Excavations at Keeladi, Sivaganga District, Tamil Nadu (2014 - 2015 and 2015 - 16)

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***Abstract**: The recent excavations at Keeladi have yielded interesting findings pertaining to the early historic period in southern Tamil Nadu. This article gives a comprehensive account of the prominent results obtained from two season excavations. The occurrence of elaborate brick structures, channels, paved brick floors associated with grooved roof tiles, terracotta ring wells in association with roulette ware and inscribed Tamil – Brahmi pot sherds is a rare phenomenon in the early historic phase of Tamil Nadu. The absolute dating (AMS) of the site to some extent coincides with the general perception of the so-called Sangam period.*

Keywords: Keeladi, Early Historic, Excavation, Structures, Rouletted Ware, Tamil Brahmi, Ring Well

Introduction

The multi-faceted antiquarian remains of Tamil Nadu occupy a place of its own in the archaeological map of India. It was indeed Tamil Nadu that put a firm base for the beginning of archaeological research in India especially prehistoric archaeology with the discovery of the first stone tool at Pallavaram near Madras by Sir Robert Bruce Foote in 1863. Ever since this discovery, Tamil Nadu witnessed many strides in the field of archaeological research carried out by various organizations including Archaeological Survey of India till date. The excavations carried out by Sir Mortimer Wheeler at Arikamedu in early 1940's is yet another milestone in the archaeology of Tamil Nadu enabling to fix a firm datum line for the early historic archaeology in South India and its external trade contacts particularly with the Roman world.

The above major discoveries made such an impact among the scholarly world over the years in Tamil Nadu, as a result of which one may observe the northern part of Tamil Nadu received maximum attention of archaeologists and had virtually left the

southern Tamil Nadu bereft of any commendable research activities. The southern part of Tamil Nadu comprising a vast geographical area including Madurai, Teni, Dindigul, Sivaganga, Virudunagar, Tirunelveli, Tuticorin, Kanyakumari and Ramanathapuram districts. Inspite of potent archaeological wealth, the southern Tamil Nadu on the whole received very little attention in the form of dedicated exploration or excavation.

The absence of any major excavation has hindered us a proper understanding about the evolution and development of different cultures in a given geographical context. The sporadic diggings made at some of the sites like Paravai, Anuppanadi, T. Kallupatti, Kovalanpottal, Alagankulam, Mangulam etc albeit showed evidences of Iron age – Early historic period, it did not provide a fuller or clear picture about its transformation and various cultural aspects. Thus in order to have a better understanding of the cultural developments that took place at various stages of time, a problem oriented archaeological survey was carried out in the Vaigai river valley in the year 2013 – 14 by Excavation Branch – VI, Bangalore.

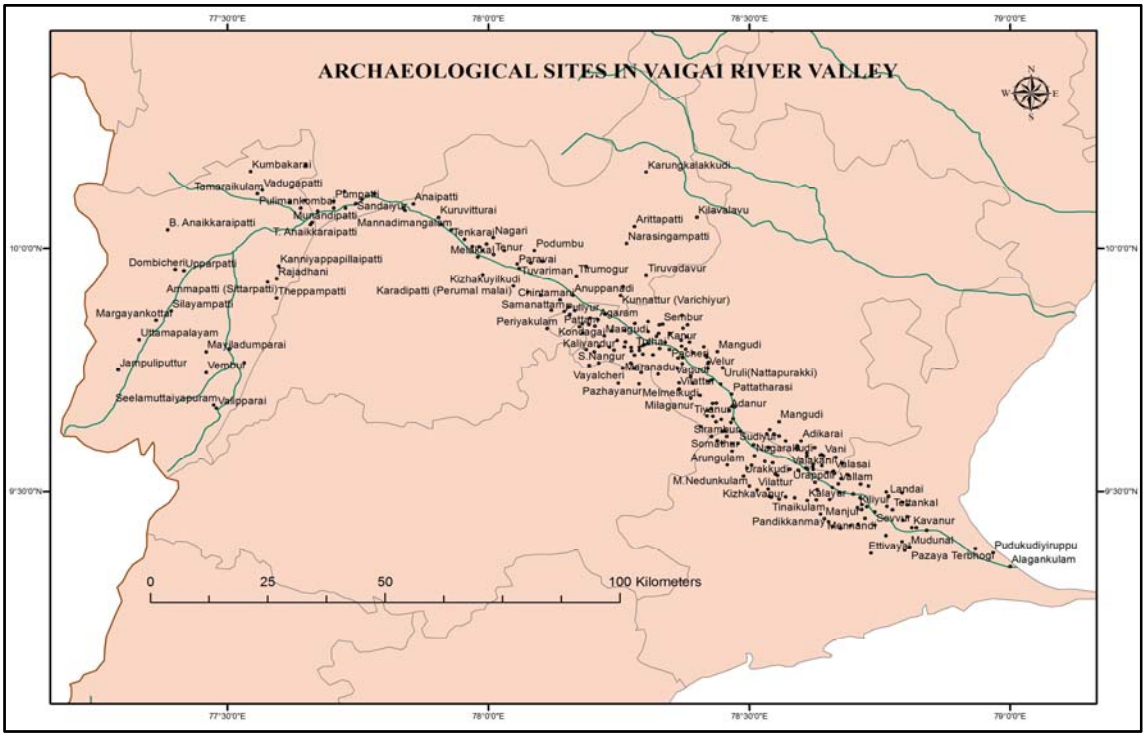

Figure 1: Archaeological Sites in Vaigai River Valley

The Vaigai river was chosen for the archaeological survey for the very crucial role it played in the development of early kingdoms of Tamil Nadu particularly the Pandyas of Madurai. Among the corpus of Tamil-Brahmi inscriptions found in Tamil Nadu, a major chunk is found in the Vaigai river valley only. One of the major reason for the concentration of Tamil-Brahmi inscriptions is that all these sites were located along the ancient trade routes or highways connecting Madurai from all directions. This fact is strengthened by the patronage of merchant guild and merchants at the sites of Mangulam and Alagarmalai. At Mangulam, we find the donation made by the trade

guild (Nikama) of the village Vellarai (Sridhar 2006: 20). At Alagarmalai, inscriptions refer to donation of rock cut beds by various merchants involved in textile, iron, gold and salt products. Among them, mention may be made to one salt merchant and goldsmith both are natives of Madurai (Sridhar 2006: 46 – 54, Mahadevan 2014: 427, 431– 433).

Drainage System

The Vaigai River runs approximately of about 250 kilometers taking its origin from a number of jungle streams near Vellimalai in the Western Ghats and traverse through Teni, part of Dindigul, Madurai, Sivaganga and Ramanathapuram districts and remain as a major lifeline for the southern Tamil Nadu. In the upper reaches it resembles like an ephemeral stream and with the aid of its tributaries such as Suruliar, Kottakudi, Varaha Nadi, Manjalar, Marunadi and Uppar it attains much bigger form in the lower reaches and again reduced to that of a small rivulet when it emerges from the Ramanathapuram tank and empties itself for namesake into the Bay of Bengal at Attangarai near the early historic port city of Alagankulam. The work of Paripadal, one among the eight anthologies of Sangam corpus vividly describes the greatness of this river as many as in eight long poems. The work of Maduraikanchi describes the grandeur of Madurai city.

Previous Explorations

It was Dr. K.V. Raman, then at Southern Circle, Archaeological Survey of India in late 1950's undertook systematic village to village survey in Madurai, Tirumangalam, Melur and Periyakulam taluks and reported number of archaeological sites and remains (Raman 1970: 499 – 509). After a long gap in 2006 Dr. K. Rajan and his team reported good number of sites along the Vaigai valley particularly in its upper reaches subsequent to the discovery of inscribed hero stones datable to early centuries of Christian era at Thathappatti in Dindigul district and Pulimankombai in Teni district (Rajan and Yatheeshkumar 2007: 39 – 45).

Recent Explorations

During the course of exploration, about 293 sites all along the Vaigai river valley with various forms of antiquarian remains such as urn burials, menhirs, inscriptions, sculptures, hero-stones, habitation mounds etc have been identified and documented (Figure 1). This includes both fresh discoveries and re-visitation of the earlier reported sites which revealed new findings hitherto unreported earlier. It may be mentioned here that among the above, more than 100 new habitational sites were identified on either banks of river Vaigai with many having potential for large scale excavation (Ramakrishna *et al* 2017: 170 – 183). There were various trade routes branched through this valley connecting the Chera region on the west and the Pandya country on the east upto Ramesvaram and further beyond to Sri Lanka for trans-oceanic trade. The objective of the intensive programme was to explore archaeological sites and remains along Vaigai river valley and identify suitable site for systematic excavation to

understand the conducive factors that led to the cultural transformation of Tamil Nadu occurred during various period in general and that of southern Tamil Nadu in particular.

Previous Excavations

No concerted attempts were made to study the archaeological remains of the region, barring some sporadic diggings made during the pre-independence era by Alexander Rea at the urn burial sites of Paravai and Anuppanadi (Rea 1888: 48 - 71) at Madurai suburb. Later Archaeological Survey of India made the first initiative to understand the archaeological potentiality of this region through systematic excavation at T. Kallupatti in the year 1976 (IAR 1976 -77: 46 - 47). The limited work tackled at both urn burial site and its associated habitational mound evinced some important findings such as the occurrence of white painted black and red ware, the first of its kind in Tamil Nadu in proper stratigraphical context.

There are also other limited works contributed by the State Archaeology Department, Govt. of Tamil Nadu at Kovalanpottal in 1980 (Sridhar 2004: 29 - 35), Alagankulam in 1986, 2017 and Mangulam in 2006 (Gurumurthi 2008). Among them the site of Alagankulam located at the ending point of river Vaigai with Bay of Bengal has yielded remarkable evidences of early historic period and identified as a port city of early Pandyas (Sridhar 2005).

Besides the above, the early historic phase of Tamil Nadu have also been addressed to certain extent through excavations carried out in the sites of Alagarai, Tirukkampuliyur, Uraiyur located along Kaveri river and Kodumanal along Noyyal river. Among them, the more recent excavations at Kodumanal has generated argument among the academic world for the beginning of early historic period of Tamil Nadu pushed to c. 4^{th} – 5^{th} cent. BCE (Rajan 2015)

It may not be wrong to say that right from from the Iron Age period the whole of the Vaigai river valley was brimming with both internal and external trade activities. There were various trade routes branched through this valley connecting the Chera region on the west and the Pandya country on the east upto Ramesvaram. To attest this one can find number of potent archaeological sites right from the upper reaches of Vaigai and upto to its end near Alagankulam near Bay of Bengal.

One may cite the important habitation site of Dombicheri located on the left bank of Suruliar in Teni district. The famous punch mark coin hoard referred as Bodinayakanur hoard is supposedly retrieved from this site and not from Bodinayakanur proper (Aravamudhan 1944: 1 – 4). DD Kosambi who studied this hoard dates to early centuries of Christian era comparing the symbols found in the punch marked coins of North India (Kosambi 1951: 214 – 18).

Similar to that of Dombicheri, another site that receive attention is that of Uttamapuram in Teni district known for the discovery of Roman coin hoard made in

1997(Santalingam 1997: 57 – 60). However one may presume that the above sites coupled with the recent path breaking discovery of inscribed hero stones at Thathappatti (Rajan and Yatheeskumar 2007: 39 – 45) and Pulimankombai (Rajan, Yatheeskumar and Selvakumar 2007a: 118 – 121) show that this area was traditionally linked by ancient trade routes connecting Pandya and Chera country. This is further attested by inscriptional evidence referring to the trade guild inscriptions dated to the later Pandya kings of c. 13th – 14th cent CE over the famous trade center Arikesarinallur i.e. present Sinnamanur (SII XXIII: no.429, 430,431,434).

Proceeding towards downstream within the lower reaches of Vaigai river, one may observe proliferation of habitation sites on its both banks as well as in the hinterland areas. Starting from the important habitation sites of Sittarnattam opposite to Jain Tamil brahmi cave inscription site of Mettupatti, a centrally protected monument, Kannapatti, Kuruvitturai such settlements could be observed along the river linking the Madurai city. Most of these sites have a continuous cultural continuity from Iron Age upto medieval period. The site of Sittarnattam could be cited as a perfect example where within the habitation complex itself is seen a hero stone inscription dated to c. 13th – 14th cent CE describing the bravery of an hero who killed the lion which caused death to the public passing through the highway called 'Cholakulantaka peruvazhi' (Sridhar 2006a: 131 – 132). Interestingly, the site of Keeladi is situated on the same ancient trade route leading from Madurai linking Alagankulam and further to Ramesvaram.

Beyond Keeladi when we travel via Tirupuvanam through Paramakudi, Partibanur towards Ramanathapuram can observe series of settlements including Buddhist and Jain sites all along the Vaigai river suggestive of trade centers proceeding towards the coastal area of Ramesvaram. The presence of Buddha images at Kizpartibanur, Jain images at Sudiyur, Arungulam, Kumarakurichi etc reflects this fact. This is strengthened further by archaeological remains found at the sites of Kallikkudi, Gandhi Nagar near Emaneswaram, Kamankottai yielding celadon and porcelain pot sherds. The finding of roulette pottery at the sites of Valasai near Nayinar kovil and Landai near Ramanathapuram amply suggests the existence of trade networks from early historic period.

Present Excavations

Out of the various sites identified in the Vaigai river valley, the site of Keeladi (Tirupuvanam Taluk, Sivaganga District) was selected for systematic excavation with the objective to unearth the missing links of Iron Age to Early Historic period and also to ascertain the antiquity of the celebrated city of Madurai for the sake of its proximity.

The greatness of Madurai is amply reflected in the early Tamil literary works like Maduraikanchi, Silappathikaram etc as a vibrant fortified city surrounded by moat all around. One of the verses of Maduraikanchi (L 351 – 360) describes the lofty entrance gate of the city of witnessed busy traffic all through the day. Similalry, the

Silappathikaram vividly describes the details of the city in two chapters in Madurai kandam namely Puranjeri irutha kathai and Urkan kathai having palatial buildings, wide streets, suburb area, temples dedicated to various gods like Siva, Vishnu, Balarama, Karthikeya and even to Jains.

But contrary at the present times, due to rapid urban expansion and continuous occupation there is hardly any scope for excavation to ascertain the veracity of its past glory. Many of the reported sites within the present Madurai city either have been totally disappeared or occupied by modern settlements. The Jain cave sites with Tamil–Brahmi inscriptions dotting the landscape of suburban Madurai are the only connecting link to understand about its glorious past. With the above backdrop, Keeladi was put to archaeological spade work for two continuous seasons 2014 – 15 and 2015 – 2016.

Site of Keeladi

The site of Keeladi[2] (09° 51' 40" N, E 078° 11' 70" E) is located about 12 kilometers south east of Madurai on the ancient highway (modern NH 49) leading to Ramesvaram via Tiruppuvanam. The village is strategically located on the south bank of river Vaigai and is surrounded by the village of Kondagai and Manalur (Figure 2) figuring in inscriptions. The present village of Keeladi and Pallichandai are of recent origin but altogether both of them formed part and parcel of ancient settlement of *Kuntidevi Chaturvetimangalam* i.e. the present Kondagai.

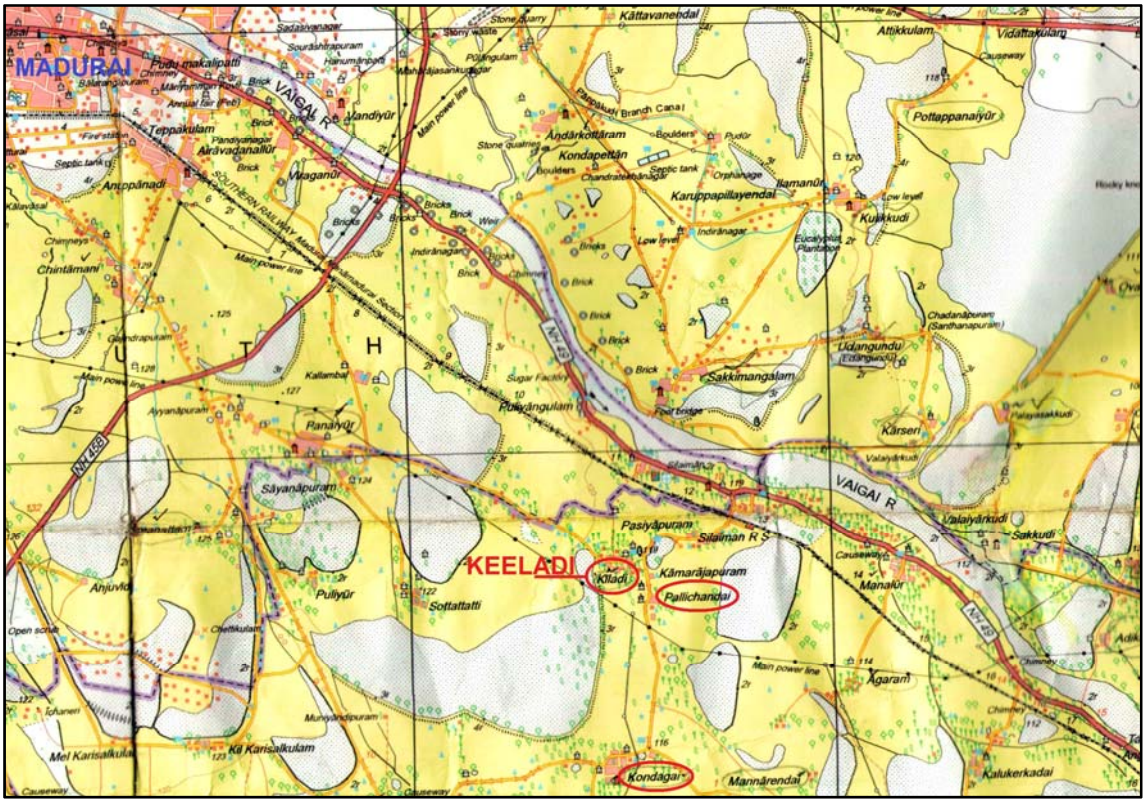

Figure 2: Location of Keeladi Village

The mound at Keeladi is located 1 km to the southeast of present Keeladi village and to the west of Manalur irrigation tank. The mound is locally known as *'Pallichandai Thidal'* (i.e. mound at Pallichandai) *or 'Mettu Punjai'* (i.e. elevated ground land) or *Vadakku Thidal* (i.e. mound at north). The mound rising of about 2.88 meters from the present ground level is partially disturbed due to coconut grove plantation. The whole area is littered with fine to coarse variety of black and red ware, black ware, red slipped ware, red ware, coarse red ware having decorations, incised patterns in various forms. Antiquities like terracotta discs, beads, pestles, querns etc have been frequently met while tilling the land. The environmental settings of the site do not reveal any distinct geomorphological features except for its location in the lower reaches of Vaigai river plains with moderate saline soil content.

Historical Background

The environs of Keeladi has a continuous historical past starting from the early Pandya period (c. 8th – 9th cent CE) upto c. 16th cent CE coinciding with the Nayak rule in this area. Apart from the mound, the historicity of Keeladi is known only through inscriptions found in the Siva temple at the village. Its basement contain Tamil inscriptions ascribable to later Pandya period of c. 12th – 13th cent AD. The inscriptions (SII XXII no. 447, 448, 449) dated in the 23rd, 31st regnal year of Maravarman Kulasekara Pandya refers to the sale of land to an individual from Malai mandalam (i.e. Chera region) by the village assembly (*mahasabha*). It refers that the village (encompassing Keeladi and Kondagai villages) was then known as '*Kuntidevi Chaturvetimangalam*', a brahmadeya of Mudivazhangu pandya Isvaramudaiya Nayanar temple located in the territorial unit of '*Velur kulakkizh'* i.e. the village located within the water spread of Velur tank fed by Vaigai river. The name Keeladi could have derived for its location lying to the east of '*Kuntidevi Chaturvetimangalam*'. The present name of Kondagai is the corrupt form of its original name.

The area in and around the eastern bank of Manalur water tank contain archaeological remains datable to c. 8th – 9th cent AD. These remains probably belong to a Siva temple with architectural remains scattered all over the ground. A half buried Nandi image near these remains on stylistic grounds could be dated to early Pandya period. The same water tank also contains a fine stone sluice datable to later Pandya period. The earlier surface collection of a copper coin datable to Chola king Rajaraja I found near the site pushes its date to c. 10th cent. AD. Besides, the prolonged life span of the site is attested by the stone slab near the burial complex at Kondagai containing inscription issued in c. 16th cent. AD during the reign of Nayaks.

The antiquity of Kondagai village dates back to Iron Age for the discovery of burial complex located between the Ayyanar temple and the water tank containing numerous urn burials without any lithic appendage. They are found to be interred within the pit cut for the purpose with or without lid. The burial goods contain various forms of Black and red ware, Black ware, Red ware kept along with select bones, teeth of the deceased. The finding of white painted Black and red ware and black painted red ware

is an interesting and rare feature found with the urn burials. The proximity of the urn burial complex not far from the habitation mound (*mettupunjai*) at Keeladi leads to surmise that it could have remained as its associated burial complex.

Layout of the Site

The impressive habitation mound spread in an area of about 110 acres with 4.5 km in circumference (Figure 3). Due to coconut grove plantation and for other agricultural activities, its topography is found to be undulated in many places. The eastern and western fringe of the mound has been more or less levelled down due to agricultural activities and brick industry while its northern and southern fringe has a gentle slope on its sides. On the east, the mound is bordered by the Manalur water tank and on the west with agricultural lands and modern village shrine. Both the north and southern part of the mound is disturbed by brick kilns and agricultural fields. On the southern side, little away from the small water tank (*Chokkatanurani*) is found a shallow depression with sand laden land strip. At the end of this land depression further on the south lie another small mound containing cultural relics similar to that of this mound.

Figure 3: Aerial view of the Keeladi Mound (Courtesy: Google Earth)

The whole mound was divided into series of squares in a gridiron pattern and trenches were laid in reference with north western peg for purpose of excavation. For sake of convenience, two localities were identified on eastern and central side named as Locality I and Locality II respectively for excavation. The eastern fringe of the mound

i.e. Locality I was selected for excavation as it already contained exposed structural remains. A total number of 31 quadrants were opened in Locality I and Locality I (extn) to ascertain the nature of the cultural deposit in association with the exposed remains.

Excavations revealed that this locality contained less structural remains but rather rich in various ceramic varieties. At Locality II, about 71 quadrants were opened and many of them yielded very promising results with various forms of structural remains. It is clear that the central part of the mound seem to be the core area of activities carried out by its inhabitants. This locality also accounted for major array of artefacts, inscribed pot sherds, rouletted ware etc found in association with the structures.

Cultural Periods

The cuttings made at different localities of the site yielded cultural deposit ranging from 2.50 meters to 4.00 meters below the present surface level. In some cases it extended up to 4.50 meters. Based on the material evidences accumulated from the two seasons of excavation at Keeladi, a threefold cultural period is being proposed with possibility of sub-cultural phases. The cultural periods are divided on the basis of the structural remains, Tamil-Brahmi inscribed potsherds, copper coins, non cultural zone pottery like Rouletted ware, indigenous black and red ware, white painted black and red ware, russet coated painted ware and associated artefacts. The broad classifications of the cultural periods are tentatively dated from c. 3rd cent. BC to 10th cent. AD. The latest date of the site i.e. 10th cent. AD was arrived on the basis of the surface finding of a copper coin datable to the Chola king Rajaraja I.

The broad classification of the cultural period at Keeladi is as follows:

- Period I – Iron Age (pre 300 BC)[3]
- Period II – Early Historic Period (300 BC – 300 AD)
- Period III – Post Early Historic Period (Post 300 AD)

The above proposed dates are purely tentative and subject to further scientific analysis of other material evidences. However, the two carbon samples subjected to AMS dating by the Beta Analytic Inc, Florida (USA) provided results for the site of Keeladi. The above samples taken from lower levels from YF1/1 (2.50 meters) and YF4/2 (1.95 meters) have given the calibrated dates ranging between 200 BC – 195 BC. The deposit below this level also needs to be firmly dated to obtain clear picture about the early formation process of the settlement.

Stratigraphy

In almost all the excavated trenches of both Locality I, I (extn), Locality II, II (extn) the cultural deposit are divided into 5 or 6 layers except few like the trench (YC1) in Locality II where the cultural deposit were divided in 8 layers. The following sequence of layers from the selected quadrant YC 1 can be considered to represent proper stratigraphy obtained in two season excavations at the site.

Trench YC1 (Locality II)

The stratigraphical position in all quadrants of YC1 found to be similar in nature. This trench had a cultural deposit of 4.00 meters from the present ground level (Figure 4). The humus measured about 0.16 meters in thickness, loose in composition and grey in colour.

Figure 4: Stratification of Layers in Locality – II

Layer (1) had dark brown colour and compact in hardness with 0.46 meters thickness of deposit. This layer has yielded limited number of potsherds and majority of them were of coarse red ware and crude black and red ware. The shapes in coarse red ware variety include storage vessels and wide mouthed bowls, while the crude variety of black and red ware consisted of bowls and dishes. The antiquities found from this layer include glass beads of green and maroon colours and few terracotta discs.

Layer (2) had light brown in colour and semi compact in hardness with a maximum thickness of 0.96 meters. Similar to layer 1, this layer also yielded more number of coarse red ware and medium fabric black and red ware pot sherds with same shapes. Rouletted sherds started to appear steadily in this layer. The occurrence of glass beads were more in number with usual terracotta objects like discs, beads, ear stud and gamesmen. The notable feature among the antiquities were the appearance of copper objects like antimony rods and semi-precious stone beads like carnelian, agate and few iron objects.

Floor

A rammed clay floor was noticed on the eastern and western side of the trench at the depth of 1.02 meters. The survived floor had a thickness from 10 to 24 centimeters and measured 1.70 x 2.90 meters. The floor was rammed with clay, pot sherds and brick bats. The notable feature found in this floor was the group of five storage vessels placed within its surface on the south-western corner. All the vessels both inside and outside had a thick layer of white accretion firmly sticking with it.

Layer (3) had 0.53 meter maximum thickness, the colour of the soil was light grey and loose in texture. The ceramic assemblage include coarse red ware and black and red ware in medium fabric in the upper level and finer variety of black and red ware in the lower level. Antiquities of this layer include glass beads (with slight decrease in quantity), terracotta objects like beads, discs, paste beads and Figurines. Copper objects like bangle, bead also continued in this layer. The new varieties of antiquities found from this layer include shell bangles, quartz beads and cowries. The occurrence of glass beads continued at this level but in limited numbers.

Layer (4) was light grey in colour and semi compact in hardness with a maximum thickness of 0.50 meters. The ceramic assemblage include finer variety of black and red ware shapes, russet coated painted ware with usual coarse red ware in same type and shape. An inscribed sherd in Tamil Brahmi script was found at the depth of 1.60 meters in this layer. The antiquities found from this layer include different types of copper and iron objects, soap stone beads, terracotta beads, discs, shell bangles, cowries etc. At a depth of 2.16 meters another Tamil Brahmi inscribed sherd was found reading '*sathan*'.

Layer (5) was yellowish brown in colour and loose in texture with a maximum thickness of the 0.60 meters. The ceramic varieties similar to layer (4) continued in this layer as well. More number of copper objects like antimony rods, bangles and shell bangles, bone points, cowries, terracotta discs and beads were collected in good numbers. An inscribed pot sherd in Tamil-Brahmi in red ware lid was found at the depth of 2.36 meters reading '*eravathan*'.

Layer (6) was light grey in colour and semi-compact in hardness with a maximum thickness of 0.25 meters. Frequency of finer variety of black and red ware continued to increase than that of coarse red ware. The shapes in both the varieties are similar to that of the above layers (4) and (5). The occurrence of antiquities gradually decreased and was limited to few terracotta discs.

Layer (7) was brown in colour and loose in texture. It had a maximum thickness of 0.15 meters. The ceramic assemblage remained same similar to that of layer (6). A group of *insitu* black and red ware bowls of finer fabric were collected in this layer. The antiquities were very less and only few terracotta discs and shell bangle were noted.

Layer (8) was blackish brown in colour and semi-compact in hardness with a maximum thickness of 0.65 meters. The ceramic assemblage continued to remain same

like that of layer (7) including white painted black and red ware. The antiquities were slightly more in number when compared to layer 6 and 7. The antiquities include shell bangles, iron objects, stone celts and terracotta discs.

Structural Remains

The evidence of structural remains at Keeladi was first ascertained during the exploratory work on the eastern fringe of the mound near the Manalur water tank. Here due to agricultural activities and removal of earth for brick industry the whole area was strewn with broken brick debris. One such exposed section was left with a part of brick structure standing *insitu* facing north east direction and also yielded good amount of black and red ware pot sherds.

Locality I

This part of the mound designated as Locality I was selected for excavation during first season (2013 – 14) to understand the nature of the exposed structure and possibility of any other associated remains in the surrounding area. Cuttings revealed that this structure (A1/3) survived with western and northern walls only. The southern and eastern wall of the structure was already lost due to removal of earth. It seems that the surviving walls originally formed part of a square shaped structure with paved brick flooring (Figure 5).

Figure 5: Stratification of Layers in Locality - I

The extant height of the structure including the floor measured 1.65 meters with twenty four brick courses on the North West and 13 courses on south west corner. The inner measurement of the structure was 1.40 x 1.40 meters. A slight variation in the size of bricks could be discerned within the structure measuring 36 x 24 x 6 and 33 x 23 x 6 centimeters. At the lower of the western wall was noticed a square hole measuring 0.10 x 0.06 centimeters.

The function of the hole could not be precisely determined but judging by its size it could have served as an inlet or outlet of the structure. No particular bonding method was adopted for its construction but the bricks were rather piled or stacked as per convenience to bring required shape binded with coarser mud. At the bottom of the structure were collected a fine black and red ware bowl, assorted bone pieces and few terracotta beads. The foundation of the structure could be placed with Layer 5 and sealed by Layer 1.

The finding of this structure prompted search for similar ones in its vicinity. About 5.00 meters north of quadrant A1/3, was traced remains of another structure (ZA1/3) survived only with lower base at a depth of 1.32 meters. Unlike the former, this structure differs in shape and size measuring 1.60 x 1.30 meters and also lacked inner brick flooring. The size of bricks also differed from the other measuring 38 x 24 x 6 centimeters uniformly. The inner portion of the structure measured 1.10 x 0.80 meters. Despite such difference both the structures stratigraphically seem to be contemporary to each other as the foundation level uniformly fit in Layer 5.

The nature of the structure is difficult to ascertain but could be compared with the structure found at the quadrant A1/3. Mention may also be made of an isolated find to west of the structure at a depth of 0.60 meters with three rows of vertically placed bricks extending towards south. The other trenches in this area did not yield any appreciable structures but for the remains of a much later date one noticed on the south east part of the mound (B3/4). Besides the structures the other activity noticed here was the presence of numerous trash pits purposefully dug into the natural soil from the top level. These pits in contrary yielded fine quality of black and red ware dish, bowls, basins, stemmed ring stands in red ware, painted sherds and grooved roof tiles.

The cuttings made at Locality I (Extn) in 2015 – 16 on the north western side yielded a fragmentary wall in north south orientation with four brick courses (YD6/2) at a depth of 1.48 meters. Another structure observed in this area was the occurrence of rammed floors surrounded by circular post holes. One such rammed floor was traced at YE6/4 at a depth of 1.70 meters a partly survived rammed floor with post holes resembling ' L' shape at the south eastern corner of the quadrant. The 11 survived post holes with an average depth of 0.20 – 0.25 meters were filled with river sand. A large number of grooved roof tiles found above the floor as well on the adjacent area suggest that the roofed super structure collapsed towards eastern side. Similarly another rammed floor

(YE6/1) survived with ten post holes seven on the east and three on the west in north south orientation was found to the north of YE6/4 at a depth of 1.32 meters indicating a later date for the floor.

Locality II

The cuttings at Locality II of the mound exposed the most interesting features of the site with varied structural remains. Except that of the sites like Arikamedu, Kaveripattinam and few at Tirukkampuliyur, Uraiyur, Kanchipuram, Korkai etc occurrence of large brick structures is indeed a rare phenomenon in the early historic phase of Tamil Nadu. In that context, the occurrence of large number of structures at Keeladi strikes importance for a systematic study and research.

The architectural remains at Keeladi display exemplary engineering skills of that period. It seems that the layout of the structures were conceived methodologically, well planned and executed over a period of time. All most all the structures at Keeladi share a common pattern in their orientation. Irrespective of the size, they have purposefully been set in north-south orientation originating from south and ending in north. The reason behind this particular orientation requires further investigation. On average the structures started occurring a depth of 1.00 meter from the present ground level with the exception of few like the one unearthed at YF5/2 on the western part of the mound where a fragmentary brick wall probably of later period at a depth of 0.40 meters.

The occurrence of structures was traced at Locality II approximately at a distance of 500 meters west of Locality I. Trenches laid at the southern part of Locality II evinced remains of structural activities but due to extensive disturbance caused by pit and dump of ancient and modern times, a clear picture could not be arrived. However it definitely had relationship with the structures traced at Locality II (Extn) on the north. The quadrants A1/1,2,3, A2/1 accounted for large amount of fallen brick debris and fragmentary walls, paved brick channel in A2/2,3, A1/2,3, B2/3, ZA1/1,2,3 and4, YB1/3,4. The notable feature in this area was the rectangular shaped tank like structure found at the western side of A1/4.

This structure found at a depth of about 1.00 meter clearly demonstrated two stages of construction leaving a gap of 0.20 meters in between. The extant height of the original structure measured 1.10 meters in height with fifteen brick courses. Traces of paved brick flooring were also noticed as a depth of 1.05 meters. Two different brick size were noticed with the structure measuring 36 x 24 x 6, 34 x 24 x 7 centimeters. The upper level of the structure was built of partly full as well as broken bricks. The post holes found on the bricks are suggestive of some upper structure. At the same wall to the tank was also found a horizontal wall with nine courses of bricks running in north-south orientation disturbed in between due to pit activity. The brick size of this structure almost remains same with few bricks varied in size measuring 38 x 24 x 7 centimeters. A part of its extension was further traced on north at ZA1/4 but abruptly

stopped thereafter. The exact nature of this wall could not precisely be related with the tank like structure.

At Locality II (Extn) three major structures were exposed one after another leaving some interval in between them. The first structure exposed during the season (2014 – 15) was the lengthy brick floor with remains of side walls on either side. Originating from southern side (YE1/3) this structure (Figure 6) extended towards north to a length of about 10.50 meters (YE1/2,3 and YF1/3). The occurrence of numerous broken grooved roof tiles suggests it had some sort of super structure supported with wooden rafters. Irregular shaped post holes were also noticed within the flooring at intervals. At a little distance away from the western side wall was noticed terracotta ring well coeval with the flooring. The well contained about twenty one courses of rings with the lowermost rings set within the river sand below the natural soil.

Figure 6: Remains of Brick Flooring and Walls in Locality – II

To ascertain the continuity of the brick flooring and occurrence of any additional structures, trenches were laid out in the nearby area during the subsequent season 2015 – 16. The working area on the north (YF1/2) revealed that the brick flooring exposed earlier was terminated with another rectangular shaped brick structure. The upper level of the structure both inside as well as outside was completely filled with debris of brick bats and with large quantity of grooved roof tiles with a few iron nails. This structure on its eastern and northern side was comparatively better preserved with brick courses counting to twelve and eight respectively.

The western side has a total number of five courses while the southern side had eleven courses. The brick flooring at its end was attached against the southern wall of the rectangular structure. The gap between the flooring and the southern wall of the structure was filled with mud mortar. The exact nature of structure is not clear at the moment but it seems the brick flooring and the rectangular brick structure could be regarded as a single unit probably for some storage purpose.

The rectangular brick structure was furnished with proper brick flooring on all sides. The brick of the flooring was set over the rammed foundation soil with its header set in east west orientation (i.e. horizontal manner). Every brick has been precisely fitted and bounded together with mud mortar at the flooring level. The flooring also yielded good number of grooved roof tiles again suggesting a roofed super structure made of perishable material.

Figure 7: Aerial View of Exposed Brick Channel in Locality – II
(Courtesy: Institute of Archaeology, ASI, Delhi)

The exposure of the brick flooring and its associated structure, prompted for further expansion of quadrants to uncover any buried structures on its either side. Accordingly, the quadrants namely ZF1/3, ZF2/4, ZE1/2and3, ZD1/2 were opened to the east of the trench ZF1/1, ZE1/1and4, ZD1/1. Out of the six quadrants opened in this area, almost every quadrant revealed presence of brick structure presumably forming part and parcel of a larger structure falling within the quadrants ZF1/3, ZE1/2and3 and

ZD1/2. Here a single brick structure measuring 16.50 meters in length was exposed running in north-south orientation originating from the south and terminating in the northern side. The exact spot of its origin could not be ascertained as the walls on the southern side were disturbed by pit activities (Figure 7).

On the whole, the brick structure revealed to be a channel like feature with two brick walls running parallel towards north and terminating like a rectangular structure in the quadrant ZF1/3 with gap in between. Here the exposed structure at the southern side was found slightly at a higher level (i.e. 0.30 meters) and gradually sloped towards the north. This sloping was purposefully given from the southern side probably to discharge some material or water that run through the channel. The channel like feature was disturbed in many places (i.e. on southern, eastern, western parts) due to dislodgement of brick courses.

Due to pit activities, the continuation of the wall towards south could not be identified. However the eastern arm measured 16.50 meters in length while the western arm measured 14.50 meters. The eastern arm of the structure comprised of nine brick courses. The channel like feature also revealed remarkable masonry skills. The channel had a widened mouth on the southern side measuring 0.80 meter to 1.00 meter breadth and gradually decreases when in converged with the rectangular structure on the northern side. The gap between the two walls of the structure varied from place to place upto its converging point. The eastern arm while running towards north was found tilted in many places due to which considerable gap could be seen in the form of recess in the northern side.

A terracotta ring well was also traced along the eastern arm of the wall on the southern side. Its features draw similarities with the ring well found during the first season at Locality-II on the southern side of the mound. The ring well was exposed at a depth of 0.15 meters from the present ground level and extended 5.00 meters into the natural soil comprising of fourteen rings. It is probable that the ring well was re-built or altered in different phases. There was a gap of about 0.15 meters beneath the third ring of the well. Beneath this were found a set of three rings which were again left with a gap of about 0.15 meters to 0.20 meters.

The placement of rings beneath the natural soil suggests that the well was constructed during the summer season when the water table shall be low and subsequently remain submerged within water during rainy season. All the rings were uniformly decorated with zigzag lines running all over the top in relief. The height of the ring varied from 0.48 to 0.50 meters, diameter measured 0.80 to 0.68 meters and thickness of the ring measured three centimeters.

The western arm of the wall with four brick courses revealed some interesting method of construction. The wall was purposefully heightened in its middle part by placing series of twelve bricks vertically aligned beneath the wall one after another from the south to northern to obtain slope. The alignment of the bricks placed measured about

5.00 meters in length from south to north. The exact reason for providing the bricks in such manner needs further examination.

The eastern arm of the structure running towards north took a turn towards west and again turned towards north forming a rectangular shaped structure at the northern side. Both, the walls extend further into the northern section of quadrant ZF1/3 and require further probing. Another aspect observed within the two walls was the accretion of white calcium like material sticking firmly along its inner side. Some of the brick courses on its upper part also revealed such accretion. Near the northern end of the tank like feature and inside were found small sized pebbles purposefully rammed all over the surface. The thickness of the pebble deposit beneath measured about 0.10 meters. On the northern end and above the east arm of the structure two big storage pots in broken condition were found. A big pit was found to be cut along the section to keep the above pots.

On the eastern side (ZF2/4) at a gap of about 1.70 meters of the structure found on ZF1/3 was exposed another fragmentary parallel running wall in north-south orientation. Both the walls were damaged extensively due to pit activities but traces of pebble flooring could be seen both inside and outside the walls. The occurrence of above structural evidences indicated the area on the western side of the mound might contain more contemporaneous structural evidences of a much larger complex. Accordingly on the western side the quadrants YE1/1and4, YF1/4, YF1/1 and YF2/2 were tackled.

Figure 8: Aerial View of Exposed brick Structures in Locality – II
(Courtesy: Institute of Archaeology, ASI, Delhi)

The digging in this area paid rich dividends in uncovering one of the biggest structure in the site (Figure 8). Digging work carried out in the quadrant YF1/1 on the northern side revealed a big brick structure at a depth of 1.55 meters and extended to a depth of 2.70 meters with brick flooring. Stratigraphically the structure was sealed by layer 2 with its foundation level extending to the lower most level of layer 3. The structure roughly in rectangular shape was constructed slightly in a diagonal position. The earliest level probably contained a small sized structure with or without enclosure on the southern side. The enclosure was constructed in a sloping manner rammed with mud over which in turn was provided with brick pavement.

On the western side the presence of disturbed wall like feature with 5 courses may suggest that a wall was constructed originally before the enclosure which in due course collapsed and part of the wall with piled bricks fell in to the floor of the tank. If such is the case the enclosure with sloping brick floor could have been added later date. The dimension of the early level structure on the west measured 3.10 meters and 2.70 meters on the eastern side with bricks measured 37x 22 x 6 centimeters. If we consider the alignment of the structure to early level then the enclosure wall with the brick flooring might have been added at a slightly later date. This is assumed on the basis of the level of the structure since majority of the bricks used for construction are almost identical to delineate later additions.

The structure was furnished with well laid brick flooring at a depth of 2.70 meters. The inner flooring of the structure measured 1.65 meters on east-west and 1.60 meters on north-south. The bricks of the flooring were placed largely in north south orientation with an exception of one row on the east placed in east west orientation. Here the bricks of the floor did not extended beneath the side wall as noticed in the adjacent quadrant YF1/2. A noticeable feature found was the square shaped opening presumably forming either inlet or outlet of the structure.

Its mouth resembled a corbelled design with a flat topped brick supported by two tapering bricks on either side with a paved base extending deep inside. At a later stage, when the original opening went into disuse a similar feature along with supportive wall but crude in design was added just above it. Both the openings were found to extend north and require further spade work. In total the structure had sixteen courses on east, seven courses on west, eight courses on north and on south with ten courses of bricks.

The structure also witnessed subsequent additions in the form of strengthening walls on the east and small rectangular structure on western side. The dimension of this structure measured north to south 2.15 meters, east to west 1.05 meters with bricks measuring 39 x 23 x 7 centimeters. The wall on the eastern as well as on the western side was the notable additions made to the structure. The wall on the eastern side extended towards further south but disturbed in between similarly the western wall was also found to running diagonally continuously towards south (YF1/4, YE2/2).

A series of irregular shaped post holes filled with river sand along the western wall and cut bricks observed here and there within the structure indicate it also had a roofed super structure. The occurrence of grooved roof tiles and nails strengthen this fact. The extension and origin point of the parallel walls of the structure towards south need further examination. A huge pit was traced along the eastern wall of the structure extending upto natural soil yielded group of rimless storage pots.

Further west and south west of this massive structure (YF1), cutting work was expanded in the quadrants YF2/2,3, YE2/2,3, YF3/2,3, YE3/2, YD1/1,2. The notable structural remains found in this area were that of a brick lined drain (YF2/3) and a parallel brick wall running in north south orientation (YF2/4). The extant brick drain measuring 3.00 meters in length was running in east-west direction with evidence of taking turn towards south. The structure traced at YF2/4 in the form of a parallel wall running in north-south direction. The eastern arm of the wall was survived with 7 brick courses while the eastern arm with five brick courses had an interesting feature instead of going parallel took a curve towards west and extending into the northern section.

The gap between these remains was completely filled with pure river sand. An isolated find within this gap was the *insitu* plastered grinding stone against northern section. The same working area beneath the structure revealed evidence of early activity in the form of terracotta ring well set right on the last working level at a depth of 3.00 meters. The well in total consisted of six rings and measured 2.00 meters in height.

The lowermost three rings were placed in the river sand, its successive two rings placed in natural soil and topmost ring was placed on the last habitation layer. Except the lowermost one all the other rings were pierced with four medium sized holes on opposite sides respectively. The immediate quadrants towards west (YE3/2, YF3/3) of the ring well also yielded structural remains like fragmentary walls highly disturbed by upper level pit activities. These pits yielded numerous coarse red ware wide mouthed bowls with flat and rounded base.

Moving further towards western side of the mound, the trenches laid in the land of Shri. Krishnan bore most promising results during second season of excavations. A total number of fourteen quadrants within the trenches YF4, YF5, YF6, YE4, and YE5 were opened and almost all quadrants evinced one after the other different forms of structural remains such as square or rectangular tanks, paved brick flooring, working platforms, furnaces, drains or channels with possibility of different structural periods (Figure 9). The functional utility of the structures shall be crucial to determine the nature of the site. Their identification shall remain highly tentative since most of them have only been partially exposed.

With some gap between the quadrant YF3 on the east, structural remains started to occur from YF4 extending towards west. Here the important find was the presence of a row of terracotta pipes (Figure 10) fitted one into another in south – north orientation

at a depth of 2.25 meters (YF4/2, 3). The northern end of the pipe was found to be slightly broken but certainly joined with the hemispherical red ware pot kept at the mouth level. The opening of the pipes on the other end also seem to have been fitted or joined with multiple big storage pots kept one above the other. Three such red ware pots in broken condition were exposed at the southern end of the pipes. A broken big globular pot was also seen placed near the pots at a little higher level. The total length of the pipes leaving the pots on either end measured 3.55 meters. The length of each pipe varied from 0.55 – 0.70 meters.

Figure 9: Aerial View of exposed Brick Structures in Locality – II
(Courtesy: Institute of Archaeology, ASI, Delhi)

A careful examination of the construction pattern of the pipes with associated pots on either side indicates that some sort of fluid material was processed from one end to other. It may be noted here that this process might have started at the southern end from the multiple pots and discharged through the pipes finally collected in the hemispherical pot kept at the northern end. This is so because the tapering mouth of each pipe was fixed with broader end of the other pipe towards south. This has been done with the purpose to arrest any leakage of the material. A total number of six terracotta pipes were noticed with the last pipe on the southern end was found completely broken. Towards northern end of the terracotta pipe, a series of circular post holes with different dimensions in east west orientation were also traced.

Figure 10: Exposed Terracotta Pipes

The area immediate to the west of terracotta pipes yielded more elaborate structural evidences. Two tanks like structures associated with intricate overlapping brick channels deserve mention. The first one traced within the quadrants YF4/1, YF4/4, YE4/1 comprised of a lengthy wall with paved flooring measuring about 8.70 meters. It emerged from the southern section and terminated with a square shaped brick structure.

The extant height of the wall was seen on southern and northern ends measuring less than a meter in height with 11 brick courses. The continuity of the wall in the middle part was disturbed by pit activities survived with only lower base. The eastern base of the wall had traces of twin layered brick flooring with large quantity of collapsed grooved roof tiles *insitu* position. Along the flooring were seen a row of 5 irregular shaped big post holes in regular intervals filled with river sand. One of the brick used in the pavement interestingly contained a foot print of an animal probably that of a dog (?).

The square brick built tank found against the wall at the northern end in YE4/1 revealed many interesting features. This structure traced at a depth of 1.00 meter was sealed by layer 2 cut through layer 3 and touched the middle of layer 4. The structure witnessed atleast two stages of construction. It was in a better state of preservation except for the top portion of eastern and western wall caved inside due to pressure exerted from the top. A rectangular shape opening was noticed against the southern side wall measuring 0.14 x 0.15 x 0.10 meters.

In all probabilities the upper part of structure survived with 5 brick courses on the west and north could be a later addition. Below this, the early level structure measured 1.30 x 1.30 x 0.80 meters. In total including the upper level, the structure measured 1.95 x 1.57 x 1.20 meters. The maximum courses of the structure were found on northern side with 17 bricks and rest of with 16 bricks. The average thickness of the structure measured 0.24 meters. The structure was paved with brick flooring at a depth of 1.20 meters. The floor was laid with bricks both in north south and east west orientation.

The inner part of the structure yielded important evidence in ascertaining its probable date with written record and other associated finds. The content of the soil found inside the structure was altogether different from the nature of soil observed outside. The semi compact soil in greyish yellow brown colour was totally wet upto the floor level but devoid of any organic remains. The associated finds collected inside the structure included assorted bones, TC discs and few iron pieces along with fine to medium fabric black and red ware and coarse red ware pot sherds. The most important find from inside the structure was the intact black and red ware shallow bowl found a little above the floor level near the western wall at a depth of 1.10 meters from the top.

The bowl on its exterior base contained label inscription written in Tamil – Brahmi script. The inscription read as '*madaicime'* could be identified as the name of a female individual. A stylistic fish symbol could be seen after the name separated by an oblique line. On its other side could be seen another label inscription with traces of three letters purposefully strike off after writing it. A stylistic graffiti with zig zag pattern could be seen here also. Besides there is yet another letter written as 'a' in Tamil – Brahmi script in between the above label inscriptions. The script on palaeographic basis could be dated to c. 2nd - 1st cent. BC.

The whole area to east of the structure along the floor level found to contain ashy deposit with broken terracotta pipe pieces indicating some working level related with it. Subsequent digging around this area revealed remains of three much disturbed terracotta pipes fitted one into another (YF4/4). Barring one pipe in the middle, the other two pipes were completely crushed to pieces. Similar to that of the terracotta pipes observed in the quadrants (Y4/2, 3) on the east, these pipes were also seen running from south to north. Interestingly, the pipes noticed in Y4/4 were given support on either side by placing bricks vertically to prevent any damage made to it.

A group of six varied sized post holes roughly forming 'U' shape were also noticed near the pipe. To north of the disturbed terracotta pipe and at the south eastern corner of Y4/1, at the same level was noticed an irregular shaped granite slab placed in east west orientation. This slab on its northern side had a bricked lined channel with pavement. The remains of the channel with two brick courses measured 0.75 x 0.65 x 0.12 meters. Traces of white accretion at the base of the channel suggest that it might have been used for cleaning or washing purpose. The same area also revealed evidences which could possibly be considered as the earliest remains among the other

structures. This evidence was ascertained below the brick tank at a depth of 1.80 meters from the ground level. The structure found in the form of a disturbed covered brick drain in east west orientation taking a turn towards south. The turn of the drain was attained by placing a dressed brick. The southern end of the drain was left open without any cover on the top.

The construction pattern of the drain showed the base was laid first with clay mixed with sand followed by placing two bricks horizontally for its side and covered by a single course of brick on the top. With a gap of 0.30 meters further below the covered drain was traced yet another covered drain emerged diagonally from south west and running towards north east direction. The brick size of this drain differed in dimension measuring 39 x 24 x 7 centimeters. The occurrence of these structures at a lower level raises the possibility of some other structure stood in the place of the brick tank which at a later stage was dismantled leaving the associated drains in disuse.

The quadrants YE5/2, YF5/1,2,3 to the west of this brick tank further evinced array of complex structural remains of different periods. The notable structure among them was another brick tank similar to the one found in YF4/1 on the east. This structure was analogous with the former in orientation, construction pattern and also in findings. Here again it was provided with a lengthy brick floor emerging from southern section with dwarf walls on either side with 11 brick courses terminating with the tank on the north. The western and eastern arm of the wall had post holes directly cut into the bricks in semi circular shape to hold the super structure.

The flooring was more elaborate with 4 brick courses laid uniformly about a foot in thickness and measured 8.34 meters from the southern section upto the tank. The digging made at the southern end of the wall showed the general construction pattern of the structures. Before the construction of the structure, at the first instance a loose layer with ashy deposit was laid. Above this, a well rammed earth mixed fine sand particles was again laid. This rammed earth was topped by a fine layer of sand above which the foundation was laid.

The tank also demonstrated two stages of construction. This was clearly seen on the top of eastern side where the side walls showing evidences of cutting the bricks in irregular manner. The overall dimension of the tank measured 2.00 x 1.95 x 1.56 meters while the inner part measured 1.15 x 0.65 meters. The maximum thickness of the tank was measured on the east wall with 0.90 meters. The walls of the brick structure survived with twenty five courses of bricks on the east, twenty one on the west, twenty one on the south and nineteen on the north respectively. The outer wall of the structure on the western side contained twelve courses of bricks probably added in the later date. The bottom of the tank contained four rows of brick flooring set in north south orientation.

Similar to that of the earlier tank, the inner portion of this tank also shared comparable findings. The colour of the soil inside remained the same in greyish brown colour in

wet condition. The findings made inside the tank included TC discs, assorted bones, bone point, black and red ware pot sherds and a large sized broken spouted basin in red ware. At a depth of about 1.00 meter the structure yielded another remarkable *insitu* find in the form of another intact black and red ware dish inscribed in Tamil – Brahmi script. The label inscription below the shoulder of the dish bore the name of an individual probably its owner as '*centan avathi*'.

The gap in between the two tank like structures displayed elaborate drainage system for the first time at the site. Two types of channels viz., covered brick channel and terracotta pipe channel were found close to each other. The overlapping channels clearly demonstrated different period of construction overlapping with one another. The lowermost covered drain was found at a depth of 1.80 meters to the east of second tank like structure. Here the orientation of the covered drain originated from northern section.

Its continuity was traced in south west orientation where it was found to split into two different channels taking turn towards south east and other going towards south. The covered top of the channel was found to be disturbed in the middle part on western side. The continuation of the channel branched towards south was completely lost. The other channel that branched towards southeast ran through the base of second tank taking a slight bend on the east and terminated with another small square shaped tank no. 3 traced on the south (YF4/4, YF5/3 baulk).

Figure 11: Close-up View of Overlapped Brick Drains

With a gap of about fifteen centimeters from the lower channel was found another similar channel in overlapped condition. The overlapped brick channel displayed two stages of construction (Figure 11). Originally it originated from the northern side running towards south. No traces of its continuation could be found on the northern side. The extant length of the channel towards the north measured 5.05 meters. At a later stage it was blocked from north and joined with another channel coming from the eastern side. The surviving portion of this channel measured 1.65 meters length in east west orientation.

Thereafter this channel was put to use to discharge processed material within the same brick tank on the south. This channel also at a later stage went into disuse by constructing a lengthy wall found in the quadrant YE4/1 connecting with the first tank on east. In between the wall and little below the second channel was traced yet another disturbed terracotta channel with four pipes in crushed state. Similar to that of the nearby two brick channels the mouth of the terracotta pipes also extended towards the tank on south. The extant length of the terracotta pipe measured 2.10 meters.

On the basis of depth and contextual position, the small square shaped brick tank probably represents the earliest structural activity in this area. Its relation with different level of covered brick channels and terracotta pipes indicate its importance used to process material continuously for a longer period of time. At a later stage the paved wall of Tank no. 1 was constructed over the eastern wall of the Tank no. 3. Stratigraphically this tank was sealed by layer 3 with its foundation resting on layer 4.

Figure 12: Double Walled Furnace with Ash Deposit

The construction of a later wall over the eastern wall inflicted considerable damage both exterior and interior including the flooring with an undulated surface. The extant dimension of the structure on east 1.02 meters, west 0.91 meters, south 1.25 meters, north is 1.34 meters in length and breadth. The eastern wall was survived with fourteen, west with nineteen, south and north with seventeen courses respectively. The depth of the tank measured about one meter from the top. The nature of the soil within the tank was strikingly similar to Tank no. 1 and 2 found in wet condition.

The western part of the brick channels showed evidences of industrial activities carried at different levels. The upper level activity coeval with structures yielded a large sized double layered furnace (YF5/3). The furnace in semicircular shape was constructed facing west (Figure 12) along with a brick paved working platform on the south. The foundation of the furnace was laid with pack of well spread brick bats all over the surface. The furnace was paved brick flooring on its southern side. Both its inner and outer walls were made with well burnt earth. The inner wall of the furnace was perhaps provided to sustain the heat within for a long period. The frequent use of the furnace in high temperature made its walls harder with bright orange colour.

The nature of the product processed or manufactured in the furnace is difficult to ascertain as it did not contain traces of any residue or waste discharged from it. Instead its western end was found with thick layer of ashy deposit. The maximum height of the furnace measured forty centimeters with a thickness of ten centimeters. In addition this, the same area on the south revealed more furnaces at its lower level. Two such furnaces were noticed side by side at a depth of 2.55 meters along the southern end of YE5/2. The first one was oval in shape with a thin outer wall encompassing a 'U' shaped inner opening towards south. The other specimen taking a rough trefoil shape was seen partly extended into the southern section. The inner portion of both the furnaces was filled with ashy deposit devoid of any waste. The surrounding area of the furnace on the east also contained similar loose ash deposit.

The next group of structures in this area were traced further west in the quadrants of YF5/1,4. Due to extensive upper level pit activities many structures lacked continuation but the structural pattern and orientation remain the same. There were also evidences of late structural activities as noticed on the eastern part in the baulks of YF4/1,4. The quadrant YF5/4 and baulks of YF5/1and YF6/2, showed another parallel running wall in north south orientation. Its western arm of the wall towards the northern section took a gentle curve towards west and extended to the northern section.

The wall had few post holes cut into the bricks. The northern end of the curved wall was survived with five brick courses. This construction pattern require further examination as it was the second instance where such similar pattern was noticed in the quadrant YF2/4 on the eastern side of Locality II (extn). A set of two neckless red ware ovoid pots were found *insitu* facing each other inside the wall. To the north of the wall against the section appeared another small rectangle shaped structure survived

with seven courses of bricks on the east. Unlike the other structures the inner portion did not yield evidence of flooring. Its nature and extension needs to be determined further north.

The last group of structures on the west were traced in the quadrants YF6/1,2 and 3. Digging work in this area again brought to light parallel running walls in north south orientation at a depth of 0.96 meters. Unlike the other parallel walls to its east, it was not provided with any brick flooring but rather left with a gap measuring 0.67 meters. This gap was found to be completely filled with river sand mixed with small pebbles upto the northern end. The presence of number of deep post holes cut into the bricks of the western wall and irregular shaped post holes along the eastern wall suggest a roofed super structure stood above it.

The western arm of the wall uniformly contained thick white accretion sticking with the bricks. This feature was so similar found within the channel like structure unearthed in the quadrants ZF1/3, ZE1/2 on the eastern side of Locality II. The nature of this accretion material associated with the structures merit further study. The extant length of the wall measured 7.21 meters survived with thirteen brick courses on the west. Deep digging carried out below the eastern wall revealed ashy deposit and presence of multiple pots kept above the other. The base of the upper pot was deliberately cut and fixed with the top of another pot. This arrangement resembled similar finding uncovered at YF4/3 on the eastern side. The soil inside the pots was wet and loose in texture.

The eastern arm of the wall was survived only with a single brick course at the base. The western arm at the northern end was badly disturbed by pit activities resulting in mangled brick debris. A notable feature at the northern end of the wall was the presence of precisely cut bricks probably meant to accommodate some big storage pot. In continuation to the parallel wall on the north western end was traced another rectangular structure set in north south orientation. The structure demonstrated two stages of construction. The original structure at a later stage seems to have been blocked by providing walls internally on the south and in the west. An additional wall was also given on the outer side of southern wall.

The northern wall of the tank was provided with a big opening probably its inlet. The square shaped inlet was provided with brick base extending towards the north. It had single vertical brick course on either for side walls and top with horizontal bricks. The inner dimension of the structure on north south measured 0.92 meters while the maximum breadth measured 0.46 meters. The eastern wall was survived with fifteen, west eleven, south eleven and north with seven courses excluding its mouth. The maximum depth of the tank measured 1.15 meters from the top. To west of the tank a disturbed terracotta pipe channel was noticed in isolated context.

Its relationship with that of the tank could not be clearly understood. The extant two pipes measured 1.18 meters with its mouth fitted towards northern direction. Along

the western end of the pipe were traced a row of twelve rectangular shaped post holes of varied dimensions. An additional row of four more postholes were also traced near the above with four vertically lined bricks. Besides this, the upper level of this area (YF6/4) also yielded activities in the form of a 'U' shaped furnace with its mouth facing south. The thickness of the furnace varied from 10 – 15 centimeters.

As far as the functional aspect of the structural remains are concerned, we may infer that The bricks used in the construction of structures revealed some notable features of manufacturing technique. Most of the bricks were made using block method. Before baking, the clay was mixed with composition of straw, husk, small plants, grass, grains etc used as tempered material to produce well burnt and quality bricks. Before firing they were kept open on plain surface resulted in getting plant or grass, reed impressions. Further the outer surface of the bricks was purposefully made with single to multiple grooves meant for better grip of the structure.

Pottery

The pottery found from the excavations by and large displayed indigenous character with minimal intrusion of external ceramic varieties. The broad classification of the pottery repertoire is as follows.

- Coarse red ware
- Red slipped ware
- Black and red ware
- White painted black and red ware
- Black ware
- Russet coated painted ware
- White painted red ware
- Matt impressed ware
- Perforated ware
- Rouletted ware

Besides, the site has yielded more than seventy Tamil-Brahmi inscribed potsherds and nearly six hundred graffiti sherds.

Coarse red ware: The coarse red ware accounts for more than 60% of the total ceramic assemblage found throughout the lifespan of the site. The bulk of this ware comes from the upper and mid level of the cultural deposit. It was fabricated both in slow and fast wheel and in most of the cases retained core in dull grey colour. The shapes were mostly utilitarian in character consisting of wide mouthed storage vessels, big to small pots, basins with or without spouts, small to medium carinated vases, corrugated bowls with a flat or rounded base, dish-on stands, miniature vessels, lids, finials, spouts, etc. The decorative pattern noticed in this ware consisted of incised, thumb impression, combed designs, finger nail impressions, criss-cross lines, leaf, herring bone pattern and other appliqué designs.

Red slipped ware: The red slipped ware formed was found in limited quantity and majority of them came from the upper levels. With fine to medium fabric, some of the storage vessels had decoration on its exterior. The shapes in this ware included medium sized storage vessels, pots etc. Locality I yielded some rare specimens of this ware in the form of lustrous globular pot with spouts on the exterior. These pots are rarely seen and definitely brought to the site from elsewhere.

Figure 13: White Painted Black and Red Ware Sherds

Black and red ware: Black and red ware is the diagnostic pottery variety found in enormous amount from many of the Iron Age – Early historic sites in Tamil Nadu. At Keeladi this variety occurs throughout the periods with much concentration in the mid and lower levels. In the upper level it occurs in a degenerated form as an associated variety with coarse red ware. In the mid level the pot sherds were of medium fabric. At the lower level it was found in profuse quantity and remained as sort of 'table ware'. Fashioned in fast wheel, with well levigated clay made it retained thin sections in evenly fired conditions. The shapes in this ware comprised of deep, shallow bowls with a featureless or sharpened rim, medium sized carinated jars, pots, dishes, plates, cups, miniature vessels etc. One of the characteristic feature found with this ware at the lower level was the presence of painted designs on the exterior. The painting was made with some natural white colour very lightly applied around the neck portion. There are few instances where the designs found to be executed even upto the carination of pots. The occurrence of paintings only in selective shapes like small to medium sized bowls and pots indicate its importance as a deluxe variety. The dot and dash pattern was the most preferred used in this ware to produce different designs (Figure 13).

Black ware: Black ware formed a very meagre amount among the pottery repertoire confined to ring stands, lids, small plates, dishes and some miniature forms ranging from medium to fine fabric. Some specimens were found to retain traces of slip also.

Russet coated painted black and red ware: Russet coated painted ware was one of the intrusive pottery variety found at Keeladi and might have reached here due to trade contacts with western part of Tamil Nadu and beyond. More than 200 sherds of this ware in medium to find fabric were collected largely from the mid level deposit with sporadic occurrence at the lower level. The shapes of this ware included small to medium bowls, flat bottomed vases, gourd form vases medium sized pots etc. The paintings on the exterior were executed with wavy, linear and criss cross designs.

White painted red ware: This ware seems to be a local variety of medium fabric confined to the upper level deposit. The paintings over the body displayed dots, dash, wavy lines, floral pattern executed in white colour with thin whitish yellow slip applied over them.

Perforated ware: A good number of perforated sherds in red ware were found in different levels. The perforations ranging from big to small found upto belly portion suggest its use for filtering and cleaning purposes.

Matt impressed pottery: Both Locality I and II yielded good collection of this ware. Most of them were survived with both sherds with medium to small sized squares or split linear lines all over the body. The fabric of this ware was found to be fine to medium. Similar type of sherds have been reported at Arikamedu, Pattanam (Kerala), Kottapattnam (Andhra) etc.

Rouletted ware: Rouletted ware was the distinct intrusive pottery found at Keeladi. This pottery is characteristic type of early historic period in Tamil Nadu. The occurrence of this ware at any given site assumes importance for maintaining external trade contacts especially with the western world. On contrary a strong indigenous origin of this ware is also advocated. The distinct shape found in this ware is the thin sectioned shallow dish, fabricated with fine levigated clay fired in sophisticated condition to produce a metallic sound. It has incurved and beaked rim with smooth surface. The inner base of the dish normally decorated concentric bands or circles resulted by rouletting or chattering pattern (Figure 14).

Out of the five varieties identified at the type site at Arikamedu, the site of Keeladi evinced three varieties such as greyish pink with grey slip on inside and brown to sepia on the outside, greyish pink with black slip inside and brown outside and grey with black slip inside and outside (Figure 15). Though this ware started to occur in upper level, a majority of the sherds were collected coeval with structural level. The upper level contained both fine and imitated rouletted sherds fashioned in plain black and black and red ware. More than two hundred roulette sherds were collected from both levels of the site from Locality II only.

Figure 14: Sherds of Rouletted Ware

Figure 15: Sherds of Rouletted Ware

Graffiti sherds: The post firing ligatured graffiti accounts for about six hundred sherds from both Locality I and II from different levels. The scratching was mostly on the exterior of the pot with few examples made inside it. Among the pottery repertoire red ware, black and red ware and russet coated ware contained the maximum number of graffiti. As far as the various patterns are concerned, the arrow was the most common symbol found to occur either in single or in composite forms. Besides this, the other forms found in the potsherds include ladder, fish, spirals, swastika, trident, sun, cart, leaf, wavy lines, single or double 'U' symbol, brahmi ' ma' like symbol with or without enclosure etc.

Figure 16: Tamil – Brahmi Inscribed Potsherd *'eravathan'*

Figure 17: Tamil – Brahmi Inscribed Black and Red Ware Dish *'ce n ta n a va (ta) thi'*

Figure 18: Tamil – Brahmi Inscribed Potsherd *'va se i y pe ru mu va r u n……'*

Tamil - Brahmi inscribed sherds: About 70 Tamil-Brahmi inscribed pot sherds were collected from two field seasons. All the inscribed sherds came from Locality II coeval with the structural activities of Layer 2. The red ware and black red ware ceramic variety was more preferred for writing purpose. The nature of these writing on the pottery was primarily aimed to register names of individuals probably its owner's. The inscribed sherds revealed an array of pure tamil, pure prakrit and prakrit converted to tamil language having names of individuals such as 'athan', 'tisan', 'uthiran', 'iyanai' 'surama', 'sathan', 'eravathan' (Figure16), 'santhan', 'madaicime' 'santhan avathi' (Figure 17), vendhan, muyan, sampan, perayan, ..kuviran kuravan, vasai perumuvar un… (Figure 18) etc. Few pot sherds inscribed in prakrit language namely 'rajakatasa(?)' 'guthasa', could be of Srilankan origin. Interestingly, the evidence from one of the lead coin bearing the legend 'guthasa' reported from the site of Akurugoda (Tissamaharama),Sri Lanka on its reverse corroborates this fact (Boperarachchi and Wickremesinhe 1999: 57). The size and mode of writing differ due to pot surface and style of writing by the individual. Some of the names have parallels with that of the names found in the Jain caverns around Madurai region and other excavated sites in Tamil Nadu. On the basis of stratigraphy and palaeographical grounds, these inscribed sherds may be dated to c. 2nd cent BCE - c. 1st cent CE.

Antiquities

The two field season excavations conducted at Keeladi yielded about 5800 antiquities (appx) in different materials of varied nature. Among them, a bulk of them belonged to the category of glass beads (about 40%), followed by terracotta objects, paste beads and metal objects. The distribution of antiquities belonged to different levels but majority of

them were found coeval with the structural period. The antiquities can broadly be classified into the following categories.

Figure 19: Ivory Objects

Figure 20: Ivory Objects

Ivory Objects

The excavations perhaps for the first time yielded more number of ivory objects in Tamil Nadu. Despite being a deluxe item its occurrence in such numbers at Keeladi deserves attention. Most of objects found at Keeladi are finished products used in the form of ear studs, dice, combs, bead, ring etc. The occurrence of dice indicates past time activity of the elite section. The intact specimen has been numbered from one to four in the form of incised twin circles with a dot at the center. The ear studs fashioned in ivory might have been used as jewellery item. It display a hemispherical top joined by a cylindrical shaft with flat base (Figure 19). Some specimens were also found to have flat top. The occurrence of ivory combs is a rare feature in the excavations carried out in Tamil Nadu. In that context, the site of Keeladi is first of its kind to yield this evidence in stratified context. Two broken combs of varied size were collected from Locality II. The first one seems to be curved variety while the other resembles a thin pocket comb. The either side of the comb were decorated with small concentric circles in regular intervals (Figure 20).

Figure 21: Copper Coins

Metal Objects

This category comprised of gold, copper and iron objects from the site. Among them, iron occupies a major percentage with diversified form of objects used domestic and hunting purpose. It includes spear heads, knives, sickles, daggers, chisel, arrow head, spade, pipe (?), rings, axe, forceps, bead and nails. The copper objects comprised mainly domestic and cosmetic items. The different forms include antimony rods with clubbed ends, bangles, beads, ear rings, ring, bell tongues, pipe and coins. Gold objects were very few occurring in the form of spherical beads.

Coins

The excavations yielded a total number of seven copper coins (square and round) in proper stratigraphical context. Most of them are highly corroded and require chemical cleaning to trace any legend on it (Figure 21).

Figure 22: Terracotta Figurines

Terracotta Objects

The terracotta objects were the most common variety among the antiquities collected from the site in many diversified forms. They included Figurines, dice, beads, ear studs, gamesmen, spindle whorls, discs, wheels, lamps, ear rings, bangle, pendant, balls, weight, stopper, cakes, net sinkers, cone etc. The occurrence of terracotta spindle whorls pierced with iron needle indicates extraction of cotton subsequently used for some textile related activities. The human and animal Figurines from the site mostly came from upper and mid level of the cultural deposit. The human Figurines show both fine and crude workmanship. The facial features were clearly delineated with a slit mouth. The head portion was decorated with pierced holes and ornaments (Figure 22). The finding of a seal in Locality II could be considered as an important find among

the terracotta objects. It had a rounded knob with flat base containing two rows of small to medium sized concentric circles in negative impression. The center part of the seal contains a big circle bordered by small concentric circles. The cardinal points of the seal were incised with paddy clearly delineated by ribs and bordered by small concentric circles (Figure 23).

Figure 23: Terracotta Seal

Semi-precious Stone Objects

The semi-precious stone objects include carnelian and agate beads. Among carnelian beads both etched and plain variety with different shades were noticed and fashioned in spherical, barrel, biconical and button shapes in small and big size. The finding of rare specimen of spacer bead in carnelian deserves mention. It had four small perforations on its sides to attach strands for necklace. The banded agate accounted for spherical and short biconical beads. The other notable stones used for making beads include quartz, crystal, beryl (?) and soapstone. The quartz was found to include spherical, biconical and collared beads. Some of the collared or lugged beads had crisscross decoration on its body.

Figure 24: Bone Points

Figure 25: Stone Celts

Glass Objects

The glass antiquities found from the excavation include beads, bangles, ear stud, rings etc. Among the glass beads, the green variety was the most preferred colour by the people. The rest of the colours found were maroon, red, yellow, black and blue colours fashioned in spherical shape. The beads ranged from micro to small in size.

Shell Objects

The shell objects include mostly bangles, beads, plain and cut conch. Few shell bangles displayed incised decoration on its surface.

Bone Objects

The bone objects from the excavations mainly consisted of points or stylus from various levels. The points had both blunt and pointed tip (Figure 24). The provision of hafting at its lower end with wooden stick indicates its use for hunting purpose.

Stone Objects

A wide range of antiquities include in the stone object category such as quern, pestles, rubbing/grinding stones, discs, balls, pendant, weights, beads, celts (Figure 25), gamesmen, door socket, sharpener etc.

Conclusion

The two seasons of excavation work (2014 – 15 and 2015 – 16) conducted at Keeladi has revealed many interesting and rare aspects pertaining to the early historic phase of Tamil Nadu. The cultural remains altogether suggest it was purely a unicultural site. The preponderance of large scale structural activities with its associated findings such as rouletted ware, inscribed pot sherds etc portray the site as a very important settlement in this region. Its strategic location near the ancient city of Madurai gains importance as it links the other important early historic port site of Alagankulam located near the mouth of Vaigai river at Bay of Bengal.

The occurrence of prakrit names in sherds suggest in external trade contacts with Sri Lanka. Further the occurrence of other materials like carnelian, agate beads, ivory items, copper objects, russet coated pottery etc certainly indicate its internal trade contacts maintained with different parts of the country.

The structural remains found at Keeladi are considered to be important in the sense of its rarity in the early historic period of Tamil Nadu. Barring Arikamedu, Kaveripattinam and isolated remains found at Korkai, Tirukampuliyur, Karur, Kanchipuram no other site in Tamil Nadu has yielded such type of structures till date. These structures possibly forming part of elaborate structural complex have only been partially exposed. Hence the functional aspect of these remains shall remain highly tentative. However based on their dimensions and associated features like channels, furnace we may infer it form part and parcel of an industrial complex and not related to residential area. This has to be corroborated only after detailed chemical analysis of

the soil obtained from the structures and channels. Further spadework is essentially required to understand the settlement pattern and also to understand the orientation, plan and purpose of the structural remains[4]. Likewise the burial complex also needs to be tapped to understand the burial pattern of the people and its relationship with the habitation complex. The ongoing extended investigations shall likely to reveal not only the cultural developments took place at the site but also the factors led to the formation of early historic phase in Vaigai river valley and Tamil Nadu on the whole.

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Notes

[1] *Mortimer Wheeler through his pioneering work attempted to find similar links at Brahmagiri and Arikamedu in corroboration with the inscriptional, literary works to verify the Mauryan presence and trade contacts with the west in both the above sites.*

[2] *The importance of the site was first brought to light by local retired school head master Sh. V. Balasubramanian in the year 1979 by collecting coin of Chola king Rajaraja I, few beads and terracotta Figurines of c. 12th – 13th cent. AD. Later Dr. V. Vedachalam, Senior Epigraphist (Retired), Govt. of Tamil Nadu revisited the site during his course of exploration and collected early historic pottery varieties including Rouletted ware.*

[3] *The lowermost levels of Period I did not reveal any inscribed materials. Some of the inscribed sherds found in lower most levels are due to pit activities.*

[4] *The recently completed fourth season excavation at the site by Department of Archaeology, Govt. of Tamil Nadu have also not addressed to this aspect due to sporadic evidence of structural activities.*

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