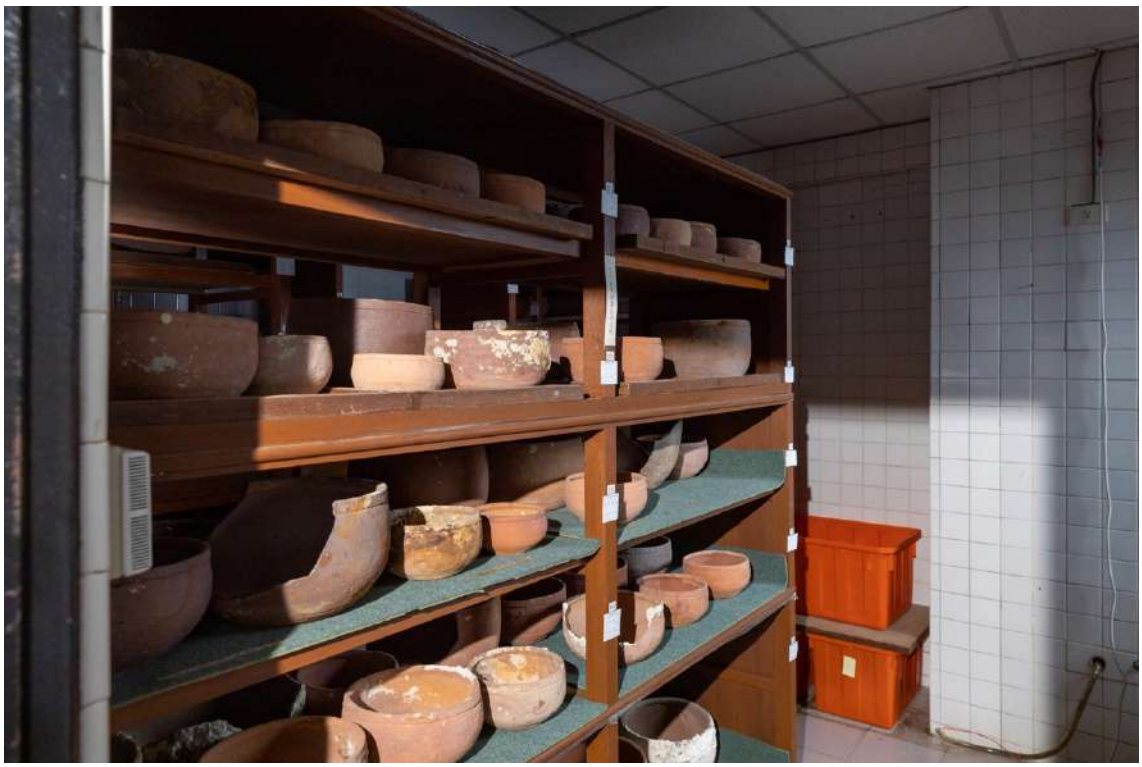
An Archaeological Assessment of the Jiangjyun No. 1 Shipwreck in the Penghu Islands, Taiwan

by

Han-Yin, Hsu



A Thesis Submitted in Partial Fulfilment of

Masters of Maritime Archaeology

Archaeology

College of Humanities, Arts, and Social Sciences, Flinders University

Adelaide

October 2023

Declaration of Candidate

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Han-Yin, Hsu
October 2023

Abstract

An Archaeological Assessment of the Jiangjyun No. 1 Shipwreck in the Penghu Islands, Taiwan

Han-Yin, Hsu

Supervisor: A. Prof. Wendy van Duivenvoorde

Chinese ceramics from the 17th and 18th centuries flourished in maritime trade. Historical research reveals that the route of Chinese ships to Southeast Asia via Taiwan played a very important role. The shipwrecks discovered in the Penghu waters prove that this area has frequent interactions with China. Few shipwrecks have been studied in this area, but after the Jiangjyun No. 1 shipwreck was found in 1995, archaeologists launched investigations and rescued more than 300 artefacts.

Various porcelains and ceramics were excavated from the Jiangjyun No. 1 shipwreck, and this research aims to identify the origin and uses of these artefacts, and the results help date the ship and explain maritime trade routes. The components of this thesis included research on artefact type and production methods, a comparative study of similar collections and artefacts from shipwrecks as well as archaeological sites in Taiwan and Southeast Asia of the same age.

Thirteen artefacts of the Jiangiyun No. 1 shipwreck were selected including blue-and-white porcelain and pottery alms-bowl. These products were made by the workshops Anxi Kiln, Dongxi Kiln, Zhangzhou Kiln, and Jinjiang Kiln in the Fujian and Minnan regions.

Acknowledgements

I would like to thank many people for their support and guidance.

First of all, to my supervisor, Wendy Van Duivenvoorde, for every online meeting with the time difference during covid 19, and your two years of teaching, advice, and support at Flinders. you led me to see a broader world of underwater archeology.

Thanks to the Bureau of Cultural Heritage, which implemented 'The Jiangjyun No. 1 shipwreck artefact inventory project', and spared no effort to strive for research on Taiwan's underwater archeology.

To the Center for Ocean and Underwater Technology Research of Tamkang University, professor Jin-Yuan Liu, thank you for giving me an opportunity and letting me know about Taiwan's ocean.

To my teacher, Kee-In Sung, thank you for teaching me about ceramics. It is a great pleasure to work with you.

To Tzu-Chia Huang, thank you for your patience in guiding me on all the details of the project and how to proceed. I would not have been able to complete this research without you.

To Pin-Wen Chen, thank you for every academic support and coffee chat. You are always the motivation for me to continue working hard, and excite me to be a better archaeologist.

Thanks to all the lecturers of the Maritime Archeology Program at Flinders University, who always patiently guide my academic research.

To the land and sea of Penghu, and to its residents, whose enthusiasm was my motivation during my fieldwork.

To my family, thank you for always supporting my decisions more than anyone else. I will always know that you are my security blanket.

To Jui Chieh Chang, thank you for helping me make the map. thanks for being my support when I was writing my thesis, and for being my listener when I was anxious.

To Philippe Kermeen and Ng Jian Cheng, even though I studied remotely most of the time during the covid 19, you two helped me a lot when I came to Adelaide and introduced me to this lovely community.

To all of my friends from Flinders, thank you for always motivating me, travelling to many places together, and bringing me happy study time.

Table of Contents

List of Figures

List of Tables

Chapter 1. Introduction

1.1 Introduction

The Penghu Islands are a prefecture at sea directly west of Taiwan's main island (Figure 1.1). Residents have always been involved in maritime activities and are intrinsically connected with the ocean—this connection has historically influenced the development of and life on the Penghu Islands. The islands have a distinctive climate, with strong northeast monsoons, dangerous sea conditions and they are surrounded by submerged reefs. People who are unfamiliar with the waters are often unaware of the islands' navigational hazards and easily encounter dangerous sailing conditions, causing numerous shipwrecks in the Penghu waters.

In 2001, the United National Educational, Scientific and Cultural Organization (UNESCO) adopted the *Convention on the Protection of the Underwater Cultural Heritage* (hereafter, the 2001 Convention). Taiwan is not a signatory to the convention, but its government does abide by and works within the framework of the 2001 Convention. In 1995, the Ministry of Education delegated the National Museum of History to undertake an undersea archaeological survey of the Penghu Islands Area (Zang 2016:40). The investigation team led by Jia-jin Huang (黃加進) commenced the work in the same year. The team observed shipwreck material which included fragments of a ship's bulwarks and numerous artefacts on the seafloor. In addition, they found a wooden cargo ship dating to the middle Qing Dynasty (A.D.[1] 1644–1911) near Jiangiyun Islet (將軍嶼) (Figure 1.2), and named it the 'Jiangjyun No. 1' shipwreck. It was the first shipwreck to be officially located and surveyed in Taiwan and Penghu Sea areas.

Since 1995 (Chen 2001:35), Archaeologists commenced archaeological excavations on the Jiangjyun No. 1 shipwreck, and they raised nearly 300 artefacts, including blue-and-white porcelain bowls with dragon and phoenix patterns, white-glaze spoons, plates, many ceramic bowls and tile fragments, olive kernels. Thus, this survey can be regarded as the first undersea research carried out in Taiwan, and the survey's findings, archives and artefacts are indeed vital national assets.

[1] Unless stated otherwise, all dates hereafter are AD.

Figure removed due to copyright restriction

Figure 1.1 Map of Taiwan showing the location of the Penghu Islands. (Source: National Museum of History Committee)

Figure removed due to copyright restriction

Figure 1.2 The Jiangjyun No. 1 shipwreck site at Da-wen. (Source: National Museum of History Committee)

1.2 Background

The Penghu Sea area has long been a transit point between Mainland China, Southeast Asia and Indonesia. The Taiwan Strait of the Penghu Islands (Chen 2001:35), however, is dangerous and many ships have sunk in the wintertime. Because of the unique climate with intense northeast monsoons, perilous sea conditions and full of submerged reefs, people who are unfamiliar with shipping routes often encounter danger. The Jiangjyun No.1 shipwreck is located near the Da-Wen Reef (大塭礁)in the southeast of Jiang-Jun Yu, with a water depth of 15 to 30 meters. The Jiangjyun No.1 shipwreck hull is buried in a sand bed and generally preserved for preservation. Comparing the structure with the wooden boats of the Song Dynasty in Quanzhou, it is representative of the shipbuilding methods and maritime cultures from the southern China and Taiwan region.

Jia-jin Huang, a fisherman and pioneer diver, found some remains of the Jiangjyun No.1 shipwreck in 1987. The year before, seafloor sediment around Penghu islands was disrupted by the Wei-en Typhoon, the first record that made landfall from Penghu Islands to Taiwan's main island. Later, when Huang was fishing the lobsters, he found some pieces of porcelain in his nets. As a result, more and more scattered artefacts and shipwreck sites were discovered, and he cooperated with the government to investigate a few years later.

Figure removed due to copyright restriction

Figure 1.3 Cleaning the Jiangjyun No. 1 shipwreck artefacts. (Source: National Museum of History)

The first excavation in 1995 discovered hundreds of cultural artefacts (Figure 1.3); most of them are pottery, jars, blue-and-white porcelain, but also fruit pits, wood, and tiles. The most important artefact is the "Qianlong Copper Coin" (乾隆通寶); it confirms that the age of the Jiangjyun No. 1 shipwreck is Qinglong Dynasty in the mid-generation, a wooden shipwreck carrying cargo of building materials and pottery. There is also a symbolic porcelain plate in underglaze blue-and-white. The shallow plate has no lines and decorations on the outside, with four fishes decorated with blue-and-white on the inside, and the centre has a trace of firing. It is one of the eight pieces of porcelain salvaged and is a complete artefact. Cultural artefacts can also represent cultural

characteristics, such as the thickness of pots and pans of islanders' ceramics (Hsieh 2009:13), multi-purpose utensils that can be boiled and salted, and bricks and building materials of different sizes from ordinary Taiwanese (Zang 2016:121). Both are the characteristics of the coastal culture of the Southeast China Sea.

1.3 Research Question and Aims

The Jiangjyun No. 1 shipwreck represents Taiwan's first located underwater cultural heritage site. The shipwreck has become an important working example for the country's efforts to protect, manage and study its underwater cultural heritage. It is currently one of the six heritage-listed places listed in Taiwan. According to UNESCO's 2001 Convention and Taiwan's Underwater Cultural Heritage Preservation, the state should provide complete data sets for the investigation, research, excavation, preservation, and restoration of the Jiangjyun No. 1 shipwreck. This research focuses on the Jiangjyun No. 1 shipwreck, and examines the artefacts raised from the site. This thesis research is carried out under the auspices of the Center for Ocean and Underwater Technology Research of Tamkang University, and it is commissioned by the Bureau of Cultural Heritage.

This thesis sets out to catalogue and examine the artefacts of the Jiangjyun No. 1 shipwreck in Penghu Islands, Taiwan, during excavations from 1995, sort them into specific categories, record their individual characteristics, and place them in their historical and cultural context in order to address the following question:

> What is the provenance and purpose of the porcelains and ceramics carried aboard from the Jiangjyun No. 1 shipwreck?

The objectives of this study are:

1. To provide an overview of the route and kiln of ceramics transported from China to Taiwan and Southeast Asia during the Qing Dynasties (1644 to 1911);
2. To analyse the morphological and stylistic attributes of the artefacts from the Jiangjyun No. 1 shipwreck and determine their typology; and
3. To compare the porcelains and ceramics from the corpus of contemporaneous shipwrecks.

Through these questions, this thesis will gradually introduce the relevant historical and archaeological context of the Jiangjyun No. 1 shipwreck and answer relevant questions related to the shipwreck's cultural artefacts.

1.4 Methodology

The National Museum of History published the cultural artefacts research report of the Jiangjyun No. 1 shipwreck in 2001. Site exploration, excavation records, detailed research methods and preliminary analysis of water cultural artefacts. Preliminary records were made of the appearance and quantity of cultural artefacts. However, no kiln site origin and trade route studies have been conducted for the cargo in the wreck.

The Jiangjyun No. 1 shipwreck's artefacts are scattered in the Cultural Affairs Bureau, Penghu County Government; Penghu Living Museum; and Bureau of Cultural Heritage (Sung 2022:161). This study also re-listed and renumbered the scattered cultural relics in the three places. The focus of this thesis is on the analysis and arrangement of cultural relics of the Jiangjyun No. 1 shipwreck. The literature review provides previous research about the shipwreck, building a comprehensive understanding; comparing the similarities and differences of other shipwrecks of a similar age artefacts recording and analysis for archaeological evidence; and get a better understanding of the kiln Industry and ceramic export routes during the Qing Dynasty.

1.5 Location

The ship's remains were discovered near Jiangiyun Islet (將軍嶼), one of Taiwan's Penghu Islands. The site is located on the sloping seabed extending northward from Da-Wen Reef (大塭礁), with a water depth of about 16-30 meters, at 34°21'24N, 199°32'34"E. It is about 1.5 nautical miles (2.778 km) away from Wangan fishing harbour (望安港) and Jiangjyun fishing harbour(將軍港) (Chen 2001:35).

After the archaeological excavation, most of the cultural artefacts are in the Cultural Affairs Bureau, Penghu County Government, and are protected by the Bureau of Cultural Heritage. The hull remains and the rest of the artefacts, remain in situ and submerged at all times for preservation purposes.

1.6 Project Significance

Taiwan is adjacent to Japan in the north and the Philippine Islands in the south. It is an important part of the Western Pacific Ocean. In the Neolithic Age, there were economic and cultural contacts with China. After the Song and Yuan Dynasties, the population of Fujian increased rapidly; as a result, trade at home and abroad flourished, and the relationship between Taiwan, China and Japan became increasingly close (Sung 2022:179). The important objects of entrepot trade were China, Japan, and Batavia, and then Batavia was exported to European and Asian countries. Chinese ceramics were unearthed from Fort Zeelandia (熱蘭遮城) in Tainan, Taiwan (Sung 2022:53). As well as seventeenth century ceramics from Europe, Germany, the Netherlands, Southeast Asia, Thailand, Northeast Asia and Japan. Such a combination of ceramics can be said to be a direct archaeological reflection of the Asian trade exchanges based in Taiwan at that time.

The Tek Sing shipwreck, a Chinese merchant ship, also had a porcelain bowl similar to the blue-and-white one with auspicious cloud and phoenix patterns from Jiangjyun No.1 shipwreck. Such works have been made in the Zhangzhou, Anxi and Dongxi kilns. This porcelain bowl also shows a year date from the end of the Ming Dynasty to the middle of the Qing Dynasty. In 2019, at a water depth of about 20 meters to the west of Penghu Island, the Penghu No. 1 shipwreck, in the middle and late Qing Dynasty was discovered (Sung 2022:54). Among the cargo, most of them are celadon, an Anping pot, blue-and-white ceramics, a sauce glaze pot and jar, and a red pottery bowl were found. The blue-and-white porcelain plates with Four-Fish Patterns and the red pottery bowl are similar characteristics to the Jiangjyun No.1 cargo. Evidence of the close relationship between the ceramic kiln industry in Fujian and Taiwan, the ceramics and pots needed for daily life, all rely on the supply of goods from China. Further research will provide greater certainty as to the origin and use of such artefacts, and point to more details. This research will provide strong support for the available reliable evidence of maritime activities of Chinese ceramics transported through Taiwan during the Qing Dynasty.

1.7 Limitations

The author was fortunate to be able to check the artefacts of the Jiangjyun No. 1 shipwreck personally. Although the artefacts are scattered all over the place, they greatly help records and research. Unfortunately, the author did not have the opportunity to record the shipwreck in situ preservation site. Therefore, the underwater survey report in this thesis comes from the Taiwan underwater archaeological team.

The preservation environment of artefacts is relatively humid and warm; the deterioration of artefacts will be exacerbated after years, as a result, may present limited information on artefacts. The wood-related artefacts are severely damaged and fragile, therefore, the artefacts were photographed and recorded in the boxes that originally contained them the wood was not taken out for shooting from different angles, and there is no suitable lighting and clean background.

1.8 Thesis Outline

Chapter one discusses the research question and aims of this study and talks about the methodological approach employed in the research. It introduces the historical background of the Jiangiyun No. 1 shipwreck, it also discusses the contents of the ship's cargo. Finally, this chapter highlights the significance and limitations of this research.

Chapter two reviews the literature on the maritime history of the regions pertinent to this study, including Taiwan, China and Southeast Asia. It also provides an overview of the Chinese ceramics from 17th and 18th-century shipwrecks. And also, includes the development of maritime archaeological research in Taiwan, and discusses the UNESCO 2001 Convention and Taiwan's underwater cultural heritage legislation. Finally, this chapter includes previous research on the Jiangiyun No. 1 shipwreck and specifically focuses on the shipwreck's cargo.

Chapter three introduces the methodology employed in this research. Firstly, contains previous research on the Jiangiyun No. 1 shipwreck and its artefacts, as well as desk-based assessments of this research work, and the physical on-site inspection and recording of the artefacts. Finally, the chapter concludes the limitations of the author's physical examination of the artefacts due to time and access restrictions.

Chapter four discusses in detail the result of the field examination and recording of the Jiangiyun No. 1 shipwreck artefacts. The information includes dimensions, make, clay, glaze colour, surface treatment and decorative elements. It also notes any similarities, differences, and details of related artefacts to help explain and identify the likely function of the subject artefacts.

Chapter five summarizes the typological attributes of artefacts, and presents the information amassed during this investigation and the interpretations. And discusses the kiln industry in the Fujian area and ceramic export routes. Finally, other contemporaneous shipwrecks in the Qing dynasty including Sydney Cove 1797, the

Nanking Cargo 1752 and Vung Tau 1690 are reviewed for insights into product preferences related to the route of Chinese ceramic and maritime trade.

Chapter six discusses the results of this survey and its conclusions. It goes back to research questions and research objectives and shows how to address them. The impact of the limitations of this work was also assessed in this regard. Finally, recommendations are provided for the future study and preservation of the Jiangiyun No. 1 shipwreck and its implications for the overall understanding and interpretation of this important site.

Chapter 2. Literature Review

2.1 Introduction

This chapter reviews the current status of Chinese ceramic studies in the context of international maritime commerce from the seventeenth and eighteenth centuries of shipwrecks. Historical and archaeological studies published so far are relevant to this study. The maritime and trade histories of Taiwan, China, and Southeast Asia are all considered and will provide a background to this ceramics study. This chapter discusses the Jiangiyun No. 1 shipwreck site and recent archaeological research undertaken, especially pertaining to the vessel's cargo. Such information assists in critiquing the characteristics of the Jiangiyun No. 1 shipwreck cargo and provides a clearer picture of maritime trade in Southeast Asia.

2.2 Maritime History of Taiwan, China and Southeast Asia

2.2.1 Dutch and Spanish Period

The Dutch and the Spaniards came to Taiwan, China and the Philippines one after another to trade with China and Japan (Jiang 2002:317-330). The routes used by the Spaniards and the Dutch in East Asia were different. The Dutch mainly used the Vasco da Gama route, and later opened up a new route from Cape Town to Batavia via the Republic of Mauritius (Jiang 2002:317-330). After reaching Batavia, it goes from the South China Sea to Northeast Asia. This route will also cooperate with the monsoon, one is close to Pratas Island, and the other is closer to the Philippine route. Both routes will reach Penghu, Taiwan, and then Japan. Afterwards, the Dutch would also follow the Kuroshio Current directly from Borneo to Japan via eastern Taiwan.

Spanish activities in Asia preceded the Dutch by decades. In the late sixteenth century, after Spain occupied the Philippines, it traded silver to China with Manila as the centre (Cheng 2008:346). Taiwan was then seen as a hub for trade and missions. The Spaniards mainly travelled from Mexico to the east coast of Taiwan to the Philippines via the Pacific Ocean, that is, the North Pacific route. In addition, routes from the Philippines to Southeast Asia to Japan or China will pass through western Taiwan and Penghu. The Dutch occupied Batavia in 1619, and the Dutch also came to East Asian waters in the late sixteenth century (Jiang 2002:317-330). When the Dutch were in Taiwan, they used Taiwan as an entrepot to exchange goods with China, Japan,

Southeast Asia and other places. Penghu has also become an auxiliary port for Taiwan's foreign trade and a transshipment point for the Netherlands' trade in East Asia.

Before the Dutch and Spaniards came to the East Asian waters, the Chinese, Ryukyu people, and Japanese around the Taiwan waters were already trading in this area (Kadi 1988:465). Chinese merchants travelled south to Southeast Asia, north to Ryukyu and Japan, and east to the Philippines for trade. Therefore, the East Asian waters centred on Taiwan are quite lively.

2.2.2 Ming and Yuan Dynasty

Before the Yuan Dynasty (1260-1368), the sea routes were mainly north of Changjiang (Yangtze) Estuary, and the second main route was Southeast Asia and the Indian Ocean. This route was mainly along the coastline to Southeast Asia or India and Arabia. This route will pass through Kinmen and part of the Matsu Islands. Archaeological remains and artefacts can be found at the Shihsanhang site.

During the Ming Dynasty (1368-1644), Brunei in Borneo was the dividing line between the East and the West. The north of Brunei was called the East Ocean, and the south of Brunei was called the West Ocean. The route from China to the Philippines also belonged to the East Ocean route. Since the Yuan Dynasty set up an inspection department in Penghu, it also made Penghu a navigation indicator in the Ming Dynasty and one of the stops on the Eastern Sea Route. As a result, much archaeological evidence was found in the Penghu area (Chen 1995:131-156).

To prevent coastal piracy, the Yuan and Ming dynasties successively ordered several sea bans (Jiang 2002:317-330) to prohibit the Chinese from doing business overseas, indirectly leading to the development of the ceramic industry in Southeast Asia (Li 1990:116). After the sea ban was lifted, merchant ships increased, and the China-to-Southeast Asia route, the Philippines route, and the East Ocean route were once again booming in trade.

2.2.3 Qing Dynasty

In the 23rd year of Kangxi (1684), the Qing government adopted a negative policy to suppress commercial exchanges, only opening trade from Xiamen to Luermen, and completely prohibiting other areas. Even so, Taiwan's foreign trade has not been interrupted. Many businessmen from Fujian and Guangdong have been smuggled into Taiwan to engage in land reclamation. Agricultural products such as rice and sugar have increased significantly (Lin 1996:174-179). The market has been expanding and cross-strait trade has become increasingly prosperous.

After the reign of Qianlong (1735), the policy of cross-strait exchanges gradually opened up. Ports such as Luermen in Tainan, Lukang in Changhua, Balidong, and Wushi in Yilan have opened up one after another. China's Zhangzhou, Quanzhou, Fuzhou, Shandong, and other merchant ships have also gradually increased (Chen 2005:87).

Although the air route from China to Manila has declined, it has never stopped. In addition to the trade from Fujian to Manila via Penghu, the smuggling trade between Taiwan and Manila has not been interrupted. To open up Taiwan routes, these foreign businessmen applied to the Qing government for navigation rights. Therefore, after the opening of Taiwan's port, more ships are travelling to and from Taiwan, but most of them are concentrated in the international ports in the north and south of Taiwan (Chen 2001:25).

2.3 Maritime Archaeology in Taiwan

Taiwan is surrounded by the sea, with the Taiwan Strait to the west, the Donghai Sea to the north, the Bashi Channel to the south, and the Pacific Ocean to the east. For a long time, this sea area has been a referral point for people to transport goods, trade and commerce. According to the report published by the Bureau of Cultural Heritage in 2020, a total of 99 underwater objects were discovered in the waters near Taiwan from 2007 to 2020, most of which are located in the Penghu Islands. Ceramics have become important archaeological evidence in these sites. It was not until the Daoguang period in the early nineteenth century that Taiwanese people made ceramic by themselves (Sung 2022:55). Before that, Taiwan relied on foreign ceramics, and these ceramic fragments fully demonstrate the grandeur of Taiwan's international trade and frequent cultural activities.

2.4 Chinese Ceramics from the Seventeenth and Eighteenth Centuries Shipwrecks

Chinese ceramics are important archaeological evidence in maritime market research. In the early Ming Dynasty, the "sea ban" was implemented, and the people were not allowed to trade overseas which caused the people of Zhangquan to suffer untold hardships and opened up "Yuegan harbour" (月港) not far from Zhangzhou Kiln for private transactions. Coupled with the political turmoil during the change of dynasties in the late Ming and early Qing dynasties, Jingdezhen's export porcelain production decreased or even ceased firing. As a result, folk kilns along the coast of Fujian gradually became production sites for many porcelains, which were exported to other countries. Archaeological research in Thailand, Vietnam and other regions has also found the same porcelain as the Anxi kiln (Ye 1997:63).

The Ming, Qing and modern ceramics found along the coast of Fujian are generally blue-and-white porcelain from Jingdezhen folk kiln, blue-and-white porcelain from Zhangzhou kiln, multicoloured porcelain, and white porcelain from Dehua kiln, etc., which proves that the coast of Fujian was an important maritime trade route at that time (Li 1997:27-29). Kiln factories were established throughout Fujian to engage in kiln firing, ushering in the heyday of porcelain making. Among them, the kiln sites most representative of the Ming and Qing Dynasties are the Dehua Kiln, Anxi Kiln, and Zhangzhou Kiln (Sung 2022:120).

Among them, the Zhangzhou kiln was active from the late 16th century to the beginning of the 17th century. Much archaeology evidence has been unearthed abroad, such as in the Kansai area of Japan, the Philippines, Singapore, Malaysia, Indonesia and other Southeast Asian regions (Li 1997: 27). Zhangzhou kilns produced white porcelain, blue-and-white porcelain, blue glaze, brown glaze, and five colours, among which ‘painted porcelain’ was quite famous and favoured by the Japanese (Tatsuya 1996:3).

Anping pots and Kraak porcelains are Chinese export porcelains representing the 17th and 18th centuries. Anping pots have been found in the San Diego shipwreck (1600), Witto Lee shipwreck (1613), Vung Tau shipwreck (1690), and Vietnam Binh Thuan shipwreck (1608) (Li 2020:36). The Vung Tau merchant ship also discovered blue-and-white porcelain, Anping pots and Kraak porcelains from the middle and late Qing Dynasty. The ship appears to have departed from a Chinese port for Jakarta (Edgar 2020:12).

2.5 UNESCO 2001 Convention

The investigations were completed in the early stage of the Jiangjyun No. 1 shipwreck case and this project has led to Taiwan's intentions to adopt the 2001 Convention to better protect its underwater cultural heritage. The 2001 Convention is currently the most important international reference for the protection of underwater cultural heritage internationally. The primary purpose of the Convention is to promote countries to better protect their underwater cultural heritage sites and prevent them from being destroyed. In addition, the Convention also sets international research standards and encourages international cooperation (Margaret 2010:89).

Regarding the protection and site management when developing underwater cultural heritage, the standard is based on the content mentioned in the appendix. "*About the Convention on the Protection of the Underwater Cultural Heritage*", Rule 25 states:

> The site management programme shall provide for the protection and management in situ of underwater cultural heritage in the course of and upon termination of fieldwork. The programme shall include public information, reasonable provision for site stabilization, monitoring, and protection against interference (25).

For the development of underwater cultural heritage records, please refer to the appendix *About the Convention on the Protection of the Underwater Cultural Heritage* Rule 27:

> Documentation shall include, at a minimum, a comprehensive record of the site, including the provenance of underwater cultural heritage moved or removed in the course of the activities directed at underwater cultural heritage, field notes, plans, drawings, sections, and photographs or recording in other media (27).

According to Articles 30 and 31 of the Annex, the development should be carried out under the work schedule, and the midterm and final reports should be submitted. It should include the actual situation of the target; the method and technology used; the results obtained; the main charts and photographs at each stage of the activity; the recommendations on the protection and preservation of the artefacts and the salvaged underwater cultural heritage; the advice on the future activities (Amanda et al. 2010:81). In August 2015, UNESCO adopted Operational Guidelines for the Convention on the

Protection of the Underwater Cultural Heritage. The further explanation is intended to provide more precise guidance and promote the implementation of the Convention. It is stated in the operation manual that archaeological sites are very fragile and vulnerable to intrusion, so the information on the sites must be recorded in detail.

2.6 Taiwan's Underwater Cultural Heritage Legislation

Before the government's Act, some projects related to underwater cultural heritage (UCH) were worked by national museums, universities or even local fishers in legal or grey zones of law. The investigation work was suspended until Jia-Jin Huang made discoveries about the Jiangjyun No. 1 shipwreck, which allowed the government to start underwater archaeology again. It was the first time Taiwan had a realistic chance to do underwater archaeology. Since Taiwan is not a member of the United Nations, according to the 2001 Convention, Taiwan cannot accede to this Convention. However, Taiwan's Underwater Cultural Heritage Preservation Act refers to the 2001 Convention in both legislative reasons and legislative directions (Yang 2000:92). After 2005, the draft Bill for Preservation of Underwater Heritage was soon written. The Legislative Yuan finally adopted the draft law to preserve UCH on November 24, 2015. Statistics full text of the 44 articles in total, 15 of them are expressed directly in the legislative reasons, and all refer to the method or spirit of the 2001 Convention.

Some of the important laws in Taiwan that refer to the 2001 Convention are discussed in this section and include the country's Underwater Cultural Heritage Preservation Act, Article 27: "The preservation in situ of underwater cultural heritage shall be the first option before allowing or engaging in any activities directed at this heritage. The proper means for in situ preservation referred to in the preceding paragraph may include recordation management, protection zone, or other proper preservation measures." This law complies with Article 2 of the 2001 Convention, for other reasons, it should be protected in situ first. In Article 14: "Any salvage or declaration of interest relating to underwater cultural heritage shall not be subject to the provisions concerning bona vacantia, lost property, treasure-trove, picking up of floating property, or sunken property prescribed in the Civil Code and other provisions concerning the law of finds or law of salvage prescribed in the Maritime Act and related maritime laws." This law is consistent with Article 4 of the 2001 Convention. Since the protection of underwater cultural heritage is for the benefit of all humanity, it is prohibited from becoming private property (Yang 2000:93).

As a maritime state, Taiwan adheres to the importance of its National Marine Policy. But they also realized that many issues were waiting to be solved including the working conditions, lack of a dedicated boat for underwater archaeological work, weather etc. With more experience and cross-discipline people who have worked in this area, they will come out with many solutions soon (Chen 2000:21).

2.7 The Jiangiyun No. 1 Shipwreck

2.7.1 Geographical and Historical Background

Penghu is a group of islands located in the Taiwan Strait. According to the Dutch Vohlen's map of Penghu in 1726, the origin of Penghu place names has listed the names of more than a dozen islands, such as Phepuo (Penghu main island), Grootetfe (虎井嶼) etc. The Penghu archipelago is made up of 64 islands, mainly including the main island of Penghu, Baisha Island (白沙嶼), and Yuweng Island (漁翁島). In the archipelago, except for the westernmost Huayu (花嶼), the remaining sixty-three large and small islands belong to the Tatun (大屯) Volcano Group. This unique geographic environment is also a dangerous sea area that has caused those mentioned above and numerous shipwrecks.

Almost one hundred shipwrecks recorded in the "Penghu Shipwreck Table of the Qing Dynasty" (1665–1892) (Yang et al.1989:280) indicate that the Penghu waters are areas where shipwrecks are frequent. The types of sunken ships include warships, merchant and cargo ships. The leading causes for their sinking are related to weather events, dangerous ocean currents and navigational hazards. The climate of Penghu is typically oceanic; in addition to turbulent winds and waves, there are also monsoons and typhoons. From September to March of the following year, there was a strong northeast monsoon and rainfall for six months. The waters around Penghu are vast and covered with submerged reefs. When the tide of the mainland coast to the south meets the Kuroshio Current to the north, it is affected by the seabed topography, undercurrents and tidal currents, forming a dangerous channel.

The earliest record of Penghu predates the island of Taiwan. It is worth noting that most of the ceramics unearthed in Penghu after the Song Dynasty (A.D. 1225) belonged to the trade porcelain fired in Fujian. Other countries globally, such as South Korea, Japan, Ryukyu, Nanyang, Egypt, and Africa, all have the same porcelain. Therefore, the land

Figure removed due to copyright restriction

Figure 2.1 Map of Penghu Islands. The red spot is the location of Jiangjyun No. 1. (Illustration by Han-Yin Hsu, Jui Chieh Chang)

site where the ceramics were found should be the place where ships and residents gather. The literature even records the actual traffic conditions between Penghu and the southern waters of China during the Ming and Qing Dynasties (Figure 2.1) (Yang et al. 1989:292).

2.7.2 The Jiangjyun No. 1 Shipwreck Introduction

Mr Huang discovered the wreckage of Jiangjyun No. 1 in 1987. The reason is that typhoon Wein in 1986 destroyed the seabed sediments and exposed shipwreck wreckage (Lu 2007:77). As a result, more and more scattered artefacts and sites have been discovered. In 1995, he cooperated with the government to conduct investigations, and until 1998, the government began to lead the Jiangjyun No. 1 project and began to conduct exploration, monitoring and excavation. Because of the successful establishment of Taiwan's Underwater Cultural Heritage Preservation Act in 2005, the government systematically restarted the investigation and completed the task with the joint efforts of the government, Penghu residents and the archaeological investigation team. Finally, in December 2018, the underwater archaeological workstation in Penghu was opened to the public.

The Jiangjyun No. 1 ship sank roughly southeast of Da-wen, and the wreckage settled on the seabed in a water depth varying from 15 to 30 meters. It is speculated that the shipwreck may have hit a reef and sank when travelling from southern Fujian to Penghu (Zang 2014:59). The hull of the Jiangjyun No. 1 ship is buried by sand and appears to be well preserved. From the ship remains and precisely the size of the vessel's bulkheads, it can be estimated that the ship measured 18 to 20 meters in length, and 8 to 9 meters in width (Zang 2016:121), which is consistent with the size of the ship that often went to and from Fujian, Taiwan and Southeast Asia in the Qing Dynasty.

2.7.3 Archaeological Survey and Study to Date

Since 1995, the National Museum of History excavated the "Jiangjyun No. 1" shipwreck intermittently. Due to the strong northeast monsoon from October to March, the sea conditions are dangerous, so it is only suitable for monitoring operations from April to September. After discovering the Jiangjyun No. 1 shipwreck, the ropes were set up by archaeological methods. In 1996, points "I "and "17" were set up as the centre of the Grid plan. 50m x 40m is the survey area and 2.5m x 2.5m as a unit (Lu 2007:87).

After investigation, it was found that most of the scattered artefacts are concentrated in the front and back areas (Figure 2.2).

In May 2017, the Underwater Cultural Assets Review Committee completed the survey of the "Jiangjyun No. 1" shipwreck site, and then started monitoring and protection work over the years. It is currently stored in the warehouse of the Cultural Bureau of Penghu County and the collection of the National Museum of History. The hull and a large number of tile artefacts did not come out of the water, they were in situ preservation.

Monitoring work in 2019, the site had not been damaged by natural forces or human-made damage, but affected by the downward flow of sand and mud, the top of the tile pile is buried by sand (Sung 2022:139). In 2020, suspected human infestation or the accidental hooking of the ship's anchor claws in the area of the ruins was found. Therefore, it went to the sea surface inspections irregularly afterwards.

Figure removed due to copyright restriction

Figure 2.2 The Grid Plan of the Jiangjyun No. 1 shipwreck and hull structure.

(Redrawer: Hsu, Han-Yin)

Based on a comparative study of ceramic-style evidence recovered from the site, the present Jiangjyun No. 1 shipwreck dates from the seventeenth and eighteenth centuries (Sung 2022:129). Since 1995, the National Museum of History has restarted its plan, and about 342 artefacts (Table 2.1) have been officially collected. The Jiangjyun No. 1 shipwreck site produced mostly ceramics, accounting for more than 70% of artefacts. There are also a few glazed potteries, all of which are daily-used dishes, plates, and bowls, and the decorative parts are in random styles. Among them, the wide-mouth flat-belly ceramic alms bowl with the largest number has three different sizes. During the excavation of the ruins, it was found that most of them were stacked, and it was very likely that they were a set of large, medium and small[2] (Chen 2001:36). The shapes are all curled lips, the retracted into a flat bottom, the fire on the surface is uneven, and there are colour changes in grey or maroon. It is still uncertain whether the jars were cargo, or were used as containers for the crew (Chen 2001:42).

Blue-and-white porcelain plate with four-fish patterns is a shallow dish style, with no decoration on the outside, with blue-and-white depicting four fishes inside. There is a trace of double firing in the centre of the plate, and there is no glaze with a crack. and another porcelain plate in the site “blue-and-white porcelain blow in expressive grass patterns” are both in a fast freehand style, and the patterns are mostly landscapes, flowers and plants (Chen 2001:36).

In addition to ceramic and porcelain, artefacts also have a 2.6cm diameter Qianlong Copper Coin (乾隆通寶), this coin's middle hole is square, and the length of each side of the square is 0.6cm, with the four characters "Qianlong Tongbao" (乾隆通寶) on one side and two lines of Manchu language on the other side, with the word " bao" (寶) on the left, and the name of the factory that minted the coin on the right. Qianlong's reign was from 1736 to 1795, which became one of the bases for shipwreck dating (Chen 2001:46).

The Jiangjyun No. 1 shipwreck includes bricks, tiles, pottery pots, etc. The bricks are relatively intact due to thickness (Hsieh 2009:8), and the others are slightly damaged. The wood varies in length and is surrounded by sediment in the water, presumably in the mast base area. According to the test results, the wood called "Luanta-fir", it is coming from Taiwan, Fujian and southern China (Chen 2001:91). The wood material

[2] Large diameter 29.5~31 cm, height 18~19 cm, bottom diameter 18~19.5 cm; Medium caliber 19.5~24.5 cm, height 10.5~13.5 cm, bottom diameter 11~14 cm; Small diameter 15.5~6 cm, height 8~8.5 cm, bottom diameter 8.5~9.5 cm

was found to be deposited with the ceramics during excavation, so it is not a general drift. Inferred from the length and width, it should be the bulkhead wood of the cabin. The appraisal also proved that it is Fuzhou fir (*Cunninghamia lanceolata*) from the high-altitude coniferous forest, a common shipbuilding material in Taiwan. In addition, pieces of paper, bricks, charcoal, ropes, olive pits, copper lamps, and coins were also unearthed.

Table 2.1 Jiangjyun No. 1 shipwreck cultural artefacts summary table. (Source: National Museum of History Committee)

Figure removed due to copyright restriction

2.7.4 Preservation and Maintenance in 2021

In the Jiangjyun No. 1 shipwreck cases, some artefacts came out of the water, and some artefacts remained on site. This paper does not discuss the preservation methods of in-situ preservation but focuses on the artefacts that have been excavated.

For cultural assets soaked in salt water for a long time, the most important tasks are desalination, moisturizing, cleaning add-ons, setting and anti-shrinking, rust prevention, etc. The purpose is to slow or stop deterioration to preserve archaeological evidence. The Jiangjyun No. 1 shipwreck's artefacts except 15 pieces exquisite artefacts placed in the Penghu Living Museum exhibition and 12 pieces placed in the Bureau of Cultural Heritage; the remaining 475 pieces have been placed in the Cultural Affairs Bureau, Penghu County Government for more than 20 years.

Until 2021, the Cultural Resources Bureau will assist the Cultural Affairs Bureau, Penghu County Government in carrying out inventory, registration, preservation and

maintenance of Jiangjyun No. 1 shipwreck artefacts. The content of artefacts preservation in 2021 is as follows:

1. Inventory login

According to the Bureau of Cultural Heritage, the Jiangjyun No. 1 shipwreck artefacts totalled 317 pieces in September 2021. It is far from the count of 502 pieces in 2022. It should be that scattered artefacts have not been checked one by one. Therefore, when counting artefacts in 2022, there is a general form, and each has its own Artefact Inventory Record (Appendix 1).

2. Desalination test

The previously excavated artefacts have not been desalinated. In the preservation work in 2021, the surface of the clay pot was tested with "chloride test paper" and then tested for silver nitrate with "acid-free thin paper". The results are:

> ""Its chloride (Cl) ion is 0, and the acid-free thin paper is still clear in RO water, and there is no sign of weathering or deterioration on the surface, so there is no need for desalination treatment."

Although the structure of the ceramic seems to be stable at present, and the current condensation on the surface does not threaten the artefact, after a long time, the deterioration phenomenon may gradually appear. Therefore, as a precaution, comprehensive testing and evaluation should continue.

3. Restoration

In the artefact of the Jiangjyun No. 1 shipwreck, there are a large number of ceramic and porcelain fragments, which are pretty challenging to restore. There are many ceramic bowls with intact shapes, with white condensation or barnacles attached to the surface. Due to the simplicity of cargo, ceramic without grain and decoration is the bulk of daily necessities. Several pieces of ceramic needed for future exhibitions were selected, and further "removal of white spot condensation on the surface" and "barnacle cleaning and descaling treatment" (Figure 2.3) were carried out. Still, no comprehensive removal of condensation was conducted.

4. Packaging

A total of 27 pieces of artefacts are located in the Penghu Living Museum and Bureau of Cultural Heritage. These 27 pieces of artefacts have individual packaging or display erection. Acid-free materials mainly protect the artefacts collected by the Bureau of Cultural Heritage. The artefacts in the Penghu Living Museum exhibition are mainly for strengthening stability, reducing sliding and anti-vibration, and adding individual labels for identification (Figure 2.4).

Figure removed due to copyright restriction

Figure 2.3 Comparison of before and after the restoration of the urn with barnacle attachments. (Different Grey Glaze Urn) (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 2.4 Brackets used to support artefact; take White Glaze Spoon as an example. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

2.8 Conclusion

This chapter reviews the latest literature on transoceanic maritime activities and commerce in the seventeenth and eighteenth centuries shipwrecks in Taiwan, China, and broad areas of Southeast Asia. It emphasizes the study of the manufacture, circulation and trends of Chinese ceramics during this period and also provides historical and archaeological evidence. There are many kiln sites and harbours along the coast of China, the maritime trade in this area is extremely active, and goods are transported to all parts of the world. There are many related sites, shipwrecks, and archaeological evidence. The research on ship cargo will need more attention and research.

Chapter 3. Methodology

3.1 Introduction

This chapter introduces the analytical methods used in this study. These methods were chosen to collect and extract critical information from various sources. The study was conducted in two parts: the method of historical research and the method of artefact inventory. It starts with the previous research about the shipwreck, building a comprehensive background understanding, as well as desk-based assessments of this research work, and the physical on-site inspection to recording and analysis for archaeological evidence. The focus of this assessment was ceramics recovered from the cargo. Finally, concludes the research limitations encountered.

3.2 Previous Archaeological Studies

The first complete publication on the Jiangjyun No. 1 shipwreck was published in 2001 by the National Museum of History. For general information, there are preliminary explanations, cargo descriptions and also contain a large number of photo records and illustrations. However, to date, this has not included detailed studies of the sources of the ceramics and the analysis of the kiln sites that are the focus of this study.

The work of this project firstly refers to the Convention on the Protection of the Underwater Cultural Heritage by the United Nations Education Scientific and Cultural Organization, UNESCO, and collects documents and historical materials about the Jiangiyun No. 1 shipwreck as complete as possible according to the standards and templates listed in it, such as publications, excavation reports, monitoring reports, research or conference papers. The Jiangiyun No. 1 shipwreck materials are mainly domestic research reports and journal articles in Taiwan. This study was further strengthened by a comparative analysis of contemporary ceramics from other terrestrial and underwater archaeological sites.

3.3 Material Culture

The main evidence of this study is the cultural artefact assemblage and ceramic salvaged from the Jiangjyun No. 1 shipwreck, which are the specific objects of this investigation. The analysis and interpretation of cultural artefacts can clarify the history and output source of this traded commodity, and further confirm the cultural meaning of these cultural artefacts in the historical and social context. To address the research questions of this study - the sources of ceramics recovered from the Jiangjyun No. 1 shipwreck and - the broad context of the route and kiln of ceramics transported from China to Taiwan and Southeast Asia during the Qing Dynasties (1644 – 1911). Under the current situation, the investigation only focuses on relevant physical evidence and conducts a concentrated investigation on specific types of cultural artefacts.

3.4 Artefacts Recording

The previous data shows the Jiangjyun No. 1 shipwreck has about 320 artefacts. After the actual statistics, the total number is as high as 502. The detailed record will be presented in Chapter 4. The Jiangjyun No. 1 shipwreck's artefacts are scattered in three storage locations:

1. Cultural Affairs Bureau, Penghu County Government;

2. Penghu Living Museum; and

3. Bureau of Cultural Heritage.

The team first went to the storage location of artefacts to check the current state of preservation and made an "Artefact Inventory Record Form" (Table 3.1). After confirming the sorting method and precautions, each artefact is classified and renumbered according to the category, and the characteristics are recorded. Secondly, we will first research the more distinctive artefacts. In addition to referring to the current research results in the past, this part also compares with the existing domestic and overseas artefacts of similar age.

This study is based on visual inspection of target artefacts. The investigation attempted to document the ceramic pieces in as much detail as possible, to benefit not only current research, but also further studies in the future. Records are broken down into four areas:

physical properties, material composition, significance assessment and degree of damage, which will ultimately serve as clues to the origin and origin of the ceramic.

Artefact Name—Identifies the artefact name and type (shoulder, handle, base, neck, lip, etc.)

Inventory Number — Since the number of artefacts differs from previous records, this study requires renumbering.

Context — Discovery location and area number (provenience), year of excavation (date recovered), current artefact storage location (store location), etc.

Materials — distinguish materials into wood, charcoal, carbon, ceramic, porcelain, metal, glass, leather, brick.....etc.

Dimension — Records the measured dimensions in centimetres of each fragment and artefact in detail. Contains length, width, height, diameter, etc.

Descriptions — Describe the artefact's exterior and interior surfaces, decoration, pattern, glaze colour, defects, etc.

Significance Assessment — Divided into archaeological, historical, cultural, artistic, scientific etc.

Conditions — Identify the completeness of the artefact, divided into almost complete (more than 85%), partially damaged (more than 65%), and severely damaged (below 50%).

Images — photographs of artefacts or fragments, all photographs include scale and often capture all sides of each piece from multiple angles.

Table 3.1 Artefact Inventory Record for the Jiangiyun No. 1 Shipwreck.

Artefact Inventory Record[3]

Figure removed due to copyright restriction

[3] This record sheet is mainly used for the inventory of the Jiangiyun No. 1 shipwreck artefact for this project. It is designed with reference to the artefact preservation form of the Bureau of Cultural Heritage and the UNESCO Artefact Record.

Figure removed due to copyright restriction

Login Date:

Inventory unit:

Inventory and photographer:

The author went to Penghu from August 2 to August 18, 2021, to record the Jiangjyun No. 1 shipwreck artefacts, totaling 13 working days (Figure 3.1). The first ten days were recorded at the Cultural Affairs Bureau and Penghu County Government, and the last three days were recorded at The Penghu Living Museum, photographed the boutiques in the exhibition. Also, on November 29, 2021, head to the Bureau of Cultural Heritage to record a total of 12 artefacts. The Jiangjyun No. 1 shipwreck artefacts are scattered scattered in three places. Although the artefacts are preserved, they have not been comprehensively and systematically sorted out. This study has made a storage location map (Figures 3.2, 3.3) for the Cultural Affairs Bureau and Penghu County

Government with the enormous storage quantity, which can facilitate the search and homing of future artefacts.

Figure removed due to copyright restriction

Figure 3.1 Inventory of artefacts work records. (Source: Center for Ocean and Underwater Technology Research Team)

Figure removed due to copyright restriction

Figure 3.2 Location map of the artefact warehouse in the Cultural Affairs Bureau and Penghu County Government. Readers can easily find it by comparing the number and shelf, which is convenient for future searches. (Illustration by Hsu, Han-Yin)

Figure removed due to copyright restriction

Figure 3.3 Cultural Affairs Bureau and Penghu County Government's artefacts warehouse. (Source: Center for Ocean and Underwater Technology Research Team)

3.5 Limitation

The author was fortunate to be able to check the artefacts of the Jiangjyun No. 1 shipwreck personally. Although they are scattered all over the place, they greatly help records and research. Unfortunately, the author did not have the opportunity to record the shipwreck in situ preservation site. Therefore, the underwater survey report in this thesis comes from the Taiwan underwater archaeological team.

The preservation environment of artefacts is relatively humid and warm; the deterioration of artefacts will be exacerbated after years. The wood-related artefacts are severely damaged and fragile, so there is no significant movement during the photography record; therefore, there is no suitable lighting and clean background. None of the artefacts related to the Jiangjyun No. 1 shipwreck have been dated, so the author hopes that in the future, we can do more accurate dating of the shipwreck rather than inferring or guessing.

Chapter 4. Results

4.1 Introduction

This chapter presents the results of the fieldwork from August 2 to August 18, 2021, to record the Jiangjyun No. 1 shipwreck artefacts, totalling 16 working days, during which the subject artefacts were re-catalogued. The chapter is organized into three parts. Section 4.2 summarizes the information recorded for the artefacts, including tables to show the total amount for every catalogue (Table 4.1). Sections 4.3, 4.4 and 4.5 present the characteristics of each porcelain, ceramic and miscellaneous. Provides one or more photographs of the artefacts or fragments. Section 4.6 concludes with an overall discussion of the entire artefacts.

This record is the field examination and recording of the Jiangiyun No. 1 shipwreck artefacts. The information includes dimensions, make, clay, glaze colour, surface treatment and decorative elements. It also notes any similarities, differences, and details of related artefacts to help explain and identify the likely function of the subject artefacts. A copy of the catalogue form for each artefact is included in Appendix 1. The front and side of each artefact and all visible details are photographed and recorded.

4.2 Artefacts Recording

4.2.1 Inventory Number

After inventorying all the artefacts of the Jiangiyun No. 1 shipwreck, the total number is 502, which is far from the " 284 artefacts" recorded in the original literature (Chen 2000:4). The reason is that this inventory is based on "single piece" calculation, and some fragile materials such as wood, charcoal, ceramic, porcelain, brick and tile have been neglected for many years and broken again due to temperature, time and humidity. Therefore, the number of pieces has increased significantly compared to the past. So that the artefacts can't be classified after they are broken into small pieces. Some missing items will be renumbered due to partial loss of original numbering.

4.2.2 Context

Artefacts can be classified into six categories: porcelains, potteries, brick and building materials, wood, metal and miscellaneous. The Jiangiyun No. 1 shipwreck artefact summary is listed in Table 3; among them, there are 18 pieces of porcelain, most of which are fragments of blue-and-white porcelain, which are used for daily use (dishes, plates, bowls). There are 271 pieces of pottery, which are the most numerous, accounting for more than 50% of the total number of artefacts. The two main types are the open-mouthed flat-bellied round pottery bowl and the small-mouthed triangular grey-glazed pottery pot; There are 31 bricks and tiles in total, the bricks are relatively intact due to the thickness, and the tiles are slightly damaged; A total of 157 pieces of wood, due to severe damage, are counted as single pieces and renumbered; There are only two metal objects, "Qianlong copper coin" and square copper lamp. The Qianlong period was from 1736 to 1795. This "Qianlong copper coin" provided the expected age range of the Jiangiyun No. 1 ship. The earliest period of the shipwreck is the Qianlong period; The "miscellaneous" category includes olive pits, ropes, bamboo pieces, etc., with a total of 23 pieces.

Table 4.1 The Jiangiyun No. 1 shipwreck artefact summary table. (Source: Center for Ocean and Underwater Technology Research Team.)

Figure removed due to copyright restriction

Figure removed due to copyright restriction

4.3 Porcelains

4.3.1 Test 277 (Figures 4.1)

In appearance, this object is characterized by a wide mouth, deep belly, white body, robust texture, and high-temperature kilning. Although the cavetto is blank, on each of the left and right sides of the belly, a phoenix and auspicious clouds are painted in cobalt blue (blue patterns) with expressive decorations. The white glaze background glitters a light blue hue, while the blue patterns carry a light blue but grey tone. The foot rim is well-processed, with blue patterns at the centre. Currently displayed in Penghu Living Museum, because it is fixed on the wall, the bowl's inner wall cannot be photographed.

4.3.2 Test 263 (Figure 4.2)

As the only intact object recovered from the Jiangjyun No. 1 shipwreck made by Anxi Kiln, it is characterized by a thick body, loosened, slightly yellow. Around the cavetto, there are dark blue fish patterns painted in a realist style on a greyish background. A foot-rim mark, i.e., the mark left by the upper object during kilning, is left at the well's centre. The lip and interior of the foot rim used different glazes, with a clear casting mark. Currently displayed in Penghu Living Museum, because it is fixed on the wall, the bowl's inner wall cannot be photographed.

4.3.3 Test 5 (Figure 4.3)

Baked at a high temperature by Anxi Kiln in the Qing dynasty, Test 263 is characterized by a round shape with a wide mouth, a slightly yellow body, a robust texture, and a slightly greyish-white background. In the cavetto, grass, clouds, stones, and auspicious patterns were painted cobalt blue. The blue is light and elegant with a greyish tone, and the belly is blank. The foot rim was not well processed with significant coarse marks.

4.3.4 Test 20 (Figure 4.4)

Test 20 is characterized by a thin and completely white-glazed body, and ice cracks are exposed all over the glaze. The handle has disappeared. Currently displayed in Penghu Living Museum.

Figure removed due to copyright restriction

Figure 4.1 Test 277- Blue-and-White Porcelain Bowl with Auspicious Cloud and Phoenix Patterns. Mid-Qing dynasty. H 4.5 cm/ M.D. 12.5 cm/ B.D. 5.5 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.2 Test 263- Blue-and-White Porcelain Plate with Four-Fish Patterns, Mid-Qing Dynasty. H 3.5 cm/ M.D. 17.5 cm/ B.D. 8.8 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.3 Test 5- Blue-and-White Porcelain Blow in Expressive Grass Patterns, Early-mid Qing Dynasty. H 3.5 cm/ M.D. 12 cm/ B.D. 6.5 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.4 Test 20- White Glaze Spoon, Mid-Qing Dynasty. H 9 cm/ Width 4.7 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

4.4 Ceramics

4.4.1 Test 23 (Figures 4.5, 4.6)

With a wide mouth, the object's robust body contains sand. Along the rim lies a fine engraved line. The vertical wall narrows down to the bottom. It has a thick wall and flat bottom but no glaze or pattern. Due to insufficient kilning, the body is greyish-red. To shorten the production time and make more money, craftsmen made the bottom before casting the bowl upwards and finished the object by "socket kilning". To prevent two objects from sticking together and cannot be separated afterwards, they intentionally skipped the glaze and put "mud" under the bottom during kilning.

Ceramics is the largest collection of artefacts from the Jiangjun No. 1 shipwreck. There are 141 pottery bowls of the same style. The largest one is 47 cm high and 37 cm in diameter, and the smallest one is 8.7 cm high and 13.5 cm in diameter.

4.4.2 Test 229 (Figures 4.7, 4.8)

Such a kind of urn often contains sand with a coarse but robust and greyish body and a vertical mouth. The size is rather small. The connection between the curved shoulder and upper body is the widest part. Then, it narrows downward rapidly into a triangular shape over a flat bottom. A thin grey glaze was coated unevenly on this casting urn. Made by Cizao Kiln, this urn was used to contain fluids such as oil and wine and food like salt, dried radish, and peanuts.

There are 32 Small-Mouth Triangular Grey Glaze Urns of the same style; it is the second most common type of pottery.

4.4.3 Test 18 (Figure 4.9)

Resembling a large "traditional teacup", Test 18 has a flat mouth, no shoulder, a vertical wall, and a converged mouth and a flat bottom. It was unevenly cast with a thin glaze and greyish surface. Kiln red marks are found on the bottom.

Figure removed due to copyright restriction

Figure 4.5 Test 23- Wide-Mouth Flat-Belly Pottery Alms-Bowl, Ming-Qing Dynasties. H 11.7 cm/ M.D. 20 cm/ B.D. 11 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.6 Ceramics of various sizes. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.7 Test 229- Small-Mouth Triangular Grey Glaze Urn, Mid-Qing Dynasty. H 20cm/ M.D. 11 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.8 Small-Mouth Triangular Grey Glaze Urns. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.9 Test 18- Converged Mouth and Vertical Urn, Ming-Qing Dynasties. H 43cm/ M.D. 36.7 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

4.4.4 Test 265 (Figures 4.10, 4.11)

In a spherical shape with an uneven wall, this thinly yellow-glazed urn with a thin body carries a greyish appearance. The body surface is plain, except for a bamboo-section-shaped “handle” and a “ring” at the middle of the wall.

4.4.5 Test 194 (Figures 4.12, 4.13)

The urn carries an egg-shell appearance and has a thick lip and broad shoulder narrowing downward rapidly into a triangular shape on a flat bottom, loosened body, light grey appearance, and unevenly coated glaze. The Blue glaze has been peeled off in many places. Three pairs of engraved lines run across the upper belly, and bumps and hollows are made by “flipping” from the pattern between the neck and the shoulder.

4.4.6 Test 238 (Figures 4.14, 4.15)

Unevenly glazed coarse greyish body with a wide mouth, scrolled lips, curved shoulder, broad belly converged downward, and spread foot-rim, there are four lugs “on the sides” of the shoulder. Clear connection seams are seen on the mouth rim, shoulder, and belly. While “flapping” was often used on the external wall to enhance urn strength and durability, unsmooth and coarse bumps and hollows made by flapping are seen on the surface. The urn was made by casting and kilned at a lower temperature.

Figure removed due to copyright restriction

Figure 4.10 Test 265- Pottery Medicine Urn, Ming-Qing Dynasties. H 8.5cm/ A.C. 39.5/ M.D. 8.2 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.11 Test 265- Pottery Medicine Urn. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.12 Test 194- Scrolled-Lip Broad-Shoulder Engraved-Line Urn, Mid-Qing dynasty. H 33cm/ M.D. 8/ B.D. 13.5 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.13 Test 194- Scrolled-Lip Broad-Shoulder Engraved-Line Urn in detail. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.14 Test 238- Wide-Mouth Curved-Shoulder Lugged Urn, Late Ming-Mid Qing dynasties. H 19.5cm/ M.D. 10/ B.D. 13.7 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.15 Test 238- Wide-Mouth Curved-Shoulder Lugged Urn in detail. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

4.5 Miscellaneous

4.5.1 Test 107& 21AUG009 (Figure 4.16)

These pottery construction materials were roughly made. There were marine deposits on them, and the tiles were in four pieces glued to each other.

4.5.2 Test 281 (Figure 4.17)

A copper coin with the four characters "Qianlong Tongbao" (乾隆通寶) on one side, only one coin was found on the Jiangjyun No. 1 shipwreck.

Figure removed due to copyright restriction

Figure 4.16 Test 107, W 24cm/ D 14 cm/ H 2.5 cm(left) & 21AUG009, W 2.5cm/ D 24.5 cm/ H 20 cm(right). Potteries Building Materials, Qing dynasty. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

Figure removed due to copyright restriction

Figure 4.17 Test 281- Qianlong copper coin, Qing dynasty. D 2.6 cm/ L (Inner-square) 0.6 cm. (Source: Center for Ocean and Underwater Technology Research Team, taken by this project.)

4.6 Conclusion

This chapter presents the recorded results of the 13 artefact inspections. Since many ceramic fragments cannot be determined to be related to each other, this study focused on analyzing items with complete details. Among them, due to the large number of ceramics, only representative artefacts were selected in this study. Records of each artefact's physical, stylistic, decorative, and technical characteristics are necessary information to assist in tracing the origin of the artefact's manufacture and give the Jiangjyun No. 1 shipwreck a more comprehensive context.

Chapter 5. Discussion

5.1 Introduction

This chapter discusses the recording and findings of artefacts. Descriptive records of their properties, decorative elements, and methods of production provide information about their provenance. The ceramics will also be compared with other archaeological samples in an attempt to determine their possible origins and uses. This chapter also discusses the origin and development of the ceramics unearthed from the Jiangjyun No. 1 shipwreck and those shipped to Taiwan, Kinmen or Penghu.

5.2 Potential Artefact Kiln Site

5.2.1 Porcelains

Test 277 "Blue-and-White Porcelain Bowl with Auspicious Cloud and Phoenix Patterns" in similar styles are also seen in the artefacts found in the shipwreck “Tek Sing” (泰興號) and Penghu No. 1. (Figure 5.1). Objects like this work were made in Zhangzhou Kiln, Anxi Kiln (安溪窯), Huaan Kiln, and Dongxi Kiln (東溪窯) in the Minnan area in early times, around the late Ming dynasty to the early Qing dynasty. Before the mid-Qing dynasty, such export porcelains were shipped to “Yuegan harbour” (月港) near Zhangzhou Kiln for exportation. As they were shipped to “Xiamen Harbour” (廈門港) for exportation later, Xiamen Harbour gradually replaced the role of Yuegan Harbour to become a major port of departure for porcelain exports (Sung 2022:71).

Ceramic and porcelain kilning in Fujian Province started very early, and most products were shipped overseas influencing the export market. In the Song and Ming dynasties, kilns were built across Fujian for local kilning, reflecting the heyday of ceramic and porcelain arts. For example, from 1821-1850, during the reign of Emperor Daoguang of the Qing dynasty, the Chinese merchant ship “Tek Sing” sailed from Xiamen Harbour. Unfortunately, it sank near Indonesia and was not recovered until 1999. Most objects found in the wreck were white and blue porcelain made by private “Dehua” Kiln in the middle to late Qing dynasty. From about 350,000 recovered objects, there are some highly similar to this work. “Blue-and-White Porcelain Bowls with Auspicious Cloud and Phoenix Patterns” identical to this work were also found in

Nanshazhou No. 1 wreck found in 2009[4]. As an imagined animal symbolizing auspice, “the phoenix” has been the beloved of oriental countries for thousands of years. Take porcelain, for example. From 1465-1487, during the reign of Emperor Xianzhong of the Ming dynasty, the official kilns in Jingde Town had mass-produced “phoenix-pattered bowls” with neatly painted patterns in a standard format.

Similarly, Test 263 "Blue-and-White Porcelain Plate with Four-Fish Patterns " was also found to be produced in Zhangzhou Kiln in a similar style (Sung 2022:73). Anxi Kiln and Huaan Kiln considered the heir of Zhangzhou Kiln, had also mass-produced the four-fish-patterned plates for domestic and export uses, also excavated from the shipwreck Penghu No. 1. (Figure 5.2). Test 5 "Blue-and-White Porcelain Blow in Expressive Grass Patterns", Besides Anxi Kiln in Minnan, where objects with such kinds of patterns were made, similar blue-and-white porcelains were also made at Dongxi Kiln. These porcelains were made for both domestic and export uses. Similar objects were also found in the “Tek Sing” and “Vũng Tàu” shipwrecks (Figure 5.3).

Test 20 "White Glaze Spoon" was also made during the reigns of emperors Jiaqing and Daoguang, such a kind of spoon was made at Dongxi Kiln, the rice-yellow glaze porcelains from Dongxi Kiln are characterized by fine cracks (ice cracks) on the surface. The same type of spoons was also produced at Anxi Kiln. The products of both Dongxi Kiln and Anxi Kiln are similar. As part of the Zhangzhou Kiln, they inherited the style.

[4] Government of Hua'an County, Fujian Province. 2016. Hua'an Dongxi Kiln. Cultural Relics Publishing House.

Figure removed due to copyright restriction

Figure 5.1 Blue-and-White Porcelain Bowl with Auspicious Cloud and Phoenix Patterns of the shipwreck Penghu No. 1. (Source: Cultural Assets Bureau of the Ministry of Culture)

Figure removed due to copyright restriction

Figure 5.2 Blue-and-White Porcelain Plate with Four-Fish Patterns excavated from the shipwreck Penghu No. 1. (Source: Cultural Assets Bureau of the Ministry of Culture)

Figure removed due to copyright restriction

Figure 5.3 Blue-and-White Porcelain Blow in Expressive Grass Patterns excavated from the Vũng Tàu Shipwreck, Vietnam. (Source: The Vũng Tàu Museum)

5.2.2 Ceramics

Ceramics Test 23 "Wide-Mouth Flat-Belly Pottery Alms-Bowl", Test 229 "Small-Mouth Triangular Gray Glaze Urn" and Test 265 "Pottery Medicine Urnboth" were made during the Ming to Qing dynasties. Besides Cizao Kiln (磁灶窯) and Dongxi Kiln, similar pottery alms bowls were made in many kilns in Minnan. Originally, an “alms bowl” was a food container used by monks. In Kinmen, Taiwan, several civilian families also used this kind of red pottery alms bowls in their daily lives. In addition, large ceramics urns like Test 18 "Converged Mouth and Vertical Urn" were often used for making pickles. In the past, when the financial condition was not good, commons made pickles for use in the long winter. While the demand was high, kilns in Minnan and Guangdong also made such a kind of urns which are still used today.

Test 194 "Scrolled-Lip Broad-Shoulder Engraved-Line Urn" was often used to contain wine, oil, salt, or pickles. Besides embellishing the urn, this pattern also made the urn more durable and prevented the urn from falling during handling. Such a kind of urns had been produced in Guangdong. In the late Qing dynasty, the same type of urns was also made at kilns in Foshan, Guangdong. Kilns in Foshan were famous in the Tang

and Song dynasties. They started operations in the Tang dynasty and continued to the Song and Yuan dynasties. Major products included blue-and-white porcelains, bluish-white porcelains, black glaze porcelains, and yellow porcelains. The forms included bowls, plates, cups, dishes, vases, pots, cuspidors, and urns.

Test 238 "Wide-Mouth Curved-Shoulder Lugged Urn" was made by Cizao Kiln in Jinjiang. Cizao Kiln was famous for making blue-glazed porcelains, soy-glazed porcelains, and plain bodies and had mass-produced products for export and use by local kitchens or as tea sets since the Song and Yuan dynasties.

5.2.3 Miscellaneous

potteries building materials (Test 107and 21AUG009), their colours and lustres are highly correlated to the kilning condition. In the past, most construction materials used in Taiwan were imported from Fujian. These construction materials included red bricks, rectangular bricks, trapezium bricks, tubular tiles, flat tiles, and eave-end covers. Tiles, bricks, and wood are the three fundamental materials for building a house. They varied in shape, such as vertical or bent, and were mostly made in Quanzhou, Zhangzhou, and Xiamen.

The “red brick culture” started in the Minnan and Taiwan regions as early as the Song dynasty. As the clay in Minnan was red, bricks made with this red clay were robust, durable, and waterproof. By bonding these red bricks into different patterns on the door frames, windowpanes, or walls, stunning Minnan architecture is characterized by red brick culture. This shows that Taiwanese architecture was inherited from Minnan architecture.

Qianlong copper coin (Test 281) with the four characters "Qianlong Tongbao" (乾隆通寶) on one side and two lines of Manchu language on the other side, with the word "bao" (寶) on the left, and the name of the factory that minted the coin on the right (Figure 5.4). It was a copper coin made in the fifth year of the Qianlong period (BCE1741) and made in Fujian Province.

Figure removed due to copyright restriction

Figure 5.4 Test 281- The schematic diagram of the Qianlong copper coin.
(Illustration by Hsu, Han-Yin)

5.3 Comparative Study

Compared with three internationally famous shipwrecks of similar ages (seventeenth to eighteenth centuries), cultural artefacts show the consistency or similarity of porcelain and objects. Blue-and-white porcelain is an example of preliminary investigations in Taiwan, Japan, Indonesia, Malaysia, the Philippines, Singapore and other places. Both in quantity, variety and the characteristics of the times, these historical artefacts provide favourable evidence for their dating.

5.3.1 Sydney Cove 1797, Australia

In February 1797, the merchant vessel Sydney Cove was wrecked while on a voyage from Calcutta to the newly established British penal colony at Port Jackson, Sydney while carrying speculative cargo, which included alcohol, foodstuffs, livestock, textiles, luxuriance (Staniforth 2003:65). In recent years the archaeological excavation of the Sydney Cove wreck site has revealed aspects of the cargo including a total of 250 kg of Chinese export porcelain. This provides material evidence about the piece of ware, such as water flasks and chamber pots. The majority of the porcelain was polychrome painted in the so-called famille rose underglaze blue painted, and 90 kg of overglaze export porcelain was recovered.

Initial survey work and excavations were carried out during 1977, 1978 and 1980. The wreck structures and artefacts were clustered in an area of approximately 40 x 10 meters on a sandy seabed strewn with seagrass (Staniforth 2003:78). The site lies about 400m off the southern of the area produced by navigator Matthew Flinders in January 1977 with the assistance of an original chart The wreck of the Sydney Cove was relocated by divers (1996) and Strachan (1986). In March 1977, the area around the site and associated land were declared a historic site under the National Parks and Wildlife Act 1970 (Staniforth 1998:4). It was subsequently declared a historic shipwreck in 1984 under the provisions of the Historic Shipwreck Act 1976.

The Chinese export porcelain found at the shipwreck Sydney Cove site must have been made around 1796 or before 1796, mostly made in Jing De Zhen (Jiang Xi province, China). Of the total 250kg of Chinese porcelain exported, 160kg of underglaze blue and 90kg of polychrome overglaze were exported. The vast majority of these porcelains are fragments, and less than 1% of the artefacts are complete, most of which were damaged after the ship's hull collapsed.

Among them, an underglaze blue-painted tea saucer with steeply rounded sides and hot-water (or warming) dish, is typical Chinese porcelain, with a light and thin structure, decorated with oriental elements such as rivers, pavilions, and willows (Staniforth 1998:26). This freehand painting of blue-and-white porcelain has the same technique as the Jiangjyun No. 1 shipwreck porcelain Test 5- Blue-and-White Porcelain Blow in Expressive Grass Patterns.

5.3.2 The Nanking Cargo 1752, South China Sea

In January 1752, the ship Geldermalsen of the Dutch East India Company (Vereenigde Oost-Indische Compagnie, VOC) ran aground. It sank in the South China Sea on the 16th day on its way back to the Netherlands from Guangzhou, China. Tea, raw silk, textiles, dried wares, groceries, gold and china porcelains are shipped on board. Captain Michael Hatcher and his team excavated a large amount of cargo in 1985 and auctioned it at Christie's in Amsterdam (Colin 1987:22). The collective name of this batch of freight is called "Nanking Cargo", then the ship is also called "the Nanking Shipwreck".

Among them, China porcelains were initially bottled in Jingdezhen, Gyangze Province, transferred to Nanjing, and finally shipped to the Netherlands. Its "Nanjing style" originated from the Kangxi period of the Qing Dynasty (1661-1722). A large number of Chinese blue-and-white porcelain produced in Jingdezhen was exported, and they were all shipped from Nanjing Port to European countries. Therefore, Western countries called it "Nanking Porcelain". The types of porcelain in this period include teacups, saucers, coffee cups, teapots, and milk jugs. These blue-and-white porcelain decoration motifs are mainly landscapes, pavilions, towers and pavilions, also known as the "Nanking Pattern", a freehand painting full of Chinese imagery that belongs to the pattern of Nanjing porcelain, which was made in Jingdezhen in southern China during the Qing Dynasty.

5.3.3 Vũng Tàu 1690, Vietnam

In 1989, a Dutch shipwreck, Vũng Tàu, was discovered offshore from the southern part of the Vũng Tàu port in Vietnamese waters. In 1990, the Vietnamese government cooperated with Swedish agencies to conduct underwater archaeology. As of 1991, a total of 48,288 artefacts have been excavated, including a large number of ceramics from the late seventeenth century. In addition, it was found that some of the ship's wood

was severely scorched, which indicated that the vessel might have sunk due to fire. This shipwreck is presumed to be around 1690. It was a shipwreck in the Kangxi period of the Qing Dynasty (1662-1722). It was the hull of a Western-style Chinese three-masted sailing ship and the first ship that combined Eastern and Western elements.

From the analysis of artefacts, the ship is going to Batavia from China to head to the Netherlands. The goods include bamboo combs, ink bottles, tweezers, dice and dishes, including much blue-and-white porcelain from Jingdezhen in the Qing Dynasty that has been restored. During this period, Western culture influenced porcelain export in the South China Sea countries the most (Edgar 2020:14). Many of the utensils used by Europeans were brought to the East by Western merchants. Some of them had unique functions and shapes following the specific dietary needs of Europeans; Some porcelains were made after Europeans gave China "drafts".

These porcelains' shapes, patterns and uses have been Europeanized and are no longer traditional Chinese vessels. The Vũng Tàu Museum in Vietnam partly owns these cultural artefacts. Most of the Kangxi porcelains in the goods are collected, including spice dishes and Kangxi porcelain vases decorated with Dutch canal houses. The artefacts are incredibly exquisite and represent typical goods produced by the booming Netherlands based on the needs of its upper-class customers. Most of them are functional luxury items, such as tea, coffee and hot chocolate (popular beverages) that only the rich can afford. All three are exotic and expensive, so exquisite foreign porcelain is needed, not local European pottery.

Among them, the Vũng Tàu artefacts in Vietnam include white porcelain printed round boxes, blue-and-white Lid-cup and vases, discs with interesting Taoist patterns that flourished in the middle and late Qing dynasties, and many Anping pots (Hsieh 1995:98), all representative trade mass goods exported to Europe during the Kangxi period. Not only the Blue-and-White Porcelain Blow in Expressive Grass Patterns mentioned in Figure 29 are similar to the Test 5 method and kiln source, but the Vũng Tàu shipwreck also excavated a round box made of floating white (Figure 5.5). Although the appearance and purpose are different, the kiln source of the white porcelain is similar to the Test 20-White Glaze Spoon of the Jiangiyun No. 1 shipwreck. The round box is characterized by a thin and completely white-glazed body, made of floating white, the lid is not polished, the top is decorated with white glaze engraved with peony flowers, and flutes are around it. It should be made in a Dehua, Fujian Province kiln, which is close to Test 20.

Figure removed due to copyright restriction

Figure 5.5 Floating white porcelain. (Source: The Museum of the Netherlands)

5.4 Place of Manufacture and Function

Analysis of the design and stylistic attributes of artefacts provides clues to where they were made. The vast majority of ceramics recovered from the shipwreck Jiangjyun No. 1 were made by Anxi Kiln, Dongxi Kiln, Zhangzhou Kiln, and Jinjiang Kiln in the Fujian and Minnan regions. Although there is reliable archaeological evidence, many kilns in this region were made of similar types of products, therefore precise identification of age remains problematic. But what is certain is that Anxi Kiln and Dongxi Kiln operated during the late Ming and mid-Qing dynasties and are located in Fujian (Sung 2022:121).

Test 194 "Scrolled-Lip Broad-Shoulder Engraved-Line Urn" carries an egg-shell appearance and has a thick lip and broad shoulder narrowing downward rapidly into a

triangular shape on a flat bottom, this type of clay pot was often used to contain wine, oil, salt, or pickles. The quantity is limited, so it may be a container for pickled food by the crew during the voyage, not a trade commodity.

It is worth noting that we found the "Wide-Mouth Flat-Belly Pottery Alms-Bowl" has a total of 141 pieces, and the "Small-Mouth Triangular Gray Glaze Urn" has a total of 32 pieces. The number is the largest type of ceramics in the Jiangiyun No. 1 shipwreck. In Kinmen, Taiwan, several civilian families also used this kind of red pottery alms bowls in their daily lives. The beauty of the bowl is not the main purpose, the practicality is. While the demand was high, kilns in Minnan and Guangdong also made such a kind of urns which are still used today.

5.5 Kiln Industry in Fujian Area and Ceramic Export Routes

The vast majority of ceramics recovered from the shipwreck Jiangjyun No. 1 were made by Anxi Kiln, Dongxi Kiln, Zhangzhou Kiln, and Jinjiang Kiln in Fujian and Minnan regions (Figure 5.6). They were then shipped directly to Taiwan, Kinmen, or Penghu from Yuegang (lit. Moon Harbor) in Zhangzhou or the Port of Xiamen. The abolition of the 150-year “oceangoing voyage ban” from the early Ming dynasty to the reign of Emperor Jiajing of the Ming dynasty led to the rapid development of the kilning industry in the mid-to-late Ming dynasty. The kilning industry further flourished during the Qing dynasty. As private maritime trade was banned during the oceangoing voyage ban, the once-busy Port of Quanzhou was eventually abandoned in the late Yuan dynasty. This made life difficult for Zhangzhou and Quanzhou locals. People developed Yuegang not far from Zhangzhou Kiln to find a way out. As the private business activities at Yuegang continued to thrive, the Ming government had no alternative but to establish Haicheng County in 1565 (the 44th year of the reign of Emperor Jiajing) to facilitate maritime trade management.

In addition to the agreeable weather all year round, coastal Fujian and Minnan have rich water resources and wood fuel. Alongside the convenient maritime traffic, Fujian became the “Maritime Silk Road” hub for ships sailing to the north or the south. As one of the three largest kilning regions in south China since the Southern Song dynasty, coastal Fujian became a major source of ceramic supply for Chinese merchant ships. In terms of routes, to the east, merchant ships reached Taiwan, Penghu, and the Philippines; to the north, they travelled to Ryukyu and Japan in the north via Taiwan and even to Korea (historically Goryeo 고려) and Japan further north via Mingzhou Harbor; to the

south, they sailed to Southeast Asia via Quanzhou and Guangzhou; to the west, they passed through the Strait of Malacca to maritime countries in the Indian Ocean and Africa and Europe in further west (Edgar 2020:12).

Figure removed due to copyright restriction

Figure 5.6 Kiln sites in Fujian during the Ming and Qing Dynasties. (Illustration by Han-Yin Hsu, Jui Chieh Chang)

Geographically neighbouring Jingde Town and Zhejiang Province, the home of ceramics, Fujian has a long history of ceramic-making. Through technology accumulation in the Qin and Han dynasties and the Period of Three Kingdoms, kilning technology advanced rapidly in the Tang and Song dynasties and drove the technological advancement of the ceramic-making industry, leading to the apex of both ceramic technology and art in the Ming and Qing dynasties. Fujian earned its fame for the black glaze porcelain from Jianyang Kiln, the porcelain (Blanc de Chine) from Dehua Kiln, the blue porcelains of Dongan Kiln, and porcelains from Cizao Kiln. As the demand was higher than the supply, kilns in Jingde Town and Zhejiang Province transferred orders for the white porcelain and blue porcelain to kilns in Fujian. After selection, qualified Fujian ceramics were then exported overseas. Particularly in the Ming and Qing dynasties, kiln works producing ceramics were everywhere in Fujian, including northern and southern regions, bringing the province to the golden era of ceramic craft. Among many kilns spreading across Fujian, porcelain from Dehua Kiln, Anxi Kiln, and Zhangzhou Kiln could best represent the Fujian porcelain in the Ming dynasty. Hence, the vast majority of ceramics recovered from the shipwreck Jiangjyun No. 1 were made by Anxi Kiln.

In the Song and Yuan dynasties, branches of Anxi Kiln spread across southwest, central, and northeast Fujian. However, they were shut down at the decline of Port of Quanzhou. When Yuegang began to rise in the mid-Ming dynasty, the revival of the local kilning industry followed suit. The local kilning centre also shifted to the northwest near Zhangzhou Kiln. Technologically, ceramics from these kilns belong to the Zhangzhou Kiln system, and most of them were exported to Southeast Asia. The development of Anxi Kiln continued during the Qing dynasty. Ceramics from Anxi Kiln were also recorded in the archaeology reports of Thailand and Vietnam.

The blue-and-white porcelain from Zhangzhou Kiln is characterized by a darker tone of blue and the “sand base” and “sand support” of containers. Most containers were bowls and plates. In addition to the blue-and-white porcelain, Zhangzhou Kiln also produced “painted porcelain”. The latter favours many Japanese who call it “wuzhou red-painted ceramics (akae あかえ)” or “wuzhou blue-and-white ceramics (sometsuke, そめつけ)”. Zhangzhou Kiln also deeply influenced Japan’s kilning tools and techniques.

Dongxi Kiln operated during the late Ming and mid-Qing dynasties and is located in Huaan County, Fujian (Li 1997: 27-29). Many archaeological surveys have been conducted since 1980, and up to 15 sites and 16 kilns were verified in 1992. Samples collected from these sites include white porcelains, blue porcelains, rice-yellow

porcelains, blue-and-white porcelains, monochrome glaze, and painted porcelains. Most of them are blue-and-white porcelains. Common blue tones include dark blue, bluish-grey, and bluish-black. Dongxi Kiln and Anxi Kiln inherited the style of Zhangzhou Kiln, and their products are similar.

5.6 Conclusion

By analyzing the type of ceramics and the origin of the kiln site, we can understand the transportation routes and manufacturing processes. The Jiangjyun No. 1 shipwreck only has a handful of exquisite blue-and-white porcelains, other artefacts are regarded as daily necessities, and the people's livelihood products will also remain records of many cultures and lifestyles. The various porcelains and ceramics found in the shipwreck represent Taiwan and China's maritime trade. But comparing the other three shipwrecks, whose delicacy is similar to that of kiln sources, most of the blue-and-white porcelains are pointed out in the Kangxi period of the Qing Dynasty (1662-1722), and the items are all ceramics exported from China to other countries. Regarding navigation routes, the shipwreck Jiangjyun No. 1 seems to be between Taiwan and China; Vung Tau (1690) and the Nanking Cargo (1752) were both wrecked on the way from China to Holland. In terms of the characteristics of travelling to and from China, they are also very similar. From this, it seems that Little Taiwan is very active in the Great Navigation Time and has not been absent from international maritime activities.

Chapter 6. Conclusion

6.1 Readdressing the Research Question and Aims

The research question to be solved in this study is what is the origin and purpose of the artefacts carried on the Jiangjyun No. 1 shipwreck? To address this question, details of the artefacts were recorded in a storeroom kept on site and described the morphological and stylistic attributes. This study draws on relevant historical and archaeological evidence from maritime archaeological sites of the seventeenth and eighteenth centuries and studies the route and kiln of ceramics transported from China to Taiwan and Southeast Asia during the Qing Dynasties (1644 to 1911). And also compares the porcelains and ceramics from the corpus of contemporaneous shipwrecks. Placing artefacts in trade ceramics is discussed in a broader context. These goals are discussed separately below.

1. Provide an overview of the route and kiln of ceramics transported from China to Taiwan and Southeast Asia during the Qing Dynasties (1644 to 1911).

This study investigates Chinese ceramics found in the seventeenth and eighteenth centuries maritime archaeological sites, and uses existing documents and historical texts to establish the status of China's ceramic trade in the Qing Dynasty (1644 to 1911).

Most of the Ming, Qing and modern ceramics found along the coast of Fujian are Jingdezhen, Zhangzhou, Dehua and Anxi kilns, proving that the coastal area of Fujian was an important maritime trade channel at that time. Due to its convenient location, Fujian has become a hub for north-south navigation on the "Maritime Silk Road" and is the main source of ceramic supplies for Chinese merchant ships. It is famous for its black glazed porcelain, white porcelain and celadon.

Archaeological evidence proves that after the policy of cross-strait exchanges gradually opened up (1735, Qianlong). Ports such as Luermen in Tainan, Lukang in Changhua, Balidong, and Wushi in Yilan have opened up one after another. China's Zhangzhou, Quanzhou, Fuzhou, Shandong, and other merchant ships have also gradually increased (Chen 2005:87). The route from China to Manila and the trade from Fujian to Manila via Penghu have not been interrupted.

Archaeology evidence about the Zhangzhou kiln has been unearthed abroad, such as in the Kansai area of Japan, the Philippines, Singapore, Malaysia, Indonesia and other Southeast Asian regions (Li 1997: 27). The Vung Tau merchant ship also discovered

blue-and-white porcelain, Anping pots and Kraak porcelains from the middle and late Qing Dynasty. The ship appears to have departed from a Chinese port for Jakarta.

2. Analyse the morphological and stylistic attributes of the artefacts from the Jiangjyun No. 1 shipwreck and determine their typology.

502 pieces of artefacts excavated from the Jiangjyun No. 1 shipwreck were examined in detail. Descriptive records of their properties, decorative elements, and methods of production provide information about their provenance, and representative artefacts were studied. Most of the Porcelains are made of blue-and-white porcelain, and most of them are damaged, with freehand brushwork as the main pattern feature. Ceramics is the most numerous artefacts, "Wide-Mouth Flat-Belly Pottery Alms-Bowl" and "Small-Mouth Triangular Gray Glaze Urn" are both thick wall and flat bottom but no glaze or pattern, the body is greyish-red. There are 141 pottery bowls of the same style. The largest one is 47 cm high and 37 cm in diameter, and the smallest one is 8.7 cm high and 13.5 cm in diameter. To shorten the production time, craftsmen made the bottom before casting the bowl upwards and finished the object by “socket kilning”. A large number of low-quality ceramics also proves that these cargoes are daily necessities, non-aesthetic display collections.

3. Compare the porcelains and ceramics from the corpus of contemporaneous shipwrecks.

Compared to the Jiangjyun No. 1 shipwreck with three international shipwrecks of similar ages (the seventeenth and eighteenth centuries), cultural artefacts show the consistency or similarity of artefacts. Blue-and-White Porcelain and Expressive Grass Patterns excavated in the Vũng Tàu Shipwreck of the same period both prove similar characteristics in time. The various urns in the Jiangjyun No. 1 shipwreck also indicate that they may have been used as shipping containers or as daily necessities for the crew. The largest number of porcelains and ceramics found in the Jiangjyun No. 1 shipwreck were made by Anxi Kiln, Dongxi Kiln, Zhangzhou Kiln, and Jinjiang Kiln in Fujian and Minnan regions. This type of pottery is not part of any decorative collection purposes, but belongs to daily life, used to contain wine, oil, salt, or pickles.

6.2 Significance and Limitation

6.2.1 Significance

The Jiangjyun No. 1 shipwreck provides evidence of early navigation in Southeast Asia. The various porcelains and ceramics found in the shipwreck represent Taiwan and China's maritime trade. The typology of artefacts and the study of the origin of kiln sites will be beneficial to future research on the status of China's maritime trade in the seventeenth and eighteenth centuries. So far, research on The Jiangjyun No. 1 shipwreck has not conducted a systematic analysis of the artefact's characteristics and uses. The combination of archaeological findings based on shape, age, function, and context analysis provides us with important clues to determine the age and source of the artefacts. For example, in the past, only a copper coin has been used for dating, which can only be used as a reference to provide an upper limit for age. Now it can be inferred from the shape, decoration and traces of the use. This is significant for discussing the Jiangiyun No. 1 shipwreck shipping route and trade exchange in Taiwan. Based on the research on the kiln sites of Anxi Kiln and Dongxi Kiln, we further analyzed the transportation routes and determined the age when the Jiangjyun No. 1 shipwreck was active.

6.2.2 Limitations

From 1995, the excavation project started at the National Museum of History; until 2022, The Center for Ocean and Underwater Technology Research of Tamkang University, commissioned by the Bureau of Cultural Heritage, implemented "The Jiangjyun No. 1 shipwreck artefact inventory project", A total of 502 pieces of artefacts have been released, includes the production of artefacts inventory form and records but does not include restoration. Due to time constraints and limited research, research can only be conducted on representative artefacts, and the rest have not yet been completed. Most of the bricks and tiles are left at the shipwreck site, so it is difficult to investigate this part. The existing excavation and restoration process needs to be improved and documented in detail. For the deduction of the age of the Jiangjyun No. 1 shipwreck, it is necessary to consider the discarding of later generations and artificial reasons, such as the interference of the natural environment, as well as the overall archaeological context of the shipwreck.

The Jiangjyun No. 1 shipwreck's artefacts are scattered in the Cultural Affairs Bureau, Penghu County Government; Penghu Living Museum; and Bureau of Cultural Heritage. The storage methods of the three locations are different, making recording and preservation more difficult. The threat and strength of the various management agencies are as follows in Table 6.1, which is also provided to the competent authority as a reference for future planning in section 6.3.

Table 6.1 The threat and strength of the artefact's storage location.

Location	Pieces/ Type	Threat	Strength
Cultural Affairs Bureau, Penghu County Government	475 / all types	1. Only an old air conditioner is used to maintain the artefact's temperature; it even broke down and needed to be repaired. It emits a peculiar smell, and the probability of artefact decay is high. 2. Many artefacts are stacked here, not only the Jiangjyun No. 1 shipwreck artefacts. There is no precise serial number, which is easy to be mistaken. 3. Artefacts have no protective measures and are only placed directly on the shelf. 4. Wooden objects use several orange plastic baskets to place in the corner, surrounded by other cartons, easy to ignore	1. It is convenient and easy to take because it is placed directly on the shelf. 2. There are many shelves that can store a large number of artefacts.
Penghu Living Museum	15 / Delicate ceramics and porcelains, Qianlong	1. Most of the stores here are high-quality artefacts, but the temperature and humidity of the site are unknown. 2. Some artefacts are displayed with a "fishing line" tied to the wall, and some are fixed with clay on the display stand, both of which have a chance of falling.	1. The display window of the transparent glass cabinet separates the public, which is safe and secure. 2. Artefacts are clearly numbered and marked, easy to find.

	copper coin	3. There are no rules for rotating exhibitions, and exhibits cannot be regularly maintained and inspected.	
Bureau of Cultural Heritage	12 / Ceramic, bowls, bricks	1. A large number of plastic baskets are stacked. Taking out the bottom plastic basket may take a lot of time. 2. The temperature and humidity control is unknown.	1. Artefacts have clear index labels, which are very convenient to search. 2. Artefacts are wrapped with "acid-free paper", and the fragile material is protected with cut EPE, showing the preservation staff's care.

6.3 Recommendation for Future Research

The Jiangjyun No. 1 shipwreck is the first underwater archaeological research in Taiwan. Although it is imperfect from planning to implementation, it can be used as a good case for reference and reflection. Furthermore, it is hoped that the Jiangjyun No. 1 shipwreck will be used as a benchmark for succession and a new milestone for Taiwan's underwater cultural assets. The Jiangjyun No. 1 shipwreck artefacts have not been appropriately preserved for over 20 years and are extremely fragile. Until 2021, the Bureau of Cultural Heritage has carried out preliminary preservation and maintenance. In the future, it is expected to optimize the preservation environment:

1. Taking the Cultural Affairs Bureau, Penghu County Government as an example, the annual average relative humidity (RH) in Penghu is 82%. It is recommended that artefacts be stored for protection and preservation in the future;
2. It is hoped that the 15 exhibits in the Penghu Living Museum will be able to establish a role in the exhibition so that the exhibits can be regularly maintained and inspected; and
3. Artefacts are scattered everywhere, making it difficult to manage them effectively. Centralized management is recommended.

If it is desired to date the shipwreck more accurately, instead of inferring or guessing, the competent authority may plan to date organic matter such as wood and fruit stones in the future. Possible future analyses for hulls and artefacts include:

a、 Shape analysis: observe, measure and analyze the shape characteristics of cultural artefacts, such as shape, type, size, weight, and decoration;

b、 Age analysis: use radiocarbon or other scientific and technological methods, as well as stratigraphic data, reference and comparison of historical data to carry out absolute or relative dating;

c、 Material analysis: use X-ray fluorescence spectrometry (XRF), X-ray diffraction analysis (XRD), electronic micro-detection and other methods to analyze the material of the water artefacts;

d、 Functional analysis: use methods such as shape, traces of use, or ethnography to analyze the use function of water cultural artefacts;

e、 Context analysis: use historical documents and archaeological records to analyze artefacts' cultural and historical context.

Whether it is "in-situ preservation" or "excavation from water", protection and management must be strengthened. To prevent the loss of important archaeological evidence, the government should pay attention to preservation in order to conduct effective research and sustainable development. Taiwan has been investigating underwater cultural assets since 2007, which has been about 16 years. Over the past ten years, the Bureau of Cultural Heritage has invested a lot of effort in underwater cultural assets, especially the representative shipwreck "the Jiangjyun No. 1", which has played an important role in investigating, researching and promoting Taiwan's underwater cultural assets.

In terms of public education and promotion, it is also one of the important links to maintain the integrity of the underwater archaeological site to make the community aware of underwater cultural assets, to encourage the public to understand "do not touch, do not take back, and do not buy or sell", and immediately report to relevant units, push toward community engagement in public archaeology.

In terms of the preservation of artefacts, the Jiangjyun No. 1 shipwreck artefacts are scattered everywhere, making it difficult to manage them efficiently. The humidity and temperature of the place where the cultural artefacts are stored are too high, which may worsen the deterioration of the artefacts over time. Therefore, it is recommended to optimize the preservation environment in the future. Regarding research, continue to regularly supplement and update information to maintain integrity.

References

Amanda M. E., A. R. Matthew and E. L.Margaret. 2010. Local Resources, Global Heritage: An Introduction to the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage. *Journal of Maritime Archaeology*. vol. 5, No. 2, p. 79-83.

Bobby, O. 2007. Zhangzhou ware in the Philippines - the San Diego and San Isidro shipwrecks: Reflections on Philippine Ceramic Trade on Swatow Wares in the 16th Century. National Museum of the Philippines. Yuchengco Museum.

Ceramic Art Editorial Department. 2002. Penghu Jiangjyun No. 1 Shipwreck and Discovery of Underwater Archaeology. *Ceramic Art*. No. 34, p. 86-91.

Chen, G. D. 2005. Taiwan's Mountain and Sea Experience. Yuan-Liou Publishing Co., Ltd. p. 87.

Chen, S. S. 1995. The Uniqueness of Penghu's Historical Development-Unique Phases and Characteristics. *Thinking and Words*. vol. 33, No. 2, p. 131-156.

Chen, Y. Y. 2000. Proceedings of the Symposium on Underwater Archaeology on Both Sides of the Taiwan Strait. National Museum of History.

Chen, Y. Y. 2001. The exhibition of the underwater archaeological study of the Sunken "Jiangjyun No. 1" in the Penghu Sea Area. National Museum of History.

Cheng, Y. C. 2008. Challenges from the Ocean: A Study on the Evolution of Maritime Trade Policy in the Ming Dynasty. Daw Shang Publishing Co., Ltd. p. 346-347.

Colin, D. S. 1987. The Nanking Cargo of Chinese Porcelain and Gold. Asian Affairs. vol. 18, No. 1, p. 22-29.

Edgar, V. 2020. Tracing the timeline of Chinese export porcelain with the help of shipwrecks. University Alberta. p. 12.

Editorial Committee of the National Museum of History. 2000. Development of Underwater Archaeology and Contribution to the Preservation of Cultural Artefacts- A Collection of Essays on a Century of World Culture. National Museum of History.

Editorial Committee of the National Museum of History. 2001. Special Collection of Underwater Archaeology Exhibition of the Jiangjyun No. 1 Shipwreck in Penghu. National Museum of History.

Flecker, M. 2002. The ethics, politics, and realities of maritime archaeology in Southeast Asia. *The International Journal of Nautical Archaeology*. vol. 31. p. 12-24.

Government of Hua'an County, Fujian Province. 2016. Hua'an Dongxi Kiln. Cultural Relics Publishing House.

Hsieh, M. L. 1995. Overview of Anping Pots. Institute of Art History, National Taiwan University. p.98.

Hsieh, M. L. 2002. The Porcelain in the Ship "Jiangjyun No. 1" in Penghu. *Forbidden City Cultural Artefacts Monthly*. vol. 19, No. 10, p. 28-41.

Hsieh, M. L. 2009. 17th-century European, Japanese and Southeast Asian ceramics unearthed from the ruins of Jeranja. Kanazawa University Archaeology. p. 8.

Huang, Y. C. 1997. Looking for the Ancient Shipwreck in Penghu-Archaeological Records of Jiangjyun No. 1 Under the Sea. *Journal of Geography*. vol. 110, p. 104-115.

Huang, Y. C. 1998. On the Preliminary Excavation of the Ancient Shipwreck in the Waters of Penghu. *Newsletter of the Chinese Society for Ethnology*. vol. 36, p. 12-16.

Huang, Y. C. 1999. Report on the Excavation of the Ancient Shipwreck Jiangjyun No. 1 in Penghu, National Museum of History.

Huang, Y. C. 2000. The Value of Underwater Archaeology and the Major Achievements of the Century: From the Archaeology of the Shipwreck of Jiangjyun No. 1. National Museum of History. p. 47-72.

Huang, Y. C. 2001. The Value of Underwater Archaeology and Major Achievements of the 20th Century- Special Collection of Underwater Research on the Shipwreck of General Penghu No. 1. Taipei: National Museum of History. p.10-23.

Huang, Y. C. 2001. The Value of Underwater Archaeology and the Major Achievements of the 20th Century—From the Archaeology of the Penghu Jiangjyun No. 1 Shipwreck. *Historical Artefacts.* vol. 11, p. 5-19.

Huang, Y. C., S. X. Lin, S. Z. Yang and D. F. Xu. 1996. Preliminary Investigation Report on the Excavation of Ancient Shipwrecks in Penghu Waters. National Museum of History.

Huang, Y. C., S. Z. Yang. 1996. Report on the Preliminary Investigation of the Excavation of Ancient Shipwrecks in Penghu Waters. National Museum of History.

Jiang, S. S. 2002. De Dagregisters van Het Kasteel Zeelandia, Taiwan. Tainan City Government. vol. 2, p. 317-330.

John, D. B., P. D. James, L. V. Prott, etc. 2010. Underwater Cultural Assets Series (3) Proceedings of the International Round Table Conference on Underwater Cultural Assets Protection, Preparatory Office of Cultural Assets General Management Office. Cultural Assets Bureau of the Ministry of Culture.

Jon, C., G. Jeremy, etc. 2010. Underwater Cultural Assets Series.

Kadi, Y. F. 1988. The Historical Development of Southeast Asia. Shanghai Translation Publishing House. p. 465.

Li, J. A. 1997. Investigation and Discovery of Zhangzhou Kiln. Fujian Provincial Museum. vol. 1997. Jan. p.27- 29.

Li, J. A. 2020.Investigation of Gaofutou Kiln Site in Shunchang, Fujian. *Elephant Archaeology*. vol. 2020. Nov. p.36.

Li, J. M. 1990. A History of Overseas Trade in the Ming Dynasty. China Social Sciences Press. p. 116-117.

Lin, S. X. 2002. An Analysis of the Ancient Sunken Ship in Penghu "Jiangjyun No. 1". *History Monthl*y. No. 169, p. 12-19.

Lin, Y. R. 1996. The Space Structure of Taiwan Ports in the Qing Dynasty. Taipei: Zhishufang Publishing House, p. 174-179.

Liu, J. Y., W. M. Tian, X. W. Xue, R. K. Qiu. 2018. The Protection and Monitoring of Underwater Cultural Assets: Taking "Jiangjyun No. 1" and "Guangbing Ship" as Examples. *Marine and Underwater Science and Technology Quarterly*. vol. 28, No. 2, p. 87-104.

Lu, T. L. 2007. The Prospect of Underwater Archaeology in Taiwan-From "Penghu Jiangjyun No. 1. Journal of National Museum of History. vol. 35, p. 73-83.

Luo, S. Z. 2011. The Story of Jiangjyun No. 1. *Scientific Development*. No. 458, p. 24-31.

Margaret, E. L. 2010. Cooperation is the Key: We Can Protect the Underwater Cultural Heritage. *Journal of Maritime Archaeology*. vol. 5, No. 2, p. 85-95.

National Sun Yat-sen University. 2017. Report on the Results of Research Cases on Underwater Cultural Assets Monitoring and Management. Cultural Assets Bureau of the Ministry of Culture. p. 89-110.

Staniforth, M. 2003. Material Culture and Consumer Society. Springer New York. p. 65-99.

Staniforth, M.1998. Chinese export porcelain from the wreck of the Sydney Cove (1797). Australian Institute for Maritime Archaeology Special Publication No. 12.

Sung, K. I, Z. H. Zang. 2022. Jiangjun No. 1, Penghu Island, Taiwan- The Research and Development of Artifacts. Cultural Assets Bureau of the Ministry of Culture.

Tatsuya, M. 1996. Wuzhou Swatow Ware. Aichi Prefectural Ceramic Museum. p. 3.

The English version of Taiwan's Underwater Cultural Heritage Preservation Act: https://db.lawbank.com.tw/Eng/FLAW/FLAWDAT0201.aspx?lsid=FL078806

The Thirteenth Museum Committee. 2008. International Symposium on Underwater Archaeology-Achievement Report. The Thirteenth Museum of New Taipei City.

UNESCO 2001 Convention website: http://www.unesco.org/new/en/culture/themes/underwater- cultural-heritage/2001-convention/

Valdes, C. O. 1993. The saga of the San Diego. National Museum. Inc.p.29.

Yang L. Z., J. Z. Liu. 1989. Discussion on the Penghu Shipwreck in the Qing Dynasty. The History of Penghu Development: Xitai Ancient Fortress Construction and the Centenary Academic Seminar of Ma Gongcheng. Penghu County Cultural Center. p. 275-307.

Yang, S. Z. 2000. The Historical Significance of the Excavation of the Shipwreck Jiangjyun No. 1 in the Qing Dynasty in Penghu- Proceedings of the Symposium on Underwater Research on Both Sides of the Taiwan Strait. National Museum of History.

Yang, S. Z. 2001. The Historical Significance of the Excavation of Jiangjyun No. 1 Shipwreck in the Qing Dynasty in Penghu. *Historical Artefacts*, vol. 11, No. 11, p. 20-33.

Yang, S. Z. 2002. Underwater Archaeological Excavation of the Sunken Ship "Jiangjyun No. 1" in Penghu. *History Monthly*. vol.169, p. 4-11.

Ye, Q. L. 1997. Investigation of Ancient Kiln Sites in Anxi, Fujian. *Cultural Relics Press*. vol.7. p. 63.

Zang, Z. H. 2014. Discovery and research of underwater archaeology in Penghu, Research Collection of the 13th Penghu Symposium. Cultural Bureau of Penghu. p.45-61.

Zang, Z. H. 2016. The first stage of the report series of the census of underwater cultural assets in the waters near Taiwan Report. Cultural Assets Bureau of the Ministry of Culture.

Zang, Z. H. and Q. G. Fu. 2013. New Horizons Under the Sea: 2013 Special Issue of Underwater Archaeology Achievements Exhibition. Cultural Assets Bureau of the Ministry of Culture.

Zang, Z. H., H. Z. Huang. X. W. Xue. 2019. The Second Phase of the Report Series of the Survey of Underwater Cultural Assets in the Seas Near Taiwan (1), (2), (3), (4). Cultural Assets Bureau of the Ministry of Culture.

Zang, Z. H., J. Y. Liou. 2009. Ocean and Taiwan Seminar: 2009, Taipei.

Zang, Z. H., J. Y. Liu, H. Z. Huang. 2018. Project Report Series for the Survey of Underwater Cultural Assets in the Seas Near Taiwan (1), (2), (3). Cultural Assets Bureau of the Ministry of Culture.

Appendix-

Artefact Inventory Record

Artefact Inventory Record

Artefact Name	Blue-and-White Porcelain Bowl with Auspicious Cloud and Phoenix Patterns
Inventory No.	Test 277
Age	Mid-Qing Dynasty
Materials	□Wood □Charcoal □Carbon □Ceramic ■Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 4.5 cm/ M.D. 12.5 cm/ B.D. 5.5 cm.
Provenience	T03-3 H64
Date Recovered	27. 7. 1998
Descriptions	A broken blue-and-white bowl with an embossed pattern on the bottom and the words "Test 277". Due to the exhibition reasons of the Penghu Living Museum, it is impossible to separate the plastic display stand for photographic recording.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	__70___% Preservation integrity of artefact. 【□ Almost complete (more than 85%) ■ Partially damaged (more than 65%) □ Severely damaged (below 50%) 】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum

Remarks	The 2001 publication notes[1]: "Blue-and-White Yunfeng bowl, with embossed pattern on the bottom, broken into three pieces to be pieced together."
Images	Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

[1] Chen, Y. Y. 2001. The exhibition of the underwater archaeological study of the Sunken "Jiangjyun No.1" in the Penghu Sea Area. National Museum of History.

Artefact Inventory Record

Artefact Name	Blue-and-White Porcelain Plate with Four-Fish Patterns
Inventory No.	Test 263
Age	Mid-Qing Dynasties
Materials	□Wood □Charcoal □Carbon □Ceramic ■Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 3.5 cm/ M.D. 17.5 cm/ B.D. 8.8 cm
Provenience	T01-1 F173
Date Recovered	2. 7. 1998
Descriptions	The blue-and-white porcelain plate with four fish patterns cannot be separated from the plastic display stand for photography due to the exhibition at Penghu Living Museum.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum

Remarks	The 2001 publication notes: "Four fish patterns, the mouth edge is slightly damaged."
Images	Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Blue-and-White Porcelain Blow in Expressive Grass Patterns
Inventory No.	Test 5
Age	Early -mid Qing Dynasty
Materials	□Wood □Charcoal □Carbon □Ceramic ■Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 3.5 cm/ M.D. 12 cm/ B.D. 6.5 cm
Provenience	800 meters from The Jiangiyun No. 1 shipwreck
Date Recovered	7. 9. 1995
Descriptions	Blue-and-White, edge defect, there is a handwritten word "Test 5" on the edge of the side defect.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_65__% Preservation integrity of artefact. 【□ Almost complete (more than 85%) ■ Partially damaged (more than 65%) □ Severely damaged (below 50%) 】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government-Orange box area.
Remarks	The 2001 publication notes: "Blue-and-White simple freehand brushwork."

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 24. 9. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	White Glaze Spoon
Inventory No.	Test 20
Age	Mid-Qing Dynasty
Materials	□Wood □Charcoal □Carbon □Ceramic ■Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 9 cm/ Width 4.7 cm.
Provenience	H171 ES0.7xW0.5
Date Recovered	27. 9. 1995
Descriptions	The broken handle of the white porcelain spoon has ice cracks on it. Due to the exhibition of the Living Museum, it cannot be separated from the plastic display stand for photographic recording.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_70__% Preservation integrity of artefact. 【□ Almost complete (more than 85%) ■ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum

Remarks	The 2001 publication notes: " broken handle."
Images	Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Wide-Mouth Flat-Belly Pottery Alms-Bowl
Inventory No.	Test 23
Age	Ming-Qing Dynasties
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 11.7 cm/ M.D. 20 cm/ B.D. 11 cm
Provenience	H171 ES0.7xW0.5
Date Recovered	27. 9. 1995
Descriptions	Well-preserved, with the words "Test 23" at the bottom.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum
Remarks	The 2001 publication notes: " well-preserved."

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Small-Mouth Triangular Grey Glaze Urn
Inventory No.	Test 229
Age	Mid-Qing Dynasty
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 20cm/ M.D. 11 cm.
Provenience	T02-1 H162
Date Recovered	2. 7. 1998
Descriptions	The urn is well-preserved with brown glaze and white mottled, and the words "Test 229" on the bottom.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government- Shelf F- F4.
Remarks	The 2001 publication notes: " brown glaze and well-preserved."

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 12. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Converged Mouth and Vertical Urn
Inventory No.	Test 18
Age	Ming-Qing Dynasties
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 43cm/ M.D. 36.7 cm
Provenience	H174 Southeast 1.2M, 1 North 1.2M, 1 East
Date Recovered	27. 9. 1995
Descriptions	The urn is well-preserved, the mouth edge is almost covered by white covering, there is a black protruding attachment on the mouth edge, and there is more white sediment at the bottom.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%) 】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government- Shelf B- B5.
Remarks	The 2001 publication notes: "18-1 includes a tile cover, well-preserved." However, the 18-1 tile cover cannot be found on the shelf.

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 5. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Pottery Medicine Urn
Inventory No.	Test 265
Age	Ming-Qing Dynasties
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 8.5cm/ A.C. 39.5/ M.D. 8.2 cm
Provenience	T01-1 F173
Date Recovered	7. 1998
Descriptions	The pottery medicine pot has part of the mouth rim broken and the words "Test 265" on the bottom.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government- Shelf F- F8.
Remarks	The 2001 publication notes: " broken."

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 13. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Scrolled-Lip Broad-Shoulder Engraved-Line Urn
Inventory No.	Test 194
Age	Mid-Qing Dynasty
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 33cm/ M.D. 8/ B.D. 13.5 cm
Provenience	T01 H161
Date Recovered	1. 6. 1998
Descriptions	There are large white marine attachments on the abdomen, and there are drilling marks below the decoration. There are three circles of decorations engraved on the widest part of the abdomen, and the words "Test 194" are engraved on the bottom. Well-preserved.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum
Remarks	The 2001 publication notes: "Green glaze, flat bottom, string pattern, slightly convex edges."

Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Wide-Mouth Curved-Shoulder Lugged Urn
Inventory No.	Test 238
Age	Late Ming-Mid Qing Dynasties
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	H 19.5cm/ M.D. 10/ B.D. 13.7 cm
Provenience	T04-1 H162
Date Recovered	7. 7. 1998
Descriptions	overglaze colour and well preserved, with the words "Trial 238" and some damaged holes on the bottom.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum

Remarks	The 2001 publication notes: "The texture of the four-series green glaze is fine and well-preserved."
Images	Figure removed due to copyright restriction Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Potteries Building Materials
Inventory No.	Test 107
Age	Qing dynasty
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	W 2.5cm/ D 24.5 cm/ H 20 cm
Provenience	T01
Date Recovered	3. 9. 1996
Descriptions	There are four bricks stacked on top of each other. One side has more white attachments and the words "Test 107" on it.
Significance Assessment	□Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_80__% Preservation integrity of artefact. 【□ Almost complete (more than 85%) ■ Partially damaged (more than 65%) □ Severely damaged (below 50%) 】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government- Shelf D- D8.

Remarks	The 2001 publication notes: " well-preserved."
Images	Figure removed due to copyright restriction

Login date: 11. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Potteries Building Materials
Inventory No.	21AUG009
Age	Qing dynasty
Materials	□Wood □Charcoal □Carbon ■Ceramic □Porcelain □Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	W 24cm/ D 14 cm/ H 2.5 cm
Provenience	N/A
Date Recovered	N/A
Descriptions	Two bricks with marine attachments on them.
Significance Assessment	□Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Cultural Affairs Bureau, Penghu County Government- Shelf D- D8.

Remarks	N/A
Images	Figure removed due to copyright restriction

Login date: 13. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Wei Hao Hsu

Artefact Inventory Record

Artefact Name	Qianlong copper coin
Inventory No.	Test 281
Age	Qing Dynasty
Materials	□Wood □Charcoal □Carbon □Ceramic □Porcelain ■Metal □Glass □Leather □Brick □Plastic □Rubber □Stone □Bone □Ivory □Seed □Bamboo □Miscellaneous_____
Dimensions (cm)	D 2.6 cm/ L (Inner-square) 0.6 cm.
Provenience	T02-1 H64
Date Recovered	29. 7. 1998
Descriptions	Qianlong copper coin have rust marks and white spots on them.
Significance Assessment	■Archaeological ■Historical ■Cultural □Artistic □Scientific □Scarcity ■Original □Technical ■Local □Miscellaneous _____
Conditions	_100__% Preservation integrity of artefact. 【■ Almost complete (more than 85%) □ Partially damaged (more than 65%) □ Severely damaged (below 50%)】 □ Marine bio-fouling □ Miscellaneous _____
Store Location	Penghu Living Museum

Remarks	The 2001 publication notes: " scorch marks, rust."
Images	Figure removed due to copyright restriction Figure removed due to copyright restriction

Login date: 16. 8. 2021

Inventory unit: Center for Ocean and Underwater Technology Research of Tamkang University

Inventory and photographer: Han Yin Hsu, Xi Yao Gao, Wei Hao Hsu