# تحلیل فنی ـ گونه‌شناسی
# تیزه‌های سنگی برگی شکل دوره مفرغ از شمال شرق ایران

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**چکیده**

این مقاله بر گاهنگاری بر اساس گونه‌شناسی تیزه‌های پرتابه دو رویه تپه حصار (دامغان، استان سمنان) و ملیان (انشان، استان فارس) متمرکز شده است. فهرست و مشخصات پرتابه‌ها ابتدا شرح داده شده و سپس در چشم‌انداز کلی پراکنش تیزه‌های پرتابی ایران از اواخر هزاره چهارم تا اوایل هزاره دوم پیش‌ازمیلاد بررسی می‌شود. تعیین ویژگی‌های متمایز فناوری که روش‌های مختلف ساخت را نشان می‌دهد (توالی عملکردی) که حداقل دو موج نوآوری فنی در تیزه‌های پرتابی دیده می‌شود که ممکن است مرتبط با تغییرات مشابه در شمال بین‌النهرین باشد. حداقل دو موج عمده از نوآوری فن‌آوری در نقاط پرتابه سنگی را نشان می‌دهد که ممکن است با پیشرفت‌های مشابه در بین‌النهرین شمالی مرتبط باشد.

**واژگان کلیدی:** دست‌تراش سنگی، دو وجهی، سرپیکان، دوره مفرغ.

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# Foliate lithic points from the Bronze Age of NE Iran,
# A techno-typological analysis

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**Abstract**

This paper is focused on the typo-chronological determination of the bifacial projectile points from Tappe Hissar (Damghan, Semnan Province) and Malyan (Anshan, Fars Province). The inventories of projectiles are firstly described and published, and set into a comprehensive picture of occurrences and distribution of projectile points in Iran from the late 4th millennium to early 2nd millennium BCE. The determination of distinctive technological attributes that distinguish different methods of manufacture (respectively the general chaîneopératoire) indicate at least two major waves of technological innovation in lithic projectile points that may be related to similar developments in Northern Mesopotamia..

**Keywords:** lithic, bifacials, arrow heads, Bronze Age.

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**Introduction**

This paper focuses the typo-chronological determination of the bifacial points of Tappe Hissar (Damghan, Semnan Province) and Malyan (Anshan, Fars Province) that are stored in the National Museum of Iran in Tehran[1]. The larger inventory stems from Tappe Hissar, while the collection from Malyan is limited on 31 pieces. As concerns the context or settlement layer the artefacts were found, unfortunately no detailed stratigraphical information is accessible for the presented collections from the old excavations, except general periodization or datings.

Additional information such as technological variations or raw materials were adopted through the author's research on the general development of lithic industries in Iran and adjacent regions, such as SE-Anatolia, Southern Caucasus and Northern Mesopotamia (Thomalsky, in press a & b).

**Observations on technological and typological attributes**

Bifacial foliates from the several lithic inventories in Iran can basically be differed into two major types:

A) Bifacial lanceolate to leaf-shaped projectile points, sometimes with a slight convex basis or shouldered haft, and

B) Lozenge points, again with different size categories. Asymmetrical points show lower (basal) elongated parts for hafting.

To determine as being associated with the foliate bifacials in a wider geographical and chronological context is a third group of bifacial worked projectiles that in contrast show thicker intersections and thus exhibit a clear different chaîne opératoire. Indeed, the flat foliate projectiles were made from appropriate flat but broad flakes that stand in the tradition of the tabular or bifacial technology of the chalcolithic period in the Upper Euphrates region and far beyond (Thomalsky 2012). For Iran, the bifacial technology seems not to be common in the earlier lithic tradition (since microbladelet and bladelet industries with geometric points are dominating the neolithic and chalcolithic periods), and thus can be regard as an innovative element in the lithic industries (see below). This is equally to state for the third group of points, the

C) Bifacial or uni-facial retouched triangular points with short wings and a short tang.

While the first two types (A & B) are equitable with the type "Tell Brak", the latter – type C - is synonymous to the type "Lidar/ Tepecik". Both were firstly determined within the collections of Norşuntepe and others in the Upper Euphrates region[2]. In fact, A & B should be differed typologically, since a larger compound of the lozenge type B is clearly representing a specialized shouldered arrowhead with a distinctive flight quality, assignable to the bow-and-arrow technology. Contrary, this attribute is not clearly to assign to the Tell Brak points, since they seem to be used in different conditions such as the inventories in Sukhte and Shahdad (see below). This assumption can be further underlined by the general larger sizes of type A. The points "Tell Brak" can be differed in two categories of sizes, the larger ones may have served as javelin/spearhead or dagger, while the smaller ones can be regarded as true projectile points, utilized with the bow. Moreover, and again with focus on the technological attributes, the general lanceolate outline of the Tell Brak type can be differed into three sub-types.

1) Narrow lanceolate (in different size (Length) categories), common is a straight or slightly convexe basis

2) leaf-shape

3) leaf-shape of lanceolates with a delicately worked triangular haft; larger specimen can also be determined as javelins or daggers.

1. The author was kindly allowed by the directory of the National Museum of Iran to study several lithic collections of the archives of the Museum. At this point I also would like to express my grateful and deeply thanks to F. Biglari for his very kind support and effort to publish this paper, and the Museums staff for their generous help in all duties

2. For a definition and chronological and regional distribution of the types "Tell Brak", "Lidar" and "Tepecik" see Herling 1994:96-126; Herling2007; Schmidt 1996: 76 fig. 72.7-12; pl. 762, 767.

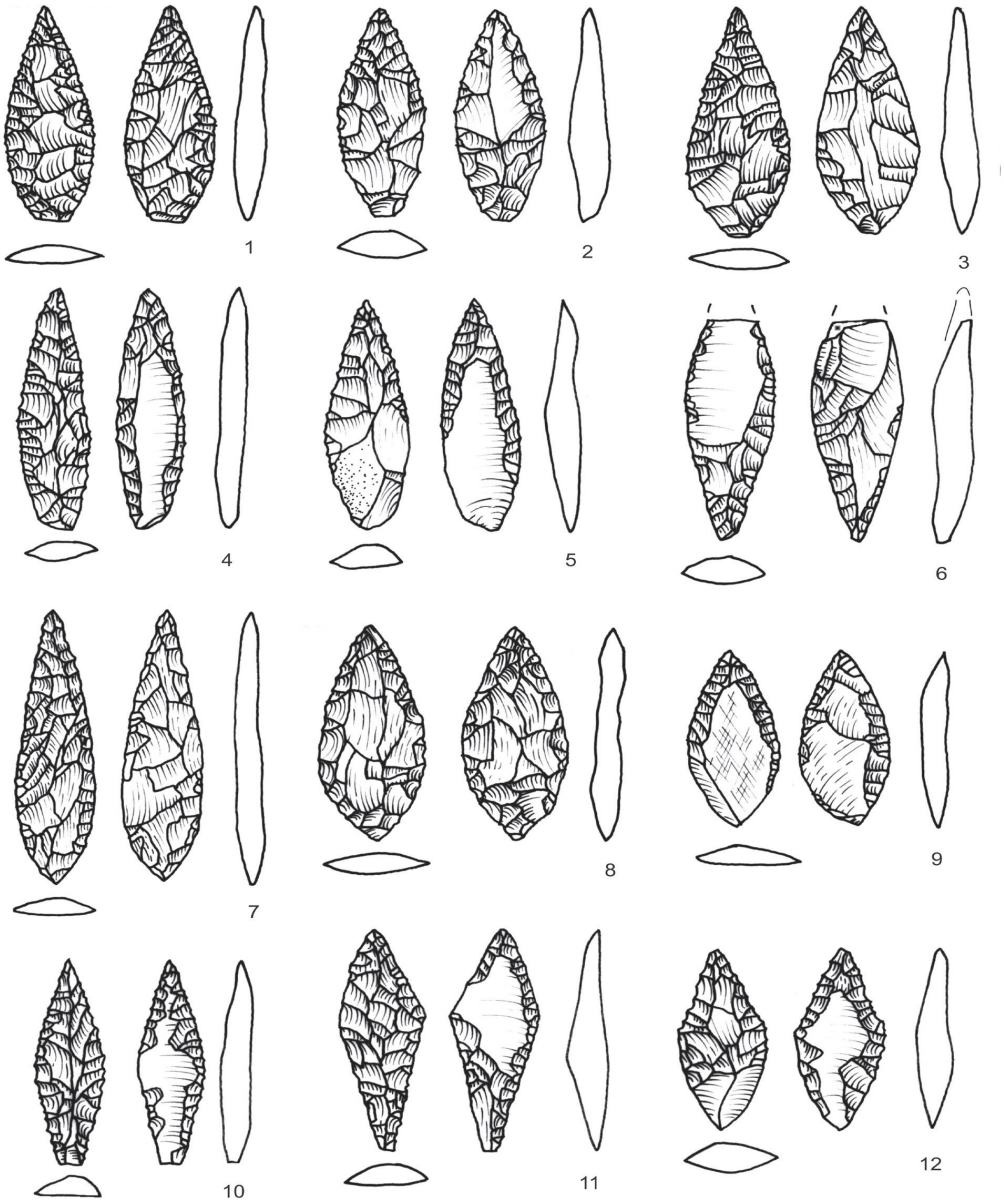


Fig. 1. Bifacial foliates from Tepe Hissar: 1-9 "Tell Brak" types A&B; 10-12: lozenge type C.

## The inventories

### *The Tepe Hissar collection (fig. 1-2)*

The herewith introduced bifacial points from Hissar stem from the investigations in Hissar of R.H. Dyson/M. Tosiin 1964, and remained unpublished until today except few descriptions by Rosenberg (1989) but without any illustrations or drawing. The total number is 37 that were found in the National Museums archive. Concerning the technological attributes, the Hissar points show a broad variety, as it is to describe as follows: They were worked from either flakes or blades, implying general differences in the manufacturing process that result from either different artisans or local workshops. Unfortunately, the total number is too small to discuss these technological differences with statistical value. However, further significant attributes are to identify in the intensity of the facial retouches that cover either the dorsal or the ventral face, and the kind of modification in general (whether invasive or edge retouching). All these divergent attributes that are to identify on the points inventory of Hissar Tepe suggest a high ratio of technological variability. The lanceolate Tell Brak types (type A) were bifacially flaked, but often the ventral side shows less inverse retouches. Few pieces still show remains of cortex on their


Fig. 2. Bifacial foliates from Tepe Hissar "Tell Brak" type.

dorsal face (Fig. 1:5; 2:5-6). The edges were delicately retouched and exhibit a fine denticular retouched, suggesting that they have not been uses so far – or as to see in fig. 2.9 - the pieces exhibit re-sharpening that implies their utilization as spearheads and not as arrows. Again, for the leaf-shaped variant (Fig. 1:8-9) one can distinguish two methods of manufacture: the complete facial retouching, and the point worked on a thin flake that exhibited already a leaf-shaped outline, so only minimal edge retouching was necessary (e.g. Fig. 1: 6, 9).

The lozenge type B is also represented in the Hissar inventory (Fig. 1:10-12). It seems that this type was more regularly manufactured in the same habit, since all pieces exhibit ventral unmodified faces but only edge retouches.

### *Gohar Tappeh (Gorgan Province)*

A very similar collection of bifacial projectiles comes from Gohar Tappe, north of the Alborzthat is dating already in the 2nd millennium BC[3]. However, primarily the short-tanged points with short wings of type Lidar/Tepecik were unearthed in the Bronze Age layers.

### *The Malyan collection (Fig. 3-4)*

The inventory of projectiles from Tal-e Mayan, mainly dated into the late 4/early 3rd millennium BC represents a rather broad type-spectrum. The major amount stems from the ABC area (Banesh phase).

The typology of the projectiles from Malyan is of a very heterogeneous range. Indeed, its composition appears as unique for the region. The most characteristic projectile in Malyan ABC (and from operation C) is the geometrical tranchet that is worked from fine, triangular flakes and were further deliberately (bifacial) flaked on both faces (Fig. 4). According the accessible documentation, these tranchet points stem mostly from layers of the 2nd millennium BCE. True foliate bifacials are represented with the types Tell Brak of both, the lanceolate shape – often with shouldered basal parts (Fig. 3:1-3) and the leaf-shaped variant (Fig. 3:4). Beyond the unpublished material, one dagger-like specimen with triangular shaped haft is noteworthy (Fig. 3. 2). Another piece (already published by Kardulias 2003 fig. 35C pl. 20a) shows a deliberately retouched dorsal surface while the ventral face is minimal modified along the edges, tip and base (Fig. 3:1b). Its base is slightly concave, and the shoulder and stem sharply worked.

A tanged lozenge-shaped point (Fig. 3:6) stems from the sounding H5, which is assigned to an early Kaftari occupation (2nd millennium BCE). It appears as a transitional form between the Tell Brak points and the short-winged and tanged types "Lidar/Tepecik". The latter, short-tanged and winged triangular points (Fig. 3:7) and smaller lozenges (Fig. 3: 8) have thicker sections and were worked from adequate thick flakes. Their facial retouches appear much more rough and irregular, indicating a complete different habit of manufacture of these projectiles in comparison to the accurate and carefully made "Tell Brak" points – or better "daggers".

Unique in the lithic collections in the National Museum of Iran is the presence of bifacial points type Niniveh (Fig. 3:9), that finds its major distribution in Northern Iraq around the reference site Niniveh in the Akkadian settlements of the mid-3rd tolate 3rd millennium BCE. Assuming, there is a considerably broad range of projectile points found in Malyan ABC and from the still unpublished operations

3. Pers. comm. A. Mahfrouzi.

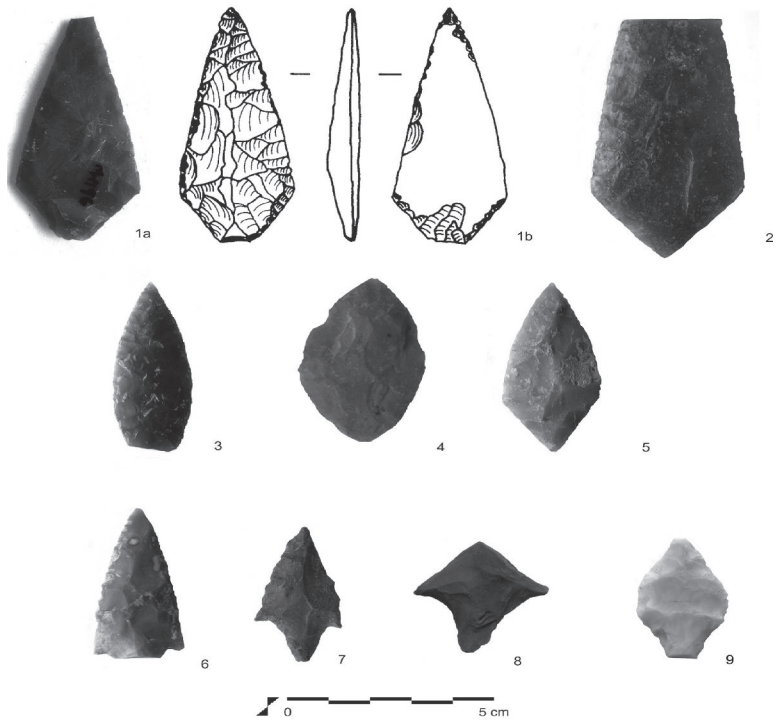


Fig. 3. Bifacial points from Malyan ABC and operation D (Iran National Museum collection, photo Thomalsky/DAI). No. 1-4: bifacial points Type A&B, no. 5: type C; no. 6,8: points Type Lidar/Tepecik; no.7: lozenge/dragon-shaped variant; no. 9: Niniveh point (?)

in the 1970ies that indicate a certain degree of imports through distinctive attacks or through interrelations of the inhabitants of Malyan.

We cannot solve this question until the older documentation and reports of the investigations in Malyan are not accessible anymore. However, a cluster of flakes and other production debris with in total 170 kg lithic artefacts was unearthed in trench EED, in a middel-elamite courtyard and can be interpreted as a workshop area (Carter and Stolper 1976:37). Beyond these remains, several pieces of unfinished worked projectiles type Tell Brak were found as well.

### *Yahya (Kerman)*

In the Tappe Yahya sequence, projectile points and in particular the bifacial retouche pattern is lacking until Yahya period IVC completely. At least, bifacial foliates appear in the proto-elamiteYahya IVBA with singular pieces (in total 3; Piperno 1973 fig. 6 d-f[4]) of the longer lanceolate Tell Brak type (Thomalsky 2019).

4 Interestingly, the illustrated points from Yahya IVA fall into two sizes and thus two weight classes that imply different use technologies.

### *Shahr-e Sokhte and Jiroft (Kerman)*

An extraordinary large number of "Tell Brak" points (50% of all implements) are known from Shahr-e Sukhte, where apparently related chipping debris indicates an extensive production on-site (Salvatori and Vidale 1997; Sajjadi 2003a; 2003b). Such points are also known from Jiroft.

### *Others, singular pieces*

Singular bifacial points are known from the middle/neo-elamite layers of Tol-e Nurabad (Potts and Roustaei 2006:64) and the Kaftari level of Tal-e Nokhodi, in Fars Province (Goff 1964 fig. 8:5 pl. IIb). A set of three points of type Brak points, discovered near Kouhdasht, Luristan, may be add on the list of Bronze Age finds (Moradi 1389/2009). Interestingly, the pieces appear as unfinished rough-outs of projectiles, as the bifacial flaking pattern is not carried out completely but instead limited on the edges of the tools. However, one can identify larger more or less regular blade blanks that were used for producing these Brak points.

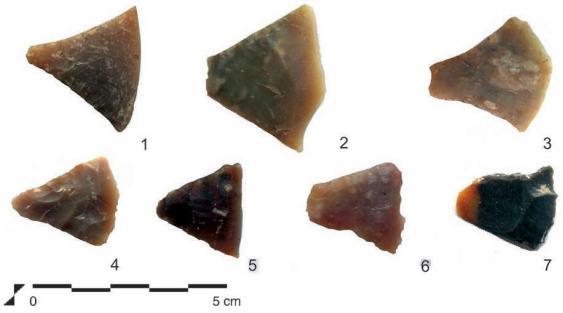


Fig. 4. Tranchets from Malyan ABC and operations H, D (Iran National Museum collection, photo Thomalsky/DAI).

Two pieces – made of obsidian – were recorded in Haftavan Tepe period IVB (Edwards 1983: 298-299 fig. 148:7-11) and Geoy D (Burton Brown 1951 fig. 44: 18) in Western Azerbaijan Province dating to the 2nd millennium BC. It is thus highly possible, that one can regard the obsidian points as imports. Finally to mention here is a fragment of a facial retouched tool with a rhomboid out-line from the uppermost levels of Hajji Firuz[5] that can be reconstructed as a lanceolate tool with a shouldered haft(dagger or javelin).

**Distribution patterns: chronology and geography**

Assuming, there are only two characteristic foliate bifacials to define – the triangular to lanceolate type "Tell Brak" (types A&B) and the lozenge type C. Tell Brak" points can be found over a wide time span, from the Halaf period to the Bronze Age, and form a typologically very heterogeneous group. One can demonstrate a wide ranging geographical distribution area, from SE of Anatolia through the river valleys of the Euphrates and the Tigris, to the Mesopotamian lowland (Susa, UR, Uruk) (e.g. Speiser 1935 pl.38a:18, pl.81:2). The smaller, leaf-shaped type seems to be restricted to the proto-elamite period. They were further abundant in the sites east and Southeastern destert fringes, such as Sahr-e Sukhte (Sajjadi 2000/1380: 8,11,45) and Jiroft, but also further northeast in Turkmenistan (Altyn-Depe). All these assemblages in the east can be date into the later third and the second millennium BC. According to the finds west of the Zagros, in the Tigridian and Euphrates valleys (Thomalsky 2011 & 2019), the square-edged slot for the hafting appears as a morphologically later type as the straight or slight concave bases that were common during the late 4th/ earlier 3rd millennium BC. The lozenge type C that appears as a further development of the A type with its shouldered part, finds a similar distribution.

Considering their distribution pattern that focuses the Southern Caucasus and SE-Anatolian as the suggested core region, several scholars suggested a Trans-Caucasian origin that spread to the east along the Southern Caspian Sea shore to East Iran and Central Asia (Quenet 2008:160). In fact, the recently detected bifacial points of the Upper Euphrates region (e.g. in the Late Chalcolithic assemblages of Arşlantepe and in the Middle Uruk layers from Sheikh Hassan) are dating clearly earlier then the Caucasian pieces already into the mid-4th millennium BC (Thomalsky 2019; Thomalsky in press a).

Points of the "Lidar" and "Tepecik" types with short tang and wings occur particularly in NW of Iran in Haftavan VIC (WI017), GeoyTepe and in the Malyan collection of the Iran National Museum. It seems thus very possible that we can associate these pieces with their "hearthland" the lands of the Altinova and Malatya, where they occurred firstly made in obsidian. Singular pieces in NW Iran stem from 2nd millennium contexts that exhibit particularly Transcaucasian characteristics. The bifacial points from Gohar Tappeh in NE of Iran can be added to this list of the younger inventories.

**Summary and conclusion**

To understand the phenomenon of occurrences, techno-typology and distribution of projectile points – and the bifacial foliates in particular - in the 3rd millennium BCE in Iran, one should consider the foregoing developments in the lithic industries that can be summarized as follows:

In the mid-5th millennium BC, one can demonstrate a significant shift in number and

5. Voigt 1983 fig.111e. The piece stems from the collapsed and possibly re-used settlement layer A3 which makes a young dating for this tool, at least the 4th-3rd millennium BCE possible.

typo-technology of projectile points in Iran. The decrease of the formerly so characteristic geometric forms is to be interpreted as a change in subsistence pattern and the usage of bow-and-arrow, in two major issues: firstly, projectile points became uncommon in the agricultural communities; secondly, new method of hunting and the introduction of javelins – accompanied by the general shift in lithic technology that is more and more orientated to the large blade industry. A prominent temporal lack of arrowheads between the disappearance of the ancient shapes (chalcolithic geometrics) and the reappearance of projectiles in form of bifacial retouched types appears as a first stage of re-organization or phase of invention of new technologies that result in the appearance of completely new types. In fact, the earliest bifacials occur with the Malyan ABC inventory in the transitional 4-3rd millennium BC, where they appear as being locally produced.

The points of the type "Tell Brak" show a very heterogeneous distribution pattern in Iran, although - or - because their local production can clearly be evidenced. This is to confirm in their heterogeneity of the technological attributes that indicate several individual and local workshops. A geographical core area can be stated with the vast inventories from Shar-iShukhte and Jiroft, where their production and utilization seem to be directly associated with the water-lake situation[6]. Other specimens are known from TappeYahya, where they firstly occur in Period VIB.

Points of type "Lidar" and "Tepecik" appear throughout Iran at the transition from the 3rd to the 2nd millennium BCE.As some pieces are made from south-eastern Anatolian obsidian these can be regarded as possible imports from this region. A more detailed examination of all these collections in the future promises important information on the chronological position of the different types in Iran.

It is further interesting, what is missing in the Iranian context. The common projectiles type Niniveh that spread during the Early Dynastic and Akkadian period for example in Brak, Chagar Bazar and Nineveh (respectively the late 3rd mill. BC), seem not to reach the Iranian Plateau, except the single piece that rather appears as a local variant without wings.

Assuming, the current evidence of foliate bifacials in Iran demonstrates a limited technological adoption of projectiles and javelins (or daggers) that was highly possible transferred from the Upper Euphrates region and SE-Anatolia. At least two temporal sequences of technological transfer can be reconstructed: firstly the occurrence of the foliate bifacials including their complete new chaîne opératoire (thus to translate as an superior innovation in projectile points); and secondly, the distribution of the short-tanged and winged points type "Lidar/ Tepecik", apparently at the transition from the 3rd to the 2nd millennium, where we can found them already associated with comparable types in copper. Time span and distribution pattern further indicate a certain association with the occurrence of the Transcaucasian Bronze Age culture in Iran[7].

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6. This model was already noted by Sajjadi 2000/1380.

7. For archaeological definition and determination of the Kura Araxes in Iran see Piller 2012.

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