



Case Report

The Temasek Wreck ceramics cargo: Yuan blue-and-white porcelain, celadon and other ceramics found in Singapore waters

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ABSTRACT

A maritime archaeological excavation recently carried out in stages over a four-year period resulted in the recovery of approximately 3.5 tonnes of ceramic shards, along with several intact or nearly intact pieces. Remarkably, the first ancient shipwreck ever found in Singapore waters is contemporary with the 14th century Singapore entrepot, Temasek. The Temasek Wreck also carried more Yuan dynasty blue-and-white porcelain than any other documented shipwreck in the world, along with a wide variety of Longquan celadon, moulded *qingbai/shufu* ware from Jingdezhen, whiteware from Dehua, greenware perhaps from Fujian kilns, and brownware storage jars and small-mouth jars from Cizao. While none of the ship's hull has survived, circumstantial evidence suggests that she was probably a Chinese junk. From the location of the wreck-site, the many parallel finds from Singapore terrestrial sites, and importantly a common dearth of large blue-and-white dishes that feature in historical collections of Turkey, the Middle East and India, Temasek would seem to have been the most likely intended destination for the ship. As this shipwreck assemblage was produced at one moment in the 14th century, it may serve as a reference collection for comparative studies of less provenanced finds.

Introduction

The 14th century Temasek Wreck was excavated in Singapore waters at the eastern entrance of Singapore Strait by the Archaeological Unit (AU) of the ISEAS Yusof Ishak Institute (ISEAS), on behalf of the Singapore National Heritage Board (NHB) [1]. Key findings such as date of sinking, likely origin of the ship, probable port of lading, and most likely destination are presented here. The ceramics cargo, however, is the primary focus of this paper.

The wreck was excavated intermittently from 2016 until 2019. Approximately 3.5 tonnes of ceramics were recovered, but little else. The ship itself had completely vanished. Without the anaerobic protection of deep and fine sediments, the hull had been scattered by waves and currents and eventually consumed by teredo worms.

The ceramics cargo

While some intact examples have been recovered, most of ceramics are in the form of shards. Stoneware storage jars and small-mouth jars

most likely from Cizao, *qingbai/shufu* ware from Jingdezhen, and Longquan celadon dishes and bowls form the vast majority. There are small quantities of crude greenware perhaps from Fujian, and some Dehua whiteware. But most impressive is an extensive repertoire of rare Yuan dynasty blue-and-white porcelain, far more than has ever been recovered from a documented wreck site anywhere else in the world.

Blue-and-white porcelain

The recovered blue-and-white porcelain weighs approximately 136 kg and is comprised of over 2350 shards along with several intact or nearly intact objects. This is 3.9 % of the total ceramic cargo by weight.¹

Fourteen different shapes have been recorded. By far the majority are bowls, making up 71.3 % of the total (Fig. 1). Next are vases at 11.3 %, and jars at 9.6 %. Note that as this analysis is by weight, the original number of heavy jars would have been far less than the original number of lighter vases. Dishes are next with 3.6 % (Fig. 2). Flasks and stem bowls make up 1.1 % and 1 % respectively. All other shapes combined account for only 2.1 % of the total.

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¹ For the complete documentation of the blue-and-white ceramics from the Temasek Wreck, including images of every shard, please see: <https://epress.nus.edu.sg/sitesreports/temasekwreck>.

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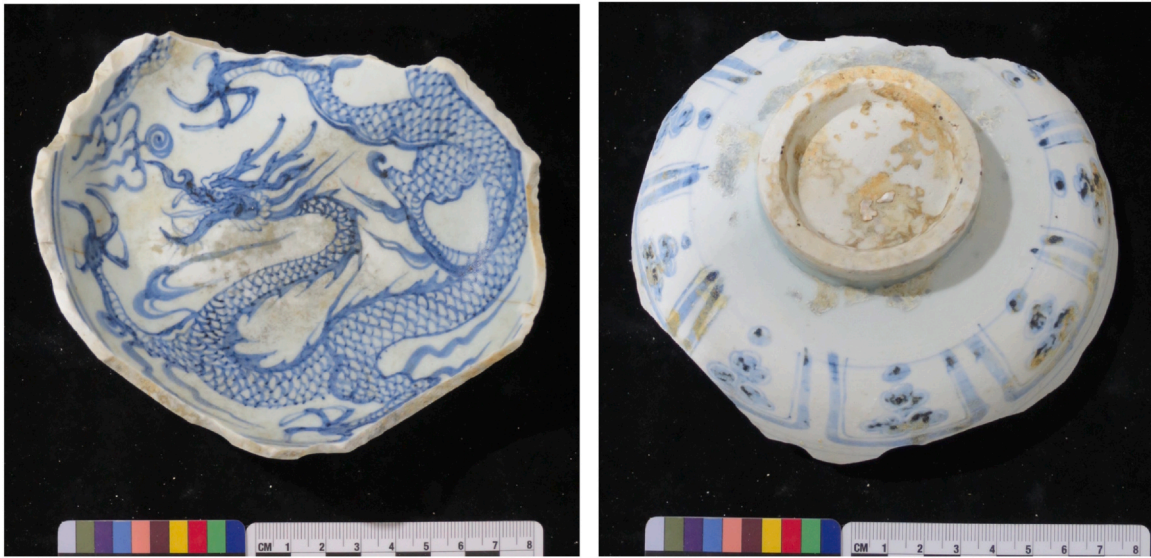


Fig. 1. A four-clawed dragon painted inside a bowl. The reverse of the bowl features typical lotus panels in underglaze blue.



Fig. 2. Small blue-and-white dish featuring a phoenix in the centre and a border band of chrysanthemums.

The most robust element of a bowl is the base, where the footing provides reinforcement. The total number of intact or nearly intact bases provides the minimum number of bowls in the original cargo. Consequently, we know that there were at least 300 blue-and-white bowls of varying size onboard the Temasek Wreck. Looking specifically at the two most popular decorations on bowls, there are three times more 'ducks in a lotus pond' (56%) than lotus bouquets (17%).

In stark contrast there were only nine intact or nearly intact vase bases. However, the total number of vase shards suggests at least double that number, based on an average weight of 700 g per vase. It should be noted that the total weight of shards is not fully representative as many shards were too small to recover.

The total weight of cover, cup, jarlet, and stem cup shards suggests that there were only a few of each of these shapes in the cargo. There may have only been one or two bottles (Fig. 3), ewers, pots and pouring bowls. Note, however, that ewers could only be categorised when spouts or handles were encountered. Some of the so-called vase shards were probably from similarly shaped ewers.

Apart from the prevalent 'ducks in a lotus pond' and lotus bouquets, motifs include dragons, phoenixes, herons, hares, double *vajra*, *ruyi*, chrysanthemums, peonies, morning glory, prunus, and melons and vines, all in vibrant and multi-hued blues. There are also some examples of applique and *anhua* ('hidden design') decoration.

Longquan celadon

Longquan celadon made up 44.5% of the ceramic cargo by weight. It has been subdivided into groups A and B, largely based on the size and shape of the objects. The size and shape correlate well with decorative technique, implying that this division is representative of different kiln complexes within the Longquan ceramic production centre in Zhejiang.

Group A (19.8% of the total cargo) consists mostly of large dishes or shallow bowls with a central moulded decoration and scalloped cavetto. There are many variations combining carving, combing and applique with the primary decorative techniques (Figs. 4–5). Rims are plain or foliated, and straight or everted. An unglazed ring is invariably



Fig. 3. An intact bottle with a flanged neck, during the cleaning process.

found on the base to facilitate stacking within the kiln. Footrings are of bevelled square section or asymmetric, tapering outwards.

Group B (24.7 % of the total cargo) consists mostly of medium sized bowls with a stamped central decoration within an incised ring. The most common stamped decoration is a lotus motif, which comes in a wide variety. Less common are chrysanthemums, an individual flower that may be morning glory, and double fish (Fig. 6). Often there is only the ring decorating the interior. The rim tends to flare and is often decorated externally by a series of incised rings. The footring and base are unglazed. Less common are finer medium sized bowls with a wavy rim and a moulded floral decoration on the cavetto. Due to the size criterion, small dishes, usually with an everted rim, are also classified as B.

One shape spans both groups. Jars (or *guan*) are usually of the same form with a scalloped exterior, but they vary markedly in size. Due to the size criterion, the larger jars have been classified as A while the smaller jars are B, even though they are probably both from the same kiln complex.

Qingbai/Shufu ware

The elements have been particularly unkind to one of the main shipwreck ceramic types. Hundreds of years of abrasion and chemical

attack have severely damaged the glaze. The underlying moulded decorations were originally subtle, but now they are often un-discernible. The glaze, while damaged, still has a pale-blue hue, hence the categorisation of *qingbai* (bluish-white) in the shipwreck database. Only well into the documentation phase of the project, after coral encrustation had been removed, were the tell-tale characters *shu* and *fu* detected on opposite sides of the cavetto of a dish. Several more have been observed since (Fig. 7). *Shufu* may be translated as 'Privy Council' which supposedly refers to *Shumi-yuan*, the Chinese ministry of military affairs. Consequently, such wares may have been intended for official use, or even destined for the imperial court. However, as 12.2 % of the Temasek Wreck ceramics cargo consisted of this ware, it was clearly also exported in bulk, contradicting the theory of exclusivity.

Most of the *qingbai/shufu* wares on the Temasek Wreck are medium or small sized bowls or dishes. There is also the small carinated bowl, with a short footring, relatively flat base and slightly flared rim (Fig. 8). The association of this distinctive shape to *shufu* ware was thought strong enough to adopt the term '*shufu* shape' for the shipwreck ceramic database. There are of course blue-and-white examples of the same shape and period, although they are relatively rare. As *shufu* ware was produced at kiln complexes in Jingdezhen including Hutian, inter-influence is to be expected.

The dishes and carinated bowls tend to be decorated in the centre with four lotus scrolls, although some of the higher quality carinated bowls have central lotus panels. The cavetto may have lotus scrolls or chrysanthemums. Larger bowls tend to have *ruyi* or flower decorations in the centre, with dragons or lotus scrolls on the cavetto (Fig. 9). Some have a double vajra in the centre. While the decorative technique used on the bowls appears to be very similar to that on the dishes, the bowls are more heavily potted. The glaze on the bowls may also tend more to grey compared to the dishes, although the degraded nature of the glaze makes this assessment problematic.

Dehua whiteware

Dehua whiteware accounts for 0.25 % of the total ceramic cargo by weight. There are only small and medium sized bowls without decoration, and covered boxes with moulded lotus petal decorations (Fig. 10). In most cases the white glaze is highly degraded or has disappeared altogether.

Greenware

The greenware accounts for marginally more than the whiteware, at 0.4 % of the total ceramics weight. There is only one shape, medium sized bowls. The glaze tends to be more olive and transparent than the Longquan celadon, and is often crackled. An unglazed ring is invariably left in the well to facilitate stacking in the kiln, a characteristic that reflects the lower quality of this product (Fig. 11). They may be attributable to provincial kilns in Fujian Province.

Small-mouth jars from Cizao

Stoneware small-mouth jars from the kilns of Cizao, Fujian account for 0.76 % of the ceramic cargo (Fig. 12). Some have a hint of brown glaze around the rim. These jars were once thought to carry mercury, but wine is a far more likely commodity.

Stoneware storage jars

Stoneware storage jars, of various sizes, account for approximately 38 % of the ceramic cargo by weight. The vast majority are of medium size and have four lug handles, a short tapering neck and a rolled rim. They were glazed brown on the upper two thirds of the body, however most of the glaze has now been lost (Fig. 13). Very few had a stamp on the shoulder, featuring either Chinese characters, Phags-Pa script, or a

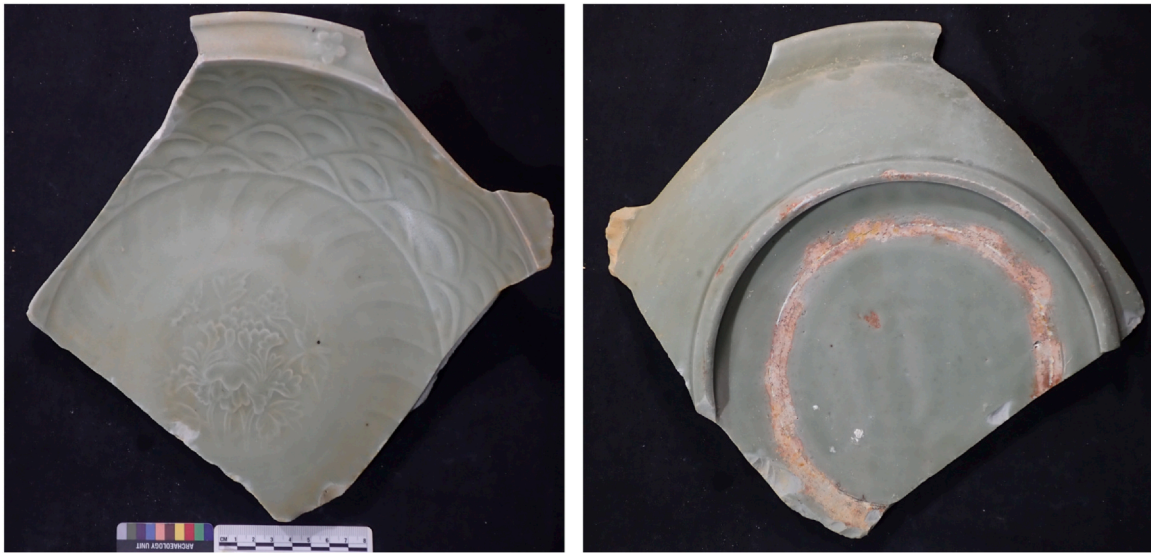


Fig. 4. Longquan 'celadon A' dish featuring a range of decorative techniques: moulded peony, combed rays, carved waves, and applique flowers on the flat rim. A comparable piece is illustrated in *Longquan of the World: Longquan Celadon and Globalization*, catalogue of the tour exhibition at the Palace Museum and Zhejiang Provincial Museum [2].

combination of Chinese and Arabic characters (Fig. 14). A small proportion of the jars were markedly larger. Some were also small and finely potted. Only a few shards displayed an abstract carved decoration. The storage jars are probably also from the Cizao kilns.

Dating

While Longquan celadon was produced for centuries with only subtle design variations over time, the distinctive blue-and-white porcelain lends itself to more precise dating. It was first produced in the kilns of Jingdezhen between the late 1320s to the early 1330s [3]. The Wenzong Emperor's signature motif, reserved for his exclusive use from 1328 to 1332, was water birds, typically mandarin ducks, in a lotus pond. In 1340, when the Shundi Emperor (reign title Zhizheng) assumed full power, restrictions on the use of this motif probably ceased,

leading to private kilns making a flood of wares decorated in this manner, with most for export [4]. The prevalent motif on the shipwreck blue-and-white porcelain is mandarin ducks in a lotus pond (Fig. 15).

The invasion of the Red Turban Army, made up of rebels aiming to oust the Mongol rulers, shut down the imperial kilns in Jingdezhen for an extended period from 1352. Many scholars argue that there is a strong possibility that all the Jingdezhen kilns were forced to cease operations at this time. Even if some kilns struggled on, the first Ming Emperor, Hongwu, banned commercial trade in 1371, three years after the Yuan dynasty fell. So, there is a distinct possibility that the remarkably tight date range of 1340 to 1352 applies to this wreck. For the more conservative, it could be no wider than the late 1320s to 1371. Either range places the wreck at the zenith of the Temasek period, when the Singapore River and the immediate hinterland played host to a dominant Southeast Asian port-city.

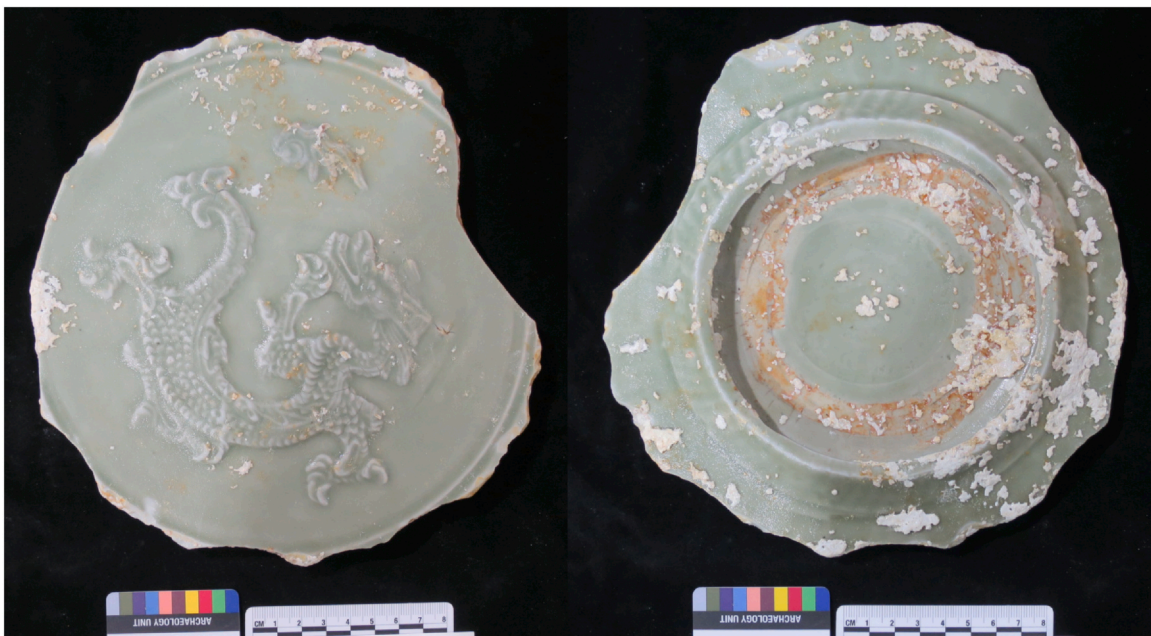


Fig. 5. Applique dragon on a Longquan 'celadon A' dish with an asymmetric footring.

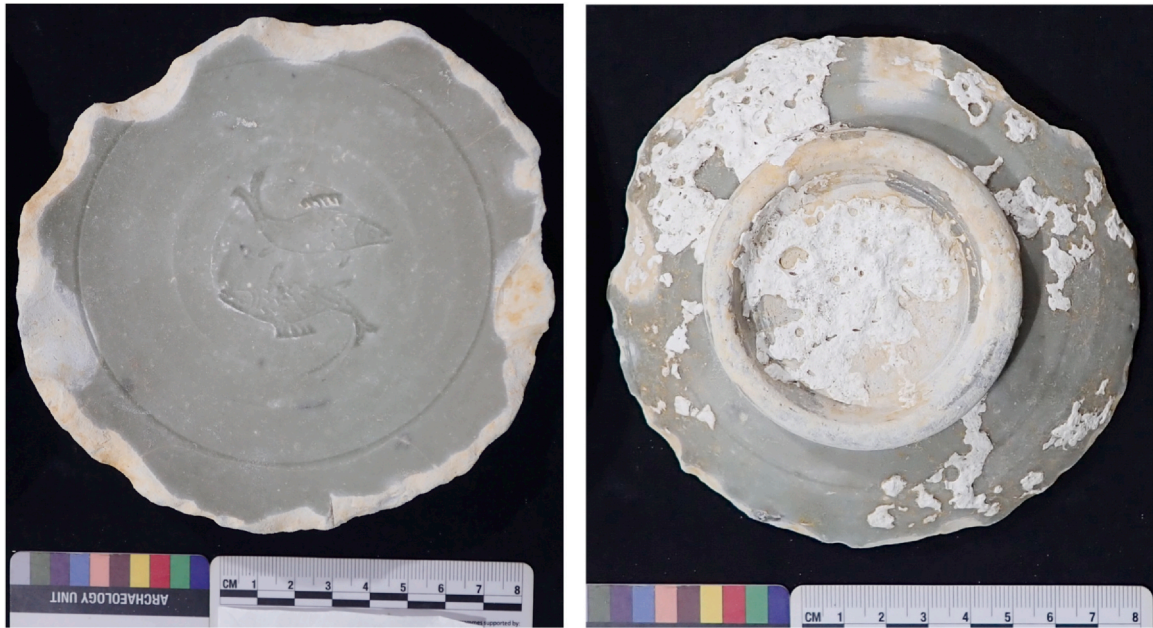


Fig. 6. Stamped double-fish motif on a Longquan 'celadon B' bowl.

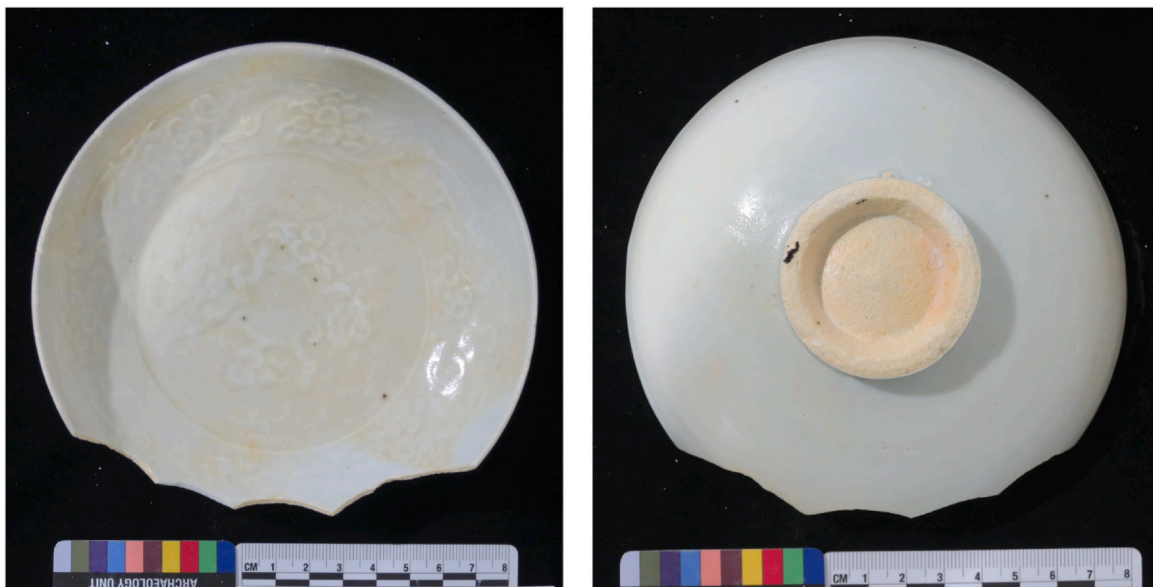


Fig. 7. A shufu ('Privy Council' 枢府) dish with moulded lotus scrolls in the well and on the cavetto. A fu 府 character can just be discerned at the 1 o'clock position.

Port of lading

The key ports in southern China during the 14th century were Guangzhou in Guangdong province, Amoy (Xiamen), Quanzhou and Fuzhou in Fujian province, and Wenzhou, Ningbo and Hangzhou in Zhejiang province. With the ceramic cargo on the Temasek Wreck originating from the provinces of Fujian, Zhejiang and Jiangxi, the long established trade centre of Quanzhou is perhaps the most likely port of lading, although diverse ceramic cargoes could have been loaded at various ports courtesy of an extensive riverine and coastal feeder network.

Intended destination

Remarkably, many of the wreck finds have direct parallels that have been unearthed from terrestrial sites in Singapore. Blue-and-white porcelain motifs are replicated, as are Longquan celadon dishes, bowls

and jarlets. Dark-blue glass beads and tiny fragments of gold foil show up on both the wreck and at Fort Canning in Singapore. The black glass bangle from the wreck is of the same style as a bangle from Fort Canning. Unsurprisingly, more common ceramics such as stoneware storage jars and small-mouth jars occur on both the wreck and at most Singapore terrestrial sites.

There is one more important parallel. The most famous historical collections of Yuan blue-and-white porcelain occur in Turkey, the Middle East and India where the majority of pieces are dishes with a diameter of 40 to 50 cm. While the undocumented Red Sea Wreck relinquished only twenty-one ceramic pieces, two thirds of them were large blue-and-white dishes. So far, Singapore terrestrial excavations have not revealed any large Yuan blue-and-white dishes. The wreck carried a wide variety of blue-and-white wares, but there are only a few dishes and the largest are less than 35 cm in diameter. The direct implication is that the ship was not destined for Indian Ocean trade ports. With no Yuan blue-and-white finds in northern Sumatra, nor along the

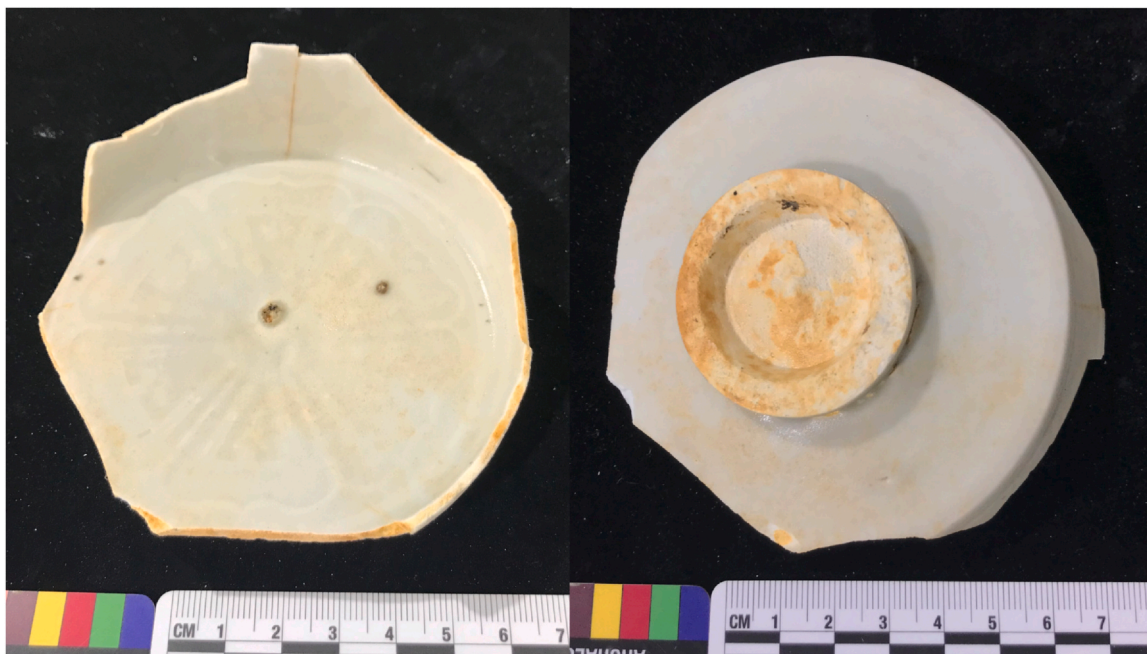


Fig. 8. Small *shufu* carinated bowl with a lotus panel decoration.

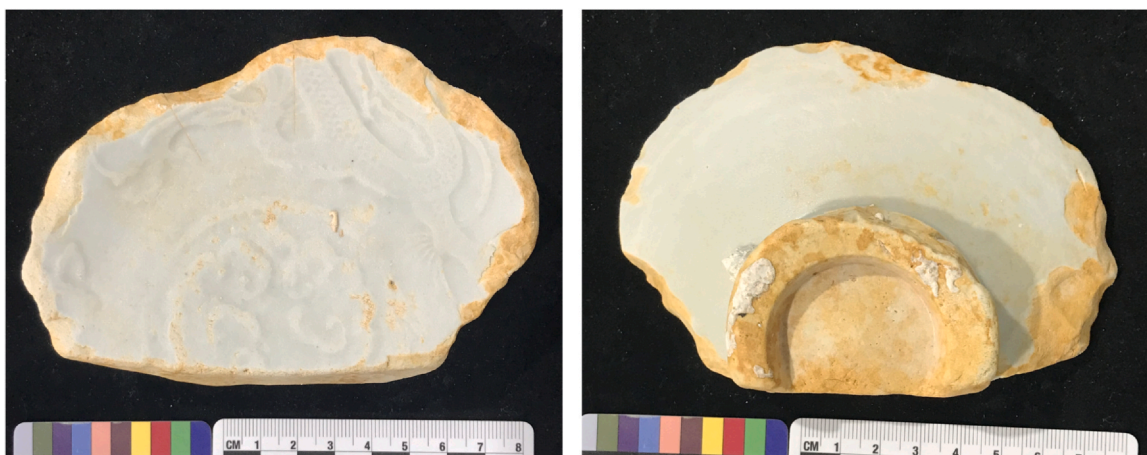


Fig. 9. A *qingbai/shufu* bowl moulded with a central *ruyi*-cloud and surrounding dragons (average diameter 16 cm).

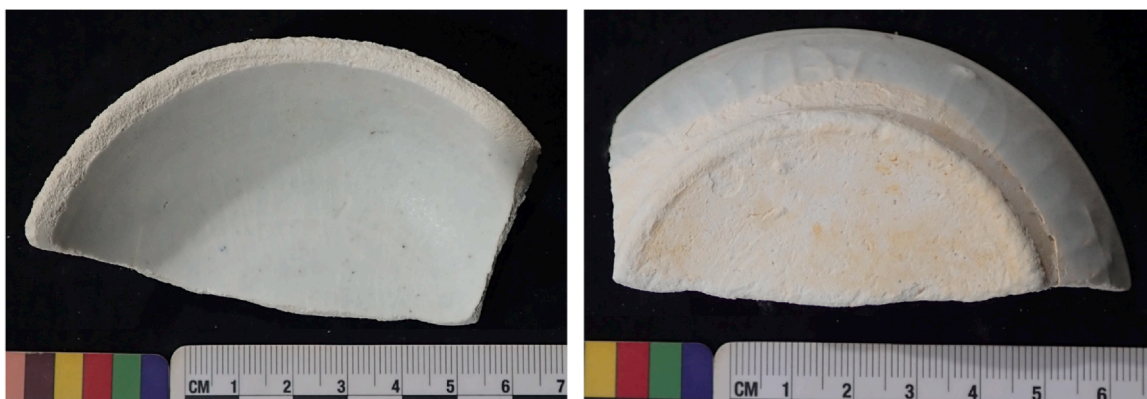


Fig. 10. A covered box base with moulded lotus petals, from Dehua, Fujian.

eastern shores of Melaka Strait and the Bay of Bengal, Temasek would seem to be the only contender for destination port.

The oblique implication of the lack of large dishes is that a significant portion of the blue-and-white cargo was intended for wealthy

Temasek residents. The relatively large quantity suggests that some was also intended for transshipment. If this is indeed the case, the recovered ceramics and artefacts provide an incredible insight into the utilitarian, elite and ceremonial wares that were used by Temasek’s inhabitants.

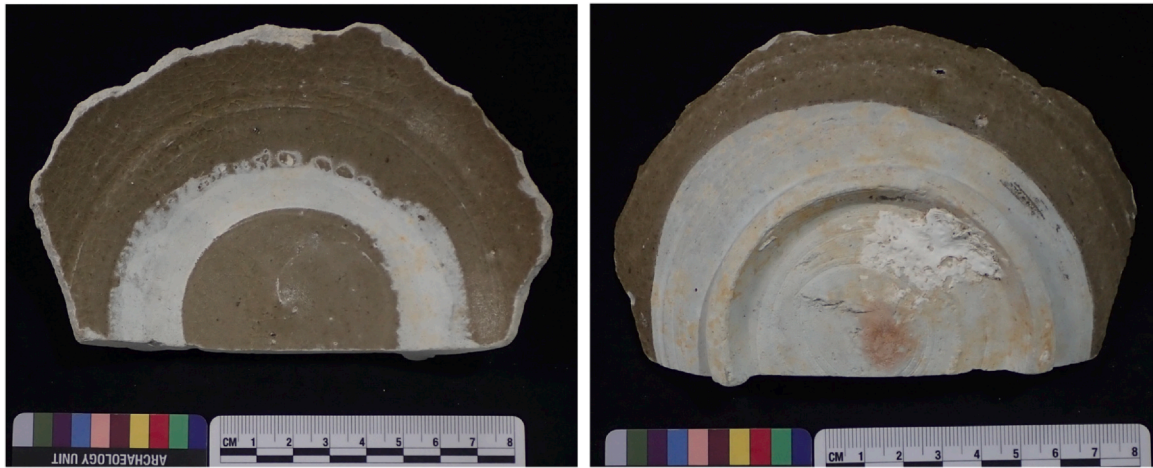


Fig. 11. An olive-green bowl with an unglazed ring in the centre, perhaps from provincial Fujian kilns.



Fig. 12. Shoulder-and-rim shards from small-mouth jars.



Fig. 13. Shoulder-and-rim shard from a storage jar, with two remaining lug-handles.

Type of ship

Without any surviving hull remains it is impossible to conclusively identify the origin of the Temasek Wreck. However, it is possible to make a very good guess, calling upon archaeological evidence for the period. While exclusively Chinese cargoes were carried by several non-Chinese vessel



Fig. 14. Stamps on storage jars: Chinese and Arabic script (left) and Phags-Pa script (right).

types, there are always non-Chinese artefacts, such as personal possessions or objects for shipboard use, recovered from such wreck sites. Chinese junks with exclusively Chinese cargoes, on the other hand, did not carry non-Chinese objects. Very few non-ceramic artefacts remained on the Temasek Wreck: an ink stone; tiny glass beads; a glass bangle; gold foil; lead disks; copper alloy vessel fragments and spoons; and a lead sinker. The ink stone is



Fig. 15. The motif of mandarin ducks in a lotus pond (*manchijiao* 满池娇 or Pond Brimming with Charming Beauty) on a blue-and-white bowl.

clearly Chinese. From elemental analysis, the glass bangle may come from India. At this stage the origin of the other artefacts has not been confirmed, but there is nothing to suggest that they did not come from China. Therefore, there is a high probability that the ship was a Chinese junk.

Conclusions

The Temasek Wreck yielded approximately 3.5 tonnes of ceramic shards, and only a dozen or so fully intact pieces. Nonetheless, the quality of the ceramics is in many cases superlative. This is especially the case for the blue-and-white porcelain from Jingdezhen, but also applies to Longquan celadon and Jingdezhen *qingbai/shufu* ware. Stoneware storage jars and small-mouth jars from Cizao were probably intended as containers for commodities rather than as trade items in themselves. Small quantities of whiteware from Dehua and greenware from Fujian provincial kilns round out the ceramic cargo.

The ship was probably a Chinese junk that loaded in Quanzhou in the mid-14th century and was bound for the thriving entrepot of Temasek.²

CRedit authorship contribution statement

Michael Flecker: Writing – original draft, Writing – review & editing.

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Declaration of Competing Interest

The author declares the following personal relationships and financial interests which may be considered as potential competing interests: Michael Flecker works at HeritageSG, a subsidiary of Singapore National Heritage Board. In addition, this project was funded by the National Heritage Board of Singapore.

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² All photos illustrated in this article are by Dr Michael Flecker, when he worked for the ISEAS – Yusof Ishak Institute, Singapore.