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Research paper

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EMERGENCE OF NEOLITHIC IN THE SOUTHERN PLAINS OF IRAN: DARAB PLAIN

Abstract. The study of the Neolithic period in Southwest Asia, particularly the Zagros region, has been a central focus for archaeologists. However, while central Zagros has been extensively researched, the southern plains and valleys remained largely unexplored until approximately a decade ago. The diverse environmental characteristics of Fars province necessitated more detailed studies of each region. The current study focuses on the southern Zagros region to further investigate the Neolithic period. In 2019, the first survey season was conducted in Darab to identify archaeological settlements. A total of 351 sites, ranging from the Paleolithic to the Islamic periods, were discovered. The study presents an overview of the Neolithic period in the Darab plain, encompassing Neolithic sites, lithic tools, grinding stones, and pottery. Furthermore, the study aims to determine the factors that prompted Neolithic people to settle in the southern Zagros valleys and this region. Finally, it aims to define the role of this region in the Neolithization and development process on the Iranian Plateau. The survey results identified one site and one rock shelter with Pre-Pottery Neolithic evidence, including bullet cores and blades. This site represents the southernmost known Pre-Pottery Neolithic site in the Zagros. De Miroschedji identified Bizdan pottery as the oldest Neolithic pottery in the region, while four distinct pottery types have been recognized in Fars. During the latest Neolithic phase, coarse plain pottery was found in the Darab plain and other areas of Fars.

Keywords: Neolithic; Fars; Darab; sedimentary settlements; agriculture

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Исследовательская статья

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РАССВЕТ НЕОЛИТА НА ЮЖНЫХ РАВНИНАХ ИРАНА: РАВНИНА ДАРАБ

Аннотация. Изучение неолитического периода в Юго-Западной Азии, особенно в районе Загрос, вызывает большой интерес со стороны археологов. Однако, несмотря на то что центральный Загрос уже довольно тщательно изучен, южные равнины и долины оставались долгое время практически неисследованными. Разнообразные природные условия провинции Фарс требовали более детального изучения каждого региона. Данное исследование фокусируется на южном районе Загроса с целью дальнейшего изучения неолитического периода. В 2019 году в Дарабе был проведен первый сезон археологических раскопок для выявления древних поселений. В общей сложности был обнаружен 351 памятник, охватывающих периоды от палеолита до исламского времени. Настоящее исследование представляет обзор неолитического периода равнины Дараб, включая неолитические поселения, каменные орудия, зернотерки и керамику. Кроме того, исследование направлено на определение факторов, побудивших неолитических людей поселиться в южных долинах Загроса и в этом регионе. Наконец, оно пытается определить роль этого региона в процессе неолитизации и развития на Иранском нагорье. Раскопки выявили одно поселение и одно укрытие в скале с докерамическим неолитическим материалом, включая карандашевидные ну-клеусы и пластины. Этот объект представляет собой самое южное известное докерамическое неолитическое поселение в Загросе. Де Мирошеджи определил керамику типа Биздан как самую древнюю неолитическую керамику в регионе, в то время как в Фарсе были выявлены четыре различных типа керамики. В позднем неолитическом периоде грубая плоскодонная керамика была обнаружена на равнине Дараб и в других районах Фарса.

Ключевые слова: неолит; Фарс; Дараб; оседлые поселения; земледелие

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Introduction

The study of the Neolithic period in Southwest Asia, particularly in the Zagros region, has long been a focus for archaeologists. The first evidence of cultivation and animal domestication comes from different sites in Zagros, such as Ganj Dereh, Sheikhiabad, and Choghagolan [1; 2; 3]. Recent studies document early Neolithization in the central Zagros Mountains, forming by the end of the Younger Dryas (c. 11,000–9700 BC) [3; 2]. However, compared to adjacent regions like the Levant and Anatolia, little archaeological research has been conducted in Zagros [4: 44; 5]. Most of this research has focused on central Zagros, while the southern plains and valleys remain understudied.

In Iranian archaeology, the Southern Zagros and many parts of the Persian Gulf shores are known as the Fars cultural zone. Excavations in Neolithic sites in this area began with Tol-e Bakun B [6: 23]. Subsequently, Vanden Berghe excavated several Neolithic sites and proposed the first chronological sequence of prehistoric Fars [7; 8]. The Japanese team's excavations at Tol-e Mushki [9] and Tol-e Jari [10; 11] represent the first systematic studies of the Neolithic period in Fars. Excavations at Tol-e Bakun, Jari, and Mushki, along with Sumner's surveys in the Kur River basin [12], revealed the oldest evidence of the Neolithic period, dating to the Mushki period (the second half of the 7th millennium BC).

As a result, this large cultural zone was not initially included in studies on the development of the Pre-Pottery Neolithic period and the emergence of pottery in Iran and Southwest Asia. However, the excavation of Haji Bahrami Cave [13; 14], Tape Rahmatabad [15; 17], Tol-e Sangi [18], and Tol-e Qasr-e Ahmad [19] uncovered evidence of Proto-Neolithic and Pre-Pottery Neolithic periods, including early pottery.

Around 7000 BC, like other regions in Iran and Southwest Asia, the people of this zone began producing pottery. However, the southern plains of Zagros remain largely unexplored archaeologically across various prehistoric periods, particularly the Neolithic. The Darab Plain, the largest intermontane plain in the southern Zagros, offers favorable conditions for human settlement across numerous periods. A 2019 survey of the region revealed evidence of Neolithic occupation [20].

This article aims to study and introduce the formation and development of the Neolithic period in the southern highlands of Zagros based on these new findings. In line with these objectives, the following questions arise: What is the earliest evidence of the Neolithic period in the Darab plain? How did cultural interactions unfold during the Neolithic period in this region? What are the cultural and economic characteristics of the Neolithic period in Darab as a marginal area of the Fertile Crescent? Was the Neolithic development of the Darab region influenced by the Fertile Crescent, or did it draw from the oases of the Persian Gulf? To answer these questions, we will first introduce the Neolithic sites in chronological sequence, followed by an analysis of cultural interactions through comparisons of pottery and stone tools.

1. Darab Plain: research background

The formation of ancient settlements depends on geographical characteristics and is often shaped by the mutual interaction between humans and the environment. Various factors, such as water sources, soil, and other resources, play a role in the establishment of settlements in specific locations. Darab County in southeastern Fars province, covering a total area of 6,500 square kilometers, includes both plains and mountains. The geographical location and landscape of Darab have long attracted human societies, leading to the formation of various settlements dating from the Paleolithic period to the present day.

The first archaeological survey in Darab was conducted by Stein [21]. Between 1971 and 1972, De Miroshedji carried out a survey to identify prehistoric settlements in Darab, with the results published in only a short paper [16]. Alamdari and Shirvani later conducted a survey in Rostaq, a district of Darab County [22]. Morgan and Seyyidin also carried out surveys at Darabgerd [23; 24]. In 2019, the author conducted a survey project in Darab County [25]. While Stein excavated several sites in Darab, Jamshidi Yeganeh conducted the first systematic excavation at the Hirbodan site in 2021 [26].

2. Darab in Neolithic period

Stein's excavation at Tol-e Siah Madovan is considered the first Neolithic excavation in Darab [21]. However, his publication focused solely on painted pottery from the Bakun period. Subsequently, de Miroschedji's

survey identified Pottery Neolithic evidence [16]. Currently, the few pieces of pottery identified by de Miroschedji remain the sole evidence of the Neolithic period in Darab.

During the author's 2019 survey of the plain, eleven Neolithic sites were identified (fig. 1), which can be divided into three periods. The oldest evidence comes from the Pre-Pottery Neolithic period. Two sites with Bizdan pottery were also identified, and the late Neolithic period is considered equivalent to the Shamsabad period in the Marvdasht plain. This period is characterized by coarse plain pottery, which was found at nine sites.

3. Neolithic sites in Darab

3.1. Galou Bozorg Shelter

Galou Bozorg shelter (fig. 2) is situated south of the Darab plain, approximately 1300 meters from Ab Shib village, at the entrance to Galou Bozorg valley. The shelter measures 30×20 meters, covering an area of 600 m². Stone tools and ground stone artifacts are found throughout the site. Several petroglyphs, including animal and geometric motifs, are carved on the cave walls. The presence of bullet cores and pressure blades suggests that the shelter was used during the Pre-Pottery Neolithic period. The limited deposit at this site suggests seasonal occupation of the shelter.

3.2.1. East Beriskan A site

The Beriskan site is located 23 km southwest of Darab city and southwest of Oubad village. The site is centered around a spring in the southwest corner of the village. Based on surface findings, different periods can be identified in various parts of the site. The cultural deposits appear to have formed horizontally. For a more detailed analysis of the site and its occupation during each period, the surface was divided into four contiguous sections.

To the south of the village and east of the spring, stone tools are scattered across the surface. The area likely served as a seasonal camp during the Neolithic period, owing to the spring's presence. The absence of pottery, coupled with the exclusive recovery of sickle blades and bullet cores, suggests a Pre-Pottery Neolithic date for this section. The stone artifact distribution covers an area of approximately 140×60 meters.

3.2.2. South Beriskan A

As previously noted, the Beriskan site comprises several sections. The Neolithic pottery deposit is located southwest of the spring. Excavation made by the qanat in the site's center revealed Neolithic deposits (fig. 3). These deposits, consisting of ash and soil layers, can be seen on both sides of the canal. The site measures 240×85 meters, with an area of approximately 14,800 m². This section appears to contain approximately three meters of Neolithic deposits. The recovered pottery is either plain or painted. While this pottery type is often referred to as Bizdan ware, after its discovery at Tol-e Pol Bizdan, the majority of deposits at Tol-e Pol date to the Bakun period, with fewer Neolithic layers compared to the Beriskan site.

3.3. Tol-e Pol Bizdan

Tol-e Pol Bizdan is located 850 meters north of Bizdan village on the western terrace of the Roudbal River. There is a historical bridge and a modern one near this site. It is known as Tol-e Pol Bizdan because of its proximity to the bridge and Bizdan village. The dimensions of the site are 290×90 meters, covering an area of 19,000 m². Located roughly four meters above the river, the site is almost level with the plain in its northern and western sections. A portion of the southeast corner has been destroyed by a loader.

The site was first discovered during de Miroschedji's survey. He recovered previously unidentified pottery, which he named Bizdan-type pottery, dating it to the Neolithic period [16]. The site appears to have been occupied at the end of the 7th millennium or the first half of the 6th millennium BC, and later during the Bakun period. Although Bizdan-type pottery was identified during the survey, the majority of surface finds can be attributed to the Bakun period. In the site's northern sections, ash and kiln remnants were observed. Surface pottery included deformed pieces, some fused together by intense kiln temperatures, and others exhibiting green discoloration from heat exposure, indicating on-site pottery production during the Bakun period.

3.4. Tol-e Banouj 1

Tol-e Banouj is located 450 meters north of Banouj village on the eastern side of the Darab plain. Its dimensions are 62×77 meters, covering an area of around 4,100 m², with a height of 4 meters. The site is situated on a flat plain suitable for agriculture (fig. 4). The water supply was likely derived from streams originating from springs on Pahana Mountain. It appears that during the Neolithic period, the site was occupied by agriculturalists.

3.5. Tol-e Dargoo

Tol-e Dargoo is located 8500 meters southwest of Fathabad village. This site measures 140×110 meters, and its area is around 12,000 m². The site is about 210 cm above the surrounding plain. A surface survey yielded both Neolithic (coarse plain ware) and Bakun pottery. The surface of the site is covered with Neolithic pottery, and a pit has been dug where the soil reveals only Neolithic pottery and lithic. The site's surface is predominantly covered with Neolithic pottery, and a pit excavation revealed exclusively Neolithic pottery and lithic artifacts. However, Bakun pottery is more densely distributed in the northern and northwestern sections. Consequently, it can be inferred that the majority of cultural deposits at this site date to the Neolithic period, with limited areas indicating (seasonal?) Bakun occupation. Furthermore, in the northern part of the site, there are remains of several stone walls. The site's surface features lithic tools produced using both pressure-flaking and percussion techniques.

3.6. Tol-e Siah DahKooch

Tol-e Siah DahKooch is located 380 meters south of Qale-no village and 1,500 meters northwest of Abshib village. Currently, the site is about 100 cm high, with dimensions of 130×120 meters and an area of 11,800 m². Based on the distribution of pottery, it seems that the site includes a central part and two seasonal settlements on the north and southeast sides. Coarse plain pottery was found in the middle of the site, while painted pottery is distributed in the northern and southeastern parts. The site was likely inhabited at the end of the Neolithic period, with some areas later occupied during the Bakun period.

3.7. Tol-e Siyah Shahnan

Tol-e Siyah Shahnan is located 2,400 meters south of Shahnan village and 680 meters northeast of the Darabgerd site. This relatively flat site has a maximum height of 100 cm above the surrounding plain. Currently, the site's dimensions are 95×75 meters, but an aerial image from 1967 shows that the site was 115×85 meters, with an area of 8,400 m². Parts of the site have been destroyed in recent years.

3.8. Tol-e Rigi Shahnan

Tol-e Rigi Shahnan is located 1,100 meters west of Shahnan village and 3,300 meters north of the Darabgerd site. The site measures 113×58 meters, with an area of 6,400 m². Significant destruction is evident at this site (fig. 5).

3.9. Dehghani site

The Dehghani site is located 1,700 meters southwest of Hirbodan village and 400 meters from the Roudbal River. This site measures 65×50 meters, and its area is around 2,800 m². The site rises approximately 40 centimeters above the surrounding plain. Situated on farmland, the site has experienced partial destruction due to agricultural activities. A surface survey yielded both Neolithic (coarse plain pottery) and Sasanian pottery.

3.10. Bizdan 6 site

The Bizdan 6 site is located 1,350 meters south of Bizdan village, on the eastern terrace of the Roudbal River. This site measures 180×150 meters, and its area is around 25,000 m². During the surface survey, Neolithic coarse plain pottery was found, along with stone tools made using both pressure-flaking and percussion techniques, similar to those at the Dargoo site.

3.11. Tol-e Beriskan B

Tol-e Beriskan B is located 710 meters south of Oubad village and 1,100 meters north of Mehrabad village. Looking at the current state of the site, it is clear that the original extent was much larger than what remains today. Apart from its obvious prominence, the site rises about one meter above the surrounding land on the east side, which is clearly visible in the exposed cultural deposits. Although the site was approximately 28,800 m², local people report that a large portion of it was leveled about 40 years ago for agricultural purposes. Today, only an area of 65×40 meters with a height of about 3 meters remains. Its section contains coarse plain pottery, as well as layers of soil and ash (fig. 6).

3.12. Tol-e Rigi Soltanabad

Tol-e Rigi Soltanabad is located 1100 meters from Soltanabad village and 1400 meters southeast of Fajr town. Its dimensions are 120×110 meters, its height is about 5 meters, and its current area is 8900 m². Over the past few years, the northern and northeastern parts of the site have been destroyed, and a pool has been constructed on this area.

3.13. Tol-e Siah Madovan

Tol-e Siah Madovan is located 2900 meters northwest of Madovan village and 2370 meters south of Fajr town. Stein conducted excavations at this site, publishing findings primarily concerning Bakun pottery [21]. The site's height is about 5 meters, its dimensions are 110×105 meters, and its current area is 7700 m². According to aerial images taken in 1967, the site was larger at that time, measuring 120×110 meters with an area of about 9600 m². Unfortunately, due to agricultural activities, gardens, and construction works, the site has been significantly damaged. Most of the pottery found on the surface is coarse plain pottery, with some painted pottery also present (fig. 7). This suggests that most of the settlement on this site dates back to the late Neolithic period and was abandoned during the early Bakun period.

4. Chronological sequence of the Neolithic period in Darab

4.1. Pre-Pottery Neolithic: Beriskan period

In the Fars cultural zone, excavations at Tape Rahmatabad uncovered evidence of the Pre-Pottery Neolithic period, designated the Rehatabad Period [17], with absolute dating ranging from 7450 BC to 7000 BC [18]. Additional evidence from this period was found during excavations at Qasr-e Ahmad [19], Tol-e Sangi [27] and surveys of the Neyriz Plain [28]. Despite this, the Pre-Pottery Neolithic period in southern Iran remains relatively understudied. Evidence of the Pre-Pottery Neolithic period was also discovered at East Beriskan A site and Galuo Bozorg shelter during the archaeological survey of Darab. Continued surveys in shelters and caves within Darab may yield further evidence from this period.

4.2. Pottery Neolithic: Bizdan and Banouj period

Excavations at Rahmatabad [17], Qasr-e Ahmad [19], and Tol-e Sangi [27] yielded evidence of the pottery emergence dating to around 7000/6900 BC in Fars. However, surveys in Darab failed to identify archaeological evidence from this period. The oldest pottery documented in the region pertains to the Bizdan period, contemporaneous with the Mushki or Jari periods. De Miroschedji's survey in the Darab region uncovered a pottery style near Bizdan village, subsequently designated the Bizdan pottery style [16].

In the Marvdasht Plain, Shamsabad pottery replaced Jari pottery [29; 18], and in Darab, coarse plain pottery similar to Shamsabad pottery replaced the Bizdan pottery. Based on surface finds, two cultural periods can be identified for the Pottery Neolithic period in Darab. There is a possibility that additional periods may be identified with further surveys or excavations at Neolithic sites in this region. De Miroschedji discovered Bizdan pottery on the surface of two sites in the Darab Plain [16]. The author also visited Tol-e Pol Bizdan and found pottery of this period at the Beriskan site in the Darab Plain and at two sites in Forg Plain [25]. Although Stein published pottery from Tol-e Siah Madovan, including a sherd of Bizdan pottery [21, Plate XXIII: no. 17], this type of pottery was not identified during the author's survey.

It appears that in the Darab Plain, the coarse plain pottery superseded painted pottery of the Bizdan period. This type of pottery, previously undocumented in Darab, was identified at eight sites in this region. Tol-e Banouj, a prominent site exhibiting this pottery style, has prompted the author to propose the designation “Banouj period” for this phase. This period is contemporaneous with Shamsabad or Bakun B1 in the Kur River basin and Yahya VII in Kerman.

Table 1: Chronological sequence of Darab plain and Kur and Polvar Rivers

Period	aproximate date	Kur and Polvar Rivers Basin		Darab	
		Chronology	Site	Chronology	Site
Pottery Neolithic	5000	Bakun		Skou	
	5500	Shams Abad	Bakun B2	Banouj	Banouj 1, Siah DahKoooh Siyah Shahnan, Rigi Shahnan Dehghani, Beriskan B Siah Madovan, Rigi Soltanabad
		Jari	Jari A & B	?	Siah Madovan? Beriskan A Pol Bizdan
	6000	Mushki	Mushki Hormangan	Bizdan ?	
	6500	Formation	Tol-e Sangi Rahmatabad	Unknown	
Pre-Pottery	7000	Rahmatabad	Tol-e Sangi Rahmatabad	Beriskan	Beriskan A Galou Bozorg
	7500			?	

5. Neolithic archeological materials in Darab

5.1. Pottery

In the following, we will describe the Neolithic pottery from 11 sites in the Darab plain.

5.1.1. Bizdan pottery

During his research in Darab, de Miroschedji identified a distinct type of pottery, differing from that of the Kur River basin, based on the surface findings. This pottery was introduced as Bizdan type pottery, associated with the Neolithic period. Characteristically, it is buff or brown-buff, featuring outer surface decoration. The ware is handmade with straw temper. Some pieces exhibit well-polished inner and outer surfaces, coated with a buff or reddish clay slip. The designs are geometric, including vertical and horizontal lines, rhombuses, or hatched rectangles. Based on its fabric, quality, and motifs, this pottery type can be attributed to the Neolithic period. However, the absence of absolute dating precludes a precise chronology for this pottery. Consequently, the initial appearance and duration of use remain uncertain. It is unclear whether it was contemporaneous with the Mushki or Jari periods. Excavations at sites with Bizdan pottery could provide insights into the local characteristics of the Pre-Pottery Neolithic period in southern Iran. It appears that in the 6th millennium BC, Darab and the southern regions of Fars had a distinct cultural material compared to the cultural material of Jari, with unique local characteristics observed in these regions (fig. 8).

5.1.2. Banouj pottery

The pottery recovered from these nine sites consists entirely of coarse plain pottery with straw temper. This pottery can be divided into two categories: coarse plain pottery and coarse pottery with a red slip. Approximately 95% of the collected samples belong to the former group. This ware is generally reddish, although buff-colored examples are occasionally found. It is handmade, and its firing quality is generally inadequate, suggesting firing in open kilns. The fabric color is often gray, indicating a lack of control over the kiln's heat. The second group includes buff or red pottery with a red slip. The only difference between the two groups is the slip on the surface of the pottery. Coarse plain pottery in the Kur River basin has been identified and introduced as Bakun B1 or Shamsabad pottery, dating to around 5600 BC to 5200 BC (fig. 9).

5.2. Lithic industries of the Neolithic period in the Darab

While Mlefaatian industry was originally defined using materials from parts of the northern and central Zagros region [30; 31] subsequent research indicates that the same framework (Early, Late, and Post-Mlefaatian) applies to Fars Province, southwest Iran. In his publication, Nishiaki analyzed the stone tools of the Fars cultural zone based on excavations in the Kur and Polvar river basins [4]. A collection of stone tools, including bullet cores, blades, and backed blades similar to those from the Pre-Pottery Neolithic phase at Rehmat Abad [32] and Tol-e Sangi, was obtained from Beriskan A (fig. 10) and Galou Bozorg shelters. The bullet-shaped cores indicate a fully developed pressure flaking technology, involving careful platform faceting.

A significant change in Fars occurred during the late 7th millennium BC, when the Early Mlefaatian was replaced by the Late Mlefaatian. Pottery Neolithic settlements at Tol-e Mushki [9; 33] and the Hormangan site [34] are among the most documented collections related to this period. In the Darab survey, no geometric tools comparable to those from Tol-e Mushki and Hormangan were found, but such tools might be discovered through further archaeological excavations in this plain.

In the early 6th millennium BC, changes in the stone tools of the Fars cultural zone were evident. Evidence from this period was obtained from Tol-e Jari B [32]. Comparable stone tools were found at 11 sites related to the Bizdan and Banouj periods in Darab. These sites exhibit a rare use of bullet-shaped cores for pressure flaking and a lack of geometric tools. Sickles made from blades increased significantly during this phase. From the sites of Dargoo and Bizdan 6, both pressure-flaking and percussion techniques for stone tools have been identified. To date, no similar tools have been found at other Neolithic sites in Fars. These types of stone tools have been discovered on the surface of various sites in the western parts of the Darab plain and Forg plain. All the stone tools were made from local chert, which appears to have been the primary material used. Although obsidian was found at Bakun period sites in this region, it was not present on the surface of any Neolithic sites. The chert used was of high quality, ranging in color from creamy brown to reddish, gray, and dark gray (fig. 11).

5.3. Ground stone

Ground stones, found alongside other material cultures at prehistoric sites, are frequently studied as tools for food preparation and production [35; 36; 37]. Beyond food production, analysis of ground stones can also provide scientific insights into settlement patterns, subsistence strategies, labor division, and specialization [38]. While ground stones are commonly discovered during archaeological excavations of Neolithic sites in Iran [39; 40; 41; 42; 9; 43], they frequently receive limited scholarly attention. They are also often overlooked during archaeological surveys. Since their function related to agriculture and food production has been noted, their distribution on Neolithic site surfaces can help us better understand the subsistence patterns.

During the Darab survey, ground stones were found on the surface of Neolithic sites, including classic mortars, pebble mortars, pestles, flat-topped grinding slabs, saddle-shaped grinder slabs, combined slab-mortars, pounders, and handstones (fig. 12). The raw material used in the production of these tools is limestone, which has minimal fragmentation and erosion when used for grinding and processing plant materials. Grinding slabs were fashioned from irregular, almost circular stones, often with uneven lower surfaces. These slabs were placed on the ground or a stable surface, and their working surfaces are generally flat or slightly concave. Pounders, consisting of river cobbles used for pounding or crushing, exhibit impact and use marks on their basal surfaces.

Although most of these ground stones appear to be related to food production in Neolithic Darab, traces of red ochre were observed on one of the mortars from Beriskan. The presence of ochre suggests that some ground stones used in Darab may have had multiple functions. Traces of red ochre on ground stones have been previously observed at sites such as Sarab [40: 305], Choghagolan [44: 371], Hormangan [45; 46], and Tol-e Sangi [47; 48]. The presence of ground stones used for food processing on Neolithic sites in Darab suggests that these sites were occupied by agricultural communities. Moreover, some ground stones have red coloration, suggesting they might have been used to prepare ochre, as seen in the mortar from Beriskan.

Discussion

The archaeological survey in the Darab plain provides new insights into the Neolithic settlement of southern Iran. Darab encompasses a vast plain with fertile lands and ample water resources, including a river and numerous springs. This environment fostered the emergence of various settlements. Evidence of Pre-Pottery Neolithic settlement has been found on the surface of one site and one rock shelter, suggesting these were seasonal settlements due to the thin cultural deposits. In the Fars cultural zone, architectural evidence from the Pre-Pottery Neolithic period was obtained from Tol-e Sangi [18] and Qasr-e Ahmad [19], although architectural evidence from Rahmatabad is limited [17]. Therefore, it can be said that both seasonal and sedentary settlements were prevalent during the Neolithic period. The initial survey season in Darab identified only seasonal settlements. Further archaeological surveys in this region may reveal additional sites from this period.

Given the lack of archaeological excavations at Neolithic sites in Darab, discussing the origins of Neolithic society in this region presents a challenge. Rose suggests that early Neolithic populations in the lowlands may have inherited cultural characteristics from the Persian Gulf [49]. Darab plain, being one of the southernmost plains of Zagros and close to the northern coast of the Persian Gulf, shows similarities in stone tools with northern regions such as the Kur River basin, rather than with the Persian Gulf oasis.

Currently, no evidence of pottery production has been found in the Darab Plain. From the second half of the 7th to the first half of the 6th millennium BC, various pottery styles emerged in Fars [5]. For example, the Kur River basin features Mushki and Jari pottery [29; 18], Kavar plain has Qasr-e Ahmad pottery [15], Fasa has Jalyan pottery, and Darab has Bizdan pottery [16]. Although similarities in production methods or fabrics exist, the motifs are completely different. According to current archaeological findings, four distinct regions can be considered in Fars at this time [15], with Bizdan type pottery being the southernmost, found at three sites in the Darab plain and two sites in the Forg Plain [25]. This pottery style appears to be a local variant.

Archaeological excavations in the Kur River basin indicate that coarse plain pottery superseded painted pottery around 5600 BC [50]. During the survey in Darab, similar coarse pottery was found at nine sites and was introduced during the Banouj period. Similar pottery was also documented during excavations at Tape Yahya, referred to as the Yahya VII period [51]. Pottery culture appears to be similar across different regions of Fars and western Kerman, a trend that persisted until the Bakun period. This cultural similarity was evident in excavations at Gavkoshi [52]. Therefore, the end of the Neolithic period marks the loss of local pottery cultures across Fars and cultural integration. Unfortunately, there is limited information about economic and social structures from this period, resulting in scattered data on this era in Fars.

A survey in the Kur River basin, as reported by Sumner, suggests the implementation of irrigation for agriculture during the Jari period, and canal construction in the Shamsabad period [53: 87-99; 54: 48]. An agricultural economy appears to have been prevalent in the Darab Plain during the Neolithic period, as evidenced by an increase in settlements and population. Two Bizdan sites are located between a river and a spring, while Banouj period sites are distributed across diverse areas of the Darab Plain. Therefore, it can be inferred that canals were employed for agriculture and water management in both Darab and the Kur River basin during this period.

Conclusion

Recent surveys on the Darab plain have yielded significant information illuminating the region's Neolithic settlements. During this survey, 13 Neolithic sites were identified. Two of these sites can be attributed to the Pre-Pottery Neolithic period based on stone tools such as bullet cores. Following this period, painted pottery

of the Bizdan type emerged. Subsequently, coarse plain pottery was observed, similar to the Kur River basin where coarse plain ware superseded painted Jari pottery. Additionally, in Darab, coarse plain pottery replaced Bizdan pottery. Although these pottery types are attributed to the Neolithic period, and this attribution is generally supported by their fabric, quality, and motifs, a precise chronology remains unclear. The exact timing of the dominance of these pottery styles is not well established. Excavations at the Bizdan and Banouj sites may help identify the local characteristics of the Neolithic period.

The identified sites suggest that the Pre-Pottery Neolithic settlements in this area were likely seasonal, relying on animal husbandry or hunting. However, during the Bizdan period, sedentary settlements were established near rivers or springs, indicating a shift towards an agricultural subsistence economy. By the Banouj period, settlements were distributed throughout the plain, suggesting the probable use of canals for agricultural water provision. Settlement patterns and site locations alongside water sources imply an emphasis on canal-based agriculture, which likely facilitated population growth and settlement expansion.

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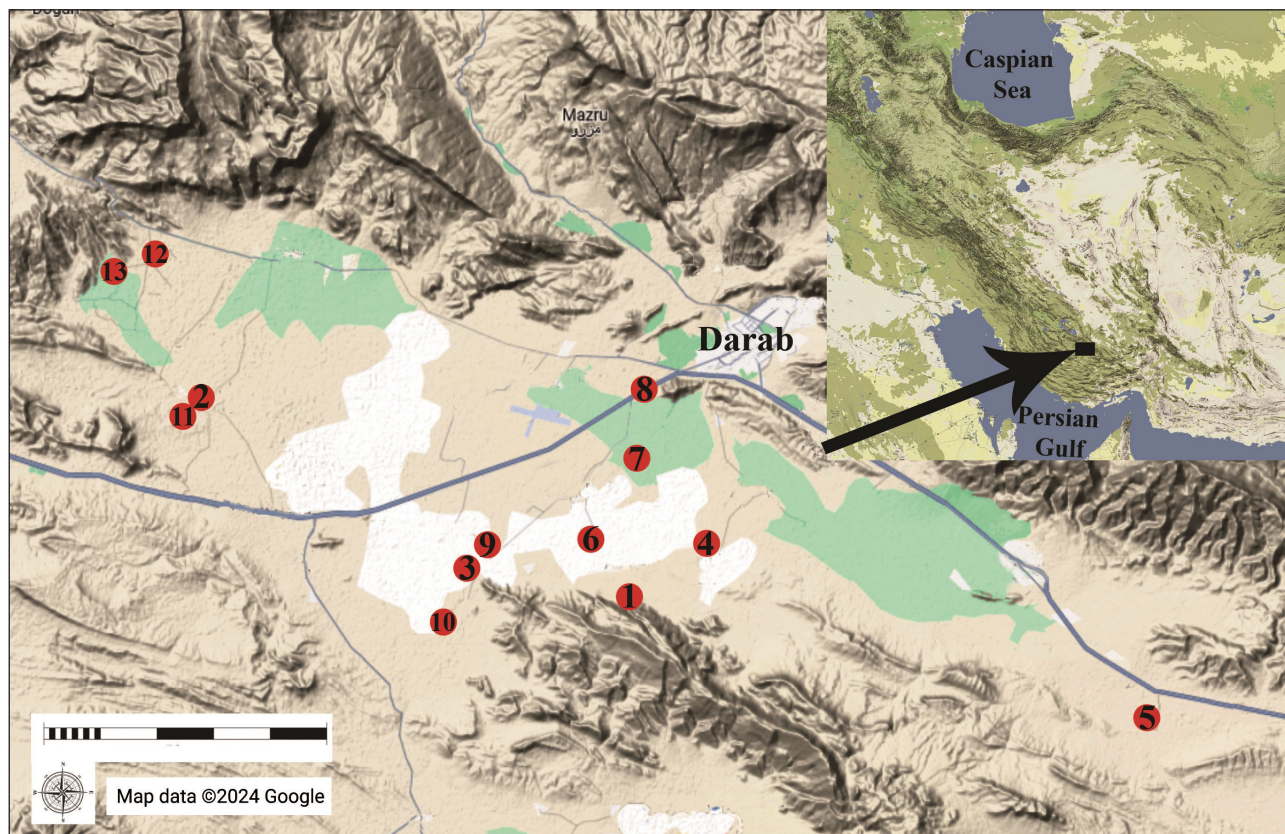


Fig. 1. Map of the Neolithic sites in Darab plain. 1 – Galou Bozorg; 2 – Beriskan A; 3 – Tol-e Pol Bizdan; 4 – Tol-e Banouj 1; 5 – Tol-e Dargoo; 6 – Tol-e Siah DahKoo; 7 – Tol-e Siyah Shahnan; 8 – Tol-e Rigi Shahnan; 9 – Dehghani Site; 10 – Bizdan 6 site; 11 – Tol-e Beriskan B; 12 – Tol-e Rigi Soltanabad; 13 – Tol-e Siah Madovan

Рис. 1. Карта неолитических стоянок Дарабской равнины. 1 – Галу Бозорг; 2 – Берискан А; 3 – Толе Пол Биздан; 4 – Толе Банудж 1; 5 – Тол-е Даргу; 6 – Тол-е Сиах ДаКух; 7 – Тол-е Сия Шахнан; 8 – Тол-е Риги Шахнан; 9 – Стоянка Дехгани; 10 – участок Биздан 6; 11 – Тол-е Берискан Б; 12 – Тол-е Риги Солтанабад; 13 – Толе Сиах Мадован



Fig. 2. Galou Bozorg rock shelter

Рис. 2 Скальное убежище Галу Бозорг



Fig. 3. South Beriskan A

Рис. 3 Южный Берискан А



Fig. 4. Overview of Tol-e Banouj 1

Рис. 4 обзор Тол-е Банудж 1



Fig. 5. Aerial photo of Tol-e Rigi Shahnan

Рис. 5 Аэрофотоснимок Тол-е Риги Шахнан



Fig. 6. Ash and heated structure in the section of Beriskan B

Рис. 6 Зола и нагретая конструкция в разрезе Берискана Б



Fig. 7. Overview of Tol-e Siah Madovan

Рис. 7 обзор Тол-е Сиах Мадован

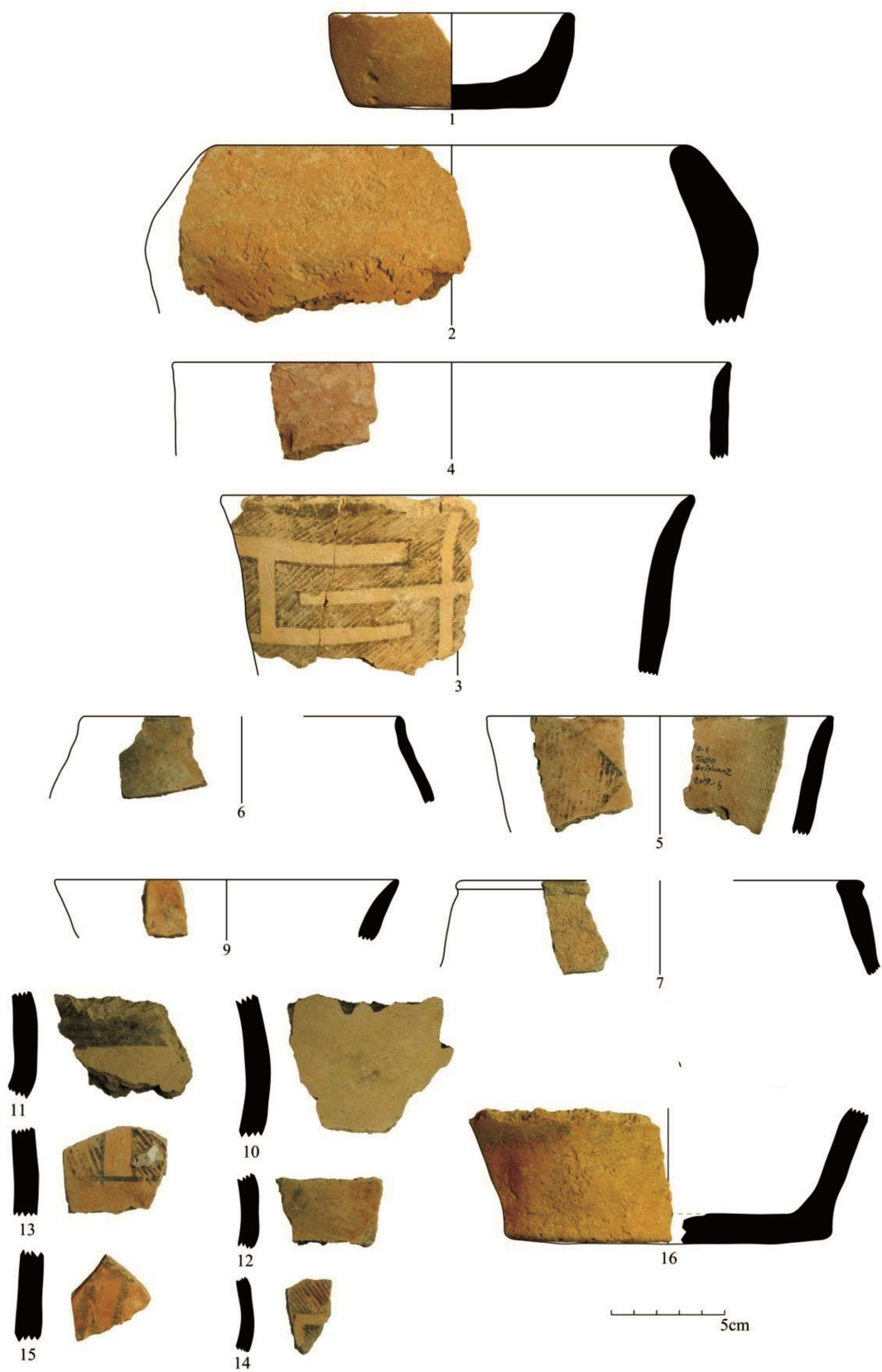


Fig. 8. Bizdan pottery from Beriskan site
Рис. 8 Бизданская керамика из Берискана

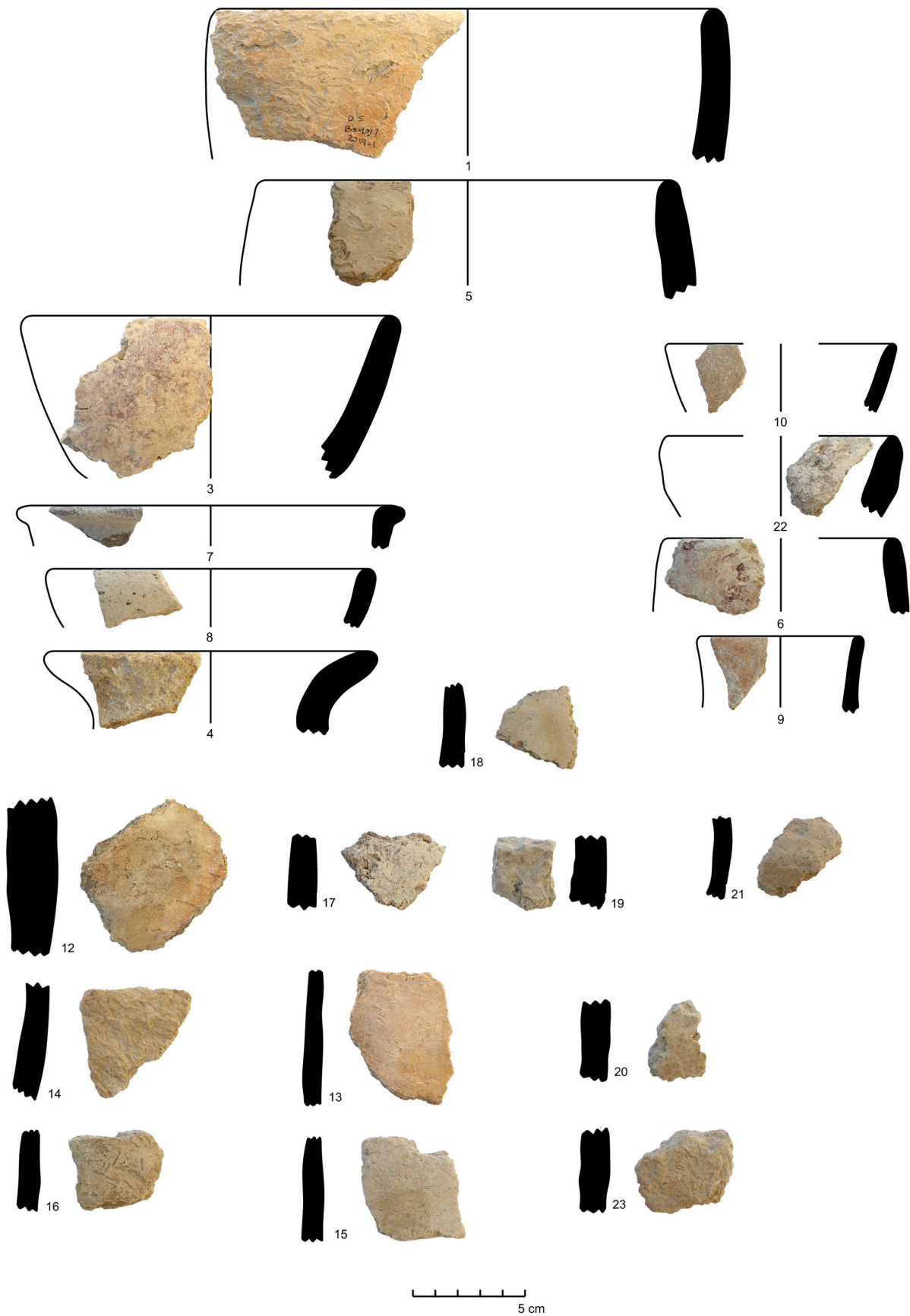


Fig. 9. Banouj pottery from Banouj Site

Рис. 9 Бануджская керамика из памятника Банудж



Fig. 10: Pre-Pottery Neolithic stone tools from Beriskan site

Рис. 10 Каменные орудия PPN из Берискана



Fig. 11: Pottery Neolithic stone tools from Beriskan site

Рис. 11 Каменные орудия PN из Берискана

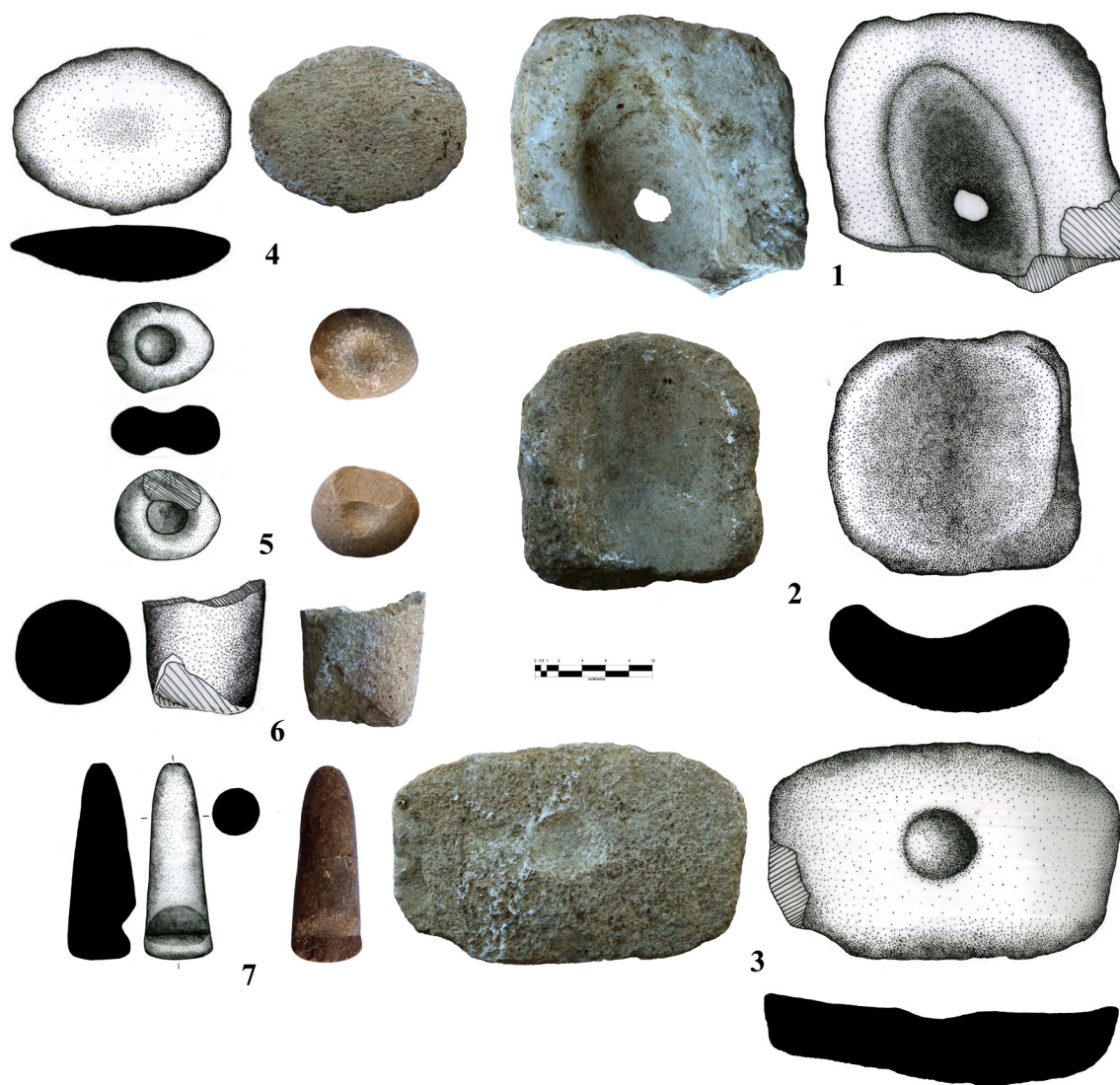


Fig. 12: Ground stone from Darab: 1- Classic mortar, 2- saddle-shaped grinding slab, 3- combined slab-mortar, 4- flat-topped Grinding slab, 5- Pebble mortar, pestle, 6 and 7- pounder

Рис. 12: Молотый камень из Дараба: 1 — классическая ступка, 2 — седловидная шлифовальная плита, 3 — комбинированная плита-ступка, 4 — шлифовальная плита с плоским верхом, 5 — ступка из гальки, пестик, 6 и 7 — толченые плиты

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