



## An overview on Three Seasons of Archaeological Excavations in Jahangir Site, Ilam

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(89-106)

### Abstract

Jahangir is one of the most prominent Sasanian sites in the west of Iran that excavated due to locating in the flood level of Kangir dam (Eyvan). The deficiency of knowledge about the manner of constructing, settlement areas, causes of formation, collapse and chronology of these structures, specify the type of livelihood, study the industries and various arts such as stucco decorations, glasses, metallurgy, pottery, determining the elements, architectural decorations and materials, functions and effective factors in different artistic styles are the questions and aims of excavation. In order to answer mentioned questions, a descriptive-analytical method with the help of excavation and historical texts have been used. At the end of three seasons of archaeological excavations, the plan of a huge building included 11 Spaces had been revealed. These Spaces consisted of two (Eyvans) porches and some rooms, with a courtyard and interior area that built with rubble and a mortar of Semi-baked and Semi-pressed plaster and brick for ceilings. Asymmetric geometric structure, division of interior and exterior areas, spatial variations and significant role of Eyvans in spatial organization of the complex are the most important features of the three phases of architecture. Various artworks in this complex are influenced by the current Sasanian art, but it has own independent and native identity. According to the archaeological data, it could be claim that Jahangir site have been designed for official requirements. The construction of this site could be interpreted in the base of natural landscape and counted as a manor house with ritual/settlement function among the other palaces of this period.

**Keywords:** Sasanian, Jahangir, Kangir River, Eyvan, Ilam.

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## 1. Introduction

Despite of a long-term life of Sasanian period, there are a few architecture remains from this era. So there are some difficulties in typological studies, dating and different aspects of Sasanian architecture (Mohammadi, 2011: 80). West of Iran had been attracted the Sasanians from Shapur II kingdom, because of adjacency to Ctesiphon (Genito, 1997: 538). The archaeological excavations in Jahangir Site are worthy in order to discover the monuments and artifacts. After the decomposition of Kangir dam in 2015, Jahangir site remained in 300 meters distant to Kangir Border River and according to the potentials and archaeological finds, decided to be protected as a historical site next to the touristic site in Kangir dam, for long-term researches and touristic goals. The actual core-zone of Jahangir is an area in 173877 m<sup>2</sup> and its buffer-zone is 208197m<sup>2</sup> (Khosravi, 2017). In this 17 Hectares site there are some huge monuments and two cemeteries. The most important part of the site, central mound surrounding the main rectangular hall have been excavated during three seasons (Fig: 2). In addition to locating in Kangir dam basin, our deficient knowledge about construction, reasons of formation, collapse and dating of these monuments those are belonged to the Early Islamic period in some cases, determination the type(s) of livelihood, study the industries and arts such as, stucco, glasses, metallurgy, pottery, specify the attributes, architecture decorations and materials, function and effective features in various artistic styles are the purposes of research, and in order to answering below questions have been designed:

-What are the reasons of formation, collapse and dating of this monument, and How was the quality of these type of buildings in the West of Iran?

-Which factors have been effected the materials, main elements and ornamentation of Jahangir site and its artistic styles?

- What are the main functions, similarities and differences between Jahangir site and the other finds with simultaneous ones?

To achieve to the answers of these questions a descriptive-analytical method of study with the help of historical texts and field studies have been used. Also the presented hypothesis are based on some historical texts those related this monuments to the Early Islamic centuries. Since there were not enough time and motivations in this period, it seems that the construction of this monuments goes back to the Pre-Islamic period and it used again in Early Islamic with small changes. The materials are vernacular like slabs, Semi-baked and Semi-impressed plaster and bricks with decorated stuccos. Also it seems that in addition to political-social factors, environmental and climate modifications are effective in both formation, life and collapse of this site. The designers of this monument were impressed by common artistic traditions of this period, beside the domestic patterns of art. According to the architecture style and the other archaeological finds this monument had settlement-ceremonial function.

## 2. Research Background

The first studies in this region is belonged to Louis Vandenberghe in 1970, with excavations in Joub Gowhar, Peliyeh cemeteries, Siahgel fire-temple and Kouria Building (VandenBerghe, 1971). In subsequent, Freya Stark visited the remains around Kangir River and then traveled to Iraq (Stark, 1979). After an archaeological survey in this region led to identify Kouria, Shemiran Castle, Janagir and Gowriyeh (Pirani, 2001). In continue, another Surveys have been done by Ali Nourollahi and Sayyad Soltani in 2002. Ebrahim Moradi did another survey in Kangir River Basin that eventually to identifying 11 Sites in this region (Moradi, 2007). In 2015 Some test trenches Sounded in rectangular hall of Jahangir by Hamid Amanollahi, and finally had been excavated by the author since 2016-2019 in three seasons.

### 3. Geographical Location of Jahangir Site

Jahangir is located in (38s:X:606595, y:3752695) about 65 km(s) in the North of Ilam, Zarneh County, in the West of Sartang Village in contact with the other simultaneous sites such as Kouria, Gowriyeh, Shemiran Castle and Siahgel fire-temple in the alongside of Kangir river (Fig1). Current Ilam was part of the Pahleh territory in Parthian and Sasanian periods and Arabs called that Jebal in later period (Ibn-e Khordadbeh, 1991: 42). The mentioned State divided into two parts: Northern part, Maspazan, with the centrality of Sirvan and Southern part, Mehrjan Qazaq, with the centrality of Seymareh. In historical text three cities mentioned: Sirvan, Ariyohan and Alraz from Maspazan County. According to this division, Jahangir site was located in a part of Maspazan named Ariyohan. Rawlinson believed that current Zarneh, previously was Ariyohan and was known by this name until 13<sup>th</sup> Century A.D (Rawlinson, 1983: 43). This city brought with different forms such as Azivjan, Ariyohan and Arboujan. There are two signs from Ariyohan: A town that a fountain could be seen from far distance and the river of this city goes to the Mandali (Bandjin) river (Qouchani, 1994: 51-52). Nevertheless, Kangir is the only river of this region that join to the Mandali in Iraq after passing Soumar lands. Due to the high taxes of this region, the presence of opponents (Akbari, 2015: 56) and highland climate with the emersion of Abbasids, this area named the moon of Kufa (Mazaheri, 2010: 45). This region was abandoned from 3-4 centuries A.H. because of earthquakes (Kambakhs Fard, 1989: 62).

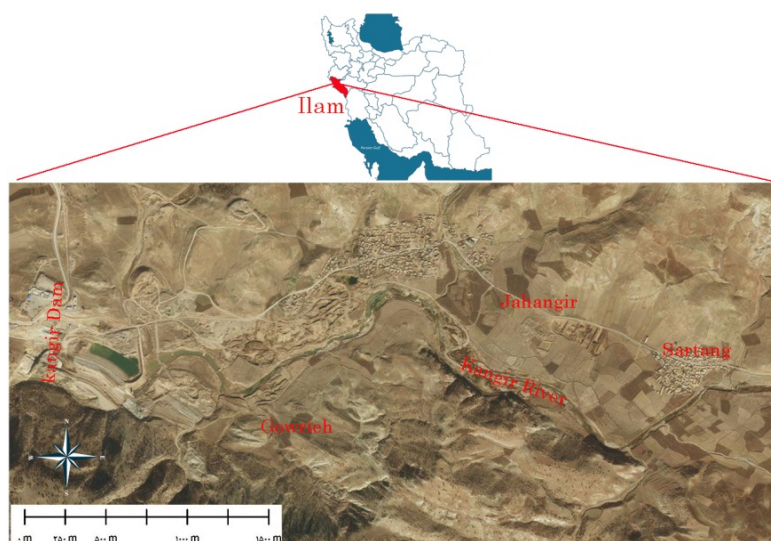


Figure 1. Geographical Location of Jahangir Site in Aerial Photo (Author, 2020)

### 4. Excavation Method and Performance

While at the first, the excavation was salvage and precious and scientific documentation because of dam intake, it has some basic goals and questions. The geometric-horizontal excavation had been selected by the author. There were a huge amount of soil and stone, because of debris falling and illegal excavation. The main excavation had been started after cleaning, documentation and systematic surveys of surrounding areas. The height of the debris was 2-4 meters to the main floor of the site. It is worth noting that the excavation in Historical and Islamic sites will be faced some difficulties if it based on mapped grids and the interference to the building range. So on, the best method of excavation is to reveal the traces of walls and the architecture remains or Organic excavation method. At the end of this method, it is possible to draw the architecture remains on map. The method of register and documentation of cultural materials was layer, feature and

phenomenon (for movable finds). During the digging, various architecture finds and their decorations (stuccos), pottery, stone, glass, bone and botanical finds had been discovered inside the debris.

### 5. Architecture Finds

According to the surveys, study the old and new aerial photos and the results of the sounding for determination of core-zone and buffer-zone, the expanse of the site is in North-South direction and the first settlement goes back to the Neolithic and Chalcolithic in the Northern part. After that, this site have been dwelled again in Parthian period. There are a complex of buildings, especially in the central part from Sasanian period. The nomadic settlements were existed until 4-5 centuries A.H. There are some significant reasons in formation of this site in different stages of human settlements, such as Kangir River, proximity to one of the most important ways to the Mesopotamia, climate and an environment that was suitable for both nomadic-husbandry and sedentary societies. Some enormous buildings are obvious in this site. In Southeastern side of central mound, there is rectangular hall in 11×19 meters. A square-shaped building in approximately in 58×58 meters, with four round-shaped towers is located in the West and Northwest of the hall. The size of the towers is 14×10 meters. The destruction caused small low-heighted mounds in the Southern parts. The cemetery of Sartang village located in the North of Jahangir site and there are the traces of walls belonged to the rectangular area. Eventually, after feasibility and anticipate to find complete constructions, the excavations at the central mound had been started from 2017 until 2019 (Fig 2). After three seasons of excavations in central mound, the plan of some parts of an enormous building including 11 Spaces and an area in 832 m<sup>2</sup> have been revealed. Jahangir building include hall, Eyvans, rooms and courtyard. The walls, round or square columns, arcades, arcs and stuccos exist in this building and the mortars are rubbles and Semi-baked and Semi-impressed plaster. These materials are quick and pressure and stretching persistent (Mirdrikvandi et al, 2015: 45). The height of the walls are different, those made by floating the slabs in mortars and covered them with a plaster/gypsum layer. The widespread use of gypsum/plaster, brick and related methods of vaulting are the tradition of Sasanian period. According to the importance of this monument, like the other ceremonial and palaces of this time, it adorned with valuable stuccos. Some phases of architecture have been identified in this site. In the first phase, the building had been made by slabs and Semi-baked gypsum on a wide Parthian site. In the second phase another buildings added to the main one and probably some reconstructions have been done. In the third phase, the monument had been abandoned and dwelled by nomadism populations. Simple and basic constructions, re-using the materials of debris such as mud mortar are the methods of architecture in this phase. The most damage of the monument belongs to the upper layers. Barrel vaults with bricks and gypsum mortar have been applied for covering the areas. The remains of them were found in the debris of the rooms. Absolutely, the form and size of the arcs were differed to the size of the rooms. In some cases, the bricks have been used vertical with gypsum mortar in Sasanian period. This pattern also used in Parthian sites such as Ashur, base of the Taq-I Kasra and Damqan Palace (Reuther, 1938: 642-643).

Darkness, the cold and the bad ventilation are the problems of the rooms without window of this type of architecture. Another important attributes are asymmetric geometric architecture, division of inner and outer parts, spatial variety, religious part and important role of the Eyvan in the spatial organization of the complex (Tahmasebi, 2013: 153). The architecture context of Jahangir was without niches and daily life stuffs. As mentioned, 11 spaces have been revealed by the excavations and **S** show it.

**S.I.** This space is approximately rectangular-shaped in size of 11×4.5 meters. The excavation started in the height of +30 cm from the bench mark and ended in the depth of -282 cm. S.IV in the North,

S.II in the West and S.III is located in the North and Northwest. There is a rectangular entrance in the Northern wall and two steps in the Southwest join this area to S.II. There is also a platform in the Southern side.

**S. II.** In fact, this space was a square Eyvan in size of 5.45×4.5 meters and the remains of its walls in the width of 80 cm(s) are in the Northern, Eastern and Western sides. Discovering a stone heel in the central mound of the site, indicate the existence of a wall and gate in the Southern part and perhaps they are related to the nomadic settlements. In the center of this space, an oven with consequence layers of charcoals and ashes and different settlement floors of nomadic phase have been found. The both sides of the walls of this space coated by plaster and in some cases their thickness are 10 cm(s). In the inner side of the walls, there are some cornices those have 15-18 knob. In the South of this small Eyvan in Southern, Eastern and Western sides, there are three steps in order to prepare a connection with surrounding spaces and entering the Eyvan . Also there is a gate in the width of 100 cm(s) in the North of space. This gate connects S.II to S.III (courtyard) with three steps. Two stucco friezes with winged horse in particular and symmetric have been discovered in the two sides of this gate. Apparently, there were some reconstructions with the low quality materials such as stone and mud after the site had been abandoned.

**S. III.** This rectangular space in the size of 13×6.5 meters located in the Northwest of the excavation area, which limited to S.II from the South, to S.I from the Southeast, to S.IV from the West and to S.VI from the Northeast. According to what discovered until now, the function of this hypaethral Space is to create a connection between different parts of the site, such as the courtyard (Fig 3-1,4).

**S. IV.** This is a rectangular room with East-West direction in the Eastern half of excavation area, in size of 8.85×8.25 meters in the North of S.I and the East of S.III. Two symmetric buttresses have been applied on the Southern and Northern walls inside of this room. A rectangular gate in the Southern side, connects this room to S.I. The main entrance is located in the Northwestern corner, between S.IV and S.III. The walls of this room are covered by plaster/gypsum in width of 10 cm(s). Parts of a colored coverage with green, yellow, blue and red had been discovered from the Western wall. An integrated debris of a ceiling with the bricks in size of 31×31×7 cm(s) with the plaster/gypsum mortar and plates had been found during the excavation (Fig 3-6). The primer plaster floor of the room which located in the depth of -260 cm(s), ruined and damaged by continuous usage and heavy weight of the debris (Fig 3-3).

**S.V.** A corridor in West-East direction of the monument, with 9.25 meters length in Southern part, 17.5 meters width in the North of S.IV and East of the S.III and S.VI and the South of S.VIII have been revealed. A part of the center of this space covered with an arc in length of 1.6 meters. The height of the highest part is 3 meters above the level floor. This corridor ended to the most Eastern point to an entrance and surrounded the Eyvan such as previous samples, which access to both Eyvan and side room. Also it is possible to enter from outside (Fig 3-5). The emerge of this type of ceiled corridor which makes the direct passing from one space to another one impossible, goes back to the Parthian, and re-used in Sasanian and Early Islamic palaces such as Qasr-I Shirin and Ukhaizar (Reuther, 1938: 435).

**S.VI.** A rectangular space in size of 11.20× 8.65 meters, located in Northern of S.III and West of S.V and S.VII, which is a connection between S.VIII and S.VII.

**S.VII.** In fact, this rectangular space in size of 9.84×8.5 meters, is the main Eyvan of the monument, which located in the North of S.V and in the East of S. VI. Its entrance is placed in the Western side. There are some symmetric knobs in the last 2 meters of the Northern and Southern walls, like the Eyvan of S.II.

**S.VIII.** This square-shaped Space in the size of 6.40×6.25 meters, located in the North of S.VII and East of S.X. This Space has an arced gate in the Western side, which connects to S.X and an

entrance with two buttresses in front of the arced gate. There is a division between Southern and Northern parts in nomadic dwellings. There is no obvious function for this space. Maybe, it was one of the entrances of the monument or connected the inner parts together.

**S.IX.** This Space Located in the Northwest of excavation area, in the size of 7.5×7 meters. One of the most significant finds from this space, are pottery sherds, which some of them, have some inscriptions in their neck. There is no evidence from ceiling in this space and probably covered with organic materials such as wood or mud, according to its importance.

**S.X.** This Space Connects S.VI to the outer part, with a North-South direction in the North of excavation area. The gate of the S.VIII opens to this space. The length of this space is 9.45 meters in a North-South direction, but its width is different because of the return of wall. Its width to the middle (Southern part) is 1.165 cm and increases to 2.72 cm in the Northern part. The floor of this space made by mud/clay, which continued until.

**S.XI.** This space in the size of 15×12.45 meters, in fact is the continue of the S.I which excavated in the third season, in order to revealing the connection between central mound and rectangular halls. The Western gate of rectangular and a round-shaped construction made by slabs and plaster in 2.45 meters distant from the West of the entrance have been found. In order to forming the round-shaped Space, especially in outer part, the molded stuccos with a curve into the inside. The diameter of this construction is between 2.30 to 2.45 meters and depth of 64 cm(s). In the Northeast of the floor, there is a round curved part, which is a closed Space and have not any pores, and covered by plaster/gypsum. In the absence of any cultural materials related to this structure, it is hard to recognize the function. There were even no traces of debris inside inner part and intentionally filled with a soft brown clay, and there were no trashes or ruin. This structure related to the second settlement plaster floor. In other words, the round-shaped structure with 45cm(s) height from the first settlement floor, had been built in later periods. Maybe a religious function could be imagined for this structure Or it can be a structure for fermenting materials for beer and wine production. The only similar and comparable specie is in Kish palace, which are round-shaped lavers with covered floor besides the vaulted room (Kroger 2017:410). this part of the site, leads us to the religious part. A single step without another surrounding construction, indicates that some parts of the monument have been ruined in Southern parts and further excavations will be revealed this issue.



Figur 2. Plan of Central Mound of Jahangir before and after Archaeological Excavations (Author, 2020)

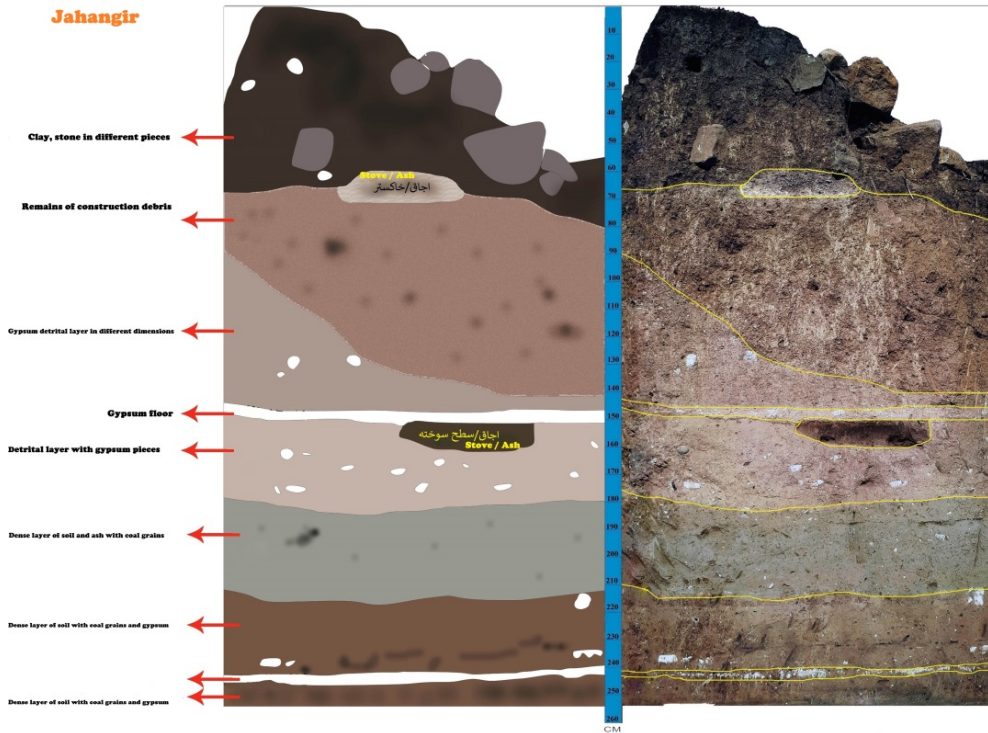




**Figur 3. A Selection of Appeared Areas in Central Mound of Jahangir Site (Author, 2020)**

## **6. Test Trenches**

In order to recognizing the various settlement floors and type of the foundation and construction, some test trenches in some rooms, and eventually the results show that the methods of building floors are different in different parts. There is also a section of the debris in the North of S.XI for identifying the sequences of settlements That 9 layers have been identified in the section of debris. Existence of two settlement plaster/gypsum floor is completely obvious in the section, and according to the other finds, there were two important settlements in the monument, and some of them related to the later settlements. The lowest layer is an impressed brown floor in the depth of -252 cm(s), which belonged to the Parthian period and Jahangir site have been built above in Sasanian period (Fig 4). So, The progressive trench of S.II in size of 1×1 meter, built in order to recognizing the grounds and probable floors, and distinguishing the end of the walls. The starting point of the excavation was in the depth of -120 cm(s) from the bench mark. The texture of soil was from clay and brown. The seeds of the plaster in the soil was concentrated somehow. There are also small layers and gray lenses, but there are not significant changes in the context and color of cultural materials. In the depth of -137 cm(s) there is an evidence of a settlement floor with the width of 10 cm(s). After that, in the depth of -183 cm(s), the cornice of the Northern wall in the width of 17 cm(s) have been appeared and ended in the depth of -267 cm(s). There is a sand layer in 11 cm(s) thickness exactly below the walls, which seems a kind of foundation or basement for building a wall. After this layer, there is a layer of an unmixed brown clay .

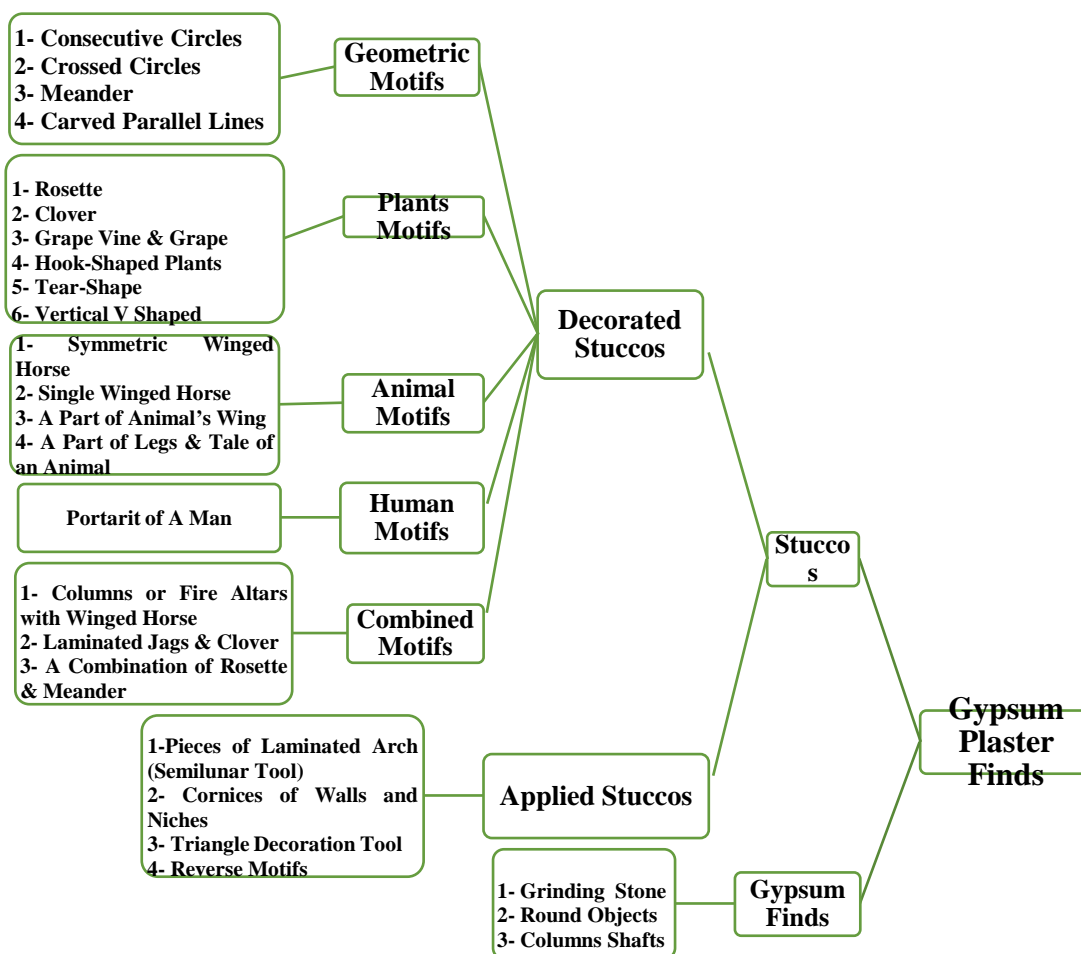


Figur 4. A Section of Debris of Jahangir Site (Author, 2020)

## 7. Stucco Decorations

Stuccos are the most prominent finds of the excavation, those are mostly used as coverage of walls and gates. The human, animals and botanical motifs in the frames with geometric decorated frames, show the influence of Sasanian common artistic tradition, while they kept their domestic identity. Botanical ornaments as the filler of empty Spaces and between the human and animal motifs in the margins. Elimination of the figurative human and animal elements those happened in the Early Islamic period, are sensible in the stuccos of Jahangir, with this different that they are only covered the animal motifs. Creating the motifs on stuccos with repeat and symmetrize and molding technique, which are simple methods, in order to prepare the friezes and decorated margins in architecture with the unmixed context and repeated motif (Fenier, 1995: 72). The delicacy and accuracy have been applied in presenting the portraits, and transformation methods and reflective symmetric in spreading the motifs could be seen. Besides the various methods and motifs, some rules were common such as symmetry, repeat, bi-meaning motifs, and square-shaped frames (Mesbah Ardakani & Lezgi, 2008: 39). The motifs are included mythical concepts and presented an imaginal and decorative combination (MakiNejad, 2009: 12). Of course in some cases they only played the decorative and ceremonial role. Plaster/gypsum finds are divided into two groups of stuccos and plaster objects and each group divided into below groups:





**Diagram 1. The Typology of Gypsum Plaster Finds**






Between the found stuccos, there were friezes decorated with winged horse, those are covered in Islamic period. According to the importance of these friezes and for recognizing the sources of plaster, two sample of stuccos and their coverages have been analyzed in XRF laboratory of RCCCR.

**Table 1. Results of Elements Analysis of a Frieze Stucco with Symmetric Winged Horses Motif**

Samples	NA2O	Mgo	Al2O3	SiO2	P2O5	S03	CL	K2O	CaO	TiO2	Cr2O3	MnO	Fe2O3	SrO	0I
1	-	0.14	0.27	1.2	0.06	39.1	-	0.01	37.5	0.02	-	-	0.20	0.018	21.45
2	-	0.16	0.27	1.2	0.07	39.3	-	0.01	37.3	0.019	-	-	0.20	0.20	21.40

The abundance of Sulfur and Calcium Oxide, shows the formation of Gyps or Plaster. Secondary minerals such as Magnesium, Aluminum, Cilice, Phosphor, Sulfur, Potassium, Titanium, Ferrous and Strontium Oxide indicate that two plaster have been supplied from the same resource (Madani, 2016). The used gypsum had been extracted from the gypsum mines near Sartang village, which are used in the past in the form of gypsum (Afshar Sistani, 1993: 489).

Table 2. A Selection of Stuccos

Type of Material	Type of Decoration	Name of Motif	Area	Measure (cm)				Photo
				Diameter	Height	Width	Length	
Stucco	Animal	Symmetric Winged Horse	II	-	-	45	83	
Stucco	Animal	Single Winged Horse	II	-	-	15.5	29	
Stucco	Human	A Man	III	-	-	30	53.5	
Stucco	Plants	Clover in the Jagged Frame	v	-	-	2	24	
Stucco	Plants	Rosette	IV	-	-	17	24.5	

### 8. Potteries

Different forms of pottery such as jug, plates, cauldrons and jars in different sizes (Fig 5). The results of Petrography analyze on some selected pottery sherds, show that the entire region composed of Lime sediments, sandstones, ciltstone, evaporating stones and related sediments. Some potteries are local, and some are not (Beheshti, 2017: 10). The paste colors are buff, orange-buff and grayish buff and their tempers are mineral. From decorations, they are plain and slipped and there are also some Sasanian ostrakas.



Figur 5. A Selection Potteries from Jahangir Site (Author, 2020).

**Table 3. The Attributes of the Selection of Potteries from Jahangir Site**

No	Descriptions (Sherd Type, Technique, Quality, Temper, Decoration, Coating, Fire)	Period
1	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Applique Pinched, Dense Slip, Well-fired	Sasanian
2	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Pinched, Dense Slip, Well-Fired	Sasanian
3	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved, Dense Slip, Well-Fired	Sasanian
4	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved, Dense Slip, Well-Fired	Sasanian
5	Goblet with Bag-Shaped Everted Rim, Wheel, Medium, Mineral, Carved, Dense Slip, Well-Fired	Sasanian
6	Rim & Handle, Ewer, Buff, Wheel, Medium, Mineral, Applique, Dense Slip, Well-Fired	Sasanian
7	Rim with Bag-Shaped Everted Rim & Handle, Ewer, Buff, Wheel, Medium, Mineral, Applique, Dense Slip, Well-Fired	Sasanian
8	Bag-Shaped Everted Rim & Handle, Buff, Ewer, Wheel, Medium, Mineral, Carved, Dense Slip, Well-Fired	Sasanian
9	Ewer with Bag-Shaped Everted Rim, Buff, Wheel, Medium, Mineral, Geometric Carved, Dense Slip, Well-Fired	Sasanian
10	Ewer with Everted Rim, Buff, Wheel, Medium, Mineral, Carved?, Dense Slip, Well-Fired	Sasanian
11	Rim & Neck, Ewer, Buff, Wheel, Medium, Mineral, Geometric Carved, Dense Slip, Well-Fired	Sasanian
12	Ewer with Everted Rim & Two Ringed Handles, Buff, Wheel, Medium, Mineral, Geometric Carved, Dense Slip, Well-Fired	Sasanian
13	Handled Goblet, Buff, Wheel, Medium, Mineral, Plain, Dense Slip, Well-Fired	Sasanian
14	Handled Goblet, Buff, Wheel, Medium, Mineral, Parallel Carved, Dense Slip, Well-Fired	Sasanian
15	Bowl with Everted Rim, Buff, Wheel, Medium, Plain, Dense Slip, Well-Fired	Sasanian
16	Bowl with Short Upright Rim, Buff, Wheel, Medium, Mineral, Plain, Dense Slip, Well-Fired	Sasanian
17	Bowl with Everted Rim, Buff, Wheel, Medium, Mineral, Plain, Dense Slip, Well-Fired	Sasanian
18	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Pinched, Dense Slip, Well-Fired	Sasanian
19	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Pinched, Dense Slip, Well-Fired	Sasanian
20	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Pinched, Dense Slip, Well-Fired	Sasanian
21	Rim, Cauldron with Everted Rim, Buff, Wheel, Medium, Mineral, Carved Pinched, Dense Slip, Well-Fired	Sasanian

## 9. Glass Objects








Many glass object pieces have been discovered that 7 pieces are prominent and delivered to Van de Graaff in method of micro-pixi. The glass objects included censers, base and body of the wares (Fig 6-4), cosmetics and jewellerys wares, those are cylinder-shaped or round and mostly plain. The color spectrum contains green, cream, yellow and streaks of red and brown. The identified elements are: (Na<sub>2</sub>O), (MgO), (Al<sub>2</sub>O<sub>3</sub>), (SiO<sub>2</sub>), (P<sub>2</sub>O<sub>5</sub>), (SO<sub>3</sub>), (Cl), (K<sub>2</sub>O), (CaO), (TiO<sub>2</sub>), (MnO), (Fe<sub>2</sub>O<sub>3</sub>) and (Cu<sub>2</sub>O). But the value and percentage weight are different in various samples. Glasses are contained from Silicon Oxide, Sodium and Calcium. According to the upper 2.5% of Sodium and Magnesium in samples, all of the glasses are from the Cilica-Soda-Lime type, those normally made from sand, flint stone or plants ashes as gassing Soda (Henderson, 2013). One of the most important attributes of the Sasanian glasses is the high percentage weight of Magnesium Oxide, and this analyzes show the 3.5%. Glasses have a low amount of Silicon Oxide and high amount of Sodium Oxide. Their resources are different from the samples found in Iraq. So that, the Silica which uses in Iran has more Aluminum and the

proportion of the Magnesium Oxide to Calcium rather the found ones in Iraq. It could be resulted that Soda and Silica basically supplied from the local resources. Also the examinations show that the Copper and Ferrous have been applied as a pigment element, and Magnesium Oxide as the opposite function, and deliberately added to the paste (Agha Ali Gol et al, 2019: 51-98).

**Table 4. The Amounts of Existing Elements in Analyze Sample in order of Oxide and Weight Percentage**

Sample	Main color	Na <sub>2</sub> O	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	SO <sub>3</sub>	Cl	K <sub>2</sub> O	CaO	TiO <sub>2</sub>	MnO	Fe <sub>2</sub> O <sub>3</sub>	Cu <sub>2</sub> O
E6	Green	13.96	4.64	4.00	66.71	0.88	0.30	0.77	2.06	5.45	0.12	0.04	1.07	Nd
E10	Green	18.20	5.12	2.67	62.25	1.14	0.62	0.47	4.01	4.86	0.06	0.02	0.57	Nd
E13	Green	16.62	4.52	3.34	62.96	1.10	0.60	0.54	3.61	4.87	0.08	Nd	0.86	Nd
E14	Green	19.63	4.88	2.74	60.41	1.08	0.48	0.66	4.19	4.78	0.11	0.02	0.66	0.03
E15	Green	15.26	4.74	4.64	64.22	0.89	0.38	0.64	2.53	5.33	0.16	0.03	1.09	Nd
E17	Green	16.57	6.38	2.85	64.22	0.44	0.13	0.79	2.19	5.88	0.02	0.22	0.31	Nd
E19	Colorless	15.73	5.18	3.59	60.71	0.59	0.37	0.68	5.13	6.20	0.06	0.33	0.90	Nd

**Table 5. Technical & Appearance Attributes of Glasses**

No	Measure (mm)	Color	Form-Decoration	Photo
E6	H: 35 , W: 29, D: 1-4	Green	Base of A Round Base Cylinder Ware	
E10	H: 70, W: 7, D: 5	Green	Flat Bangle, Plain	
E13	H: 50, D: 7	Green	Round Bangle, Plain	
E14	H: 72, W: 7, D: 5	Green	Flat Bangle, Plain	
E15	H: 38, W: 24, D: 2	Green	A Piece of Ware, Hive Decoration	
E17	H: 79, W: 40, D: 5	Sand Coating	Base, Hive Decoration	
E19	H: 47, W: 30, D: 2	Sand Coating	A Part of Base, Plain	

## 10. Botanical Finds

Many botanical remains have been found during the excavation. The results of the Microscope studies on seeds remains and fruits, led to identifying various plants with different frequency. The diagram of Seeds shows that some cereals such as wheat and barley have the most frequency (Fig 7-6) and the other plants like agricultural and non-agricultural grains, fruits and wild plants have a low frequency. Also 25 pieces of wood charcoal belonged to the four types of trees, which have

hydrophilic structure, wood-steeps and desert-steeps such as almonds, willow and chenopodiaceae have been identified those have various frequency (Shirazi, 2019).

### 11. Other Finds

Stone objects such as grindstone, quern, mortar (Figures 6-5), weighing stone, whittler, metal objects like bracelet, rings (Figures 6-3), earrings, silver coin of Shapur II (Fig 6-1) and bronz coin (Figures 6-2) those are under laboratory studies.



Figur 6. A Selection of Prominent Finds of Jahangir Site (Author, 2020)

### 12. The Proposal of Function and Chronology

Jahangir site includes some rooms with courtyard and inner Space, and the designers were completely conscious of natural potentials and existing architecture elements, according to the map and predefined patterns. The method of construction and materials of Jahangir evoke all of the Sasanian architecture characteristics, while the local elements inside it. This Sasanian monument such as the other Sasanian buildings is without basement and the walls directly built on the ground and the ceiling are barrel vaults (Azad, 2013: 97). There is no special style about the residential are from the Sasanian period. Lack of expanded excavations, biodiversity and different traditions, make the residential architecture different (Mohammadi, 2011: 88). The movable and unmovable finds from Jahangir site from the abundancy of the rooms, could be compared with simultaneous sites in Ctesiphon such as Um-I Za'tar, Um-al Ma'arid (Azamouh, 1994: 79) and Kish palace (Bier, 1993: 65). Jahangir site could be named by different titles such as palace, summer-palace, manor house, castle, royal villa and hunting-palace and so on. However, there were the accommodation of a high-ranking dignity, which have royal elements, even they are asymmetric. In the excavated houses of Ctesiphon also the inner and outer parts with asymmetric pattern (Tahmasebi, 2013: 162). There is another method for building palaces in the highlands. Because of lack of the flat platforms for making the courtyard, the designers followed the environmental situations and royal monuments have been built in small spaces (Kleiss, 1987: 236-237).

The plan of the Jahangir also obeyed the royal plans. According to the finds can be acclaimed that Jahangir have been planned for official demands and counted as a manor summer-palace with ceremonial-residential function. Dispreading the princes and aristocrats in different points of the government was in order to prevent the dissociation, present the power of kingdom in the other parts, build up various parts and maintain the peace with the different tribes are the reasons of construction of this type accommodations in different parts of the territory. Construction of this site is related to environmental landscape and can be known as a royal Sasanian village and



accommodation. There were some small villages out of the big cities in Sasanian cities, which were a place for hunting and entertainment of the kings and rulers (Pigulveskaya, 1998: 290). Ariyohan was a part of Maspazan state and a promenade in Sasanian and Early Islamic periods. There are some reasons for abandoning this place such as political-social and environmental and also earthquakes. According to the historical texts, two heavy earthquakes have been occurred in 3-4 centuries A.H. (Masoudi, 1965: 48 & Akbari, 2015: 65) which are conformed to the Seismotectonical and Morphotectonical studies. Most of the historical recorded earthquakes are bigger than 6 Richter, which are obvious as cracks, ruining the walls and tilt horizontal and vertical lines of the construction (Khosravi & Ghorbani, 2018). According to the dating examinations in Thermoluminescence method on two samples of bricks and three samples of potteries and comparison studies, all of them confirm the Late Sasanian for Jahangir (Bahrololoumi, 2018: 4-5). But finding a silver coin of Shapur II in the Recent Season of excavation Shows that habitation probably began in the middle Sasanian to the 4<sup>th</sup> centuries A.H. and then dwelled by nomads.

**Table 6. Results of Thermoluminescent Analyzes**

N0	Sample Type	Depth	Location	Percentage of Sodium Oxide (K20%)	The Concentration of (ppm) Thorium	The Concentration of (ppm) Uranium	Dating	Year
1	Pottery	-180 to -250	Area 9	2.07	3.21	40.04	1468 ± 55 Y.A.	551 ± 606 496
2	Pottery	-25 from Trench Surface	Burial 1	50.77	3.52	5.97	1470 ± 60 Y.A.	549 ± 609 489
3	Pottery	Nomadic Settlements in Recent Years	S.II	5.218	5.22	3.81	227 ± 23 Y.A.	1792 ± 181 5 1769
4	Brick	-	S.IV	1.96	2.27	4.94	1462 ± 74 Y.A.	557 ± 631 483
5	Brick	-	S.V	1.75	2.88	4.66	1450 ± 43 Y.A.	569 ± 612 526

### 13. Conclusion

At the end of three seasons of excavation in the central heap of Jahangir area, the plan of parts of a large building including 11 Spaces was revealed. Jahangir building includes a hall, Eyvan, portico, rooms, open Space (courtyard) and so on. In this building, gypsum arches and gypsum decorations have been used and its materials are rubble and semi-baked, semi-impressed gypsum mortar. Extensive use of plaster and brick and related arched methods is the heritage of the Sassanid period, which due to the importance of this building, like other palaces and aristocratic buildings of this period, is decorated with valuable decorative stucco. Existence of Kangir River, proximity and being on one of the important roads to Mesopotamia, climate and pristine and rich environment that could meet both nomadic and livestock communities as well as monogamous and inhabited communities can be of the most important reasons for the formation of the Jahangir area during different settlement periods. The area is north-south and the beginning of settlement in it dates back to the Neolithic and Chalcolithic period in its northern part. Then, during the Parthian period, it gained attention and then during the Sassanid period, a series of buildings were created, especially in its central part.

According to historical texts and seismotectonic and morphotectonic studies conducted in this area, in addition to socio-political and environmental factors, the occurrence of earthquakes in the region can also be one of the reasons for the decline of habitation in it. Dating texts on the artifacts all

confirmed that the site dates to the late Sassanid period, but with the discovery of the silver coin of Shapur II in the recent season of the excavation, it shows that habitation probably began in the middle of the Sassanid period and continued up to the fourth century AH. And has ever since been used by nomads. In this building, three phases of architecture can be distinguished. In the first phase, the building was built on a large Parthian area with carcasses of semi-baked stone and semi-baked gypsum mortar. In the second phase, other structures were added to the building and possibly repairs were made and in the third phase, the building was abandoned and used by nomads. Darkness, cold and lack of air flow in rooms without windows are the architectural problems of this type of building and their most important architectural features are asymmetric geometric structure, internal and external separation, great spatial diversity, religious part and the important role of Eyvan in the spatial organization of the complex. Jahangir's architectural texture has been without a niche and ordinary everyday objects in terms of function. Its geometry designers have committed themselves to using features and variables such as natural features, ecology and even belief in construction and decoration. Its various works of art are influenced by the common art of the Sassanid era with their independent local identity. According to the findings, it can be claimed that Jahangir was designed for formal needs and can be considered among the types of palaces of this period as a noble summer residence with ceremonial-residential function. The construction of such a building can be interpreted in relation to the natural landscape around and it can be considered as a residence of Sassanid aristocrats. The material and immaterial artifacts found in Jahangir, especially in terms of the number of rooms, are comparable to other contemporary buildings in Ctesiphon, Iraq, such as Umm al-Za'tar, Umm al-Ma'arid, and Kish Palace. The process of building small aristocratic palaces continues even until the Umayyad period, when the architectural style of Qasr Kharaneh and Al-Hair is an example of such palaces. By better understanding the quality and different areas of Sassanid habitation of which Jahangir is an example, we can have a better evaluation of the works of this period.

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## مروری کلی بر نتایج سه فصل کاوش در محوطه جهانگیر، ایلام

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### چکیده

جهانگیر یکی از محوطه‌های شاخص ساسانی در غرب ایران است که به دنبال مسئله قرارگیری در تراز سیلابی سدکنگیر ایوان، فرصت کاوش در آن فراهم شد. کمبود اطلاعات ما درباره چگونگی ساخت، عرصه‌های سکونتی، علل شکل‌گیری، افول و تاریخ‌گذاری این نوع سازه‌ها، تعیین نوع معیشت، بررسی صنایع و هنرهای مختلف گچ‌بری، شیشه‌گری، فلزگری، سفالگری، مشخص نمودن شاخصه‌ها، تزئینات معماری و مواد و مصالح، نوع کاربری و عوامل مؤثر در سبک‌های هنری مختلف آن، از سوالات و اهداف کاوش بود که جهت پاسخ‌گویی به آن‌ها از روش تحقیق توصیفی-تحلیلی، با بهره‌گیری از متون تاریخی و کاوش استفاده شد. در انتهای سه فصل کاوش در پشته مرکزی، پلان بخش‌هایی از یک بنای بزرگ شامل ۱۱ فضا نمایان شد. بخش‌های پدیدار شده متشکل از دو ایوان و تعدادی اتاق، با حیاط و فضای داخلی بوده که مصالح آن از قلوه‌سنگ و ملات گچ نیم‌پخته نیم‌کوب و پوشش سقف‌ها از آجر است. ساختار هندسی نامتقارن، جدایی بخش اندرونی و بیرونی، تنوع فضایی فراوان و نقش مهم ایوان در سازمان فضایی مجموعه، از مهم‌ترین ویژگی‌های سه فاز معماری قابل تشخیص در بنا است. آثار هنری گوناگون آن، متأثر از هنر رایج دوران ساسانی با هویت مستقل محلی خود هستند. با توجه یافته‌ها می‌توان ادعا کرد که جهانگیر برای نیازهای رسمی طراحی شده است. ساخت چنین بنایی در ارتباط با چشم انداز طبیعی پیرامون آن قابل تفسیر است و می‌تواند در میان انواع کاخ‌های این دوران به عنوان یک دسکره و اقامتگاه بیلاقی اعیانی باکارکرد تشریفاتی/مسکونی مطرح باشد.

کلید واژگان: ساسانی، جهانگیر، رود کنگیر، ایوان، ایلام.