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Pottery Discoveries at the Penanggootu Site, East Kolaka Regency, Southeast Sulawesi: A Study of Form, Decorative Varieties, and Technology

Temuan Gerabah Pada Situs Penanggootu, Kabupaten Kolaka Timur, Sulawesi Tenggara: Kajian Bentuk, Ragam Hias dan Teknologis

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Abstract

Archaeological research in East Kolaka Regency, Southeast Sulawesi, remains limited, particularly in the Mendoke Mountain region. This study reports the discovery of pottery fragments from the Penanggootu Site and aims to examine their typological diversity, as well as stylistic and technological attributes. Employing a qualitative-descriptive approach, the research encompasses stages of data collection, processing, analysis, and interpretation. The results reveal a range of vessel forms, including cooking pots, bowls, and jars. Motif analysis indicates the continuity of an early pottery tradition alongside a high degree of visual complexity, suggesting the intergenerational transmission of technical and artistic knowledge. These findings contribute new insights into the dynamics of ancient cultural development in the Mendoke Mountains and underscore the significance of this area as an important cultural landscape that has remained largely overlooked in regional archaeological and historical studies.

Abstrak

Kajian arkeologis di Kabupaten Kolaka Timur, Sulawesi Tenggara, hingga kini masih relatif terbatas, khususnya pada wilayah Pegunungan Mendoke. Penelitian ini melaporkan temuan fragmen gerabah dari Situs Penanggootu dan bertujuan mengkaji keragaman tipologi, serta aspek stilistik dan teknologi pembuatannya. Penelitian dilakukan melalui pendekatan kualitatif-deskriptif yang meliputi tahapan pengumpulan, pengolahan, analisis, dan eksplanasi data. Hasil penelitian menunjukkan variasi bentuk gerabah berupa periuk, mangkuk, dan kendi. Analisis motif mengindikasikan keberlanjutan tradisi gerabah tua yang berpadu dengan tingkat kompleksitas visual yang tinggi, mengisyaratkan adanya transmisi pengetahuan antargenerasi. Temuan ini memberikan kontribusi baru terhadap pemahaman dinamika budaya kuna di Pegunungan Mendoke serta menegaskan posisi wilayah ini sebagai lanskap budaya penting yang selama ini terabaikan dalam kajian arkeologi dan sejarah regional.

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1. Introduction

Archaeological research on early human occupation in mainland Southeast Sulawesi of Indonesia has predominantly focused on the North Konawe Karst Mountains.

Excavations at Gua Tenggera, North Konawe, indicate cave occupation dating back approximately 10,000 years BP (Nur, 2018). Meanwhile, investigations in the Routa area—located within the same karst system as North Konawe, namely the Matarombeo Karst—suggest an even earlier phase of human presence, with occupation extending to at least 19,000 years BP (O'Connor et al., 2014). In contrast, intensive archaeological investigations in other regions remain limited, particularly in Kolaka. Archaeological studies addressing early human life in the Kolaka region are still scarce, although several exploratory efforts have been conducted in parts of the Northern Kolaka Karst Mountains.

A number of studies in the Mala-Mala area of North Kolaka have identified caves containing significant archaeological remains. Bernadeta's research in several of these sites concluded that the archaeological materials were most likely associated with mortuary practices in the past (Bernadeta, 2010). Similarly, investigations in the Uesi area and its surroundings revealed multiple burial contexts within caves (Syahrun & Melamba, 2022). East Kolaka itself is a relatively new autonomous region, formally established through Law of the Republic of Indonesia No. 8 of 2013 (Lembaga Negara Republik Indonesia, 2013). Prior to this, East Kolaka was administratively part of Kolaka Regency. Considering the assemblage of artifacts documented in the *Mengkoka* (Mekongga) karst region, there is clear evidence of intensive cave utilization during certain periods. Although previous interpretations have largely emphasized the function of caves as burial spaces, the possibility that these caves also served as habitation sites cannot be dismissed.

A community report concerning the discovery of various ceramic fragments in Lambandia Village, East Kolaka, prompted the author to conduct a direct field inspection to verify the information. The survey confirmed the presence of archaeological materials at the site, consisting primarily of pottery sherds scattered across the ground surface. Pottery—commonly referred to in Indonesia as *gerabah*—is a type of ceramic made from fired clay (Mochtar, 2013), typically produced through firing processes at temperatures ranging between 300°C and 1000°C (Rangkuti et al., 2008). The presence of pottery is widely recognized as a key indicator of ancient settlement activities (Mochtar, 2013). Most scholars agree that pottery production in Indonesia emerged during the Neolithic period, a phase characterized by sedentary lifeways and the development of agriculture (Bawono, 2018; Qalam et al., 2020; Triwurjani, 2018).

Based on these considerations, the occurrence of pottery fragments in the site constitutes crucial evidence of past human activity. Moreover, the study of ceramic remains provides valuable insights into how past communities organized their daily lives and interacted with their surrounding landscapes. Having Having regard to those circumstances, this paper aims to present the results of our recent archaeological investigation in the Mendoke Mountains, East Kolaka. This study documents the

morphological variation and decorative patterns of the pottery assemblage and explores the potential functions of the recovered objects. As one of the first systematic discussions of pottery finds from this region, the research offers original and novel data that significantly enhance our understanding of early human activities in East Kolaka. Ultimately, this study is expected to serve as an important baseline for future archaeological research and to contribute meaningfully to regional archaeological discourse in Southeast Sulawesi.

2. Method

This study employs a qualitative–descriptive research design. Qualitative research is considered descriptive due to its strong inclination toward inductive analytical approaches, through which patterns and meanings emerge directly from the data (Murdiyanto 2020, 19). Furthermore, this approach is commonly referred to as an interpretative method, as it ultimately seeks to uncover and understand the meanings embedded within the phenomena under investigation (Sugiyono, 2013). Accordingly, this research aims to provide a holistic and in-depth portrayal of the studied object, with a particular emphasis on interpreting the cultural and technological significance of archaeological materials within their contextual framework.

The research object consists of ceramic sherds recovered from the Penanggootu Site, located in the Mendoke Mountain range, East Kolaka Regency. More specifically, this study seeks to identify and classify the variability of ceramic fragment forms, examine stylistic variations in decorative motifs, and analyze the technological aspects involved in ceramic production, including manufacturing and decorative techniques. This research is grounded in both literature-based data and primary data obtained through direct field observation. Field data were collected using purposive sampling, a technique that selects samples based on specific analytical considerations to ensure representativeness (Sugiyono, 2013). The selected samples represent distinctive forms, decorative styles, and technological attributes of the ceramics identified at the site.

Subsequent to data collection, a comprehensive analytical process was conducted, encompassing morphological, stylistic, and technological analyses of the ceramic assemblage. The final stage of the research involved data interpretation and explanation, aimed at elucidating broader cultural patterns and technological practices reflected in the ceramics. By focusing on an archaeologically underexplored mountainous region of Southeast Sulawesi, this study offers original and novel insights into regional ceramic traditions, contributing significantly to the understanding of local cultural dynamics and technological adaptations. The findings are expected to enrich regional archaeological discourse and serve as a valuable reference for

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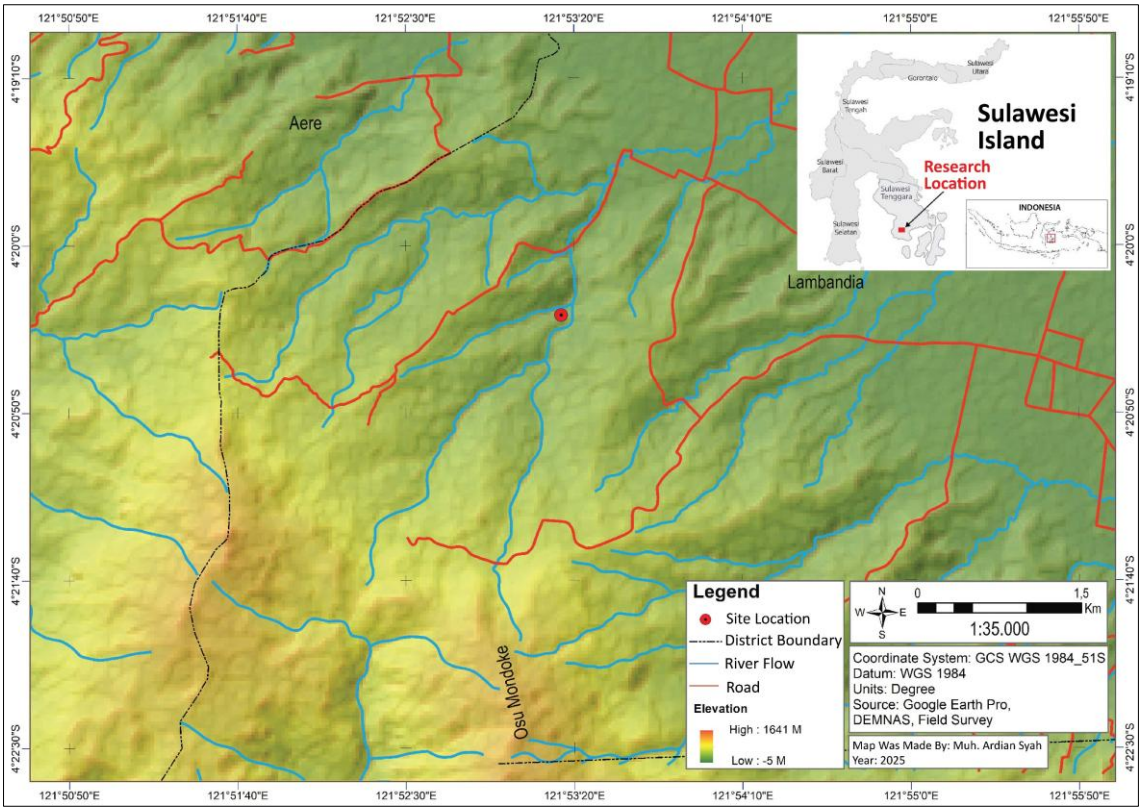
future studies on ceramic production and cultural interaction in eastern Indonesia.

3. Findings and Discussion

Location and Morphological Description of the Site

The Penanggootu Site is located in Penanggootu Village, Lambandia District, East Kolaka Regency, at coordinates 04°20'20.77" SL and 121°53'16.28" EL. The site lies at an elevation of approximately 138 meters above sea level and situated on the lower slope of a hill at the foothills of the Mendoke Mountain. The mountain occupies the southernmost extension of Southeast Sulawesi and reaches a maximum elevation of 981 meters above sea level (Nandika & Agustina, 2018). Topographically, the southern part of the region is characterized by a heterogeneous landscape comprising lowlands, gently to steeply sloping hills, and mountainous terrains (Hasria et al., 2021). Geologically, the Mendoke Range is primarily composed of metamorphic and ophiolitic rock formations. However, metamorphic lithologies are predominant, including schist, quartzite, slate, and marble (Surono, 2013).

Image 1
The Maps of Research Location



Source: Made by Muh. Ardian Syah, 2025

The site is located approximately 2.33 kilometers from the nearest settlement. Access to the site is possible by two-wheeled vehicles via a well-established local road used by the local resident, which extends to the forest edge before transitioning into a forest trail.

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Although the road is relatively narrow and uneven, it remains navigable by bicycles and motorcycles. The access route to the site closely follows a river channel.

The site is situated within a forested area characterized by relatively dense vegetation. It was initially discovered by a local resident, Sul, while cultivating land in the vicinity of the site. During agricultural activities, he inadvertently encountered scattered pottery sherds exposed on the surface of a landslide deposit. These ceramic fragments were exclusively found within the redeposited landslide material and were absent from undisturbed ground surfaces. Geographically, the site is bounded by forested areas to the north, east, and south, while the western side is adjacent to community-managed plantation land.

Image 2
Environment (top) and pottery fragments on the soil surface of the site (bellow left and right)

Source: Authors, 2025

The archaeological assemblage recovered from this site comprises ceramic fragments exhibiting diverse morphologies and dimensions. These artifacts were retrieved from a destabilized landslide surface, with

certain fragments preserving discernible features such as rims, vessel bodies, and other structural components. A subset of the ceramics displays ornamental motifs, predominantly geometric in design. The surface context, heavily obscured by grasses and dry leaf litter, impeded systematic identification of additional fragments, while the diminutive size of the ceramics necessitated meticulous, fine-grained survey methods. The following section provides a detailed account of the archaeological objects documented in this study.

Types of Pottery Containers at Penanggootu Site

Systematic investigations at the site yielded a total of 60 ceramic fragments, of which 18 preserved discernible morphological typologies. Ceramics are conventionally classified according to their fundamental forms, encompassing plates, bowls, pots, vases, small jars, ewers, bottles, censers, figurines, ornamental jars, and storage amphorae (Eriawati, 2013; Soegondho, 1993). Morphometric analysis of the fragments with identifiable forms revealed that all 18 corresponded to functional containers, comprising 14 pots, two jugs, and two grips.

- Pot

Pot is fundamentally a closed container primarily employed for cooking purposes. Its defining characteristic is a relatively narrow mouth diameter in proportion to the body (Soegondho, 1993). Pots are frequently the most abundant ceramic type recovered in archaeological contexts, surpassing other vessel forms in quantity (Sendana & Rauf, 2017; Triwurjani, 2018). Based on their dimensions, the pots recovered at the site are classified into three size categories: large, medium, and small.

A total of five large pots were identified in this study, all of which were recovered as fragments representing the rim to neck sections. These vessels exhibit everted rims and open bodies, with wall profiles indicating a globular body form. The large pots display rim diameters ranging from 23 to 31 cm and are consistently adorned with rows of small perforations aligned horizontally along the neck. In addition, four medium-sized pots were recorded, each characterized by everted rims and rounded bodies, preserved as rim-to-neck fragments and uniformly bearing decorative motifs. Small pots are distinguished by rim diameters measuring approximately 14–17 cm.

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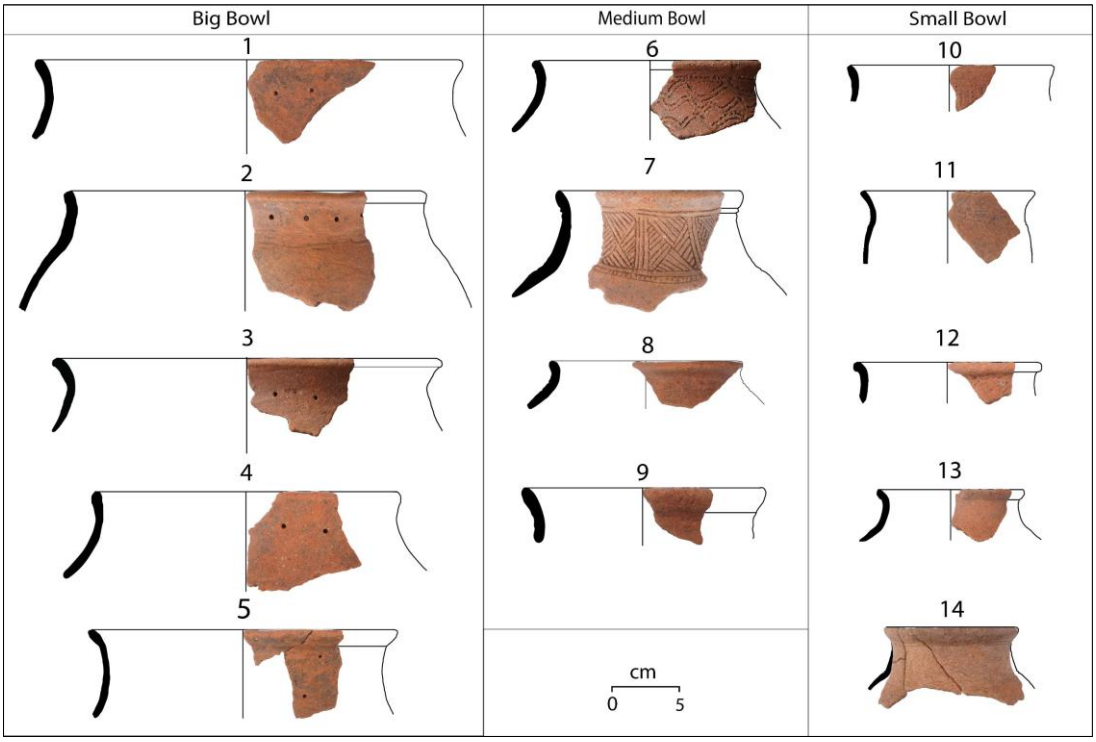
Image 3
The forms of Pot



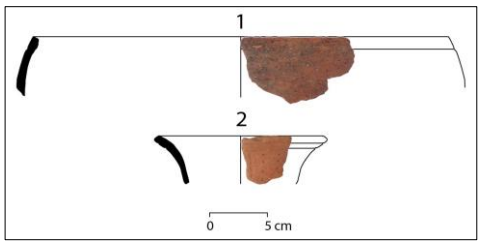
Source: Authors, 2025

Furthermore, five small-sized pots were documented. The recovered fragments predominantly comprise rim-to-neck sections, with several specimens extending from the rim to the body. Morphologically, these small pots exhibit everted rims, while the body forms vary between globular and slightly elongated profiles. Rim diameter measurements range from 10 to 15 cm. All small-pot fragments display decorative motifs, each exhibiting distinct ornamental variation.

- Bowl

Bowls represent an open vessel form characterized by a mouth diameter that is wider than or nearly equivalent to the body diameter. The vessel body is generally rounded, while the base tends to be relatively flat (Triwurjani, 2018). In this study, two bowls were identified: one larger and one smaller specimen. The larger bowl exhibits an inward-curving rim, whereas the smaller bowl displays an open rim profile. Decorative motifs are exclusively present on the smaller bowl.

Image 4
The Form of Bowl Fragments

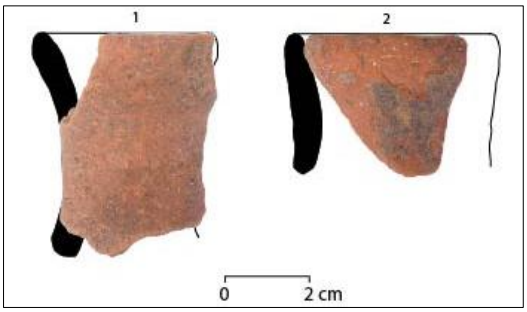


Source: Author, 2025

- Jug

Jug or *kendi* in Indonesia is a vessel type commonly employed for the storage and dispensing of drinking water. It is typically characterized by a convex body and the presence of a spout, which functions to collect and pour water (Winata, 2020). The morphological variability of jug across regions reflects localized craftsmanship and, in some cases, serves as an indicator of interaction or affiliation with different cultural groups (Hakim, 2001). In this study, two jug fragments were identified, both of which appear to derive from the spout rim sections. The first fragment is elongated and exhibits a more pronounced curvature, with a clearly everted rim orientation. In contrast, the second fragment displays a relatively straighter profile, although the rim orientation remains distinctly open. Beneath the rim, the surface appears flatter and curves inward.

Image 5
The jug fragments

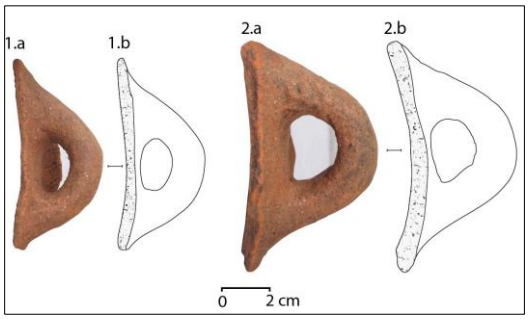


Source: Authors, 2025

- Grip

Grips constitute a functional component of pottery vessels, facilitating lifting and transportation, and may be attached either to the vessel body or to its lid (Triwurjani, 2018). Body-mounted grips are typically manufactured by shaping clay into an elongated form, curving it into an inverted C profile, and affixing it to the exterior wall of the vessel (Rahmayani, 2012). In this study, two grip fragments were recovered, differing markedly in size and wall thickness, with the first fragment being smaller and thinner than the second. These morphological discrepancies indicate that the fragments do not originate from the same vessel. Moreover, the first fragment exhibits decorative treatment on one lateral side of the handle, a feature absent from the second specimen. Based on their form and attachment characteristics, these grips are interpreted as body-mounted vessel grips rather than lid grips.

Image 6
The grip fragments



Source: Authors, 2025

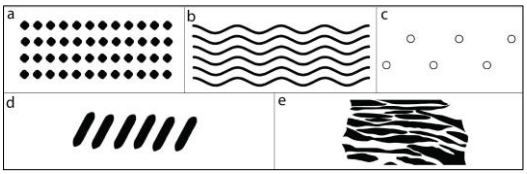
The Decorative Motifs of the Pottery

Decorative motifs identified in this study are classified into single and composite types. Further elaboration of the two forms of decoration is explained in the following section:

- Single Decorative motifs

The single decorative motifs comprise diamond-shaped punctate patterns, wavy linear designs, oblique linear incisions, circular impressions, and cord-marked motifs. The diamond-shaped punctate motif (a) consists of systematically arranged points forming a rhomboid configuration and occurs in notably high frequency, particularly on vessel bodies. The wavy line motif (b) is characterized by a series of horizontally arranged undulating lines and, in several instances, appears in combination with other decorative elements. The circular motif (c) takes the form of rounded impressions produced by perforating the vessel wall with a specific implement; these motifs are predominantly located on the neck of the vessel and often penetrate the wall, although non-perforating examples are also present.

Iamge 7
Single Decorative Variations



Source: Authors, 2025

The oblique-line motif (d) is composed of a series of vertically incised lines deliberately set at an inclined orientation and is predominantly observed along the vessel rim margins. The final decorative motif, the cord-marked pattern (e), comprises vertically oriented linear impressions arranged in an irregular and non-uniform configuration.

- Combined-decorative motifs

In this study, composite decorative motifs refer to ceramic ornamentation that incorporates two or more distinct decorative elements applied to a single vessel. The composite motifs identified are classified into three categories: combinations of two motifs, combinations of three motifs, and combinations of four motifs.

The two-motif composite designs exhibited the greatest variability, including: a combination of diamond-shaped punctate with horizontal lines (a), diamond-shaped punctate with wavy horizontal lines (b), circular motifs with horizontal lines (c), dashed horizontal lines paired with two wavy dashed lines (d), dashed horizontal lines with three wavy dashed lines (e), horizontal lines combined with wavy lines (f), horizontal lines with sharply angled wavy lines (g), dashed horizontal lines with triangular dashed lines (h), dashed horizontal lines with vertical dashed lines (i), and cord-marked motifs resembling net patterns (j).

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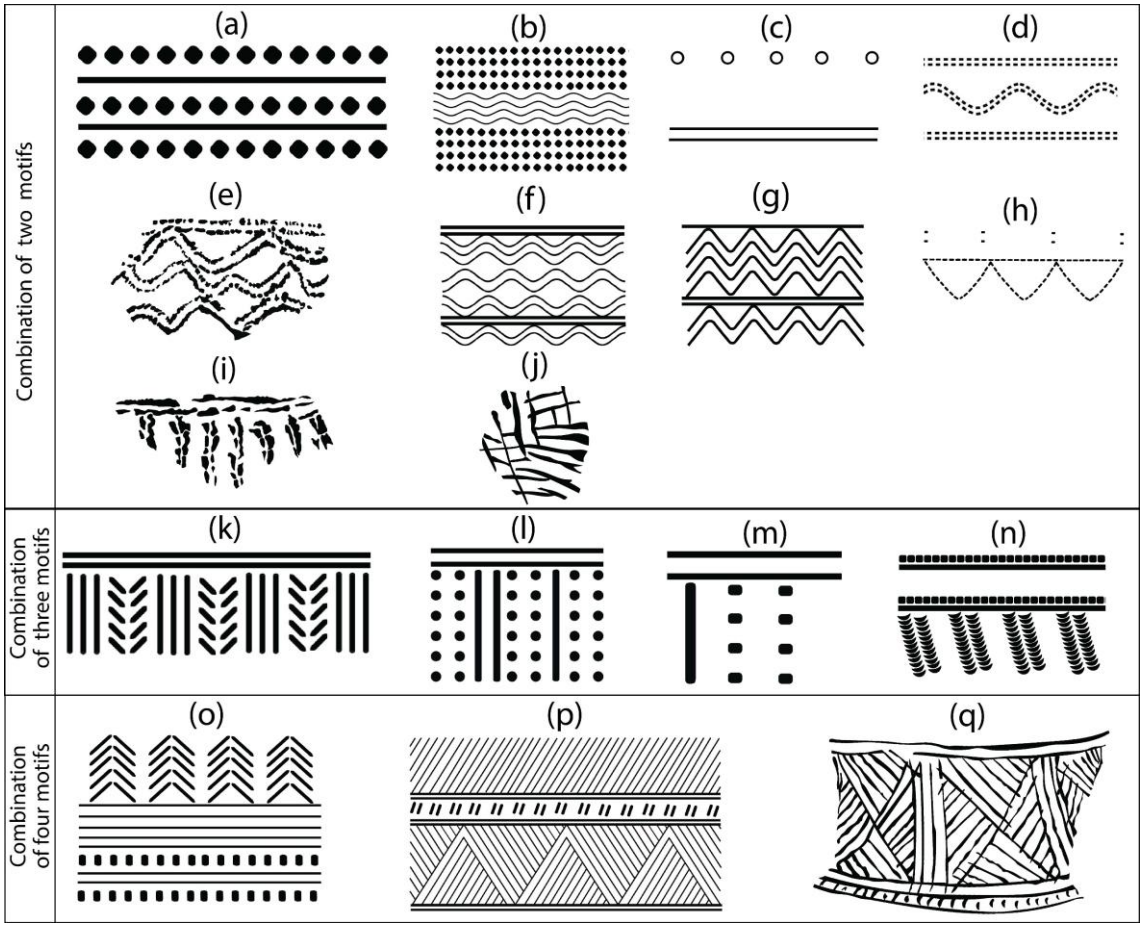
Image 8
Combined-Decorative Motif Variations



Source: Authors, 2025

The three-motif composites comprise: horizontal lines with vertical lines and angled oblique lines (k), two horizontal lines with two vertical lines and vertical punctate (l), two horizontal lines with one vertical line and vertical punctate (m), and a combination of horizontal dashed lines, straight horizontal lines, and curved punctate (n). Four-motif composites include: angled oblique lines, five straight horizontal lines, horizontal punctate, and two horizontal lines (o); closely spaced oblique lines, horizontal lines, widely spaced oblique lines, and triangular lines (p); and, finally, horizontal lines, vertical lines, curved punctate, and oblique lines combined in a single motif (q).

Technique Applied to form the Ceramic and its decoration

Overall, the pottery recovered from the site exhibits substantial surface degradation, which complicates technological analysis. Nevertheless, certain surfaces preserve discernible evidence of specific manufacturing techniques. Analysis of these surfaces indicates that the ceramics from the Mendoke Highlands were produced using the potter's wheel, slab-building, and

paddle-and-anvil methods. Traces of wheel-thrown production are observable on interior wall surfaces, which display characteristic striation patterns (Rangkuti et al., 2008). Conversely, some vessels exhibit localized pressure marks on the interior walls, indicative of paddle-and-anvil and slab-building techniques. The paddle-and-anvil method produces depressions approximately 1 cm in diameter, whereas slab-built surfaces display larger depressions exceeding 2 cm in diameter.

Regarding decorative application, multiple technological approaches were identified, including impressing and incising techniques. Impressing yields motifs such as perforated circular patterns, punctate dots, diamond-shaped punctate, curved puncta, and cord-marked impressions. Incising produces linear patterns, including vertical lines, horizontal lines, wavy horizontal lines, and oblique lines. These techniques are occasionally combined within a single ceramic fragment.

The Historical Relevance of the Penanggootu Site within the Archaeological Narrative of East Kolaka

This study has revealed critical insights into the artifact assemblage at the Penanggootu Site, East Kolaka, highlighting the diversity and complexity of material evidence preserved at the location. The recovered artifacts provide strong indications that the area was once occupied by a human community, a conclusion consistent with the surrounding geography: fertile plains to the north suitable for cultivation and proximate river systems supplying essential resources. However, it is important to note that the presence of pottery does not unequivocally indicate settlement, as ceramics may also be associated with mortuary or ritual practices (Atmosudiro, 1998). The absence of complementary artifact types that could clarify the site's function leaves several questions regarding its precise role, yet the data confirm the site's archaeological significance.

Regarding form, the assemblage predominantly comprises storage and cooking vessels, including pots, jug-type containers, and handle fragments, all of which are typical of archaeological sites and closely linked to daily activities such as cooking, food consumption, and water storage. This suggests that the community responsible for these artifacts placed considerable emphasis on storage technology. In Indonesia, pottery traditions have been established since the Neolithic, coinciding with the advent of agriculture, when human populations developed not only tools for cultivation but also vessels designed for cooking, serving, and storing essential resources (Atmosudiro, 1998). Many researchers associate the introduction of pottery with the arrival of Austronesian-speaking populations in Sulawesi around 4,000 years ago (Simanjuntak et al., 2016), who subsequently dispersed across wider regions, with ceramic production serving as a hallmark of their cultural identity (Bellwood, 2016).

The technological and decorative characteristics of the Penanggootu ceramics indicate a sophisticated understanding of production techniques and ornamental practices among the site's associated community. Analysis of decorative motifs reveals a complex artistic sensibility, while simultaneously providing critical data for assessing interregional connections between sites exhibiting stylistic affinities. Several motifs, including circular designs, zigzag patterns, and wavy horizontal lines, have roots in prehistoric periods (Bulbeck & Clune, 2003), as does the cord-marked motif, which in Southeast Asia has been interpreted as evidence of Neolithic influences from western Indonesia, potentially introduced by Austroasiatic-speaking groups (Fauzi, 2017; Putri et al., 2022; Solheim II, 2005). Nonetheless, the presence of more technologically complex motifs suggests contributions from later periods, making it difficult to ascribe the site solely to the early Neolithic despite the long-standing tradition of certain designs. This phenomenon likely reflects sustained interregional interaction and the transmission of knowledge across generations within specific cultural frameworks.

The significance of the Penanggootu Site is inseparable from its geographic context within the Mendoke Mountains. Beyond providing economic resources, the mountain can be understood as a sacred landscape, occupying a central role in the sociocultural life of past communities. Across many cultures, mountains hold profound ritual significance (Laneri, 2015), and similarly, the Mendoke Mountains have exerted a substantial influence on the location and function of this site. In contemporary belief systems, the Mendoke range continues to be recognized as an entity of considerable cultural and spiritual importance to the communities of East Kolaka.

4. Conclusion

This study has highlighted the rich archaeological resources of the Penanggootu Site in East Kolaka. The recovered assemblage, including pots of various sizes, bowls, and jug-type containers, represents essential domestic implements left by the communities that once inhabited the area. The diversity of decorative motifs further reflects the sophisticated creativity and technical understanding of the site's former inhabitants. Collectively, these findings contribute to a deeper comprehension of the cultural diversity that historically characterized East Kolaka. Moreover, this research opens new avenues for future studies, encouraging broader spatial and interpretive perspectives on the region. To ensure the preservation and protection of the site, however, immediate preventive measures are imperative.

Acknowledgment

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