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REVIEW ARTICLE

SURVEY ON JIANGJUNYA ROCK ART IN LIANYUNGANG CITY, JIANGSU PROVINCE, CHINA

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ABSTRACT

As one of the most famous historic sites for rock art, Jiangjunya rock art is in the ecotone of China's eastern coastal areas, including five groups which are mask, rice pattern, cupules, waffle pattern, and sun image. Among them, the mask is an important link in the mask rock art of Pacific Rim. The systematic investigation on Jiangjunya rock art is the foundation of the study as well as the key to rock art protection. The meticulous records about various images at the historic site of Jiangjunya rock art will provide precious materials for the image analysis on China's petroglyph and mask of Pacific Rim.

KEYWORDS

Jiangjunya Rock Art; Mask; Cupules; Geographical Conditions

As a global phenomenon, the rock art has been discovered in the culture of many different areas around the world; the creation of rock art has run through the whole course of human history. The earliest record about rock art in China can date back to the geographer of the Northern Wei Dynasty (北魏), Li Daoyuan's (酈道元) description about Yinshan animal figures in *Commentary on the Waterways Classic* (水经注), "On the rock in the mountains, there are textures formed naturally, like tigers and horses; they have well-defined outlines, as if they were painted, so it is also called the Rock Art Mountain" (山上之石, 自然有文, 尽若战马状, 粲然成著, 类似图焉, 故亦谓之画石山也). In the survey on the rock art of Inner Mongolia in the 1970s, Mr. Gai Shanlin (盖山林) tried to locate the rock art by following the clues, and discovered many rock paintings in Yinshan area according to Li Daoyuan's records about the rock art in *Commentary on the Waterways Classic*. However, the rock art study of scientific significance in modern China started in 1915 when Huang Zhongqin (黄仲琴) investigated Xianzitan rock art in Taixi, Huaan, Fujian Province and published the *Ancient Chinese Prose of Taixi* (汰溪古文). It has been more than 100 years for China to investigate and study the rock art. The rock art works in Yinshan of Inner Mongolia, Helan Mountain of Ningxia, Jiangjunya of Jiangsu, Hutubi of Xinjiang, Juci Mountain of He'nan, Zuojiang of Guangxi, and Cangyuan of Yunnan are all our historical treasures, and they are one of the elements to know about Chinese prehistory, religion and economic life.

1. DISCOVERY OF JIANGJUNYA ROCK ART

Jiangjunya rock art is in China's eastern coastal areas, situated in

Jinping Mountain of Taohua Village, Jinping Town, Haizhou District, Lianyungang City, Jiangsu Province (江苏省连云港市海州区锦屏镇桃花村的锦屏山). (Fig1))Jiangjunya rock art was discovered by the workers of Lianyungang City Museum, including Li Hongfu, Liu Hongshi, Ding Yizhen and Zhou Jinping (李洪甫、刘洪石、丁义珍、周锦屏), when they explored Taohuajian Historic Site (桃花涧遗址) in 1979. At that time, several images holding spears were discovered on a rock surface with the length of 4 meters and width of 1.67 meters in Taohuajian, and the workers of the museum mobilized the masses to provide clues about surrounding cultural relics. The villager Hu Baoshan reported the situations of Jiangjunya rock art to Gu Yuliang (顾良玉) who was the secretary of Jinping Town Taohua Brigade. Later, Gu Yuliang reported to the municipal museum, and Jiangjunya rock art of Jinping Mountain was formally discovered then.

There is a rock community comprising "one big and three small" rocks on Jiangjunya, and the local residents consider that it is divine. It was moved by nearby villagers to the foot of the mountain when the phosphorite was built in the 1950s, to avoid any damage due to mining. On April 1, 1981, the *People's Daily* (《人民日报》) published the article *Petrographic Remains of 3,000 Years Ago Were Discovered in Lianyungang City* (《连云港市发现三千年前的岩画遗迹》), "After discussion and identification, the experts unanimously agree that this was a rare and important discovery of China, and had important values for the study of history, archaeology, ethnology and art history." Hence, Jiangjunya rock art has become widely known and attracted extensive attraction. It was announced as the "National Key Culture Relic Protection Site" by the

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Figure 1: Geographical location of Jiangjunya rock art



Figure 2: Front view of Jiangjunya rock art 1-4 group, UAV Model: Trimble UX5

State Council of the People’s Republic of China in 1988.

Jiangjunya rock art has five groups: the first, second, third and fourth groups are located on the semicircular rock mass humping in the south of Jinping Mountain. The rock is migmatite granite, with the length from south to north of 23 meters and the width from east to west of

15 meters. Its geographical coordinates are as follows: 34°53’26.995” N, 119°13’11.999” E; its altitude is 23 meters. The fifth group is on the west wall of an independent raised north-south rock in the east by south above the semicircular rock mass where the fourth group is located. Its geographical coordinates are as follows: 34°53’16.048” N, 119°13’25.456” E; its altitude is 47 meters. (Fig2,3) The straight-line



Figure 3: Lateral view of Jiangjunya rock art, UAV Model: Trimble UX5



Figure 4: Natural environment of Jiangjunya rock art

distance from the fifth group to the first four groups is 180 meters, and the vertical height difference is 24 meters. According to the local folklore, there was a dolmen in the southeast side of the raised semicircular rock mass, and the vertical rock face of the dolmen had a petroglyph of “General Riding the Horse”. A man wearing coat armors was riding on the horse and looking back, and this is the origin of the name “Jiangjunya”. The painting of the “General Riding the Horse” was bombed out during mining in the 1950s, and its specific pattern and creation year are unverifiable. However, this name has been used till today.

2. GEOGRAPHICAL CONDITIONS OF JIANGJUNYA ROCK ART

Lianyungang City of Jiangsu Province is located at the intersection of Shandong Hills and Huaibei plain; its geographical coordinates are as follows: 33°59′–35°07′N, 118°24′–119°48′E. Situated in the south of the warm temperate zone, Lianyungang is a transition area from the north temperate zone to the subtropical zone, and has a warm oceanic monsoon

climate under the influence of the oceanic monsoon. It is suitable for rice, wheat, cotton, soybean, peanut and other crops, and is rich in marine and terrestrial plant and animal resources. With diversified geomorphic types, Lianyungang City has high mountains, open seas, hills, intertidal zones, wetlands, rivers, lakes and islands. The mountain range of Lianyungang mainly belongs to the remaining range of Yimeng Mountain and stretches from the northwest to the southeast in Lianyungang for nearly 300 kilometers. There are 107 mountain massifs and 375 hilltops, including South Yantai Mountain, Middle Yantai Mountain, North Yantai Mountain, Jinping Mountain, Maling Mountain, Yu Mountain, Jia Mountain, Dayi Mountain, etc.; the rocks on these mountain massifs are engraved with many petroglyphs. The geological basis of Lianyungang is the metamorphic rock of pre-Sinian period. In terms of Jinping Mountain where Jiangjunya rock art is located, its geology is low mountains and hills comprising metamorphic rocks and mixed rocks of pre-Sinian period, formed with migmatite granite and gneiss. Gneiss still exists in some mountain rocks with uniform structure similar to granite, and the mountain presents a southeasterly outline gradually under long-term weathering effect.



Figure 5: Front view of Jiangjunya rock art, UAV Model: Trimble UX5

The social productive force was low in prehistoric period, and the dependence on the nature was especially strong. The natural mountains and rivers, temperature and weather are all important elements to influence the livelihood means and social types. Lianyungang area has rich mountain massifs and dense rivers. The dense relics and petroglyphs in both banks of Yishu River, Jinping Mountain, Dayi Mountain, Maling Mountain, and the piedmont belt indicate that the suitable natural environment of the banks and piedmont belt provided a production and living platform for human beings in prehistoric period. Jinping Mountain possesses abundant resources, with mountainous regions, hills and rivers distributed alternatively. Rich in fresh water & seawater resources as well as animal and plant resources, it was suitable for early human habitation and development. Moreover, the richness of resource types is also beneficial for the complementary development of multiple livelihood modes. This was also the material base for the prosperity of prehistoric culture in this region.

Animal fossils of the horse, rhinoceros, mammoth, etc. were discovered in Jinping Mountain. According to the soil identification on the gray-green soil layer of the fossils during vertebrate paleontology and hominin studies of the Chinese Academy of Sciences, they were considered as the lacustrine sediments of Late Pleistocene Epoch 19080 years ago. Meanwhile, Jiudian ruins of the Old Stone Age were discovered in this region, and the age of the stone specimens collected from Jiudian ruins was almost consistent. This indicates that this region was rich in animal and plant resources about 20,000 years ago, and early human activities existed. According to the sporopollen analysis on the profile of Qingfeng Town, Jianhu County, Yancheng City, Northern Jiangsu Plain (苏北平原盐城市建湖县庆丰镇) which is 150 kilometers from Lianyungang, 10,100–9,300 years ago, the pollen concentration was low, and the herb pollen was dominant; 9,300–9,000 years ago, the pollen concentration increased, and local vegetation of halophytic meadow type was formed. Hence, about 10,000 years ago, herbaceous plants were thriving, which is consistent with the time when the climate of this area entered the warm period. The mammoth extinguished during this period, primitive agricultural production and stone grinding technology appeared, and people began to live a settled life, but pottery producing, acquisition and hunting were still important economic sources.

In ancient China, Lianyungang was the northernmost end of agriculture civilization in the south, and the southernmost end of nomadic culture in the north; meanwhile, it was also an important region of maritime civilization in the Pacific Rim. The gathering of the above three civilization forms is associated with the boundary property and diversity of its ecological environment. In other words, Lianyungang is the ecotone of several ecological communities, and the meeting place of north and south cultures.

In ancient times, the livelihood modes and settlement structure are two elements which are the closest to the environment. When projected to the environment, the livelihood modes mainly involve the distribution of wildlife resources, climatic characteristics & internal differentiation of the region, development of land resources and agriculture, development of marine resources and fisheries, etc. The settlement structure is closely associated with the landform, including whether the food and water resources are suitable for collection, settlement site selection, and material selection & construction of building groups, whether the regional settlement distribution pattern and living area are safe, and so on. In ancient times, the productivity was relatively low, the production efficiency was not high, and the single production mode could hardly maintain people's existence. Generally speaking, several production modes were needed as supplements, to form a diversified and complementary economic pattern. Therefore, this required environmental diversity. Lianyungang had seas, lands and rivers; as the transition region of climate and region between north and south in China, it had rich biological diversity and large population. Hence, it was the ideal activity area for early humans, and provided objective natural conditions for the development of complementary livelihood modes and settlements. From a smaller ecological scale, Jinping Mountain was rich in resources, and the stream flowed with a rich susurrus among the mountains. The sea was in the east, and the hills and plains were in the south. Hence, a suitable condition was provided for the dwelling of early humans. And in line with that, Stone Age sites including Taohuajian, Jiudian, Ercun and Jiangjunya were discovered in Jinping Mountain and surrounding areas, proving that humans settled down and survived here tens of thousands of years ago. Meanwhile, we should notice that there was a transitional area from mountainous regions to plains, and a warm zone of mountain front existed, also called "warm slope effect".



Figure 6: Realistic picture for the first group of Jiangjunya rock art

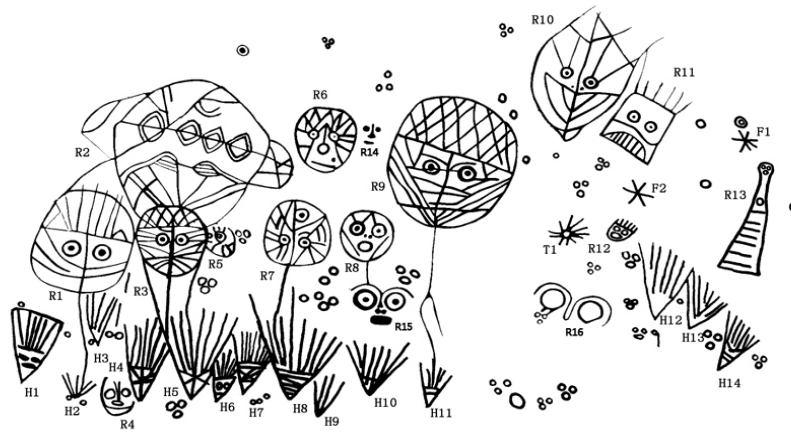


Figure 7: Line drawing for the first group of Jiangjunya rock art

Jiangjunya was in the region of “warm slope effect”, with its back against Jinping Mountain, facing the farmable plains (the north, west and south of Jinping Mountain are extensive fertile lands). Undoubtedly, in a regional environment with abundant natural resources, warm climate, multiple landforms and corresponding production modes, Jiangjunya and its surrounding areas were more suitable for early human habitation under the influence of the “warm slope effect”. Therefore, a dawn of early civilization was cultivated in this region. Jiangjunya rock art is the glorious prehistoric artistic art remains created by the ethnic group developing under the above environment. (Fig4,5)

3. INVESTIGATION ON THE IMAGES OF JIANGJUNYA ROCK ART

3.1 Investigation on the first group of Jiangjunya rock art

The first group of Jiangjunya rock art is on the west rock of the mountain massif, and the slope forms a degree of 45°. The south-north length of the image is 4.2 meters, and the height is 2.8 meters; the lines are different in depth and width. In the picture, there are 16 masks, 14 grain seedling images, 1 sun image, 2 “Mi (米)” signs, and several cupules. The first group is the most representative figure in Jiangjunya rock art. According to the field observation, the masks of the first group was created with metal tools, and most masks have lines, associated with the grain seedling images.

The height of R1¹ mask is 59 cm. The center line of the mask is 8 cm

above the head; the height of the overall mask is 126 cm, and the vertical height of the part connecting the mask and grain seedling is 58 cm; the widest part of the mask is 50 cm. The height of the forehead is 24 cm, and the face is 34 cm. The eyes are concentric circles. There are three nicks on the left face, and two on the right. On the forehead, there are 8 vertical nicks, and the fourth nick is treated as the center line, connecting the head and grain seedling 1-H2.

R2 is the largest image in this group, and the total length is 90 cm; the width is 80 cm; the height of the upper forehead is 32 cm. Across the forehead line, there are four even-distributed double-side diamonds; the maximum height of the diamond is 17 cm, and the width of the single diamond is 15 cm. The eyes have double scratches connected to the outer contour of the face respectively. The nose is an inverted triangle; the left cheek has three vertical nicks and one transverse nick crossing them; the right cheek has two vertical nicks. The foreheads of R2 and the mask R3 are connected. Though R2 and R3 don't use the same R3, but they form a continuous figure in visual sense.

R3 is connected to the grain seedling H5; the height of the grain seedling is 111 cm, and the width is 37 cm. the height of the crown ornament is 11.5 cm, and the height of the face below the ornament is 30 cm. The ornament is a fishing mesh, with 5 vertical lines in two directions respectively. The space between the lines is almost equal, and the lines cross each other to form a diamond. The eyes are concentric circles. The cheeks have several nicks, with 8 nicks on the left cheek and 9 nicks on the right cheek. The left and right cheeks are basically symmetrical.

Generally speaking, the widest nick of R3 is 3 cm, and the deepest part is 2 cm. All nicks of the mask R3 are deeper than that of the mask R2.

R4 is at the bottom of the picture, and is mottled and indistinct now. Moreover, its molding style is greatly different from other masks.

R5 is at the intersection position of R2 and R3, and the image is relatively abstract. It is now Intersection position.

The height of R6 is 38 cm, and the eyes are concentric circles. The picture presents bilateral symmetry, and there is no center line. The part of eyes is now obscure.

The height of R7 is 39 cm, and the width is 36 cm. Connected to the grain seedling H8, it forms an inverted image. The eyes are concentric circles. The nicks are unclear, and it is almost symmetrical.

The height of R8 is 12 cm, and the width is 15 cm; the eyes are concentric circles. The bottom has nicks, connected to R15. There are shapes like the nose and mouth, similar to a human skeleton.

The height of R9 is 76 cm, and the width is 64 cm. The center line of the face is connected to the grain seedling H11. The eyes are concentric circles. Seven nicks are uniformly distributed on the forehead in two directions, and they cross each other to form a fishing mesh. The face has crisscrossed lines.

The mask of R10 is similar to a diamond; its height is 93 cm, and its width is 55 cm; the eyes are concentric circles. There are two lines connected to the head above the eyes.

The mask of R11 is a square; its height is 48 cm, and its width is 30 cm; the eyes are concentric circles. There are six lines emitting outwards on the head. There are nicks in the mouth, but they are mottled in visual sense. According to the line drawing, the mouth has 7 vertical nicks.

R12 is mottled and indistinct on the rock. According to the line drawing, the eyes and mouth are round; except for the outline, the head has four vertical lines.

The height of R13 is 64 cm, and the width is 21 cm. There are three circular rings to form the eyes and mouth respectively, similar to a human skeleton. The body is a triangle, connected to the head; there is a circular ring and 7 horizontal stripes on the body.

R14 is on the right side of R6. According to the original line drawing, R14 is different from other masks of the group in style, and similar to the

masks of the fifth group in modeling.

The height of R15 is 25 cm and the width is 34 cm; the eyes are concentric circles. The eyebrows are connected to the nose. There is a grain seedling below, but no connecting line exists.

The height of R16 is 50 cm and the width is 43 cm; the eyes are circular rings, and the eyebrows are connected to the nose.

The first group has 14 grain seedlings which are all inverted triangles. Except H1 which has horizontal lines on the top to form a closed shape, the remaining grain seedlings all have an open top. In the images of 14 grain seedlings, various images are mainly different in the organization pattern of lower lines and number of upper lines. Generally speaking, the length of the upper lines is basically consistent; the middle lines are slightly long and the lines on both sides are short in some parts. The top presents an arc-like shape.

The height of H1 is 41 cm, and the widest part is 27 cm, located in the westernmost side of the picture. The height of the grain seedling in the middle is 20 cm. Except for the outline border, there are 6 nicks at the top, and three nicks in horizontal direction at the root. The grain seedling nick in the middle at the vertical direction crosses the grain seedling nick at the top of the root. The overall image presents an inverted triangle of closed state, and it is the only grain seedling image of closed state in this group.

H2 is connected to the mask R1; the height is 16 cm, and the widest part is 15 cm. It presents an open type. The grain seedling has 6 nicks, and the fourth nick is connected to the mask R1.

The height of H3 is 32 cm, and the width is 16 cm. The grain seedling has 5 nicks, and there are two cupules with the diameter of 4 cm arranged horizontally.

The height of H4 is 28 cm, and the width is 46 cm. Except for the border, the upper part of the grain seedling has 7 nicks, and the crossed lines in the lower part form an ornament of "Mi" (米) shape.

The height of H5 is 50 cm, and the width is 41 cm. It presents an inverted triangle. Except for the border, there are 6 nicks at the upper part of the grain seedling, and the height is 34 cm. The root of the grain seedling shows a "Mi" (米) sign. H5 is connected to R2 and R3.

The height of H6 is 16 cm, and the width is 15 cm. There are 5 nicks in the middle, and it presents an open inverted triangle.

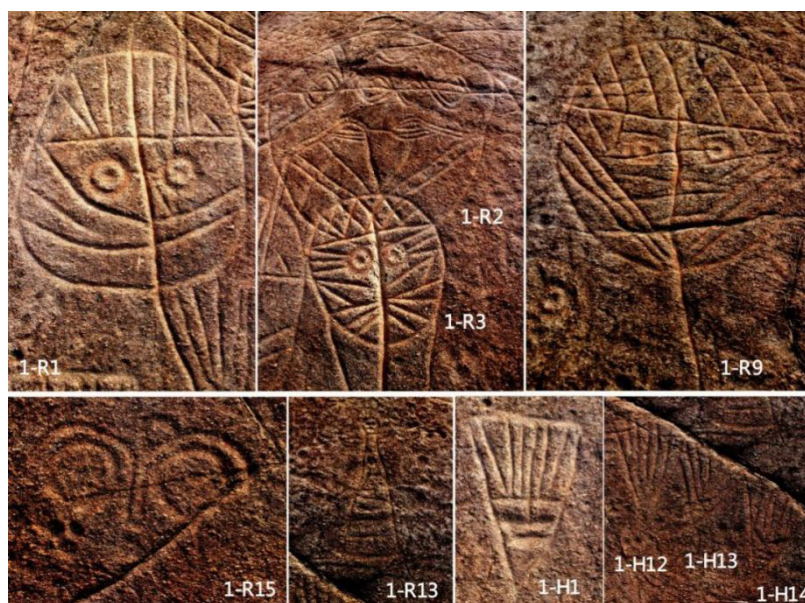


Figure 8: Some images of the first group of Jiangjunya rock art

H7 is connected to R7; the width is 42 cm, and the height is 48 cm. There are 8 nicks in the upper part, and the lower part is a horizontal line.

The width of H8 is 40 cm, and the height is 46 cm; there are 10 lines in the upper part, and 6 horizontal lines form the root.

H9 is mottled and indistinct.

The height of H10 is 30 cm, and the width is 32 cm. Except for the border, there are 6 nicks at the upper part of the grain seedling.

H11 is connected to R9; the height is 31 cm, and the width is 21 cm. Except for the border, there are 5 nicks in the middle.

H12 is on the right side of the picture; the height is 40 cm, and the width is 27 cm. It presents an inverted triangle. Except for the border, there are 4 nicks.

The height of H13 is 34 cm, and the width is 21 cm. Except for the border, there are 6 nicks in the internal side.

The height of H14 is 36 cm, and the width is 19 cm. Except for the border, there are 6 nicks in the internal side.

In the first group of Jiangujunya rock art, five masks are also the master

drawing of this group, and a line is directly connected to the grain seedling. In addition to the mask and grain seedling, the first group also has a sun image (T1). There are 11 lines and two "Mi"(米) signs (F1 and F2) distributed in surrounding areas; besides, dozens of cupules are scattered in the petroglyph of the first group. In some areas, three cupules form a group, presenting a regular triangle or inverted triangle, similar to the eyes and mouth visually. They have some element properties of the mask in modeling.

3.2 Investigation on the second group of Jiangujunya rock art

The second group is located in the south of the rock; its length is 9 m and the width is 9 m. There are sun images, cupules, "meridian line", and masks. The masks of the second group are between "the Milky Way (银河)" and "the meridian line (子午线)", and the style is obviously different from that of the first group. Images like crescent, cupules, concentric circles and sun are distributed around the meridian line.

The inner circle diameter of T1 is 4 cm, and the outer circle diameter is 10 cm; there are 20 radioactive lines to represent the brilliant rays.

T2 is the largest in the three sus, and it is composed of 3 concentric rings and 23 lines outside the rings. The diameter of the image is 28 cm; the outer ring diameter of the concentric circle is 12 cm, and the inner ring diameter is 6.5 cm; the inner diameter of the innermost cupule is 3 cm.



Figure 9: Panorama and some images of the second group of Jiangujunya rock art



Figure 10: Line drawing for the second group of Jiangujunya rock art

T3 is composed of two concentric rings and 14 lines.

T4 and T5 are on the bottom left of the above T1-T3; a horizontal ring is in the upper part of T4 and T5 respectively, and the middle is a concentric circle. T4 has 18 lines, while T5 has 15 lines.

Both T6 and T7 are composed of one circular ring and lines; there are 18 lines around T6, and 17 lines around T7.

Data about relatively clear concentric circles of the second group are as follows:

X1: The diameter of the outer ring is 15 cm, and the diameter of the inner ring is 6 cm.

X2: The diameter of the outer ring is 15 cm, and the diameter of the inner ring is 7 cm.

X3: The diameter of the outer ring is 14 cm, and the diameter of the inner ring is 7 cm. It is a concentric circle with relatively large grinding depth, and its depth is 2.5 cm.

X4: The diameter of the outer ring is 9 cm, and the diameter of the inner ring is 4 cm.

X5: The diameter of the outer ring is 15 cm, and the diameter of the inner ring is 4 cm.

X6: The diameter of the outer ring is 15 cm, and the diameter of the inner ring is 6 cm.

X7: The diameter of the outer ring is 14 cm, and the diameter of the inner ring is 5 cm.

The second group has 16 masks, and the data about some clear ones are as follows:

R1: The width of the mask is 8 cm, the height is 12 cm, and the depth is 0.5 cm; the inner ring diameter of the eyes is 3 cm.

R7: The width of the mask is 30 cm, and the height is 34 cm; the diameter of the west eye is 11 cm, and the diameter of the east eye is 10 cm; the diameter of the nose is 6 cm, and the width of the mouth is 19 cm.

R8: The width of the mask is 30 cm, and the height is 46 cm; the diameter of the eyes is 14 cm, and the distance between the eyes is 30 cm; the diameter of the west nose is 7.5 cm, and the diameter of the east mouth is 5.5 cm.

R10: The width of the mask is 27 cm, and the height is 34 cm.

R11: It is mottled and indistinct, and cannot be measured.

R12: The width of the mask is 28 cm, and the height is 43 cm; the diameter of the west eye is 10.5 cm, and the diameter of the mouth is 18 cm.

A relatively recognizable sign in the second group F8: It is between R12 and R13; its height is 28 cm, and its width is 31 cm. There is a circular ring outside, with a nick of "big (大)" inside.

"The Milky Way (银河)": Its length is 6.2 m. It is called "the Milky Way" because there is a silver and shiny zonal region on the rock surface, with the sun, concentric circle, cupule and scribed line on it. However, the scribed line is not connected to the cupule. There are different sayings about whether "the Milky Way" was created by the ancients or contemporary. In the interview, when talking about "the Milky Way", all villagers shared their experience of "sliding" on the rock surface when they were young, and there is still no conclusion on whether the brightness of the rock surface where "the Milky Way" exists was caused by the "sliding".

"The meridian line (子午线)": There is a long hand-ground groove in the easterly position of the second group, and it is conventionally called "the meridian line". Its length is 5.5 m, and its error from the present meridian line in direction is only 3°55'88". Images like crescent, cupule, concentric circle and sun are distributed around the meridian line.

3.3 Investigation on the third group of Jiangjunya rock art

The third group of Jiangjunya rock art is in the easterly position of the hill. The length of the petroglyph is 2.2 m, and the width is 2 m; it is about 5 m away from S1 of the fourth group. The third group is dominated by the masks, and there are 16 masks in total. Among the masks, R1, R2, R4, R6, R7, R9, R11 and R14 have a facial profile; R3, R5, R8, R10, R12, R13, R15 and R16 have no facial profile. In addition, some cupules and signs are also scattered in the picture.

The sightseeing wooden trestle road is 20 cm above the third group of petroglyphs, there is no guard bar, and the third group of petroglyphs is on a completely horizontal rock surface, so the third group is severely damaged and trampled by human beings (as shown in Fig. 1-12). It is now mottled and cannot be clearly identified. The line drawing was painted according to the early rubbings. The images of this group will be analyzed according to the clear pictures as well as the line drawing. R11: It is the clearest and most representative mask in the third group. Its width (south-north) is 23.5 cm, and its height is (east-west) is 29 cm; the deepest nick in the image is 1.5 cm. The shape is like an apple; the eyes are two round cavities, and there are depictions resembling the nose and mouth. Besides, there are three radial lines and two round cavities on the top of the head.

According to the author's interview among surrounding villagers, there are many sayings about the mask R11. Old people with the surname of H consider that R11 is the embodiment of Nuwa and the symbol for the female patriarch in the matriarchal society; it is the oldest and most important image in Jiangjunya rock art. Of course, such description is nothing but the local villagers' construction and imagination for the local culture. However, it can reflect the image of Jiangjunya rock art in the concept of the local people. Meanwhile, it is also a kind of cultural reproduction, and can enhance the identity and confidence in the local culture.

3.4 Investigation on the fourth group of Jiangjunya rock art

The fourth group of Jiangjunya rock art comprises "one big and three small" rocks as well as the waffle patterns and cupules below. (As shown in Fig. 1-14 and 1-15) The numbers of the four rocks from east to west is S1, S2, S3 and S4. The south-north length of the biggest rock S1 is 4.3 m, and the east-west length is 2.2 m; the distance from the highest point to the rock surface is 1.9 m. The whole rock and the rock surface form an angle of 60°, and it leans westward. The distance between S1 and S2 is 3 m; S2: 2.2X1.4 m; the distance from the highest point to the ground



Figure 11: Line drawing for the third group of Jiangjunya rock art

is 1.1 m, and it is to the west of S2, on the edge of S2. S4: 1.2 m X 2.4 m; it is prolate, and the distance from the highest point to the ground is 1.1 m. S4 is to the southwest of S2, relying on S2. There are 18 clear cupules of different sizes on S4.

The “one big and three small” rocks are called “Stone Ancestor” by local people. They were collected by the residents during quarrying in the 1950s. However, the residents cannot crush them, so they believed that the rocks were intelligent, and they dared not destroy them anymore. Moreover, they began to protect them. Around the year of 1982, under the assistance of the local cultural relic department, they moved the rocks back to Jiangjunya with steel rope, and we can still see the punching and ligaturing marks now. Their positions have moved and changed recently, so the positions and combinatorial arrangements are not discussed in the following text. In addition, on the earth surface near the fourth group and the rock surface of S1 and S2, the rock is covered with black, which was not caused by burning. Instead, it is the accumulation of manganese under the joint effect of moisture (rainwater, etc.) and microorganisms (the microorganisms will maintain their metabolism via manganese).

As shown in Fig. 1-16, the numbers of cupules on S4 from west to east are from A1 to A18. The diameter of A1 is 8.5 cm, and the depth is 3.5 cm. The diameter of A2 is 7 cm, and the depth is 2 cm. The diameter of A3 is 13 cm, and the depth is 5 cm. The diameter of A4 is 20 cm, and the

depth is 8 cm. The diameter of A5 is 10 cm, and the depth is 8 cm. A6 is a semicircle; the south-north length is 6 cm, the east-west length is 3.5 cm, and the depth is 3 cm. The south-north length of A7 is 7 cm, the east-west length is 10 cm, and the depth is 2.5 cm. The diameter of A8 is 7 cm, and the depth is 0.5 cm. The diameter of A9 is 6.5 cm, and the depth is 3 cm. The diameter of A10 is 10.5 cm, and the depth is 7 cm. The diameter of A11 is 15 cm, and the depth is 9 cm. A12 is severely abraded, and it is almost on the same level with the rock surface. Its diameter is 5 cm, and its depth is 0.2 cm. The diameter of A13 is 11 cm, and the depth is 6 cm. The diameter of A14 is 5 cm, and the depth is 2.5 cm. The diameter of A15 is 4 cm, and the depth is 1 cm. The diameter of A16 is 9 cm, and the depth is 6 cm. The diameter of A17 is 15 cm, and the depth is 10 cm. The diameter of A18 is 7.5 cm, and the depth is 1.5 cm. A19 is on a slope, its diameter is 7 cm, and the depth of the deepest part is 6 cm. On this rock (S4), the three cupules including A3, A4 and A5 are connected; the east-west length is 31 cm, and the south-north length is 32 cm. Below the four big rocks, there are 9 different waffle patterns, also called “Mi lattice” or “chessboard”:

F1:50x38 cm: The square has nine cupules arranged parallelly with three longitudinal and three horizontal ones. The nine cupules in the square are almost the same, and their diameter is about 5 cm. In addition, a relatively big cupule of 9x8 cm to the west of the square is connected to the square.

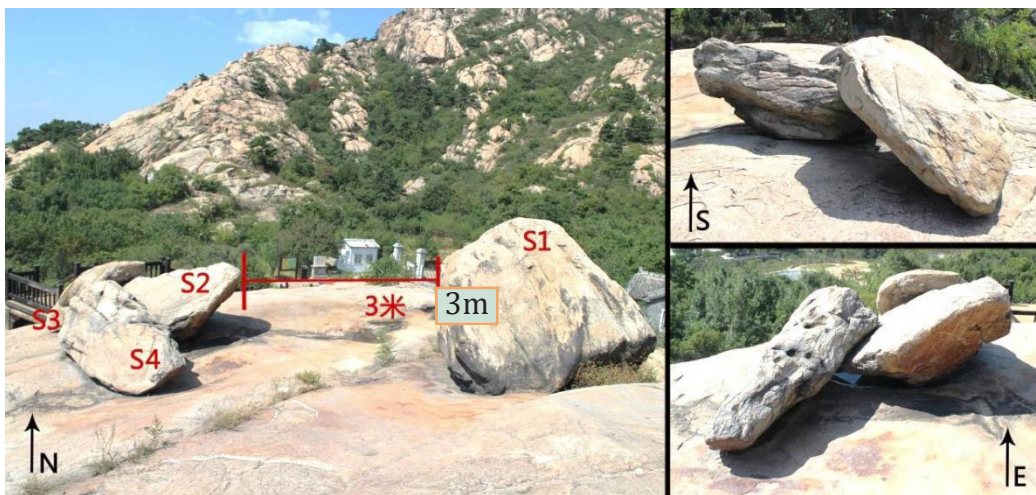


Figure 12: Full view and some images of the fourth group of Jiangjunya rock art

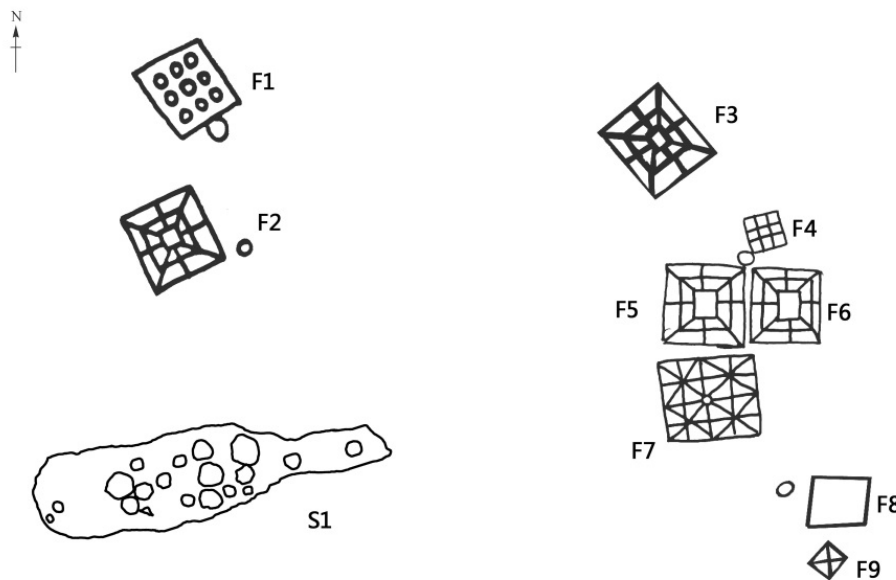


Figure 13: Line drawing for the fourth group of Jiangjunya rock art

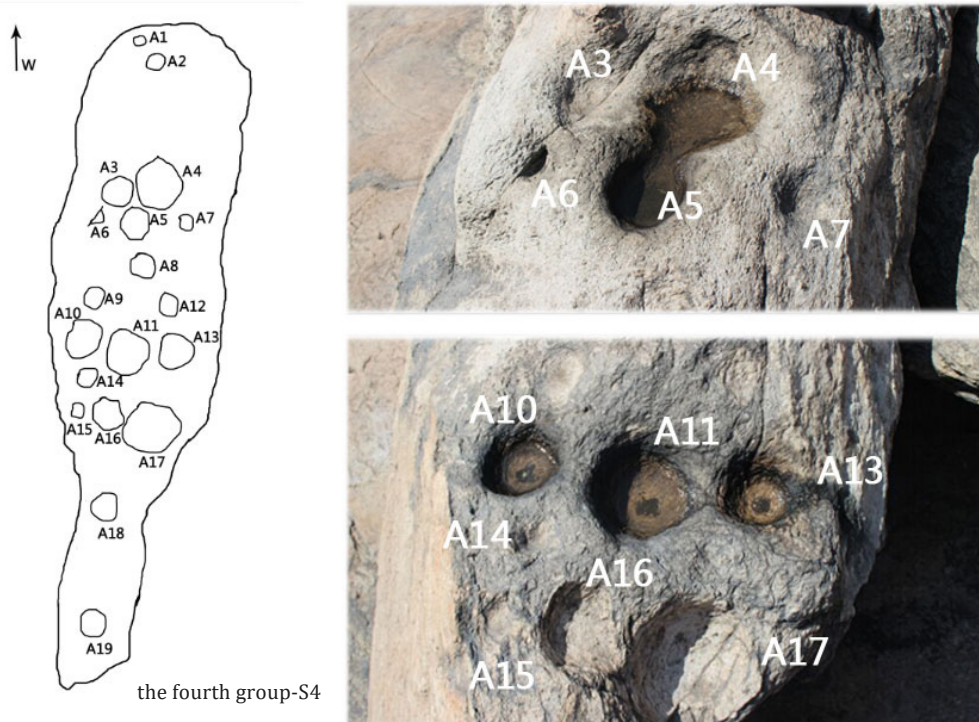


Figure 14: "Cupped cavity" in the fourth group of Jiangjunya rock art

F2: 36x35 cm: It is composed of three squares with different sizes. The side length of the innermost square is 10 cm, and the side length of the middle square is 21 cm; the diagonal lines are crisscrossed, running through the corner of the middle square to the corner of the innermost square from the corner of the biggest square. The length from the outermost corner to the innermost corner is 19 cm; the length of the vertical line crossing the square vertically from the innermost square to the outermost square is 14 cm.

F3: 30x50 cm: It is the same as F2 in modeling. The side length of the innermost square is 6 cm, and the side length of the middle square is 17 cm. The side length of the middle square is 21 cm from the inner square to the outer square is 13 cm, and the length of the oblique line from the inner corner to the outer corner is 18 cm.

F4: 16x15 cm: Two horizontal and two longitudinal lines crossing each other in the square form a pattern similar to the Sudoku, and the single side length of each square grid is about 4.5 cm.

F5: 30x50 cm: It is the same as F2 in modeling. The south-north side is slightly longer than the east-west side. The length of the south-north line of the innermost square is 11 cm; the length of the south-north line of the middle square is 17 cm; the length from the innermost corner to the outermost corner is 17 cm; the length of the line vertical to the square from the inner square to the outer square is 11 cm.

F6: 27x32 cm: It is the same as F2 in modeling. The side length of the innermost square is 11 cm, and the side length of the middle square is 20 cm; the length of the line vertical to the innermost and outermost squares is 9 cm; the length of the diagonal line connecting the innermost corner and the outermost corner is 12 cm.

F7: 35x34.5 cm: Three transverse lines and three vertical lines cross each other in the square, to form a "Mi" (米) character. There is a cupule with the diameter of 2.5 cm in the middle of the square, and the lines cross each other to form small checks; the length of the single side is 8-9 cm.

F8: 28x28 cm: It is a square.

F9: 10x10 cm: There is a crossed diagonal line in the outer square.

In addition, there is a cupule with the diameter of about 4.5 cm and

depth of 1.5 cm at the northwest corner of F5, i.e. among F4, F5 and F6. This cupule exists independently, and is not connected to any square. At the northeast corner of the square F8, there is a circular ring with the diameter of 6 cm.

This group of petroglyphs has 9 waffle patterns. Among them, F2, F3, F5 and F6 are the same in modeling. In other words, this group has 6 waffle patterns of different shapes. Except F8 which comprises one square, the internal lines of the remaining 8 squares are symmetrical horizontally and vertically.

Some rock surfaces are covered with black, especially A9, A10 and A12.

3.5 Investigation on the fifth group of Jiangjunya rock art

The fifth group of petroglyphs was discovered and reported by the local villager Ma Weihong in 2006. It is located at the top of Jiangjunya. The petroglyphs were engraved on the side wall of a rock with the south-north length of 7.7 m and height of 0.5-1.8 m. The picture faces the northwest direction. In terms of image division of this group, such as images of R3, R13, R14 and R15, there is a long circular ring in the middle, and two circular rings resembling the eyes on both sides. Some scholars consider that such image is associated with the "male genitalia". However, the shape based on such images is the simplification and abstraction for the main part of the mask images in this group, and such images are classified as the mask. Besides, this group also has many cupules scattered in the picture. According to the arrangement mode of the cupule, three cupules forming a regular triangle or inverted triangle will be classified as one group, such as F1, F2 and F3. In addition, other cupule combinations and irregular images composed of lines are uniformly called signs, started with F. Hence, this group has 20 masks, 14 signs, and some scattered cupules & concentric circles.

The fifth group of Jiangjunya rock art and the first four groups are not on the same rock, and it is located on a big rock at the top of the back mountain of Jiangjunya. There is still no road to the mountain and the place is steep and covered with vegetations, so few people can get there. Moreover, this group of petroglyphs was discovered in 2006. As a result, the outside knows and studies little about this group. This group of petroglyphs is well-preserved. Compared with the first four groups, it almost encounters no man-made destruction, and the striking points in the engraving process still exist.



Figure 15: Panorama of the fifth group of Jiangjunya rock art

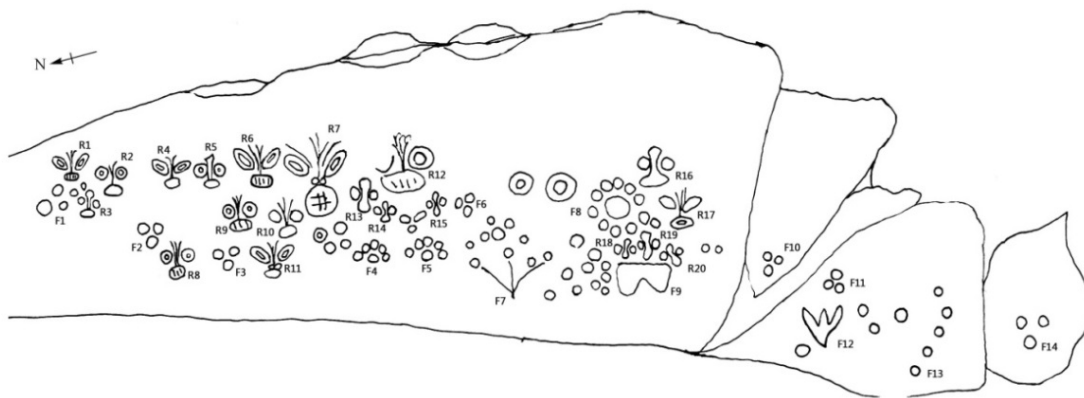


Figure 16: Line drawing for the fifth group of Jiangjunya rock art

Table 1: Image elements in the existing Jiangjunya rock art

	The first group	The second group	The third group	The fourth group	The fifth group
Mask	√	√	√		√
Rice image	√				
Abstract sign	Cupule	√	√	√	√
	Waffle pattern			√	
	Other abstract signs	√	√	√	√

The specific information of typical images in this group is as follows:

The eyes of the masks R1, R6, R7, R8, R9 and R12 in the fifth group of Jiangjunya rock art are round or oval concentric circles; vertical lines are engraved in the mouth. According to the rubbings, there are 3 lines, while R6 and R12 have 4 lines. Due to natural weathering, only the following could be clearly identified and measured during the investigation in 2015: R6, 22×30 cm; R7, 35×42 cm, R9, 22×20 cm; R12, 40×40 cm. In addition, the eyes of R2, R4, R5 and R11 are round or oval concentric circles; the nose comprises several vertical lines; there is no vertical line in the mouth. R3, R13, R14, R15, R16, R18, R19 and R20 have taken the core images of the above two kinds of masks; the size of R13 is 19×22 cm.

The signs F1, F2, F3, F6, F10, F11 and F14 of the fifth group of Jiangjunya rock art are regular triangles or inverted triangles composed of cupules; the diameter of the cupule is about 4.5 cm, and the depth is 2 cm. F4 and F5: There is a cupule in the middle; the upper part is a semi-arc where 5 cupules are arranged side by side, and the size of the cupules is similar; the diameter is about 5 cm, and the depth is 2 cm. F7 is similar to the grain seedling image, and three lines present a divergent state; there is a cupule at the ends of the line respectively. F8 is the cupule

combination; there is a big cupule in the middle, and 10 relatively small cupules uniformly arranged as a circular ring in surrounding areas. F9 is an irregular figure composed of closed lines; the height of the left side is 18 cm, and the height of the right side is 16 cm; the width is 33 cm, and the depth of the deepest part is 3 cm.

4. MAIN PETROGLYPH TYPES OF JIANGJUNYA ROCK ART

In five groups of Jiangjunya rock art, all groups except the fourth group have masks. However, the masks have different forms, especially the first group which has 16 masks with different styles. In the second group, third group and fifth group, masks also appear, and the styles in the same group are basically the same. The rice crop image only appears in the first group, and five rice crops are connected to the masks. The waffle pattern only appears in the fourth group, and is also the main image of the fourth group. Cupules exist in all the five groups, but their specific forms are different. Cupules of the first group are just associated figures. The second group has many cupules arranged on a band of 6.2 m. It is like “the Milky Way”, and forms the main picture of the second group together with the masks. In the fourth group, the cupules are on a “rock community”, with relatively great size and depth. They are “cupped cavities”, and A4 is the biggest one, with the diameter of 20

Table 2: Mask in the Jiangjunya rock art













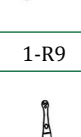


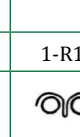



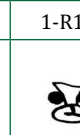



























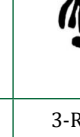
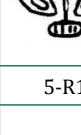
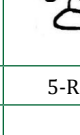
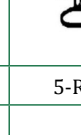
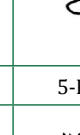
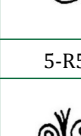
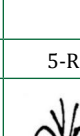
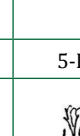
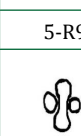
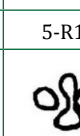
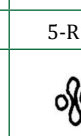
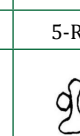

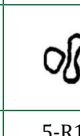
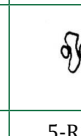

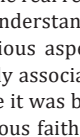
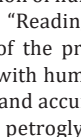
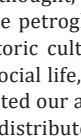
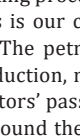
The first group					
	1-R1	1-R2	1-R3	1-R4	
					
	1-R5	1-R6	1-R7	1-R8	
					
	1-R9	1-R10	1-R11	1-R12	
					
	1-R13	1-R14	1-R15	1-R16	
	The second group				
		2-R1	2-R2	2-R3	2-R4
					
		2-R5	2-R6	2-R7	2-R8
					
		2-R9	2-R10	2-R11	2-R12
					
		2-R13	2-R14	2-R15	2-R16

Table 2 (continued): Mask in the Jiangjunya rock art

The third group					
	3-R1	3-R2	3-R3	3-R4	
					
	3-R5	3-R6	3-R7	3-R8	
					
	3-R9	3-R10	3-R11	3-R12	
					
	3-R13	3-R14	3-R15	3-R16	
	The fifth group				
		5-R1	5-R2	5-R3	5-R4
					
		5-R5	5-R6	5-R7	5-R8
					
		5-R9	5-R10	5-R11	5-R12
					
		5-R13	5-R14	5-R15	5-R16
					
5-R17		5-R18	5-R19	5-R20	

cm. In the fifth group, the cupules are also associated figures, but the proportion rises when compared with that in the first group. Moreover, half quincunx and quincunx composed of cupules appear. The waffle pattern only appears intensively in the fourth group.

5. CONCLUSIONS

As the human expression of the world view and self in early times, the

petroglyph is the real refraction of human thought, thinking process and evolutionary understanding. "Reading" the petroglyphs is our channel to explore various aspects of the prehistoric culture. The petroglyph has been closely associated with human social life, production, religion and belief since it was born, and accumulated our ancestors' passionate feelings and pious faith. The petroglyphs distributed around the world are like stars all over the sky, and they have become the focus of today's society via their global breadth and historic depth. Jiangjunya rock art is one of the most famous petroglyph sites in China, and an important link in the mask petroglyph of the Pacific Rim. It can reflect the hunting civilization and agriculture civilization of this region in early times, and it is an agricultural sacrificial site of a high social class in the

Table 3: Rice image in the Jiangjunya rock art

The first group				
	1-H1	1-H2 The upper part connected to the mask	1-H3	1-H4 Overlapped by H5
	1-H5 The upper part connected to the mask; overlapping H4 and H6	1-H6 Overlapping H5 and H7	1-H7 Overlapping H6; overlapped by H8	1-H8 The upper part connected to the mask; overlapping H7
	1-H9	1-H10	1-H11 The upper part connected to the mask	1-H12 Overlapping H13
	1-H13 Overlapped by H12	1-H14		

Table 4: Cupules and other signs in the Jiangjunya rock art

Cupule				
	1/2/4/5-A			
Concentric circle				
	1-A	1-A	2-A	
Sun				
	1-T1	2-T1	2-T2	2-T3
	2-T4	2-T5	2-T6	2-T7
"Mi(米)" sign				
	1-F1	1-F2		
Waffle pattern				
	4--F1	4--F1、F3、F5、F6	4--F4	4--F7
	4--F8	4--F9		
Other signs				
	2-F7	2-F8	5-F4	5-F5
	5-F7	5-F8	5-F9	5-F10

prehistoric society. The systematic investigation on Jiangjunya rock art is the foundation for us to unscramble Jiangjunya rock art, and plays a positive role in propagandizing and protecting Jiangjunya rock art.

ANNOTATION

1. The numbering mode of images in this paper is as follows: group-mask (R) / grain seedling (H) / sun (T) / sign (F) / cupule and concentric circle (A)-figure. For example, the third mask of the first group of Jiangjunya rock art is numbered as 1-R3. The third sun pattern of the second group of Jiangjunya rock art is numbered as 2-T3. Other abstract symbols like waffle pattern and "Mi" sign are classified as signs; the number of cupules is group-A, and no figure will be used.

