Iran Heritage - ISSN 2676-5217

Baluch Settlement and Features of Chipped Stone Resulting from Surveying Tepeh Baluch

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Article Info

Use your device to scan and read the article online

Received: 2019/05/20;
Accepted: 2019/06/15;
Published Online: 2019/07/01

Iran Heritage
2019; 1(1): 1-9

ABSTRACT

Tepeh Baluch is located in the northeast of Iran in Khorasan Razavi Province and in the west of Neyshabour Miankouh Plain. Prehistoric studies, especially the Neolithic period of this section of the Iranian Plateau have been less considered compared with the western part. Tepeh Baluch was explored during a short season in the spring and summer of 2011 under the support of Neyshabur University. Organizing the production of lithic hand tools is one of the most important aspects of the study of stone artifacts. Such studies are important in explaining the differences between a set of stone artifacts belonging to one era in a region and their variability in different periods. Sequence models have special features that distinguish them from other archaeological structures. In this paper, a collection of stone artifacts from the exploration of Tepeh Baluch in terms of the technological structure, typology, and morphology of the tools are investigated and on this basis the function of the site and the organization of stone tools' production are reconstructed. The feature of the stone artifacts of Tepeh Baluch is the abundance of chips most of which have been used as scratches; in contrast to the high frequency of blades and micro-blades, chips have the largest number in the collection. Most of the pieces are retouching. The cores in this set are often small in size and irregular in shape with uneven edges. Considering the use of chamfered blades to collect cereals, food production through raising livestock and hunting and food gathering were more common than agriculture in the Neolithic and chalcolithic layers of the Baluch hill. This article aimed to shed further light on the study and surveying these stone artifacts.

Keywords: Tepeh Baluch, Neyshabour, Neolithic, Chipped Stone, Iran

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How to Cite This Article:

Bakhtiari S, Bakhtiari S, Garazhian O. Baluch Settlement and Features of Chipped Stone Resulting from Surveying Tepeh Baluch. Iran Herit. 2019; 1 (1) :1-9

Introduction

Despite the increased archeological studies on the Neolithic period in the western Iran, especially Zagros Mountains (Braidwood, 1960 &1962), the other parts of the northeastern Iran have remained unknown in terms of the studies related to the Neolithic period. Natural landscape of the area, investigating the valleys' lowlands and neglecting highlands, dispersion of relics due to low population distribution (Hiebert and Dyson, 2002), shortage of surface data which probably resulted from the formation process, and finally the lack of antique-oriented archeological research performed in this area, and providing the situation for the subsequent activities all have caused the region to remain unknown (Garazhian, 2013: 5).

Concerning the history of archeological studies in Iran during the last 150 years, pre-historic studies of Khorasan have always remained in the preliminary visits and investigations. History of archeological research including investigations and excavations in the northeast of Iran dates back to 1938. In that year, the excavation program for the old city of Neyshabour whose executer was the Metropolitan Art Museum, a pre-historic mound called P Neyshabour (Yousefabad) located in 4 Km to Tepeh Baluch was excavated. This team was supervised by Charles Wilkinson (Hiebert and Dyson, 2002; Hauser et al., 1938). After the 1940s, Neyshabour palin was explored and visited by different archeological teams several times (Garazhian, 2008; Etemadi, 1998; Tohidi, 1988; Laleh, 2008-2009). Field research, excavation, and stratigraphy in in the prehistoric area of Khorasan, Tepeh Baluch in 20Km from Neyshabour mound were performed under the supervision of Garazhian in 2011. Excavations in Tepeh Baluch was initiated for the students' apprenticeship. These excavations were conducted in a limited region depicting information specific to the deposits of Neolithic sites from which no specific archeological data was obtained. Archeological findings obtained from excavations in Tepeh Baluch included cultural remains, chipped stones, pottery, clay objects, and some plant and animal remain (Garazhian, 2011). With respect to the quantitative data related to the Neolithic period in the northeast of Iran and the scarcity of Neolithic sites in this region that could provide a situation for the regional comparisons for the site, this article aimed to deal with the introduction and systematic study of chipped stones obtained from excavations in Baluch settlement with an introspective approach. Also, it was aimed to provide analyses on the settlement practices in this site by studying the collection of chipped stones, discovered in Tepeh Baluch versus the archeological features of the site.

Geographical Location and Landscape of Neyshabour Plain

Neyshabour plain is an inter-mountain plain, generally located in the northeast of Iran. Neyshabour plain is situated in the south of the foothills of Binaloud mountain ranges in Khorasan Razavi Province. This plain is surrounded by the mounds (Velayati, 2000: 122; Velayati, 1988: 92). Delta sediments of permanent rivers in the southern foothills of Binaloud mountain ranges have fertilized the plain surface and southern mountain ranges prevent the direct influence of the central deserts of Iranian Plateau on the region. In this plain, the main surface flows are originated from snowy heights of Neyshabour, flowing into the foothills. In general, Neyshabour is a plain stretching from north-west to south-east, surrounded by Binaloud mountains in the northeast and Sorkh Kouh in the south. Also, from northwest and southeast, some low-height mounds have surrounded the plain. Pre-historic settlements of this plain have less dispersion and density and they are formed in various locations of the plain. Due to the special conditions of the uneven grounds, surface flows have been available on the plain surface, not reaching the lowland areas in the southern parts of the plain. This plain with an approximate longitude of 120 Km (northern-southern) and the latitude of 114 Km (eastern-western) has at least six pre-historic relics; Tepeh Baluch situated in the west of Neyshabour plain is one of these relics in this area (Fig. 1). The main activities and research and their main findings and existing data on the archeology of Neyshabour plain are related to the Islamic and historic periods (Riazi Kashe, 1992; Diamand and Wilkinson, 1937: 4-22; Wilkinson, 1944: 282-291).

Site Description

The ancient Tepeh Baluch that is located at 35, 18, 36° of the north and 28, 36, 58° of the east and 1220m above the sea level is situated in Khorasan Razavi Province and in the limits of the newly-established town of Firouzeh. The exact location of the relic is about 3.5 km from the north of Firouzeh (the former Bozghan); exactly around its northeast part, the Steel Complex of Neyshabour is located and there is a sugar factory in the south of this mound. Neshat Garden (Salar Motamed Mansion, one of the local Khans during Pahlavi I period, which is now possessed by the Organization of Cultural Heritage), is located in about 1.5 Km of the northwest of the relic. Around the mound is

surrounded by the farms and lands of Hajiabad and Taghiabad villages. Tepeh Baluch, which has been known by this name due to the temporary seasonal camping of several Baluch families on the mound, is among the natural mounds which had been probably stretched from the north to the south. What have today remained from this mound include two relatively small nesses (Figure 2); cultural remains are stretched dispersedly, mostly centralized in the eastern sides of the natural nesses, consisting of natural sediments and gravel. As the pit in front of the southern mound indicates, at the moment, the southern part of the mound has been used to extract gravel (Garazhian, 2011).

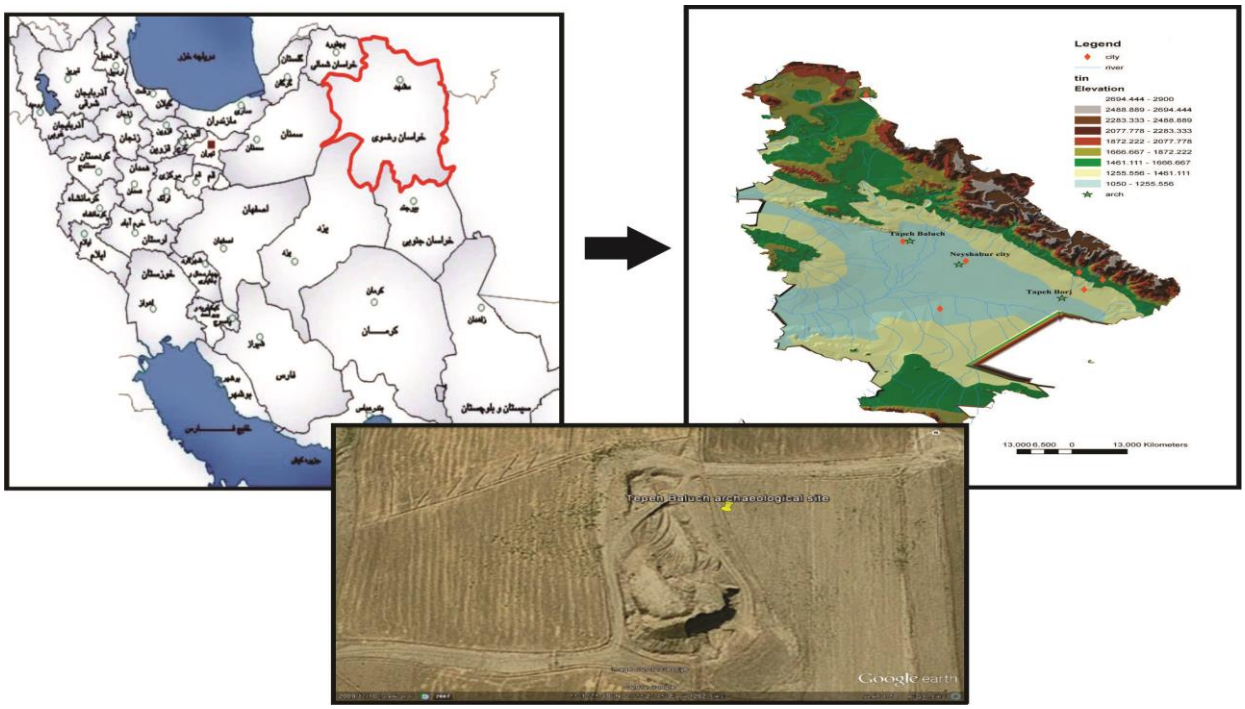

Fig. 1. Geographical Location of Tepeh Baluch in Neyshabour Plain (Garazhian, 2012: 21)

Fig. 2. General view of Tepeh Baluch (Garazhian, 2011)

Field studies on Tepeh Baluch were performed in two stages. The first stage included the investigation and evaluation of the site, aiming to locate the experimental boreholes and tomography. During this investigation and

in order to do a more precise evaluation, the study area was divided into four sections and then they were given names. Section A, or the northern bulge, section B, or the southern bulge, section C, the series of pits and flattened lands surrounding it, section E, the agricultural land limit in the eastern side of the mound, and section F, agricultural land which is located in the western side of the bulges of Tepeh Baluch. The performed research including surveys and systematic investigations suggested that the surface data in sections A, B, and C are richer than the other two sections. Therefore, the second stage of the field studies was initiated during which experimental boreholes and tomography boreholes were developed. As mentioned, the boreholes were more focused on the afore-said sections which were in a higher level regarding the cultural materials (Garazhian, 2011).

The central apex of this mound had been cut by agricultural road and cultural layers had been scratched. Clearing this section was called the third cut (section 3). Another local road passes the north of this cutting where sections 2 and 1 are located. Generally, eight tomography layers and 14 experimental boreholes (Figure 3) were created in this site among which chipped stones were obtained from the first, second, fourth, sixth, seventh, eighth, and tomography boreholes and the experimental borehole No. 3. Totally, from these eight boreholes, 817 chipped stone pieces were collected for the study and investigations (Garazhian, 2011).

Fig. 3. General view of Tepeh Baluch, western view (Garazhian, 2012, 22)

Methods to Study Chipped Stones

The method used to study and classify chipped stones is based on typology and morphology (Andrefsky, 1998: 74); but it does not mean to reflect its performance or date. Although the terms such as scraper and borer are applied to explain various types, the names of these types do not hold a single specific function, merely implying their morphologies. Many variables such as tools (Binford and Binford, 1966), dispersion type of the raw material source as well as its availability rate (Andrefsky, 1994), and the installment of the tools in the holder (Keeley, 1982) are also important in changing the technological organization of the collection of chipped stones (Kelly, 1992: 55-5). In the studies about chipped stones, implemented tools are usually divided into two groups; the first group includes the debitages that find a specific function through retouch; the second group includes those that on their edges the traces of attritions are observed for which the term "used" is sometimes applied. In many cases, it might be that, both above-mentioned groups of tools are not recognizable merely through observation. So, in order to recognize them, laboratory studies such as investigating Used Wear Analysis are needed (Keely, Lawrence, 1977). In the present article, only those tools which have been changed into the tools through retouch and applied debitages or their morphology indicated that they had been tools are introduced as tools; because, recognizing the attrition on the edge of chipped stones in the collection, particularly those artifacts gathered from the sites' surfaces was highly important and required laboratory studies. In Tepeh

Baluch, eight boreholes with chipped stones (Table 1) were studied. The following table demonstrates the technological structure of the collection of chipped stones on Tepeh Baluch.

In order to study and classify the data, three main tables were designed as follows (set of tables, No. 3-5):

1. A table designed to classify the debitages including flakes, bladelets, and pieces such as the distal end, medial part, proximal end, and finally debris.
2. A table developed to classify the tools including scarpers, borers, backed, crescents, notched, denticulate, retouched, geometrical and eventually used items had been included.
3. Finally, another table was also developed in order to record the cores of the collection in which the core type, the number of hit platforms, ridges, and core shape were included.

Descriptions of Stones

Investigating the function of chipped stones leads to the familiarity with agriculture or livestock-based livelihood practices in this settlement. In the collection of Tepeh Baluch, 817 pieces of chipped stones were studied (Fig. 4); this collected set included debitages, tools, cores, and debris (Table 2).

Table 1. Chipped Stone of Tepeh Baluch

Trench	Debitage	Tool	Debri	Core	Sum	Percentage
t1	178	28	13	5	224	27
t2	255	62	46	5	368	45
t4	41	12	9	4	66	8
t5	24	12	11	1	48	6
t6	7	2	1	0	10	1
t7	17	9	2	2	30	4
t8	31	15	0	3	49	6
tt3	11	4	5	2	22	3
total	564	144	87	22	817	100

Table 2. Technological categories

Tool	Debitage	Debri	Core	Total
144	564	87	22	817
17	69	11	3	100

Fig. 4. Selected lithic artifacts from Tepeh Baluch.1) cortical flake, 2) bladelet, 3) notched proximal segment of a blade, 4) proximal blade segment, 5-6) utilized proximal blade segments, 7, 9-12) trapezoids, 8) lunate, 13) distal end of a retouched blade (Garazhian, 2012: 29).

1. The Core

Investigation of the cores in a collection is in fact a technique used in the production of the chipped stones of that collection (Shidrang, 2005: 79). 22 cores were identified in this collection which accounted for 3% of the total chipped stones (Table 3). Most of the cores in

this collection were multidimensional and the bump of their ridges were nonparallel in small sizes. A high percentage of these cores were irregular in shape some of which were formed on the pieces with single or multiple platforms and appropriate angles for the removal. In this collection, there was only one conical core. Also, in some cases, they were left on the remains of a core and a limited chip operation was performed on them. What is common in all of these cores is the removal of several chips and then leaving the cores unused. Only 3 pieces of the cores had CRF which was indicative of further traumatic activities on them. On 7 pieces of these cores, cortex traces were observed.

Table 3. Core typology

Core type / trench	Blank		Core type		Core shape		Ridges		Number of platforms		Cortex	Sum	Percentage
	Flake	Other	Core	Crf	Irregular	Cone	Non parallel	Parallel	Multiple	Single			
T1	0	5	5	0	5	0	5	0	5	0	2	5	23
T2	4	1	4	1	4	1	2	3	1	4	2	5	23
T4	3	1	4	0	4	0	4	0	2	2	0	4	18
T5	0	1	1	0	1	0	1	0	1	0	1	1	4
T6	0	0	0	0	0	0	0	0	0	0	0	0	0
T7	0	2	2	0	2	0	2	0	0	2	1	2	9
T8	0	3	2	1	3	0	3	0	3	0	1	3	14
Tt3	0	2	1	1	2	0	2	0	2	0	0	2	9
Total	7	15	19	3	21	1	19	3	14	8	7	22	100

2. Debitage

The number of debitages and debris in the chipped stones′ collections obtained from excavation in Tepeh Baluch was 651 accounting for 80% of the total chipped items, divided into 4 classes including flakes, blades, bladelets, and debris. There were 178 flakes and 212 broken flake pieces in the set of debitages that were not mainly indicator in terms of technology. From the debitages, cortex traces were observed on 8 pieces of them including 3 complete flakes, a distal end, 2 broken pieces of distal ends, and 2 broken pieces of proximal end of flake. There were 16 blades and 158 bladelets (Table 4) which were technologically homogeneous but were not much regular and stretched. There were only 4 polished pieces which included 3 pieces of medial part of bladelets and a piece of end part of bladelet. Flakes constituted the highest number of the debitage type in the entire boreholes and blades constituted the least number in the debitages. One reason for this can be the fact that flakes were byproducts of production and preparation of cores in the site (a fact supporting the high percentage of unused flakes in all layers compared to the blades used as tools). Existence of remained cortex on the outer surface of the debitages indicated the preparation of cores in the site.

Table 4. Debitages′ typology

Debitage type / trench	Bladelet	Flake	Bladelet distal end	Bladelet medial part	Bladelet proximal end	Flake proximal end	Flake distal end	Flake medial part	Blade proximal end	Blade distal end	Distal end	Proximal end	medial part	Sum	Debri	Percentage
t1	1	43	10	37	16	11	8	3	5	2	13	8	21	178	13	29
t2	2	56	10	15	16	6	9	2	3	0	23	39	74	255	46	46
t4	0	7	2	8	2	5	2	0	2	0	6	1	6	41	9	8
t5	0	3	0	5	2	1	4	2	0	0	0	3	4	24	11	5
t6	0	1	0	3	1	0	0	0	1	0	0	0	1	7	1	1
t7	0	2	1	6	0	2	0	0	0	0	0	0	6	17	2	3
t8	1	1	1	9	4	1	3	2	3	0	1	3	2	31	0	5
tt3	0	2	0	2	4	1	1	0	0	0	0	0	1	11	5	3
total	4	115	24	85	45	27	27	9	14	2	43	54	115	564	87	100

3. Tools

The number of the tools in the present collection was 144 pieces accounting for 17% of the entire chipped items built on three groups of flakes, blades, and bladelets. Generally, tools of this collection were divided into 9 classes of scrapers, borers, backed, crescents, notched, denticulate, retouched, geometrical objects, and used items (Table 5).

3.1. Flakes

Tools built on the flakes were 86 pieces that constituted 59 flakes and 27 broken pieces of flakes, including 16 scraper pieces, 13 borer pieces, 10 backed pieces, 5 notched items, one crescent piece, 34 retouched pieces, and 4 used pieces. Among the tools in this group, cortex traces were observed on 6 flakes including the end part of a broken piece of a scraper flake, 4 complete scraper flakes, and a used flake.

3.2. Blade / Bladelet

The number of tools built on bladelets was 58 pieces among which there were one borer piece, 3 backed pieces, 5 notched pieces, 3 denticulate pieces, 29 geometrical pieces, 9 retouched pieces, and 8 used pieces. In the geometrical class of this group, the dominant type was trapezoid bladelet (24) and there was one piece of geometrical rectangular blade which was also polished. Polish traces could be seen on 6 pieces built on a bladelet that existed on the proximal part of a retouched bladelet and the medial part of five bladelets; these five pieces included 2 used bladelets, a retouched bladelet, a backed bladelet, and a rectangular geometrical bladelet. From the tools built on the blades, only one piece was discovered that was a notched blade. No effect of cortex was observed on any of the blades. Precise interpretation of the functions for the tools is impossible with the current information level (although Use Wear Analyses can be very helpful in this regard). Therefore, the classification provided in this section is based on their morphology. The tools obtained from excavations in Tepeh Baluch were almost heterogamous. A few numbers of the tools were used pieces (debitages which were not retouched but used traces were evident on their edges) along with the tools which were retouched; however, they were not classified in any defined group of the tools because their retouch was irregular and did not follow any specific pattern. Regardless of the retouched and geometrical pieces (mainly in trapezoid forms), the most frequent types of the tools were scarpers, borers and used ones. A few numbers of denticulate, notched, crescent, and backed pieces existed in the tools′ collection obtained from Tepeh Baluch. As such, general characteristics of the tools′ collection of Tepeh Baluch included the lack of arrow heads and chisels and an abundance of scrapers and borers. No specific diversity was seen in the morphological composition of the tools in various boreholes.

Table 4. Tools′ typology

Tool type / trench	Scraper	Borer	Backed	Crescent	Notched	Denticulate	Retouched	Geometrical		Used	Sum	Percentage
								Rectangular	Trapezes			
t1	4	5	2	1	3	4	5	1	3	0	28	20
t2	4	4	1	3	2	0	27	0	15	6	62	43
t4	2	1	0	0	2	0	2	0	2	3	12	8
t5	1	2	5	0	1	0	3	0	0	0	12	8
t6	1	0	0	0	0	0	1	0	0	0	2	1
t7	2	0	2	1	0	1	1	0	2	0	9	6
t8	2	1	2	0	2	1	2	0	2	3	15	11
tt3	0	1	1	0	0	0	2	0	0	0	4	3
Total	16	14	13	5	10	6	43	1	24	12	144	100

Backed and crescent tools were present in most of the boreholes; based on the polish evident on the edge of these tools, they were believed to be associated with the plans′ processing. As pointed out by Keeley, special retouch “making backed” which creates a thick edge in the tool is done in a way that the tool can be embedded in the handle or can be used by hands (Keeley, 1982: 807). Although no direct evidence was obtained from the handles in Baluch mound, the small size of the backed pieces increased the probability of installing backed pieces in the handle.

Scrapers from Tepeh Baluch have been occasionally produced through retouching them in a denticulate way. Their sizes were relatively small and they were only made of flakes; while, the borers existing in Tepeh Baluch were made of flakes and narrow bladelets.

Conclusion

Stone tools in Tepeh Baluch were obtained from the layers related to the boreholes number 1, 2, 4, 5, 6, 7, 8 and the experimental boreholes number 3. The present research aimed to introduce the chipped stones obtained from the excavations in Tepeh Baluch and deal with the preliminary description of cores, debitages and tools. Characteristics of chipped stones in Tepeh Baluch included an abundance of flakes and the use of pushing technique in producing bladelet. Although the flakes had the highest number in the collection since they were produced by stone traumatic technique, most of them were not used as tools. The number of retouched tools was very low compared to the debitages. Polished blades which were indicative of agricultural livelihood in the Neolithic and chalcolithic periods in Tepeh Baluch and crescent and backed tools which were probably categorized in bone or wooden classes, used as hybrid tools as a sickle for working with plants, were obtained in a very low number. Accordingly, since these blades were used to collect grains, it is concluded that food production through livestock and hunting and collecting food had been more common than agriculture in the Neolithic and chalcolithic periods in Tepeh Baluch.

Acknowledgements

The Tepeh Baluch excavations were supported by Neyshabur University. We would like to thank Dr. Gharazhian, who helped us effectively in this field work.

Conflict of Interest

Authors declared no conflict of interest.

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