point was stone cushion was given at the bottom of the urn. The grave pots like small bowls in broken condition were noticed inside along with few bones.

URN No. 127 – Secondary burial

In the same trench no 2ZB15, only base of Black-and- Red ware urn was noticed. 18 teeth were collected from the urn. The grave pots found inside the urn were two Black-and- Red ware bowls of which one was covered with an inverted lid and four small bowls. In the pit were found high necked red ware vase and two black polished ring stands.



General view of urn nos. 126 & 127

<p>URN No. 128 - Secondary burial</p> <p>Black-and red ware urn pyriform in shape with conical base and thick rim was noticed in the trench no 2ZB15 at the depth of 1.26m and was accommodated by cutting into the bed rock. The lid used for closing this urn was broken and seen inside the urn. The urn was perfectly kept in the pit cut deliberately to accommodate this urn. Three concentric grove lines are noticed around the body of the urn. The urn was devoid of any grave pots or skeletal remains.</p>	 <p>General view of urn no 128</p>
<p>URN No.129 The urn was completely damaged.</p>	
<p>URN No. 130 - Secondary burial</p> <p>It was a big red ware urn with globular body and thick flaring rim. The base was broken. Finger pinching design was noticed around the neck portion. This urn was noticed in the trench no 2ZB16 at the depth of 1.55m.</p> <p>Mandible along with tooth and tooth of some animal were noticed inside the urn.</p> <p>The grave pots found inside were two bowls of black- and red ware with narrow mouth and sager base and having white dotted painting around the rim (one partially broken) and two black polished ware lids with white dotted painting around the body surface. Two beakers (broken) and two ring stands of Black-and- Red ware (partially broken) were noticed beneath the urn once it was removed.</p> <p>Iron celt and chisel was collected from the southern side of the urn near the bottom.</p>	 <p>Urn no 130 and associated pottery Height of urn – 0.89m Diameter of urn – 0.58m Depth of pit – 1.15m Width of pit – 0.90m</p>
<p>URN No. 131 - Secondary burial</p>	

In the trench no 2ZB16 at the depth of 1.02m, a pyriform shaped handmade red ware urn of coarse fabric and out turned thick rolled rim and flat ring base was noticed. (Fig3).

Only 22 charred teeth were found which included 6 canine teeth placing it in the secondary burial category. As more canine teeth were found it could be a joint burial?

The grave pots noticed inside the urn were bowl with white dotted paintings in oblique manner and one carinated bowl, all of black and red ware.

On the northern end outside the urn, were noticed Black-and- Red ware pottery - two vases of medium size - one vase having white dotted painting around shoulder (rim partially broken) and one bowl, one black polished lid with white dotted painting and one black ware ring stand (both slightly broken). One more beaker was noticed below the urn on the eastern side(broken).



Urn no 131 and associated pottery Height of urn – 0.60m
Diameter of urn –0.33m
Depth of pit –0.82m
Width of pit –0.70m

URN No. 132 - Secondary burial

The base portion of a Black-and- Red ware urn was noticed in the trench no 2ZB16 at the depth 0.94m. It was filled with soil. Damaged grave goods were noticed inside the urn.

URN No. 133 - Secondary burial

A red ware globular urn with flat base and thick beaded rim having finger pinching design around the neck was noticed in the trench no 2ZB16 at a depth of 0.84m. (Fig 2). The urn was filled with brownish loose soil along with small stones. Few fragile bones were found inside the urn.



Inner view of Urn no 133

A red ware globular vase (broken), black and red ware globular vase, three Black-and- Red ware bowls – one with beaded rim and another with featureless rim, two black polished ring stands (one partially broken) was noticed inside the urn. In the pit to the west of the urn was seen a red ware vase. A big black ware ring stand was found below the urn (partially broken).

Height of urn – 0.82m
Diameter of urn – 0.52m
Depth of pit – 1.05m
Width of pit – 1.15m



Urn no 133 and associated pottery

URN No. 134 - Secondary burial

A Black-and- Red ware medium sized urn distinguished by pyriform shape and round base was noticed in the trench no 2ZB16 at the depth of 0.80m. It has in-turned broken rim. Three incised lines were noticed around the shoulder portion. The urn was filled with soil and stones. The soil filling in the top level of the urn was red in colour and at a depth of 0.10 m it changed to ashy brown and was also



General view of Urn no 134

Height of urn – 0.50m
Diameter of urn – 0.30m
Depth of pit – 0.85m
Width of pit – 1.10m

interspersed with few stones.

The grave goods which were noticed inside the urn were Black-and- Red ware bowl with white dotted painting, a Black-and- Red ware beaker (broken) and black polished ware lid, a black ware ring stand (partially broken). On the north eastern corner of the urn, one beaker of Black-and- Red ware with white dotted painting was noticed which was broken, below which a lid was placed upside down. On the western side of the urn another beaker (broken) was noticed and at the southern side of it a ring stand of black ware was noticed placed closely to the urn.

Two Black-and- Red ware bowls were noticed outside the urn near the belly portion one on eastern side and another on western side. Interestingly an iron chisel was noticed placed on the top of the beaker on the northern side in vertical position.



Urn no 134 and associated pottery

URN No. 135 - Primary burial

A red ware urn with pyriform shape with truncated base and straight everted rim, broken partially on one side near the rim was noticed in trench no 2ZB16 at the depth of 1.25m (Fig 4). The pit was cut into the natural rock. The urn was closed with a broken red ware lid which had a flaring mouth and ring like flat top and had fallen inside the urn.

Skeletal remains like fragments of the skull, bones of the upper and lower limbs, the vertebrae were all found inside the urn. The grave goods noticed inside the urn were three Black-and- Red ware bowls (two intact) with white dotted oblique design around rim, one red slipped



Urn no 135 with associated pottery

ware vase, one Black-and- Red ware deep bowl (partially broken), three black polished cannoid lids (on partially broken) and one shallow dish of black and red ware. A ring stand was noticed on the east. The iron objects which were noticed inside include two knives (one with traces of wood), two chisels and a dagger.

Height of urn –0.75m
 Diameter of urn –0.40m (neck portion broken)
 Depth of pit – 1.35m
 Width of pit – 0.95m

URN No. 136 - Secondary burial

A Red ware urn with globular body, flat base and out turned thick flaring clubbed rim with short neck was noticed in the trench no 2ZB16 at a depth of 0.40m. (Fig 3). It was closed with red ware lid with flaring rim and flat base.

The bones were pulverized and very few like the limb bones could be identified. The grave goods found inside the urn were one Black-and- Red ware bowl (broken), one black polished ware ring stand, one broken black ware lid. The goods noticed outside the urn were a beaker (broken) on the south western side and a shallow bowl on the western side.



Urn no 136 and associated pottery

Height of urn – 0.72m
 Diameter of urn –0.40m
 Depth of pit –1.05m
 Width of pit –1.15m

URN No. 137 - Secondary burial

A secondary burial was noticed inside the red ware urn which was closed with a red ware conical lid. Both the urn and the lid were broken. It was ill fired handmade urn of coarse variety. This Urn was found in trench no 2ZB16 at a depth of 1.25m.



Grave goods of Urn no 137

It was filled with soil (which was wet) and affected by the termite. The bones particularly the lower limbs were noticed in vertical position on the east wall of the urn. Skull, mandible, limbs etc were broken and in fragile condition.

The grave goods found outside the urn were black and red ware bowl with white dotted painting, one black ware lid and a red ware globular vase in a

Height of urn –0.80m
Diameter of urn-0.60m
Depth of pit – 1.50m
Width of pit – 1.15m

group on the southern side, a red ware globular vase (rim portion broken). A black ware ring stand was also noticed on the west but near the bottom of the urn. Two black polished black cannoid lids with white dotted paintings were also found. A terra cotta object – hopscotch (?) was found outside urn.

URN No. 138 - Primary burial

A primary burial having full skeleton remains of an adult most probably placed in crouched position was noticed in a red ware urn which was pyriform in shape with thick rim and truncated base. It was covered with a conical Black-and- Red ware lid. (Fig 2).This urn was noticed in trench no 2ZB16 at a depth of 1.20m and to the south of urn no139.

The bones of the limbs were found all on one side while the fragmentary portions of the skull and vertebrae were seen on the opposite side. The remaining portions were all fragmentary.



The grave goods noticed inside the urn were two small dishes (one broken and one partially broken) and two miniature vases – all of black and red ware. The associated potteries noticed outside the urn were a red ware vase east side of the urn at the body level. On the western side of this vase two ring stands of black polished ware were noticed. On the south eastern side two beakers of Black-and-Red ware were noticed (one broken and other was noticed with lid placed inverted into the beaker). After the removal of the pots, one black ware lid and two Black-and-Red ware shallow dishes (one broken) were noticed. One of the shallow dishes contained husk.

Urn no 138 and associated grave goods

Height of urn –0.75m

Diameter of urn –0.38m

Depth of pit – 1.10m

Width of pit – 0.80m

URN No. 139 - Primaryburial

A handmade ill fired globular shaped red ware urn with out-turned flaring beaded rim and narrow neck was noticed in trench no 2ZB16 at a depth of 1.02m and had a truncated ring base. The vertically broken urn was mended. Water logging marks and incrustation was found on the outer surface of the urn which also seemed worn out. It was covered with a red ware lid having a thick rim, flat top and flaring mouth. The lid was almost like an urn cut into half. The pit was cut into the bed rock.

A full skeleton remain of an adult shown seated in crouched position facing west direction was noticed inside. Head was fallen above right leg and broken in to pieces. One small stone was noticed inside the urn along with skeleton remain.



<p>Grave goods were noticed above the skeletal remains which include two red ware vases and Black-and- Red ware pottery like one vase with white dotted paintings, one big shallow dish , bowls (big, small and beaker like) Two cannoid lids of black ware were also noticed.</p> <p>In the pit outside the urn, black ware ring stands were noticed in the south, east and west. A shallow bowl of Black-and- Red ware was seen on the east and a black polished cannoid lid was kept in the south east. Besides three more cannoid lids were also found. The associated potteries noticed in the pit were a black polished cannoid lid on the south east, a Black-and-Red ware small dish on the east, a black ware ring stand and red ware vase on west side of urn in broken condition and three black polished ware cannoid lid with white paintings (all partially broken).</p> <p>Husk samples were collected from a big bowl placed on the centre above the skeleton remains.</p> <p>An iron spear head (broken in to pieces) was noticed on the south west side. The presence of a big iron sword probably kept vertical and large number of grave goods suggests that it was an important burial urn.</p>	<p>Urn no 139 and associated grave goods</p> <p>Height of urn – 1m Diameter of urn –0.56m Depth of pit – 1.65m Width of pit –0.90m</p>
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URN No. 140 - Secondary burial

A red ware urn was noticed in trench no 2ZB15 at a depth of 1.70m. The pit was made by cutting the natural rock. It was a red ware pyriform shaped urn having with thick straight rim and flat ring base. It has finger pinching design around the neck of the urn. (Fig 5). Two dotted protuberance like eyes on the shoulder of the urn with 4 lines of thumb impression running a few cms in anticlockwise direction were noticed.

The grave goods noticed inside the urn were of Black-and- Red ware - a deep bowl with white dot paintings, a bowl, and bowl with black ware lid with white dotted painting (partially broken), shallow dish and a flat base lid like bowl in black ware.

On the east and south east at belly level of the urn were noticed red ware vases (one on south east broken). A shallow dish of Black-and- Red ware and ring stand of black ware (partially broken) were noticed on the eastern corner outside the urn. Apart from this, two black polished cannoid lids, four ring stands, and a deep bowl were noticed in broken condition.



Urn no 140 and associated grave goods Height of urn –

1.02m

Diameter of urn –

0.56m Depth of pit

– 2m

Width of pit – 1.50m

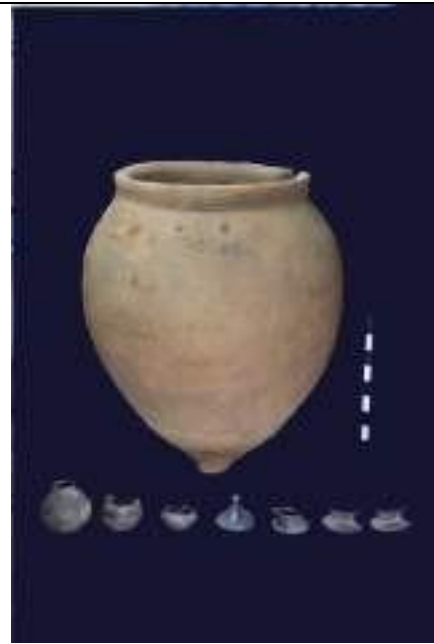
URN No. 141 - Secondary burial

In the same trench at the depth of 2.40 m, a red ware handmade urn distinguished with thick flaring out turned rim, and globular body was noticed. (Fig 5). It had a flat ring base. Two eye like protuberances with two lines of finger impression starting in-between two dots and one running in anticlockwise direction and another in clock wise direction for few meters like border to the dots or protuberance was noticed. Lid was noticed in the broken condition and urn was filled with soil and small stones.

Fragile and fragmentary pieces of bone were unearthed. Rice husk was noticed outside the urn.

One black polished ware globular vase with straight and beaded rim having white dotted paintings in oblique manner around the shoulder, one red ware vase (broken), one cannoid lid with white dotted paintings and few broken pot shards were found in the urn.

Two bowls and ring stand and few grave pots were noticed west side of the urn. They were three black ware ring stand (all partially broken), six black-and- red ware bowls (two intact including one carniated bowl) and two black ware lid (totally broken).



Urn no 141 and associated pottery

Height of urn – 0.98m
Diameter of urn – 0.60m
Depth of pit – 2.15m

Width of pit – 1.25m

URN No. 142 - Secondary burial

A medium size red ware with pyriform shape, thick flaring rim and truncated base, with very short neck was noticed at the depth of 0.90m in trench no 2ZB15. (Fig 3). It was a hand-made coarse variety urn closed with a lid whose broken pieces were noticed in the urn along with soil and silt.

One globular vase and one shallow bowl of Black-and- Red ware were noticed outside the urn on east side. The grave pot inside included two black-and red ware bowls, (partially broken) one black-and red ware bowl with white dotted painting, one red slipped medium sized vase, two black ware ring stands(partially broken). Apart from this few grave pots in broken condition was noticed. An iron sword and arrow head kept vertically outside the urn were noticed.



Urn no 142 and associated grave goods

Height of urn – 0.93m
Diameter of urn – 0.52m
Depth of pit – 1.60m
Width of pit – 1.30m

URN No.143 - Secondary burial

The lower half of a badly damaged black-and red ware urn with few grave pots was noticed in trench no.2ZB15. The grave goods of Black-and- Red ware included – deep bowls – 2 with white dotted paintings (one broken), miniature vases- 2 (one broken), partially broken dish on stand. A Black-and- Red ware bowl was seen outside.



Grave goods of urn no 143

URN No. 144 - Primary burial

A red ware urn with globular body, short neck and out turned flaring beaded rim and flat ring base was found in trench no 2ZB16. (Fig 4). It was a handmade urn having finger pinching design around the neck.

The bones except for the limb bones were fragmentary and very fragile. No grave goods were noticed in this urn. One iron dagger was placed outside the urn.



Urn no 144

Height of urn – 0.90m
Diameter of urn – 0.55m
Depth of pit – 1.6m
Width of pit – 1.45m

URN No. 145 - Secondary burial

In the trench no. 2ZB16 at a depth of 1.08m a black- and red ware urn was noticed with pyriform shape, thin in section, incurved small rim and with no prominent neck. An ill fired wheel made urn it is decorated with three horizontal bands running around at shoulder level. (Fig 6). The urn was closed with half broken Black-and- Red ware lid. The urn was filled with soil and affected by termite.

The grave goods inside the urn included black and red ware – bowls (3) with white dotted paintings in two and a miniature vase; one black polished ware lid with white dotted painting on its surface.

At east side of the urn in the pit at the lower level were found one red ware vase, a black polished cannoid lid with collared rim, one beaded bowl, Black-and- Red ware bowl were found. Except lid all were in broken condition



Urn no 145 and associated grave goods

Height of urn – 0.50m
Diameter of urn – 0.32m
Depth of pit –0.80m
Width of pit –0.70m

URN No. 146 - Secondary burial

Urn with globular body and thick beaded rim was noticed in trench no 2ZB17 at a depth of 1.19m. This urn was superimposed by urn no 91 and both are in the same pit. The urn was closed with a lid which was broken. Between these two urns was a layer having the whitish patch finely packed with rubble and murrum. The urn was filled with a mixture of loose soil and silt and stones.



Grave goods of urn no 146

Height of urn – 0.56m

Diameter of urn – 0.32m

Some charred bones and others in highly disintegrated condition were noticed inside the urn.

The grave pots found inside urn were black-and red ware pottery – bowls (3), shallow bowl (1), miniature vases (2) – of which one had white dotted painting, , squat vase with rim broken - painted at the neck (white dots) with linear lines, and one black ware lid. Of the miniature vases only one was intact.

Grave goods were noticed on three sides of the urn in the pit. In the south was a Black-and- Red ware bowl containing husk and two black ware ring stands (one contained husk). To the west was a black and red ware globular vase and to the north were a bowl and a wide mouthed shallow bowl.

Iron chisel broken into two was noticed at a depth of 0.50m in the pit to the south of the black and red ware globular vase.

Depth of pit – 1.60m

Width of pit – 0.96m

URN No. 147 - Secondary burial

A pyriform shaped wheel made black-and-red ware urn with thin walls clubbed with a thick rim was noticed in trench no 2ZC15 at a depth of 1.24m and was resting on the bedrock. It was of medium fabric, and was vertically cracked and mended. The urn was filled with murrum and stones right from the top.

Fragmentary pieces of skull, mandible, vertebrae and limb bones of small size were noticed (burial of child) and some of them were charred.

Only two miniature Black-and- Red ware bowls (one broken) were the grave goods found inside the urn.

The grave goods noticed outside the urn were placed to the north east, east, south and south east of the urn. The goods in the north east were placed at three levels – near the shoulder of the urn was a short necked red ware vase. Below it was a bowl of Black-and- Red ware with white dotted paintings and a cannoid lid of black ware and finally was a ring stand of black ware. A vase of Black-and- Red ware was found to the east and south (broken) of the urn respectively while the south east had a cannoid lid and ring stand of black ware and a bowl of black and red ware near the bottom of the urn.



Urn no 147 and associated grave goods

Height of urn – 0.64m
Diameter of urn – 0.42m

URN No. 148 - Secondary burial

In trench no 2ZC15 at the depth of 0.94 m a short necked pyriform shaped red ware urn was noticed in damaged condition. Since the Black-and- Red ware lid was broken, the urn was filled with soil and silt. Fragmentary bone pieces were noticed inside the urn.

The grave goods inside the urn were one black-and red ware carinated bowl (partially broken) and one black polished ring stand. Red ware vases were noticed placed outside the urn towards the west, north west, east and south east. All were broken. A black and red ware bowl was covering the jar as a lid on the south east.



Grave pot of urn no 148

Urn no. 149 - Secondary burial



A globular shaped black-and red ware urn was noticed in trench no 2ZB15 at a depth of 1.92m. It was a high necked ill fired urn with beaded rim and of coarse fabric. The urn was filled with soil and silt.

The grave goods pots which were noticed inside the urn were mostly in broken condition. The intact ones were two small sized Black-and- Red ware vases and two ring stands of black ware - one has elongated body and other looks like cup on stand. An iron chisel was noticed inside the urn.



Grave goods of urn no 149

Height of urn – 0.46m
Diameter of urn – 0.26m
Depth of pit – 0.75m
Width of pit – 0.65m

<p>Urn No. 150 - Secondary burial</p> <p>In trench no 2ZC17 at a depth of 0.55m, a broken Black-and- Red ware urn of pyriform shape and conical bottom was noticed. The lid which was used to close the urn was broken and had fallen in to the urn. This urn was placed above urn no151.</p> <p>Some skeleton remains were noticed inside the urn below the soil filling.</p> <p>Two Black-and- Red ware bowls and a black ware ring stand were noticed as grave goods inside the urn.</p>	 <p>Grave goods of urn no 150 Urn - broken Depth of pit – 1.10m Width of pit – 1.35m</p>
<p>URN No. 151 – Secondary burial</p> <p>A red ware globular shaped urn with thick out-turned rim and closed with a broken lid was found in trench no 2ZC17 at a depth of 0.70m. A handmade urn with a truncated base and finger impression around the neck, the urn was filled with soil. (Fig 4). Though urn 150 was placed above this urn the lid of this urn was only damaged but still covering the urn. Both the urns were placed in the same pit.</p> <p>Fragmentary bones including skull were noticed inside the urn. The grave goods found inside the urn were a black and red ware shallow dish with straight featureless neck having lines of painting in white colour painted at regular intervals on the rim, a bowl (broken) and a miniature vase of the same ware and a black polished lid with white dotted paintings.</p> <p>Grave goods noticed outside the urn were Black-and- Red ware - big shallow cum lid, miniature lid and two black polished ring stands (all partially broken) and a miniature black ware lid.</p>	<p>Urn no 151</p>  <p>Height of urn – 0.90m Diameter of urn – 0.55m Depth of pit – 1.10m Width of pit – 1.35m</p>

Urn no 152 - Primary burial

A handmade red ware urn with globular shaped body, out turned flaring straight rim and ring base was found in trench no 22C17 at a depth of 1.15m. (Fig 1) The pit was cut into the bedrock. An urn of coarse fabric, the outer surface was peeling off. It was closed with a cracked red ware lid. The lid was also handmade with a flat ring base and the top having mat impression. It had a flaring mouth and thin rim and the whole lid was mended.

The position of the bones indicated that the body was placed in a crouched position with the lower limbs balanced along the wall of the urn and the lower limbs fallen on one side. The bones of the vertebrae were on the opposite side and the skull etc had fallen in the centre of the urn.

The grave goods were noticed as if placed above the body. They included Black-and-Red ware pottery – shallow bowl, big sized carinated dish with straight sided neck, beaded rim and conical base and a lota type vase with out-turned rim (broken). A black polished ware ring stand and a lid of the same ware with white dotted painting were also retrieved.

Height of urn – 0.90m
Diameter of urn – 0.54m
Depth of pit – 1.70m
Width of pit – 1.30m



Urn no 152 in situ

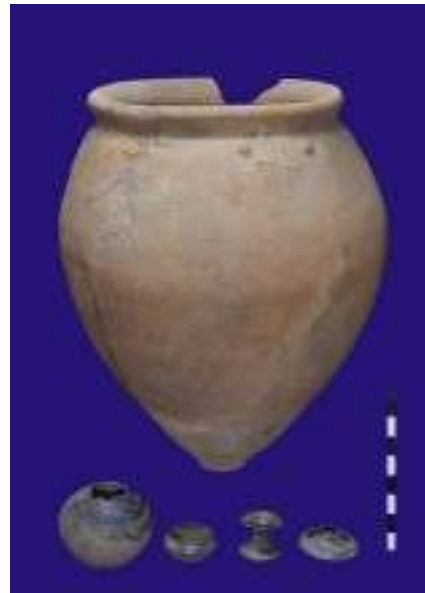


Inner view of urn no 152

URN No. 153 - Secondary burial)

A big red ware globular shaped urn with thick out- turned flaring rim and incised design around the neck was noticed inside trench no 2ZB15 at the depth of 1.92m. (Fig 5). It was handmade and of coarse variety. The urn had two dotted 'eye like' protuberance at the shoulder level and in between them were six rows of finger impression running down for few metres. thumb impression was also noticed at the neck level and running around.

The grave goods found inside the urn were of Black-and- Red ware - a globular vase with white dotted paintings around the shoulder (rim partially broken), a carinated bowl, a black polished ware ring stand with protruded band around the neck and a lid (knob broken) with white dotted paintings.



Urn no 153 and associated grave goods

Height of urn – 0.94m

Diameter of urn – 0.61m

URN No. 154 - Secondary burial

A medium sized pyriform shaped red ware urn with thick beaded rim and truncated base was noticed in the trench no 2ZC15. (Fig1).

No skeleton remains were noticed.

The grave goods of black and red ware noticed inside the urn were three bowls with narrow mouth and white dotted paintings around the rim, a beaker with white dotted paintings, a miniature vase, a small globular vase (rim broken), a black ware cannoid lid with white dotted paintings and two ring stands (one looks like cup on stand -partially broken) also of the same ware.

The associated pottery noticed outside the urn were black ware shallow dish cum lid, two cannoid lids with white dotted paintings, big black ware polished ring stand and a Black-and- Red ware bowl with white dotted paintings. Three red ware vases were placed around the urn (all broken).

Bangles and chisels – two each of iron were noticed along with the urn.



Top view of Urn No. 154

Height of urn – 0.68m

Diameter of urn –0.38m



Inner view of Urn No. 154

URN No. 155 - Primary burial

A big wide mouthed red ware urn in damaged condition was noticed with a broken red ware lid in the trench no 2ZC17 at the depth of 1.71 m. The urn was globular in shape with thick beaded rim and finger incised design around the neck. The urn was filled with soil, silt and stones. In the same pit was also placed urn no 15 and the gap between the two urns



<p>was 0.20m.</p> <p>Skeletal remains in the urn were badly disintegrated and the bones could hardly be identified. No pottery was found with the burial.</p> <p>Iron implements such as two knives, a celt, arrow head, and dagger were placed around the urn in the pit in vertical position.</p>	<p>General view of urn no 155</p> <p>Height of urn –0.70m Diameter of urn –0.54m Depth of pit – 1.90m Width of pit – 1.30m</p>
<p>URN No. 156 The urn was completely damaged.</p>	
<p>URN No. 157 – Secondary burial</p> <p>A big red ware urn with globular body, thick flaring rim was found in trench no 2ZC15 at a depth of 0.80m. (Fig 2). A row of incised designs seem to be made with some sharp instrument was noticed around the neck. It was handmade urn of coarse fabric. The base of the urn was flat and round in shape. The urn was covered with a red ware lid which was half broken.</p> <p>Fragmentary bones and skull was noticed inside the urn. The grave goods noticed inside the urn were of Black-and- Red ware - two bowls with white dotted paintings, one large shallow bowl (partially broken) and one black ware ring stand with wide base and narrow top.</p> <p>The associated ware found outside the urn were, red slipped ware vase with flaring rim, two black polished ware ring stands (one was having wide base and narrow mouth), a black polished lid with white dotted design and a Black-and- Red ware bowl with white dotted paintings.</p>	<div data-bbox="966 718 1390 1318" data-label="Image"> </div> <p>Urn no 157 and associated grave goods</p> <p>Height of urn – 0.75m Diameter of urn – 0.49m Depth of pit – 1.15m Width of pit – 1.30m</p>

URN No. 158 – Secondary burial

This urn was noticed above the urn no 160 in the same pit. Both the urns were seen in trench no 2ZC17. It was a big red ware urn with globular body, distinguished with wide mouth, thick in-turned rim. (Fig 3). It had a flat ring base. It was hand made coarse fabric urn. The urn was closed with a red ware lid.

No skeletal remains and grave goods were found inside the urn. The associated ware which was noticed inside the urn were red ware vase, black polished lid with white dotted paintings, Black-and- Red ware bowls one with white dotted paintings and the other carinated, a miniature vase and a shallow dish (broken) of the same ware, one black polished ring stand.



General view of urn no 158

Height of urn – 0.75m
Diameter of urn 0.49m

URN No. 159 – Secondary burial

In the trench no 2ZB17, a big red ware urn with globular body having thick flaring rim was noticed. It had finger impression design around the neck. (Fig 5). It has two dotted 'eye like' protuberance on the shoulder and in between are three lines of pinching design one turning in clock wise direction, another in anti-clock wise direction and one running straight down. It was closed with a big red ware lid big having flaring mouth, thick rim and almost hemispherical in shape. It was partially broken and mended. No bones were found in the urn.

The grave goods found inside the urn were two black ware ring stands (like cup on stand), medium sized Black-and- Red ware globular vase and beaker with white dotted paintings, a miniature black and red ware vase with white dotted paintings, two cannoid lids of black polished ware with white dotted paintings.

Outside the urn were noticed on the north - a red ware vase (partially broken) at body level, on the south - a beaded black and red ware bowl with white dotted painting nearby body (broken). Apart from these were noticed a Black-and- Red ware big shallow dish cum bowl, vase with white painting, a big black polished ring stand, and a broken black ware lid with white painting.



Urn no 159 and associated grave goods

Height of urn – 1.05m

Diameter of urn –0.60m

URN No. 160 Secondary burial

It is a red ware globular urn and closed with lid of red ware which was in broken condition. A red ware vase noticed at lid level of the urn. Urn no 158 was placed by disturbing urn no 160, hence it is totally damaged.

<p>Depth of pit – 1.8m Width of pit – 1.10m</p>	
<p>URN No. 161 – Secondary burial</p> <p>A globular shaped red ware urn with rolled internally turned rim and flat ring base was noticed in trench no 2ZB17. Urn was totally broken and mended. (Fig 2) Two rows of incised design below the neck were noticed in this urn. No bones were found in this urn.</p> <p>The grave goods included pottery of Black-and- Red ware - two vases with white dotted painting around shoulder (rim of one vase broken), four bowls (three having white dotted painting around rim), one miniature lid cum bowl and one black polished ring stand (partially broken).</p> <p>Two copper rings found inside the urn.</p>	<div data-bbox="946 478 1349 1043" data-label="Image"> </div> <p>Urn no 161 and associated grave goods</p> <p>Height of urn – 1.10m Diameter of urn –0.63m</p>
<p>URN No. 162</p> <p>The urn was completely damaged.</p>	

URN No. 163 - Secondary burial

Red ware urn of pyriform shape with out-turned thick rim and flat ring base was found in trench no 2ZB17. Water logging marks was noticed in the exterior surface. No bones were found in this urn.

The grave goods found inside the urn were one Black-and- Red ware vase with white dotted painting around shoulder, a black-and red ware miniature high necked vase, one black polished ware ring stand (like cup on stand) and one Black-and- Red ware lid cum bowl which looks like a lamp was noticed.



Urn no 163 and grave goods

Height of urn – 1.35m

Diameter of urn -0.71m

Urn No.163 B – Secondary burial

A broken Black-and- Red ware urn was noticed in trench no 2ZB17. only grave goods like three Black-and- Red ware bowls (one carinated) were found.






Inner view of urn no 163B

Urn No 164 – Secondary burial

A broken Black-and- Red ware urn having conical base with some grave goods was noticed. They included Black-and- Red ware pottery - two deep bowls, two medium sized bowls with white dotted painting around rim (partially broken) and carinated bowl.



Grave goods of urn no 164

<p>Urn No 165 – Secondary burial</p> <p>A Black-and- Red ware urn with globular body, round base, thick rim was noticed. It has 4 concentric lines around the shoulder portion.No bones were found.</p> <p>Two partially broken Black-and- Red ware bowls (one carniated) were noticed along with urn.</p>	 <p>Urn no 165 and associated grave goods</p> <p>Height of urn – 0.90m Diameter of urn –0.45m</p>
<p>URN No. 166 – Secondary burial</p> <p>It was a medium sized red ware urn with pyriform shape in-turned rim and flat ring base found. It was handmade, of coarse variety fabric. Fragmentary bones were noticed.</p> <p>The grave goods found along with this urn were broken red ware vase, one black-and red ware bowl with white dotted painting, one black ware ring stand like cup on stand, and one black polished broken lid with white paintings.</p>	 <p>Urn no 166 and associated pottery</p> <p>Height of urn – 0.78m Diameter of urn –0.48m</p>
<p>URN No. 167 – Secondary burial</p> <p>A medium sized pyriform shaped red ware urn with truncated base and thick everted rim was found. No bones were found in this burial.</p> <p>The grave goods associated with this urn were one Black-and- Red ware vase with white dotted paintings (rim broken), one broken black ware ring stand like cup on stand, one miniature lid cum bowl and one miniature cannoid black ware lid.</p>	 <p>Urn no 167 and associated grave goods</p> <p>Height of urn – 0.69m Diameter of urn –0.35m</p>

URN No. 168 - Secondary burial

A red ware big urn with globular body, high neck, flaring mouth and thick rim having pinching design around the neck was found in trench no 2ZB16. (Fig 5). It has conical bottom flat base and hole seen in the body surface may be for revetment. Two 'eye like' protuberances in the body surface were noticed. In between these dots were three rows of appliqué design running down like in Urn 16. Initially the urn was closed with two black-and red ware lids upside down and then it was closed with red ware lid which was broken totally and only the Black-and- Red ware lids were intact.

One big and one small red ware vases were noticed on the northern side of the urn at the lid level. Urn no 163 B was placed one side of this urn.

Skull and mandible fragments in fragile condition were noticed.

The grave goods found inside the urn were one red ware medium sized vase with slip, two black-and red ware small vases, one black-and red ware lota type vase, (broken up to neck), two Black-and- Red ware carinated bowl (one partially broken) and two black polished cannoid lids with white dotted paintings.



General view of urn no 168



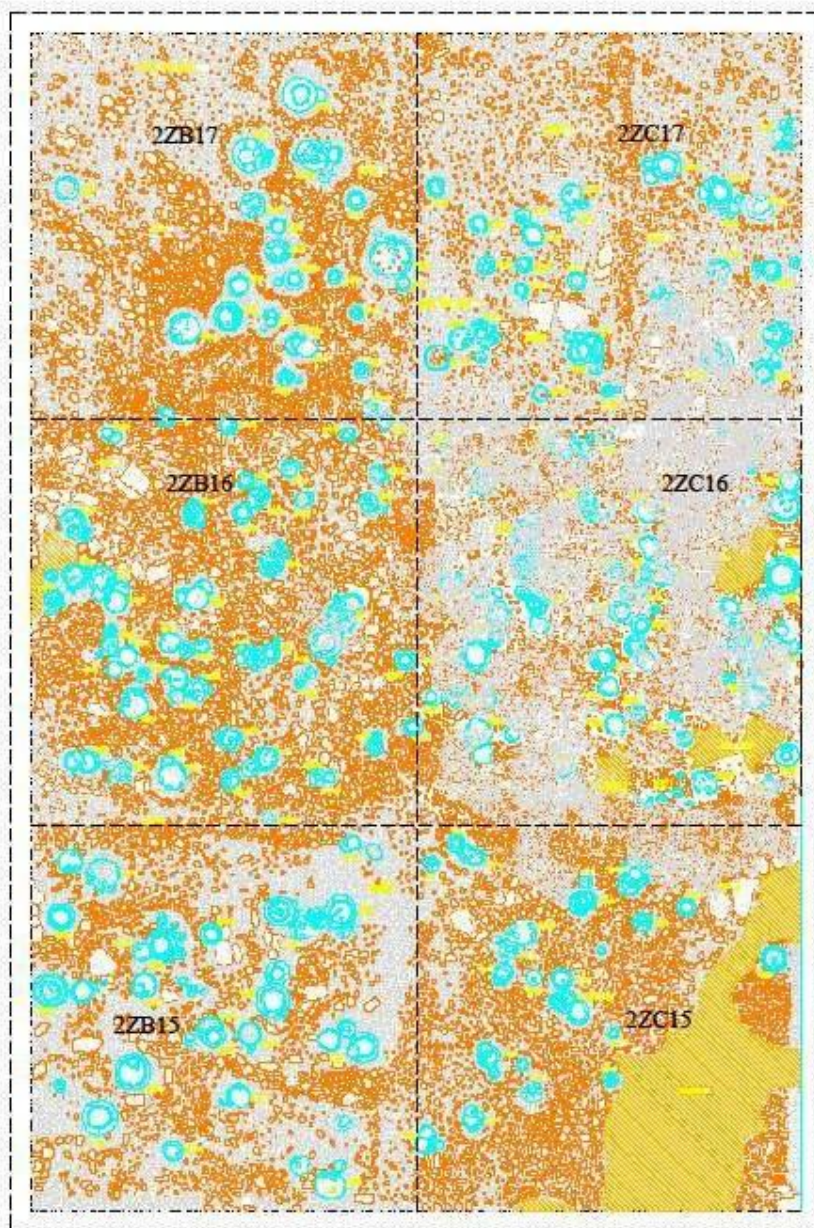
Urn no 168 and associated grave goods

<p>The grave goods placed outside the urn were two broken red ware vases, one Black-and- Red ware bowl, one black polished ring stand (partially broken).</p>	<p>Height of urn – 1.03m Diameter of urn –0.50m</p>
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EXCAVATED SITE AT ADICHCHANALLUR

DIST: THOOTHUKUDI

STATE: TAMIL NADU



PLAN

COMPLETE PLAN OF THE BURIAL URNS

APPENDIX II-

(a) Report from Institute of Physics, Bhubaneswar

Regd. 1001

भौतिकी संस्थान
भुवनेश्वर
Institute of Physics
Bhubaneswar-751005, India
(भारतीय ऊर्जा विभाग, भारत सरकार के एक स्वायत्त अनुसंधान संस्थान)
(An autonomous research institution of Dept. of Atomic Energy, Govt. of India)

Dr. V. Vijayan
Health Physicist

No. 520/HF /IOP

January 3, 2005

Dr. T. Satyamurthy
Superintending Archaeology
Archaeology Survey of India
Chennai Circle
Fort St. George
Chennai - 600 009.

Dear sir,

Please find enclosed herewith a copy of the report on analysis of Fe and Cu objects.

With best regards,

Yours faithfully
Vijayan
(V. Vijayan)

Archaeological Survey of India
Chennai Circle, Chennai-9.
Diary No. 478 Date 10/1/05
File No. _____ Section Tech

पो. ऑ. - सैनिक स्कूल, भुवनेश्वर - 751 005, भारत
P.O. SAINIK SCHOOL BHUBANESWAR-751005, INDIA
दूरभाष / Tel: (0674)300637, 301058, 301205, 301823, फैक्स / FAX: (0674)300142, वेब : Web: <http://www.iopb.res.in>
E mail: vijayan@iopb.res.in

Table: Concentration (in weight %) of various elements of the iron samples

Sl. No	Cu	Ti	V	Mn	Fe	Ni	Cr	P	S
Fe5	0.23	1.07	0.12	0.10	94.49	—	0.037	—	0.19
Fe6	—	1.44	0.13	0.10	93.70	0.058	—	0.36	0.12
Fe7	0.15	1.38	0.10	0.15	95.52	0.087	0.030	0.39	0.20
Fe8	0.11	1.52	0.16	0.24	94.27	0.086	0.043	—	0.15
Fe9	0.20	1.63	—	0.17	93.42	0.071	0.035	0.30	0.24
Fe10	0.14	1.50	0.059	0.18	94.37	0.092	0.051	0.34	0.13
Fe11	0.17	1.44	0.049	0.29	95.38	0.090	0.044	0.36	0.16
Fe12	0.21	0.37	0.32	0.17	96.59	0.075	0.032	0.52	—
Fe13	—	—	—	—	—	—	—	—	—
Fe14	0.34	1.47	—	0.32	94.13	0.24	—	0.44	0.18
Fe15	0.26	1.76	0.16	0.12	94.52	0.038	0.046	0.48	0.25
Fe16	0.17	2.11	0.14	0.18	93.46	0.038	0.037	0.35	0.20
Fe17	0.39	2.19	0.17	0.27	92.77	0.25	0.046	0.27	0.14
Fe18	0.42	1.99	—	0.28	94.19	0.31	—	—	0.17
Fe19	0.24	1.99	0.20	0.21	93.26	0.097	0.053	0.45	0.22
Fe20	0.25	1.68	—	0.14	95.44	0.10	0.032	0.40	0.15
Fe21	0.14	1.80	0.095	0.13	93.62	0.038	0.046	—	0.20
Fe22	0.13	2.04	0.15	0.26	94.08	0.25	0.039	0.41	0.21
Fe23	0.34	1.90	0.18	0.16	94.15	0.23	—	0.28	0.11
Fe24	0.18	1.76	0.23	0.25	94.74	0.21	0.043	0.33	0.15
Fe25	0.28	2.12	0.25	0.21	92.83	0.18	0.045	—	0.24
Fe26	—	1.76	0.19	0.17	94.18	0.079	0.067	0.34	0.11
Fe27	0.19	1.77	0.25	0.37	93.90	0.18	—	0.27	—
Fe28	0.28	1.75	0.28	0.31	95.71	0.15	0.038	0.38	0.18
Fe29	0.15	1.85	0.19	0.14	93.86	0.11	0.041	0.45	0.20
Fe30	—	1.14	0.13	0.14	93.48	0.086	0.041	0.41	0.23
Fe31	—	1.73	0.23	0.10	94.41	0.064	—	0.65	0.15
Fe32	0.41	1.44	0.21	0.12	94.23	0.051	0.031	0.46	0.23
Fe33	0.36	1.57	0.15	0.32	93.60	0.063	0.035	0.51	0.28
Fe34	0.38	2.75	0.18	0.32	94.05	0.065	0.042	0.47	0.12
Fe35	—	1.70	0.22	0.12	94.05	0.068	0.033	0.59	—
Fe36	0.25	1.80	—	0.11	94.79	0.080	—	0.42	0.15
Fe37	0.32	1.67	0.29	0.38	93.22	0.10	0.054	0.40	0.27
Fe38	0.27	1.46	0.17	0.11	94.54	0.060	0.032	—	0.18
Fe39	0.39	1.49	0.26	0.10	94.51	0.046	0.035	0.43	0.24
Fe40	0.43	1.64	0.14	0.36	94.58	0.14	0.038	0.56	0.26
Fe41	0.18	2.40	0.19	0.20	91.79	0.18	0.043	0.57	0.16
Fe42	0.29	1.73	0.25	0.18	94.05	0.10	0.049	0.38	0.19
Fe43	0.31	1.94	0.15	0.15	93.16	0.12	0.037	0.42	0.23
Fe44	0.19	1.84	0.18	0.16	94.87	0.10	—	0.47	0.11
Fe45	0.24	1.90	—	0.11	94.35	0.086	0.041	0.53	0.25
Fe46	0.34	0.67	0.17	0.33	95.90	0.054	0.049	0.39	0.17
Fe47	0.37	0.94	0.16	0.14	94.96	0.15	0.038	—	0.20
Fe48	0.40	0.86	0.23	0.21	94.42	0.12	—	0.46	0.22
Fe49	0.32	1.76	0.27	0.24	94.26	0.10	0.039	0.43	0.14
Fe50	0.31	1.16	0.16	0.17	94.26	0.10	0.045	0.38	0.17
Fe51	0.21	2.16	—	0.10	92.88	0.066	0.030	0.54	0.26
Fe52	0.11	1.34	0.13	0.41	95.20	0.14	0.035	0.56	0.15
Fe53	0.15	1.95	0.15	0.13	94.14	0.038	0.037	0.61	0.21
Fe54	0.13	0.99	0.26	0.17	95.09	0.10	0.046	0.54	0.26
Fe55	0.24	1.09	0.28	0.13	94.39	0.067	0.032	0.44	0.23

Table: Concentration (in ppm by weight unless mentioned) of various elements of the slag samples

Sl. No.	Si (%)	P (%)	S (%)	Ca (%)	Ti (%)	V	Mn (%)	Fe (%)	Ni	Cu	Rb	Sr	Zr
Fes41b	39.18	0.12	0.12	—	0.027	89.7	0.11	8.93	262.8	—	162.5	17.5	330.8
51b	—	0.51	0.15	0.14	0.018	55.9	—	11.51	124.6	35.8	105.0	76.8	—
14b	—	1.89	0.36	0.27	0.026	75.7	0.12	14.06	482.0	—	357.1	28.7	186.3
38b	—	0.52	—	0.35	—	57.6	—	6.16	47.6	52.1	—	—	251.7
1b	—	0.16	0.18	—	0.74	426.3	0.10	7.77	45.2	43.6	94.3	177.8	—
1b1	—	0.68	0.55	0.23	0.18	184.2	0.13	14.37	174.9	25.7	253.1	95.8	310.7
1b2	—	0.52	—	—	0.82	52.1	0.12	2.43	—	—	46.9	29.6	188.1
1b3	—	—	0.11	0.19	0.17	108.6	0.14	6.96	66.2	40.9	55.6	69.7	328.6
1b4	20.87	—	0.33	0.28	0.48	295.0	0.20	8.82	170.6	—	543.9	175.2	2437.0
4a	—	0.53	0.18	0.13	0.22	421.8	0.17	19.99	48.0	30.7	418.6	49.5	223.0

External PIXE technique

Particle induced x-ray emission (PIXE) is a unique technique for performing non-destructive analysis using measurements of characteristic x-rays induced by a millimeter size proton beam (MeV energy scale) directed onto the surface of a specimen¹. This technique has successfully been used for analysis of various types of samples for almost three decades. The reasons for use of PIXE as a method of choice for characterization of various materials are its well-known features like multi elemental capabilities, small sample mass requirements, high sensitivity, large dynamic range, and simple or virtually no need for sample preparation method. At the Ion Beam Laboratory of Institute of Physics, Bhubaneswar, the PIXE technique for ion beam analysis of samples was first started in 1992. Since then, various environmental, geological, archaeological and biological samples have been analyzed using PIXE, and were reported from time to time. This technique employs the proton beam from the 3 MV Tandem pelletron accelerator and samples are irradiated keeping them in vacuum. But, while dealing with specific samples of archaeological (manuscripts etc.), biological (fishes, teeth etc.) and geological materials (big rocks etc.), the pre-requisite of pellet-making procedure makes the conventional PIXE technique unusable (either the sample or a part of it needs to be destroyed at the sample preparation stage itself). To overcome this difficulty, there is a need to bring the proton beam outside the accelerator vacuum to carry out the analysis by the external PIXE method. The advantage of this method is that the samples of almost any size and type can be analyzed 'as such'. This technique has several advantages apart from easy sample handling and positioning in air. Objects of large size and complex structure and shape can be analyzed in-situ without the need of sampling, a fact particularly valuable for art objects. Also, it is possible to study materials containing volatile compounds, which could otherwise not withstand in vacuum. The risk of damage due to heating is considerably reduced (mostly not) because of efficient cooling by the air or the helium flow. Another positive aspect is that the charging of insulating materials can totally be avoided without the need of a thin conducting coating required when operating under vacuum. Indeed, charging effects can produce potentials up to several tens of keV and accelerate accordingly secondary electrons with a subsequent extension of the bremsstrahlung background to higher energy. The detection limit would then be markedly increased. This paper describes the recent development of an external PIXE set-up at Institute of Physics and some of the preliminary experiments that were carried out.

The Institute of Physics external proton beam facility

The proton beam energy of 3 MeV obtained from the 3 MV tandem type pelletron accelerator was collimated by a graphite collimator to a beam size of 3 mm diameter and the beam was extracted using a KaptonTM foil at the exit point of a vacuum scattering chamber (8 microns thickness). The scattering chamber has an inner diameter of 80 cm and was designed to cater to the requirements of the external beam as well as to serve for the charged particle reaction measurements for nuclear physics experiments. The beam is first focused and centered at the target location inside the scattering chamber and then let through the thin Kapton foil placed at the exit port. The chamber is pumped by a high throughput diffstack pump to maintain a vacuum in the range of 10^{-7} mbar in the chamber and the beam line. The KaptonTM foil is used as exit window due to its several special

characteristics like low beam-induced background emission, minimal energy loss and resistance to radiation damage. The beam is allowed to travel 2.5 cm in air by which the energy get reduced to about 2.5 MeV, and the proton beam then irradiates the targets. Charge measurements were carried out using a rotating chopper. The targets were kept in air over a sample stand (of 5kg capacity) making an angle 90° to the beam direction. In case of incompatible big samples, the stand was removed and samples were adjusted (and/or positioned) according to the requirement. The samples were irradiated with maximum beam current of 20 nA passing through 8 micron thick KaptonTM window. A Si (Li) detector (active area 30 mm^2) having energy resolution of full-width at half maximum (FWHM) of 165 eV at 5.9 keV placed at 45° with respect to the beam direction) was used to detect characteristic X-rays emitted from the target. The detector has an active area of 30mm^2 and an entrance beryllium window of 8-microns thickness. A 50-microns thick aluminium absorber (with 6% hole) was kept in front of the detector to attenuate the bremsstrahlung background and the dominant low energy X-ray peaks. Spectra were recorded by using a PC based multi channel analyzer.

Concentration (by wt.%) of elements in copper objects from
Adichchanallur

Elements	Sample No 2	Sample No. 3	Sample No.4
Fe <i>Iron</i>	0.02	1.46	5.25
Ni <i>Nickel</i>	0.029	0.033	0.046
Cu <i>Copper</i>	91.49	87.48	87.95
As <i>Arsenic</i>	6.37	4.62	3.85
Au <i>Gold</i>	0.99	0.81	0.90
Su <i>Tin</i>	--	0.95	--
Pb <i>Lead</i>	--	2.68	--

(b) Report from Manipur University – OSL Dating

The OSL/TL dating of Adichchanallur pottery was carried out by Dr.Raj Kishore Gartia of Manipur University.

The un-calibrated dates furnished are as follows. All dates furnished below are from the Middle phase.

Sl.No	Sample No	Trench No	Urn No	Age(Ka)(BP)
1	1	2ZB16	U-52	3000±700
2	4	2ZC16	U-21	2700±600
3	8	2ZB17	U-104	3160±600
4	13	2ZC15	U-10	3400±700
5	16	2ZB17	U-93	2600±500
6	Thin pottery	2ZB17/2		2500±530
7	Thin Pottery	2ZC16Q2-Layer		1920±350

(c.) Report of Shri A.K. Sharma, (Retd. SA,ASI) – On Bones

**The bones of Adichchanallur were studied by Shri. A.K. Sharma,
Superintending Archaeologist (Rtd.)**

Adichchanallur Burials

The rough Red ware urns used for burial are mostly very large in size wide mouth, having featureless rim and conical base. As the burials have yielded apart from human skeletal remains, both belonging to primary and secondary interments; smaller sized bowls, vases and significantly typical Black and Red ware megalithic pottery, but as per the tradition concept stones are absolutely absent here so the excavator adopted to call the site as a Urn burial site. There are two phases of interments; In case of secondary burials as the human skeletal remains were interred after the body of the deceased remained exposed to the atmosphere, whatever remains could be collected have been interred. Whereas in case of primary burials including the one i.e. Urn No 83-B which yielded a double burial, the human body was put inside the urn by folding the fore and hind limbs and tying them with bark or vegetation rope when the flesh was still intact. The limbs were folded to such an extent that the body could easily be inserted inside the urn. In case of urn- 83-B, one of the almost intact skeletons appears to have been put in sitting posture.

In almost all cases bones are very fragile and fragmentary and due to desiccation, they have become light in weight and porous. The reason for increase in spongy texture is also perhaps due to salt action as; as per practice sodium chloride (common salt) was sprinkled over the body before the urn mouth was closed with lid.

Urn – 58

The skeletal remains recovered from this urn belong to a female aged around 30 to 35 years. The skull though found in very much damaged condition and in fragments, after preliminary reconstruction shows dolichocephalism i.e. long-headed characters, with sharp nasal spine, narrow straight forehead. Hardly any sutures of the skull show fusion. The mastoid process is smooth and not so prominent. Glabella point is prominent. Eye orbit is thin and sharp indicating to female characters. Except the eye orbit and the maxilla bone all other facial bones are missing. Of the mandible, only fragments with a molar are present. Cusps of the molar are well developed and do not display any marked wear and tear. Chin is smooth and slightly protruding indicating to single chin.

Urn-60

The urn yielded fragmentary bones in highly fragile condition. These bones belong to a fully mature individual of nearly 5' 2 to 4" height

(d.) Bio Report of Dr.Raghavan Pathmanathan

Bio Report-1

General Pathological Abnormalities of Adichchanallur's prehistoric humans

According to Raghavan *et al* (2008) the recovered skeletons showed many striking pathological and structural abnormalities, which were caused by a number of epigenetic variants, nutritional factors and bio-cultural alterations. A large number of tumorous growths, sexually transmitted diseases, and epidemic diseases including infectious diseases, age and work related sicknesses particularly on bones were also identified. Observation of pathological problems on long bones provides fascinating data on these prehistoric humans. They can be observed on various fossa, articular condyles, angles of the condyles and heads, outer structure of auditory canals, texture and hardness of the skeletal material. Injuries including cut and crack marks on various long bones and crania indicate the physical conflicts and the application of various weapons.

Further skeletal evidences of trauma episodes experienced by the Adichchanallur's past populations could be divided into many forms such as fracture caused by a number of factors including mechanism - Flexion(bending, shearing, compression, rotation, and traction or tension. Raghavan *et al* (2008) further observed that the fracture complications on the bones incorporated with following healing processes such as delayed healing, pseudoarthrosis, poor alignment, bone shortening, osteomyelitis, avascular necrosis of bone, neuropathy and articular changes. Observations on cranial portions and rushing injuries on the recovered crania were caused by a number of used. On the basis of the nature of the injuries, they were divided as

sharp edged incisions caused by metal /flint axis, penetrating wounds created by pointed and hafted weapons, linear fractures on the skulls which reflect the application of blunt and small weapons. The gross crushing injuries were resulted by using large stones and clubs. The neck bones and other vertebrae were also showed injury marks and fractures. Long bones of the skeletons often showed luxations where as degenerative changes were found at the upper portion.

General conclusions

The current investigations are based particularly on the non-metric traits of the recovered skeletons and dentitions. They are kept at the head office of Archaeological Survey of India at Chennai. In addition to this material, we have also utilized the Adichchanallur crania deposited at the Tamil Nadu Government Museum at Egmore.

The present investigation showed the presence of various races during the Iron Age period at the sub coastal prehistoric harbor town at Adichchanallur. It also confirms Kennedy's investigations on the Egmore material in 1986. Associated materials along with the burials had yielded vital clues for the maritime trade activities at the Southern rim of the Indian Ocean. Recoveries of many Tamil cultural artifacts in Vietnam, Cambodia and other South East and Far East Asian countries right from Iron Age till early 17th century prove that there were aggressive free sea trades activities, flourished for a long time. Even ancient Tamil epics have mentioned about them. Physical Anthropologists, Archaeologists, Geologists and Pre-historians should systematically excavate this area. The recovered skeletal biological data is insufficient to draw a genuine conclusion on the ancient community structure. The results on pathological skeletal and dental abnormalities are just amazing. So far these abnormalities had never been reported from anywhere. Information on epigenetic variants, genetical pathology and osteogenetics may

contribute good clues for the evolutionary genetics and the various factors of stress and strain that operate upon the sea voyagers and settlers of the Iron Age India.

Bio Report-2

Abnormalities caused by other factors:

Our preliminary studies on the Adichchanallur's skeletons and dental elements indicate that there were considerable numbers of other factors responsible for certain abnormalities on the skeletons. For example, cuts, holes, fissures and scars on the bones shows about the physical conflicts or cultural / intentional alterations.

These researchers have also observed considerable number of diseases, which affects the bones such as bone rickets, criba, leprosy, tuberculosis, and some other sexually transmitted diseases by the micro organisms like bacteria and virus. The malnutrition problems were mainly caused by the inadequate supply of appropriate vitamins and minerals.

Abnormalities caused by the genetic factors and epigenetic variants on Adichchanallur's skeletons.

In an international conference held on Archaeological Sciences at the Australian National University in early 2008, where *Raghavan et al* came up with their new discoveries on the pathological abnormalities of the recovered skeletal material from Adichchanallur. On the basis of the nature of the abnormalities, they have divided the skeletal abnormalities into two major divisions. They are constitutional abnormalities – cause the mechanical defects. They include the unusual position or presence and angles of various parts of the skeletal material.

These abnormalities might have caused by some epigenetic variants e.g.: Urn 83-B provided a male and a female skeleton. The lateral view of the male cranium shows the presence of a typical archaic form (extraordinary) of Henle spine (suprameatal groove). This structure is generally responsible for independent movements of the external ear as some of the muscles of the pinna are attached to this structure (in various mammals including nonhuman primates). This is normally found only in a vestigial or underdeveloped condition in humans. (Yet this is not an isolated case; a majority of the unearthed crania show this peculiar trait). The right parietal fragment of the male 83-B has a well-developed parietal eminence. The female skeleton of 83B also shows some abnormal features. The sub mandibular fossa is exceptionally well developed, extending from the angle of the mandible to the symphysis menti, and is divided by a prominent ridge at its anterior $\frac{1}{4}$. The mandibular angle of 90° is also a noticeable curiosity.

The lower jaw of U81 shows two fossae below the mylohyoid line. The small anterior fossa is separated from the large posterior by a small ridge of bone. This suggests either that the anterior one is meant for the sublingual gland and the posterior for the sub- mandibular gland, or that the sub-mandibular gland might have been a bi-lobed structure.

The right humerus from the skeleton of Urn 152 also shows some constitutional abnormalities. The trochlea is very wide and sloping downwards, and the capitulum is not developed in the rounded form as in modern populations but is almost horizontal. The trochlear notch of the ulna is also oblique, corresponding with the trochlea of the humerus.

Further *Raghavan et al (2008)* had also observed congenital disorders such as Craniosynostosis (premature closure of sutures) which causes an abnormal shaped skull – depends on which bones are affected. These clinically abnormal conditions are often found in the prehistoric populations. They cause morphological variations such as plagiocephaly, scaphocephaly, and trigonocephaly. Clinically normal values indicate intracranial structures are symmetrical and have specific or standard density, position, size and shape. Some of the morphological alterations were caused by genetic factors such as “autosomal dominant trait” or “rare autosomal recessive trait”.

Bio Report-3

Results and Conclusion

The victim was well past 60 years of age and suffering from a Benign **Pott's puffy tumor**. It is well developed on the right superciliary ridge and also found at rudimentary stage on the left side. This pathological condition was first described by Sir Percivall Pott in 1760. This condition is characterized by an osteomyelitis of the frontal bone with frontal breakthrough, either direct or through haematogenic spread. As the result, there is a swelling found on the forehead, hence the name. The infection has a tendency to spread inwards, leading to an intracranial abscess. This pathological condition has no age bar, it is mostly found among teenagers and adolescents. Often it attacks the sea traveler and deep sea divers.

It has also been noticed that this individual was suffering from Acute sinusitis. Initially it starts as an upper respiratory tract infection, generally of viral. It is usually precipitated by an origin. If the infection is of bacterial origin, the most common 3 causative agents are *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* respectively. *Haemophilus influenza* in the past was the most common bacterial agent to cause sinus infections. Fungal invasion can also initiate acute episodes of sinusitis. These infections are most often seen in patients with diabetes or other immune deficiencies. Chemical irritation can also trigger sinusitis. Commonly, from cigarettes and chlorine fumes. Rarely, it may be caused by a tooth infection.

General facts about **Pott's puffy tumor**

- Pott puffy tumor is defined as a subperiosteal abscess of the frontal bone with frontal *osteomyelitis*.
- Frontal sinus infection can spread directly through the thin bone wall of this sinus or through the network of small veins that drain its mucosa.
- Today, this is a rare complication given the widespread use of antibiotics.
- Trauma and frontal sinusitis are the most common causes of this condition.
- The bacteria causing Pott puffy tumor usually reflect the type of bacterial species responsible for community-acquired chronic sinusitis with the most common causal organisms being *streptococci*, *staphylococci*, and *anaerobic bacteria*. Cultures frequently reveal polymicrobial involvement.

- The infection may spread as a *thrombophlebitis* from the frontal sinus through the diploicveins, involving the intracranial space with consequent epidural lor Subdural *empyema*, meningitis, brain abscess, and venous sinus thrombosis.

Few more skulls with such *Puffy Tumor* conditions unearthed from Adichchanallur are deposited with the Egmore Museum. On the whole, Iron Age cemetery of Adichchanallur has granted wonderful information on many branches of Bio archaeology, Bio anthropology and Social Archaeology.

(e) Report on Archaeo-botanical Studies

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Introduction

The excavations at Adichchanallur in Tutukudi District of Tamil Nadu were carried out under the direction of Dr.T. Satyamurthy, Former Superintending Archaeologist, Archaeological Survey of India, Chennai Circle, in 2004-05 (Satyamurthy 2007). Adichchanallur is a single cultural Iron Age site wherein 3 phases were noticed based on the burial patterns. The phase 1 dates back to 850 BCE and Phase 2 dates back to 640-650 BCE. The archaeo-botanical samples retrieved from the excavations have been sent to Prof. M.D. Kajale (now retired from Deccan College, Pune) for further studies. The same samples were therefore kindly assigned to me by Dr.T. Satyamurthy. These samples have been recovered from the repository of Palaeo-botany Laboratory and studied. It has been found that, these samples were collected from six trenches viz., 2zB15, 2zB16, 2zB17, 2zC15, 2zC16 and 2zC17. There are two kinds of samples: 1) wet sieved (flotation) samples and 2) husk samples. The total number of wet sieved samples is 61 and that of the husk samples is 23. All these samples are arranged trench-wise, layer-wise and depth-wise (Table 1 to 3) and studied in detail with respect to morphological and anatomical features of grains/seeds, husk and spikelet bases, etc.

Table 1: List of Flotation Samples from Adichchanallur, Tr. No. 2zB15 to 2zB17.

Table 2: List of Flotation Samples from Adichchanallur, Tr. No. 2zC15 to 2zC17.

Table 3: Samples for Palaeo-botanical Analysis, Tr. No. 2zB15 to 2zC17.

Materials and Methods

The wet sieved samples were in the form of dry compact soil lumps. These were deflocculated in water and immersed in water containing tub. It resulted in the release of carbonized botanical material from the soil and floating to the surface, where it was scooped out by using 10 micron size mesh. Special care was taken to see that no organic materials howsoever minute are lost through the mesh. The residual matter was thoroughly examined for grains as well as for other organic material. The recovered carbonized materials were, therefore, sorted out, preserved in mesh and dried without directly exposing it to the sunlight and stored in plastic vial to avoid mechanical damage.

All these plant remains were segregated and categorized in Palaeobotany laboratory under low power Stereo-binocular microscope (LEITZ WETZLAR). It has been found that the grains, seeds and spikelet bases which did not actually catch fire during conflagration but burnt slowly, retained their shape and fine morphological details. Characteristic features such as embryonic position, hylum scar, etc., were retained in some of the carbonized grains. The husk samples were found preserved in silicified condition. These were critically studied and identified on the basis of external morphological features and also photographed satisfactorily under a low-power stereo microscope (WILD HeerbruggM400). The total numbers of grains, seeds and spikelet bases belong to each species from all the trenches have been noted. Identifications were made using the reference collection housed at Deccan College, and relevant published material. Measurements of grains and seeds were taken using a stage micrometer and an ocular disc. The material has been plotted

quantitatively, trench-wise, layer-wise and the results are summarized as under (Table 4 to 10).

Table 4: Archaeo-botanical remains from Tr. 2zB15

Table 5: Archaeo-botanical remains from Tr. 2zB16

Table 6: Archaeo-botanical remains from Tr. 2zB17

Table 7: Archaeo-botanical remains from Tr. 2zC15

Table 8: Archaeobotanical remains from Tr. 2zC16

Table 9: Archaeo-botanical remains from Tr. 2zC17

Table 10: Samples for Palaeo-botanical Analysis, Tr. No. 2zB15 to 2zC17.

Description of the archaeo-botanical remains

1. Silicified rice (*Oryza* sp.) husk (Fig. 1:a and b):Single silicified rice husk from Tr. 2zB16 and lot of silicified rice husk with characteristic chessboard pattern have been noted along with the Vase, southern side of main Urn, south of Urn below the GPO from Tr. 2zB15; from bowl inside the Urn and GPI from Tr. 2zB16; along with bowl and a ring stand, outside the Urn and below the Urn on the North from Tr. 2zB17; beneath the GPO on Eastern side, beneath the Urn and outside the Urn from Tr. 2zC15; outside the Urn and GPI from Tr. 2zC16 and Eastern side of Urn, from the bottom of Urn, along with Bowl, below the Urn and inside the Urn from Tr. 2zC17.

2. Silicified rice (*Oryza* sp.) spikelet bases (Fig. 1:c):Six silicified spikelet bases of cultivated rice (*Oryza sativa* L.) and single wildrice? (*Oryza* sp.) have been noted from Tr. 2zB16 and lot of silicified rice spikelet bases along with the Vase, southern side of main Urn, south of Urn below the GPO from Tr. 2zB15; from bowl inside the Urn and GPI from Tr. 2zB16; along with bowl and a ring stand, outside the Urn and below the Urn on the North from Tr. 2zB17; beneath the GPO on

Eastern side, beneath the Urn and outside the Urn from Tr. 2zC15; outside the Urn and GPI from Tr. 2zC16 and Eastern side of Urn, from the bottom of Urn, along with Bowl, below the Urn and inside the Urn from Tr. 2zC17.

3. Carbonised rice (*Oryza* sp.) spikelet bases (Fig. 1:d-i):Eight carbonised spikelet bases smaller than 1 mm of mature and immature rice grains of cultivated rice (*Oryza sativa* L.) from Tr. 2zB16 and single from 2zC17 have been noted.

4. Green gram (*Vigna radiata* (L.) Wilczek) (Fig. 1:j):A single complete carbonised cotyledon of green gram (*Vigna radiata* (L.) Wilczek) measuring 2.53 mm x 1.75 mm (*LxB*) have been noted from Tr. 2zB16. Cotyledon is elongated and characterized by squarish to somewhat rounded ends. In general morphology, the carbonized cotyledon is therefore referred to as *Vigna radiata* (Green gram). Four pulse fragments from Tr. 2zC16 and two from Tr. 2zC1 have also been recorded.

5. *Vigna* sp. (Fig. 1:k and l):A single dormant un-carbonised seed measuring 2.69 mm x 1.74 mm (*LxB*) have been noted from Tr. 2zB15 at the depth of 2.16m. The complete seed is elongated and somewhat cylindrical in appearance, hilum about 1.00 mm long is situated below the level of seed-coat surface. In general morphology, the seed is therefore referred to as *Vigna* sp.

6. *Solanum* sp. (Fig. 1:m):A single carbonised seed measuring 1.40 mm x 0.72 mm has been recorded from Tr. 2zB16.

7. Nutshell,(Fig. 1:n):Two fragments of nutshells have been noted, one each from Tr. 2zB15 and 2zB16.

Fig. 1 Archaeo-botanical remains from Adichchanallur: *a* and *b*, Silicified rice (*Oryza* sp.) husk; ***c*,** Silicified rice (*Oryza* sp.) spikelet bases; ***d-i*,** Carbonised rice (*Oryza* sp.) spikelet bases; ***j*,** Cotyledon of green gram (*Vigna radiata* (L.) Wilczek); ***k* and *l*,** Dormant seed of *Vigna* sp. ***m*,** seed of *Solanum* sp. ***n*,** Broken Nutshell (Scale: 1mm).

Discussion and Conclusion

The foregoing archaeo-botanical investigation of carbonized grains, seeds, silicified husk and rice spikelet bases recovered from urn burial deposits at Adichchanallur have brought to light valuable information on ancient agriculture economy and cultural values such as crop seed offerings in the urn burials. The study is exclusively based on the analytical studies of 84 samples of well-preserved carbonized as well as silicified plant remains recovered from the excavations of season 2004-05.

The wet sieved samples contained carbonised seeds, grains, rice spikelet bases and also silicified husk, and spikelet bases of cultivated rice (*Oryza Sativa* L.), fragments of green gram (*Vigna radiata* (L.) Wilczek), a single un-carbonised seed of *Vigna* sp., a single seed of *Solanum* sp., fragments of nutshells and microcharcoal bits/pieces. The dry samples of husk comprised silicified spikelet bases and husk of wild? and cultivated rice. These plant remains, coming as they do from earthen urn burials, represent earthen offerings made to the dead. The offerings were of two kinds: 1) placing fresh rice grains with husk in earthen baked pots and 2) direct offerings of rice grains to urn burials. On the basis of these findings, it can be concluded that the ancient settlers at Adichchanallur dated to the

early first millennium BC have cultivated both rice and green gram.

Acknowledgements

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List of Tables

Table 1: List of Flotation Samples from Adichchanallur, Tr. No. 2zB15 to 2zB17

1. Tr. No. 2zB15					
Sr. No.	Sample No.	Urn No.	Layer No.	Depth in m	Sample
1	55	132	2	0.94	Wet Sieved Soil
2	54	29	3	1.08	Wet Sieved Soil
3	64	58	3	2.16	Wet Sieved Soil
2. Tr. No. 2zB16					
4	76	75	1	0.59	Wet Sieved Soil
5	74	80	2	0.72	Wet Sieved Soil
6	86	80	2	0.72	Wet Sieved Soil
7	81	81	2	0.75	Wet Sieved Soil
8	50	70	2	0.77	Wet Sieved Soil
9	71	70	2	0.77	Wet Sieved Soil
10	88	76	2	0.80	Wet Sieved Soil
11	39	68	2	0.85	Wet Sieved Soil
12	22	64	2	0.92	Wet Sieved Soil
13	6	83A	2	0.95	Wet Sieved Soil
14	35	74	2	0.97	Wet Sieved Soil
15	40	82	2	1.00	Wet Sieved Soil
16	42	82	2	1.00	Wet Sieved Soil
17	67	134	2	1.04	Wet Sieved Soil
18	16	65	2	1.21	Wet Sieved Soil
19	69	136	2	1.36	Wet Sieved Soil
20	36	83B	3	1.38	Wet Sieved Soil
21	38	130	3	1.55	Wet Sieved Soil
3. Tr. No. 2zB17					
22	20	95	2	0.68	Wet Sieved Soil
23	15	93	2	0.80	Wet Sieved Soil
24	32	88	2	1.06	Wet Sieved Soil
25	21	86	2	1.62	Wet Sieved Soil
26	95	85A	3	1.38	Wet Sieved Soil
27	14	146	3	-	Wet Sieved Soil
28	23	146	3	-	Wet Sieved Soil

Table 2: List of Flotation Samples from Adichchanallur, Tr. No. 2zC15 to 2zC17

4. Tr. No. 2zC15					
Sr. No.	Sample No.	Urn No.	Layer No.	Depth in m	Sample
29	46	7	2	-	Wet Sieved Soil
30	84	11	2	0.59	Wet Sieved Soil
31	51	4	2	0.62	Wet Sieved Soil
32	17	101	2	0.68	Wet Sieved Soil
33	83	123	2	1.92	Wet Sieved Soil
5. Tr. No. 2zC16					
34	12	32	2	0.49	Wet Sieved Soil
35	27	32	2	0.49	Wet Sieved Soil
36	56	32	2	0.49	Wet Sieved Soil
37	9	3	2	0.77	Wet Sieved Soil
38	1	20	2	0.88	Wet Sieved Soil
39	43	20	2	0.88	Wet Sieved Soil
40	22	18	-	0.09	Wet Sieved Soil
41	5	39	2	1.00	Wet Sieved Soil
42	11	22	2	1.05	Wet Sieved Soil
43	30	22	2	1.05	Wet Sieved Soil
44	96	22	2	1.05	Wet Sieved Soil
45	97	22	2	1.05	Wet Sieved Soil
46	78	17	2	1.09	Wet Sieved Soil
47	85	17	2	1.09	Wet Sieved Soil
48	94	17	2	1.09	Wet Sieved Soil
49	31	19	2	1.10	Wet Sieved Soil
50	62	19	2	1.10	Wet Sieved Soil
51	63	19	2	1.10	Wet Sieved Soil
52	8	30	3	1.18	Wet Sieved Soil
53	53	16	2	1.18	Wet Sieved Soil
54	65	16	2	1.18	Wet Sieved Soil
55	80	41	3	1.20	Wet Sieved Soil
56	58	32B	3	1.46	Wet Sieved Soil
6. Tr. No. 2zC17					
57	2	43	2	0.34	Wet Sieved Soil
58	24	44	2	0.79	Wet Sieved Soil
59	79	44	2	0.79	Wet Sieved Soil
60	25	45	3	1.32	Wet Sieved Soil
61	19	111	2	1.53	Wet Sieved Soil

Table 3: Samples for Palaeo-botanical Analysis, Tr. No. 2zB15 to 2zC17

S. No.	Sample No.	Trench No.	Urn No.	Layer No.	Depth in m	Sample	Remark
1	47	2zB15	58	2	2.48	Husk	-
2	108	2zB15	62			Unidentified	Along with the Vase
3	23	2zB15	140	3	2.1	Husk	Southern side of main Urn
4	105	2zB15	58	1		Husk	South of Urn below the GPO
5	83	2zB16	138	3	1.2	Traces of Wood on Bone	
6	76	2zB16	135	3	1.38	Wood	From bowl inside the Urn
7	39	2zB16	83B	murum	1.38	Husk	
8	62	2zB16	83B	murum	1.38	Husk	From GPI
9	101	2zB17	146	3	1.86	Husk	Along with bowl and a ring stand
10	81	2zB17	86	2	1.62	Husk	Outside the Urn
11	64	2zB17	105	3	1.86	Husk	Below the Urn on the North
12	87	2zC15	4	2	0.62	Husk	
13	21	2zC15	4	2	0.62	Husk	Beneath the GPO on Eastern side
14	56	2zC15	45	3	1.32	Husk	Beneath the Urn
15	96	2zC15	144			Husk	
16		2zC15	36	2	1.46	Husk	Outside the Urn
17	25	2zC16	30	3	1.7	Husk	Outside the Urn
18	88	2zC16	35	3	2.1	Husk	GPI
19	91	2zC17	114	2	1.99	Husk	Eastern side of Urn
20	92	2zC17	121	2	1.72	Husk	From the bottom of Urn
21	104	2zC17	114	3	1.99	Husk	Along with Bowl
22	73	2zC17	50	2	1.92	Husk	Below the Urn
23	40	2zC17	108			Husk	Inside the Urn

Table 4: Archaeo-botanical remains from Tr. 2zB15

Adichchanallur 2004	Serial No.	1	2	3	SUM
	Sample No.	55	54	64	
	Layer No.	2	2	3	
	Urn No.	132	29	58	
	Depth in m	0.94	1.08	2.16	
Species	Notes	No remains			
<i>Vigna</i> sp.	Dormant seed			1	1
Indet Nutshell	Fragments		1		1
Microcharcoal bits			2	5	7

Table 5: Archaeo-botanical remains from Tr. 2zB16

Adichchanallur 2004	Serial No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	SUM
	Sample No.	76	74	86	81	50	71	88	39	22	6	35	40	42	67	16	69	36	38	
	Layer No	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	
	Urn No.	75	80	80	81	70	70	76	68	64	83A	74	82	82	134	65	136	83B	130	
	Depth in m	0.59	0.72	0.72m	0.75	0.77	0.77	0.80	0.85	0.92	0.95	0.97	1.00	1.00	1.04	1.21	1.36	1.38	1.55	
Species	Notes																			
<i>Oryza sativa</i> L.	Spikelet base Carbonised	1		4	2													1		8
<i>Oryza sativa</i> L.	Spikelet base Silicified			6																6
<i>Oryza</i> sp.	Spikelet base Silicified			1																1
<i>Oryza</i> sp.	Silicified Husk		1																	1
<i>Vigna radiata</i> (L.) Wilczek)	Cotyledon		1																	1
<i>Solanum</i> sp.	Intact Seed			1																1
Indet Nutshell	Fragments					1														1
Microcharcoal bits		5	1	5	8	20	4	25	8	7	3	23	8	8	2	9	4	12	3	155

Table 6: Archaeo-botanical remains from Tr. 2zB17

Adichchanallur 2004	Serial No.	1	2	3	4	5	6	7	SUM
	Sample No.	20	15	32	21	95			
	Layer No.	2	2	2	2	3	3	3	
	Urn No.	95	93	88	86	85A	146	146	
	Depth in m	0.68	0.80	1.06	1.62	1.38	-	-	
Species	Notes								
Microcharcoal bits		1	0	19	5	4	3	0	32

Table 7: Archaeo-botanical remains from Tr. 2zC15

Adichchanallur 2004	Serial No.	1	2	3	4	5	SUM
	Sample No.	46	84	51	17	83	
	Layer No.	1	2	2	2	2	
	Urn No.	7	11	4	101	123	
	Depth in m	-	0.59	0.62	0.68	1.92	
Species	Notes						
Microcharcoal bits		10	3	10	12	4	39

Table 8: Archaeo-botanical remains from Tr. 2zC16

Adichanallur 2004	Serial No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	SUM
		12	27	56	9	1	43	52	5	11	30	96	97	78	85	94	31	62	63	8	53	65	80	58	
	Layer No.	2	2	2	2	2	2		2	2	2	2	2	2	2	2	2	2	2	3	2	2	3	3	
	Urn No.	32	32	32	3	20	20	18	39	22	22	22	22	17	17	17	19	19	19	30	16	16	41	32B	
	Depth in m	0.49	0.49	0.49	0.77	0.88	0.88	0.90	1.00	1.05	1.05	1.05	1.05	1.09	1.09	1.09	1.10	1.10	1.10	1.18	1.18	1.18	1.20	1.46	
Species	Notes							1						1											2
Pulse	Fragments					2												1		1					4
Microcharcoal bits		1	3	5	4	5	20	2	5		2	30	3	5	7	12	2	5	5	6	20	4	8	4	158

Table 9: Archaeo-botanical remains from Tr. 2zC17

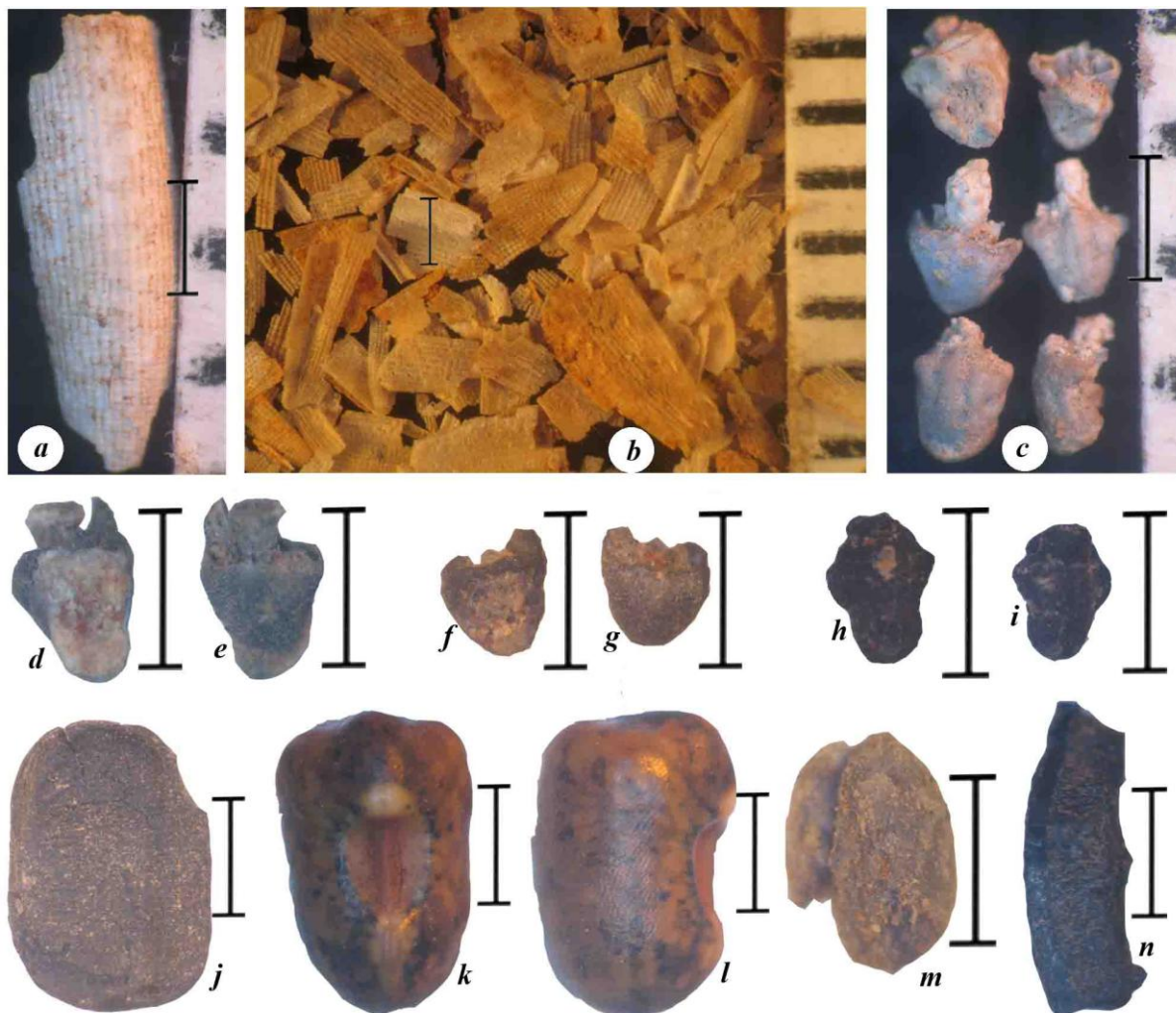
Adichchanallur 2004	Serial No.	1	2	3	4	5	SUM
	Sample No.	2	24	79	25	19	
	Layer No.	2	2	2	3	2	
	Urn No.	43	44	44	45	111	
	Depth in m	0.34	0.79	0.79	1.32	1.53	
Species	Notes						
<i>Oryza sativa</i> L.	Spikelet base Carbonised	1					1
Pulse	Fragments	1		1			2
Indet		1					1
Microcharcoal bits			2	6	10	3	21

Table 10: Samples for Palaeo-botanical Analysis, Tr. No. 2zB15 to 2zC17

Sr. No.	Sample No.	Trench No.	Urn No.	Layer No.	Depth in m	Sample	Remark	Identification
1	47	2zB15	58	2	2.48	Husk	-	<i>Oryza</i> sp. (Rice) Husk
2	108	2zB15	62			Unidentified	Along with the Vase	<i>Oryza</i> sp. (Rice) Husk
3	23	2zB15	140	3	2.1	Husk	Southern side of main Urn	<i>Oryza</i> sp. (Rice) Husk
4	105	2zB15	58	1		Husk	South of Urn below the GPO	<i>Oryza</i> sp. (Rice) Husk
5	83	2zB16	138	3	1.2	Traces of Wood on Bone		<i>Oryza</i> sp. (Rice) Husk
6	76	2zB16	135	3	1.38	Wood	From bowl inside the Urn	<i>Oryza</i> sp. (Rice) Husk
7	39	2zB16	83B	murrum	1.38	Husk		<i>Oryza</i> sp. (Rice) Husk
8	62	2zB16	83B	murrum	1.38	Husk	From GPI	<i>Oryza</i> sp. (Rice) Husk
9	101	2zB17	146	3	1.86	Husk	Along with bowl and a ring stand	<i>Oryza</i> sp. (Rice) Husk
10	81	2zB17	86	2	1.62	Husk	Outside the Urn	<i>Oryza</i> sp. (Rice) Husk
11	64	2zB17	105	3	1.86	Husk	Below the Urn on the North	<i>Oryza</i> sp. (Rice) Husk
12	87	2zC15	4	2	0.62	Husk		<i>Oryza</i> sp. (Rice) Husk
13	21	2zC15	4	2	0.62	Husk	Beneath the GPO on Eastern side	<i>Oryza</i> sp. (Rice) Husk
14	56	2zC15	45	3	1.32	Husk	Beneath the Urn	<i>Oryza</i> sp. (Rice) Husk
15	96	2zC15	144			Husk		<i>Oryza</i> sp. (Rice) Husk
16		2zC15	36	2	1.46	Husk	Outside the Urn	<i>Oryza</i> sp. (Rice) Husk
17	25	2zC16	30	3	1.7	Husk	Outside the Urn	<i>Oryza</i> sp. (Rice) Husk
18	88	2zC16	35	3	2.1	Husk	GPI	<i>Oryza</i> sp. (Rice) Husk
19	91	2zC17	114	2	1.99	Husk	Eastern side of Urn	<i>Oryza</i> sp. (Rice) Husk
20	92	2zC17	121	2	1.72	Husk	From the bottom of Urn	<i>Oryza</i> sp. (Rice) Husk
21	104	2zC17	114	3	1.99	Husk	Along with Bowl	<i>Oryza</i> sp. (Rice) Husk
22	73	2zC17	50	2	1.92	Husk	Below the Urn	<i>Oryza</i> sp. (Rice) Husk
23	40	2zC17	108			Husk	Inside the Urn	<i>Oryza</i> sp. (Rice) Husk

List of Figures

Fig. 1 Archaeo-botanical remains from Adichchanallur: *a* and *b*, Silicified rice (*Oryza* sp.) husk; *c*, Silicified rice (*Oryza* sp.) spikelet bases; *d-i*, Carbonised rice (*Oryza* sp.) spikelet bases; *j*, Cotyledon of green gram (*Vigna radiata* (L.) Wilczek); *k* and *l*, Dormant seed of *Vigna* sp. *m*, seed of *Solanum* sp. *n*, Broken Nutshell (Scale: 1mm).



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ISO/IEC 17025:2005-Accredited Testing Laboratory

March 18, 2019

Dr. Sathyabhama Badhreenath
Archaeological Survey of India
Chennai Circle Fort St George
Chennai, 600009
India

RE: Radiocarbon Dating Results

Dear Dr. Badhreenath,

Enclosed are the radiocarbon dating results for two samples recently sent to us. The report sheet contains the Conventional Radiocarbon Age (BP), the method used, material type, and applied pretreatments, any sample specific comments and, where applicable, the two-sigma calendar calibration range. The Conventional Radiocarbon ages have been corrected for total isotopic fractionation effects (natural and laboratory induced).

All results (excluding some inappropriate material types) which fall within the range of available calibration data are calibrated to calendar years (cal BC/AD) and calibrated radiocarbon years (cal BP). Calibration was calculated using one of the databases associated with the 2013 INTCAL program (cited in the references on the bottom of the calibration graph page provided for each sample.) Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric ^{14}C contents at certain time periods. Looking closely at the calibration graph provided and where the BP sigma limits intercept the calibration curve will help you understand this phenomenon.

Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than ± 30 years, a conservative ± 30 BP is cited for the result.

All work on these samples was performed in our laboratories in Miami under strict chain of custody and quality control under ISO/IEC 17025:2005 Testing Accreditation PJLA #59423 accreditation protocols. Sample, modern and blanks were all analyzed in the same chemistry lines by qualified professional technicians using identical reagents and counting parameters within our own particle accelerators. A quality assurance report is posted to your directory for each result.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact us.

Sincerely,

Digital signature on file

Chris Patrick Director



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REPORT OF RADIOCARBON DATING ANALYSES

Sathyabhama Badhreenath
Archaeological Survey of India

Report Date: March 18, 2019
Material Received: February 25, 2019

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes	
		Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 519499	Urn-No-58	2510 +/- 30 BP	IRMS $\delta^{13}C$: -24.5 o/oo

(67.7%)	696 - 540 cal BC	(2645 - 2489 cal BP)
(27.7%)	791 - 701 cal BC	(2740 - 2650 cal BP)

Submitter Material: Organics
Pretreatment: (charred material) acid/alkali/acid
Analyzed Material: Charred material
Analysis Service: AMS-Standard delivery
Percent Modern Carbon: 73.16 +/- 0.27 pMC
Fraction Modern Carbon: 0.7316 +/- 0.0027
D14C: -268.36 +/- 2.73 o/oo
 $\Delta^{14}C$: -274.44 +/- 2.73 o/oo(1950:2,019.00)
Measured Radiocarbon Age: (without d13C correction): 2500 +/- 30 BP
Calibration: BetaCal3.21: HPD method: INTCAL13

Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP). "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the ^{14}C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.



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REPORT OF RADIOCARBON DATING ANALYSES

Sathyabhama Badhreenath

Report Date: March 18, 2019

Archaeological Survey of India

Material Received: February 25, 2019

Laboratory Number	Sample Code Number	Conventional Radiocarbon Age (BP) or Percent Modern Carbon (pMC) & Stable Isotopes	
		Calendar Calibrated Results: 95.4 % Probability High Probability Density Range Method (HPD)	
Beta - 519500	Urn-No-105	2700 +/- 30 BP	IRMS $\delta^{13}\text{C}$: -24.4 o/oo
	(95.4%) 905 - 806 cal BC	(2854 - 2755 cal BP)	
	Submitter Material: Organics		
	Pretreatment: (organic sediment) acid washes		
	Analyzed Material: Organic sediment		
	Analysis Service: AMS-Standard delivery		
	Percent Modern Carbon: 71.45 +/- 0.27 pMC		
	Fraction Modern Carbon: 0.7145 +/- 0.0027		
	D14C: -285.46 +/- 2.67 o/oo		
	$\Delta^{14}\text{C}$: -291.40 +/- 2.67 o/oo(1950:2,019.00)		
	Measured Radiocarbon Age: (without d13C correction): 2690 +/- 30 BP		
	Calibration: BetaCal3.21: HPD method: INTCAL13		

Results are ISO/IEC-17025:2005 accredited. No sub-contracting or student labor was used in the analyses. All work was done at Beta in 4 in-house NEC accelerator mass spectrometers and 4 Thermo IRMSs. The "Conventional Radiocarbon Age" was calculated using the Libby half-life (5568 years), is corrected for total isotopic fraction and was used for calendar calibration where applicable. The Age is rounded to the nearest 10 years and is reported as radiocarbon years before present (BP), "present" = AD 1950. Results greater than the modern reference are reported as percent modern carbon (pMC). The modern reference standard was 95% the ^{14}C signature of NIST SRM-4990C (oxalic acid). Quoted errors are 1 sigma counting statistics. Calculated sigmas less than 30 BP on the Conventional Radiocarbon Age are conservatively rounded up to 30. d13C values are on the material itself (not the AMS d13C). d13C and d15N values are relative to VPDB-1. References for calendar calibrations are cited at the bottom of calibration graph pages.

BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: $\delta^{13}\text{C} = -24.5$ o/oo)

Laboratory number **Beta-519499**

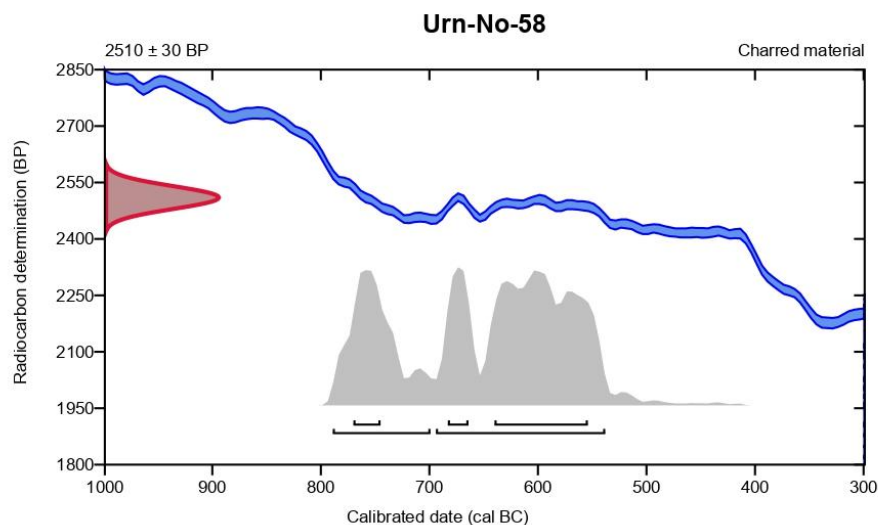
Conventional radiocarbon age **2510 \pm 30 BP**

95.4% probability

(67.7%)	696 - 540 cal BC	(2645 - 2489 cal BP)
(27.7%)	791 - 701 cal BC	(2740 - 2650 cal BP)

68.2% probability

(44.3%)	642 - 556 cal BC	(2591 - 2505 cal BP)
(13.4%)	772 - 747 cal BC	(2721 - 2696 cal BP)
(10.5%)	685 - 666 cal BC	(2634 - 2615 cal BP)



Database used
INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

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BetaCal 3.21

Calibration of Radiocarbon Age to Calendar Years

(High Probability Density Range Method (HPD): INTCAL13)

(Variables: $\delta^{13}\text{C} = -24.4$ o/oo)

Laboratory number **Beta-519500**

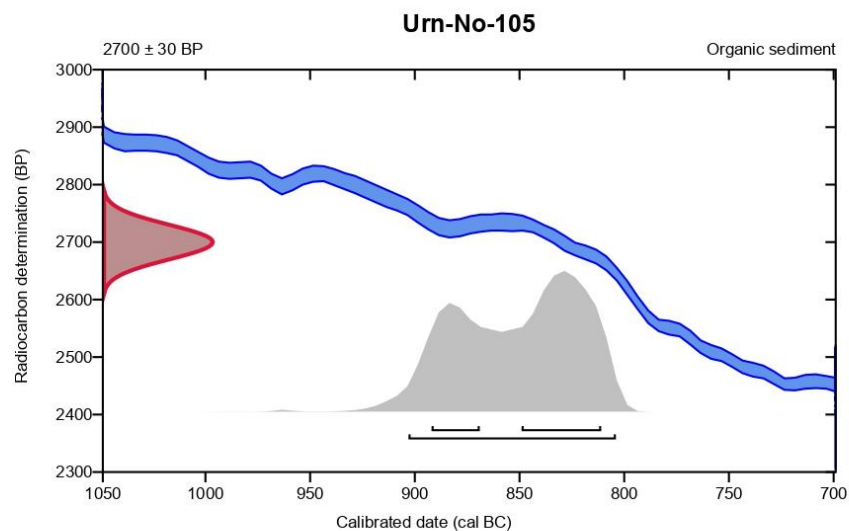
Conventional radiocarbon age **2700 \pm 30 BP**

95.4% probability

(95.4%) 905 - 806 cal BC (2854 - 2755 cal BP)

68.2% probability

(45.6%) 851 - 813 cal BC (2800 - 2762 cal BP)
(22.6%) 894 - 871 cal BC (2843 - 2820 cal BP)



Database used
INTCAL13

References

References to Probability Method

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. Radiocarbon, 51(1), 337-360.

References to Database INTCAL13

Reimer, et.al., 2013, Radiocarbon55(4).

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RADIOCARBON CALIBRATION PROGRAM*

CALIB REV8.2

Copyright 1986-2020 M Stuiver and PJ Reimer

*To be used in conjunction with: Stuiver, M., and Reimer, P.J., 1993,
Radiocarbon, 35, 215-230.

ADC-URN NO.58

Lab Code

Description

Radiocarbon Age BP 2572 +/- 28

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020
relative area under
probability distribution

68.3 (1 sigma)	cal BC 800- 769	1.000
95.4 (2 sigma)	cal BC 807- 751	0.832
	684- 667	0.060
	634- 619	0.026
	615- 590	0.073
	578- 571	0.009

Median Probability: -780

ADC-URN NO.107

Lab Code

Description

Radiocarbon Age BP 2654 +/- 27

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020
relative area under
probability distribution

68.3 (1 sigma)	cal BC 823- 798	1.000
95.4 (2 sigma)	cal BC 897- 870	0.110
	838- 789	0.890

Median Probability: -813

ADC-URN NO.83B

Lab Code

Description

Radiocarbon Age BP 2664 +/- 30

Calibration data set: intcal20.14c

% area enclosed cal AD age ranges

Reimer et al. 2020
relative area under
probability distribution

68.3 (1 sigma)	cal BC 888- 885	0.026
	832- 798	0.974
95.4 (2 sigma)	cal BC 899- 859	0.219
	846- 792	0.781

Median Probability: -821

References for calibration datasets:

Reimer P, Austin WEN, Bard E, Bayliss A, Blackwell PG, Bronk Ramsey C, Butzin M, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Hajdas I, Heaton TJ, Hogg A, Kromer B, Manning SW, Muscheler R, Palmer JG, Pearson C, van der Plicht J, Reimer P, Richards DA, Scott EM, Southon JR, Turney CSM, Wacker L, Adolphi F, Büntgen U, Fahrni S, Fogtmann-Schulz A, Friedrich R, Köhler P, Kudsk S, Miyake F, Olsen J Sakamoto M, Sookdeo A, Talamo S. 2020.

The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kB Radiocarbon 62. doi: 10.1017/RDC.2020.41.

Comments:

* This standard deviation (error) includes a lab error multiplier.
 ** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
 ** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
 where ^2 = quantity squared.
 [] = calibrated range impinges on end of calibration data set
 0* represents a "negative" age BP
 1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

