The excavation of the Qihe Cave prehistoric remains in Zhangping City, Fujian

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Abstract

Archaeological excavations were conducted at the Qihe Cave Site in Zhangping City, Fujian, during the years of 2009-2011. The remains recovered at the site are divided into three cultural phases, with the absolute dates of 17ka-13ka BP, 12ka-10ka BP, and 10ka-7ka BP, respectively. These remains include three human skulls, stone implements, pottery, bone tools, and mammal fossils. The discovery of the Qihe Cave Site fills in the gap of cultural manifestation during the transitional period between the Paleolithic and Neolithic Ages in the region. It provides important materials for new insights on the archaeological sequence as well as provides important evidence on physical features of modern humans during this period in Fujian.

Keywords: Neolithic Age; Paleolithic Age; Qihe Cave Site (Zhangping City, Fujian)

A brief introduction to the site

Discovered and confirmed in 2008, the site, now named as the Qihe Cave, is located 42km to the northeast of Zhangping City seat, Fujian Province, about 4km to the closet residential area of Zaotou Village in Xianghu Township in the southwest. Three terms of small-scaled excavations took place from 2009 to April 2011, which opened three excavation squares (T1, T3 and T4) 5 x 5m each and one 4 x 10m test trench (T2) and exposed areas 96sq m in total (Figures 1 and 2). The cultural deposits at the site are composed of nine cultural layers, covering various periods from prehistoric through the Song and Qing Dynasties. The cultural remains from prehistoric components include stone artifacts, bone implements and potteries, as well as three human skulls and a large number of mammalian fossils. With ^14C dating results in accordance with stratigraphy, the prehistoric cultural components are divided into three phases: with Layer 6 being the earliest Phase I, Layers 4-5, Phase II, and Layers 3A, 3B and 3C, Phase III.

Figure 1 The full-view of Qihe Cave (W–E).

Figure 2 The plan and transverse section of Qihe Cave and the arrangement of the excavation squares.
The remains of Phase I

1. Features, include two ash pits and one activity pebble floor.
2. Artifacts, include stone assemblages and animal fossils. Following will focus on lithic artifact only.

Lithic assemblage is represented by chipped stones including cores, flakes, choppers, scrapers, points, and whetstones.

Cores: the sample T2-7 ⑥ D:15 is of dark gray quartzite, 9.2cm in length, 9.5cm in width and 3.8cm in thickness. It has knapping scars from three directions, which have almost equal lengths and widths. The longest scar is 7.5cm and shortest one is 4cm (Figure 3:1).

Flakes are in large quantity, most in medium-size. Flake T2-28 ⑥ A:27 was made by striking percussion on bluish-gray sandstone. It retains natural cortex on striking platform displaying bulb of percussion and smooth fracture surface. It is about 4.2cm long (Figure 3:6).

One chopper (T2-10 ⑥ A:1) is made of bluish-gray fine sandstone. It was used as a core which displays flake removal scars around the edges, subsequently modified into a chopper by shaping up a broad convex edge by intentional retouch. It is 14.5cm in length (Figure 3:4).

Two scrapers: the sample T2-8 ⑥ D:18 was touched on a flake blank made on quartz. A large flake was removed from the left side, followed by a series of fine retouch to make into a convex edge. It is 5.9cm in length (Figure 3:5). The other sample T2-15 ⑥ D:4 was made on bluish-gray sandstone flake, roughly in rectangular shape. Edge retouches are shown along the two longitudinal edges so to form a double-side scraper.

It is 8.5cm in length (Figure 3:3).

One point (T2-15 ⑥ B:34) is made on bluish-gray sandstone, and modified by retouch on the distal end, which forms a 45° angle. It is 5.4cm in length (Figure 3:2).

The remains of Phase II

1. Features, include three hearths.

Hearth No. 1 was underneath Layer 5, the surviving part showing a semicircular plan and nearly flat bottom. The wall has burnt coating 7-8cm thick in bluish-gray color with a large quantity of plant ash. Within the hearth also contains small number of potsherds, stone cores and flakes.

2. Artifacts, include stone artifacts, pottery, bone implements, as well as animal fossils.

(1) Stone artifacts include chipped stones and ground stones.

Chipped stones include cores, flakes, choppers, scrapers, points, anvils, etc.

Choppers have two types: double-edged scrapers and concave scrapers. The sample T2-35 ⑤ :6 was made on gray sandstone and bilaterally touched into two working edges. The dorsal side retains portions of cortex. It is 8.5cm in length (Figure 4:1). The scraper labeled T2-6 ⑤ :57 was made on a thin flake blank of brownish-yellow granite, whose dorsal side are covered with negative scars of flaking. A notch was produced on one side of the blank by secondary retouch. It is 10.2cm in length (Figure 4:2).

Ground stone include seven adzes. The sample T2-16 ⑤ :13 is made of a natural pebble of gray fine sandstone, being ground into a smooth-side obverse while the reverse rough. The working edge is broad, with an

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**Figure 3** Chipped stone artifacts of Phase I.

1. Core (T2-7 ⑥ D:15); 2. Point (T2-15 ⑥ B:34); 3 and 5. Scrapers (T2-15 ⑥ D:4 and T2-8 ⑥ D:18); 4. Chopper (T2-10 ⑥ A:1); 6. Flake (T2-28 ⑥ A:27).

**Figure 4** Stone artifacts of Phase II.

1 and 2. Choppers (T2-35 ⑤ :6 and T2-6 ⑤ :57); 3 and 4. Adzes (T2-16 ⑤ :13 and T2-16 ⑤ :11)
One house foundation (F2) is situated in the east of excavation squares T1 and T2 and covering the entire excavation square T3, and beneath Layer 3B. It has not been completely uncovered thus its overall formation remains unknown, except for the 11 postholes in sub-circular or sub-square shapes and living floor. The postholes were dug at the living floor, filled with black-gray silt mud. The living floor was paved with reddish sandy mud.

2. Cultural remains include lithic artifacts, pottery, bone tools, human remains, and animal fossils.

(1) Lithic artifacts: including chipped and ground stone artifacts.

The chipped stone assemblage includes cores, flakes, choppers, scrapers, points, anvils, hammers, arrowheads, and adze-shaped objects.

The ground stone assemblage includes adzes, axes, and one fish-shaped pendant.

Adze is the most dominant, counting for 42 in number. The sample T2 ③ A:111, made of grayish-green silt sandstone, is ground into trapezoid in the outline. It is 14.1 cm in length (Figure 6:2).

Whetstones, 16 pieces. Sample T1 ③ C:24 is made of grayish green sandstone in rectangular shape. It has a breakage on the top, with oval cross-section, ground into curved working edge which retains some degree of use-wear. It is 8.5 cm in length (Figure 4:4).

(2) Potteries are all fragments. They were represented by those primarily with sandy wares reddish-brown or brown in color, followed by those in black-brown and grayish-brown color. Most of potteries were tempered with coarse sand, bodies are thick and fired under low temperature. They are mostly plain, and the only decorations are cord marks and fine incised patterns. The restored types include jar and bo-bowl. For example, the sample T2-6 ⑤ :24 is of sandy dark brown with round rim and straight-up mouth. It has two lines of picked dots around the rim flanking zigzag pattern formed with picked dots. It is 21.3 cm in diameter at the mouth (Figure 5:1). The other sample T2-11 ⑤ :28 is of sandy grayish-brown with pointed-round rim and straight-up mouth. The rim was decorated with impressed serrate pattern. It is 21 cm in diameter at the mouth (Figure 5:2).

(3) Bone implements and animal fossils. Bone tools include awls and needles, most of which were polished on the tip only. Animal fossils are represented by that of birds, tortoises and mammalians.

The remains of Phase III

1. Features include remains of houses and ash pits.
reddish sandstone in irregular shape with two concaves where use-wear appears. It is 15.3cm in length (Figure 6:3).

Only one stone arrowhead (T1 ③ A:27), made of a small grayish quartzite flake with the method of retouching one side from dorsal to ventral surfaces and the other side from ventral to dorsal surfaces to shape into a curved top and sharp edges. It is 4cm in length (Figure 6:5).

The special fish-shaped pendent (T1 ③ B:3) is made of light brownish-red sandstone into a flat body and then ground from two sides to make the fish head form with engraved gills and vertebrates and a bilaterally drilled hole as the two eyes. It is 5cm in length (Figures 6:6 and 7).

(2) Pottery wares. All of the pottery wares are fragments. The assemblage was represented by predominant sandy brown pottery, followed by reddish-brown color and grayish-brown color. Dark brown and grayish-yellow potteries are present but in low quantity, so do fine clay potteries. Most of the potteries are not decorated. In addition, there are a few polished pottery and dark red-coated pottery wares. The observed decorations in existence were represented by cord-marks and incised lines and a few combined patterns (Figure 8). The types of earthenware include jar, fu-cauldron and bo-bowl.

One of the jars in surviving rim segments, T2 extension ③ C:245, is of sandy brown pottery. It appears with a flared mouth and square rim decorated with impressed serrate pattern. Along the rim are several sets of radiation patterns each of which comprising four incised fine lines, beneath which there are several rows of impressed serrate patterns. Inside the rim there are rough hand-smeared impressions. The rim is 20.7cm in diameter (Figure 9:1). Another jar, T1 ③ A:62, is of sandy reddish-brown pottery. It appears with a flared mouth and a pointed rim with round end. Its surface is decorated with net pattern but unclear. The mouth is 20.5cm in diameter (Figure 9:3). The third one, T1 ③ A:57, is of sandy reddish-brown pottery. It appears with a flared mouth and a pointed rim with round end. Its surface is decorated with the combination of incised fine cord-marks and engraved oblique lines. The mouth is 19.57cm in diameter (Figure 9:4). The fourth jar, T1 ③ A:55, is of sandy dark-brown pottery. It appears with a flared mouth and a pointed rim with round end. Its surface is decorated with the combination of fingernail- and cowry shell-impressed patterns; 6 and 13. Picked dot pattern; 7. Coarse cord-mark; 8 and 15. Cowry shell impressed pattern; 9 and 18. Crossed incised lines; 10. Incised lines; 11. Net pattern; 16. Crossed cord-mark; 17. Combed pattern; 19. Fingernail-impressed pattern.
Inside the jar incised with leaf vein-like design while the outside is decorated with incised parallel lines. The mouth is 14.9cm in diameter (Figure 9:6).

One of the *fu*-cauldrons in surviving rim segment, T2 extension ③ A:216, is of sandy brown pottery. It appears with a flared mouth and a point rim with round end. The outside is decorated with net pattern. The mouth is 19.93cm in diameter (Figure 9:2). The other sample, T2 extension ③ A:236, is of sandy brown pottery. It appears with a flared mouth, restrained neck, and a pointed rim with flat end. Its rim is decorated with impressed serrate pattern, and the surface has alternated cord-marks. The mouth is 17.7cm in diameter (Figure 9:5).

(3) Bone tools include a fish hook, awls, a hairpin, needles, a tube and an arrowhead.

The fish hook (T1 ③ A:15) is made of mammalian tubular bone by grinding and fine polishing. The appearance is regular and the tip is sharp. It is 2.33cm in length (Figures 10:3 and 11).

All six awls are made of small tubular bone from mammals by chipping and grinding. One example, T1 ③ B:6, is made of a tip part of an antler. It was ground on the snap-off antler tip and made into a bevel edge. Its remaining length is 4.4cm.

One hairpin (T1 ③ A:165) was made of an animal limb bone by chipping and grinding. Its surface is fine polished with two sharpened tips. Its remaining length is 12cm (Figure 10:1).

One tube (T1 ③ A:16) is made of bird leg bones, two ends of which were chipped off, ground and polished. It is 4.2cm in length (Figure 10:4).

One arrowhead (T1 ③ A:172) misses its tip, showing it made on a piece of tubular bone by grinding. It appears in flat triangular with two wings and a short tang. Its remaining length is 2.4cm (Figure 10:2).

(4) Human remains and animal fossils.

Three human skulls were recovered (nos. 1, 2 and 3). Skull no. 1, incomplete, was unearthed from Layer 3A and belongs to an infant. Both nos. 2 and 3 were unearthed at the bottom of Layer 3C and belong to adult individuals (Figure 12). Skull no. 2 was buried under a stack of human limb bones, and 0.7m away from the intact skull no. 3.

Animal bones include fishes, birds, turtles, and mammals.

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**Figure 9** Potteries of Phase III.


**Figure 10** Bone artifacts of Phase III.

1. Hairpin (T1 ③ A:165); 2. Arrowhead (T1 ③ A:172); 3. Fish hook (T1 ③ A:15); 4. Tube (T1 ③ A:16).

**Figure 11** Bone fish hook (T1 ③ A:15).
Conclusions

The fact that continuity of cultural depositions from Paleolithic to early and middle Neolithic Ages with abundant cultural remains is rarely known in Fujian even in southeastern China. This discovery is significant in this region, filling in the gap for the transitional period between the Paleolithic and Neolithic Ages. It provides new evidences for completing Neolithic chronology in Fujian, as well as materials for the researches on the physical features of prehistoric human beings and subsistence types in this region.

1. The $^{14}$C dating results indicate that the Phase I of Qihe Cave Site is about 15-13 ka BP, falling in the transitional period from Paleolithic to Neolithic Ages. The cultural remains from this phase do not yield pottery and ground stone assemblages, but only chipped stones. Most of bone implements were made by percussion retouch, a few with ground blades and tips. The overall features at Layer 6 and below represent different cultural traits in Paleolithic Age from the generation of the South China’s "pebble tool tradition". On the other hand, it is close to those found in stone tool assemblages from Ch’ang-pin Culture in Taiwan, in terms of tool types, manufac- ture techniques, retouch styles, as well as dating.

2. The dates of Phase II fall into 12-10 ka BP, equivalent to early Neolithic Age, which is represented by coarse sandy potteries with thick body resulted from low temperatures. The pottery assemblage is predominated by reddish-brown and brown potteries, whose surface are primarily plain. A few decorations in observation include cord-marks, impressed and cowry shell-impressed patterns and picked dots. The types are few, including fu-cauldron, jar and bo-bowl.

3. The date of Phase III falls into 10-7 ka BP, equivalent to middle Neolithic Age. The pottery assemblages are characterized by sandy gray pottery, which include coarse and fine sandy wares. There are also a few fine clay pottery wares as well. The pottery types increased to include fu-cauldron, jar, basin, bo-bowl, and pan-plate. The decorations appear to have serrate impression, cowry shell-impression and picked dots, most of which exhibit on rims. Such characters seems to be close to the style on earthenware recovered from sites at Qiaoqiutou Site in Pingtan as well as Tapenkeng and Nankuanli Sites in Taiwan, but much earlier in time than the latter three.

In summary, there seems a bit discontinuity in cultural remains and dates between Phase I and Phase II; however, there is a clear continuity from trains of Phase II moving onto that of Phase III.

4. The human skulls discovered from the bottom of Layer 3A and Layer 3C represent populations who lived in the Qihe Cave in different times. Their presence provided us a unique opportunity to study physical features of human beings during the transition from Paleolithic to Neolithic Ages in this region, thus to provide important comparative data for paleoanthropological studies between North China and South China, as well as their subsistent patterns.

References


Postscript

The original report published in Kaogu 考古 (Archaeology) 2013. 5: 7–19 was authored by Xuechun Fan 范雪春, Yunning Huang 黄运明, Changfu Wei 危长福, Jinyan Lü 吕锦燕 and Yinping Wang 王银平. This abridged version is prepared by Jinyan Lü and Xuechun Fan and translated into English by Chen Shen 沈辰.