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# Reassessing the Iron Age in the Region of Gorgan (Southeast of the Caspian Sea): New Evidence from the Excavations at the Site of Mahiyan, Ali Abad-e Katul, in the Eastern Alborz, Iran

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## Abstract

The Iron Age in the Gorgan region represents one of the least understood archaeological periods. Most studies have focused on Iron Age II and III, primarily within cemetery contexts. Research has tended to emphasize both earlier and later periods in the plains, with limited targeted investigation in the mountainous areas. During test excavations at the Mahiyan site in Ali Abad-e Katul (Golestan Province), a funerary structure was uncovered containing two human burials accompanied by grave goods. This article presents these new findings to refine the current understanding of the Early Iron Age chronology and material culture in the region, with a particular focus on its understudied mountainous zone. The study addresses two main questions: What are the cultural and funerary features of the Mahiyan site, and how does its material culture compare to contemporary cemeteries in neighboring regions? I hypothesize that the Mahiyan cemetery displays cultural and burial characteristics typical of the Late Bronze Age and the Early Iron Age in the northern Alborz Mountains. Moreover, it likely shares cultural affinities with contemporaneous sites in northeastern Iran, west of the Alborz, and the Central Plateau. Using descriptive-analytical methods, data from the trial trenches were examined. Typological assessment and comparative analysis indicate that Mahiyan burial practices closely resemble those found in Iron Age cemeteries throughout the Caspian Sea Basin, the Central Plateau of Iran, and the Sumbar Valley in Turkmenistan. In total, seven pottery vessels and two metal artifacts were recovered. These artifacts correspond closely to finds from the early phases of the Marlik cemetery, the Jamshidabad and Qeytariyeh cemeteries, as well as Cemetery 1 of Sumbar and Parkhai 2 in Turkmenistan. All these sites date to the Late Bronze Age through Iron I (circa 1500–1300 BC).

**Keywords:** Mahiyan Site, Gorgan Region, Iron Age I, Burial.

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## Introduction

The archaeological record regarding the onset of the Iron Age in the Gorgan region is extremely limited. Existing data are confined to the later Iron II and III periods. Investigations to date have primarily focused on the plains and on either antecedent or subsequent periods, and mountainous zones in particular remained largely neglected. A joint survey and test-excavation program was conducted in July 2011 by the Iranian Center for Archaeological Research, the Research Institute of Cultural Heritage and Tourism and the General Directorate of Cultural Heritage and Tourism of Golestan Province. This intervention aimed at determining the core zone and propose a protective boundary for the Mahiyan site[1], following an enquiry from private landowners within its approximate buffer zone (Nokandeh, 2012: 450). Within this program, five test pits were excavated on the private land in the immediate vicinity of the site.

The salvage excavation of the Mahiyan site led to the discovery of a grave containing a human burial and associated grave goods from the beginning of the Iron Age. This discovery is significant in its own right and represents the first such find from this geographical area. The findings from this excavation provide new evidence for the beginning of the Iron Age in the mountainous regions of Gorgan and offer information, albeit limited, concerning cultural changes from the end of the Bronze Age to the onset of the Iron Age.

This research was conducted with the aim of achieving a better understanding of the onset of the Iron Age in the mountainous regions of Gorgan and examining the cultural characteristics of this period, based on the new discoveries from the Mahiyan cemetery. The primary objectives of this study are: 1) to investigate the cultural and funerary characteristics of the Early Iron Age at the Mahiyan site in the Gorgan region; 2) to compare the findings from the Mahiyan site with those from other contemporaneous sites within the Caspian Sea Basin and the Iranian Central Plateau.

This research seeks to address the following questions: 1) What cultural and funerary characteristics can be identified at the Mahiyan cemetery in Aliabad-e Katul, located in the mountainous region of Gorgan? 2) What similarities and differences exist between the findings from this site and other contemporaneous cemeteries in the Caspian Sea region and the Iranian Central Plateau?

In line with the proposed questions, the following hypotheses have been put forward: 1) The Mahiyan cemetery contains cultural and funerary features characteristic of the Late Bronze Age and the Early Iron Age in the northern regions of the Alborz Mountains and the Gorgan area; 2) This

cemetery likely shares cultural affinities with contemporaneous sites in the northeast, the western Alborz, and the Central Plateau.

Following the salvage excavation of the Mahiyan site and the precise documentation of archaeological findings, including burials, grave goods, and tomb structures, we analyzed the typology of the ceramic and metal objects unearthed, in comparison with similar finds from other contemporaneous archaeological sites within the Caspian Sea Basin, the Iranian Central Plateau, and Turkmenistan.

This study aims to present the findings from the Mahiyan cemetery, thereby contributing to an enhanced archaeological understanding of the beginning of the Iron Age in the mountainous region of Gorgan.

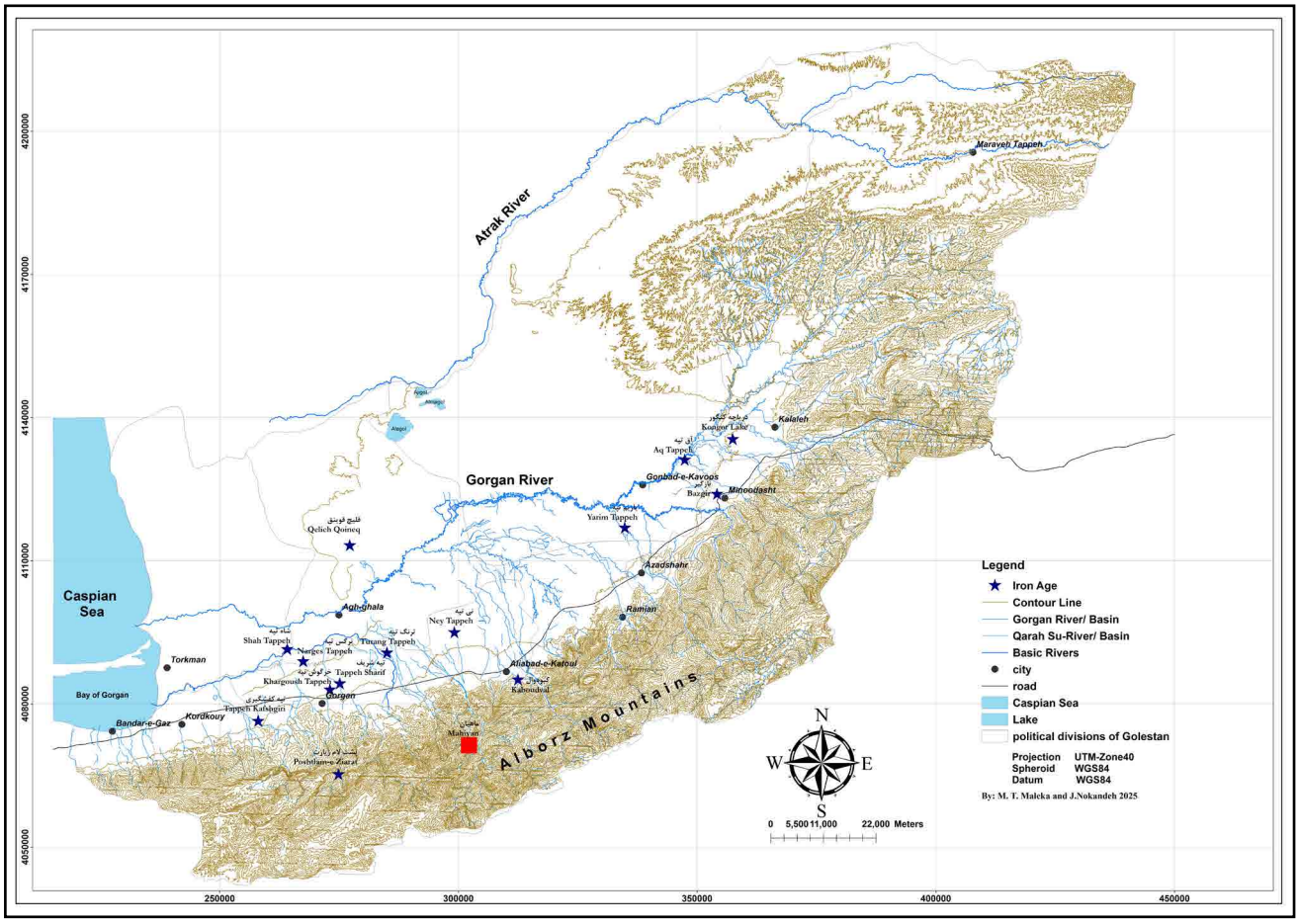
## Geographical Setting

The Gorgan region has been and remains one of the pivotal human habitats in the history of Iran. Geographically, the land of Gorgan is situated in the southeastern Caspian Sea area, and it is positioned between the steppes of Turkmenistan to the north and the eastern Alborz Mountain range to the south (Map 1). The Gorgan Plain was formed from alluvial fan deposits deriving from the Alborz Mountains, combined with sediments from the Gorgan River and deep accumulations of loess. The mountainous region of Gorgan encompasses a significant portion of the forest-covered Alborz range. The Hyrcanian forests are situated on the northern slopes of the Alborz Mountains, with the majority of early human settlements established on the forested foothills and along the southern periphery of the Gorgan Plain (Shumilovskikh et al., 2023; Hopper, 2017: 131; Wilkinson et al., 2013: 28-40).

Paleoclimatic research at Lake Kongor has provided new insights into the geomorphological sequence of the region. This research indicates climatic changes and the presence of an arid period between 5900 and 3900 years before present (Shumilovskikh et al., 2016).

## Research background

Archaeological research on the Gorgan Plain has a long history. The region was first surveyed and excavated by Jacques de Morgan during the reign of Naser al-Din Shah Qajar (De Morgan, 1896: 110). Among the significant sites explored, worth noting in particular are Yarim Tappeh near Gonbad-e Qabus (Crawford, 1963: 263-272) and Torang Tappeh near Gorgan (Deshayes, 1963, 1965; Mousavi, 2004), which have produced material remains not only from the Iron Age but also from the Neolithic through to the Islamic periods.

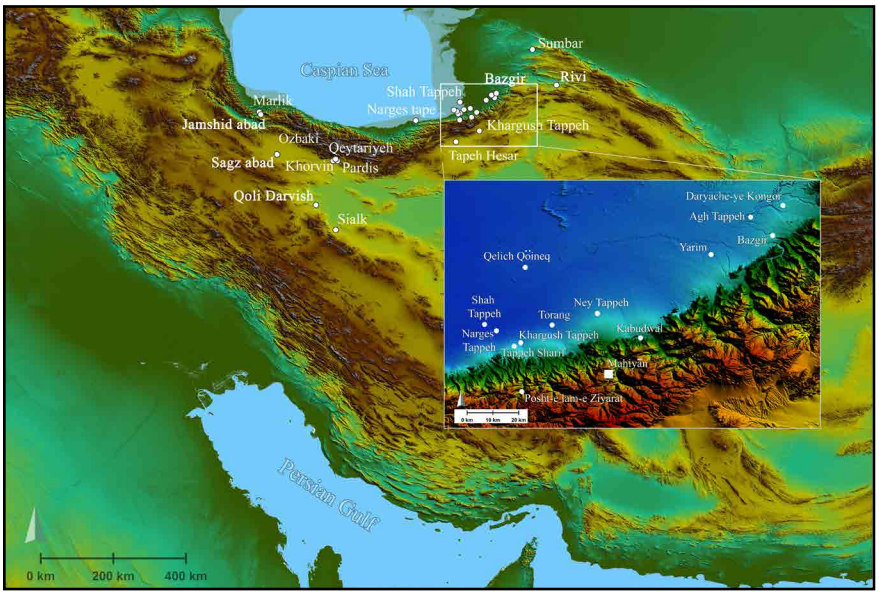



▲ **Map 1: Location of the Mahiyan site and other key Iron Age sites in the Gorgan Region (Maleka and Nokandeh, 2025).**

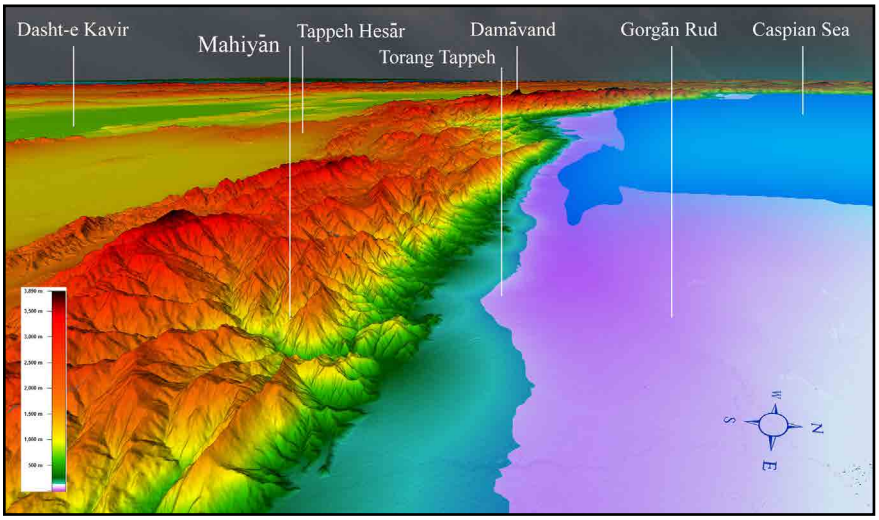
Several sites have yielded evidence from the Late Iron Age (the Late Iron II and Iron III periods). These include Aq Tappeh near Gonbad-e Qabus (Malek Shahmirzadi and Nokandeh, 2000: 55 and 69), Narges Tappeh in northwestern Gorgan (Abbasi, 2011), Qelich Qoineq near the Great Wall of Gorgan (Sauer et al., 2013: 407-418; Priestman 2013: 525-527), Tappeh Bazgir in Minudasht County (Nokandeh et al., 2006: 113-129; Abbasi, 2016: 35-37), Ney Tappeh to the north of Fazelabad (Jahed, 2021) and Sharif Tappeh near Gorgan (Rezaei, 2016). The Ziarat Collection (Alaheddin, 2015) and the Kabudval Collection (Mirmousavi and Nokandeh, 2017) represent two out-of-context assemblages from the Gorgan region that are attributed to the Iron Age (Map 2).

## The Site

The Mahiyan site is located in a village of the same name, situated approximately 14 kilometers south of Fazelabad, 16 kilometers southwest of Aliabad-e Katul, 34 kilometers southeast of Gorgan and 26 kilometers southeast of Torang Tappeh (Map 3).




**Map 2: Location of Mahiyan and the other contemporary sites discussed in the text (Rokni and Nokandeh, 2025). ▶**

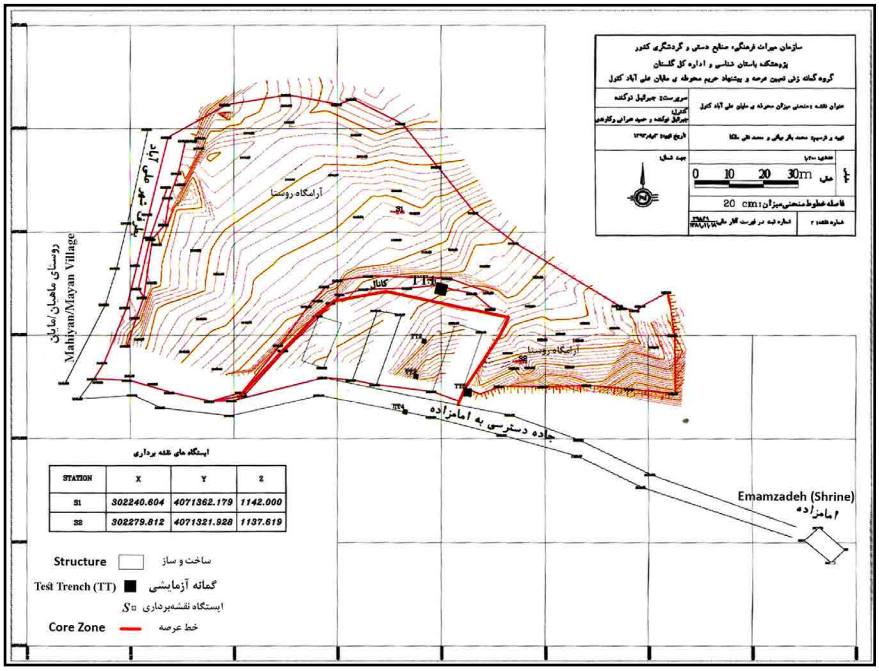



**Map 3: Aerial view of the Mahiyan site on the northern slope of the Alborz Mountains, facing the Caspian Sea (basemap: Google Earth; modified by Rokni and Nokandeh, 2025). ▶**

The Mahiyan site lies at an elevation of 1,133 meters above sea level in a forested mountainous (upland) area. It extends over an area of approximately one hectare (Map 4). In 2011, following a request from the landowners, a section of the site's perimeter was subjected to a test-pit survey under the direction of Jebrael Nokandeh. A total of five test pits were excavated during this project. Findings from one of these pits yielded new evidence pertaining to the Iron Age.

In addition to the Iron Age remains, surface evidence indicates the presence of an Islamic-period cemetery, featuring upright and box-shaped seated grave markers. This cemetery likely dates to the late medieval Islamic period and appears to have remained in use until recent times. Furthermore, surface surveys of the site have identified fragments of

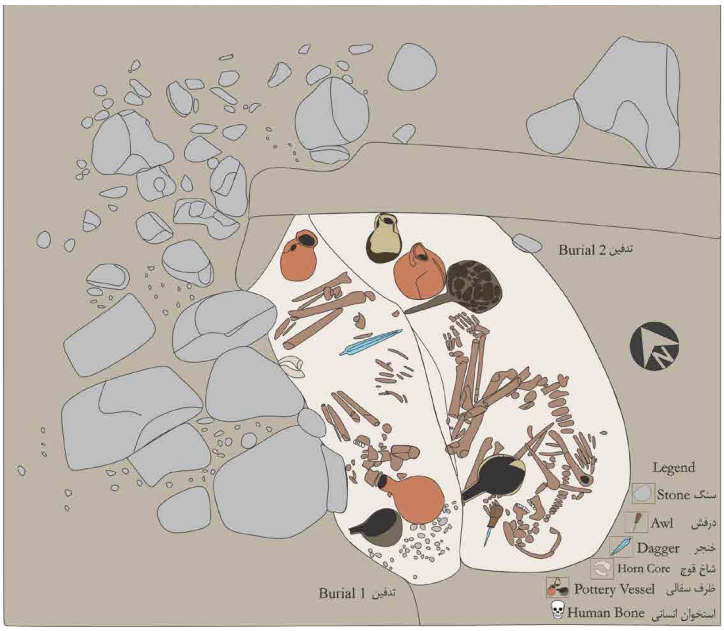
Islamic-era pottery, similar to ceramics known from the ancient city of Gorgan (Kiani, 1984).




◀ **Map 4: Topographic map of the Mahiyan site showing the location of test trenches (after Bayati et al., 2012).**

## The Mahiyan Cemetery and Burial Practices

In Test Trench No. 1, the remains of a grave containing two human burials accompanied by grave goods were discovered[2]. The first skeleton was interred approximately 80 to 90 centimeters below the modern ground surface, and the second skeleton at a depth of approximately 110 to 120 centimeters (Fig. 1).



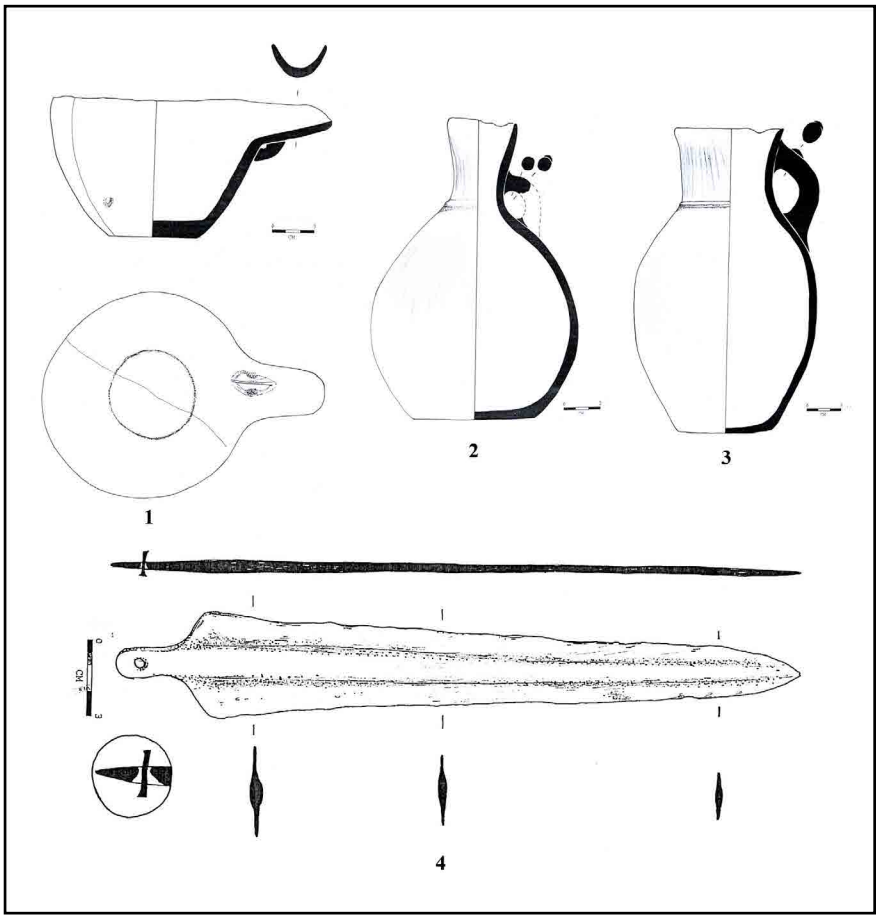

◀ **Fig. 1: Plan of Test Trench 1 with human burials (drawn by M. Madihi).**

The grave was in a burial pit whose walls were lined with unworked river cobbles set in a clay mortar. No evidence of a roof or covering for the grave was found. The remains of the western wall were visible to a height of 65 centimeters, comprising three courses of stone, the first of which was disturbed. It is likely that the grave originally had a rectangular plan, the northern, eastern, and southern walls of which have been destroyed due to illegal excavations.

Skeleton No. 1, Feature 104 (Excavation No. 1114): This skeleton was oriented north-south, lying on its left side with the face turned to the west. Due to weathering and moisture, the bones had suffered severe deterioration and damage, making them extremely fragile; however, the overall layout was recognizable. The arms were flexed and positioned in front of the face, and the legs were bent at the knees and drawn close to the abdomen. This burial posture is commonly described as flexed (or tightly flexed) (Fig. 2).


**Fig. 2: a) General view of Test Trench 1 and the grave structure containing Burials 1 and 2; b) Burial 2 after the removal of grave goods; c) In situ long-spouted grey ware jug and red jar from Burial 2, Mahiyan site (photographs by the author). ▶**

Skeleton No. 1 belongs to an adult individual with a robust build and heavy skeletal structure. Based on the robust skeletal morphology, prominent mastoid processes, pronounced frontal bone and brow ridges, muscular occipital bone, a femoral head with a very broad neck, and a femoral shaft of short length, this individual is identified as a male of relatively short stature. The age at death is estimated, based on available evidence, to between 45 and 50 years3. The grave goods associated with Skeleton No. 1 consist of: a tube spout bowl and a holemouth jar placed above the cranium, a tanged dagger located on the pelvis, a red-colored handled pitcher positioned beneath the feet (Fig. 3) and two ram horn cores placed opposite the knees. These horn cores were positioned beside the knees of the skeleton and to the west of the dagger. These two horn cores likely belong to a single individual of wild sheep. It appears that the base and tip of one of the horns may have been deliberately cut. The species of wild sheep that currently inhabits the Gorgan region (notably the Golestan National Park) is known as the Urial or eastern sheep (Ovis orientalis).




◄ **Fig. 3: Grave goods from Burial 1, Test Trench 1: 1) Open-spouted, grey ware bowl with a perforation beneath the spout; 2) Red ware holemouth jar with a vertical handle; 3) Red ware pitcher with a vertical handle; 4) Bronze tanged dagger with a wire rivet through the tang (drawn by Mohaddesh Mansouri Razi).**

The inclusion of animal remains, such as horns, can provide insights into funerary practices and the relationship between humans and animals in this region. The horns could have been utilized as tools or decorative objects, and their presence serves as evidence for the hunting of this animal for both subsistence and non-subsistence purposes (Fig. 2).

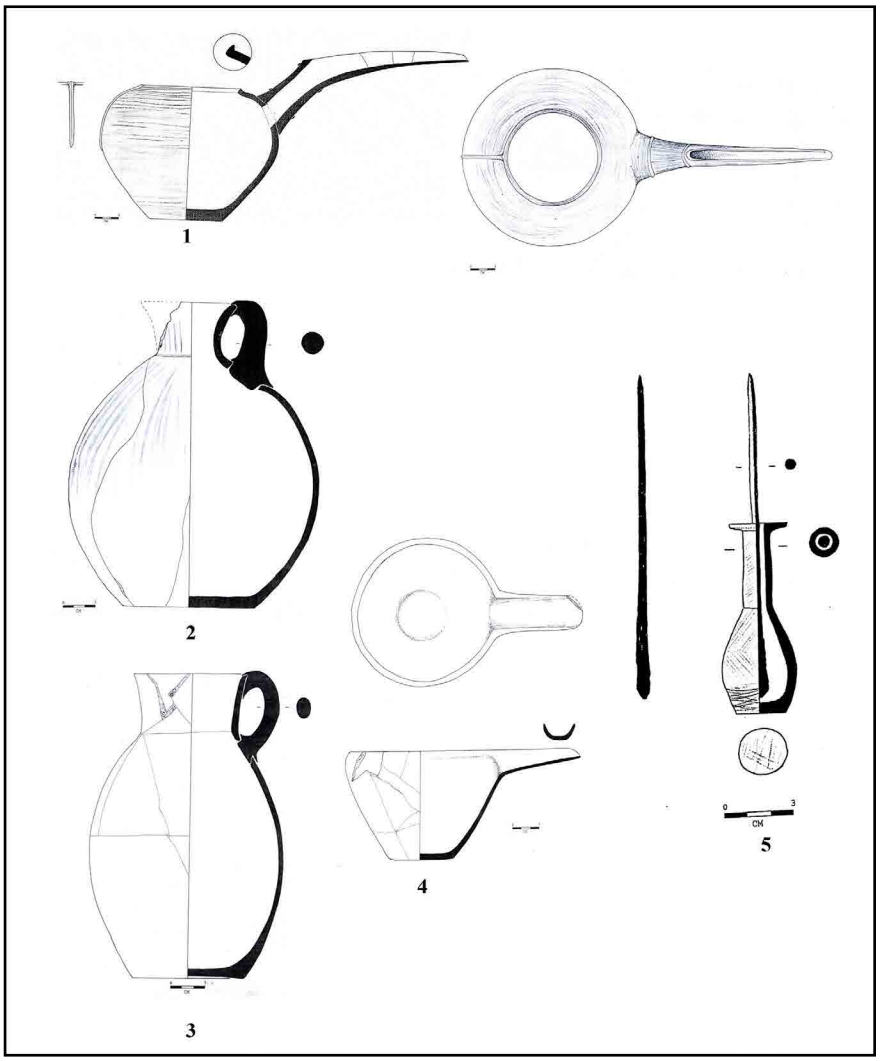
Skeleton No. 2, Feature 105 (Excavation No. 1125): Skeleton No. 2 was oriented north-south and laid on its left side, with the face turned to the west. The arms were flexed and positioned in front of the face, while the legs were bent at the knees and drawn close to the abdomen. This body was also placed in a flexed (fetal) position (Figs. 2b and 4).


**Fig. 4: Plan of Burial 2 at the Mahiyan site (drawn by M. Madihi). ▶**

The robust bone development and pronounced, muscular jaw indicates male sexual characteristics. The dentition shows fully developed third

molars, with evidence of significant and oblique dental wear. The cranial vault is of medium volume. Based on the available evidence, the individual's age at death is estimated to between 35 and 40 years.

The assemblage of grave goods associated with Skeleton No. 2 consists of: a bronze awl with ceramic handle, positioned in front of the forehead on a north-south axis, a tube spout bowl located between the chin, chest, and forearm and a grey bridgeless spouted pot , accompanied by two vessels—a red jar and a grey pitcher —placed beneath the feet of the deceased (Fig. 5).




◀**Fig. 5: Grave goods from Burial 2, Test Trench 1: 1) Grey ware bridgeless-spouted pot; 2) Red ware holemouth jar with a vertical handle; 3) Grey ware pitcher with a vertical handle; 4) Grey ware open-spouted bowl; 5) Bronze awl with a grey ware, burnished ceramic handle (drawn by Mohaddesh Mansouri Razi).**

## Ceramic Analysis: Typology and Comparative Dating

A total of seven ceramic vessels were discovered in the Mahiyan grave (Table 1). Three vessels are associated with Burial 1, and four are associated with Burial 2. Four vessels are grey in color, while three fall within the red to reddish-brown spectrum. All vessels are wheel-made, appearing to

have been produced primarily using a slow wheel (i.e., a slow rotational axis). Four vessels exhibit proper firing, while the remaining three show evidence of uneven or insufficient firing. The ceramic temper consists of fine sand and soft sand.

The exteriors of the vessels predominantly feature either a wash or a thick slip. Some are decorated with burnished patterns, a knob-like appliqué on the handles or a raised band on the necks of jugs and on pitchers at the junction of the body and neck, as well as around the spouts of the pots.

**Table 1: Detailed description of pottery vessels (Author, 2025).** ▶

| No. | ID | Description | Dimensions (in cm) | Remarks |
|---|---|---|---|---|
| 1 | 1112 | Tube spout bowl with an open mouth, grey on brown, wash slip, sand-tempered, insufficiently-fired, coarse ware, wheel-made, | H:9.6, Di of bottom: 6.8 Di of mouth: 15, Length with Di of mouth with tube spout: 20.1 | A hole beneath the tube spout |
| 2 | 1113 | Holemouth jar with vertical handle, brown on red color, red-slipped, sand- and mica-tempered, well-fired, fine ware, wheel-made | H:24, Di of bottom :10.5, Di of mouth :6.3 | Applied decoration on handle and applied band between body and neck |
| 3 | 1115 | Pitcher with a vertical handle, red on brown, wash slip and burnished pattern, sand-tempered, well-fired, fine ware, wheel-made | H:25.8 Di of bottom :9.5 Di of mouth :9.5 | Applied decoration on handle and applied band between body and neck |
| 4 | 1118 | Grey bridgeless spouted pot, grey slip, burnished pattern and two applied bands on spout, sand-tempered, reduced-fired, coarse ware, hand-made | H:17.2 Di of bottom :9.1 Di of mouth :15 | On the body of the vessel, a vertical band, resembling a column, runs prominently in the direction opposite to the vessel's spout, extending from the rim down to the bottom. The spout of the vessel has two forms, close and open shapes; the closed section connects to the body just beneath the rim, and there are also two applied bands on this closed section of the spout. Burnished patterns are visible on most parts of the body, especially on the spout. |
| 5 | 1117 | Holemouth jar with a vertical handle, red on brown color, slip and burnished pattern and applied band, sand-tempered, insufficiently-fired, medium ware, wheel-made | H:26.8 Di of bottom :11.7, Di of mouth :9.5 | Applied band between body and neck |
| 6 | 1116 | Pitcher with a vertical handle, grey color, wash slip, and burnished pattern, sand-tempered, reduced fired, medium ware, wheel-made | H:25.7 Di of bottom :9.7 Di of mouth :9.8 | |
| 7 | 1123 | Tube spout bowl with an open mouth, grey color, wash slip, sand-tempered, well-fired, fine ware, wheel-made | H:12.4 Di of bottom :7.3 Di of mouth :16 Length with tube spout: 25.5 | |

## Typological Characteristics and Relative Chronology of the Mahiyan Ceramic Vessels (Fig. 6)

Type 1: bridgeless spouted pot (Fig. 6 type 1): This pot features an open, trough-shaped spout horizontally attached to a cylindrical neck. A similar pot was recovered from Grave No. 17 at the Marlik cemetery (Negahban, 1996: 233, Fig. 25, 579 and Pl. 110: 579). According to the revised chronology of the Marlik cultural materials, Grave 17 is attributed to the early phase of the Old Marlik culture, dated circa 1500–1300 BC (Late Bronze Age) (Vahdati and Piller, 2018: 24–27 and Table 1; Piller, 2008: 215 and 237–8: Abb. 33).

This vessel form is comparable to a long-spouted, grey, globular-bodied jug from Grave 53 at Qeytariyeh, Tehran (Kambakhsh Fard, 1991: 56, Image 104, artifact no. 324 and 2045; Farrokhnia, 2020: 100, Table 1, type Q.G). The sole difference lies in the decorative appliqué. A similar Late Bronze Age jug was also discovered at Gohar Tappeh, Behshahr. The Gohar Tappeh example has a cylindrical body and three raised bands on the spout (Mahfrouzi and Piller, 2009: Figs. 6 and 8.4), whereas the Mahiyan jug has a globular body and two raised bands. A parallel form was also found in Grave 3 at the Jamshidabad cemetery, featuring raised bands on the vessel rim (Fallahian, 2020: 61–62, Figs. 3–27, 3–26, and 3–30). These vessels share a general structural similarity with the Mahiyan example, differing only in minor decorative details. Furthermore, this vessel type resembles jugs discovered in over 18 graves at the Sumbar cemetery (Chlopin, 1986: Abb. Va-b-c) and in Graves 1, 6, 7, and 11 at the Parkhai 2 cemetery (Chlopin, 1986: Abb. 105: 3, 107:6, 108: 2, 110: 11), which are dated to the Late Bronze Age.

Type 2: Tube spout bowl: This is a wide-mouthed vessel featuring an open, trough-shaped spout at the rim and a flat base. This variant lacks a handle (Fig. 6: Type 2a). In another subtype, instead of a handle, a small, perforated horizontal lug or knob is present at the junction of the spout and the vessel body (Fig. 6: Type 2b).

Type 3: Pitcher with a vertical handle: The rim diameter is approximately equal to the base diameter. The vessel has a flat base. In subtype 3a, a knob-like projection is present on the handle, and an applied, raised band encircles the junction of the neck and body (Fig. 6: Type 3).

Type 4: Holemouth jar with a round body: This vessel has a vertical handle. The rim diameter is less than the diameter of its flat base (Fig. 6: Type 4).

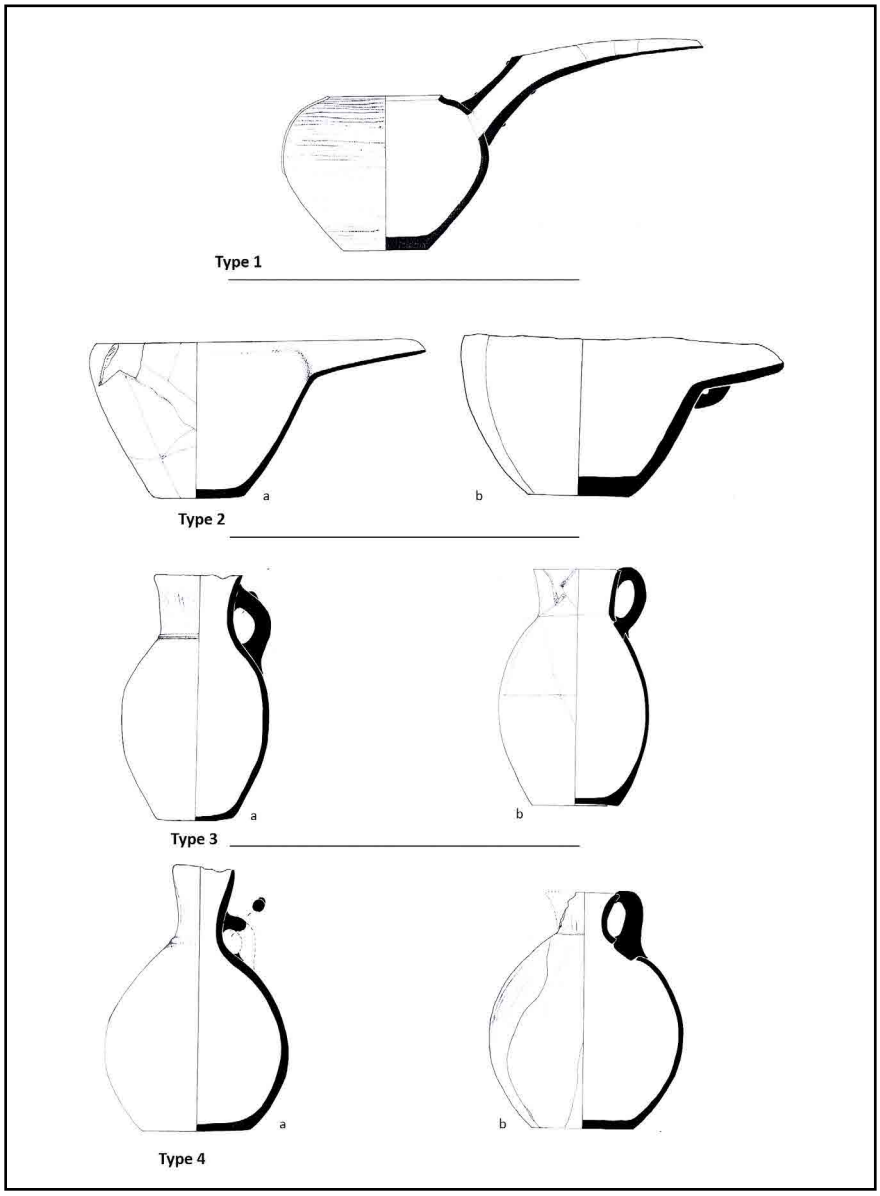
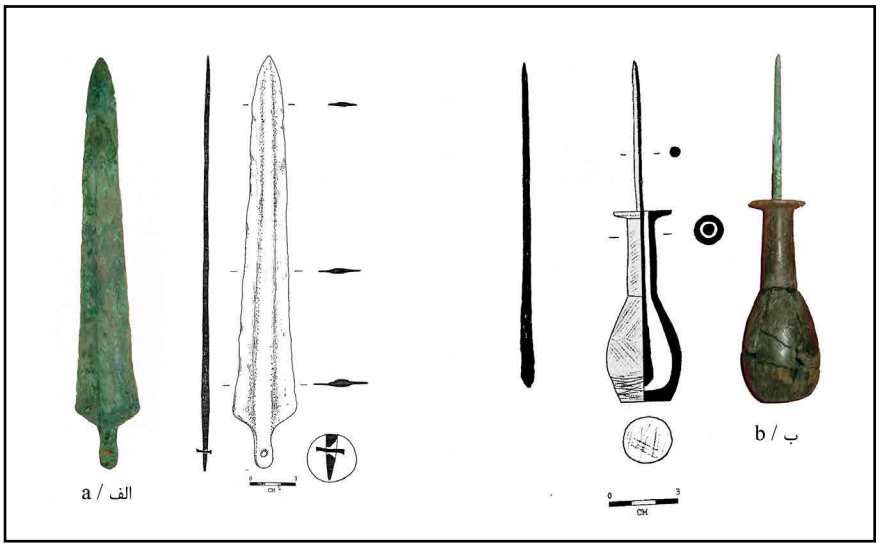



**Fig. 6: Principal ceramic vessel types (Author, 2025).** ▶

## Metal Objects

A single metal object was associated with each burial. A bronze tongue dagger was discovered on the pelvis of Skeleton No. 1 (Figs. 1, 2, 3 and 7a) while a bronze awl with ceramic handle was found with Skeleton No. 2 (Figs. 1, 2, 5 and 7b).

**The Bronze Dagger:** The dagger was manufactured using a bivalve casting technique. Both the hilt and the blade were subsequently worked via hot forging after being removed from the mold. Hammer marks are evident on the distal end of the hilt. This secondary forging was likely employed for two reasons: 1) The thinness of the hilt and blade sections would have made them difficult to cast successfully, as the low fluidity of




◄ **Fig. 7: Metal objects: a) Bronze tanged dagger; b) Bronze awl with ceramic handle (drawn by Mohaddesh Mansouri Razi).**

the molten metal increases the risk of incomplete mold filling in thin areas; 2) Forging increases the strength and structural integrity of the blade, enhancing its resistance to impact and stress.

A perforation was drilled into the hilt post-casting, probably for the attachment of a wooden handle. Following the hot forging of the blade, the final polishing was carried out. Use-wear is visible on the blade, including a bending of the cutting edge backward from impact. A central midrib runs the length of the blade from tip to base, serving to increase rigidity. This is a tanged dagger type.

Dimensions of the dagger are as follows: total length 26.4 cm; maximum blade width 4.1 cm, minimum width 3 mm; midrib thickness 4.05 mm, width 1.05 cm. The tang length is 2.5 cm, with a maximum width of 1.2 cm and a minimum of 1 cm. The rivet hole in the tang has a diameter of 3 mm. The surviving rivet is 9 mm long and 1 mm in diameter. The total weight of the dagger is 118 grams (Fig. 7a).

Radiography analysis on the dagger shows indications of spots and cavities in the form of dark spots, which were created as a result of variations in thickness and changes in density within the object. (Fig. 8b). Based on the results obtained from X-ray fluorescence (XRF) spectrometry (Fig. 8) conducted on the bronze dagger from Mahiyan, copper, at 53.4% (expressed as oxide), is the primary constituent element of the sample, as shown in Table 2. The presence of tin alongside copper indicates a bronze alloy. Typically, this alloy consists of approximately 90% copper and 10% tin (Bahramzadeh and Miri, 2014).

The presence of elements such as aluminum, sulfur, and other trace elements detected could be attributed either to the sample's prolonged

interaction with the burial environment or may originate from the primary ore (gangue). Sulfide compounds in bronze artifacts, resulting from impurities, are derived from the primary ore and remained in the metal due to incomplete extraction and refining processes. This is also related to copper's strong affinity for sulfur (Rezavizadeh and Vaghar, 2003). The presence of chlorine is likely due to chloride corrosion, which typically appears as a light green, powdery deposit on the sample.

Furthermore, X-ray diffraction (XRD) results indicate a significant presence of quartz, which aligns with the XRF findings and the detection of silicon. Quartz is a primary mineral found in soil and is a major component of many soil types with varying compositions. Illite, another identified mineral phase, belongs to the category of secondary minerals formed from the weathering of micas (biotite or muscovite). Another phase is albite, a sodium-rich variety from the alkali feldspar group (Emami, 2022: 182 and 208). All three of these phases are attributable to the burial soil and sediments adhering to the sample. No phases indicative of the object's original metallic structure or of copper and its alloy corrosion products were observed (Table 2; Fig. 8).

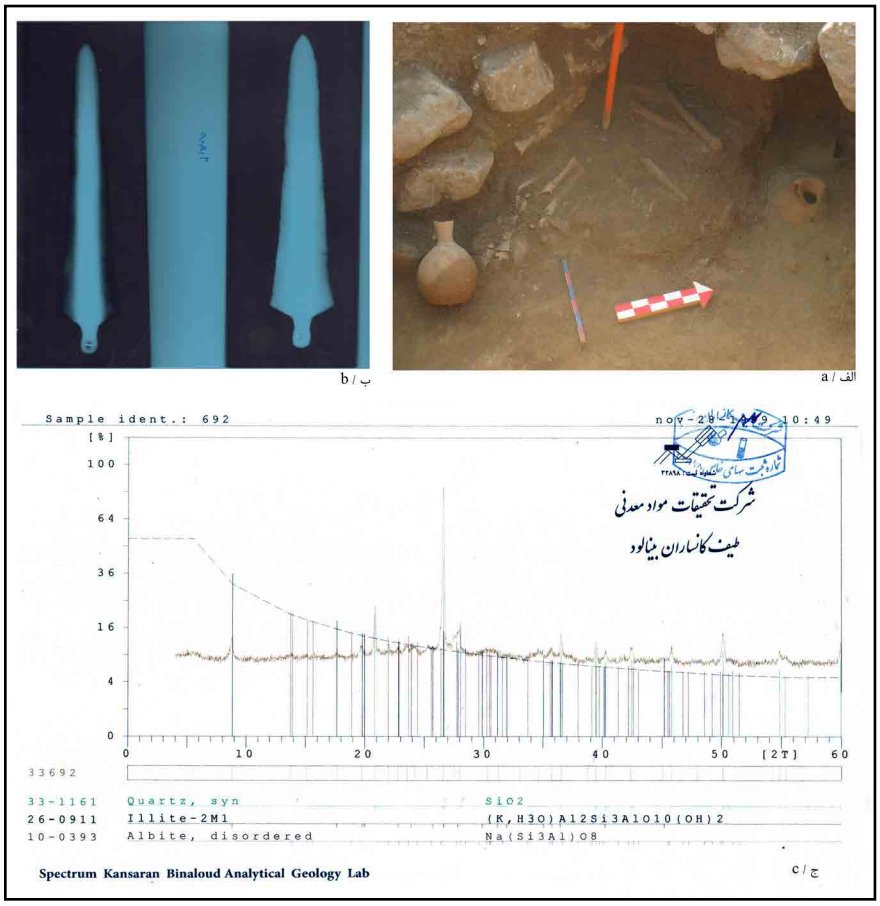



**Fig. 8: a) Bronze dagger in situ, Burial 1 (photograph by the author); b) Radiograph of the bronze dagger (Marziyeh Moslehi); c) X-ray diffraction (XRD) pattern of the bronze dagger, identifying mineralogical phases (analysis by Binalud Spectroscopy Mineral Research Company and Marziyeh Moslehi). ▶**

**Table 2: X-ray fluorescence (XRF) analysis of the bronze dagger from the Mahiyan site (Binalud Spectroscopy Mineral Research Company and Moslehi). ▼**

| P2O5 | Sio2 | Cao | Fe2O3 | Cuo | Sno2 | CI | A12o3 | K2O | Mgo | NA2O | s | pbo | Cr2o3 | Tio2 | Ag2O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| %19.40 | %8.90 | %5.20 | %4.60 | %53.40 | %1.30 | %1.19 | %1.04 | %1.00 | %0.95 | %0.83 | %0.65 | %0.15 | %0.12 | %0.09 | %0.03 |

Typologically, the Mahiyan dagger is comparable to tanged daggers from Jeyran Tappeh (Majidzadeh, 2010: Fig. 97, Pl. 2: 12), Qeytariyeh Tappeh (Kambakhsh Fard, 2001: 35, 37, 41, and 56; Kambakhsh Fard, 1991: 103, Fig. 10; Farrokhnia, 2020: 106), and the bronze dagger from Grave 12 at the Marlik cemetery (Negahban, 1995: 67, Pl. IX, Fig. 116; Piller, 2008: Taf. XII: 2). This grave at Marlik is attributed to the Old Marlik culture (15–13$^{th}$ centuries BC) (Vahdati and Piller, 2018: 24, Fig. 3 and Table 1; Piller, 2008: 213–237 and 238, Abb. 23). Furthermore, this dagger resembles the example discovered in Grave 133 at Cemetery 1 in Sumbar, Turkmenistan (Chlopin, 1986: Abb. 9: 10 and Abb. 85: 2).

One of the most common dagger types of the Iron Age features a tang at the base of the blade, which was inserted into the handle (Medvedskaya, 2005: 116). The use of this dagger type dates back to the Chalcolithic period, evidenced by examples from the Sialk III period at the Southern Tappeh of Sialk, Kashan (Nokandeh, 2010: Taf. 114) and the Middle and Late Plateau / Sialk III period at Tappeh Qabrestan, Qazvin (Majidzadeh, 2017: 61, Pl. 3-1). The use of such daggers continued through the Bronze and Iron Ages (Medvedskaya, 2004: 116). The Mahiyan dagger is consistent with this type (Medvedskaya, 2004: Fig. 12: 5).

**Bronze Awl:** The bronze awl (Excavation No. 1124) is fitted with a high-quality ceramic handle, properly fired to a greyish-brown color and bearing applied decoration (Fig. 2). The metal shaft appears green due to corrosion, suggesting it is made of copper or a copper-base alloy (bronze) and was manufactured by forging. The total length of the awl is 17.8 cm. The metal shaft is 13.2 cm long, and the ceramic handle is 8.2 cm in height. The upper diameter of the handle is 2.6 cm, and its central diameter is 3.6 cm. The use of metal (copper) awls with bone handles in Iran dates back to prehistoric times, as evidenced by examples from Tappeh Zagheh (Malek Shahmirzadi, 1977: 396) and Tappeh Qabrestan at Qazvin (Majidzadeh, 2017: Fig. 24c). This type of awl with a wooden handle continues to be used in traditional shoemaking today (Fig. 9).

## Discussion and Conclusion

Over a century of archaeological research in the Gorgan region has provided a diachronic overview from the Paleolithic to the late historical periods. As in other regions of Iran, this area exhibits both cultural

**Fig. 9: Modern shoemaking awl compared with the ancient bronze awl from Burial 2, Mahiyan site (photograph by the author).** ▶

continuity and disjuncture. The full publication of results from key sites such as Torang Tappeh (Mousavi, 2004) and Yarim Tappeh (Stronach, 1972), along with the archaeological map of the Gorgan Plain produced by Japanese expeditions, could potentially address some of these gaps in the record.

The comparatively clearer picture we have of the Bronze Age, Sasanian, and Islamic periods in Gorgan stems largely from systematic research conducted in the plains. Sufficient methodical surveys have yet to be carried out in the mountainous regions, highlands, and foothills.

As noted, many sites containing Bronze and Iron Age cultural materials feature highly diagnostic "pot"-type vessels (Mousavi, 1999: 174-178). Long-spouted vessels in the Gorgan region have their origins in the Bronze Age (e.g., Torang Tappeh, Tappeh Bazgir, Narges Tappeh, Shah Tappeh (Arne, 1945), and this ceramic tradition continued into the Iron Age. According to Kambakhsh Fard, similar pots in the Qeytariyeh cemetery were typically placed either above the head or below the feet of the skeleton (Kambakhsh Fard, 1991: 83). At Mahiyan, the pot was positioned beneath the feet of the skeleton.

Regarding the two burials discovered at Mahiyan, it can be stated that each burial was accompanied by a metal object, a spouted bowl, a pitcher, and a jar. In both cases, the spouted bowl was placed above the head of the burial. The bodies were aligned and buried back-to-back, facing west and laid on their left sides.

The new finds from Mahiyan, particularly the pot and dagger, correspond with the first type of spouted vessels from the Qeytariyeh cemetery, attributed to the Early Iron Age (Mousavi, 1999: 175, Fig. 1:4). Recent research at Qeytariyeh indicates a date between 1600 and 1500 BC (Farokhnia, 2020: 110).

Furthermore, these finds are analogous and comparable to those from the aforementioned first stage of the Marlik cemetery. The revised chronology and recent research at Marlik assign this layer to the Late Bronze Age, circa 1500–1300 BC (Vahdati and Piller, 2018: 24, Fig. 3, and Table 1; Piller, 2008: 213–237 and 238, Abb. 23).

This proposed chronology is earlier than the absolute dates established for Iron Age I at Yarim Tappeh and, more broadly, for the Gorgan region (Stronach, 1972: 23; Young, 1985: 376). Based on this comparative analysis, the Mahiyan site is attributed, provisionally and relatively, to Iron Age I. This attribution may be subject to revision following absolute dating. The excavated sites in the Gorgan region underscore its significance during the Iron Age.

The majority of published research on the Iron Age in this region pertains to the Iron II and III periods. Sites related to Iron Age I remain largely unexplored, unpublished, and shrouded in uncertainty. This raises a critical question: Did this region, similar to other eastern and central areas of Iran, experience a decline following the Bronze Age? Young also poses the question of where the populations of the Gorgan Plain went after the collapse of the Bronze Age cultures. He suggests that many likely remained in the region, but their archaeological traces have yet to be found. This gap could stem from two causes: either key sites have not been properly excavated, or these populations adopted a different subsistence strategy, such as pastoralism and nomadism (Young, 1985: 372).

The findings from the Mahiyan site indicate that evidence from the Late Bronze and Early Iron ages exists in the mountainous and piedmont zones. This suggests that if an environmental crisis, such as aridity, prompted lifestyle changes in the plains, settlements may have shifted to higher elevations. It is also highly probable that human populations inhabited these mountainous areas even before the Bronze and Iron Ages.

This research question can be addressed through a multi-method program, including a systematic archaeological survey of the Gorgan highlands, an examination of the spatial and functional relationship between cemeteries and habitation sites, and the integration of bioanthropological analyses with scientific techniques—such as stable isotope analysis of dental enamel—

alongside archaeozoological and archaeobotanical studies. Together, these approaches will refine our understanding of Iron Age cultural dynamics in the Gorgan region and clarify the nature of its interactions with adjacent areas.

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## Author Contribution

The author is solely responsible for the writing, analysis, and interpretation presented in the manuscript, "Reassessing the Iron Age in the region of Gorgan (southeast of the Caspian Sea): new evidence from the excavations at site of Mahiyan, Ali Abad-e Katul, in the eastern Alborz, Iran".

## Conflict of Interest

The author declares that there are no conflicts of interest. All sources have been duly cited in accordance with academic publication ethics.

## Endnotes

1. The archaeological fieldwork was conducted over ten days, commencing on July 11, 2011, to determine the core and buffer zone of the Mahiyan site (also locally pronounced "Mayan") and to investigate the prehistoric mound of Chino. The project was supervised by Jebrael Nokandeh (Nokandeh, 2011: 450) and jointly organized by the Iranian Center for Archaeological Research (ICAR), the Research Institute of Cultural Heritage and Tourism (RICHT), and the Cultural Heritage, Handicrafts, and Tourism Organization of Golestan Province (Nokandeh, 2012).

2. Test Trench No. 1 was initially excavated as a 1×1 meter unit. Following the removal of the surface layer, the identification of grave architecture necessitated the enlargement of the trench to a 3×3 meter square.

3. The physical anthropological analysis of the Mahiyan burial was conducted by Dr. Farzad Forouzanfar on May 10, 2012.

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# بازنگری عصر آهن در منطقهٔ گرگان (جنوب‌شرقی دریای کاسپی): نویافته‌های کاوش محوطهٔ ماهیان علی‌آباد کتول در البرز شرقی ایران

جبرئیل نوکنده[I]

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## چکیده

عصر آهن یکی از کم‌شناخته‌شده‌ترین دوره‌های باستان‌شناسی در منطقهٔ گرگان است. بیشتر پژوهش‌های منتشرشده از این عصر، مربوط به دورهٔ آهن II و III است که در بافت گورستانی شناسایی شده‌اند. آگاهی ما دربارهٔ شروع این عصر، بسیار محدود است و پژوهش‌های باستان‌شناسی در منطقه بیشتر بر دوره‌های کهن‌تر و جدیدتر در بخش جلگه‌ای متمرکز بوده است. پژوهش‌های هدفمند باستان‌شناسی در منطقهٔ کوهستانی تاکنون صورت نگرفته است. طی گمانه‌زنی به‌منظور تعیین عرصه و پیشنهاد حریم محوطهٔ ماهیان در منطقهٔ کوهستانی علی‌آباد کتول در استان گلستان، بقایای یک ساختار گور با دو تدفین انسانی و گورآوندها شناسایی شد. این پژوهش تلاش می‌کند به معرفی نویافته‌های گورستان ماهیان بپردازد تا آگاهی‌های باستان‌شناسی از شروع عصر آهن منطقه، به‌ویژه مناطق کوهستانی، افزایش یابد. پرسش اصلی این پژوهش این است که، چه ویژگی‌های فرهنگی و تدفینی در محوطهٔ ماهیان قابل شناسایی است؟ و چه شباهت‌ها و تفاوت‌هایی در فرهنگ مادی این محوطه با دیگر گورستان‌های هم‌دوره در مناطق همجوار وجود دارد؟ فرضیه‌های مطروحه عبارتند از این‌که گورستان ماهیان دربردارندهٔ ویژگی‌های فرهنگی و تدفینی اواخر عصر مفرغ و اوایل عصر آهن در نواحی شمالی رشته‌کوه البرز است و این گورستان احتمالاً اشتراکات فرهنگی با محوطه‌های هم‌زمان در شمال‌شرق، غرب البرز و فلات مرکزی دارد. اطلاعات گردآوری شده از گمانه‌زنی، با روش توصیفی-تحلیلی بررسی شدند. درنتیجه گونه‌شناسی یافته‌ها و انجام مطالعات تطبیقی، مشخص شد که شیوهٔ تدفین در ماهیان، مشابه دیگر گورستان‌های عصر آهن حوضهٔ دریای کاسپی و فلات مرکزی ایران و درهٔ سومبار ترکمنستان است. درمجموع، هفت ظرف سفالی و دو شئ فلزی کشف شدن که قابل‌مقایسه با یافته‌های مرحلهٔ اول تپه مارلیک، گورستان جمشیدآباد رودبار گیلان، گورستان قیطریه و گورستان ۱ سومبار و پرخای ۲ ترکمنستان هستند. این گورستان‌ها همگی به دورهٔ مفرغ جدید و آهن I (حدود ۱۵۰۰ تا ۱۳۰۰ پ.م.) تاریخ‌گذاری شده‌اند.

**کلیدواژگان:** محوطهٔ ماهیان، منطقهٔ گرگان، دورهٔ آهن I، تدفین.

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