

PREHISTORIC RICE AGRICULTURE IN THE YELLOW RIVER VALLEY

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ABSTRACT

In 1992 the flotation of carbonised materials from Lilou, a Longshan Culture site in Henan Province, yielded the first carbonised remains of prehistoric rice from northern China. But it is often forgotten that from as early as 1921 impressions of ancient rice have been found embedded in pottery in many northern sites, suggesting that rice was cultivated there from as early as 7500 BP. The origin of domesticated rice in China was probably further south in the Yangzi Valley, where it is known from an even earlier period.

China traditionally is divided into two parts; North China focused on the Yellow River Valley and South China dominated by the Yangzi Valley. The boundary between the two runs from the Qinlin Mountains to the Huaihe River. Since prehistoric times, millets (*Setaria italica* and *Panicum miliaceum*) have been the main crops of North China, while rice has been the main crop in South China. But when was rice first cultivated in the Yellow River Valley? Was there also prehistoric agriculture of rice there, as in the south?

The fact is often overlooked that Chinese archaeologists have found much evidence for the prehistoric cultivation of rice in the Yellow River Valley, following the first discovery by Andersson in 1921 of a grain imprint baked into a piece of pottery of the Yangshao Culture (Andersson 1934). Rice impressions in sherds of the Yangshao Culture were also recovered during the 1950s from excavations at the sites of Huanglianshu, Xiaji and Xiawanggang in Xichuan County, Henan Province, and from the Quanhucun site in Huaxian County, Shanxi Province. No further discoveries of rice were made in the Yellow River Valley during the 1960s and 1970s, but new finds began again in the 1980s with rice impressions

recovered from various sites, including Xigaoya near Luoyang City and Dahecun in Zhengzhou City (both Yangshao Culture sites in Henan Province), and Lijiacun and Hejiawan in Xixiang County, Shanxi Province - the last two being pre-Yangshao sites (Wu and Chen 1994). There are also spodographs (silica skeletons) of rice from the Anban site in Fufeng County (a Longshan Culture site in Shanxi Province), impressions in sherds from the Yangjiaquan site in Qixia County (another Longshan Culture site in Shandong Province), and rice pollen from the Wangyin site near Yanzhou City, a Dawenkou Culture site in Shandong Province.

In terms of chronology, these finds start with the pre-Yangshao Culture dated about 7500-7000 BP (Lijiacun), continue through the Yangshao Culture dated about 7000 to 5000 BP (Xigaoya and Hejiawan), and extend into the Longshan Culture dated approximately 5000-4000 BP (Anban and Yandjiaquan) and the Dawenkou Culture dated about 5400-4400 BP (Wangyin).

All this evidence, however, is from the impressions of rice contained within the walls of ceramic vessels and not from actual remains of the rice itself, excepting the spodograph of rice from Anban and the pollen from Wangyin. In order to obtain better evidence of early rice in China, the Institute of Archaeology of the Chinese Academy of Social Sciences has attempted to obtain direct evidence by flotation of excavated materials. Water separation techniques were used in the excavations at the Lilou site near Ruzhou City in Henan Province in 1992 (Wu and Chen 1994a & b). Heavily carbonized material from a black ash layer 1.5 to 2 meters below the surface at the Lilou site was subjected to flotation, which produced more than 100 grains of carbonized rice, one grain possibly of wild rice, and many other grains as well as many fragments of charcoal. The various grains were identified by Professor Li Pan of the Genetic Institute of the Chinese Academy of Sciences. He concluded that the

carbonized rice is of two varieties known today as *xian-dao* (*Oryza sativa* var. *indica*) and *jingdao* (*Oryza sativa* var. *japonica*) (Li 1994). This is the first reported instance of the recovery and identification of actual remains of rice from the Yellow River Valley, in this case belonging to the late period of the Henan Longshan Culture about 4000 years ago.

Where did the prehistoric rice in the Yellow River Valley originate? Was it of local origin or was it imported from southern China? The various present-day varieties of wild rice in China have been well studied but information about prehistoric distributions is lacking. However, about twenty years ago, wild rice of the Shang and early Zhou Dynasties (about 3000 years ago) was discovered in Xichang City in Sichuan Province. The possible wild rice from the Lilou site is about 1000 years older than that of Xichang. It has the potential to provide important information about the origins of prehistoric cultivation of rice in the Yellow River Valley.

On the other hand, we know that southern China has had a long history of rice cultivation. In the Yangzi Valley, carbonized rice from the famous Hemudu site dates back to 7000 years and rice traces in potsherds from Pengtoushan in Hunan date to perhaps 8000 to 9000 years ago (Pei 1989; Yan 1991). Clearly, southern China was one of the original centres for the early domestication of rice and the crop perhaps spread into the Yellow River Valley from the south, appearing first in intermediate sites such as Lijiacun, Hejiawan, Xiaji and Xiawanggang and then spreading to the most northerly

regions where rice could be grown (including Lilou and Anban). Clay bird figurines of the Qujialing Culture of the middle Yangzi Valley have also been found in the Lilou site, attesting to the existence of north-south prehistoric exchange.

The results of the excavation at Lilou suggest that rice cultivation came to the Yellow River Valley from the Yangzi, most probably during Yangshao times. Thus, both rice and the millets formed the agricultural bases of the complex economy that allowed the Yellow River Valley cultures to develop into the first civilization in the history of China.

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