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Ceramics from the Tanjung Simpang Mengayau Shipwreck: Classification and Description
Seramik dari Tanjung Simpang Mengayau: Pengelasan dan Deskripsi

Masyella Masbaka,[1] Stephen Chia Ming Soon,[1] and Baszley Bee Basrah Bee[2]
[1] Universiti Sains Malaysia
[2] Universiti Malaysia Sabah

Correspondence:
syella87@gmail.com
stephen@usm.my

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Abstract

The Tanjung Simpang Mengayau shipwreck ceramics, from Kudat, Sabah, have previously been identified as Chinese ceramics dating to the Northern Song Dynasty (960-112 CE) by Sjostrand (2003). In this study, the shipwreck ceramic samples can be classified into 11 main ceramic types based on form, i.e., shape, function, glaze colour and decoration. The ceramic types are bowls, jars, plates, ewers, kendis, bottles, covered boxes, basins, teapots, vases and lids. The majority of ceramics are bowls with olive green glaze, followed by jars with various shades of brown glazes, and ewers with white glaze. These ceramics are mostly decorated with bamboo-comb incision, such as vertical lines on the outer body for bowls and plates, whereas jars and jarlets are predominantly decorated with floral or pattern incisions. The inner body of most of the bowls, plates and basins have either floral or pattern incisions or they have no decoration at all, while teapots and ewers are usually undecorated. These ceramics were part of the cargo of a ship travelling from China, via the Philippines, to Borneo. It is believed to be the oldest cargo ship so far found in Malaysian waters, providing important evidence of early maritime trade from China to Borneo, as well as cultural affinities between Tanjung Simpang Mengayau and other areas of the Indonesian archipelago.

Seramik dari kapal karam di Tanjung Simpang Mengayau, Kudat, Sabah telah dikenal pasti sebagai seramik Cina bertarikh Dinasti Song Utara (960-1127 M) oleh Sjostrand (2003). Kajian ini telah mengelaskan sampel seramik dari kapal karam kepada 11 jenis seramik utama berdasarkan bentuk, fungsi, warna glais dan hiasan. Jenis-jenis seramik tersebut adalah mangkuk, tempayan, pinggan, ewer, kendi, botol, kotak bertutup, besen, teko, pasu dan penutup. Sebahagian besar seramik adalah mangkuk dengan warna glais hijau zaitun, diikuti dengan tempayan pelbagai warna glais perang dan ewer dengan glais putih. Seramik ini kebanyakannya dihias dengan ukiran sisir buluh seperti garisan menegak pada badan luar mangkuk dan pinggan, manakala tempayan dan jarlet kebanyakannya dihiasi dengan ukiran bunga atau bercorak. Badan bahagian dalam kebanyakan mangkuk, pinggan dan besen pula mempunyai sama ada ukiran bunga dan bercorak atau tiada hiasan langsung, manakala teko dan ewer biasanya tidak berhias. Seramik ini merupakan sebahagian daripada kargo kapal yang belayar dari China ke Borneo melalui Filipina. Ia dipercayai

kapal kargo tertua yang ditemui di perairan Malaysia setakat ini dan memberi bukti penting berkenaan perdagangan maritim awal dari China ke Borneo serta hubungan kebudayaan di antara Tanjung Simpang Mengayau dan sekitar kepulauan Indonesia.

Keywords: ceramics, ceramic classification, shipwreck, Tanjung Simpang Mengayau, Sabah

The Tanjung Simpang Mengayau Shipwreck

The Tanjung Simpang Mangayau (TSM) shipwreck was found around the tip of northern Borneo, off the coast of Kudat, Sabah (Figure 1). It was discovered in the 1990s by local fishermen and was subsequently made known to the public in April 2003 (Sjostrand 2003; Tongkul 2008: 159). A large quantity of ceramics from the TSM shipwreck is believed to have been looted by locals. The TSM shipwreck was found at a depth of 12 meters and approximately 400 meters from the coast.

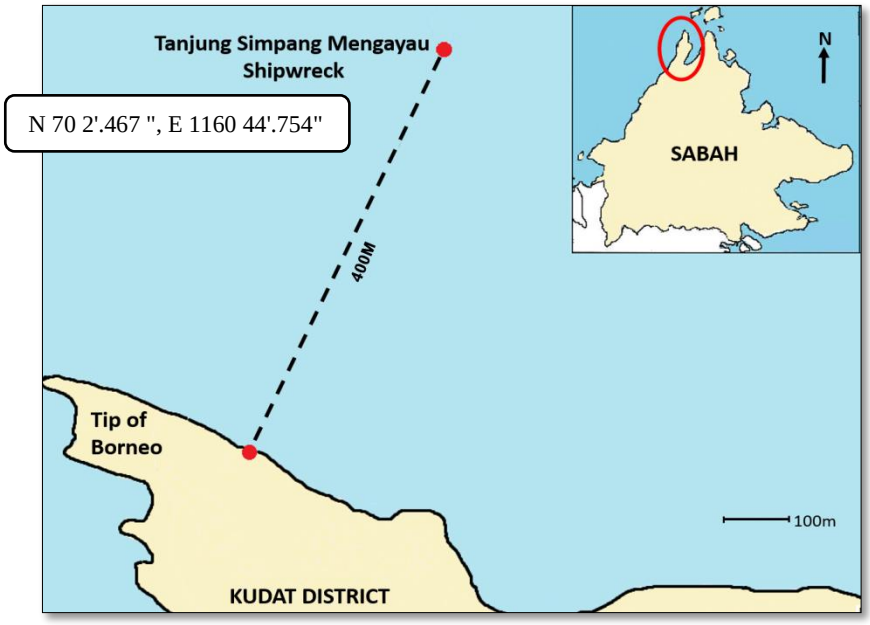

Fig. 1 Location of the Tanjung Simpang Mengayau shipwreck, off the coast of Kudat, Sabah. Map by Masbaka.

Since its discovery in 2003, a series of projects have been undertaken on this shipwreck. These projects followed the UNESCO 2001 Convention on the preservation and protection of underwater cultural heritage and included at least one academic representative in each of the projects. One of the authors of this article, Mr Baszley Bee Basrah, was actively involved during the excavation work in 2003 as an academic advisor and supervisor of one of these projects. In 2003, surveys and salvage work were undertaken through collaborative efforts of the Department of Museums and Antiquities Malaysia (Jabatan Muzium Malaysia, JMM), Department of Sabah Museum (Jabatan Muzium Negeri Sabah, JMNS) and the Nanhai Marine Archaeology Sdn. Bhd, a Malaysian-based commercial salvage company. The company was granted a license to carry out salvage work on the TSM shipwreck under the supervision of the Department of Museums and Antiquities Malaysia (Jabatan Muzium Malaysia, JMM) and the Department of Sabah State Museum (Jabatan Muzium Negeri Sabah, JMNS).

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In total, 303 complete or near complete ceramic artefacts were salvaged from the wreck site, together with 250 kilograms of broken ceramic shards, as well as 61 bronze gongs and 76 copper ingots, which are thought to be among the earliest Chinese gongs exported to Southeast Asia (Sjostrand 2003). No hardcopy archaeological report was produced except for a training report which was submitted to the JMM and JMNS (Sahar 2016: 3, Sjostrand 2003). Among the ceramics identified were rare and unique brown-glazed kendis and teapots, along with Qingbai, ewers, covered boxes and other brown-glazed wares. After the completion of the salvage operation and following the concession agreement previously made between the private company and the Malaysian authorities, 70% of the finds was given to the private company and the remaining 30% was allocated to the JMNS (Bee and Bala 2009: 115). Based on the report by Sjostrand (2003) and Sahar (2016), all unique pieces were kept by the Sabah Museum and hence all samples included in this research have been accounted for.

This initial archaeological investigation of the TSM shipwreck was followed by the Kudat Waters Survey Project, which was a collaborative effort between Universiti Malaysia Sabah (UMS), Universiti Kebangsaan Malaysia (UKM), JMM and JMNS, taking place from 2-4 October 2003. The pre-disturbance survey tools used included hydrographic equipment such as seabed scanners (side-scan sonar), depth gauges (echo sounder), a contour-marking submarine (sub-bottom profiler), and seabed mapping with Geographic Information System (GIS) software. As this was a survey project intending to relocate, grid, mark with a buoy and collect site surface details, 131 artefacts were recovered, including ceramics, wood and metallic objects (Bala and Bee 2009: 96).

Two maritime archaeological projects for surveying purposes were carried out at the TSM wreck site, in 2004 and 2006, by researchers from UMS and JMNS, respectively (Bee and Bala 2009: 115). In 2004, an underwater archaeological research project was conducted from July 30 to August 21 via the collaborative efforts of the JMM, JMNS, UKM and UMS (Bee et al. 2004: 1). This had been a rescue project applying archaeological methods such as surface fanning and the north-south and west-east quadrant placement method. Additionally, the team was able to locate the sunken ship, using a scanning device to pick up the debris field of the wreckage (Bala and Bee 2009: 104).

In 2006, the last rescue project at TSM wreck site was carried out from 5 to 17 June 2006 through the cooperation of the JMM, JMNS and UMS (Bala and Bee 2009: 105). The team used the dive-in salvage method, and retrieved 420 pieces of ceramics with some wooden and metallic debris (Sahar 2016: 3). As an improvement from previous methods, this 2006 project used air-lift replacing air-blower (Bala and Bee 2009: 105).

The TSM shipwreck is unique because it is thus far the oldest wrecked ship found at Borneo, dating to the 10th century CE, corresponding with the Northern Song Dynasty (Sjostrand 2003; Kwa 2012: 22). However, Flecker (2012: 27), argued that the shipwreck s of a later date based on the ceramic types found, suggesting more probably the Southern Song Dynasty (12th century CE). The ship's cargo is believed to have been intended for maritime trade in Southeast Asia. It is the only ship known that carried a substantial number of gongs, estimated to be over 400 intact flat gongs along with other metal artefacts. In comparison to 17 other contemporaneous shipwreck sites in Southeast Asia, such as the Pulau Buaya shipwreck at Riau Island, which carried only eight flat gongs, while the Muara Jambi shipwreck around South Sumatra only had a single flat gong (Nicolas 2009: 315-318). TSM wreck is therefore a rarity and is unique particularly in terms of the large number of gongs as well as the ceramics it was carrying. The wood planks which were part of the ship were made using a species of wood grown in the temperate climate of China (Sjostrand et al. 2006: 82;

Kwa 2012: 31). The ship is believed to have been heading toward Srivijaya (modern-day Sumatra, Indonesia) because of the diplomatic ties and trade relationships which existed between China and Srivijaya at the time (Munoz 2006: 117; Miksic 2009: 70; Orillaneda 2012: 5).

Most of the ceramics found at the TSM shipwreck site are celadon wares with various monochromic colours, such as white, whitish blue, grey, jade green, yellowish green, olive green, orange brown, brown and dark brown. The colours vary according to the differences in type and ratio of metals incorporated into the heated feldspar solution (Brown 1977: 84; Chin 1988: 1-7; Azman 2016: 67). Overall, however, celadon with jade green colour is the most common type found among the TSM celadon collection. Some of ceramics have floral incision and impressions of the Chinese character *chi* on the inner base, similar to common Chinese ceramic patterns from the 10th to 13th centuries AD (Ko 2015: 110), which were widely traded around Southeast Asia and China (Miksic 2009: 70; Muhammad 2010: 3-40). In fact, many local ceramic manufacturers are still producing closely similar ceramic types as can be seen in some ceramic producers in Kota Kinabalu, Sabah such as Claytan Corporation Sdn Bhd and Sabah Pottery Studio (Website: sabahpotterystudio.blogspot.my).

Methodology and Sampling

Archaeological analysis and classification of the TSM shipwreck ceramics in this study was performed based on morphological characteristics, which included ceramic type, shape/form, design, and decoration. All the ceramics were accordingly classified into ceramic types and sub-types. First, the ceramics were classified into types based on shape/form and function. Each type was further analysed and classified into sub-types on the basis of significant differences within each class, such as colours (according to the Munsell Soil Colour Chart), shapes (plates, bowls and jars) as well as decorative or design patterns (floral, faunal, inscriptions, and appliqué motifs). This classification method has been widely used by ceramic scholars (see for example Wirgin 1970: 5; Harrisson 1975: 37-58; Brown 1977: 84; Chin 1988: 1-7; Brown 2009: 47; Miksic 2009: 70; Flecker 2012: 9-29; Orillaneda 2012: 5-22; Azman 2016: 32). What follows is a summary and diagram of the ceramic classification method used for TSM shipwreck ceramics (Figure 2).

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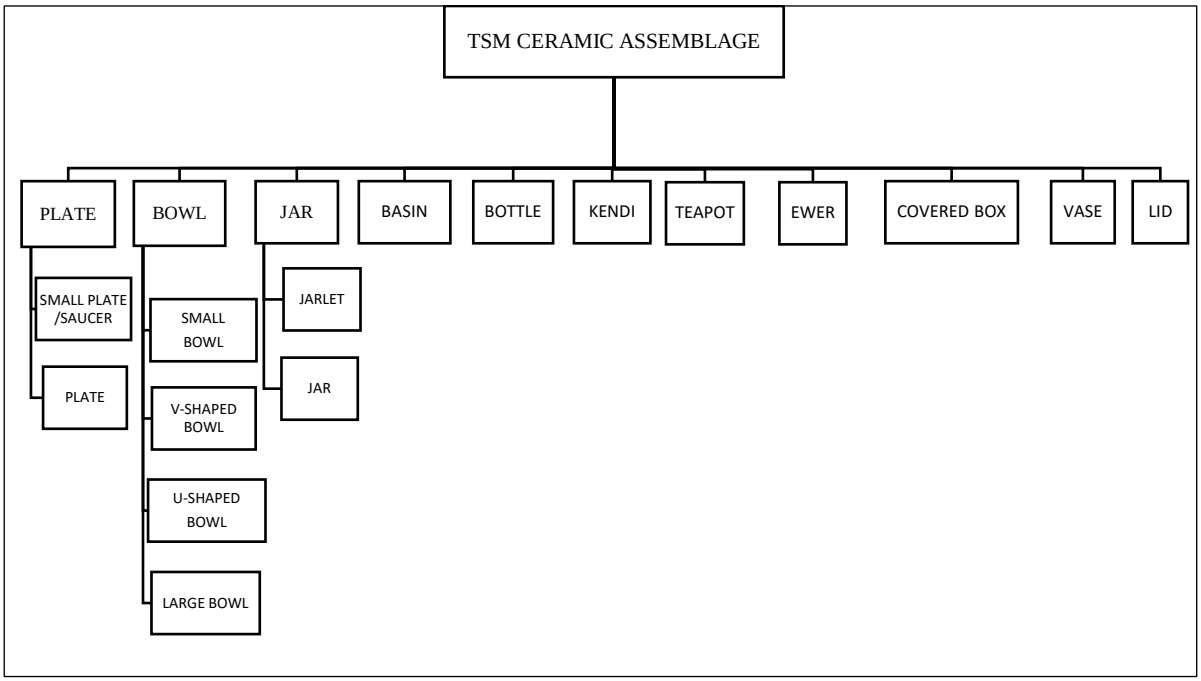

Fig. 2 Classification of TSM ceramic types. Drawing by Masbaka.

In terms of sampling and the quantity of ceramics from the TSM shipwreck, JMNS had provided the largest quantity, representing 94.4% of the 2,458 pieces of ceramic samples, while UMS provided 5.6%. All ceramic samples in this paper are collected from TSM wreck salvage work done in June 2003, salvage in October 2003, and rescue dive in August 2004 and June 2006.

We were able to access the ceramic collections at the museum storage at the Conservatory Building and Archaeology Unit with approval and permission from the Sabah Museum Director. The available artefacts were kept after two concessions: first was after June 2003 salvage and second was in July 2007 after the rescue project in 2006. According to the second concession reported by JMM, it was a 50-50 division between JMM and JMNS, of which JMNS received 210 pieces of artefacts including ceramics, wood and metal, and further divided their part with UMS for research purposes. However, the same cannot be said with the first concession of which report is not available for reference (Bala and Bee 2009: 110, Sahar 2016: 4). For this study, only ceramic pieces from the Department of Sabah Museum and Universiti Malaysia Sabah were selected (Table 1).

Location of ceramic collection	No. of pieces	Percentage (%)	Complete	Incomplete
Department of Sabah Museum	2,320*	94.4	96	2224
Universiti Malaysia Sabah	138**	5.6	2	136
Total	2,458	100.0	98	2360

Tab. 1 Location and quantities of TSM ceramic samples for study

Ceramic Types

In terms of ceramic typology, we classified them into 11 types, being bowls, jars, plates, ewers, kendis, bottles, covered boxes, basins, teapots, vases, and lids (Table 2). The bowl sub-class entails the largest percentage of the ceramic collection with 67.45% (almost 3/4), followed by the sub-class of jars with 19.2%, plate or saucer with 6.55%, and ewers entailing 3.62% of the ceramic collection.

No.	*Type*	*Department of Sabah Museum*		*Universiti Malaysia Sabah*		*No. of Pieces*	*Percentage %*
		Complete	*Incomplete*	*Complete*	*Incomplete*		
1	*Bowls*	*73*	*1,503*	*2*	*80*	*1658*	*67.45*
2	*Jars*	*4*	*433*	*-*	*35*	*472*	*19.20*
3	*Plates*	*4*	*136*	*-*	*21*	*161*	*6.55*
4	*Ewers*	*5*	*83*	*-*	*1*	*89*	*3.62*
5	*Kendis*	*5*	*14*	*-*	*-*	*19*	*0.77*
6	*Bottles*	*1*	*14*	*-*	*1*	*16*	*0.65*
7	*Covered Boxes*	*1*	*-*	*-*	*-*	*1*	*0.04*
8	*Basins*	*-*	*3*	*-*	*-*	*3*	*1.22*
9	*Teapots*	*3*	*-*	*-*	*-*	*3*	*1.22*
10	*Vases*	*-*	*-*	*-*	*-*	*-*	*0.00*
11	*Lids*	*-*	*38*	*-*	*-*	*38*	*1.55*
	Total	*96*	*2,224*	*2*	*136*	*2458*	*100.0*
	Total in Types	*2,320*		*138*			
	Grand Total	*2,458*					

Tab. 2 Ceramic types based on collection locations

Bowls

The bowl is the largest sub-class of the ceramic assemblage and forms the most common ceramic type because it was widely used in the Chinese tableware culture. Out of the 2,458 sherds of ceramic bowls recovered from the TSM shipwreck site, 98 are complete bowls whereas the rest of the 2,360 pieces are sherds. So far, four other sub-classes under this grouping were established based on size, namely small bowls, V-shaped bowls, U-shaped bowls, and large bowls, as follows.

Small bowls

A small bowl is rather like a combination of the U-shaped and V-shaped bowls, but it is smaller in size. It appears as an adaptation of the V-shaped bowl's inner and outer designs, but the lateral view shows that it is almost U-shape in form (Figure 3). The foot is usually visible and unglazed, whilst the glaze colour is mostly olive green with a lightly combed body throughout the entire collection. Although the glaze has degraded over time, its original colour is still explicitly green. The small bowl has a slightly upturned rim with a diameter of below 12.1 cm and a height of less than 7.0 cm.

Fig. 3 Small bowl. Photos by Masbaka.

V-shaped bowls

As the name implies, this bowl is V-shaped, typically having a rim diameter of between 14.0 cm and 18.0 cm and a height ranging from 5.5 cm to 7.5 cm (Figure 4). The outer body of the bowl is usually decorated with vertical bamboo-combed designs while the inner body of the bowl has incision patterns of flowers, clouds, or fish; this type of ware is rarely undecorated. Some of the glaze colours on these bowls are still intact (greyish green to dark greenish grey, 5G 4/1.5) but most, unfortunately, have lost their sheen and colour after being submerged beneath the sea for an extended period of time. Most of these are now badly corroded.

Fig. 4 V-shaped bowl. Photos by Masbaka.

U-shaped bowls

The U-shaped bowl has been classified as a deep bowl (Chin 1988: 1-7). It has a U-shaped body from the lateral view (Figure 5). Compared to the V-shaped bowl, its diameter is noticeably smaller (ranging from 15.0 cm to 16.3 cm) due to its U-shape form. These average a couple of centimetres taller than V-shaped bowls due to the slightly taller foot. Additionally, the clay and glaze are also remarkably thicker and brighter (light greenish grey, 7.5Y 8/1) than V-shaped bowls. Interestingly, it has the least decoration on both the inner and outer body of all the bowl types despite the smoothness of its fabric. Other than an unglazed ring around the inner bottom, these generally lack any incisions whatsoever.

Fig. 5 U-shaped bowl. Photos by Masbaka.

Large bowls

A large bowl typically has a rim diameter of between 18.0 cm and 26.0 cm, with the same height as the U-shaped bowl which is around 9.5 cm. Its stability relies on the thick footing and wide base (normally more than 7 cm) but its body is thin and can easily become chipped or broken (Figure 6). These typically have little decorations, which might include either a small Chinese letter "chi" inscription stamped on the inner base or a light incision on the inner body. The glaze colour is typically red (2.5YR 4/6).

Fig. 6 Large bowl. Photos by Masbaka.

Jars

Jars and jarlets comprise the second largest number of ceramic sub-classes, constituting around 20% of the ceramic assemblage in this study. These jars can have a variety of sizes, shapes, fabrics, thicknesses, mouth diameters, and bear decoration - each ware often having distinct designs without following specific standards. In addition, the glaze colour varies from light greenish grey (10Y 8/1) to light olive grey (5Y 6/2). The wide varieties and inconsistencies of jar types also suggested that jars had wide versatility in terms of usage and were not likely mass produced.

Jarlets

A jarlet is a container, small in size with a distinct mouth opening, which is often globular or oval in shape (Figure 7). Jarlets usually do not have rims or lug handles, and have a short neck or sometimes no neck at all, with the shoulder attached directly to the mouth. The typical vessel height is usually under 10 cm, which is one prominent feature to differentiate jarlets from other types of jars. Other characteristics of jarlets include having a small mouth diameter of about 3.0 cm, and a thin body with a thickness of around 0.2 cm.

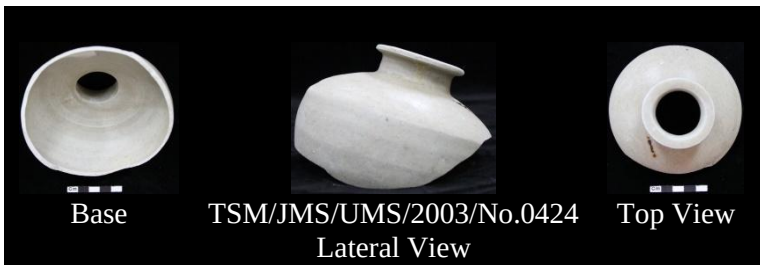

Fig. 7 Jarlet. Photos by Masbaka.

Jars

A jar is much larger in size compared to jarlets. The dimensions of a jar are wildly irregular throughout the entire sub-class, as do the glazes colours, mouth opening diameters, heights of neck, thickness, number of lug handles (up to five lugs), decorations (multiple carved motifs/patterns or none); even within the same size group, the productions are not standardised. It is normal to see such variety of ideas in decorations throughout Chinese ceramic. Hence, it is challenging to propose jars classifications within groups and classes. Wirgin (1970: 20-24) and Chin (1988: 1-7) did not mention the function of lug handles on jars in their studies, but it is known elsewhere that the lug handles, usually located on the shoulder of large jars, are for fastening ropes to secure a cover or lid (Dueppen 2013: 75-118; Swart et al. 2019: 20; Wong 2017: 339). Regarding the colour, jars are consistently monochromic in glaze from top to near-bottom with the bases often left unglazed. Jars also have thin bodies compared to the necks and bases, contributing to the fragility of their structures. One good example of a jar is shown in Figure 8. This jar remains about 40% complete and has two intact lug handles. It probably had four or five lugs in its complete form. Based on graphic extrapolation, the largest jar recorded has a mouth diameter of 22 cm and is about 40 cm in height.

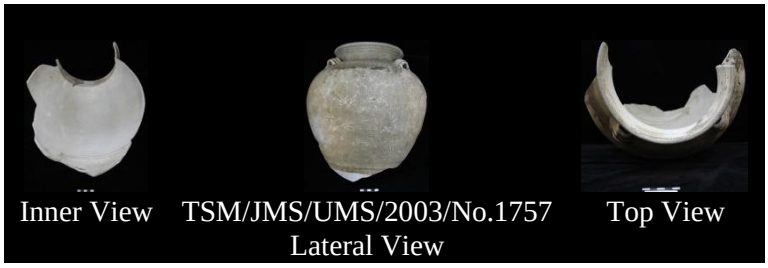

Fig. 8 Jar. Photos by Masbaka.

Plates

The plate is the second largest sub-class in the ceramic assemblage in this study (Figure 9). A regular plate was also found in 2010 in the nearby Jade Dragon Wreck (Flecker 2012: 10). The sub-class of small plates may also be considered as a type of saucer in the utilitarian sense. A small plate usually has a rim diameter ranging from 14.0 to 16.8 cm and is usually around 5.1 cm in height. The small plate is obviously a different sub-class from a regular plate in terms of size and function.

Fig. 9 Small bowl/saucer. Photos by Masbaka.

Ewers

The ewer is white in appearance with a jade green glazed and sometimes a tinge of pale blue. Ewers may or may not have lids (Figure 10). The clay colour ranges from white to light greenish grey (N 8/ to 10GY 8/1) and is smooth in texture. Ewers are often decorated with weaving patterns all over the body and shoulder, and are heavily glazed on the inside of the mouth opening and on the base. Ewers have an ovoid shaped body, a straight foot, rounded shoulder with a tall, broad, cylindrical neck which is attached with an almost L-shaped spout with a rounded aperture on the top, and a high, flat, loop handle attached at the shoulder.

Fig. 10 Ewer. Photos by Masbaka.

Kendis

The kendi is type of vessel used mainly as a container for liquids, similar to teapots (Figure 11). However, the three differences between kendis and teapots are the absence of a lid in a kendi, the consistent shape of kendi spouts, and the pale-yellow glaze (5Y 7/4) of the kendi. A kendi has no handle, nor lid or cover. It has a wide rim mouth and the neck is restricted to prevent liquid from coming out through the upper opening. Spouts are typically short, without decorations, and are straight and stubby (Figure 10).

Fig. 11 Kendi. Photo by Masbaka.

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Bottles

A bottle closely resembles a jarlet but has a more elongated body. Bottles have no decorations and have a brown glazed on the interior. However, the distinguishable features of a bottle from the jarlet are the smoothness of the clay materials and the height, whereas bottles are typically about 7cm taller than jarlets. There are few exceptions, however, such as one of bottle sherd found to have a whiter, coarser clay and no trace of glaze. Clay materials can also be used to differentiate the quality of bottles. White clay bottles usually have a smooth texture, pale yellow colour (5Y 8/3), and a glassy surface due to the high kaolin content. Some pieces have a rougher finishing and bits of black inclusions of tiny stones as shown in Figure 12. Dripping glaze can still be seen on some pieces although it has become thinned over time.

Fig. 12 Bottle. Photos by Masbaka.

Covered Boxes

A covered box, or a shallow box with a cover, typically have a rounded, flanged rim and also a shallow foot (Figure 13). The container has a matching cover with a slightly projecting flat top and a carved decorative motif designed like a blooming flower. Covered boxes typically measure 14 cm in diameter and 7 cm in height. The glaze colour, however, is difficult to determine because the clay can make the box appears yellowish if the glaze colour does not stand out. A keen observation nonetheless reveals that the colour is light greenish grey (5GY 8/1). In cross examination, covered boxes are found to be similar with ewers in clay materials and glazes, except that the covered boxes recovered were all in complete forms, fully intact with covers, unlike the ewers, which were found fragmented. Covered boxes have an overall foliated outer body, and it is believed they were used as a jewellery box, powder box, or other premium elixir at the disposal of the wealthy.

Fig. 13 Covered box. Photo by Masbaka.

Basins

A basin is essentially an open container without a lid intended for holding liquids or other things. It is the only surviving basin fragment in the ceramic cargo, it is an interesting piece because of its unusual design (Figure 14 lateral view). It has no elaborate carving or pattern on the outer body, but

there is some glaze residue with traces of possible paint on the inner curve of the body. It appears as a dark-coloured hue, close to dark olive green or dark greyish brown (10YR 4/2). Regardless of being faded, some streaks are still clearly visible, presumably intended as a decoration by design. After extrapolation, the original overall measurements of this artefact are about 25 cm in base diameter and 8.5 cm in height. The rim is notably wide, measuring 5.3 cm from its mouth opening to the rim.

Fig. 14 Basin. Photos by Masbaka.

Teapots

A teapot has physical characteristics which include a handle, a small top opening covered by a lid, and a uniformly thin and a slightly bent spout. Teapots usually have an overall brown coloured glaze, as shown in Figure 15. The glaze is semi matte and opaque (ranging from very dark greyish brown to dark yellowish brown, 10YR 3/4), but the base is left unglazed for stability and to prevent the object from sliding when being set down. Teapots have been found in small quantities but mostly in complete form.

Fig. 15 Teapot. Photo by Masbaka.

Vases

The vase is a vessel used for containing substances which can be liquid or powder in form. Although a vase is similar to a jar in terms of shape, it can be distinguished from a jar by the lug handles attached to the body and the upper portion which has a wide mouth opening and a high neck. Correspondingly, vases are usually brown or dark brown coloured glaze on the body and around the inner parts of the neck. They typically have a body diameter of 16 cm, a mouth opening diameter of 10 cm, and are 24 cm tall (Figure 16). This bulbous-body vase has also been referred to as an urn (Chin 1968). An urn, however, is customarily used to contain the ashes of a cremated body.

Fig. 16 Vase. Photo by Masbaka.

Lids

All lids have jade green glazes, made with whitish coloured clay with smooth surfaces and with good quality craftsmanship compared to other ceramic types (Figure 17). The lids were secured in a sealed plastic bag in the conservatory storage of Sabah State Museum. They are bundled together because of they are small in size (ranging from 4.0 cm to 7.0 cm of in diameter) and can be misplaced or breaks easily. The lips of some lids were found chipped at the edges and cracked on the bases. In the middle section of the lid there is a lug used to loop a thread to secure the lid to the vessel. Unfortunately, no lid has ever been recovered together with the matching vessel. After comparison with other ceramic sub-classes (i.e., glaze colour, clay colour, clay finishing texture, opening diameter and compatibility), the sub-class that matches this lid is most probably the ewer.

Fig. 17 Lid. Photos by Masbaka.

In summary, the largest sub-class type is bowls, consisting of 66.32% of the TSM shipwreck ceramic samples. This is followed by jars (and small tableware) which formed 18.72% of the TSM shipwreck ceramic samples. The third largest sub-type is plates (small plate or saucer) which constituted 6.16%, followed by ewers (water containers) with 3.92%. The lid (ewer cover) and kendi (stone pottery) constituted 1.52% and 1.04% of the total samples respectively. Other sub-classes identified among the samples and with quantities below 1% of the total ceramic samples include bottles, covered boxes, basins, and vases. Among these vessel types, the sub-class of ewers is by far the most renowned class, likely due to the high demand for this white ware. The most sought-after quality of ewer in ancient market are its shape, bright jade green colour and the highest finesse to produce it.

Glaze colour	Example	Sub-glaze colour	No of samples	Percentage (%)
White		White	2	0.08
Blue		Whitish Blue	66	2.68
Green		Jade Green	236	9.6
		Olive Green	637	25.9
		Yellowish Green	445	18.1
Grey		Grey	29	1.17
Brown		Yellowish Brown	466	18.95
		Brown	84	3.42
		Dark Brown	293	11.9
Bisquě		Bisquè	200	8.13
		Total	2,458	100.00

Tab. 3 Ceramics classification by glaze colour

Glaze colour

The main glaze colours of ceramic wares recovered from the TSM shipwreck consist of shades of white, blue, green, grey and brown, but each colour can have a different hue, value (lightness), and chroma based on the Munsell Colour System. However, it must be stated that the determination of glaze colours was difficult at times due to the weathering and discolouration of the glaze colours on the ceramic samples. In total, 2,458 ceramic samples, including sherds, were analysed and divided into six classes of glaze colours using the Munsell Soil Colour Chart (Table 3). In summary, most of the ceramic samples have a green glaze (50.9%), in particular olive green (24.6%). In general, most of the bowls have olive green glaze. Glazes of brown, dark brown, and yellowish brown totalled 42.5% of the ceramic samples, and are mostly represented by jars (18.9%). Other glazes such as white, blue, and grey are found scattered throughout the ceramic samples. It is noteworthy to mention that all the ewers have white glazes.

Decoration/design

Analysis of the ceramic samples revealed eight main types of decorations on the body, rim and handle, which were classified as fluted (body/rim), foliated (body/rim/handle), carved (inner/outer body with pattern), no decoration (apart from its body shape), floral (flower or flower with leaves on the inner/outer body by being either impressed or carved), faunal (if any), nature (depictions of waves or clouds), and inscriptions (Table 4).

Fluted	Foliated	Carved	No Decoration
			
Floral	**Nature**	**Inscription Etched**	**Inscription Stamped/ *appliquè***
			

Tab. 4 Ceramics classification by decoration/design

Most small bowls and V-shaped bowls have vertical incision with bands of lines made by scraping bamboo on the outer body. Only the V-shaped bowls have one or two horizontal lines as a ring, located below the rim. In addition, not all of the small bowls have upturned rims, and the fluted rim is occasionally found among small bowls. The inner body carving can be further divided into floral and nature patterns. Some pieces have more than one incision motif. Regarding large bowls, the inner body has a flatter surface and is less curved and often filled with decorative carvings. Interestingly, the large bowl is the only sub-type which has lettering or inscriptions on its inner centre. Jars and jarlets are intricate with two or three earlobes which are smooth or foliated. They have low or high necks with floral incisions, with or without an upturned mouth, and have small or large mouth openings. Plates or saucers are simpler, with a hybrid inner body design of a small bowl and an outer body design of a U-shaped bowl. Other ceramic types such as ewers, kendis, bottles, vases and teapots are rather different in form. An ewer is distinctively white in colour with a long neck, a long, foliated handle and a segmented body. The covered box resembles ewers in fabric, glaze colour, and foliated body but has traits mainly shared between a lid, a covered box, and an ewer. None of the lids have any foliated decoration. Basins are usually found in the form of sherds and lacked observable decorations but have a dark brown glaze on the inner body while the outer body is heavily eroded, exposing the layers of brown glazes.

Discussion and Conclusion

The ceramic samples from the TSM shipwreck included in this study were classified based on form (shape), function, glaze colour and decoration into eleven main types, namely being bowls, jars, plates, ewers, kendis, bottles, covered boxes, basins, teapots, vases and lids. Most of the bowls have olive green glaze, followed by jars with brown with yellowish brown, dark brown and brown glazes, while all the ewers have white glaze. The TSM ceramics are mainly decorated with bamboo-comb incision such as vertical lines on the outer body for bowls and plates, where jars and jarlets are found mostly with floral or pattern incision. The inner body for most of the bowls, plates and basins have either floral or patterned incisions or bear no decorations at all, while teapots and ewers are usually undecorated. The TSM ceramics have previously been classified by the Nanhai Marine Archaeology Sdn Bhd (Sjostrand 2003) into ten types of ceramics, bowls, dishes, kendis, ewers, bottles, urns, covered boxes, teapots, storage jars and saucers, using only complete or near complete ceramics of about 303 pieces from TSM shipwreck salvaged in 2003 (Table 5). From the only report available and provided by the salvage company, the artefacts were salvaged mainly for recovery using the east-west, south-east area division method, implying that the company used a quadrant during the salvage but did not state it was an official archaeological excavation. It is also reported to have Department of State Museum personnels on site all the time for observation and training.

All the ceramics were reportedly Chinese, dating from the Northern Song Dynasty (960-1126 CE). As for the present study, the assemblage of TSM ceramic samples analysed is considerably larger in number, consisting of 2,590 pieces of complete wares and sherds are from two sources which included the 2003 TSM salvaged ceramics kept at the Sabah Museum, as well as TSM ceramics salvaged and kept for study at Universiti Malaysia Sabah from 2003 to 2008.

The similarities in ceramic classifications between our study and the one conducted by the Nanhai Marine Archaeology Sdn Bhd (Sjostrand 2003) include the classifications of kendis, teapots, bottles, and covered boxes. The minor details in classification by Nanhai is the use of either glaze colour or the function of ceramics for classification for brown-glazed kendi or brown-glazed teapot. Nanhai also reported the presence of maker's marks on the ceramic artefacts. These marks resemble Chinese characters painted in iron oxide, believed to be made by the owner or merchant who would need to identify his own goods at the export destination. Although such marks might have been made by the potter or maker of the ceramic artefacts, similar marks have also been found on bronze artefacts. This strengthens the suggestion that they were indeed the owners' or merchants' marks.

No.	Ceramic classification done by this study (2018-2019)		Ceramic classification done by the Nanhai Marine Archaeology Sdn Bhd (Sjostrand 2003)
1	Bowl	Small Bowl	Biscuit ring bowl
		V-Shaped Bowl	Olive-glazed bowl
		U-Shaped Bowl	Olive-brown glazed bowl
		Large Bowl	Olive green bowl
			Large olive bowl
2	Jar	Jarlet	Black-glazed storage jar
		Jar	Brown-glazed urn
3	Plate	Small Plate / Saucer	Green-glazed porcelaneous dish
		Plate	Olive green dish
			Green-glazed saucer
4	Ewer		Porcelaneous ewer
			Brown-glazed ewer
			White ewer
5	Kendi		Brown-glazed kendi
6	Bottle		Mercury bottle
7	Covered box		Covered box
8	Basin		Not classified
9	Teapot		Brown-glazed teapot
10	Vase		Not classified
11	Lid		Not classified

Tab. 5 A comparison of TSM ceramic classifications

Among the types of ceramics that had been classified, it was reported that brown-glazed kendis and brown-glazed teapots were never found in any shipwrecks around the Malay Archipelago prior to the discovery of Tanjung Simpang Mengayau wreck in 2003. Other ceramic types, in particular the white ewer (believed to be *Qingbai* ewer), covered boxes and other brown-glazed wares have been reported from shipwreck sites in Indonesia, such as the Java Sea shipwreck and the Intan shipwreck (Brown 1977: 84; Flecker 2002: 101, 103, 115; Sjostrand 2003). The mercury bottle type, on the other hand, is believed to function as a container for mercury. It is partially brown-glazed and around 18 cm in height. Similar artefacts have been classified as mercury jars at Fort Canning, in Singapore, but it has alternatively been suggested they may have been used to contain wine instead (Wong 2017: 333-358). Hence, classifying ceramic based on its function such as the mercury bottle can sometimes still inconclusive. The covered box had similar description by Nanhai Company

and this study which included the slightly projecting flat top with a floral motif, and a sequence of vertical incisions on the body. However, Nanhai's records do not detail the glaze colour, which this study identified as jade green. Similar artefacts were also found at the Jepara shipwreck and the Java Sea shipwreck in Indonesia, which had been described as molded white/Qingbai wares made in Fujian province, China (Brown 1977: 84).

In conclusion, the TSM shipwreck ceramics have been identified as Chinese ceramics dating to the Northern Song dynasty (960-1127 CE). The ceramics form part of the cargo of a ship believed to be travelling from China, via the Philippines, to Borneo. It is the oldest cargo ship so far found in Malaysian waters and provides important evidence of early maritime trade from China to Borneo (Brown 1977: 47). The types of Chinese ceramics from the TSM shipwreck had been traded in Borneo, and the presence of these ceramics indicate trade and cultural affinities between Tanjung Simpang Mengayau and the Indonesian other areas of the archipelago, such as Pulau Buaya, Sumatra (Kurz 2011: 53; Miksic 2014: 353-431), the Jepara shipwreck (Munoz 2006: 209) and Sungai Musi underwater archaeological site (Munoz 2006: 117-147). The relationships between China and early Srivijayan maritime kingdoms of Southeast Asia need to be explored in future research.

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