# Archaeological survey in Ketema Ra'esi, Adet district, central Tigray, Ethiopia

**Abstract**: This study presents the findings of an archaeological survey conducted at Ketema Ra'esi from 13 to 21 June 2024. Despite its considerable archaeological potential, the site had previously received little attention. Using fieldwork and interviews as primary data collection methods, the study analyzes and presents the data qualitatively. Preliminary findings highlight the site's significant archaeological value, evidenced by the frequent discovery of architectural remains, pottery, Aksumite coins, and metal artifacts. A comparative analysis of material culture from Ketema Ra'esi with artifacts documented at Aksum and surrounding regions suggests that the site dates from the early to late Aksumite periods. However, the site's rich archaeological heritage is currently under threat from both natural and anthropogenic agents of destruction. This research aims to establish a foundational dataset to guide future archaeological investigations and to support development of cultural heritage management strategies.

**Keywords**: Aksumite period, material culture, architectural remains, pottery, coins, metal artifacts, cultural heritage management, site destruction

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## INTRODUCTION

Northern Ethiopia (including the present state of Eritrea) is strategically located at a crucial crossroads where diverse cultural and socioeconomic groups have interacted for centuries. This region was one of the busiest trade routes in antiquity and served as a vital hub for population movements, trade, and cultural exchange due to its strategic location and abundant natural resources (Curtis 2005; Gerlach 2013; Bard 2021; D'Andrea et al. 2023; Bard et al. 2014). Modern archaeological research in the region, including surveys and excavations, only began in earnest in the early 20th century (Munro-Hay 1991; Phillipson 2012). These studies have revealed that the earliest complex societies in the area emerged during the Pre-Aksumite period, (2nd millennium BC), followed by the rise of the ancient state of Aksum in the early 1st millennium AD (see Phillipson 2012; D'Andrea et al. 2023).

Numerous archaeological sites in the region reveal traces of ceremonial centers, nucleated settlements, and complex societies or kingdoms with sophisticated architectural designs dating back at least to the 2nd millennium BC (Gerlach 2013; D'Andrea et al. 2023). The archaeological findings from sites such as Qohayto, Matara, Adulis, Keskese in Eritrea, as well as Yeha, Hawelti-Melazo, Meqabir Ga'ewa, Ona Adi, Bete-Giorgis, and Aksum in Tigray —along with historical accounts— indicate extensive socio-economic and cultural exchanges between this region, South Arabia, and the Mediterranean world during antiquity (Sernicola and Phillipson 2011; Harrower and D'Andrea 2014; Gaudiello 2014; Peterson 2017; Mekonnen 2019; Wiederick 2020; D'Andrea et al. 2023). However, these studies have largely been limited to easily accessible and visually impressive sites (Kobishchanov 1979; Curtis 2005; Bard and Manzo 2025). Even elite settlements in the region remain insufficiently studied and await comprehensive, multidisciplinary research. For instance, the ancient city of Aksum —one of the major urban centers of the ancient world— has received comparatively more archaeological attention than other sites in the Horn of Africa, yet it remains far from fully understood. Research in and around Aksum has shown that numerous Aksumite-period settlements, towns, and villages are scattered across the Tigrayan plateau, from Shire (west of Aksum) to Lake Hashinge (about 300 km to the south), and along the Aksum–Adulis trade route, which connected Aksum to the Red Sea trade network (Kobishchanov 1979; Wiederick 2020; Harrower *et al.*, 2023). Nevertheless, many potential archaeological sites remain underexplored, both geographically and chronologically (Munro-Hay 1991; Fattovich 2001; Phillipson 2012; Mekonnen 2019).

A comprehensive study of the region's cultural history, which requires systematic and thorough investigation, is still urgently needed. This study documents one of the previously unexplored archaeological sites: Ketema Ra'esi in Jira Qebelle, Adet *Woreda*, Central Zone of Tigray, near the ancient city of Aksum. Despite the site's rich archaeological evidence and its potential to fill significant

gaps in regional knowledge, it remains poorly understood. Therefore, the objectives of this study are to document the site and its associated findings, assess its state of preservation, and recommend appropriate conservation measures.

## OBJECTIVES OF THE STUDY

The main objective of this study is to explore and document the archaeological evidence found at Ketema Ra'esi, Adet *Woreda*, Central Tigray, northern Ethiopia.

The specific objectives of the study are to:

- identify and describe the archaeological sites and findings in the study area;
- establish the relative chronology of the identified site; reconstruct the function of the identified site.

## RESEARCH METHODS AND TOOLS USED IN THE STUDY

The researchers employed both primary and secondary sources for data collection. Specifically, document review, informal fieldwork/ground reconnaissance survey, and interviews were used during the study. Prior to fieldwork, both published and unpublished materials —such as books, articles, theses, and official reports— were reviewed to assess previous archaeological research in the region, identify gaps in existing knowledge, and evaluate the site's potential. Archaeological fieldwork remains a fundamental research tool and the principal source of data collection (Sharer and Ashmore 2003). Accordingly, an extensive ground reconnaissance survey was conducted during this study. It proved helpful in identifying, locating, and recording the presence of previously undocumented archaeological sites. This informal archaeological survey, carried out from 13 to 21 June 2024, not only helped identify potential archaeological sites in the area but also provided valuable information regarding settlement patterns, current site management and preservation conditions, and the environmental setting of the study area.

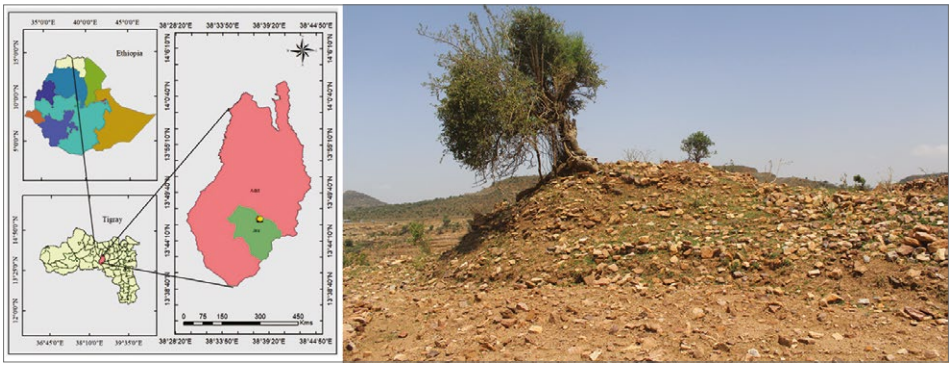


Fig. 1. General view of the architectural features of the site and cultural mound (Photo Mearg Abay Abebe)

In addition, interviews were conducted with local residents to gather oral histories and legends related to the site. Interviews were carried out with individuals and stakeholders familiar with the area's history and material cultures. The results were instrumental in evaluating the archaeological potential of the sites, understanding their historical development, and reconstructing their function. These interviews also yielded insights into the preservation history and causes of deterioration affecting the identified sites and their associated material remains.

Finally, the archaeological findings from the newly identified sites were described and compared qualitatively with similar material types previously documented in the region, particularly with those discovered in northern Ethiopia and the present-day state of Eritrea.

To achieve effective and meaningful results, archaeological fieldwork requires a variety of tools. Although it is difficult to obtain all necessary instruments at this stage, the researchers were equipped with basic tools essential for locating and documenting the newly identified archaeological sites. These included tools for map production, photography, and measurement. A Global Positioning System (GPS) device was used to record the

Fig. 2. Architectural remains at the site (Photos Mearg Abay Abebe)

absolute locations and altitudes of the identified sites. A digital camera was employed to photograph the archaeological findings and to document the physiographic context of selected sites. Measuring tools such as meters and scales were used to record the dimensions of certain artifacts, including rectangular dressed stones. The distances between identified sites and nearby physical landmarks were estimated and expressed in kilometers. Additional basic tools, such as notebooks, pens, and brushes, were also used to document observations and record data during the fieldwork.

Fig. 3. Reused rectangular well-dressed stone slabs (Photos Mearg Abay Abebe)

Fig. 4. Sinkholes indicating possible underground structures (Photos Mearg Abay Abebe)

## RESULTS AND DISCUSSION

The Ketema Ra'esi archaeological site is located approximately 50 km south of Aksum, at GPS coordinates N 15 23 217.91, E 049 08 27.70, at an elevation of 2435 m a.s.l. It lies among various archaeological sites dating to the pre-Aksumite, proto-Aksumite, and Aksumite periods. For example, to the north is Seglamen, an early pre-Aksumite settlement in Tigray (Gaudiello 2014), while to the east and southeast are Natika Bila'e and Hawesta, recently identified as Aksumite sites (Brhane 2018) [*Fig. 1*].

The archaeological survey, conducted from 13 to 21 June 2024, aimed to identify previously undocumented archaeological sites within Ketema Ra'esi. As a result, three key new sub-sites were identified and are described below.

### *Ona* and architectural evidence

This sub-site, locally known as *ona* — which means "ruin" in Tigrigna— is situated in the middle of cultivated land [see *Fig. 1* and *Figs 2–4*]. Its approximate area is 200 m², with GPS coordinates of N 15 23 14.7, E 460 78 1 and an elevation of 2340 m a.s.l. The mound revealed substantial architectural evidence, including ruined walls, well-dressed rectangular and circular stone slabs, and stone rubble. Although no intact ancient structures were visible on the surface, exposed and partially disturbed wall remains could be observed. Local residents reported discovering wall foundations while constructing new homes. Unfortunately, many of the exposed stone slabs have been repurposed

Fig. 5. General view of the ceramic site (Photo Mearg Abay Abebe)

for private residential construction. These slabs, made from locally sourced stone, measure up to 200 cm in length, 50 cm in width, and 15 cm in thickness. Residents also described areas that produced a hollow sound when walked upon, suggesting the presence of subsurface structures. The research team observed holes, supporting the possibility of underground features. According to oral accounts, the site once served as the seat of Bermberas Hailu, a local ruler and relative of Emperor Yohannes IV (r. 1872–1889).

Fig. 6. Pottery sherds identified at the site (Photos Mearg Abay Abebe)

## Ceramics and grinding stones

This sub-site lies about 500 m north of the cultural mound, with GPS coordinates of N 15 23 240, E 46 07 80, and at an elevation of 2244 m a.s.l. It occupies cultivated land measuring approximately 70 m by 90 m. Surface findings included numerous potsherds, both diagnostic and non-diagnostic, showing variation in surface treatment, color, thickness, and form.

Most of the potsherds found at the site are reddish-brown to buff or red in color, with smooth surfaces, finely levigated red paste, and traces of crushed, decayed basalt. According to Wilding (1989), sherds —reddish-brown to buff in color due to the firing process and the presence of iron oxides in the clay— can be dated to the early Aksumite period. Moreover, the red ware ceramics discovered at this site closely resemble 2nd- to 5th-century AD Aksumite pottery docu-

Fig. 7. Horizontally dotted potsherd (left) and sherds with internal wave and horizontal line decorations (right) (Photos Mearg Abay Abebe)

Fig. 8. Miniature vessels, top and bottom views of the same objects (Photos Mearg Abay Abebe)

Fig. 9. Both sides of stamp-like ceramic objects (top left and top right), and a small ceramic incense burner (bottom left and bottom right) (Photos Mearg Abay Abebe)

Fig. 10. Both sides of a foot washer fragment (Photos Mearg Abay Abebe)

mented by Wilding (1989). Some of the potsherds exhibit simple decorations, including incised lines, impressed patterns, and occasional painted designs — often geometric in nature— which are also characteristic of the early Aksumite period (Wilding 1989; Curtis 2005).

Brown ware potsherds, which are harder and denser than the red wares, were also identified at the site. These brown ware ceramics exhibit characteristics typical of early Aksumite period pottery and are similar to those found at Medebai, Central Tigray (Zeru 2015). This suggests that the site was occupied from the early to the late Aksumite periods.

Some potsherds from the site also feature thick wavy lines, dotted horizontal patterns, and V-shaped motif deco-

Fig. 11. Grinding stones of various sizes and shapes (upper left, upper right, and lower left), and a polishing stone (lower left) from the site (Photos Mearg Abay Abebe)

rations — typical characteristics of the Aksumite period (Wilding 1989). Miniature vessels, incense burners, foot washers, and decorative stamp-like ceramic objects were also uncovered. According to Mekonnen (2019), the middle Aksumite pottery sherds continue to show similar color variations to the reddish-brown types of the early Aksumite period. However, the firing techniques of the middle Aksumite period are more refined. This suggests that some of the potsherds from this site may also date to the middle Aksumite period.

According to Phillips (in Phillipson 2000/II), the late Aksumite ceramics are less decorated, with firing less controlled and performed at lower temperatures. This results in gray or black wares, thicker vessel walls and handles, and coarser fabrics, likely to enhance strength. As Fattovich (1990) also notes, pottery sherds from the late Aksumite period are characterized by very thick walls and coarse grains. Archaeological excavations in Aksum and the greater Asmara areas have shown that late Aksumite black ware typically features thick body walls and handles, coarse fabrics, and mostly black color. These ceramics often display flash or reduction marks, suggesting a shift toward reduction firing techniques (Wilding 1989; Mekonnen 2019).

At the site, potsherds with rough and thick body walls, coarse grains, and black to gray coloring are frequently observed. Some of the ceramic objects/sherds also have thick walls and moderately rough surfaces on both sides, with inclusions of medium-sized quartz and mica grains. These characteristics closely resemble those of late Aksumite period pottery as described by Wilding (1989), Phillips (in Phillipson 2000/II), and Fat-

Fig. 12. Aksumite coins recovered from the site (Photos Mearg Abay Abebe)

tovich (1990), implying that the site was continuously inhabited until the late Aksumite period.

Grinding and polishing stones were also identified in various sizes and shapes, suggesting different functional uses. Larger grinding stones measured approximately 13 cm × 15 cm × 9 cm, while smaller examples measured around 6 cm × 10 cm × 3 cm. These findings indicate that cereal crop processing took place at the site, although further analysis is needed to identify the specific types of grains [*Figs 5–11*].

## Coins and other metal objects

The third sub-site lies approximately 500 m east of the ceramic site, with GPS coordinates of N 15 23 216, E 46 08 53 and an elevation of 2352 m a.s.l. During the survey, eight Aksumite coins were discovered, all currently in the possession of local residents. Informants reported that many similar coins have been unearthed during daily activities and subsequently sold through illegal markets [*Fig. 12*].

Among the identified coins are:

- King Armah's coin (7th century AD): A bronze coin depicting a crowned king seated on a throne, holding a cross-shaped staff. The reverse displays a cross encircled by cereal grains, possibly wheat or barley. This coin resembles those previously documented by Munro-Hay (1991) and dates to the reign of King Armah, the last ruler of the Aksumite dynasty to mint coins [*Fig. 13*] (Hahn and Keck 2024: Armh 72a).
- King Joel's coin (6th century AD): This coin features a crowned king and a cross. Its iconography aligns with similar coins described by Lowick (1970) and Munro-Hay (1991) and is attributed to King Joel [*Fig. 14*] (Hahn and Keck 2024: Joel 86).
- Coin from the period of King Ebana (late 5th to early 6th century AD): a coin depicting a king, minted anonymously starting from the period of King Ebana (younger anonymous type, Hahn 2024: anonymous 45). It

Fig. 13. King Armah's coin from Ketema Ra'esi (upper left and upper right) (Photos Mearg Abay Abebe) and comparison with King Armah's coin documented from Aksumite sites (lower left and lower right) (After Munro-Hay 1991: Fig. 16)


Fig. 14. King Joel's coin from Ketema Ra'esi (upper left and upper right) (Photos M.A. Abebe), compared with King Joel's coin documented by Lowick (1970: No. 57, Pl. XLII, No. 15) from another Aksumite site (lower left and lower right)

can be compared to coins documented by Munro-Hay (1991) and Lowick (1970) from various Aksumite period archaeological sites [*Fig. 15*].

In addition to the coins, the survey also documented several other metal artifacts, including bracelets and a finger ring. The ring is typologically similar to examples from other Aksumite sites (Munro-Hay 1991; Phillipson 1998; 2000). These objects further confirm the site's occupation during the Aksumite period [*Fig. 16*].

## CONCLUSION

Archaeological research in northern Ethiopia, particularly in Tigray, has a long history dating back over a century. However, most studies have focused on easily accessible or monumental sites, leaving many culturally rich regions underexplored.

The Ketema Ra'esi site represents a newly documented archaeological area with diverse findings, including architectural remains, ceramics, grinding stones, coins, and metal artifacts. At this stage, the researchers have provided a preliminary description of the site and its associated materials. To obtain more refined and detailed data about the site and its surrounding context, a more comprehensive archaeological investigation involving multidisciplinary experts is planned for the near future. Comparative analysis suggests that the site was occupied from the early to the late Aksumite periods, offering important insights into local interactions and cultural exchanges during that time. Unfortunately, despite its archaeological significance, the site is currently subject to rapid deterioration due to both human and natural disturbances. Therefore, urgent and appropriate preservation measures must be taken by the relevant authorities. Preserving this site is crucial for understanding the historical and cultural development of northern Ethiopia. To this end, raising community awareness, conducting scientific impact assessments before any development activities, and promoting collaboration among academic institutions, governmental bodies, and other stakeholders are essential steps that must be undertaken promptly.


Fig. 15. Anonymous coin from the period of King Ebana from Ketema Ra'esi (upper left and upper right) (Photos Mearg Abay Abebe), compared with a coin from another Aksumite site (lower left and lower right) (After Lowick 1970: 152–154)

Fig. 16. Finger ring and other metal objects from Ketema Ra'esi (Photo Mearg Abay Abebe)

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