

Human remains from Kan-Gohar cave, Iran, 2010-2015

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Kan-Gohar cave (30° 18' 03'' N 53° 54' 32'' E) is located near Monj village in Bavanat County, north-east Fars province (**Figure 1**). The cave's name (*kan* means “ore” and *gohar* means “a treasure” in Persian) relates to its volcanic nature (Karimi et al. 2017), which rendered it rich in iron and magnesium ores. Slag deposits are found around the cave suggesting that smelting activities took place in the area dating perhaps to the Iron Age and later (Rahpeima 2006). While it is unclear during which periods iron was exploited in the cave, a rock bearing an inscription near the cave's entrance dates to 1338 CE, suggesting that the mine was exploited during the Middle Islamic period (Khanipour 2015). Several historic sources mention that Bavanat was famous for the production of steel locks and arrowheads, and that these items were exported to the other regions of Iran (Mostofi 1993).

After several centuries of abandonment, Kan Gohar cave was re-discovered in 1962 by a mountain climbing team from Shiraz. In it they discovered some human remains and the skulls were collected for further research (Marefat 2010). In 2007, Mostafa Salahi visited the cave to gather contextual information regarding its location, structure, and other specifications for his book about the caves of Iran. According to him, three mandibles “of different size” were found there together with some pieces of cloth and a part of a leather shoe (Salahi 2007). In 2008 the site was registered as a national monument by the Cultural Heritage Organization of Fars Province (Abdollahi & Paknejad 2008).

In 2010 villagers from Monj found more human remains in the cave and warned the Fars Cultural Heritage Organization. Since the remains were very well preserved and also because of security matters, Fars Legal Medicine Organization got involved and took responsibility for the study of the human remains. Khadem Nazmi, Director

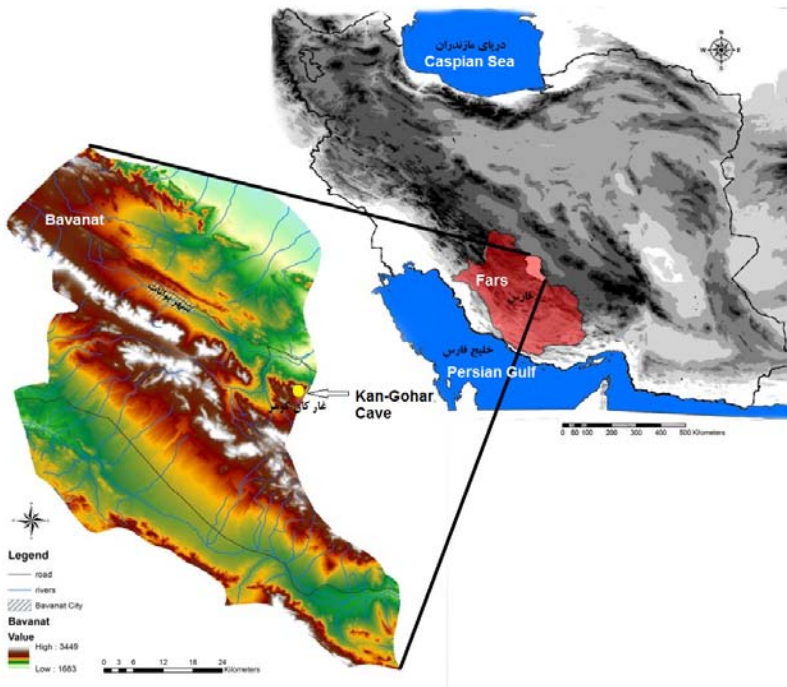


Figure 1. Location of Kan-Gohar Cave in Bavanat County in Fars, Iran (Khanipour et al. 2015).

of the Autopsy Hall in Fars Legal Medicine Organization visited the cave and took 47 skulls together with some postcranial elements to Fars Legal Medicine Organization laboratory (Figure 2).

While the results of the preliminary analysis of the human remains were never published, Khadem Nazmi did discuss them in an interview with ISNA (Iranian Students News Agency) and in personal communication to Mahsa Najafi in 2018. Nazmi stated that 41 skulls belonged to children and women (5–35 years old) and six of them belonged to men (no mentioning of age range). Fire was assumed as the cause of death because a burnt wooden spoon and a tray were found beside the remains. Based on the position of the skeletons, Nazmi interpreted this assemblage as the remains of a group of individuals who were burned alive.

Soon after this discovery Aziz-Allah Rezayi (Fars Cultural Heritage Organization) was interviewed by the Islamic Republic News Agency. According to him, the skeletons from Kan-Gohar cave belonged to people who were living in the cave and exploiting the ores within it. The clothing and shoes that were found beside the human remains were commonly used in Safavid (1501–1736 AD) and Qajar (1789–1925



Figure 2. Human elements *in situ* during the exploration of the cave in 2010 (Archive of Bavanat Cultural Heritage).

AD) periods in Iran. Finally, Rezayi argued that the deaths of these individuals was the result of a cave roof collapse.

In 2011, a team from a speleology association in Shiraz re-visited the cave to study its geomorphological structure and to produce a map (Figure 3). In their report nothing is mentioned about the human remains, but a picture of two femora was included (Ghaderi 2011).

Finally, in 2015, Morteza Khanipour, the director of the archaeological survey project of Bavanat, visited the cave and found some more skulls. In the report of this survey he stated that these human remains were most likely war victims and their deaths were unlikely to be the result of an accidental event such as a cave roof collapse. In addition to the human remains, some clothing fragments, leather shoes, potsherds, baskets, and a spoon and tray made of wood were found in the main chamber of the cave (Khanipour 2015) (Figure 4). The wooden spoon is a typical item from the area of Bavanat, where such items were produced and exported to other areas within Iran (Etemadosaltane 1989).

During both surveys (2010 and 2015) human and animal remains were retrieved from several locations near the entrance of the cave, but their most dense concentration was found in a small lateral chamber (marked by an arrow on Figure 3). Perhaps this part of the cave was enclosed by stones which prevented the removal of human remains prior to local people cleaning the entrance in 2010. Obviously due to long-

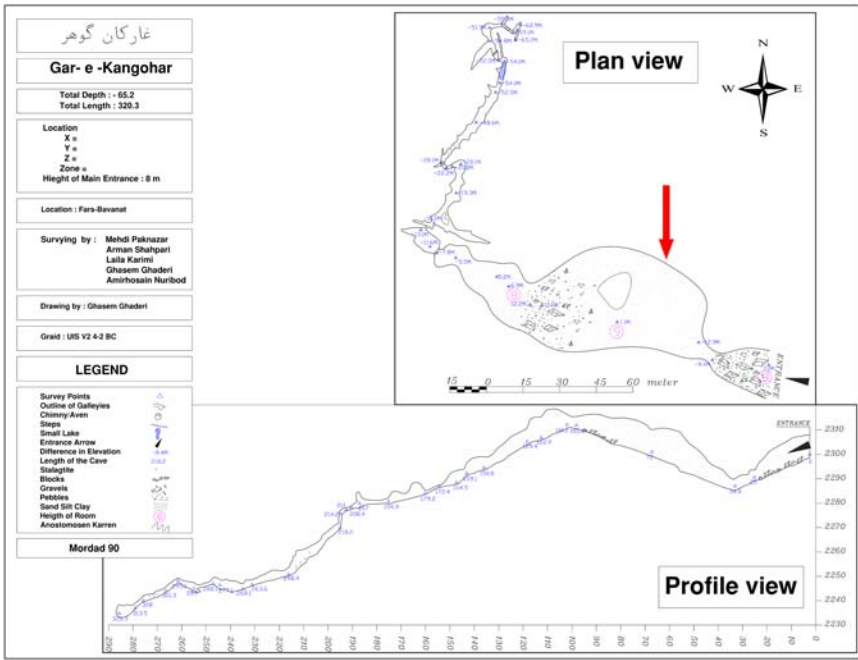


Figure 3. Plan and profile of Kan-Gohar Cave (after Ghaderi 2011). Concentration of human remains explored in 2010 has been marked with an arrow.



Figure 4. Artifacts found in the cave (Khanipour et al. 2015).

lasting human activity in the cave both bones and artifacts exposed on the surface were in disturbed and secondary contexts.

Research on the human remains from Kan-Gohar cave was undertaken in March 2018 in the Fars Legal Medicine Organization by Mahsa Najafi under the supervision of Arkadiusz Sołtysiak. The available assemblage included 40 skulls and 110 other elements retrieved in 2010 and 2015. They were described and measured using standard protocols (Buikstra & Ubelaker 1994) that included specifically sex determination, age-at-death estimation, observation of pathological conditions and taphonomic agents, and non-metric traits.



Figure 5. Plagiocephaly (skull number 29).

The catalogue of crania is included in the **Table 1**. Although standard sex determination methods may be not completely adequate for a local population, there is quite clear domination of females in the sample. Also age-at-death distribution is biased, with neonates and infants under-represented in comparison to older subadults and adults. There is no evidence of perimortem trauma and only three cases of unspecific antemortem trauma to the skull were recorded. Plagiocephaly was common and most crania were short (**Figure 5**, cf. **Table 1**).

The most common taphonomic agent was black and brown staining observed on most elements retrieved from the cave. In some crania small areas of surface burning at low temperatures were present (**Figure 6**). This is consistent with the presence of large quantities of ash, especially near the entrance to the cave. Some skulls exhibited white crystalline spots, which are likely calcium carbonate deposits due to karstic processes in the cave.

The unusual context of human remains found in Kan-Gohar cave may be explained by an examination of available historical sources. Sources report a raid by the

Table 1. Crania from Kan-Gohar cave.

No.	Comp. ¹	Sex ²	Age-at-death	PC ³	CI ⁴	Other observations ⁵
1	2	F**	adult	0	88.7	
2	2	?	old	0	82.4	
3	2		10 yrs	0	79.5	
4	3	F*	old	0	81.8	
5	3	F*	old	0	85.3	
6	2		9-10 yrs	2		
7	3	F*	old	0	84.4	irregular HT on frontal
8	2	F*	adult	0	79.5	two small BO at coronal suture
9	3	F*	adult	0	79.6	
10	1	F	adult	2		irregular BS, completely black base
11	2		7 yrs	2	95.9	intensive erosion of the base
12	3		12-15 yrs	0	88.1	
13	3	?	adult	0	83.3	big BO on right parietal
14	2	F*	15-18 yrs	1	88.4	HT on right parietal
15	1	M	adult	0		natural color (no BS), slight weathering
16	3		8 yrs	0	81.3	face with white irregular spots
17	3	F*	adult	1	83.8	
18	3	?	adult	2	79.5	
19	3		9 yrs	2	91.4	
20	3	?	adult	0	72.8	
21	1		young child	1		
22	1		3 yrs			
23	1		young child	0		
24	1		adolescent			
25	3	F*	adult	0	74.8	
26	3	F*	adult	0	88.9	
27	3	?	adult	1	77.8	
28	2	F	adult	2	91.6	LTB on both parietals
29	3		6-7	2	95.2	
30	2	F	old	2	90.4	slight LTB on parietal, 12 BO on frontal and parietal
31	3	M*	old	1	89.4	
32	3		8	0	87.8	
33	3	?	old	0	87.1	small HT on right frontal
34	1	?	old			four small BO on frontal
35	2		15	0	82.8	
36	2	?	old	2	89.1	three small BO on frontal DJD in right condyle
46	3	F*	old	1	85.1	
47	3		6	0	97.3	white irregular staining on left side
48	3	?	old	0	73.5	small BO on parietal
49	3	F	old	1	84.9	

¹ Completeness: 1 – fragments only, 2 – slightly damaged, 3 – complete;

² Sex: M – male, F – female, F* – likely female, F** – more likely female than male;

³ Plagiocephaly: 0 – none, 1 – slight, 2 – advanced;

⁴ Cranial Index;

⁵ HT – healed trauma, BO – button osteoma, BS – black staining, LTB – low temperature burning, DJD – degenerative joint disease.



Figure 6. Evidence of surface burning (skull number 28).

last Chūpānid ruler Malek Ashraf against Shiraz in 1343 AD. During this expedition the Chūpānid army destroyed Bavanat forcing its people to find shelter in the cave. Malek Ashraf ordered his men to set a huge fire at the entrance of the cave and the refugees (their number is reported as 2000) were suffocated by the smoke and died (Yazdi 1947). Although Kan-Gohar cave is too small to provide shelter to so many people, the massive amounts of ash at its entrance, the traces of burning on some crania and under-representation of males seem to support the hypothesis that the studied assemblage of human remains represents victims of this historical event.

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