



Full length article

Mongol fleet on the way to Java: First archaeological remains from the Karimata Strait in Indonesia

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ABSTRACT

At Serutu Island, a recently discovered stone inscription refers to an unusual voyage of the Mongol troop dispatched by Kublai Khan to conquer Java. This article reports the content of this intriguing inscription, as a way to reconstruct the 4000-km-long journey of the Mongol fleet composed of 500 ships, led by the General SHI Bi and the Uyghur navigator IKE Mese, from Quanzhou to Java in CE 1293. We contextualize this event in relation with the Mongol Empire in China, the Singhasari Kingdom in Java, and the cultural history of the indigenous islanders in the Karimata Archipelago.

1. Introduction

The Mongols ruled China from CE 1271 through 1368, during the period known as the Great Yuan or the Yuan Dynasty in Chinese history. The first emperor of the Great Yuan was Kublai Khan, grandson of Genghis Khan who had founded the Mongol Empire, and in CE 1293 he sent a naval expedition to invade the Singhasari Kingdom in Java. The conquest of Java was one of the most extraordinary journeys for the Mongols, as they 'had fought everywhere from the steppes... to the snowy forests..., from the mountains... to the deserts.... but it was in the jungles of Southeast Asia where the Mongols were faced with conditions and factors that were the most unfamiliar to them' (Turnbull, 1980).

As early as CE 1274, Kublai Khan, with a strong desire for expanding his political power into East Asia and Southeast Asia, dispatched thousands of ships and warriors to invade Japan, Dai Viet (northern Vietnam), Champa (a group of ancient kingdoms in today's central-southern Vietnam), and the Singhasari Kingdom in Java. Archaeological remains of Mongol ship anchors, timbers, and weapons have been found off the coast of Takashima Island in Japan, and large wooden stakes probably for defense function have been reported from northern Vietnam (Kimura, 2006; Kimura et al., 2014). These discoveries have attracted great scholarly interest into investigating the expansion of the Mongol Empire (Lien, 2017).

Among these ocean-crossing campaigns during Kublai Khan's time,

Java was the most distant location from China that required an exceptional long-range voyage (Fig. 1). As recorded in the *History of Yuan* (*Yuan Shi*), one of the major causes of the Mongol expedition to Java was to avenge the insult from the Singhasari King to the Mongol envoy MENG Qi, which occurred when MENG Qi traveled to Java for a diplomatic mission in CE 1289 (Shao, 2003; Deng, 2015).

From the perspective of Java, the MENG Qi event was probably only a convenient excuse. The ancient Javanese records clearly documented the Mongol empire's strategies for attempting a long-distance control of the Singhasari Kingdom (Phalgunadi, 1996), especially when the maritime power of Singhasari rapidly grew and then became a threatening force to the Mongol empire. The preparation for the voyage and the results of the Java campaign were recorded briefly in the *History of Yuan* (*Yuan Shi*), *Yuan Literature* (*Yuan Wen Lei*) and other ancient documents. Until now, however, some key issues about the historical event were debatable and unresolved, due to the scarcity of details about the fleet size, personnel, travel routes, and individual activities of this journey.

Recently, a large sandstone boulder, with lengthy inscriptions related to the Mongol invasion of Java, was discovered on Serutu Island in the Karimata Strait. This discovery marked the first direct archaeological evidence from the Indonesian Archipelago to confirm the historical event of the Mongol invasion. This new finding provides an opportunity to clarify the date when the invasion occurred, the scale of the Mongol fleet, and the navigation abilities that were involved more

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than 700 years ago. This new research can advance the basic knowledge of the maritime routes between ancient China and Southeast Asia, and furthermore it opens a window into the naval battlefield archaeology of Island Southeast Asia.

2. Geography, history and archaeological discoveries in Karimata

The Karimata Strait is located in the waters between Sumatra and Borneo (Kalimantan). More than 100 islands of the Karimata Strait are divided into three Districts, namely Sukadana (nine islands), Pulau Maya (nine islands), and Karimata (83 islands) (Central Bureau of Statistics, North Kayong Regency, 2019). Within the Karimata District, the namesake island of Karimata is the largest.

Relevant to the present research, the island of Karimata is situated about 100 km west of the city of Ketapang in West Kalimantan (Suryani, 2016), and the island of Serutu is situated about 5 km southwest of Karimata. These two larger islands both are in the Karimata Island District, along with eight small and uninhabited islands in their nearby vicinity.

The Chinese traveler WANG Dayuan described Karimata Island during the 1330s, just a few decades after the historical event of the Mongol fleet in CE 1293. The relevant portion is provided here from *A Brief Account of Island Barbarians* (Dao Yi Zhi Lii), originally translated by Rockhill (1915: 262–263) and modified by the authors according to the Chinese text:

‘The island has rows of green mountains.... The arable soil is poor; no grain is got from it. The climate is hot.... Men and women shave their heads.... They gather bananas for food, and they boil sea-water to make salt, which they carry to other places to exchange for rice; one catty of salt is exchanged for one *dou* [about 10 litres] of rice. Formerly the native products include an outlandish variety of sheep, the largest of which could be ridden, making from fifty to sixty *li*

[about 25–30 kilometers] a day. There is also brown tortoise-shell. The goods used in trading are brimstone, coral, Javan cloth, blue glass beads, [badula] cloth, and such like things.’

According to Wang's record, Karimata was one of the major trading centers for the textiles that were made in Java during the 1330s. The Javan cloth was traded from there to other Southeast Asian countries, China, and perhaps farther. The advantageous location of Karimata continued to support trade networks for several centuries. Around CE 1600, this area gained prominence in exporting *parangs* (general-utility knives) and other iron tools. For example, the communities of Java and Makassar imported their axes and parangs from Karimata, while the Malays of the Peninsula were said to carry *krisses* (asymmetrically patterned daggers) made from Karimata steel (Reid, 2011: 23).

Archaeological evidence of ancient and historical trade in the Karimata Strait has been confirmed through diverse findings on land and in shipwrecks (Tjoa-Bonatz, 2016, 2018). In 2009 and 2010, a research team from the Regional Agency for Archaeological Research in South Kalimantan (former institution name: Center for Archaeology, Banjarmasin) discovered archaeological remains in the islands of Datu, Maya, Meledang, Karimata, and Serutu. The archaeological remains were from different time periods and cultural origins, including indigenous pre-historic, Chinese, Buddhist, Arabian, European, and other contexts (Hindarto et al., 2017; Regional Office for Cultural Properties Preservation in East Kalimantan Province, 2019).

3. The Mongol and other remains discovered from Serutu

3.1. The Pasir Kapal Inscription

The focal point of this study is a rare inscription, made of Chinese characters, carved into sandstone. The new discovery was at Pasir Kapal, located at the southwest coast of Serutu Island (Fig. 2). In 2010, people from the local community informed the research team from the Regional



Fig. 1. The Mongol Empire and the Singhasari Kingdom during the early 1290s, about the time frame discussed in this study.

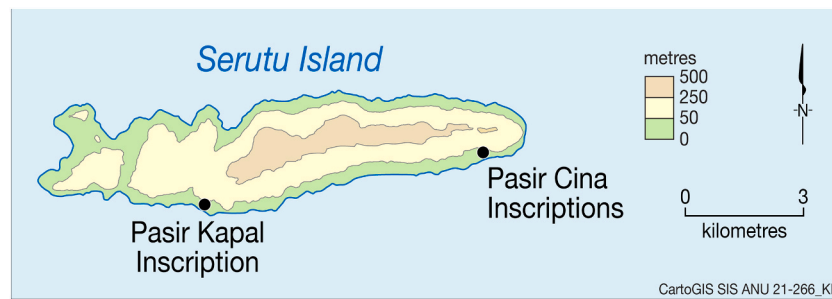


Fig. 2. Locations of the Pasir Kapal Inscription and the Pasir Cina Inscriptions on Serutu Island.

Agency for Archaeological Research in South Kalimantan about ‘the Pasir Kapal Inscription’. The piece of sandstone originally was located at the top of a slope, but then it fell about 5–10 m to its current position (Hindarto et al., 2017: 26). This fall was due to illegal excavation activities undertaken by people in search of treasure around the inscription stone (Fig. 3). Currently, the location of the Pasir Kapal Inscription is about 20 m north of the modern coastline (Fig. 4).

The inscription was written in seven vertical columns of Chinese characters (Fig. 5 and Fig. 6). At present, a translation needs to contend with the fact that much of the writing has been weathered to the point that it cannot be read. The chiselled characters were traditional Chinese, as was used during the time of the Yuan Dynasty, rather than the simplified characters used in China today.

The first six Chinese characters appeared in the first recognisable vertical row, identified as ‘da yuan guo shi ping zhang(?)’. The part of ‘da yuan guo’ means ‘Great Yuan Nation’, referring to the official name

of the Yuan Dynasty in China, lasting from CE 1271 through 1368. After the division of the Mongol Empire, the ‘Great Yuan Nation’ was established by Kublai Khan, leader of the Mongol Borjigin clan and the 5th Khagan of the Mongol Empire, and this new entity became the ruling Yuan Dynasty in China.

After ‘da yuan guo’, the inscription shows ‘shi’ and then a barely legible character of ‘ping’, followed by a character that probably represents ‘zhang’. In the context of the inscription, the character of ‘shi’ here most likely indicates the family name of General SHI Bi. SHI Bi was the Leading General of the Mongol troops (see below), and his official title was Ping Zhang (the chief manager of governmental affairs) during this period.

The central part of this inscription is difficult to read, but most of the characters in the final four vertical columns can be recognized (Fig. 6). Only a few of these characters have been unidentifiable. This part of the inscription can be read as:

‘zhou wu bai zhi yuan san shi nian zheng yue
shi ba ri bo ci jing xun zheng shou zhao
wa [wang?] [li?] shi er zhi yi [sheng?] tong zhu
zhi xiong feng’.

These words can be translated into English as:

‘Five hundred boats, Zhiyuan year 30, 1st month, 18th day, park here, 10 days have passed, going to conquer the king of Java, writing on this standing rock, to commemorate [surpass?] the glory of Copper columns’.

The glory of ‘Copper columns’ is related to a historical event in Vietnam during the time of the Chinese Han Dynasty. We will discuss the details below. Other portions of the Pasir Kapal Inscription will need further investigation to clarify or confirm.

3.2. The Pasir Cina-1 and the Pasir Cina-2 Inscriptions

At a place known locally as ‘Pasir Cina’, two blocks of sandstone have shown inscriptions, made with traditional Chinese characters, now labelled as Pasir Cina-1 and Pasir Cina-2 (Hindarto et al., 2017) (Fig. 7). The two blocks are situated behind the settlement of Betok Jaya Village in the Kampak Hamlet at the southeast of Serutu Island (see Fig. 2). They are located on the bank of a small river, about 76 m from the southern coastline, and about 3.5 km east of the Pasir Kapal Inscription.

Pasir Cina-1 is a lump of sandstone, measured 2.6 by 1.7 m. On the front of the stone, two Chinese characters read from right to left as ‘lin qing’ (Fig. 8.1). To the southeast of the Chinese writing, a carved square figure measures 25 by 25 cm, enclosing four centrally intersecting lines in the design of a radial pattern inside the square (Fig. 9).

Pasir Cina-2, located about 1 m below the Pasir Cina-1, bears an inscription of two Chinese characters in sandstone. The boulder measures 2.7 by 1.2 m, and it stands 1 m high. The carved Chinese characters from right to left are ‘shi quan’ (Fig. 8.2).

The part of ‘lin qing’ can be interpreted as ‘near a limpid river’, and the part of ‘shi quan’ is related to water springing outward from stones,



1



2

Fig. 3. Images of the Pasir Kapal Inscription (no. 2, and the lower sandstone boulder in no. 1) from different distances (Image source: Regional Office for Cultural Properties Preservation in East Kalimantan Province 2019).



Fig. 4. Aerial view of the Pasir Kapal Inscription (Image source: [Regional Office for Cultural Properties Preservation in East Kalimantan Province 2019](#)).

mountains, or a small waterfall. The setting next to the riverbank and close to the coast could suggest a convenient place for sailors to collect fresh water, for example from a river, spring, pool, or waterfall as appears to be mentioned in the inscription. Unlike the Pasir Kapal Inscription, the inscriptions at Pasir Cina-1 and -2 show no clear date reference, but the traditional Chinese characters and contextual cannot exclude the possibility that they were related with the events of the Mongol Fleet.

Conceivably, the Pasir Cina-1 and -2 inscriptions and the Pasir Kapal Inscription collectively were the same pieces recorded in the *Dong Xi Yang Kao* (On the [countries] in the Eastern and Western Oceans), written by ZHANG Xie (CE 1574–1640). Specifically in Vol. 9 (Fleets and navigation), the text offers: ‘There are ponds on the hills of Karimata, and the water storage is inexhaustible. There are ancient inscriptions on the stone walls of the ponds’.

4. The implications of the Pasir Kapal Inscription

4.1. The year of the invasion

The regal years of Kublai Khan were known as *Zhiyuan*, from CE 1264 through 1294. The Pasir Kapal Inscription was written on Zhiyuan year 30, 1st month, 18th day, calculated as the year CE 1293 (February 25, 1293; see [Table 1](#)). This reference is consistent with other preceding events in the *History of Yuan*, specifically in the 2nd month of Zhiyuan

year 29 (CE 1292), when three people listed as SHI Bi, GAO Xing, and IKE Mese (some translated into Iqmiš, or Yi Hei Mi Shi) were assigned by Kublai Khan as the managers of governmental affairs at the Fujian Executive Secretariat to conquer Java. Reportedly, the emperor originally planned to dispatch 20,000 warriors for this mission (Shizu 14, Imperial Biographies 17, *History of Yuan*) (see below). In the last month of Zhiyuan year 29, the Mongol fleet departed from Quanzhou for Java (Shi Bi, Biographies 49, *History of Yuan*).

4.2. The numbers of ships and warriors

The *Yuan Literature* (Vol. 41) noted 20,000 warriors, 1000 ships, and one year's food supply given by the emperor, for the invasion of Java. However, regarding the numbers of ships sent to Java, several differing documents and interpretations have been considered by scholars. For example, the total number of 1000 ships (Vol. 41, *Yuan Literature*; Java, Biographies 97, Foreign Barbarians 3, *History of Yuan*) and alternatively 500 ships (Shizu 14, Imperial Biographies 17, *History of Yuan*) were noted in different Yuan Dynasty records.

Moreover, some historians have interpreted other notes, suggesting that although originally 20,000 warriors were planned to be sent (Shizu 14, Imperial Biographies 17, *History of Yuan*; Java, Biographies 97, Foreign Barbarians 3, *History of Yuan*; Vol. 41, *Yuan Literature*), later in fact only 5000 soldiers participated in the campaign (Shizu 14, Imperial Biographies 17, *History of Yuan*; Shi Bi, Biographies 49, *History of Yuan*).



Fig. 5. A close view of the Pasir Kapal Inscription (Image source: [Regional Agency for Archaeological Research in South Kalimantan Province, 2010](#)).



Fig. 6. The Pasir Kapal Inscription with white powder infilled (for facilitating legibility; read from right to left) and the preliminary reading of this study (inset at the lower right-hand side, characters inside red squares are uncertain) (Image source: [Regional Office for Cultural Properties Preservation in East Kalimantan Province 2019](#)).

In yet another interpretation, if the numbers of soldiers were reduced from 20,000 to 5000, then the eventual size of the fleet sent to Java should be less than 200 (Wu, 2017). One more note of *Yuan Literature* (Vol. 65) recorded that 7000 soldiers had participated in this journey.

The Pasir Kapal Inscription of this study noted that the ships numbered 500, consistent with the record in the *History of Yuan* (Shizu 14, Imperial Biographies 17). Regarding the total number of warriors aboard those ships, another part of *Yuan Literature* offers a clue. According to *Yuan Literature* (Vol. 41), on Zhiyuan year 30, 2nd month, 7th day (March 16, 1293) (Table 1), more than 500 pioneer warriors were aboard 10 ships led by IKE Mese, thus indicating 50 people per ship in this advance group. If this passenger capacity of 50 is extrapolated for the full fleet of 500 ships, then the fleet could have brought as many as 25,000 warriors from China. In the other words, this passenger capacity of 20,000 warriors noted in the *Yuan Literature* was not impossible.

Most of the soldiers originally were from three southern Chinese provinces of Fujian, Jiangxi, and Huguang (a province of China that existed during the Yuan Dynasty, including the modern areas of southern Hubei of the Yangtze Valley, Hunan, Guizhou, and Guangxi) (Vol. 41, *Yuan Literature*). As recorded, the ships rolled heavily in the strong winds and rough seas, and the soldiers could not eat for several days (Shi Bi, Biographies 49, *History of Yuan*). The long ocean voyage must have been extremely difficult for these warriors, especially considering that many of them came from landlocked provinces of China.

4.3. The navigation route and travel time

The navigation route from China to Java was mentioned briefly in the *Account of SHI Bi* (Shi Bi, Biographies 49, *History of Yuan*), and others. Several historians (Groeneveldt, 1876; Rockhill, 1915; Wen, 1929) attempted to verify the place-names recorded in the Chinese ancient archives. A recent work by Deng (2015) clarifies a summary of these ancient place-names along the Mongol navigation route (Table 2).

The records in *Yuan Literature* (Vol. 41) suggest that the fleet departed from Quanzhou of Fujian on Zhiyuan year 29, 12th month, 14th day (January 22, 1293) (Table 1), and then traveled through the Sea of Seven Islands (Qizhouyang in northeastern Hainan), the Paracel



Fig. 7. The Pasir Cina-1 Inscription (under the two men at the left), and the Pasir Cina-2 Inscription (beside the two men at the right) in southeast Serutu (Image source: [Regional Office for Cultural Properties Preservation in East Kalimantan Province 2019](#)).

Islands (also known as Xisha Islands), waters around Giao Chi (Jiaozhi) in northern Vietnam and Champa in central-southern Vietnam, as well as around the islands of Grande Catwick, Hon Hai (Poulo Sapate; Pulau Sapate; Sapatu), Little Catwick, and Con Son in the South China Sea. Within the first month of Zhiyuan year 30 (CE 1293), the fleet passed the islands of Natuna, Tambelan, and Karimata, and at last the fleet reached Pulau Gelam Island on Zhiyuan year 30, first month, 18th day (February 25, 1293) (Shi Bi, Biographies 49, *History of Yuan*; *Great Statutes of Statecraft, Jing Shi Da Dian*) (Tables 1 and 2, Fig. 10).

A few ancient records have noted that the Mongol fleet arrived at the island of Gao Lan (or Kol-lan) in the first month of Zhiyuan year 30 (CE 1293), then deliberated there about the plan for the campaign. Previously, some writers presumed that Gao Lan was the island of Billiton (Belitung) (Groeneveldt, 1876:22). However, other scholars have suggested that the Gao Lan Island as mentioned in the ancient Chinese text indicates Pulau Gelam rather than Billiton (Rockhill, 1915; Wen, 1929; Deng, 2015). Pulau Gelam Island is about 208 km southeast of Karimata and Serutu, located between Serutu and East Java, the target area of the Mongol invasion. Now the Pasir Kapal Inscription can confirm that the fleet reached the Karimata Islands first, and then later the fleet headed southward to Pulau Gelam before attacking Northeast Java, where the Singhasari Kingdom was located.

Before reaching the Indonesia waters, the Mongol fleet had passed by Champa in the 12th month of Zhiyuan year 29 (CE 1293) (Shi Bi, Biographies 49, *History of Yuan*), but still unclear is for how many days the fleet stayed in Champa for other assignments and activities. Presumably, the troops were in Champa for at least 3 nights (Ike Mese, Biographies 18, *History of Yuan*). Champa is about halfway between Quanzhou and Serutu. The travel time from Champa to Pulau Gelam (about 2188 km) usually required 10 days and 10 nights, sailing with the wind (*The Overall Survey of the Star Raft, Xing Cha Sheng Lan*).

According to the Pasir Kapal Inscription, the Mongol warriors already had stayed at Serutu for 10 days before the inscription was created on the date of Zhiyuan year 30, 1st month, 18th day (February

25, 1293). The fleet probably arrived at Serutu on the date of Zhiyuan year 30, 1st month, 8th day (February 15, 1293), thus the total sailing time from Quanzhou to Serutu was about 25 days and included a few days in Champa.

Sailors during the Yuan period already knew sea-crossing routes from China to Indonesia (Ptak, 1998: 270–271). Groeneveldt (1877:32) noted that ‘the Mongol fleet sailed from Quanzhou in Fujian, did not follow the accustomed course along the coasts of Malacca and Sumatra, but kept further off, boldly taking the shortest road to its destination’. This particular navigation course may have followed one of the regular commercial shipping lanes prior to the Yuan Dynasty, connecting from Quanzhou to Java, via Champa, islands in southern Vietnam waters, and then the western island chains of Borneo.

One piece of evidence which supports this presumption is that Chinese ceramics of the Song Dynasty (about CE 960–1279) already had appeared in the Karimata Islands (Hindarto et al., 2017). Furthermore, the nearby Belitung shipwreck, also called the Tang shipwreck or Batu Hitam shipwreck, carrying many Chinese ceramics and other products of the Tang dynasty had sunk off the coast of Belitung Island in the 9th Century AD (Flecker, 2000; Qi, 2017), suggesting the Karimata waters were among the busy traffic routes for international transportations at least since more than 1000 years ago.

4.4. The Uyghur navigator and navigation skills

The military mission, comprised of 500 ships and 4000 km seafaring from Quanzhou to Java, was led by IKE Mese, the first Uyghur navigator in Chinese historical records. Only an experienced navigator and diplomat like IKE Mese could lead the Mongol fleet along such a route to Java. IKE Mese started his official career in Zhiyuan year 2 (CE 1265), and he completed at least four diplomatic missions overseas before the Javan campaign. These missions were launched from China to Southeast India and Sri Lanka in CE 1272, 1275, 1284, and 1287 during Kublai Khan's time (Ike Mese Biographies 18, *History of Yuan*; Chen, 2017).

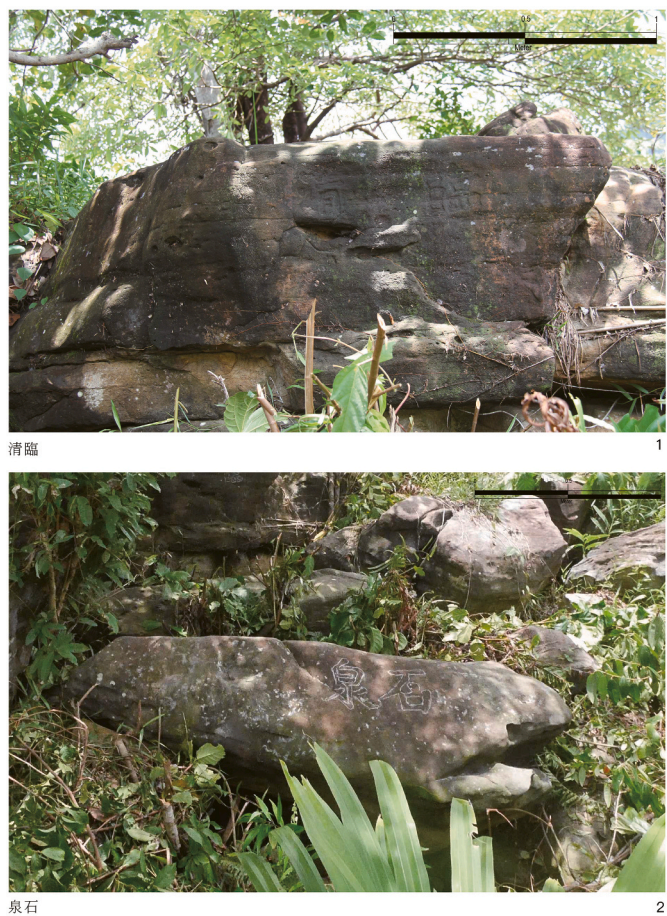


Fig. 8. (1) The Pasir Cina-1 Inscription: lin qing; (2) The Pasir Cina-2 Inscription: shi quan, both read from right to left (Image source: [Regional Office for Cultural Properties Preservation in East Kalimantan Province 2019](#)).

The selection of the traveling season was another key that made this voyage so swift. The early navigators from Mainland China often utilized the monsoon season to power their seafaring voyages. They usually departed from southern Chinese ports in the 11th or 12th month (around

December to January of Western Calendar) and followed the strong north wind heading to Southeast Asia, and then they returned to China from Southeast Asia in the 5th or 6th month (around June to July), powered by the south wind (*Matters Worth Discussing from Pingzhou, Ping Zhou Ke Tan*).

According to the records of ZHU Yu in CE 1119–1125, ‘The experienced sailors know how to pinpoint the ship’s position; they watch the

Table 1
The related dates and distances mentioned in the text, conversion of Lunar Calendar to Western Calendar (calculated by Digital Cultures, <https://sinocal.sinica.edu.tw/>).

Events and Locations	Dates in Lunar Calendar	Western Calendar
Kublai Khan ordered a mission to conquer Java	Zhiyuan year 29, 2nd month, 8th day	February 27, 1292
Quanzhou, Fujian (depart)	Zhiyuan year 29, 12th month, 14th day	January 22, 1293
Quanzhou to Champa: 1460 km Champa, Central Vietnam (stop)	Zhiyuan year 29, 12th month	January? –February? 1293
Champa to Serutu: 1980 km Serutu Island (arrive?) ^a	Zhiyuan year 30, 1st month, 8th day	February 15, 1293
Serutu Island (create the Pasir Kapal Inscription) ^a	Zhiyuan year 30, 1st month, 18th day	February 25, 1293
Serutu Island (depart?) ^a	Zhiyuan year 30, 1st month, 18th day	February 25, 1293
Serutu to Pulau Gelam: 208 km Pulau Gelam Island (arrive)	Zhiyuan year 30, 1st month, 18th day	February 25, 1293
Pulau Gelam to Karimun Jawa: 328 km Karimun Jawa Island (500+ pioneer warriors arrive)	Zhiyuan year 30, 2nd month, 7th day	March 16, 1293
Karimun Jawa to Tuban: 215 km Tuban, Northern Java (all warriors arrive)	Zhiyuan year 30, 2nd month, 13th day	March 22, 1293
Java (conquest fail, depart)	Zhiyuan year 30, 4th month, 24th day	May 31, 1293
Java to Quanzhou: about 4100 km Quanzhou, Fujian (arrive)	68 days and nights of travel from Java	early August 1293

^a Specifically, from this study; km: kilometers.



Fig. 9. The square of intersecting lines, associated with the Pasir Cina-1 Inscription (Image source: [Regional Agency for Archaeological Research in South Kalimantan Province, 2010](#)).

Table 2

The place-names of the Mongol navigation route recorded in the *Account of SHI Bi* (Shi Bi, Biographies 49, *History of Yuan*), listed with their mostly likely corresponding modern names and locations (after Deng, 2015).

Chinese names	Pinyin	Modern names and likely locations
泉州	Quanzhou	Quanzhou (Fujian, China)
七洲洋	Qizhouyang	The Sea of Seven Islands, east of Wenchang and its surrounding waters, north-eastern Hainan
萬里石塘	Wanlishitang	Paracel Islands (Xisha Islands)
交趾	Jiaozhi	Giao Chi (in northern Vietnam)
占城	Zhancheng	Champa (in central-southern Vietnam)
東西董山	Dong Xi Dongshan	Hon Hai and Grande Catwick Islands (Vietnam)
東董山	Dong Dongshan	Hon Hai (Poulo Sapate; Pulau Sapate; Sapatu) Island (Vietnam)
西董山	Xi Dongshan	Grande Catwick (Great Catwick; Hon Da Ty) Island (Vietnam)
牛崎嶼	Niuqiyu	Little Catwick (Petite Catwick; Pyramid; The Pyramid) Island (Vietnam)
混沌大洋	Hundun	Surrounding waters of the Con Son Island, south of Vung Tau (Vietnam)
橄欖嶼	Ganlanyu	Natuna Islands (Indonesia) Tambelan Island (Indonesia) (Gerini, 1909; Wen, 1929)
假里馬答	Jialimada	Karimata (Indonesia)
勾欄	Goulan	Pulau Gelam (Indonesia)
吉利門	Jilimen	Krimun Jawa Island (Indonesia)
杜井足	Dubingzu	Tuban (Java, Indonesia)

stars at night and the sun in the day, and when it is cloudy, they use the compass' (*Matters Worth Discussing from Pingzhou*). The magnetic needle compass, the Star-guided Ocean Crossing Technique ('Fettering the stars'), and the navigation charts had been used for ocean navigation since the time of the Song Dynasty (CE 960–1279).

Furthermore regarding navigation at sea, a discovery from the Pasir Cina-1 Inscription potentially could provide some insights. As mentioned above, a square-shaped engraving was carved into a rock with four centrally intersecting lines, thus creating eight evenly divided parts inside the square. The outer perimeter of the square figure is aligned at about 45 degrees (Northeast) (Fig. 9). The engraved figure may have related to ancient knowledge of how to ascertain a direction of travel, although further research will be necessary to clarify this issue.

4.5. The ending note of Pasir Kapal Inscription

As mentioned, the Pasir Kapal Inscription ended with the words '... writing on this standing rock, to commemorate [surpass?] the glory of Copper columns'. According to Chinese historical records, the 'Copper columns' stood at the southern frontier of Tuong Lam (Xianglin in Chinese; the central Vietnam provinces of Quang Nam, Quang Ngai, and Binh Dinh today), marking the southern boundary of the Chinese Han Empire. The pair of copper columns was erected by General MA Yuan of Han Dynasty in CE 43, after his suppression of the Trung sisters' rebellion (*Records of Guangzhou, Guang Zhou Ji*). In CE 1272, Kublai Khan sent his emissary to Vietnam in search of the columns, but the mission was unsuccessful. Currently, the precise location of the columns is unknown.

The writer of the Pasir Kapal Inscription in 1293 must have been familiar with the 'Copper columns' as a symbol of an important event in Chinese history. In this context, the reference in the Pasir Kapal Inscription alluded to the action of making a symbolic monument or commemoration of a meaningful historical event. Furthermore, the inscription seemingly was made with the expectation that the Mongol fleet would defeat the forces of the Singhasari Kingdom in Java, essentially replicating the example of MA Yuan's suppression of the Trung sisters' rebellion in Vietnam.

5. Before and after invasion

In the first month of Zhiyuan year 30 (CE 1293), the Mongol warriors stopped in Pulau Gelam to repair their vessels, and they made smaller boats for entering the shallower rivers (Shi Bi, Biographies 49, *History of Yuan*). The total duration of their stay on the island of Serutu and Pulau Gelam (and also probably Karimata, according to *History of Yuan*) was about one month.

The fleet reached Karimun Jawa Island on Zhiyuan year 30, 2nd month, 7th day (March 16, 1293). The troops landed at Tuban in northern Java on 2nd month, 13th day (March 22, 1293), and then the invasion began (Vol. 41, *Yuan Literature*). In Java, the Mongol troops dramatically were involved in a civil war, and by the end of the 4th month in the same year, more than 3000 Mongol warriors had died in the Javan campaign (Shi Bi, Biographies 49, *History of Yuan*). Eventually, the surviving troops left Java on 4th month, 24th day (May 31, 1293). After a voyage of 68 'days and nights', they arrived in Quanzhou (Shi Bi, Biographies 49, *History of Yuan*).

During this time, more than 100 Mongol warriors stayed behind at Pulau Gelam, neither fighting in the Javan war, nor going back to their homes in China. About 40 years later, in the AD 1330s, some of these Mongol troops were encountered by the traveler WANG Dayuan who visited at Pulau Gelam. This observation was recorded in *A Brief Account of Island Barbarians*, following the translation by Rockhill (1915: 261), with minor revisions by the authors according to the Chinese text written by Wang:

Gou Lan mountain [the Pulau Gelam Island]:

'The hills are high and forest growth luxuriant. The soil is poor and grain scarce. The climate is hot. They hunt with the bow. When the dynasty (of the Yuan) was first founded, the forces to attack She-p'o (Java) were driven by the wind to this island and the junks wrecked. One junk fortunately escaped with stores of nails and mortar. Seeing that there was a great deal of timber on this island, they built some tens of junks here, everything from ribs to sails and bamboo poles were supplied (from the island). Over a hundred men who were ill from the long beating about in the storm and were unable to leave (with the rest of the expedition) were left on this island, and to-day the Chinese live mixed up with the native families. Men and women do up their hair in a knot and wear a short shirt, winding around themselves Wu-lun cotton cloth (as a sarong). The natural products are bears, leopards, muntjac deer skins, and tortoise-shell. The goods used in trading are grain, rice, rice colored taffetas, blue cotton cloth, copper-ware, blue ware, etc.'

According to this record from the AD 1330s, the Mongol warriors and the indigenous people (likely including mostly Austronesians) lived together at Pulau Gelam in peace. This observation offers valuable insight for understanding the local response and subsequent story of the Mongol warriors and how they spent the rest of their lives at this island in the tropics.

6. Conclusion

The Pasir Kapal Inscription, discovered on the island of Serutu, provides direct evidence for reconstructing the scenario of the Mongol invasion to Java. The details can clarify several aspects that otherwise have been vague or debatable in the surviving Chinese historical records, specifically in terms of the scale of the fleet, the navigation routes, and the dates of events. The inscription supports a conclusion that the 500 ships departed from Quanzhou on January 22, CE 1293, and then traveled through the Sea of Seven Islands, the Paracel Islands, coastal central-southern Vietnam, and the islands of Catwick, Hon Hai, Con Son, Natuna, Tambelan, Serutu (and also probably Karimata), and Pulau Gelam. Thereafter, the fleet reached Karimun Jawa Island, landing at Tuban in northeastern Java to begin the battle on March 22, CE 1293



Fig. 10. The reconstructed travel route of the Mongol fleet from China to Java in CE 1293.

(Tables 1 and 2).

The distance from Quanzhou to Tuban is about 4100 km. The moving speed of the Mongol fleet can be estimated as fast as 130–200 km per 24-h period, based on knowing the total distance within the numbers of travel days, including stops. Before attacking Java, the fleet paused for about one month, staying on the islands such as Serutu and Pulau Gelam. The major purpose was likely for resting the personnel, repairing ships, making smaller boats, and planning the Javan campaign. However, the other operation details, such as the possible splitting of the crew and ships among the islands during the one-month pause, remain unknown. The return trip from Java to Quanzhou was slower in the reverse

direction, around 60 km per 24-h period (Table 1). If the real number of Mongol warriors who participated in the campaign was 5000 (Shizu 14, *Imperial Biographies* 17, *History of Yuan*; Shi Bi, *Biographies* 49, *History of Yuan*), then the number of survivors probably was less than 2000.

Currently, no evidence yet is available to evaluate the quality of the battleships that were used for this journey. A previous study of timber fragments collected from the seabed off Takashima suggested that the shoddy workmanship and poor design of the ships may have caused the Mongols' defeat during an attempted invasion of Japan in CE 1281 (Sasaki, 2005). Albeit with uncertain vessel quality, a fleet of at least 500 ships was required during the Javan invasion. Several ancient

documents have recorded the speedy ship building process during the Yuan Dynasty, mentioning thousands of ships every year. For example, 5000 and 3000 battleships were constructed in CE 1270 and 1272 respectively (Shizu 1–14, Imperial Biographies 4–17, *History of Yuan*).

From a different perspective, the Yuan Dynasty once had witnessed the peak of Chinese ship-building technology, before ZHENG He's time (CE 1371–1433 or 1435, Ming Dynasty). The Yuan technology had been inherited from the Song Dynasty and improved through the exchange of shipbuilding technology and ocean-navigation knowledge by way of interactions with other seafaring people such as from Southeast Asia, India and Arabia (Manguin, 1993). Numerous western travelers had noted the large ships made in China during this time. During the time of the early Yuan Dynasty, Marco Polo (1875: 231–232) recorded large ships which required at least 200 and sometimes at least 300 mariners each. They could carry 5000 to 6000 baskets of pepper. These ships included one floor or deck, and on the deck were 60 cabins and four to six sails. The Berber-Moroccan traveler Ibn Battuta, who arrived in Quanzhou during the latter part of the Yuan Dynasty (ca. CE 1345), mentioned that each Yuan ship held 600 sailors and 400 warriors, along with 12 sails and four decks. The ships included guest rooms, suites, and shops, and each suite contained guest rooms and bathrooms (Li, 2019).

These different lines of information together can help to depict the scene of the Mongol fleet appearing in the South China Sea and then arriving in the Java Sea about 700 years ago. In future studies, a search may be useful, especially in Serutu and Pulau Gelam, for finding possible remains related to the Mongol fleet (Kimura et al., 2014), such as timbers, masts, anchors, and weapons (e.g. helmets, iron arrows, swords), as well as possibly the remains of explosive ordnance made of ceramics (a possible early form of grenade). Other possible Yuan artifacts on the islands could relate with daily life and support of the warriors, for instance including celadon bowls, Yuan porcelains, storage jars, and similar items.

Although this research has presented a narrow focus of a stone inscription from Serutu Island, the findings involve a much larger scope of issues and implications, including the ambition of the Mongol emperor, the competencies of the Uyghur navigator, the suffering of Chinese warriors, the resolution of Indonesian islanders, and the wonder of early travelers. While more research certainly can clarify further, so far this piece of stone inscription represents one of the most extraordinary naval events in human history.

Declaration

The authors declare no competing interests.

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