



## Fruit stones from Tiao Lei's tomb of Jiangxi in China, and their palaeoethnobotanical significance

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### ABSTRACT

Fruit stones were discovered in Mr. Tiao Lei's Tomb (around 300 AD) at Nanchang, China. The morphology and anatomy of the fruit stones were investigated. They are identified as belonging to three species, namely, Chinese plum (*Prunus salicina* Lindley), red bayberry (*Myrica rubra* Sieb. et Zucc.), and Chinese date (*Ziziphus jujuba* Mill.). These stones suggest the possibility of orchards in the local area, and the fresh or processed drupes of these three species probably played important roles in the tomb owner's life.

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### 1. Introduction

Fruits play an important role in our daily lives, as they are usually juicy and rich in sugars, which are easily digested and absorbed. Some fruit trees like apricot (*Armeniaca vulgaris* Lamarck) and David's peach (*Amygdalus davidiana* (Carrière) de Vos ex L. Henry) also produce beautiful flowers. China has a vast territory, complicated geography, and diversified climate, which led to rich plant resources, especially fruit species. It has been reported that there were around 670 fruit species, belonging to 158 genera and 59 families, which are native or have been introduced into China. Most are still grown or preserved as germplasm collection, but only a few have commercial value (Yu, 1979). The fruit trees cultivated in China are mainly native species, such as pear (*Pyrus bretschneideri* Rehder), peach (*Amygdalus persica* L.), and Japanese apricot (*Armeniaca mume* Siebold), etc. With the establishment of communications between China and the other countries, some exotic fruit trees, such as grape (*Vitis vinifera* L.), pistachio (*Pistacia vera* L.), common fig (*Ficus carica* L.), etc., were introduced into China more than one

thousand of years ago. There are also some excellent fruit trees, like cherry (*Cerasus vulgaris* Mill.), sweet cherry (*Cerasus avium* (L.) Moench), and pecan (*Carya illinoensis* (Wangenheim) K. Koch), etc., which have been introduced into China during the recent past. All these fruit species enriched the plant resources of China, and raised the living condition of the Chinese.

The indigenous fruit resources have been exploited by the inhabitants of China for a long time. Endocarps of hackberry (*Celtis* sp.) were unearthed in the Palaeolithic cave of Zhoukoudian, home to Peking man (*Homo erectus pekinensis*), which has been dated between 700,000 and 200,000 years old (Chaney, 1935; Shen et al., 2009). Later endocarps of *Celtis* were also discovered in Donghulin, a Neolithic site in Beijing which is nearly 10,000 years old (Hao et al., 2008). Other fruit remains like kernels of *Ziziphus jujuba* var. *spinosa* (Bunge) Hu ex H. F. Chow were discovered at a Neolithic site named Egoubeigang (around 7000 BP) in Henan (HM and CCMC, 1981). It is still unknown when and where fruit cultivation began in China. Documents such as the *Shijing* (Book of Odes), written around 500 BC, show that peach, Japanese apricot, Chinese plum (*Prunus salicina* Lindley), etc., were already cultivated in the northern part of China (Pan, 2003). Furthermore, images in tombs of the Han Dynasty (202 BC –220 AD) show that horticultural production co-existed with cereal production (Anon, 2001). Aside from these indirect records, there were also occasional discoveries

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of fruit remains during archaeological excavations. One of them was from the Han Tomb No. 1 at Mawangdui of Changsha (around 100 BC). Cereal remains, such as rice (*Oryza sativa* L.), wheat (*Triticum cf. turgidum* L.), common millet (*Panicum miliaceum* L.), as well as remains from cultivated fruit trees like Chinese pear (*Pyrus pyrifolia* (N. L. Burman) Nakai), Japanese apricot, red bayberry (*Myrica rubra* Sieb. et Zucc.), and Chinese date (*Z. jujuba* Mill.), were discovered (Anon, 1978). All the above demonstrate fruit cultivation and utilization in ancient China.

The Jin Dynasty (266 AD–420 AD) played an important part in the history of ancient China. During that period there were occasional wars in North China, which led to the movement of peasants from the north to the south. They brought novel tools and techniques of farming, which led to a rapid development of agriculture in South China. According to historical records during the Jin Dynasty the indigenous people of South China lived on fish and rice. With the coming of dry land agriculture, cereals like wheat and beans were cultivated and consumed (Yang, 2006). However, there is still little known about the agriculture and horticulture in Central and South China during the Jin Dynasty. Although a book named *Qimin yaoshu* (Important Arts for the People's Welfare) gave a detailed description of the agriculture of that age, it paid more attention to North China than Central and South China. Plant remains provide physical evidence for tracing ancient plant production and utilization. During recent years, an increasing number of studies have focused on the origin, domestication and cultivation of cereals of ancient China. However, fruit remains have usually been overlooked and have not been well described. For example, in Jiangxi Province, there has only been one report of stones of red bayberry (JPM, 1974), and one report of stones of red bayberry and peach buried as funeral objects in Nanchang to date (IAJ and NM, 2001). In order to gain a better understanding of the lifestyle of the ancient people, knowledge of their habit of fruit consumption is indispensable. In the present study, three types of fruit stones, namely Chinese plum (*P. salicina*), red bayberry (*M. rubra*), and Chinese date (*Z. jujuba*), were found well preserved in the waterlogged conditions at the site of Nanchang Railway Station. We have studied them in detail, including their morphology, anatomy, and palaeoethnobotanical significance. These fruit remains have enriched our knowledge of the daily life of people living during the Jin Dynasty.

## 2. Site description

The Nanchang Railway Station is located in the centre of Nanchang City, capital of Jiangxi Province in China (Fig. 1). In March 2006 an ancient tomb was discovered during construction work. An archaeological excavation was undertaken by the Institute of Archaeology of Jiangxi, under the direction of Prof. Jun Yang, one of the authors of the present paper. The walls of the tomb were constructed of brick, and there is no indication that the tomb was disturbed after burial (Fig. 2).

Inside the tomb, there was a coffin and 69 funereal objects (Fig. 2). The coffin was preserved in a waterlogged condition, and retained its natural colour. It was tightly sealed by a 60 cm-thick layer of mud, which isolated it from the atmosphere and thus prevented decay. When opened initially, the chamber of the coffin was also covered by nearly 40 cm of mud. After removing the mud, 27 antiquities, including a comb, a mirror, a table-shaped wooden inkstone, a celadon chamber pot for a man, as well as two wooden boards, and some copper coins, etc., were discovered. One wooden board, 47 cm long, 3.2 cm wide and 0.7 cm thick, displayed the name and birthplace of the deceased. The deceased was named as Tiao Lei, male, from Poyang County, 200 km northwest of Nanchang. This type of board, which has been occasionally unearthed in coeval tombs around Nanchang, could be interpreted as an ancient name card for those with a high status. Regarding the funereal objects such as the inkstone, name card, the deceased, Mr. Lei, was deduced to be not only an intellectual, but also a nobleman. With the analysis of tomb structure and burial artifacts, this tomb was considered to be one of the Eastern Jin Tombs at the Nanchang Railway Station, whose age should be 319–420 AD.

## 3. Materials and methods

Altogether, 90 fruit stones were uncovered in Mr. Tiao Lei's tomb, 30 of which were found inside the coffin (Fig. 3a). Outside the coffin there were a celadon pot (Fig. 3b) and a bronze wine-heating-three-legged jar (Fig. 3c), which also contained 30 fruit stones, respectively.

All the fruit stones discovered in Mr. Lei's tomb were preserved in a waterlogged condition. Most of the pulp had decayed, while all

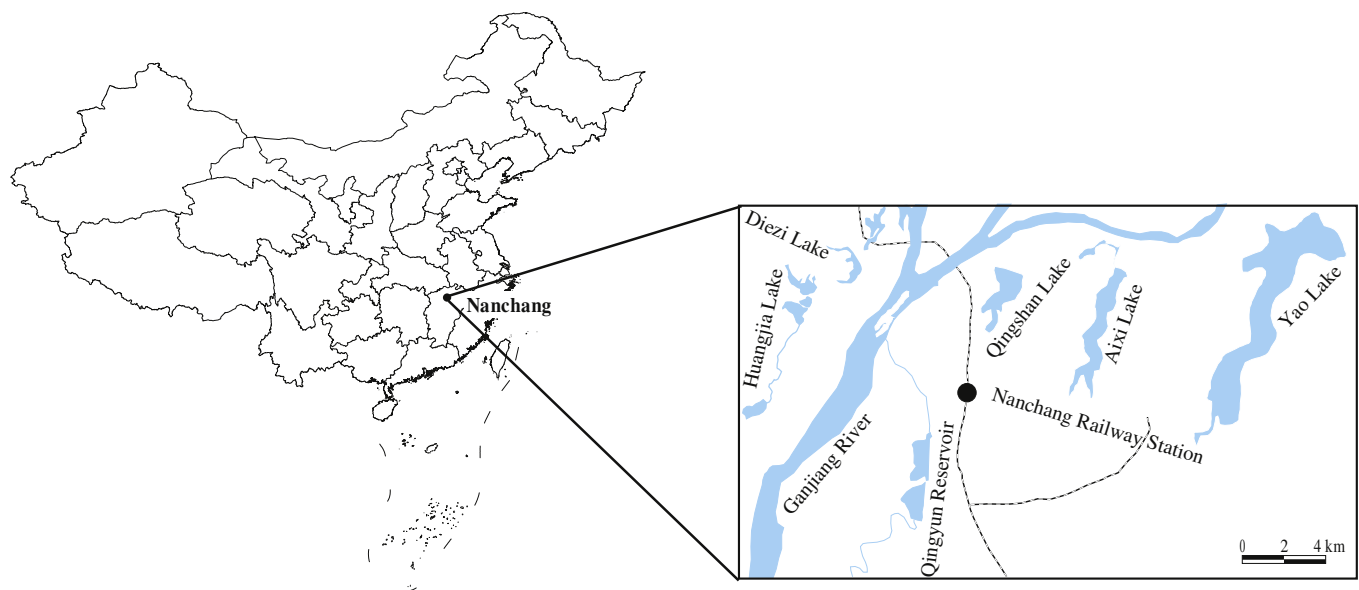


Fig. 1. Map of China showing the location of Nanchang city and the geography around Nanchang railway station (adapted from Wei et al., 2012).

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