# The Archaeological Investigation of "Kamikaze" The Mongol Invasion of Japan

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## *Abstract*

The historical event that produced the term "Kamikaze," the Mongol Invasion of Japan led by Kubilai Khan in 1281 Common Era (C.E.), was shrouded in mystery until a chance discovery off Takashima Island in Japan revealed the remains of his fleet. It is said that more than three thousand Chinese and Korean ships met catastrophic ends as a result of the powerful storm. Scholars have asked why such a large number of ships perished; their answers range from the effects of a typhoon to ill-prepared ships to the skills of Japan's Samurai defenders. Despite detailed research efforts, no conclusion has been reached due to the lack of substantial evidence. The archaeological remains discovered at the Takashima underwater site may change how we view this significant battle that changed Japan's history. Based on his own research, the author discusses various reasons why the invasion may have failed and whether the analysis of archaeological remains can add new evidence for understanding the fate of Kahn's fleet. In particular, the author focuses on the construction and outfitting of the vessels used for the invasion.

Ships are arguably the most complex "artifacts" that humans have created and thus reflect the environment, society, and people that were involved in building the vessel. Furthermore, ships were the essential component for the invasion of Japan. Anchors, degraded timbers, possible repairs, artifacts such as personal effects and weaponry, as well as timber species analysis and the study of fleet organization all tell a story about what took place in the past. Close examination of information from Takashima sheds new light on the cause of the largest naval disaster in the pre-modern era.

## *Introduction*

Legends tell us that a catastrophic storm obliterated Kublai Khan's fleet of more than 4,000 ships off Takashima Island in Southwestern Japan during his second invasion in 1281 C.E. (Figure 1). However, many have doubted the storm was the only cause and proposed several reasons for the failure of the invasion (Conlan 2001; Saeki 2003; Turnbull 2010). This paper tries to answer whether it was human or environmental factors that caused the invasion to fail. A Japanese archaeological team has successfully located fragments of hull timbers from this ill-fated fleet along the southern shores of the island of Takashima (Matsuura Board of Education 2008). This is not a typical archaeological excavation because the entire bay may be considered an archaeological site; perhaps only 1 % of the "site" has been properly excavated. Several excavation projects were conducted intermittently for the past 20 years at Takashima (Matsuura Board of Education 2008). In 2004, the author initiated a project funded by the Institute of Nautical Archaeology at Texas A&M University and RPM Nautical Foundation to analyze over 500 pieces of timber excavated at Takashima underwater site. The data gathered from subsequent analysis provide hints of the organization of the fleet, as well as signs of poorly constructed ships and evidence of possible Japanese defense (Sasaki 2008). This research has provided evidence for various factors that played a significant role in an event that changed the course of Japanese history.

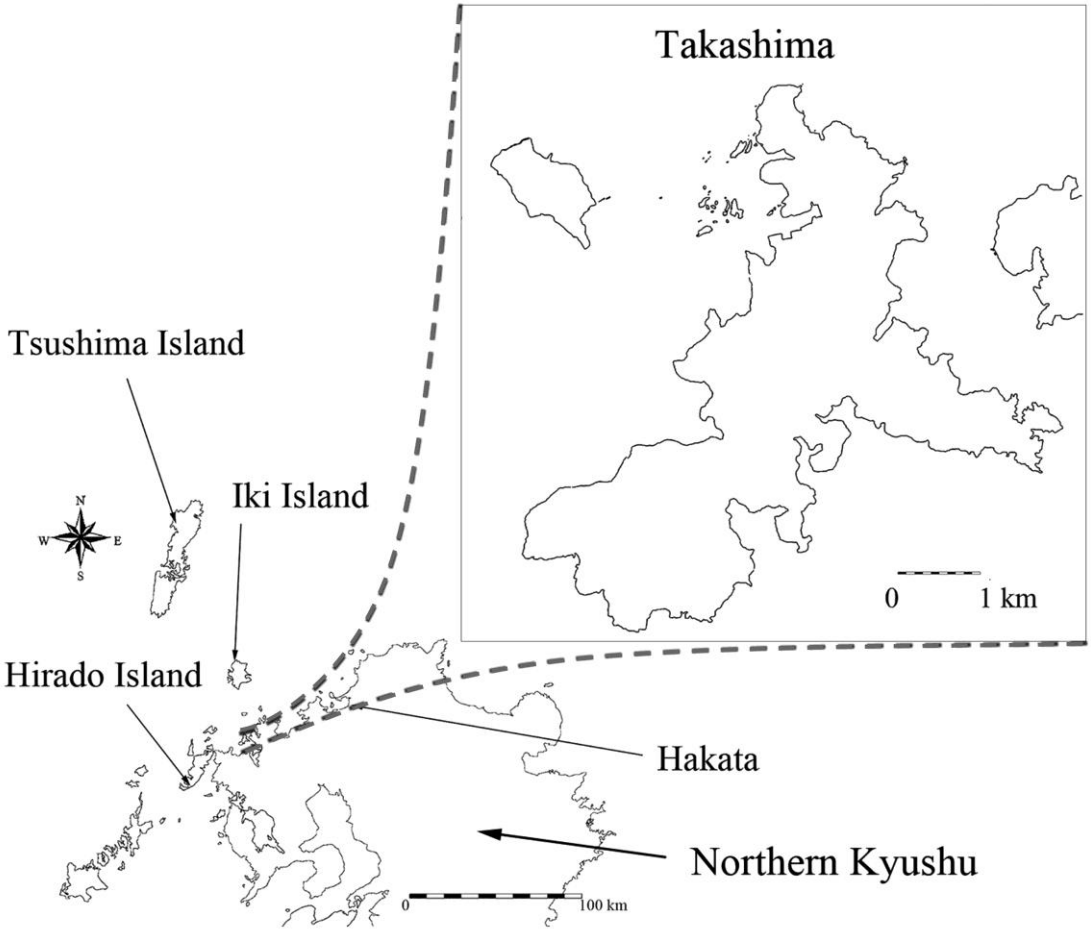


Figure 1. A Map of Southwestern Japan and Takashima Island

## *Takashima Underwater Site*

A unique characteristic of the Takashima underwater site is that there is no discernable distribution pattern of artifacts and the large majority of the artifacts appear to be small broken fragments. A brief analysis showed that 90% of the timbers were less than 1 meter (m) in length. In addition, close to 70% of the timbers were simply too degraded to provide any useful information. The author believes their degraded state to be attributable to a series of post depositional events. All excavations conducted at Takashima were rescue projects and mainly areas close to the shoreline were excavated. The near shore zones are usually directly affected by current and have been heavily churned up. The visual inspection of the timber fragments exhibited shipworm damage typical of such conditions.

Although the majority of areas excavated were heavily disturbed zones, clear signs of an undisturbed layer were found when a small but slightly deeper location was excavated; the discovery of well preserved anchors described below

evidenced such condition. Four wooden anchors were found *in situ* as if these were cast overboard during the legendary storm (Figure 2). These anchors, all aligned in the same direction, were set to prevent the ships from striking against the shore and their directions indicate that the wind was blowing from south - a typical typhoon wind direction in the area (Takashima Board of Education 1996: 31-33). The estimated original length of the largest anchor's shank may be 5 m or more. Based on his study of a military treatise, Kinya Yamagata (1996:128-130) estimates that the vessel may have been about 40 m in length. There appears to be no need for further proof that there was a storm other than the four anchors in the same direction trying to prevent the ships from being blown against the shore. The Takashima underwater site has the potential for retaining a number of intact and well-preserved vessels. Until this breakthrough discovery takes place we must rely on broken isolated fragments to tell us the story of this historic event.

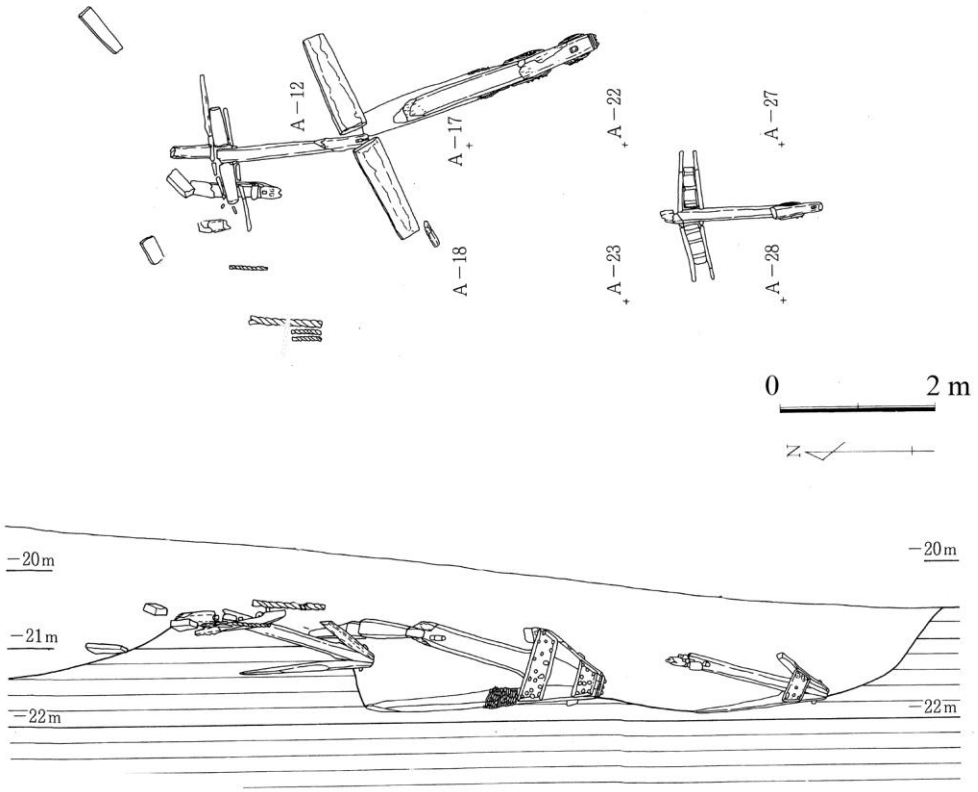


Figure 2. The Four Anchors Found at Takashima *in situ.*
(After Takashima Board of Education 1996: fig.13)

## *Organization of the Fleet*

The first invasion of Japan in 1274 C.E. provides excellent insights into how the second invasion may have been organized. Historical accounts mention three types of vessels being prepared; one-thousand-*Liao* ships, *Baator* fast-boats, and water transport boats). The *Liao* ship can be considered a large vessel that

is 300 tons or more, the *Baator* ship is most likely a slender landing craft, and the water transports can be considered as miscellaneous small boats (Yamagata 2004: 48-49). Any invasion across the sea requires a large amount of grain, thus large cargo vessels were a necessary asset of the Kublai Khan fleet. Such vessels, however, must be accompanied by smaller craft to carry supplies between ships and shore. A large vessel, although excellent at keeping a straight course in deep water, cannot navigate in shallow water because of its deep draft. In addition to V-shaped deep draft cargo vessels, it was necessary to bring shallow draft watercraft capable of beaching to quickly disembark troops. The composition of the first invasion fleet makes perfect sense. The author assumes that the second invasion was organized with a similar strategy in mind. Written sources note two separate fleets organized for the second invasion; one set out from Korea and another from the Yangtze River mouth. Historian Kōki Ōta (1997) suggests that the fleet from Korea carried the main fighting force, while the ships from China were to support the operation and to carry supplies to the front. He based this hypothesis on differences in circumstances and physical environment. The number of ships and troops, and the amount of grain that each fleet carried appears to support this claim.

It also appears that Kublai may have organized the two fleets using different ships knowing the types of vessels built in the area and the types of vessels best suited for a specific task. Ōta (1997:46) notes a remark in *Koryo Sah* made by Kublai stating “ships from the Song are big but not strong; Korean ships are small but strong.”This implies that he was aware of different ships available for his use and the characteristics of those ships.

Besides the 900 ships built in Korea, Kublai ordered the provinces and towns of Yangzhou, Hunan, Kanzhou, and Quanzhou to build 600 vessels. Korean flat-bottom vessels were constructed to navigate in shallow waters and withstand the harsh sea environment (Sasaki 2010; Kim 1994). Vessels built in Yangzhou were suited for both estuaries and coastal waterways while Hunan and Kanzhou are known for excellent river-craft that they built (Worcester 1971). These vessels were made with flat, to rounded-bottom, structure hull shape best for miscellaneous functions including reconnaissance and transporting supplies and soldiers between ships and near shore. Quanzhou is a famous shipbuilding town in Fujian province where large ocean going ships with V-shaped hulls were built (Kimura 2010). Based on the evidence discussed above, it can be suggested that the fleet from Korea was composed of shallow draft vessels capable of landing troops, while the fleet from China was composed of large deep draft vessels that could carry large cargo as well as miscellaneous ships suited for various tasks including reconnaissance and transporting goods for short distances.

Based on the discussion above, the ship timbers from Takashima should include fragments from large vessels built in Fujian province and smaller watercraft built along the Yangtze River. First, the size of timbers from Takashima is a good indication of the general composition of the fleet. Only a handful of planks from Takashima were thicker than 8 cm, suggesting that many of the timbers belonged to small vessels, most likely from the Yangtze River.

Most of these timbers were beams, railings, supporting timbers, and broken planks. A possible hull frame was found and this artifact may suggest a gentle curving hull typical of the Yangtze estuary ships. Many of the complete timbers were also from smaller ships. While not representing a significant portion of the remains, at least one large vessel with a V-shaped hull built in Fujian province was present (). The 6 m wide bulkhead plank is from a large ship, based on its size and construction features similar to those observed in other excavated vessels, including the Shinan and Quanzhou shipwrecks (Green, *et al.* 1998; National Maritime Museum of Korea 2006) (Figure 3). The estimated length of the vessel may be beyond 30 m and its capacity may have been 300 tons or more. In my research, I realized that what seems to be a minor construction feature, such as differences in joinery methods, can be used to identify the original port of a vessel. Korean shipwrights built ships without using a single iron nail, while the Chinese built their vessels with the liberal use of iron nails (Kimura 2010). One area of possible hull remains was isolated from other timbers at the Takashima site, and close to two thirds of its timbers contained at least one nail. Furthermore, none of the timbers from this site could be confirmed with certainty as having originated from Korea. It must be noted that other types of artifacts, such as ceramics, suggest a similar scenario; almost all artifacts were from China, and only a small percentage were Korean made. This evidence seems to correspond to the historical records. According to historical accounts it is known that most of the Korean ships were saved (Ōta 1997:71-76). Overall, the archaeological evidence gleaned from Takashima seems to correspond well with the organization of the fleets derived from historical documents.

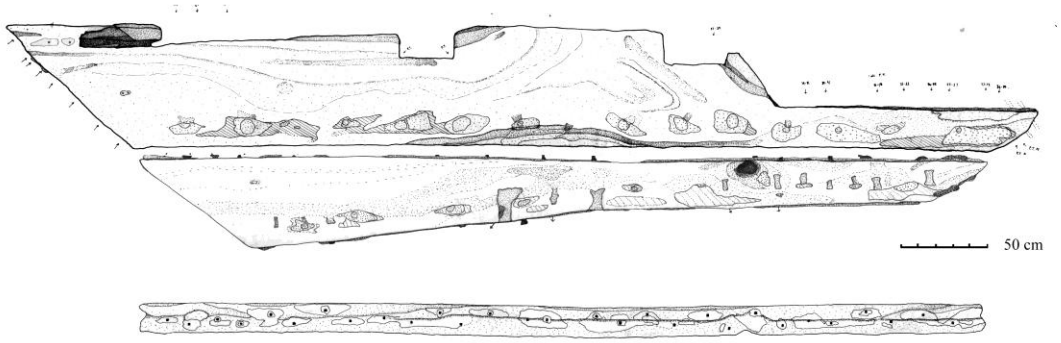


Figure 3. The 6 m wide V-shaped Bulkhead Planks of a Cargo Vessel Discovered at Takashima

## *Sign of Poorly Constructed Ships*

It is difficult to imagine how Kublai amassed more than 4,000 ships and thus it is often argued that it was not the storm but rather poorly constructed ships that ultimately caused the invasion to fail. Analysis of historical documents tells us that the use of merchant and pirate ships for naval use was a common practice

at the time (Lo 1969). One important artifact, a wooden tag with lacquer inscription, was uncovered at Takashima. This tag reads, “in the first year of …., [name of an official] inspected, repaired, and approved [this item]” (Yokkaichi 2002). It is logical to assume that the item repaired was something important, perhaps a ship. If this was indeed the case, it implies that not all ships were newly constructed.

From Takashima, no less than twenty timbers exhibit evidence of possible repair and recycling. More than a dozen timbers had multiple nails of different sizes from various angles placed in close proximity--often less than 2 cm--which can be taken as a sign of recycled wood. It is not logical to place so many nails in such a close proximity and I believe these are signs of repairs. The presence of such signs indicates some repairs took place, but does not shed light on how many vessels were repaired or how extensive these repairs were. Considering the nature of the site, it is difficult to know exactly what percentage of the ships were repaired. Many timbers, including a possible mast step and 6 m long bulkhead planks, exhibit what seems to be a sign of poor craftsmanship. However, a deeper understanding of East Asian shipbuilding tradition may alter such ideas. For instance, a mast step from Takashima has been noted as an example of poor craftsmanship (Man 2006; Turnball 2010) However, mast steps in East Asian ships played a minor role in the hull’s overall integrity, compared to Western ships and should not be used as a clear evidence for the ship being built in a poor manner. A mast step played an important role in supporting a mast in Western built ships (Steffy 1994). On the other hand, in Chinese shipbuilding tradition, the stress from the mast is distributed to the hull through tabernacles, carlings, and bulkheads. A mast step is only a small component in supporting the weight of the mast. Thus, a poorly constructed mast step alone may not indicate that the ship itself was constructed in a hasty manner. At the same time, some timbers exhibit evidence of excellent craftsmanship and attention to detail. A representation of one or two example(s) of poorly constructed or well-crafted components does not tell us about the relative strength of a vessel. Nonetheless, it is clear that not all ships in the invasion fleet were new.

The species identification of wooden artifacts from Takashima may hold the key to the riddle, and these analytical results may be essential to understanding the strategy for preparing the invasion. Historical accounts as well as archaeological evidence from some shipwrecks reveal that traditional shipwrights had a preference in choosing the types of wood they used to build vessels. In general, Chinese shipwrights used camphor (*Cinnamomum camphora*) or China fir (*Cunninhamia lanceolata)* to construct ship hulls (Xi 1999). It can be assumed that if the shipwrights were constructing vessels in a hasty manner and were subject to environmental pressures, the species that shipwrights used to build vessels would vary.

The species identification of 475 samples of wood from Takashima was conducted and the results published (Matsuura Board of Education 2008: 193-230). The author isolated 174 samples of hull components from the rest of the timbers, and 32.8% are camphor wood, while pine accounted for 22.4% and China fir accounted for 14.9% of the sample group. Fifteen timbers were

identified as possible bulkheads and twelve of these were manufactured from camphor wood. Also, fifteen timbers thought to be hull planks included nine samples of camphor. Smaller components and thin planks showed more variety in wood species while larger and thicker components showed less variety of wood types.

The analysis of firewood, perhaps the most overlooked item in the archaeological record, was also important in determining the potential environmental pressure that China experienced at the time of the invasion. A total of 80 timbers from Takashima were identified as firewood (Figure 4). One important use for firewood was for communication between ships. The use of signal fires to keep the fleet intact and guide its vessels (many of which had few navigators), was a well known practice in East Asia (Batten 2006:83; Ōba 2001:1). The result of the species identification revealed that 80% of these logs were softwood, with 63% of them pine. Softwood, such as pine, does not require much time to season and can be used when slightly damp, which makes an excellent choice for use on board a vessel. Softwood also produces more smoke than hardwood. The analysis of the wood species indicates that preparation for the invasion was not based on the strategy of, “using whatever wood they could get their hands on”, but was based on, “using the wood types that best fit the purposes”. It appears that when constructing these vessels shipwrights were not forced to use alternative less desirable timber.

Figure 4. A Large Number of These Firewood were Found at Takashima.

## *Evidence of Possible Japanese Defense*

Thomas Conlan (2001) claims that the Japanese did not need a great typhoon to win the war; the Samurai's bravery and fighting skills combined with the defensive walls that the Japanese built, were effective in keeping the Mongols from landing. The timbers found at Takashima contain clues to the actions of the Japanese defenders. Charred ship timbers may be one such clue. Close to forty timbers appear to have been scorched and many more timbers showed traces of fire damage. These charred timbers may be parts of vessels consumed by Japanese fire attacks. Furthermore, remnants of heavily burnt upper hull structures add credence to the argument that the samurai set fire to the enemy's ships (Man 2006; Turnball 2010). Another clue is an elongated plank the surface of which was covered with numerous nails. Various sizes of nail holes were found and no order was found in the placement of nails. It might have been part of a spiked gunwale that prevented the enemy from boarding the vessel; when enemies tried to board the vessel, their hands would be caught on these nails. Yamagata (2004:88) mentions a Chinese treatise stating the use of such a defensive device. The presence of the spiked gunwale, if indeed that is what this artifact represents, implies that the Mongols were prepared for the possibility of Japanese attacks on their vessels.

## *Conclusions*

The archaeological evidence from Takashima contributes new data to the ongoing discussion of what really took place during the second Mongol invasion of Japan. Although the site's environment would appear to prevent its meaningful interpretation, careful analysis has revealed a variety of potential research directions. Although it is clear that there was indeed a powerful storm at the time of the invasion, there was no single cause that led to the invading fleet's destruction. When discussing whether human or environmental factors caused the failure of a particular event in history, we forget that the environment often shapes human decisions. First, Kublai Khan decided upon an invasion across an open sea, which can be considered an "environmental barrier". A large number of troops had to be gathered with enough provisions to sustain them during and after the battle, and the invasion ships had to be built to withstand open sea conditions. The presence of shallow water along the Japanese coastline made it necessary to bring smaller, shallow-draft vessels. These would necessarily include vessels not suited for open ocean sailing or the ability to withstand a storm, but the plan to bring such vessels was part of Khan's larger military strategy. The wood species analysis and interpretation implies the vessels were constructed using preferred timbers. From historical documents, it is known that the Mongols could not take control of the land and were kept at bay by Japanese fighters for a prolonged period of time. The Japanese defending forces that prevented the Mongols from landing contributed significantly to the outcome of the invasion event. Considering that the invasion took place during the typhoon season, the chances of the Mongol forces being struck by a storm increased day by day as long as they remained in their ships.

Discovery of a complete vessel in the near future may or may not confirm this interpretation of the Mongol invasion event. The research presented here is based on actual remains of participating vessels and their associated artifacts, but is still far from complete. Historians and archaeologists must actively debate these analyses in order to clarify what really took place, and it is hoped such discussion persists for the foreseeable future.

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