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# Introduction

The Guanyindong site, located in Guanyindong village, Qianxi County of Guizhou Province (26°51′26″N, 105°58′7″E) at an elevation of 1464 m a.s.l., is a limestone cave site extending from east to west it was discovered by a team organized by the institute of Vertebrate Paleontology and Paleoanthropolgy(IVPP),Chinese Academy of Sciences in 1964. Several excavations were conducted in 1965, 1972 and 1973, yeilding A total of 176 cores, 1292 flakes, 1101 retouched pieces and 802 pieces of debris were identified.

Introduction of paleolithc research in south Asia (or China).

Introduction the distribution of levollois technique (origin, dispersion, distribution).

Prolem: East Asia, why people thought no levollois. Why studying this site is important. Aim in this study.

## Raw materials

The assemblage is dominated by chert (78.02%) followed by limestone (20.59%) and small amounts of basalt, sandstone and quartz. In terms of retouched pieces, XXX of them are made of chert, XXX of them are made from limestone, which indicates hominins intended to selected chert as optimal raw material to manufacture stone tools. Based on previous study (Li, 2009; Leng, 2001),

## Flakes

We found 196 complete unretouched flakes. The average maximum length of the flakes is 62.6 mm, the average thickness is``mm. There are xxx flakes or flake breaks that have distinguishable platform, that can be divided into cortex(%), plain(%), facet(%),dihederal(%) and focus(%). The shapes of platform include triangle (%), fusiform (%), quadrangle (%) and CDG (%). Most of flakes dorsal side is partially covered with cortex (%). And the average scar number is xxx. The directions of these scars are recorded. Among them, the scars with the same directions of flake are dominated (%), following with opposite direction(%). We also found a number of centripetal scars (%).

## Cores

We found 176 cores in the lithic assemblage. According to the number of platform, there are 3 types of cores: single platform (%), double platform (%) and multiple platform (%). According to technological reduction, they can be classified as ordinary core (%), blade core (%), disc core (%) and Levallois core(%). The average max dimensions of cores are xx mm. Most of them are covered with partial cortex(%). And their location is always on platform (%) and bottom (%). The type of platform is dominated by plain (%) which suggests that most of cores are not prepared and insufficient exploited. This observation also reinforced by the small number of rotation.

## Retouched pieces

A total of 1101 retouched pieces were found, accounting for 48.5% of lithic assemblage. The average max dimension is xxx. % retouched pieces are made on flakes (%) and flake breaks (%), others are made on either chunks or pebbles. Side scrapers dominate the sub-division of retouched pieces (%), followed by denticulates and borers. Convex edge constitutes the largest proportion of the edge shapes of side scrapers(%). Looking at the location of retouch and the size of the retouched flakes can provide us further insight into retouching behaviours. Most of tools have more than one retouched edges. We introduced two concepts “Zone Index” and “Geometric Index of Unifacial Reduction(GIUR)” to estimate the invasion and intensity of retouching. From our observation… We also measured the angle of each retouched edge. For notch pieces(n=91), we found that most notches only have one notch end on each retouched piece and the average depth and length is xx and xx. The location of retouching is mainly on one side which defined as longer side of the piece.

### Indices

## Levallois

We distinguished 70 stone artifacts that are Levallois like including 11 Levallois cores, 22 flakes, 4 points and 33 tools made on levallois flakes. The average dimension of levallois products is xxx which is smaller (or larger) than ordinary products. The platform shapes of levallois flakes are various ranging from triangle, quadrangle, fusiformis to chapeau de gendarme(CDG). For flakes, we measured the thickness at 25%, 50%, 70% max dimension and compared them with ordinary flakes found that levallois flakes are relatively more flat. This found is consistent with the theory that ... The scar number is also relatively more than ordinary flakes, the direction of which is mostly centripetal.

# Discussion

1. Comparing with other sites in south China, Guanyindong is featured by the appearance of Levallois technique.Why do you think Gyd has levallois? Previous results from other sites in South China suggest that they have no levallois techinique (give examples and discussions)
2. In the lithic assemblage, we found 59 Levallois flakes, 11 Levallois cores, with distinguishable characters from Europe and Africa(less proportion, relative more proto morphology). What are the main difference between Gyd and other sites. What is the implication of such difference. Are there any difference in the Levallois techniques in Europe and Africa or other Asia sites?
3. Provide detailed discussion on the Demographic model, and explain the reason why Levallois technique in Southeast Asia is different from western. China and Southeast Asia is geographically distant from East Africa where Levallois technique is originated, as hominids dispersal from western to eastern, progressively smaller population, drastic changes of environment have made an inevitable influence on the style of Levallois technique.
4. Drawbacks (assumptions) of the model. Other possible explanation you can offer.

# Conclusion