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Analyzing Animals as A Subject: Economic and Symbolic Role of Animals at Tape Qeshlaq, A Chalcolithic Settlement in the Central Zagros, Iran

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Abstract

Tape Qeshlaq represents a Chalcolithic settlement that was excavated as part of a larger archaeological survey conducted between 2011 and 2013. This study investigates the role of animals during the Chalcolithic period (ca. 5000–3500 BCE) in the Central Zagros region of Iran, utilizing data obtained from the excavations at Tape Qeshlaq. By examining both organic and inorganic data, the research aims to elucidate the subsistence and non-subsistence dimensions of human-animal interactions, thereby assessing how biological data can enhance the understanding of cultural data. The primary objective of this investigation is to ascertain the environmental conditions of the area through faunal data and to explore the cultural implications of the animal species present for the inhabitants during the Chalcolithic era. Faunal remains from Tape Qeshlaq have been collected and stored at the Archaeological Laboratory of Bu-Ali Sina University, where they are analyzed according to Stiner's coding system (2004) and Von den Driesch's (1976) measurement techniques. Statistical evaluations of the organic data reveal that the faunal assemblage from Tape Qeshlaq comprises 550 specimens, which include 474 bones, 41 teeth, 22 horns, and 13 shells. The category of large ungulates includes the fragmented remains of *Bos taurus* (cattle) and equids, specifically wild horses and onagers. Morphological and dental analyses reveal that approximately 70% of the equid remains are attributed to the onager, *Equus hemionus*, or the Asiatic wild ass. This study examines both the practical and relational dimensions of these animals, emphasizing their economic and symbolic significance at Tape Qeshlaq. The dominance of goats, sheep, cattle, and onagers as primary livestock underscores the necessity of varied pastoral strategies in response to the environmental challenges characteristic of steppe regions. Furthermore, the essential role of animal bones in tool production is underscored, highlighting their functional utility. The presence of non-organic artifacts, including zoomorphic figurines, horn-shaped tokens, and decorative pottery, reveals additional cultural dimensions of these animals, illustrating their role not only as vital resources but also as cultural symbols that inspired artistic expression and contributed to the social structure of Chalcolithic communities in western Iran.

Keywords: Central Zagros Archaeology, Zooarchaeology, Chalcolithic, Faunal Data, Herding System, Symbolic Motifs.

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Introduction

The archaeological examination of human-animal interactions has progressed to a new phase that transcends the traditional focus on the utilitarian roles of animals (Reitz & Wing 2008; Hill 2013). Contemporary zooarchaeological methodologies now encompass not only dietary and subsistence patterns but also the social and symbolic dimensions of these relationships (Russell 2011). This research exemplifies a broader archaeological approach that emphasizes the importance of animal data in salvage archaeology, resulting in a prioritization of both organic and inorganic materials. The excavation of Tape Qeshlaq, conducted by Motarjem within the framework of salvage archaeology related to the Talvar Dam, illustrates these efforts (Motarjem 2011 & 2014). Research in this area is hindered by challenges such as unreliable dating techniques, limited systematic investigations, and an overdependence on pottery analysis (Sharifi & Motarjem 2018: 87). This situation underscores the growing importance of interdisciplinary approaches, particularly in the exploration of the broader animal economies in the region, as the Zagros Mountains, recognized for their fertility, have been pivotal in the domestication of key species like *Capra hircus* (goats) in the Eastern Fertile Crescent of Southwest Asia (Zeder & Hesse 2000: 2254).

◀ **Fig. 1: Tape Qeshlaq in the Central Zagros, influenced by the southern basin of Lake Urmia (Authors, 2022).**

Tape Qeshlaq of Talvar

Tape Qeshlaq, located in Bijar, Kurdestan, Iran, is a significant prehistoric site within the Central Zagros archaeological zone (Fig 1). It is recognized as the largest site in the Talvar valley, encompassing an area of 5,600 square

meters and rising approximately 7 meters above the adjacent terrain at its peak. The site is situated near the Talvar River. As a permanent river, it serves as a reliable water source. Before 1971, no archaeological research was done in Bijar. In 1975, Swiny (1975) conducted a survey aimed at identifying sites from the first millennium BC. Subsequent systematic excavations were carried out by Iranian academic teams decades later (Mohamadifar 2010; Motarjem 2011 & 2014). Evidence indicates that the site was continuously occupied across five stratigraphic layers (I–V) from the Early Chalcolithic period to Iron Age III, with two notable cultural gaps. Initial analyses suggest connections to the Hajji Firuz-Dalma cultural traditions and influences from the Hassuna culture (Motarjem & Sharifi 2014: 54-62). Thermoluminescence dating has provided the following chronological framework for the chalcolithic layers (V-III) at Tape Qeshlaq: late Chalcolithic (3600±220-3800, 3915±270, 3850±280-4100 BC), Middle Chalcolithic (396±290-4100 BC), and Early Chalcolithic (5000±305, 5000±250 BC) (Sharifi & Motarjem 2018: 88-91).

Materials and Methods

This research project seeks to demonstrate the substantial influence of biological data analysis on enhancing the accuracy of cultural data interpretations. Faunal remains recovered from Tape Qeshlaq have been systematically collected and preserved at the Archaeological Laboratory of Bu-Ali Sina University. The analysis employs Stiner's coding system (2004) and Von den Driesch's (1976) measurement techniques, supplemented by established methodologies (Boessneck 1969; Schmid 1972; France 2008; Russell 2011) that inform the subsequent identification and analysis processes. Detailed methodological insights into the zooarchaeological and faunal analyses of Tape Qeshlaq are provided in Dehghan (2018). The data analysis was conducted following the implementation of conservation strategies. An effort has been made to establish a coherent relationship between organic and inorganic data, focusing on the economic, symbolic, and social roles of animals (DeFrance 2009) in maintaining the stability of this site over a millennium. The term non-organic animal data encompasses materials that illustrate the connections between humans and animals or reflect their physical characteristics and behaviors, such as zoomorphic motifs found in pottery and figurines.

Statistical Analysis of Organic Data

Statistical evaluations of organic remains from Tape Qeshlaq reveal a total

of 550 specimens, which include 474 bones, 41 teeth, 22 horns, and 13 shells. As presented in Table 1, the category of large ungulates comprises fragmented bones from *Bos taurus* (cattle) and equids (wild horse/onager). Morphological and dental analyses suggest that approximately 70% of the equid remains are attributable to the onager, specifically *Equus hemionus* or the Asiatic wild ass. The caprid remains consist of bones identified as *Ovis aries* (sheep), *Capra hircus* (goat), *Capra aegagrus* (ibex), as well as those classified under the broader Caprine category (goat/sheep). Due to constraints in time and specific research goals, a limited number of intact specimens were collected and analyzed, resulting in an average identification rate of 87% of the total specimens (see Table 2). The overall weight of the organic remains is approximately 5.780 kg, excluding burned and calcified fragments (Von den Driesch, 1976: 3-4).

Taxon	Early Chalcolithic			Middle Chalcolithic			Late Chalcolithic		
	NISP	MNI	NISP%	NISP	MNI	NISP%	NISP	MNI	NISP%
Goat/Sheep	11	7	10.9	9	6	19.1	35	17	8.7
Goat	7	6	6.9	6	5	12.7	35	17	8.7
Sheep	6	6	5.9	5	4	10.6	33	29	8.2
Ibex							4	4	1
Suid	7	6	6.9				15	15	3.7
Gazelle	4	4	3.9	2	2	4.25	8	8	2
Auroch	1	1	1	1	1	2.1	14	14	3.5
Cattle	11	9	10.8	14	13	29.8	86	42	21.4
Equid	25	17	24.7	2	2	4.25	39	25	9.7
Canid	6	4	5.9				34	6	8.5
Felid	1	1	1				18	5	4.5
Large Ungulate							7	7	1.7
Rodent				1	1	2.1	2	2	0.5
Lepus				2	2	4.25	5	3	1.2
Turtle				2	2	4.25	2	2	0.5
Birds	3	2	2.9				11	8	2.7
Freshwater Shells	4	4	3.9				9	9	2.2
Total	86	67	85%	44	38	93%	357	213	89%

◄ **Tab. 1: The NISP (Number of identifiable specimens), MNI (Minimum number of individuals), and NISP% (Number of identifiable specimens%) for each taxon, the Chalcolithic phases, Tape Qeshlaq (Authors, 2022).**

For the Early Chalcolithic era, an examination of 101 specimens showed that equids were the most prevalent at 24.7% NISP, and Bos genera, including both *Bos primigenius* (aurochs) and *Bos taurus* (cattle), made up 11.8%. Caprids accounted for nearly 23.79% of the NISP, and suids (boar/pig) accounted for 6.9%, highlighting the significance of small herbivores. The presence of various carnivores (6.9%), *Gazella spp*. (gazelle) at 3.9%, and birds at 2.9% added to the diversity of animals.

The team encountered difficulties in gathering animal remains of the Middle Chalcolithic which were affected by issues such as layer disturbance, high humidity, and time constraints. Out of 47 bone fragments, 44 were successfully identified. During this phase, caprids, with an NISP of 33.5%, highlights the ongoing significance of small ruminants. Cattle (29.8%) accounted as the second predominant NISP% among large herbivores. The

Tab. 2: Summary of animal remain identification during the Chalcolithic era at Tape Qeshlaq (Authors, 2022). ▶

	Early Chalcolithic	Middle Chalcolithic	Late Chalcolithic
NI (indeterminate)	15	3	45
Total NI %	15%	7%	11%
Total MNI	67	38	213
Total NISP	86	44	357
Total NISP %	85%	93%	89%
Total Fragment	101	47	402
Total Fragment: 550		Average NISP%: 89%	

presence of gazelle, equid, Lepus, and turtle, each with a similar NISP of 4.25%, indicates a diverse taxonomy. The scarcity of animal remains during this phase presents challenges in discussing the economic strategies of this period, but the cultural data highlighted the importance of ruminants in the society in terms of function and art.

The late Chalcolithic period is characterized by a more extensive organic dataset, comprising a total of 357 identifiable specimens out of 402 fragments. Within this dataset, cattle account for 21.4% and aurochs for 3.5%, establishing the Bos genus as the primary source of protein among ruminants. Following this, equids represent 9.7% of the NISP, while caprids, which include goats (8.7%), sheep (8.2%), goat/sheep (8.7%), and ibex (1%), also contribute significantly. The percentages for canids and felids are 8.5% and 4.5%, respectively. Notably, while carnivorous bones are present, they lack cut marks or evidence of skinning, although some have been categorized. The NISP percentage for wild fauna, such as gazelles, ibex, and birds, is recorded at less than 3%. The bone data from the late Chalcolithic phase were collected from two pits filled with compacted ash and other refuse sites, indicating a clear pattern of consumption. A significant 51% of the Chalcolithic fragments exhibit a variety of brown hues, which are influenced by environmental factors such as climate, humidity, and soil composition. Additionally, approximately 6% of the bones display distinct signs of burning, likely due to cooking or incineration, with the most pronounced traces found on the calcaneus and phalanges of herbivores (Figs. 2 & 3).

Economic Analyses and Aging

The faunal assemblages identified at Tape Qeshlaq reveal a straightforward dynamic in the interactions between humans and animals. Evidence of caprids, cattle, equids, and gazelles are found consistently across all three layers of the chalcolithic period, suggesting that animal products were sourced from both domesticated herds and wild populations. The Talvar Valley, characterized by its steppe-like environment, served as a habitat for wild animal herds, including equids, gazelles, and ibex, particularly during

◄ Fig. 2: Equine Distal phalanges show tendency to hunt young equids in the early chalcolithic phases (Authors, 2022).

◄ Fig. 3: Cattle and caprids' third phalange, probably charred in disposal pits (Authors, 2022).

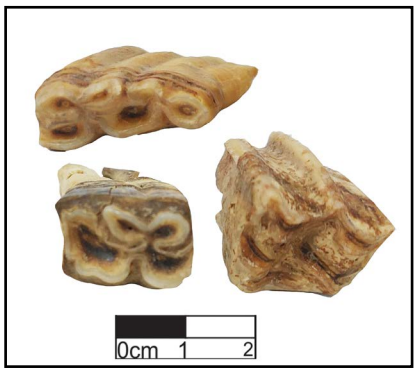
▲ Fig. 4: Proximal phalange of an equid with skinning marks (Authors, 2022).

the colder months. Additionally, the region's verdant pastures supported the practice of animal husbandry. This dual approach to resource acquisition offers settlements a degree of stability amidst seasonal fluctuations and the uncertainties of water and food availability.

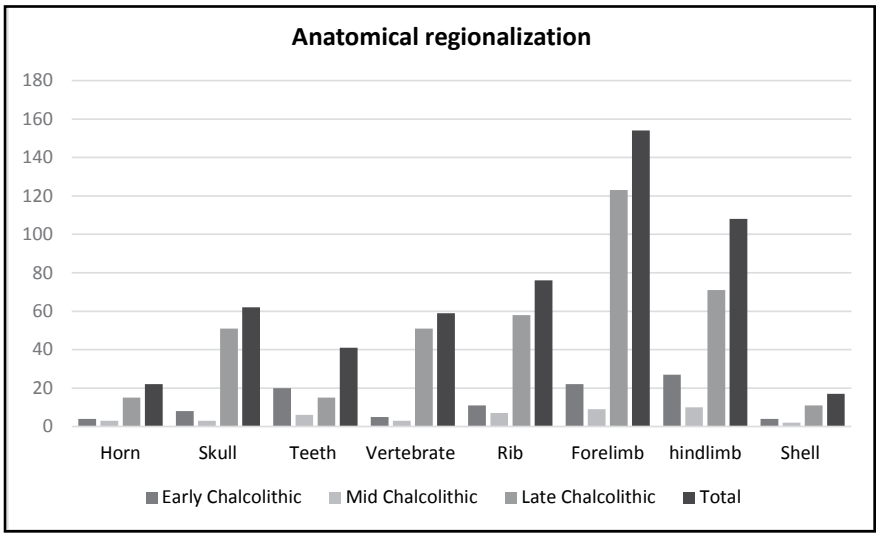
The investigation reveals a diverse array of animal species, encompassing both domesticated and wild adult specimens. Age assessment was conducted through measurements of body size, tooth eruption, and bone density, indicating that 65% of the identified animals are domesticated (65% adults and 35% juveniles), while 35% are wild (62% adults and 38% juveniles). The butchering practices and aging assessments suggest that cattle were generally slaughtered between the ages of 2 and 4, which aligns with prevalent cattle breeding methodologies. In contrast, the aging analysis for equids does not reveal a distinct pattern; however, there is a noted inclination towards hunting younger individuals, typically those under two years of age (Dehghan 2018: 76–91). The spatial distribution of these findings and the taxonomic composition do not imply any specific socioeconomic status (Ashby 2002: 38–43), as the majority of remains from Tape Qeshlaq were retrieved from refuse deposits rather than from defined contexts such as architectural structures.

The Nutritional Value of Animal Resources

Anatomical regionalization (Fig. 6) entails the identification of distinct components within an organism's anatomy. Factors such as spatial orientation, size, age, and domestication status are critical in assessing the nutritional value of animal resources and in reconstructing butchering practices. The skeletal analysis indicates a total of 260 elements in the axial skeleton, which is comparable to the 262 elements found in the appendicular skeleton. The discovery of skulls, horns, and limbs implies that killing and butchering occurred on-site. While long bones are prevalent, they are predominantly fractured to access the bone marrow. Fractures observed on flat bones are attributed to the processes of skinning and flesh removal. Ribs and vertebrae, which serve as meat carriers, are seldom found intact and are mostly fractured. Damage to horns, skulls, and other facial bones is evident, with 20% of ruminant mandibles exhibiting signs of skinning. The on-site processing of carcasses suggests that the Tape Qeshlaq served as a productive center, facilitating easier access to animal resources. Taphonomic analyses reveal that over 60% of the faunal remains in Tape Qeshlaq consist of food remnants.



▲ Fig. 5: The lower M3, M2 and upper M2 of equids. The deep ectoflexid and V-shaped linguaflexid are typical of *Equus hemionus* (Authors, 2022).



◄ **Fig. 6: The anatomical regionalization of organic identifiable data (Authors, 2022).**

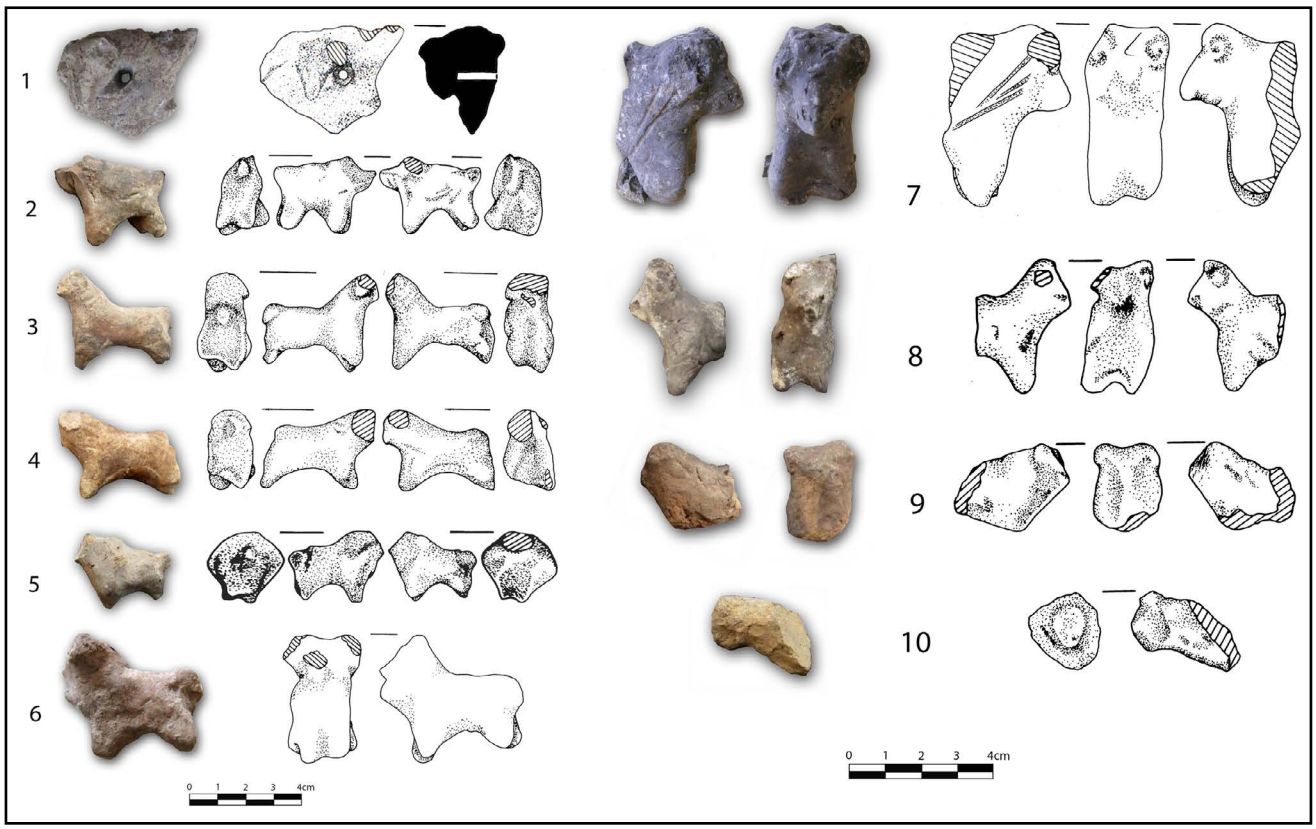
Bone tools

The archaeological excavations yielded 40 bone samples identified as tools, which include 13 needles, 6 awls, 10 cylindrical objects, 8 rings, and 3 clasps. The majority of the tools discovered at Tape Qeshlaq are crafted from the long bones of gazelles and caprids, with a particular emphasis on long bone material. The longest cylindrical artifact measures approximately 11.7 cm in length. The practice of creating bone rings appears to be a local tradition, although instances of awls and cylindrical bones have been documented in the Zagros region (Hamlin 1975: 125; Voigt 1983: 29; Braidwood 1983: 367). The texture analysis of these tools indicates that artisans predominantly utilized unheated natural bone tissue rather than remnants of food (Fig. 7).

Non-organic Animal Data

Investigating non-organic animal data within a broader framework provides a more profound insight into the relationship between humans and animals. This analysis facilitates the exploration of the social functions of animals and emphasizes their role in artistic endeavors and the evolution of human settlements. Ancient populations produced animal-inspired artifacts to honor and connect with their spiritual convictions, perceiving animals as embodiments of strength, agility, and wisdom. Many cultures viewed animals as symbols of protection, fertility, and fortune, making the creation of such items a method to integrate these desirable qualities into their existence. Studies at Tape Qeshlaq reveal the essential importance of animals to its residents, as their access to animal resources has been a fundamental aspect of their livelihood (Fig. 8).

▲ Fig. 7: Bone cylinder, rings and awls, Tape Qeshlaq, mainly from layers III & IV (Authors, 2022).

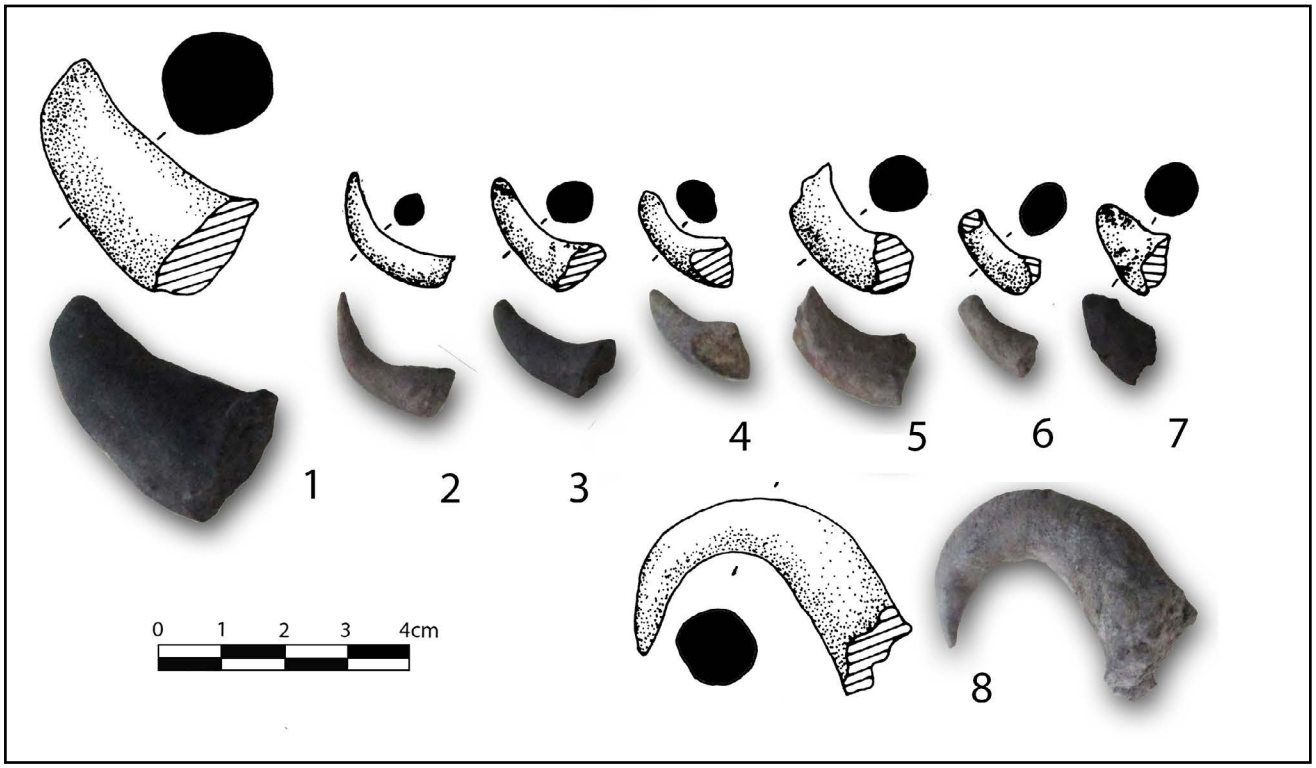


▲ Fig. 8: Animal clay figurines of Loc: 303, T.T.T.VI trench, Tape Qeshlaq (Authors, 2022).

Zoomorphic Figurines

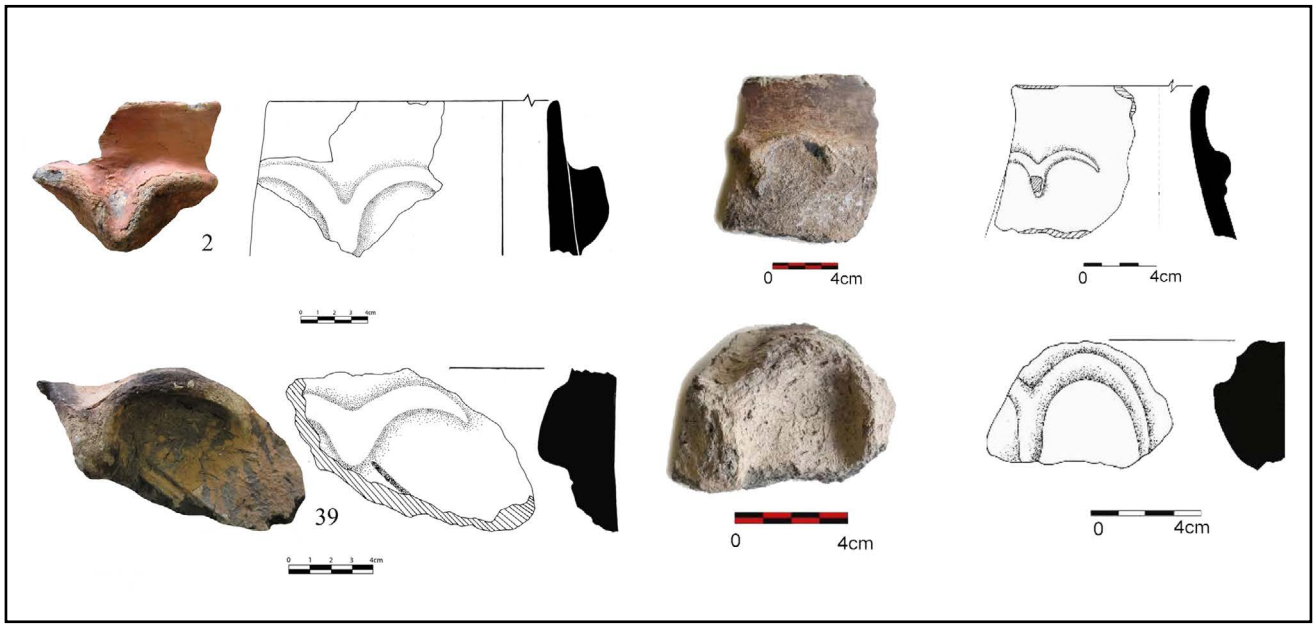
Unless the biologic data in Tape Qeshlaq do not symbolize any particular ideology, the zoomorphic figurines offer intriguing insights into animals as a cultural subject. In the second season, animal figurines were found in a western stratigraphy trench, within the deposition of ashes in two pits associated with the Middle Chalcolithic layer, along with other household waste such as burnt bones and pottery shards (Motarjem 2014: 93). The pit cannot be a cache because the collection is not purposefully buried. These 26 clay figurines have no color or nail decorations. Only one of them depicts a human figure, while the rest represent livestock. They are made in one piece with short legs, similar to Jarmo and Ain Ghazal samples (Broman 1990; Schmandt-Besserat 2013). In less damaged specimens, the twists of the horns resemble bucks, while the other specimens with straight and narrower horns are more likely to represent goats (Fig. 9). The remains of both species are recorded on site (Table 1). Analyzing species, style, size, and context of appearance could be an attempt to understand the social roles these figurines may have played, focusing on prehistoric ontologies and cognitive processes (Valera et al., 2014). Broman (1990: 27–29) mentioned that these miniature forms are based on real-life models that ancient people used to break, probably to release hidden powers, but they were not considered sacred and were mostly found in pits.

Fig. 9: Horn-shaped tokens of Tape Qeshlaq (Authors, 2022). ▼



Horn-shaped Tokens

Many tokens have been discovered in the chalcolithic layers, indicating the area's active trade relations (Sharifi & Motarjem 2018: 94–95). These tokens give numeracy information and are made of clay and burned in the process of incineration. They are modeled in various shapes, such as cylinders, cones, spheres, and disks, but there are also 11 horn-shaped specimens resembling cattle and goat horns, demonstrating their direct inspiration from animals in creating different forms (Fig. 10).



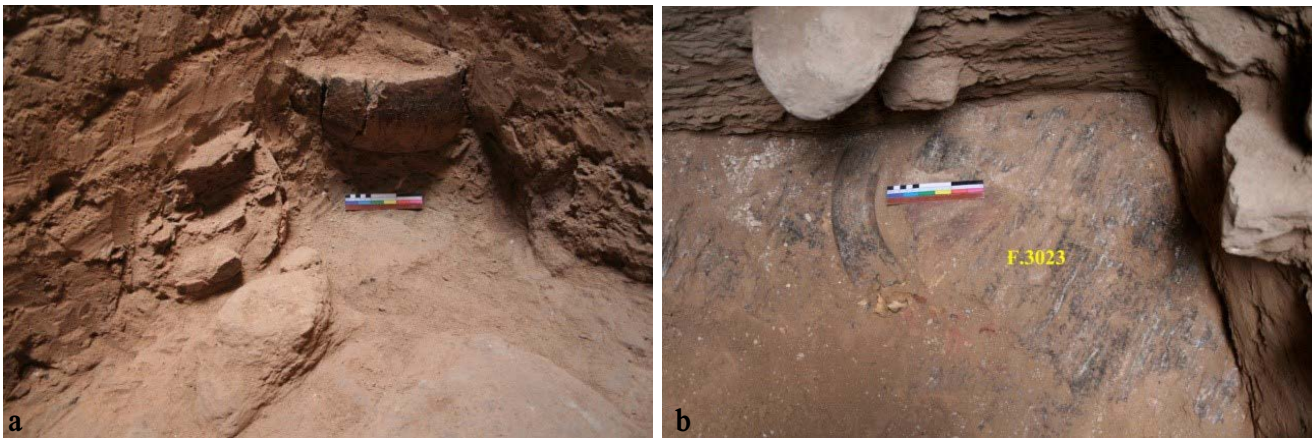
▲ **Fig. 10: Zoomorphic pottery decorations, inspired from ibex and ram horns (Authors, 2022).**

Zoomorphic Pottery Decoration

A limited fraction of the decorative elements found in Tape Qeshlaq pottery is classified under animal motifs, characterized by applied decoration techniques (Fig. 11). These designs prominently feature the stylized horns of both goats and rams. This particular technique is similarly evident in pottery from the lower Hassuna period at Umm Dabaghiyah (Motarjem, 2014: 57; Sharifi & Motarjem, 2018: 92–93). This phenomenon may signify the cultural importance of animals, highlighting their roles in daily activities and inspiring artistic endeavors that reflect the natural world or honor the economic and social significance of these creatures.

Evidence of animals and their presence in ritual activities

The Middle Chalcolithic layer of the T.T.C.VI trench features a stone structure designated as Fi:3023. This structure contains distinct evidence of pottery associated with ritual activities and cattle horns. Particularly significant are the remnants of straw and Cyprus, which have also been



▲ **Fig. 11: a & b: 3023 of the Middle chalcolithic, providing evidence of probable contribution of animals in ritual activities (Authors, 2022).**

identified in other layers. Motarjem (2014: 31-32) strongly posits that the presence of these ritualistic artifacts and cattle horns likely indicates that this area was utilized for ceremonial functions.

Discussion

Tape Qeshlaq reflects a contextual relation between humans and animals shaped by climate and topography. The primary data indicate that domestic animals, followed by wild animals, play a crucial role in meeting the subsistence and non-subsistence requirements of the region. It also acknowledges the functional roles of caprids, cattle, and equids. The Talvar Valley links the Central Zagros and the south of Lake Urmia. The remains of straw, Cyprus, and abundant cattle bones suggest the area probably had sufficient water and humidity. However, due to environmental factors like steppe vegetation, a high-altitude of 1600 meters above sea level, and acidic soil, it does not provide suitable conditions for extensive agricultural activities. Yet, the permanent source of the Talvar River, the steppe vegetation, and rich pastures created a suitable condition for raising domestic ruminants and attracting wild herds.

The significance of animal resources is underscored by the limited agricultural practices and the rarity of sickle blades. Additionally, artifacts such as tokens, stamp seals, obsidian tools, and Ubaid pottery provide substantial evidence of interregional interactions, emphasizing the settlement's dependence on trade networks. Overall, a mixed economy that incorporates both hunting and animal husbandry appears to be the most viable approach for the domestic economy of Tape Qeshlaq. Moreover, after a millennium of sustained habitation in this region, the climate and environmental conditions remained stable until the conclusion of the Late Chalcolithic period and the onset of the Godin VII phase, marked by the incursion of the Yanik culture (Kura-Araxes), which significantly

transformed the spatial organization of the site (Sharifi & Motarjem 2018: 95–97). A comparative analysis of the maximum terrace and overflow levels of the Talvar River, alongside the depth of late Chalcolithic deposits in the western section of the T.T.A.VI trench, suggests a period of aridity at the end of the Chalcolithic, coinciding with the introduction of a new cultural phase and the subsequent abandonment of the settlement.

This research primarily sought to enhance the understanding of human-animal interactions and to facilitate more focused investigations into the Chalcolithic period of western Iran. Consequently, it is essential to prioritize the documentation and analysis of animal-related data in future analysis.

Conclusion

In summary, the evidence strongly suggests a significant relationship between the subsistence functions of animals and their symbolic representations. Animals that have played a pivotal role in the livelihoods of local populations are prominently featured in both cultural and practical contexts. Research conducted on animals during the Chalcolithic period (approximately 5000–3500 BCE) in Central Zagros has uncovered a complex interplay between the inhabitants and their animal counterparts. By examining both practical and relational dimensions, the study emphasizes the economic and symbolic significance of animals at Tape Qeshlaq. The dominance of goats, sheep, cattle, and onagers as primary livestock underscores the necessity of varied pastoral strategies to navigate the environmental challenges characteristic of a steppe region. Taphonomic analyses further illustrate the economic relevance of these animals within consumption practices. The essential role of animal bones in tool production is also underscored, highlighting their practical and functional value. Moreover, non-organic artifacts, including zoomorphic figurines, horn-shaped tokens, and decorative pottery, reveal additional cultural dimensions of these animals, showcasing their evolution into cultural symbols that inspired artistic expression and contributed to the social structure of Chalcolithic communities in western Iran. This investigation deepens our comprehension of the intricate relationships between humans and animals in the ancient societies of Central Zagros during the Chalcolithic, a critical prehistoric era in southwestern Asia.

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of the laboratory of the archeology department who helped us in carrying out this research

Observation Contribution

Abbas Motarjem, was supervised the project, developed the theoretical formalism and unearthed all data in the field Excavation and Zahra Dehghan Studied the Faunal in the Bu-ali Sina laboratory of Archaeology Department and write the manuscript. All authors provided critical feedback and helped shape the research, analysis and manuscript

Conflict of Interest

All authors declare that they have no conflicts of interest.

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تحلیلی بر نقش و اهمیت نمادی و اقتصادی حیوانات براساس مطالعهٔ بقایای جانوری تپه قشلاق از دورهٔ مس‌وسنگ شرق زاگرس‌مرکزی ایران

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چکیده

تپه قشلاق درهٔ تالوار واقع‌در حاشیهٔ شرقی زاگرس‌مرکزی، یک محوطهٔ استقراری از دورهٔ مس‌وسنگ (حدود ۵۰۰۰ تا ۳۵۰۰پ.م.) است که به‌عنوان بخشی از یک پروژهٔ باستان‌شناسی نجات‌بخشی طی سال‌های ۲۰۱۱ تا ۲۰۱۳م. مورد کاوش باستان‌شناسی قرار گرفت. بقایای استخوانی جانوری گردآوری‌شده در این کاوش از دو منظر معیشتی و غیرمعیشتی مورد مطالعه دقیق قرار گرفتند. هدف این پروژه، بررسی وضعیت زیست‌محیطی منطقه در دورهٔ مس‌وسنگ برپایهٔ ترکیب گونه‌های جانوری شناسایی شده و در مرحلهٔ دوم برآورد میزان استفاده از بقایای جانوری در ساخت و تولید داده‌های فرهنگی و هم‌چنین انعکاس آن بر دیگر جنبه‌های فرهنگی مانند سفال بود. به‌لحاظ روش‌شناسی، بقایای جانوران تپه قشلاق در محل آزمایشگاه باستان‌شناسی دانشگاه بوعلی‌سینا با استفاده از سیستم کدگذاری استینر (۲۰۰۴) و اندازه‌گیری‌های فون دن دریش (۱۹۷۶) طبقه‌بندی و سپس مورد تجزیه و تحلیل قرار گرفتند. طبقه‌بندی برپایهٔ گونه‌شناسی جانوری از تعداد ۵۵۰ نمونه شامل: ۴۷۴ استخوان، ۴۱ دندان، ۲۲ شاخ و ۱۳ پوسته نشان‌داد که ترکیب اصلی این مجموعه شامل: گونه‌هایی از اسب‌سانان وحشی، گاو و بزسانان بودند؛ درحالی‌که برمبنای بررسی‌های مورفولوژیکی و دندانی مشخص گردید، بیش از ۷۰٪ از داده‌های اسب‌سانان به گونهٔ اکووس همیونوس یا الاغ وحشی آسیاتیک تعلق دارند. فراوانی گونه‌های بز، گوسفند، گاو و اسب‌سانان به‌عنوان منابع اصلی حیوانی در دسترس ساکنان، نشان‌دهندهٔ اهمیت استراتژی‌های متنوع دامداری در سازگاری با چالش‌های زیست‌محیطی این منطقهٔ استپی است؛ چراکه فراوانی گونهٔ الاغ وحشی آسیایی مؤید وجود یک زیست‌محیط نیمه‌بیابانی با پوشش علفزار استپی تلقی می‌گردد. علاوه‌بر این، داده‌های غیرارگانیک مانند پیکرک‌های حیوانی، نشانه‌های شاخی‌شکل پلاک‌شده برروی بدنهٔ برخی سفال‌ها میزان تأثیرات حیوانات بر نشانه‌ها و نمادهای فرهنگی را آشکار می‌کنند.

کلیدواژگان: باستان‌شناسی زاگرس‌مرکزی، دورهٔ مس‌وسنگ، بقایای جانوری، تاریخ دامداری، نمادهای فرهنگی کهن.

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