



# Techno-typological analysis of the microlithic assemblage at the Xuchang Man site, Lingjing, central China



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## ABSTRACT

Cultural deposits of the Lingjing Xuchang Man site are up to 9 m thick and are divided into eleven levels. Level 5, which is dated to ca.13,500 ± 406 BP, contains abundant microlithics, including microblade cores, the blanks of microblade cores, the flakes produced by renewing and removing the platform, microblades, and tools. In this paper, the operational sequences for producing the microlithics from Level 5 are analyzed to indicate the production processes of microblades. Compared with other sites yielding microlithics in north China, the microblade technology at Lingjing is not unique. There are two kinds of microblade core technologies in north China, namely prepared technology and unprepared technology. The former is characterized by wedge-shaped microblade cores, while the latter one is characterized by pyramidal types of microblade cores. The microblade cores at Lingjing are mainly pyramidal. There are several types of microlithic tools and most were produced by pressure flaking. However, a few were detached by bipolar percussion. During the LGM (Last Glacial Maximum), a microblade technology appeared and existed widely in North China. As the southernmost site in north China yielding microlithics, research on the microlithics of Lingjing is of great importance in providing new materials for studies of the microblade technology and human behavioral pattern in north China and northeast Asia in the Late Paleolithic.

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## 1. Introduction

Microlithic industries are widely distributed in north China during the Late Upper Paleolithic period. The microlithic tools found in Level 5 of Lingjing represent the southernmost presence of a microlithic technology in north China and possess considerable research value. After the Last Glacial Maximum (LGM), a microblade technology was intensively adopted in the northern part of China. Henan Province, which is traditionally regarded as the Chinese Central Plain, is located in the southern part of north China and is thought to have been on the migration routes of early humans between both north and south China and east and west China (Wang and Qu, 2014). The Lingjing Xuchang Man site (E113°41', N34°04') in Henan Province is located in this important region, with the Hung-Huai-Hai Plain in the east and the Songshan Mountain in the west (Fig. 1). The diverse landscapes and transitional geography of the Xuchang Man site location created a

diversified ecology which was also influenced by frequent climatic changes in the Pleistocene, providing a favorable place for the subsistence of early hominids.

As an open-air site formed around a spring, Lingjing possessed favourable natural conditions during the Level 5 period. The microlithic culture at Lingjing is regarded as the result of the southward migration of hunter–gatherers to lower latitude areas during the LGM. These populations probably moved back to the higher latitude regions when global warming happened at the beginning of the Holocene (Jia, 1984; Li, 2007). The aims of this paper are to focus on a detailed techno-typological analysis of the microlithic assemblage at the Lingjing Xuchang Man site, and to compare it with other contemporary microlithic technologies in north China.

## 2. The Lingjing Xuchang Man site

### 2.1. Background of the site

The Lingjing Xuchang Man site, first discovered in 1965 (Zhou, 1974), has an overall coverage of more than 30,000 m<sup>2</sup>. The first

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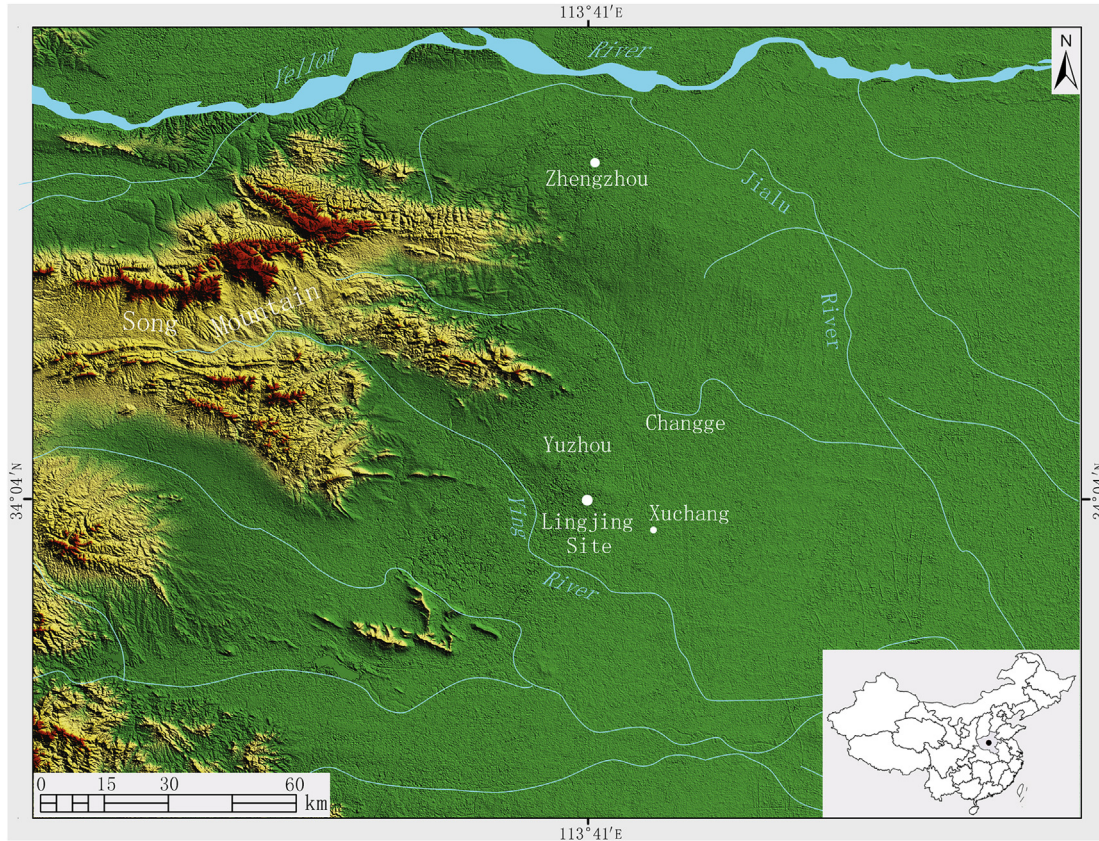


Fig. 1. Location map of the Lingjing site.

season of excavation was carried out in 2005 (Li, 2007), followed by repeated seasons of excavation. The site has been studied extensively (Li, 2007, 2010, 2011, 2014). The deposits are c. 9 m thick, including 11 levels. Among them, Level 5 contains microlithics, early pottery, a bird figurine, animal fossils, ostrich eggshells and ornaments, etc. Animal fossils and more than 30,000 stone artifacts were discovered in Levels 10–11, and a human cranium was unearthed from Level 11 in December 2007. This was dated to c. 100,000 BP, and it was named the “Xuchang Man” (Zhang and Li, 2008). In April 2014, a second cranium was discovered in the same level (Lingjing Archaeological Team, 2014). These two crania will play an important role in illuminating the origins of modern humans in China and in East Asia.

The site is currently the subject of multi-disciplinary studies, which include stratigraphy (Li, 2010, 2011), fauna and chronology (Li and Dong, 2007; Dong and Li, 2009), animal taphonomy (Li and Chen, 2007; Li and Zhang, 2008; Zhang et al., 2009, 2012; Zhang and Li, 2011), microlithic technologies (Li, 2009; Li and Kato, 2010; Kato and Li, 2012; Li, 2014), micro-wear analysis of bone artifacts (Li and Chen, 2010), and palynology (Wang et al., 2013). All the above have provided useful information for understanding the technology and behavior patterns of the inhabitants.

2.2. Stratigraphy

The 9 m-thick cultural deposits of the Xuchang Man site overlie the Middle Pleistocene terrace deposits of Ying River, which are characterized by brown–red soil filled with abundant grey–greenish calcium nodules. The stratigraphy of the excavated area can be divided into two units. The upper unit contains Level 4 and the levels above, which belong to the periods from the Neolithic Yangshao Culture to the Shang and Zhou dynasties. The lower unit includes Levels 5–11, which are the Paleolithic deposits. Specifically, Level 5 discussed in this paper consists of fine orange sand deposits containing the microlithic assemblage (Fig. 2).

2.3. Chronology

Three groups of specimens, i.e., 20 samples, from Level 5 have been dated by the Japan Accelerator Research Institute. Among them, 19 samples are carbonized material, such as charcoal and burned bones. With the exception of one sample yielding a questionable radiocarbon date of 32,952 BP, the other 18 samples gave an age range of 11,847–13,854 BP. The average age is 13,402 BP, with an average standard deviation of 406 years, and can be taken as an accurate age of the microlithics and other remains from Level 5 (Table 1).

Table 1  
The AMS dates of carbonized substances from Level 5 of the Xuchang Man site.

ID	Samples	Dating method	Measured radiocarbon age (Half-life: 5568 yrs) <sup>a</sup>	Measured radiocarbon age (Half-life: 5568 yrs) <sup>b</sup>	Measured radiocarbon age (Half-life: 5730 yrs) <sup>b</sup>	Calibrated age (1σ)	Average date (yr BP)
IAAA-92123	carbonized material	AaA	11,360 ± 50	11,530 ± 50	11,870 ± 50	13,310–13,426 cal BP	13,374
IAAA-92124	carbonized material	AaA	11,490 ± 50	11,590 ± 50	11,920 ± 50	13,335–13,479 cal BP	13,420

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