

Typology and Chronology of Ancient Ceramics in Mekar Alam Village, Tanjung Jabung Barat Regency

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ABSTRACT

This study was prompted by the discovery of a substantial assemblage of ancient ceramics during an accidental excavation by residents in a plantation area in Mekar Alam Village, Seberang Kota Subdistrict, West Tanjung Jabung Regency, in 2021. Since the finds had not been chronologically identified, this study aimed to determine their materials, forms, types, and periods. The study employed archaeological research methods, beginning with a preliminary survey and followed by data collection using purposive sampling. The analysis identified 921 Chinese ceramic bowls classified into three categories based on glaze characteristics: Yue ware, Anhui yellow-glazed ceramics (*Anhui Lime Glazes*), and Five Dynasties white-glazed ceramics (*Five Dynasties Whiteware Glazes*). These categories indicate a chronology spanning the ninth to tenth centuries CE, encompassing the late Tang and Five Dynasties periods rather than the Tang Dynasty exclusively. The typological and chronological identification of this assemblage provides archaeological evidence for understanding Mekar Alam within the wider circulation of Chinese ceramics and the historical trade networks that connected the region to external commercial centers during this period.

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INTRODUCTION

"Ceramics" refers to objects made from clay that acquire their characteristic physical properties through a firing process at a specific temperature. In English, the term derives from "ceramic," and its etymological origin can be traced to the Greek word *keramos*, meaning objects made from fired clay (Muhamad, [2010](#)). The firing process distinguishes ceramics from unfired clay objects and produces material characteristics that allow archaeological analysis of their form, technology, and production (Batubara & Syam, [2026](#)). Archaeologists can therefore use ceramic remains as material evidence to identify cultural activities and reconstruct the historical contexts in which such objects circulated and were used (Siahaan et al., [2024](#)).

In March 2021, residents of Mekar Alam Village, Tanjung Jabung Barat Regency, discovered a substantial assemblage of ancient ceramics in a coconut plantation owned by Supangat, a resident. The discovery occurred accidentally when the landowner dug a deeper drainage ditch around the plantation. The large concentration of ceramics prompted the landowner, assisted by several residents, to excavate and bring the objects to the surface. Following their recovery, Supangat stored the ceramics at his residence for safekeeping (Taim, [2023](#)). The quantity and condition of the assemblage raise important archaeological questions concerning its typology, chronology, and relationship with the historical activities that once occurred in the area (Adhy et al., [2026](#)).

The geographical setting of Mekar Alam provides an important context for interpreting these ceramic finds. The village lies near the estuary of the Tungkal River, approximately 10 km from the Strait of Malacca coastline, placing it in a riverine environment connected to one of Southeast Asia's major maritime corridors (Maharani & Meihan, [2024](#)). Historical accounts indicate that the kingdoms of Jambi and Johor contested control over the Tungkal waterways because merchant vessels used this route to transport commodities from Jambi, including pepper, resin, and other agricultural products (Andaya, [2013](#)). The Tungkal River, therefore, functioned not merely as a local waterway but as an inland-coastal connection through which commodities, people, and material culture could circulate. From the perspective of riverine archaeology, the ceramic assemblage can be examined in relation to the rivers' role in connecting inland settlements to coastal and maritime trade networks.

Foreign vessels had used the Tungkal waterway for commercial interaction with local communities since earlier historical periods, indicating its position within broader exchange networks. The proximity of Mekar Alam to both the Tungkal River and the Strait of Malacca reveals a large ceramic assemblage particularly relevant to the study of historical trade and material circulation. Rather than treating the ceramics solely as isolated archaeological objects, their typological and chronological characteristics can provide evidence for examining when and how Mekar Alam participated in wider networks of exchange. The ceramic finds, therefore, provide a material basis for linking riverine activity in the Tungkal area to regional maritime trade. Establishing their provenance and chronology is essential for a more precise evaluation of this archaeological relationship.

Following the discovery, the government initiated preliminary measures through the Jambi Cultural Heritage Preservation Office (BPCB), which inspected the site in collaboration with the West Tanjung Jabung Education and Culture Office. The BPCB conducted initial documentation and registered the objects as suspected cultural heritage, but this preliminary work did not establish their specific types, historical context, or chronological periods. During the inspection, the BPCB also encouraged residents to discontinue unauthorized excavations around the plantation to prevent further disturbance of the archaeological context. The absence of subsequent archaeological analysis has left fundamental questions concerning the ceramic assemblage unresolved. This condition underscores the need for systematic identification of the artifacts rather than relying solely on documentation of their discovery.

The BPCB's 2021 preliminary survey report has not yet provided detailed information concerning the typology and chronology of the Mekar Alam ceramic assemblage. Although ceramic studies have contributed broadly to archaeological interpretations of historical interaction and trade, the information available in this study has not specifically identified the materials, forms, types, or chronological periods of the unusually large assemblage discovered at Mekar Alam. This unresolved problem constitutes the principal research gap addressed in the present study. The study, therefore, identifies and classifies the ceramics by their material and formal characteristics and establishes their chronological position to clarify the assemblage's archaeological significance. Its novelty lies in providing the first focused typological and chronological identification of the Mekar Alam ceramics and using these findings to place the site more clearly within the historical context of the Tungkal River and its connection to wider trade networks.

METHOD

The study examined ancient ceramics discovered by residents of Mekar Alam Village, West Tanjung Jabung Regency, which are currently stored at Supangat's residence, the landowner of the discovery site. The documented assemblage comprises 921 ceramic objects and constitutes the primary archaeological dataset of this study. The researchers used purposive sampling to select artifacts that exhibited diagnostic characteristics for identifying ceramic forms, materials, types, origins, and chronological periods. The selection focused on observable attributes that could support typological identification, particularly vessel morphology, glaze characteristics, decorative patterns, and visual material features. This procedure allowed the analysis to focus on diagnostic characteristics present in the assemblage without assuming that every object possessed equally informative attributes for classification.

The analytical procedure combined morphological, decorative-pattern, and visual material analyses within a typological framework. Morphological analysis identified and compared vessel forms, while decorative-pattern analysis examined glaze color, surface treatment, and motifs as diagnostic attributes for distinguishing ceramic types and possible origins. Visual material analysis examined observable characteristics of the ceramic bodies to provide additional information relevant to their classification and provenance. The researchers integrated these attributes rather than using any single characteristic as the basis for identification. The resulting combinations of form, glaze, decoration, and material characteristics provided the framework for grouping the ceramics into identifiable typological categories.

The study determined the origin and chronology through comparative analysis, matching the diagnostic characteristics of the Mekar Alam assemblage with established ceramic typologies and chronological parallels for the identified ceramic categories. The comparison considered similarities in vessel form, glaze characteristics, decorative features, and visual material properties to distinguish ceramic groups and establish their probable production origins and chronological ranges. Comparative dating consequently formed part of the analytical procedure rather than being applied only after the ceramic categories had been identified. The researchers used the comparative references presented in the identification and chronological discussion of the Results section as the basis for assigning the ceramic types to their respective periods. This integrated typological and comparative approach enabled the study to identify the forms, materials, origins, and chronological periods of the ancient ceramics discovered in Mekar Alam Village.

RESULT AND DISCUSSION

Archaeological Context and Discovery of the Mekar Alam Ceramic Assemblage

The ceramic discovery site in Mekar Alam Village is located at S 0.8082968, E 103.3910063, within a landscape dominated by coconut plantations. Ditches fed by small streams surround the plantation area and eventually connect with the Tungkal River (Tanjung Jabung Barat In Figures 2022: Statistics of Tanjung Jabung Barat Regency, [2022](#)). Local communities continue to use these waterways as transportation routes connecting the plantation area with the urban center. The site's position within the Kuala Tungkal River basin provides an important geographical context for examining the movement of people and material objects through riverine routes. This geographical relationship indicates the site's accessibility to a wider waterway system, although the location alone does not demonstrate direct interaction with external traders or long-distance commercial networks.

Supangat, a 60-year-old farmer and owner of the coconut plantation, accidentally discovered the ancient ceramics in February 2021. He encountered the assemblage while widening a ditch on his plantation that local farmers used to float harvested coconuts downstream (Sairi, [2021](#)). Residents of Mekar Alam Village and the surrounding areas commonly construct such ditches across coconut plantations as part of their agricultural transportation system. Ceramic finds associated with ditch excavation have nevertheless been reported only on Supangat's land. The localized concentration of the assemblage distinguishes this particular area from the surrounding plantation landscape and indicates the need to investigate its archaeological context more systematically.

Supangat encountered a concentration of ancient ceramics while deepening the ditch and subsequently asked several villagers to assist with their recovery. The ceramics were excavated from a depth of approximately 170–200 cm below the present ground surface. They occurred in a vertically arranged and stacked concentration within peat soil mixed with mud, and most of the recovered objects remained intact despite being covered by sediment. Excavation by residents exposed an area of approximately 8 × 8 m and produced five pits, which are now submerged in water and mud. According to Supangat, the pits were approximately 60–80 cm apart, and each yielded between 130 and 200 ceramic objects.

The first concentration appeared near the ditch that Supangat planned to widen to transport coconuts. In contrast, subsequent concentrations were found along the edges of the same ditch, near the initial discovery point (Figure 1). Muddy peat characterizes the plantation soil, allowing water and mud to enter the excavation pits during recovery easily. The clustered distribution of the ceramics across five closely spaced pits provides important contextual information about the assemblage's archaeological character. The stacking and concentration of numerous largely intact vessels differ from a random distribution of isolated surface finds. However, the unsystematic excavation prevents a definitive reconstruction of their original depositional context. This limitation requires subsequent interpretations of the assemblage and its function to distinguish clearly between directly documented archaeological evidence and interpretations derived from artifact analysis.

After receiving information from the community, the Jambi Cultural Heritage Preservation Office (BPCB), together with the West Tanjung Jabung Regency Education and Culture Office (*Dikdikbud*), inspected the discovery site. Their activities focused on salvage measures, preliminary documentation of the ceramics, and public outreach to prevent further unauthorized excavation (Rahim & Hutabarat, [2024](#)). The intervention was particularly important because residents had recovered the ceramics without archaeological excavation procedures, thereby limiting information about stratigraphy, associations, and the original depositional sequence. The BPCB subsequently instructed residents to discontinue excavation in accordance with Law No. 11 of 2010 on Cultural Heritage. Article 26, Paragraph 4, prohibits searches for cultural heritage, or for suspected cultural heritage, through excavation, diving, or retrieval on land or underwater without authorization from the central or local government. "No person shall search for cultural heritage sites or suspected cultural heritage sites through excavation, diving, and/or retrieval on land and/or in water as referred to in paragraph (2), except with a permit from the central government or local government in accordance with their respective authorities."

The regulation establishes that the previous excavations lacked the government authorization required for archaeological retrieval. Following the BPCB's public awareness campaign, Supangat and other residents ceased further excavation at the discovery site. This intervention prevented additional uncontrolled disturbance to the remaining archaeological context. It also underscores the importance of distinguishing the artifacts already recovered by residents

from any archaeological materials that may remain *in situ*. The preservation of the undisturbed portion of the site remains important for any future investigation of the assemblage's spatial and stratigraphic context.



Figure 1. Site of the ancient ceramic discovery in a coconut plantation
(Source: West Tanjung Jabung Regency Education and Culture Office, 2021)

By 2021, the BPCB had not conducted a comprehensive study of the assemblage, leaving its ceramic types, materials, origins, and chronology unidentified. The author therefore conducted a follow-up study on 24 May 2023, focusing on the ancient ceramic artifacts stored at Supangat's residence. The study collected and analyzed the recovered artifacts to establish the characteristics necessary for their archaeological identification. This stage provides the empirical basis for the subsequent morphological, material, glaze, typological, and chronological analyses. The identification results can then be interpreted in relation to Mekar Alam's archaeological position within the Tungkal River landscape, without assuming that the presence of imported ceramics alone proves direct contact with particular foreign merchants.

Material Characteristics and Glaze-Based Classification of the Mekar Alam Ceramic Assemblage

After recovering the ancient ceramics from the discovery site, the residents transferred them to Supangat's house for storage. According to Supangat, the ceramics received no specific conservation treatment and remained in a storage room without systematic arrangement. The initial storage room measured approximately 3 × 4 m, where the ceramics were stacked irregularly and without protective separation (Figure 2). This arrangement caused several objects to crack or break, while transporting them over a considerable distance from the discovery site to Supangat's house posed an additional risk of physical damage. The storage history, therefore, affected the present condition of some objects and must be considered when assessing the archaeological assemblage.

By 24 May 2023, when the author conducted data collection, Supangat had relocated the ceramics from their original storage room. He moved them to a 2 × 2 m storage area beneath the house, constructed primarily of corrugated iron, because the assemblage occupied considerable space. According to Supangat, several ceramics sustained additional damage during this relocation, including cracking and fragmentation. These changes in storage conditions demonstrate that some damage occurred after archaeological recovery rather than necessarily being part of the artifacts' original condition. The study, therefore, treated observable cracks and breakage with caution when documenting the assemblage's physical characteristics.

The author classified the ceramics stored at Supangat's house using archaeological attributes relevant to artifact classification. Ashmore and Sharer (2010) define classification as the process of organizing or grouping artifacts into smaller categories and distinguish three basic categories of archaeological attributes: stylistic, formal, and technological. Stylistic attributes include decorative forms, patterns, and designs, as well as pigments; formal attributes include three-dimensional shape, size, material, thickness, and other physical characteristics; and technological attributes concern raw materials and production characteristics. Following this framework, the present study classified the Mekar Alam assemblage primarily according to observable material characteristics and glaze color (Ashmore & Sharer, 2010). These

attributes provided a consistent basis for distinguishing groups within the assemblage prior to subsequent typological and chronological comparisons.



Figure 2. The ceramic storage location before it was moved
(Documentation: Thifal Sausan, 2022)

Before classification, the author removed the ceramics from storage and cleaned adhering dust and soil with a brush. This procedure exposed the ceramic surfaces and unglazed areas more clearly while minimizing alteration of their existing surface characteristics. The author then placed the cleaned ceramics on a tarpaulin to examine their observable body characteristics (Figure 3). Each object received a label recording its color code, material category, and ceramic number (e.g., Green Stoneware 1 [KSH 1]) to facilitate subsequent analysis. The author subsequently separated the assemblage into three glaze-color categories: green, brown, and white.



Figure 3. Ceramic pieces discovered by the community
(Documentation: Mutiara Hikmah, 2023)

Visual examination indicated that the 921 ceramics exhibit characteristics consistent with *stoneware*, particularly on the unglazed undersides, where the ceramic bodies remain visible. The author did not identify any objects displaying visual characteristics associated with porcelain or earthenware among the assemblage stored at Supangat's residence. At the same time, Supangat stated that all recovered ceramics had been retained and none had been sold. These observations support classifying the documented assemblage as *stoneware* based on the analytical procedure used in this study. This identification nevertheless relies primarily on macroscopic visual characteristics rather than laboratory-

based mineralogical, petrographic, or compositional analysis. The classification should therefore be understood as a visual archaeological identification and not as definitive confirmation of the material composition of every ceramic object.

Western ceramic terminology also recognizes *porcelaneous stoneware*, a material category that displays characteristics intermediate between stoneware and porcelain. This category refers to ceramics that exhibit porcelain-like qualities without fully attaining porcelain's characteristics, including gray-to-creamy-white bodies and green, brown, or white glazes. *Porcelaneous stoneware* typically has a hard surface, a dense but non-glassy texture, resistance to water penetration, a stone-like body, and pores beneath the glaze layer; descriptions also place its relative hardness at approximately 3 on the Mohs scale, allowing scratching by a nail or other metal object (Arman, 2019; Hill, 2006). The Mekar Alam ceramics exhibit several comparable macroscopic characteristics, including hard, relatively heavy bodies; dense, non-glassy surfaces; rough, sandy textures on exposed areas; visible pores; and glaze layers of different colors. These similarities provide the comparative basis for their visual identification as *stoneware*, while the absence of laboratory testing remains a methodological limitation.

The classification documented 921 ceramics displaying the visual material characteristics described above and divided them according to glaze color. The assemblage consists of three glaze groups: white, brownish-yellow, and green, as summarized in Diagram 1. Glaze color provides a measurable attribute for identifying internal variation within an otherwise materially similar assemblage. The distribution also establishes a quantitative basis for subsequent comparison with recognized ceramic types and chronological parallels. The numerical pattern should therefore be interpreted together with morphological and typological evidence rather than treated as an independent indicator of origin or date.

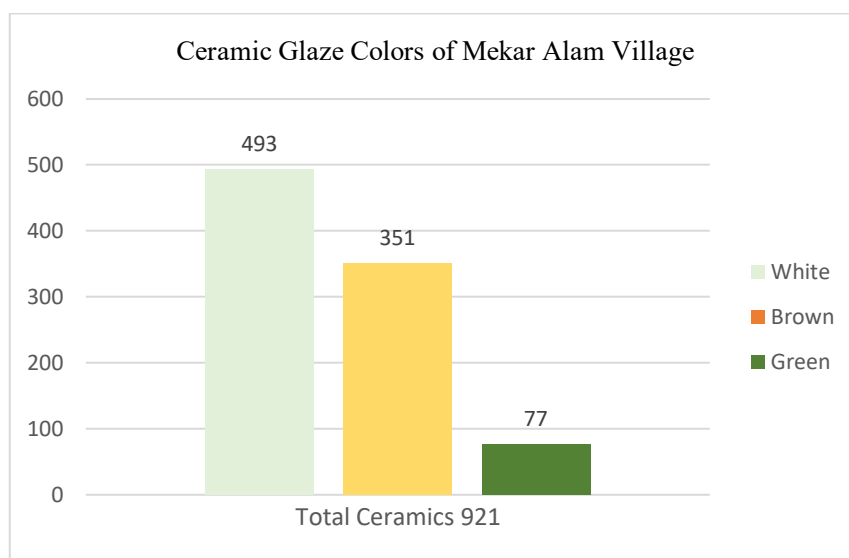


Diagram 1. Comparison of the number of ceramic pieces by glaze color

Diagram 1 shows that the assemblage contains 493 white-glazed ceramics, 351 brownish-yellow-glazed ceramics, and 77 green-glazed ceramics. White-glazed ceramics constitute the largest group, followed by brownish-yellow-glazed ceramics, whereas green-glazed examples form a substantially smaller component of the assemblage. This unequal distribution demonstrates that the Mekar Alam assemblage is not a uniformly distributed collection of glaze categories but is quantitatively concentrated in the white and brownish-yellow groups. The predominance of these two categories provides an important basis for evaluating the assemblage's typological and chronological composition when compared with identified Chinese ceramic traditions in the subsequent analysis. Glaze distribution alone, however, cannot establish chronology, production origin, or direct participation in international trade and must be interpreted alongside form, material characteristics, and comparative typology.

Typological Identification of Yue Ware Based on Morphology, Glaze, and Decorative Attributes

The Mekar Alam assemblage comprises 921 intact ceramic vessels whose forms remain sufficiently preserved for morphological identification. Visual examination shows that all documented objects are bowls and display body

characteristics provisionally identified as *stoneware*, consistent with the material classification discussed in the preceding section. Nurhadi Rangkuti, in *Analysis of Ceramic Guides*, defines bowls as household vessels commonly used for eating and drinking (Figure 4). The bowls from Mekar Alam generally measure approximately 16 cm in rim diameter, 6 cm in base diameter, and 7 cm in height. Comparative assessment of their glaze colors and other diagnostic attributes divides the assemblage into three typological groups: Yue ware, Anhui yellow-glazed ceramics (*Anhui Lime Glazes*), and Five Dynasties whiteware (*Five Dynasties Whiteware Glazes*).



Figure 4. An overall view of a bowl from Mekar Alam Village
(Figure credit: Mutiara Hikmah, 2023)

Yue Ware

Yue ware generally refers to *stoneware* vessels with dull grayish-green to yellowish-green glazes, occurring in forms such as bowls, plates, and vases. The glaze commonly forms a thin, sometimes uneven layer, and examples may appear either undecorated or decorated with floral motifs. Undecorated examples display relatively smooth glazed surfaces, although the ceramic bodies retain a comparatively coarse texture with visible pores beneath the glaze. These characteristics serve as diagnostic attributes for comparative identification rather than as direct evidence of production origin. The present study, therefore, identifies the Mekar Alam examples as Yue ware by comparing their observable morphological, technological, and decorative attributes with established descriptions of the Yue ware tradition.

Archaeological and ceramic studies associate Yue ware with Zhejiang Province in southern China, an important production center for green-glazed ceramics. Previous studies date Yue ceramic production to the Tang Dynasty and associate its manufacture with *dragon kilns*, which used firing installations involving wood ash and clay (Putra, 2018; Rahim, 2022). These established production and chronological characteristics provide comparative references for evaluating the Mekar Alam ceramics. The identification of the Mekar Alam examples does not constitute direct evidence that their precise production location has been archaeologically established. Instead, the study assigns their probable origin and chronology through typological comparison with recognized characteristics of Yue ware.

The comparative analysis identifies 77 bowls in the Mekar Alam assemblage as displaying characteristics consistent with Yue ware. These 77 objects correspond to the green-glazed group and constitute the smallest of the three glaze categories identified among the 921 ceramics. Most remain in sufficiently good condition to allow observation of their glaze, morphology, and exposed ceramic bodies. The bowls have open rims, bodies that taper slightly toward the base, short foot rings, and uneven glaze application around the foot. Their relatively small numerical representation indicates that Yue-type ceramics formed a minor component of the recovered assemblage compared with the white- and brownish-yellow-glazed groups. However, frequency alone cannot establish differences in chronology, production, or patterns of circulation.

The Mekar Alam Yue-type bowls display dull grayish-green to yellowish-green glazes and numerous small pores visible beneath the glaze layer (Figure 5). Harkantingsih identifies manufacturing residues or stacking marks on the inner base of Yue bowls as characteristics that can assist in identifying ware types and aspects of kiln production; these marks commonly measure approximately 3–4 cm (Harkantingsih et al., 1998). Comparable features occur on the Mekar Alam specimens, where an unglazed circular area approximately 3 cm in diameter appears on the inner base and may represent a firing-support or stacking mark (Figure 6). Circular lines visible around the bodies of several bowls also resemble traces produced during wheel-forming. These observed manufacturing attributes strengthen the comparative identification of the objects as Yue-type ceramics when considered together with their morphology and glaze characteristics.



Figure 5: The base of the Mekar Alam Yue bowl showing traces of the firing support
(Source: Mutiara Hikmah, 2023)



Figure 6: The body of the ceramic piece, which has pores in the form of small holes beneath the glaze layer
(Source: Mutiara Hikmah, 2023)

Comparative typology shows similarities between the decorated Mekar Alam bowl and ceramics excavated from kiln complexes in Zhejiang Province. Comparable Zhejiang celadon displays incised floral decoration and linear motifs beneath a yellowish-green glaze, while its ceramic body has been identified as *stoneware* (Figure 9). A comparative specimen measures approximately 17 cm in rim diameter, 6 cm in base diameter, and 8 cm in height, closely approaching the dimensions of the Mekar Alam example (Izza et al., 2022; Valenstein, 1989). The similarities in form, glaze, decoration, and dimensions strengthen the typological association with Zhejiang ceramic traditions. They should nevertheless be treated as comparative evidence for identification rather than direct archaeological proof that the Mekar Alam specimen originated from the same kiln complex.



Figure 7: Bowl with a floral motif found in Mekar Al Village
(Source: Mutiara Hikmah, 2023)



Figure 8: The bottom of the bowl features a vertical line pattern
(Source: Mutiara Hikmah, 2023)

A further comparison is based on a ceramic fragment recovered from the Siti Hawa site and analyzed by Mulviana in 2022. The Siti Hawa specimen displays a decorative pattern of parallel vertical lines on the lower part of the ceramic body, comparable to the motif observed on the Mekar Alam bowl (Figure 10). Mulviana identified the comparative

specimen as dating to the Song Dynasty, providing an additional chronological parallel for this particular decorative feature. This comparison indicates that similar decorative attributes circulated across ceramic traditions and chronological contexts, so the motif alone cannot determine the date of the Mekar Alam specimen. The study, therefore, uses the Siti Hawa comparison alongside glaze, morphology, material characteristics, and other diagnostic attributes, rather than treating decorative similarity as conclusive chronological evidence.



Figure 9: Stoneware bowl with carved motifs under a celadon glaze from the Song Dynasty
(Source: *A Handbook of Chinese Ceramics*, 1989)

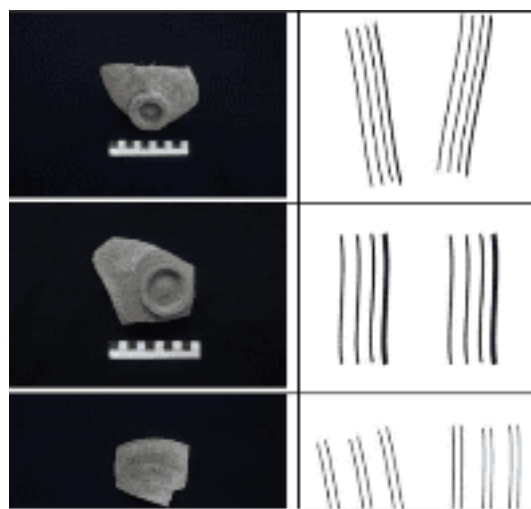


Figure 10: Vertical line motif on a bowl fragment from the Siti Hawa site
(Source: *Novita Mulviana*, 2022)

Typological and Chronological Identification of Anhui Lime-Glazed Ceramics

The second-largest ceramic group in the Mekar Alam assemblage consists of 351 bowls whose characteristics are comparable to those of Anhui yellow-glazed ceramics (*Anhui Lime Glazes*). Previous studies describe this ceramic type as *stoneware* covered with a dull yellow lime glaze and characterized by a relatively hard body and a glaze that may fade, become brittle, or deteriorate after drying. Comparative references associate this ceramic tradition with the Tang Dynasty, providing a chronological framework for evaluating the Mekar Alam specimens (Rahim, [2022](#); Wood, [2000](#)). The example presented in Figure 11 illustrates the characteristics used as a comparative reference rather than direct evidence for the production origin of the Mekar Alam assemblage. The identification of the Mekar Alam specimens as Anhui-type ceramics, therefore, rests on similarities in glaze, morphology, material characteristics, and production features.



Figure 11. Tang Dynasty Anhui Lime Glaze Bowl
(Source: *Chinese Glazes: Their Origins, Chemistry, and Recreation*, 1991)

Previous studies associate comparable ceramics with production using relatively simple potter 's-wheel technology and with kiln complexes in the Tongguan and Changsha areas of Hunan Province, which developed during the ninth and tenth centuries. These ceramics generally occur as bowls or jars measuring approximately 12–17 cm in diameter. The Mekar Alam specimens show comparable morphological characteristics, with an average rim diameter of 17 cm, a base diameter of 6 cm, and a height of 7 cm. Their surfaces display the dull yellow glaze characteristic of the comparative group (Figure 12). These similarities support a typological association with the yellow lime-glazed ceramic tradition, although visual comparison alone cannot establish a specific kiln of origin.



Figure 12. Anhui Lime Glaze Bowls from Mekar Alam Village
(Source: Mutiara Hikmah, 2023)

Direct observation of the Mekar Alam specimens shows that their glaze is brittle, with some areas peeling away to expose a chalk-like surface. The glaze also varies in thickness, while the unglazed bases expose the ceramic bodies and provide observable material characteristics for visual classification. Linear marks on the interior surfaces resemble traces produced by a rotating potter's wheel during manufacture. The 351 examples make this group considerably more numerous than the 77 green-glazed Yue-type bowls, but fewer than the white-glazed group. This quantitative position indicates that yellow-glazed ceramics constituted a substantial component of the assemblage and, when combined with comparative dating, helps identify a strong ninth- to tenth-century component without treating glaze color alone as chronological evidence.

Typological and Chronological Identification of Five Dynasties Whiteware

The largest category in the Mekar Alam assemblage consists of 493 white-glazed bowls whose characteristics most closely correspond with early Five Dynasties whiteware. These vessels generally measure approximately 16 cm in rim diameter, 6 cm in base diameter, and 7 cm in height. Direct observation reveals circular lines on the interior surfaces that appear to represent traces of wheel forming during manufacture (Figure 13). Comparative ceramic typologies place similar whiteware within a chronological range extending from the late Tang Dynasty into the Five Dynasties period. The identification, therefore, derives from the combination of morphology, glaze characteristics, manufacturing traces, and comparative chronology rather than from glaze color alone.



Figure 13: White Bowl Found in Mekar Alam Village
(Documentation: Mutiara Hikmah, 2023)

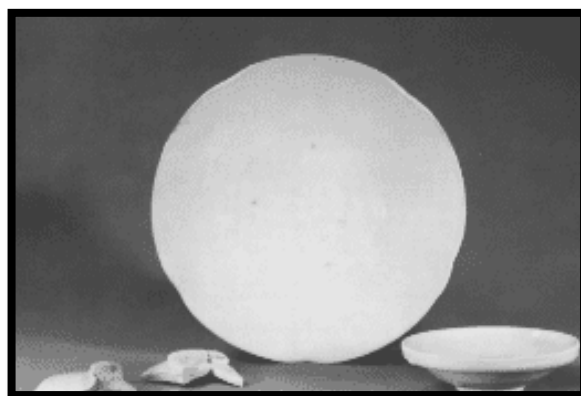


Figure 14: White Bowl from the Tang Dynasty
(Source: A Handbook of Chinese Ceramics, 1989)

The white-glazed bowls display relatively even glaze coverage on their interior surfaces, whereas the glaze becomes uneven near the exterior foot and sometimes forms droplet-like accumulations. Several specimens also preserve manufacturing traces created through contact with other ceramic objects during firing. Visual assessment of their material suggests characteristics associated with white *porcelaneous stoneware*, representing a technological stage between *stoneware* and fully developed porcelain. This interpretation remains based on macroscopic observation and should not be regarded as definitive compositional identification without mineralogical or laboratory analysis. The observable technological characteristics nevertheless provide useful comparative evidence for distinguishing this group from the green- and yellow-glazed ceramics in the same assemblage.

Nigel Wood, in *Chinese Glazes: Their Origins, Chemistry, and Recreation*, discusses several traditions of Chinese white ceramics, including Gong Xiang Porcelain, Guan Ware, Shang Whitewares, Xing Ware, and Ding Ware. Among these comparative categories, the morphological and glaze characteristics of the Mekar Alam specimens most closely resemble early Five Dynasties whiteware (Figure 14). This resemblance provides a typological basis for proposing a late Tang–Five Dynasties chronological association, but it does not independently establish the exact production center of the Mekar Alam ceramics. The numerical predominance of 493 white-glazed bowls is archaeologically significant, as this category constitutes more than half of the assemblage of 921 objects. When considered alongside the 351 yellow-glazed and 77 green-glazed examples, this distribution suggests that ceramic types associated comparatively with the ninth-to-tenth-century transition constitute the principal character of the recovered assemblage.

Comparative Chronology of the Mekar Alam Ceramic Assemblage

The study determined the chronology of the Mekar Alam ceramic assemblage through comparative typology rather than direct absolute dating. The author compared the morphological, glaze, material, and technological characteristics of the bowls with established ceramic typologies discussed by Nigel Wood in *Chinese Glazes: Their Origins, Chemistry, and Recreation* and Neave Hill in *A Handbook of Chinese Ceramics*. The analysis also used ceramics recovered from the Siti Hawa site in Muara Sabak, East Tanjung Jabung, as an archaeological comparator. These references provide chronological parallels for evaluating the Yue-type, yellow lime-glazed, and whiteware ceramics identified at Mekar Alam. The resulting chronology should therefore be understood as a relative date based on typological correspondence rather than direct scientific dating of the Mekar Alam artifacts.

Comparative analysis places the principal characteristics of the Mekar Alam assemblage within ceramic traditions that developed between the Tang Dynasty (618–906 CE) and the subsequent Five Dynasties period. Tang-period ceramics display characteristic developments in vessel form, glaze technology, and color, including white-based surfaces and green, brownish-yellow, and bluish-gray glazes (Mulviana, [2022](#); Utomo, [1990](#)). These characteristics provide relevant comparative attributes because the Mekar Alam assemblage similarly contains green-, brownish-yellow-, and predominantly white-glazed bowls. The correspondence does not demonstrate that every ceramic belongs exclusively to the Tang Dynasty, particularly because the whiteware category extends chronologically into the Five Dynasties period. The assemblage is therefore more appropriately interpreted as representing a ninth- to tenth-century chronological range encompassing the late Tang–Five Dynasties transition.

Technological comparisons also contribute to this relative chronology. Previous studies characterize Tang ceramics as sturdy vessels commonly produced as bowls, plates, and vases, while ninth-century production continued to develop in firing and glazing technology (Agustiningsih & Pamungkas, [2018](#); Witkowski, [2016](#)). Early glaze technology employed relatively simple layers, while later developments contributed to greater technological and visual diversity. The Mekar Alam bowls preserve several comparable attributes, including hard ceramic bodies, wheel-forming traces, firing-support marks, and variations in glaze quality and color. These similarities strengthen the proposed chronology when considered collectively, although visual technological attributes alone cannot provide an absolute production date.

Ceramic production associated with the Tang period flourished in Zhejiang Province, where environmental conditions and raw materials supported large-scale production. Archaeological research has documented numerous *dragon kilns* in this region, with approximately 196 examples reported in southern Zhejiang (Heng, [2019](#); Wade, [2009](#)). Yue ware represents one of the ceramic traditions associated with these production contexts, making Zhejiang kiln material relevant to the 77 green-glazed Yue-type bowls identified at Mekar Alam. The comparison provides a production and technological context for interpreting their characteristics rather than direct evidence that the Mekar

Alam bowls originated from a particular Zhejiang kiln. Figure 15, therefore, functions as a comparative illustration of the kiln tradition associated with the ceramic type.



Figure 15. Ceramic Kilns (Dragon Kilns)
(Source: A Cultural History of Chinese Dragon Kilns, 2021)

Historical evidence indicates that high-quality ceramics circulated within China as tribute to the imperial court during the ninth century CE, with Yue bowls and plates represented among the ceramic objects associated with Famen Temple in Shaanxi Province. Ceramics also circulated through waterways, allowing these commodities to move beyond their production centers. This broader pattern provides historical context for the movement of ceramics but does not, by itself, establish the route by which the Mekar Alam assemblage reached the Tungkal River region. The archaeological significance of Mekar Alam rests instead on the presence of ceramic types with parallels in the wider distribution of Chinese ceramics. Their occurrence in a riverine setting, therefore, contributes evidence for examining the Tungkal River within regional systems of material circulation while stopping short of demonstrating direct contact with Chinese or other foreign merchants.

Whiteware provides an important chronological indicator because its technological development continued from the late Tang Dynasty into the Five Dynasties period. Comparative studies associate early white porcelain and *porcelaneous stoneware* with production traditions that developed in southern China, including kilns in Jingdezhen, Jiangxi Province. The 493 white-glazed bowls constitute the largest component of the Mekar Alam assemblage and display characteristics that the preceding typological analysis associates with early Five Dynasties whiteware. Their numerical predominance, together with the 351 brownish-yellow-glazed and 77 green-glazed bowls, strengthens the interpretation that the assemblage reflects ceramic circulation during the transition from the late Tang into the Five Dynasties period. This distribution provides a more precise chronological interpretation than assigning all 921 ceramics generally to the Tang Dynasty.

Comparative finds from other Indonesian archaeological contexts provide an additional framework for evaluating the Mekar Alam assemblage. Tang-period ceramics have been documented in the Cirebon Shipwreck (Figure 16), while Yue ware plates and bowls occur in the Intan Shipwreck assemblage (Figures 17 and 18). Comparable Tang-period bowls have also been recovered from Margomulyo Village, Muara Sugihan (Figure 19), and whiteware is represented among ceramics from the Intan Shipwreck (Figure 20). These comparisons demonstrate that ceramic traditions resembling those identified at Mekar Alam also occur in maritime, riverine, and settlement-related archaeological contexts elsewhere in Indonesia. Their distribution supports the interpretation of Mekar Alam as part of a broader regional pattern of ceramic circulation, although typological similarity does not establish that these sites participated in identical trade routes or received ceramics through the same commercial actors.



Figure 16: Tang Dynasty Plate from the Cirebon Shipwreck
(Source: Eka Asih Putrina Taim, 2016)

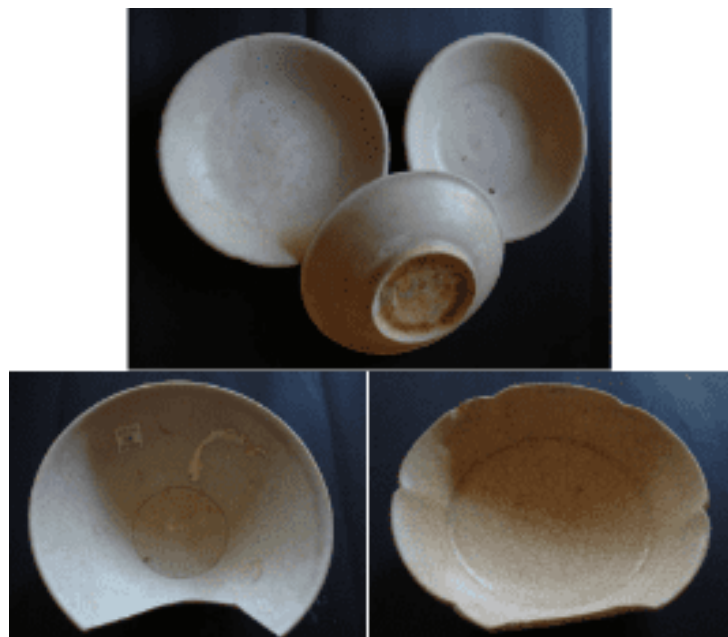


Figure 17: Tang Dynasty Yue Ware Plate from the Intan Shipwreck
(Source: Naniek Harkantiningasih, 2013)

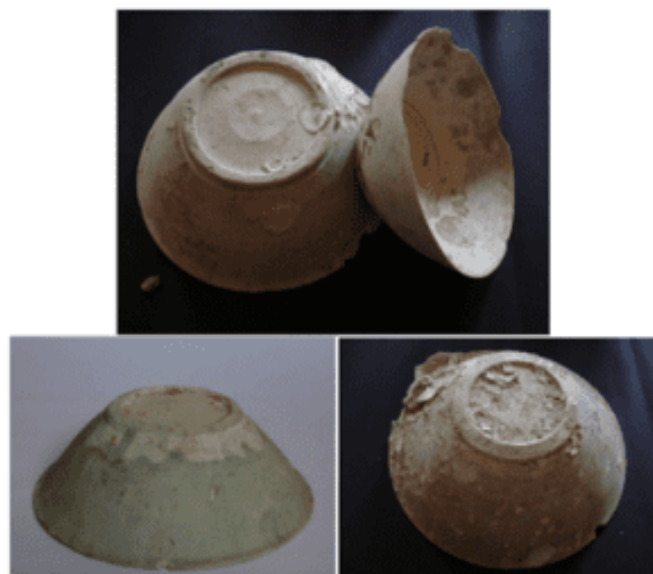


Figure 18: Tang Dynasty Yue Ware Bowl from the Intan Shipwreck
(Source: Naniek Harkantiningasih, 2013)



Figure 19: Tang Dynasty Bowl from Margomulyo Village, Muara Sugihan
(Source: Budi Wiyana, 2014)



Figure 20: Tang Dynasty White Ware Bowl from the Intan Shipwreck
(Source: Naniek Harkantiningasih, 2013)

Taken together, the comparative evidence indicates that the Mekar Alam assemblage is best situated within a ninth- to tenth-century CE chronological framework rather than attributed uniformly to a single dynasty. The Yue-type and yellow lime-glazed ceramics provide comparative links with Tang-period traditions. At the same time, the dominant whiteware group extends the chronological interpretation into the late Tang–Five Dynasties transition. The concentration of 921 bowls near the Tungkal River adds a substantial riverine assemblage to the distribution of comparable Chinese ceramics already documented at Indonesian archaeological sites. This evidence strengthens the interpretation of the Tungkal River as a landscape connected to wider regional movements of ceramic commodities. However, the artifacts alone cannot determine the specific routes, merchants, or mechanisms responsible for their arrival. The principal contribution of the Mekar Alam assemblage, therefore, lies in providing material evidence for the participation of the Tungkal riverine area in broader patterns of regional ceramic circulation during the ninth and tenth centuries CE.

The Mekar Alam Assemblage and the Tungkal River within Regional Ceramic Exchange Networks

Chinese ceramics circulated extensively through overseas markets and provide archaeological evidence for examining the movement of commodities across regional and long-distance exchange networks. Major production centers in Fujian, Zhejiang, and Jiangxi expanded ceramic manufacture during the Tang Dynasty, particularly from the mid-ninth century onward (Witkowski, 2016). These production areas supplied different ceramic traditions that subsequently appeared at archaeological sites beyond China. The Yue-type, yellow lime-glazed, and whiteware ceramics identified comparatively at Mekar Alam can therefore be situated within this broader historical pattern of ceramic circulation. Their presence in Mekar Alam demonstrates the arrival of ceramic goods, paralleling Chinese production traditions. However, the artifacts alone cannot identify the merchants or specific commercial mechanisms responsible for their distribution.

Long-distance maritime exchange transported various ceramic forms, including Yue bowls, Changsha ceramics, plates, cups, bottles, jars, figurines, household vessels, and ritual objects. Historical accounts associate these

commodities with maritime networks involving Arab and other merchants who transported goods between China, Southeast Asia, and regions farther west. Ports along the southern Chinese coast, including those connected to Guangdong, Fujian, and Zhejiang, served as hubs for assembling cargo before ships departed via major ports such as Hangzhou and Guangzhou (Rahim & Hutabarat, 2024). These maritime connections provide a historical framework for understanding how Chinese ceramics could circulate widely beyond their production centers. They do not, however, demonstrate that the Mekar Alam ceramics arrived through direct transactions between local inhabitants and Chinese or Arab merchants.

Maritime navigation depended strongly on seasonal monsoon winds, which facilitated movement across the South China Sea and through the Indonesian archipelago. Merchant vessels distributed cargo at multiple ports rather than necessarily carrying all commodities to a single final destination. At the same time, they also acquired regional products such as spices and resin during their journeys. Tang-period exports included green Yue ceramics associated with southern China and white ceramics associated with northern production traditions, both of which entered wider maritime circulation. The Strait of Malacca occupied an important position within these exchange systems, while Sriwijaya in Sumatra benefited from its strategic relationship with maritime commerce. This wider distributional context provides a plausible framework for interpreting imported ceramics found in Sumatra without requiring direct contact between every archaeological site and foreign merchants.

Archaeological evidence from shipwrecks provides an important comparative context for reconstructing the scale and diversity of early ceramic circulation. The Belitung shipwreck demonstrates that vessels operating within ninth-century maritime networks transported large quantities of Chinese ceramics together with other commodities. Its cargo illustrates substantial demand and long-distance distribution of Chinese ceramic products during the Tang period. The shipwreck, therefore, provides evidence for the broader maritime system within which ceramic commodities circulated rather than direct evidence for the particular route through which ceramics reached Mekar Alam. This distinction is important because archaeological similarities between cargoes and terrestrial assemblages establish patterns of circulation but do not necessarily demonstrate identical routes or commercial actors.

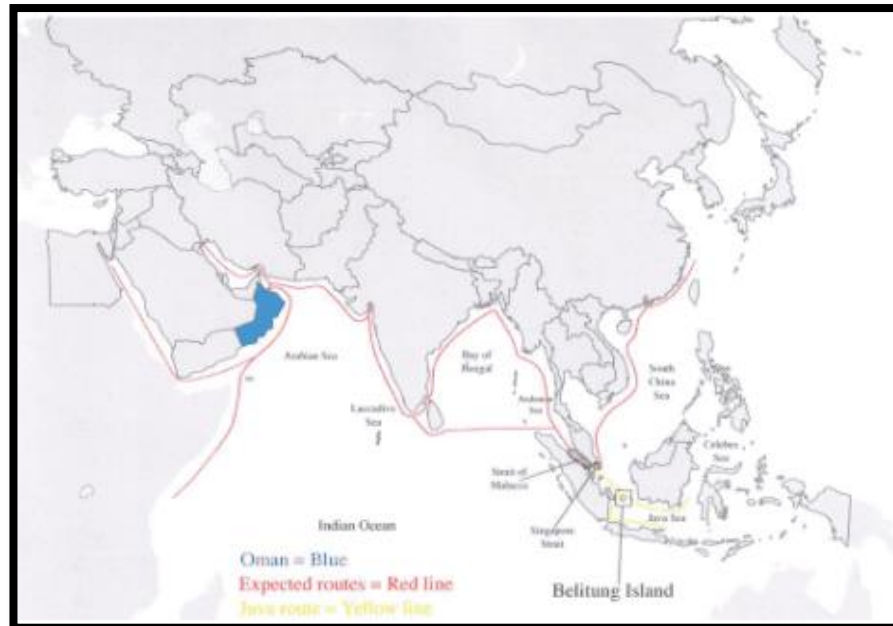


Figure 21. Routes of ancient ceramic trade and the location of the shipwreck discovery in Belitung
(Source: *An Ordinary Ship and Its Stories of Early Globalism*, Journal of Medieval Worlds, 2019)

Historical and archaeological interpretations associate the ninth-century Belitung vessel with a voyage originating from Guangzhou on the southern coast of China and with commercial connections extending toward the Abbasid world. The vessel carried thousands of Chinese ceramics and other commodities within a maritime system that relied on monsoon winds to traverse the Indian Ocean and Southeast Asian waters, connecting with markets for spices, resins, and aromatic products from the Indonesian archipelago (Heng, 2019). The ship eventually sank near Batu Hitam off the western coast of Belitung Island (Figure 21), preserving a cargo that included bowls, plates, jars, cups, incense burners,

gold, silver, and other objects. This archaeological context confirms the large-scale overseas circulation of Chinese ceramics during the Tang period. Its relevance to Mekar Alam lies in demonstrating the wider distributional environment in which comparable ceramics circulated, not in proving that the Belitung vessel or its specific route had a direct connection with the Tungkal River.

The geographical context of Mekar Alam adds an important riverine dimension to this broader pattern of ceramic circulation. The ceramic assemblage was recovered within the Tungkal River basin, where waterways connected inland areas with the coast and, ultimately, the Strait of Malacca. The presence of 921 bowls—including 493 white-glazed, 351 brownish-yellow-glazed, and 77 green-glazed—demonstrates a substantial concentration of ceramic artifacts in this riverine landscape. When compared with ceramics recovered from other Indonesian archaeological contexts, including shipwreck and terrestrial sites discussed in the preceding section, the Mekar Alam assemblage expands the geographical evidence for the circulation of comparable ceramic traditions beyond major maritime locations. The assemblage, therefore, contributes specifically to understanding how river systems such as the Tungkal may have connected local landscapes with broader regional movements of material goods.

The predominance of white-glazed and brownish-yellow-glazed ceramics is particularly relevant to the archaeological interpretation of Mekar Alam. Together, these two groups account for most of the assemblage, while the 77 green-glazed Yue-type ceramics constitute a substantially smaller component. Comparative typology associates these groups with ceramic traditions spanning the late Tang and Five Dynasties periods, suggesting that the assemblage reflects a concentrated ninth- to tenth-century phase of ceramic circulation rather than an undifferentiated accumulation of Chinese ceramics. The quantitative distribution also indicates that different ceramic types reached the Tungkal River area in unequal proportions. However, the present evidence cannot determine whether this pattern resulted from market preference, availability, chronological differences, or depositional processes. This distribution provides a stronger basis for interpreting the assemblage's archaeological character than simply noting the presence of imported ceramics.

The Mekar Alam finds consequently provide material evidence that strengthens the archaeological significance of the Tungkal River within regional exchange networks during the ninth and tenth centuries CE. The combination of a substantial ceramic concentration, riverine location, and typological parallels with Chinese ceramics documented elsewhere in Indonesia supports an interpretation of the Tungkal area as connected to broader patterns of commodity circulation. The evidence does not establish that Chinese, Arab, or Persian merchants personally reached Mekar Alam, nor does it identify a specific international route responsible for depositing the ceramics at the site. Intermediate exchange, redistribution through regional centers, and movement through interconnected coastal and riverine networks remain possible mechanisms that the present assemblage cannot distinguish. The principal contribution of the Mekar Alam ceramics, therefore, lies in demonstrating the archaeological relevance of the Tungkal River corridor to regional ceramic distribution while providing a foundation for further investigation of its precise role within wider maritime exchange systems.

The Mekar Alam Ceramic Assemblage and the Tungkal River in Regional Exchange Networks

Mekar Alam Village lies in West Tanjung Jabung Regency, a strategically situated area bordering Riau Province and facing the South China Sea. The landscape consists largely of lowlands crossed by the Tungkal River, whose estuary opens toward the eastern coast of Sumatra. This geographical configuration connected inland and coastal areas via a navigable river system, creating opportunities for the movement of people and goods. Historical evidence indicates that the Tungkal River served as an alternative route for transportation and exchange in the past. Its geographical position, therefore, provides an important riverine context for interpreting the ceramic assemblage recovered at Mekar Alam.

The presence of an ancient port on the banks of the Tungkal River further demonstrates the historical importance of this waterway. Sairi (2021) associates the port with past social, cultural, commercial, and technological activities in the Kuala Tungkal area. The broad river mouth could accommodate maritime movement and facilitated connections between riverine and coastal environments. This evidence supports the interpretation of the Tungkal River as an active historical corridor rather than an isolated inland waterway. The archaeological context of Mekar Alam should consequently be considered within this established riverine landscape.

The Mekar Alam assemblage adds material evidence to this historical context through the recovery of 921 ceramic bowls. Comparative analysis places these ceramics within traditions spanning approximately the ninth to tenth

centuries CE, including 493 white-glazed, 351 brownish-yellow-glazed, and 77 green-glazed examples. Their substantial concentration indicates that ceramic commodities reached and accumulated within the Tungkal River landscape during this period. The finds do not independently demonstrate direct interaction between the inhabitants of Mekar Alam and Chinese, Arab, or other foreign merchants. Instead, they provide archaeological evidence that the area participated, directly or indirectly, in broader processes through which externally produced or derived ceramic traditions circulated across Sumatra.

Jambi occupied an important position in the history of maritime and riverine exchange through its economic, political, and cultural connections with surrounding regions. By the seventh century, political entities associated with Malay, Sriwijaya, and Swarnabhumi influenced the region's historical development and engaged in broader diplomatic and commercial relations. Jambi's eastern coastal position and the Batanghari River basin provided important routes for moving goods and people between coastal and inland areas (Taim, 2023). These conditions attracted foreign commercial interests and linked Jambi with wider networks of exchange. This historical setting provides a regional framework for interpreting the Mekar Alam assemblage without assuming that every imported object resulted from direct foreign contact.

Historical accounts identify two prominent political centers in Sumatra: *Mo-lo-yeu* (Malay), associated with the eastern coast and the Batanghari River, and Sriwijaya to the south in the area of present-day Palembang. Both participated in international political and commercial networks and sent envoys to China via maritime routes during the Tang Dynasty (Agustiningsih & Pamungkas, 2018; Rahim, 2022). These diplomatic connections demonstrate that eastern Sumatra participated in wider interregional networks during periods broadly relevant to the Mekar Alam ceramic chronology. Maritime routes linking the South China Sea, the Strait of Malacca, and the Indian Ocean formed part of the wider system conventionally associated with the Maritime Silk Road (Mulviana, 2022). The Mekar Alam ceramics should therefore be interpreted against this regional historical background rather than treated as independent proof of a specific China–Tungkal trade route.

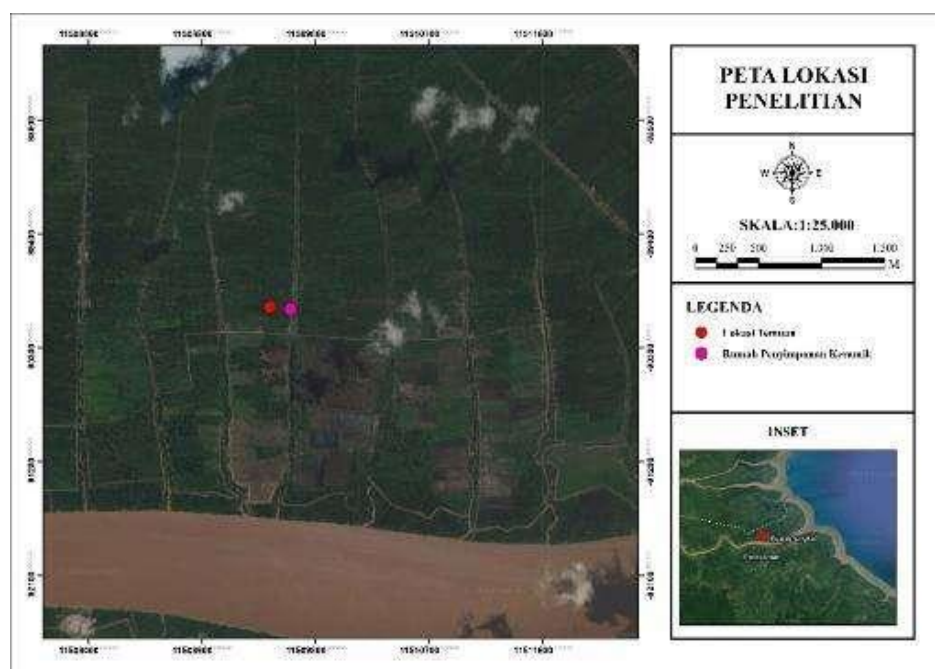


Figure 22. Location of Ceramic Finds
(Source: Google Earth)

Political authorities also sought to regulate and benefit economically from commercial movement along these networks. The Song Dynasty, for example, imposed duties on foreign ships arriving at southern Chinese ports, reportedly collecting one-tenth of the value of high-quality imported commodities and one-fifteenth of the value of lower-quality goods (Utomo, 1990). Such measures illustrate the institutional importance of maritime commerce and commodity circulation in the broader historical setting. The ceramics recovered in West Tanjung Jabung provide archaeological evidence that objects belonging to comparable Chinese ceramic traditions eventually reached the Tungkal River region. Their presence cannot, by itself, establish whether they arrived through direct maritime exchange, intermediary

merchants, redistribution from another Sumatran center, or successive movements through coastal and riverine networks.

Riverine networks within Jambi provide another important framework for explaining how ceramic commodities may have moved after reaching eastern Sumatra. Historical interpretations distinguish downstream Tanjung Jabung from upstream Batanghari areas and suggest that goods could move from downstream locations toward Jambi and its surrounding regions. The Tungkal River offered an alternative route to Indragiri and Kuala Tungkal, with movement continuing via the Sumai River and along forest paths. At the same time, commodities, including ceramics, were transported between waterways. Arman (2018) interprets the use of forest routes by upstream communities as a strategy for avoiding direct contact with the downstream political center. Such alternative routes demonstrate the complexity of internal distribution and caution against explaining imported ceramics solely through direct overseas transactions.

Asnan's (2016) discussion in *Rivers & the History of Sumatra* provides a conceptual framework for understanding the importance of rivers and alternative waterways in Sumatran mobility. This framework allows the Tungkal River and its smaller tributaries to be considered components of a broader transportation landscape in which travelers and merchants could move between coastal and inland zones, sometimes avoiding dominant political centers. The locations of the Mekar Alam ceramic finds, marked by red dots in Figure 22, demonstrate the spatial relationship between the archaeological assemblage and this riverine environment. Their distribution is consistent with the possibility that commodities circulated through interconnected waterways, although the ceramics cannot identify who transported them or reconstruct their precise route. The Mekar Alam evidence, therefore, strengthens an interpretation of the Tungkal basin as part of a regional distribution system rather than proving that Chinese merchants personally transited these smaller rivers.

The Belitung shipwreck provides a useful comparative context for understanding the wider maritime environment in which Chinese ceramics circulated during the Tang period. Its cargo demonstrates that maritime networks connected Chinese ceramic production with long-distance exchange involving Southeast Asia and regions farther west, including commercial connections associated with Arab merchants. The wreck and its Tang-period artifacts provide independent archaeological evidence for the large-scale movement of Chinese ceramics through Southeast Asian waters. This evidence establishes the broader historical plausibility of imported ceramics reaching different parts of the Indonesian archipelago. However, it does not demonstrate a direct connection between the Belitung vessel and Mekar Alam. The comparison is therefore most useful for situating the Tungkal finds within a wider pattern of ceramic circulation rather than reconstructing a specific route from China or Arabia to Mekar Alam.

Taken together, the Mekar Alam assemblage, the historical importance of the Tungkal River, and comparative evidence from other Indonesian contexts contribute to a more nuanced reconstruction of regional exchange in eastern Sumatra. The concentration of ceramics dating comparatively to the ninth and tenth centuries CE indicates that the Tungkal riverine landscape participated in the circulation of ceramic commodities during a period of expanding maritime and interregional exchange. The evidence does not establish whether these objects arrived through direct overseas commerce, intermediary redistribution, or a combination of maritime and riverine transactions. This distinction places the archaeological evidence at the center of the interpretation while separating it from broader historical inferences about merchants and trade routes. The principal contribution of the Mekar Alam finds lies in identifying the Tungkal River basin as an archaeologically significant component of regional commodity circulation and providing a material basis for future investigation of its relationship with the wider exchange networks of eastern Sumatra.

CONCLUSION

This study documented 921 ceramic bowls from Mekar Alam Village, West Tanjung Jabung Regency, whose observable material characteristics were visually identified as consistent with *stoneware*. Based on glaze color and comparative typology, the assemblage comprises three principal groups: *Yue Ware*, associated with the ninth century CE and characterized by green glaze and firing-support marks; Anhui yellow-glazed ceramics (*Anhui Lime Glazes*), also associated with the ninth century CE and distinguished by their yellow lime-based glaze; and *Five Dynasties Whiteware Glazes*, associated with the early tenth century CE and characterized by undecorated white surfaces and circular wheel-forming traces. The assemblage also includes a ceramic specimen with floral decoration, comparatively associated with the Song Dynasty. In contrast, the predominance of white- and brownish-yellow-glazed ceramics indicates that the principal archaeological character of the assemblage belongs to the ninth- to tenth-century chronological horizon.

Beyond ceramic identification, the concentration of these objects provides archaeological evidence that Mekar Alam and the Tungkal River region participated in broader patterns of ceramic circulation during a period of expanding regional and maritime exchange. The finds, therefore, contribute to the historical understanding of the Tungkal River as a significant riverine landscape connected with wider exchange networks. However, the available evidence does not demonstrate direct interaction between the inhabitants of Mekar Alam and particular Chinese, Arab, or other foreign merchants.

Future research should strengthen the identification of Mekar Alam ceramics through laboratory-based material analysis, as the present classification of *stoneware* relies primarily on macroscopic and visual characteristics. Researchers should also conduct systematic archaeological investigations at the discovery location and surrounding areas to clarify the stratigraphic context, spatial distribution, depositional processes, and possible relationship between the ceramic concentration and historical activities along the Tungkal River. Comparative analysis should incorporate ceramic assemblages from other archaeological sites in Jambi and elsewhere in Indonesia to refine the proposed ninth-to-tenth-century chronology and evaluate patterns of ceramic distribution more systematically. Further investigation of riverine archaeology may also clarify how the Tungkal River interacted with coastal and inland distribution systems. Such research would allow future studies to more precisely distinguish among direct maritime exchange, intermediary redistribution, and local or regional movement of ceramic commodities.

The Mekar Alam ceramic assemblage should receive systematic documentation, appropriate storage, and conservation measures to prevent further deterioration and loss of archaeological information. Relevant cultural and archaeological institutions should prioritize documenting the discovery area and the 921 recovered ceramics, including their dimensions, glaze characteristics, morphology, physical condition, and spatial information, whenever this can still be reconstructed. Research on the Tungkal River should also integrate archaeological evidence with historical sources and comparative material from other riverine, terrestrial, and maritime sites rather than interpreting imported ceramics as independent proof of direct international contact. The Belitung shipwreck and other Indonesian ceramic assemblages remain valuable comparative evidence for reconstructing broader patterns of circulation. However, researchers should distinguish such regional comparisons from evidence directly recovered at Mekar Alam. This approach can strengthen the archaeological significance of Mekar Alam while providing a more reliable foundation for reconstructing the historical role of the Tungkal River within the regional exchange networks of eastern Sumatra.

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