www.maajournal.com

*Mediterranean Archaeology and Archaeometry*
*Vol. 22, No 1, (2022), pp. 97-109*
*Open Access. Online & Print.*

**DOI: 10.5281/zenodo.6311418**

# ARCHAEOLOGICAL EVALUATION AND PROVENANCE ANALYSIS OF APOLLON'S TORSO IN SIVAS ARCHAEOLOGICAL MUSEUM

**Erdener Pehlivan**

*Department of Archaeology, Faculty of Letter, Sivas Cumhuriyet University, Sivas, Turkey*
*(erdenerpehlivan@cumhuriyet.edu.tr)*

**Received: 21/01/2022**
**Accepted: 26/02/2022**

## ABSTRACT

The subject of this study is the torso of Apollon in the Sivas Archaeological Museum. This study aims to make an archaeological assessment of the artifact and to find answers to questions about its origin by performing archaeometric analysis with the p-XRF device. The data obtained by this analysis were compared with the literature sources concerning for ancient marble quarries. It was argued that the work had artistic characteristics of sculpturing statues of 160-270 AD and is thus dated to the Late Roman Period. The hypothesis that the work may be stylistically related to Dokimeion has been proven that the raw material of work in question belongs to a marble bed stretching between Vakıf Neighborhood in the Tavas district of Denizli province and the Goktepe Neighborhood of Menteşe District of Mugla Province. As a result, the sculptured marble of Apollon was taken from a raw material source other than Dokimeion during the period when the Dokimeion workshop was active and processed by masters/sculptors and used in necropolises of the ancient world.

**KEYWORDS**: marble quarries, Apollon, sarcophagus, p-XRF, provenance analysis

## 1. INTRODUCTION

Apollon's torso, which is the subject of this study, is now located in the Sivas Archaeological Museum. It is recorded that the artifact was brought to Sivas High School in August 1927. However, before that, it is not known exactly where and how the work was brought in (Archive of the Sivas Museum Directorate). The work has been preserved here for a long time and has been located in the museum with the refunctioning of the Industrial School as the Sivas Archaeological Museum (Pehlivan, 2021; Bulut, 2019; Pürlü et al., 2011; Denizli, 1998).

When the artifact is examined, it is seen that it is carved from white marble with fine grains. It is seen that the head, arms, and legs do not reach the present day. The right arm of the artifact is broken at the level of the biceps. The left arm is presented as wrapped in ephaptis/chlamys, bent at the elbow. It is seen that the arm is broken after the elbow. A very small part of the neck part of the artifact in the body junction has survived to the present day. Both legs of the statue were broken at groin level. A flat floor is seen in the part below the right arm of the artifact. A quiver strap extends over the chest from right shoulder to left waistline. The back of the artifact is also carved flat. The artifact was not considered an independent sculpture as a result of the initial observation. It is seen that it is a plastic art product made as high relief. The work is 51 cm high and 40 cm wide. The height of the relief is 31 cm.

The aim of the study is to bring the work in question to literature through archaeological evaluation and archaeometric analysis. In this context, p-XRF method, which is one of the analysis methods, was used as explained in the material method section. This method has been used in many different fields so far (Shqiarat et al. 2019; Di Bella et al. 2020; Korkanç et al. 2018; Liritzis et al. 2020). Spectroscopic methods support the hypotheses regarding the accuracy of the data generated in the archaeological area (Liritzis, et al. 2020). This study is an important study in terms of presenting the Sr values along with the Mn and Fe values which are examined together.

## 2. MATERIALS AND METHODS

Evaluation methods belonging to two different disciplines were applied to the artifact discussed within the scope of the article. The work was first subjected to a typological analysis by associating it with sculpture types with similar characteristics in the archaeological perspective. This stage includes steps such as analogic comparisons and the style critique method. While applying this method, the statues of Apollon, which were the subject of mythologies with similar iconographic features, were used as a comparison element. With this approach, it was possible to answer the questions of the workshop to which the work is related and its dating.

After this stage, the elemental structure of the artifact was analyzed with the portable – XRF device. Then, the comparison was made with the samples taken from ancient marble quarries in Anatolia for provenance analysis studies. The P-XRF method whose reliability and validity has been proved and has been used in some recent archaeological studies (Shqiarat et al. 2019; Di Bella et al. 2020; Korkanç et al. 2018).

## 3. RESULTS AND DISCUSS

In this section of the article, archaeological evaluation was made in the first stage. First of all, the Archer God of Apollo was emphasized and the reason why the work in the Sivas Museum was associated with Apollo. In this study, style critique method was used for dating.

Under the heading Archaeometric analysis, the numerical data obtained were extensively examined. Thanks to the elemental analysis studies carried out here, Sr, Mn, Fe values were examined and marble deposit suggestions were made for the origin of the work.

### *3.1 APOLLON MARBLE STATUES ANALOGICAL COMPARISON*

Apollon comes across as the personification of male beauty. God Apollon is the personified version of diseases, epidemics, medicine, music, prophecy, and, most importantly, archery (Hamilton, 1942; Howatson, 2013). For this reason, it is seen that many depictions of Apollon in vase painting and sculpture art are created with arrows, bows, and quivers (Grimal, 1997).

This section will focus on the types of God's statues and their depictions associated with archery. In addition, apart from Apollon, different types of sculptures bearing markers associated with archery will also be examined. In this context, Apollon depictions are encountered since the 7th century BC. It is possible to say that Apollon is a mythological character, often depicted naked (Carpenter, 2002). However, apart from the types of Apollon's sculptures, other sculptures with similar stylistic characteristics will be examined.

Apollon Amyklaios; the statue is considered one of the earliest sculptures of God with bow and arrow (Pausanias, Vol. 3.III.XVIII., 353). The statue did not reach the present day in one piece. However, Pausanias states that the height of the statue is 13 m and adds that it is depicted with a bow and arrow (Pausanias, Vol. 3.III.XVIII., 353). The discovery of a large helmeted head in the excavations carried out in

Amyklai in recent years is at a level that can provide evidence for the reports of Pausanias (Karaosmanoğlu, 2005; Durukan, 2020). The work, called the Apollon of Mantiklos, dates back to the early 7th century BC (Lullies, 1956; Fuchs, 1969; LIMC II. 1-2, 194, Apollon, Nr. 40). The work is a 20 cm high bronze figurine. On the legs of the work, there is the inscription "Mantiklos presented me to the God with the silver arrow. Phoibos, do me a nice favor on my return" (Boardman 2001). The inclusion of the phrase silver-arrowed God on the work, confirming God's myths, can be considered concrete archaeological data that refers to Apollon's mission associated with archery. The quiver and quiver belt cannot be seen in this work, which is considered among the early examples. When the epithet "philesios" of God is examined before Apollon Philesios, it is seen that this epithet is derived from the Latin word "phila" Greek word "philos" means "friendship, fellowship, peacefulness, kindness" (Çelgin, 2018). The work, which can be identified thanks to a bronze replica found at the British Museum, is depicted holding a deer in its right hand. In his left hand, probably there was a bow that has not survived to the present day. It is depicted as the right leg being the carrier, left leg staying in front freely. When the body symmetry is examined, although it is not very dominant, the "S" form of the body draws attention when examined carefully (Durukan, 2020). Other works that can be considered concerning this work are the statues of Apollon exhibited as "Apollon of Pireaus" in the National Archaeological Museum of Naples, in the orchestra of the Miletos Theater, in the Archaeological Museum of Piraeus, and as "Apollon of Piombino" in the Paris Louvre Museum (Durukan, 2020). The posture of the carrier feet and hands differs in these works. However, it is seen that they present a composition associated with each other in general type. It is possible to say that the affectionate and peaceful aspect of Apollon is emphasized in the works produced in this type. When the type of sculpture named Apollon Kitharoidos is examined, it is seen that Apollon is depicted as playing Kithara. Based on the known examples when examining this type, it is seen that the work has long clothes and long hair. It is possible to say that the Apollon Kitharoidos type was encountered beginning from the 6th century BC. When this type of sculpture is examined in terms of its general physiognomic characteristics, its right arm extends over its head towards the kithara on its left. His left-hand holds the kithara on his left, which is attached to his body with a strap. The fact that his hair reaches his shoulders is also a characteristic of this type (Flashar, 1992; Şahin, 2000; Boardman, 2014). Usually, the left leg is free, bodyweight is on the right leg. An Apollon sculpture of this type is exhibited in the Istanbul Archeology Museum (Pasinli, 1989). It is possible to say that this type of sculpture has been encountered since the Classical period. Sculptors that can be associated with this type include Euphranor, Skopas, and Bryaxis (Dinç, 2015). When the work named Apollon Sauroktonos is examined, it is seen that it was defined by Plinius (Pliny, Vol. VI. Bk. XXXIV.4.19). In this statue, which is named in Turkish as Apollon catching a lizard, the scene of Apollon, who is depicted as a young man, catching a lizard on a tree stump which is placed as a carrier is depicted with an arrow in his hand (Charbonneaux, 1943). The left leg of the statue is free; the right leg is used as a carrier. There are numerous copies of the work with these compositional properties (Bieber, 1955). Apollon Belvedere is attributed to Leochares. God is depicted in a free posture with long legs and a small head. In addition, a sad expression is seen on the face of the work. These features appear as features that integrate with Leochares (Boysal, 1967). This work is known thanks to its copies in the Roman Period. One of its well-preserved examples is in the Vatican Museum (Boardman, 2014). This type of sculpture of the god, Apollon Cyrene, which has increased since the Hellenistic Period, generally shows effeminate features (Flashar, 1992). This type is also a personification of the young and beautiful male type in mythology (Smith, 2013). In this work, the 'S' curve of Apollon's body draws attention. Another work with similar features, which this work sets an example for, is the Tralleis Apollon sculpture (Flashar, 1992). Because of its form features and similarity, it is discussed under the title of Apollon Cyrene.

One of the examples with a similar stance and pose with the work that is the subject of the article is a Meleager sculpture on display at the Antikensammlung in Berlin. When the work in question is examined in terms of pose and posture characteristics, it is observed that the external oblique muscle in the right lumbar region is contracted, and on the contrary, the external oblique muscle in the left lumbar region is in a tense structure. When the general form and composition of the statue are examined, it is striking that the structure of the supports has similar characteristics with the Borghese sculpture of Agasias of Ephesus. For this reason, the work in question was dated to the 1st century BC (Kansteiner, 2007; Conze, 1891; Neudeckler, 1988; Stemmer, 1995; Heres, 1996; Heres et al, 1997).

Another torso of Apollon that can be evaluated similarly is a sculpture preserved in the Archaeological Museum of Cherchell, Algeria. When the posture and pose characteristics of this sculpture are examined, it is seen that its posture has become a little more strident than that of its Classic period copies. In addition, when the work is examined, it can be seen as a

long-haired statue of Apollon. It is noticed that the quiver or kithara strap extends from the right shoulder to the left groin. This work is dated to the second half of the 2nd century AD (Landwehr, 2000; Gauckler, 1895).

Another work with similar features is on display at the Civitavecchia Museum. In this sculpture, the strap of Apollon's quiver extending from his right shoulder to the lower right side of his abdomen is observed. The head of the sculpture is depicted slightly high, with messy hair. His right arm is broken at the shoulder. This artifact is a copy from the Late Flavian Period (LIMC II. 1-2, 194, Apollon, Nr. 59).

Another work that shows similar characteristics in terms of analogy is a work belonging to the Albertinum group from the Dresden State Art Collection. It is seen that Apollon is depicted in an archaistic style with a griffin. The quiver belt extends from the right shoulder to the lower abdomen of the left. This statue is also among the statues where Apollon is depicted with his quiver (Herrmann, 1925).

When another statue of Apollon from the British Museum is examined, the right external oblique muscle of the statue is depicted as contracted, and the left lumbar oblique muscle is depicted in a tense structure. This feature shows similar features with the Meleager sculpture evaluated above (Smith, 1904).

Another work with similar features is a sculpture on display at the Civico Archaeological Museum in Milan. The quiver strap extending from the right shoulder of the sculpture to the lower left part of its abdomen and the chlamys on the left shoulder draws attention. The lower part of Chlamys forms a balteus under the quiver belt. The work is dated to the 1st century AD (Camporini, 1979).

Another statue of Apollon, in the Kitharodios type depicted with a quiver strap, whose hair extends to the root of the neck, is located in the El Bayda Archaeological Museum in Libya. It was found in Leptis Magna of the African Proconsularis. It appears as a copy of the Hellenistic period original from Hadrian's period (Bartoccini, 1929; Manderscheid, 1981; Zanker, 1974, LIMC II. 1-2, 194, Apollon, Nr. 197).

***Figure 1. (a)Torso of Apollon (EPA, 2021), (b)Sarcophagus of Antiocheia Museum Detailed (EPA, 2021).***

The statue of Apollon Belvedere is exhibited in the Vatican Museum. As is known, the original of the work is dated to 330-320 BC. However, the work that has survived to the present day is a copy of Hadrian's period. In the work, the quiver belt extending from the right shoulder to cover the abdomen is seen. In addition, a chlamys wrapped around his neck and hanging from his left arm draws attention. He is depicted with his head turned to his left (Amelung, 1908; Andreae, 1998; Brunn - Bruckmann, 1902; Helbig, 1963; Himmelmann, 1998, Stemmer, 1995).

Another statue of Apollon with similar iconographic details is the statue of Apollon Lykeios. The right arm of this work is in an upright pose, and his

hand reaches towards the back of his neck. His left arm looks forward in a bent elbow pose. The work is dated to the second half of the 4th century BC and is in the Early Hellenistic sculpture group (Cagiano de Azevedo, 1951).

In addition, when the Antiochia Sarcophagus, which is currently on display in the Antakya Museum, is examined, the Apollon carving is seen in the middle of the front long face of the work. This situation has been evaluated with speculation that the owner of the sarcophagus may have a relationship with sports (Kocaman Sakin, 2018; Öğüş, 2003; Elderkin, 1939; Koch, 2001; Koch, 2010; Kılınç, 2000; Mc Cann, 1978; Vermeule, 2000). This sarcophagus is dated back to 265-270 AD thanks to the numismatic finds found inside (Kocaman Sakin, 2018; Bashar et al. 2017).

Apollon's depictions with bows and arrows appear in vase paintings as much as in sculpture art. There is a depiction of Apollon with an arrow in his hand on a Lekythos decorated in the red-figure technique, which is preserved in the National Archaeological Museum of Madrid. His chlamys hangs down from his right and left shoulders. This iconography has been used since early periods. It also closely influenced the art of sculpture in the 4th century BC. This work is dated to 500-450 BC (Bonet, 2003; LIMC II. 1-2, 194, Apollon, Nr. 67). The depictions of Apollon in the vase paintings are not limited to this, and the depiction of Apollon on the mentioned lekythos bears stylistic similarities with the works discussed (Figure 1 – 2).

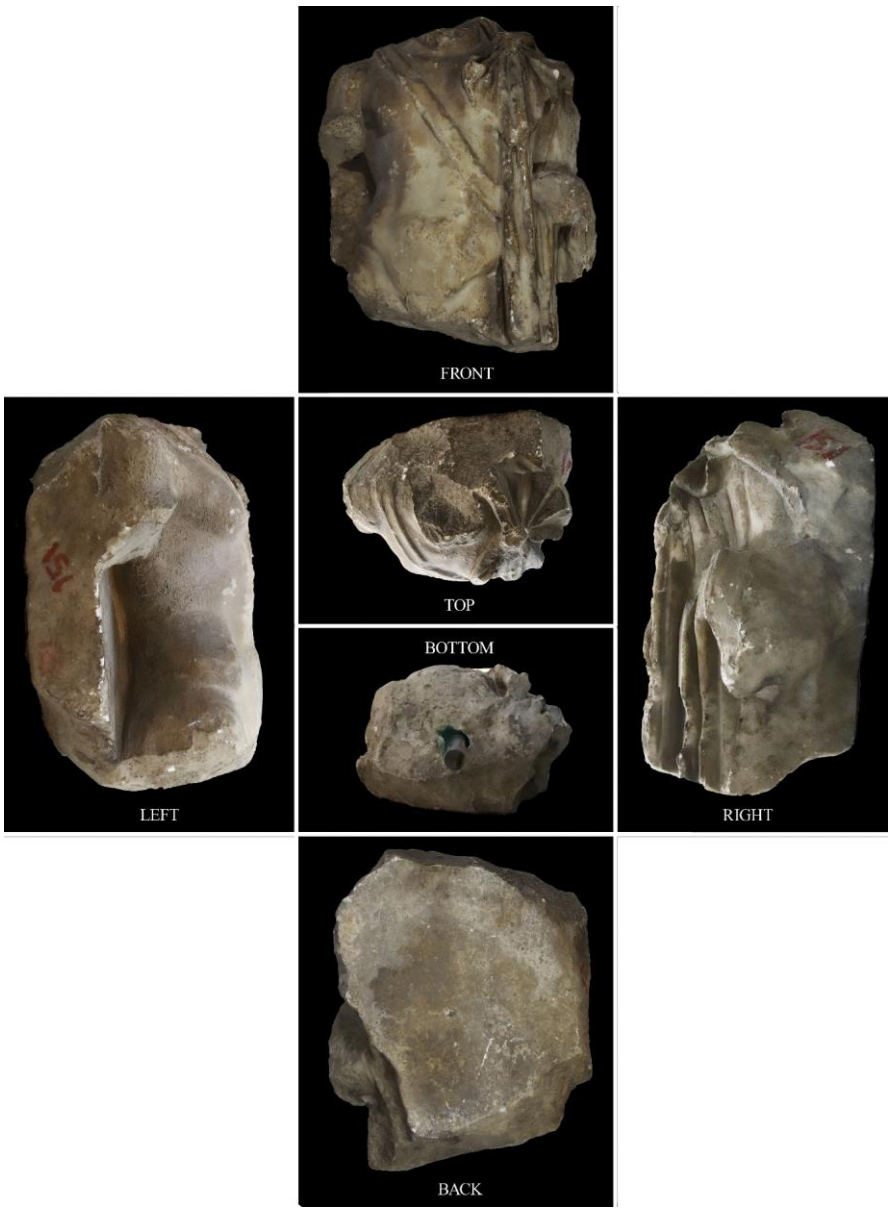


***Figure 2. Torso of Apollon (EPA, 2021)***

### 3.2 ARCHAEOMETRIC ANALYSIS

Archaeometric analysis studies were also carried out on the work that constituted the subject of the article. Principal elements and trace elements analysis methods were used as methods at this stage of the study (Liritzis et al. 2020). In order to compare the data obtained thanks to p-XRF on an elemental basis, the literature sources that provide data on the elemental structures of ancient marble quarries were examined in detail and the numerical data from these sources were processed into a database created in excel program. After this process, the numerical database and the elemental structure of the work that constitutes the subject of the article were comprehensively compared (Figure 3-4).

*Table 1. Torso of Apollon pXRF Elemental Concentrations (ppm)*

| Element | pXRF concentrations (ppm) |
|---|---|
| Fe | 261,3261 |
| Si | 18696,7 |
| Ca | 949183,9 |
| Mg | 5701,661 |
| S | 21690,07 |
| Ti | 712,7076 |
| Cr | 237,5692 |
| Mn | 1354,144 |
| Cl | 1520,443 |
| V | 190,0554 |
| Zn | 166,2984 |
| As | 23,75692 |
| Sr | 166,2984 |
| Ag | 47,51384 |
| Pb | 47,51384 |

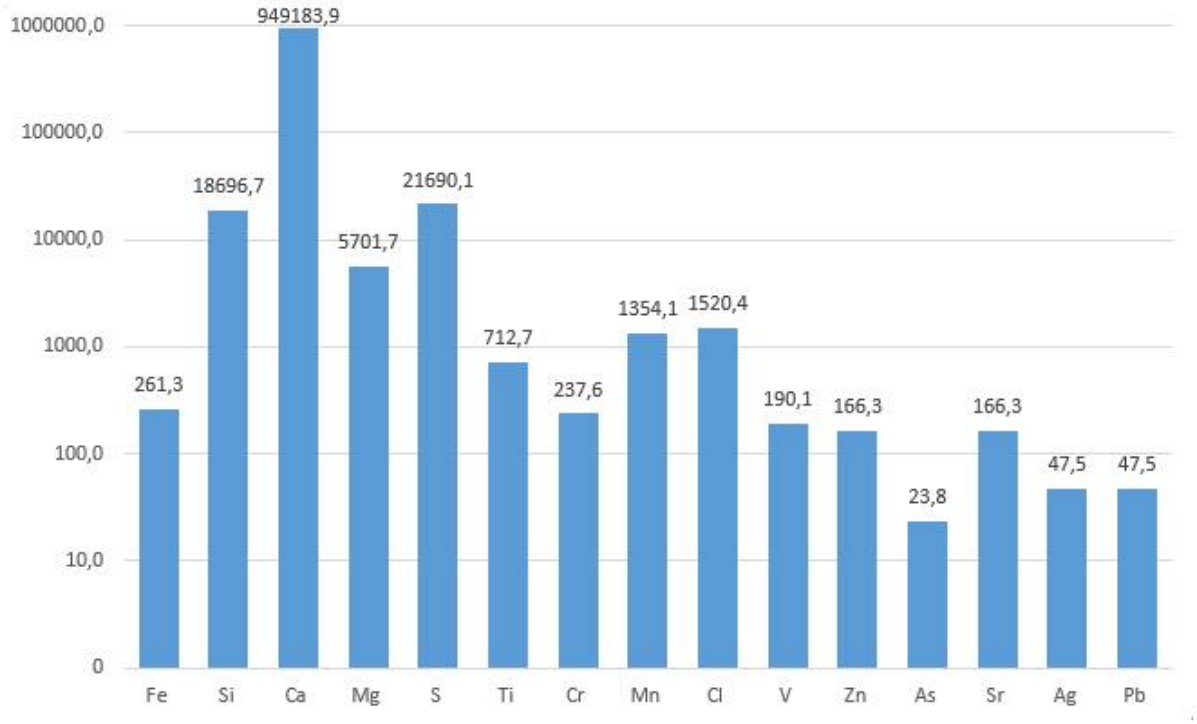


*Figure 3. Torso of Apollon's Logarithmic Elemental Concentrations Chart in ppm values (see Table 1).*

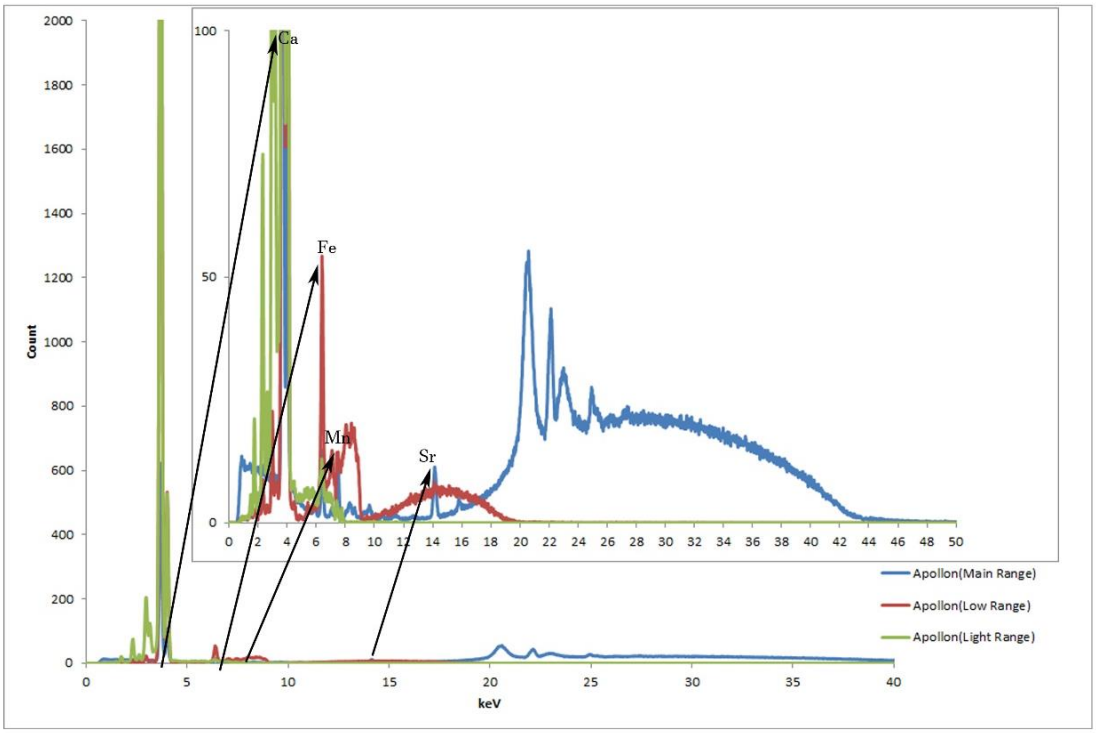


*Figure 4. Torso of Apollon's keV Chart*

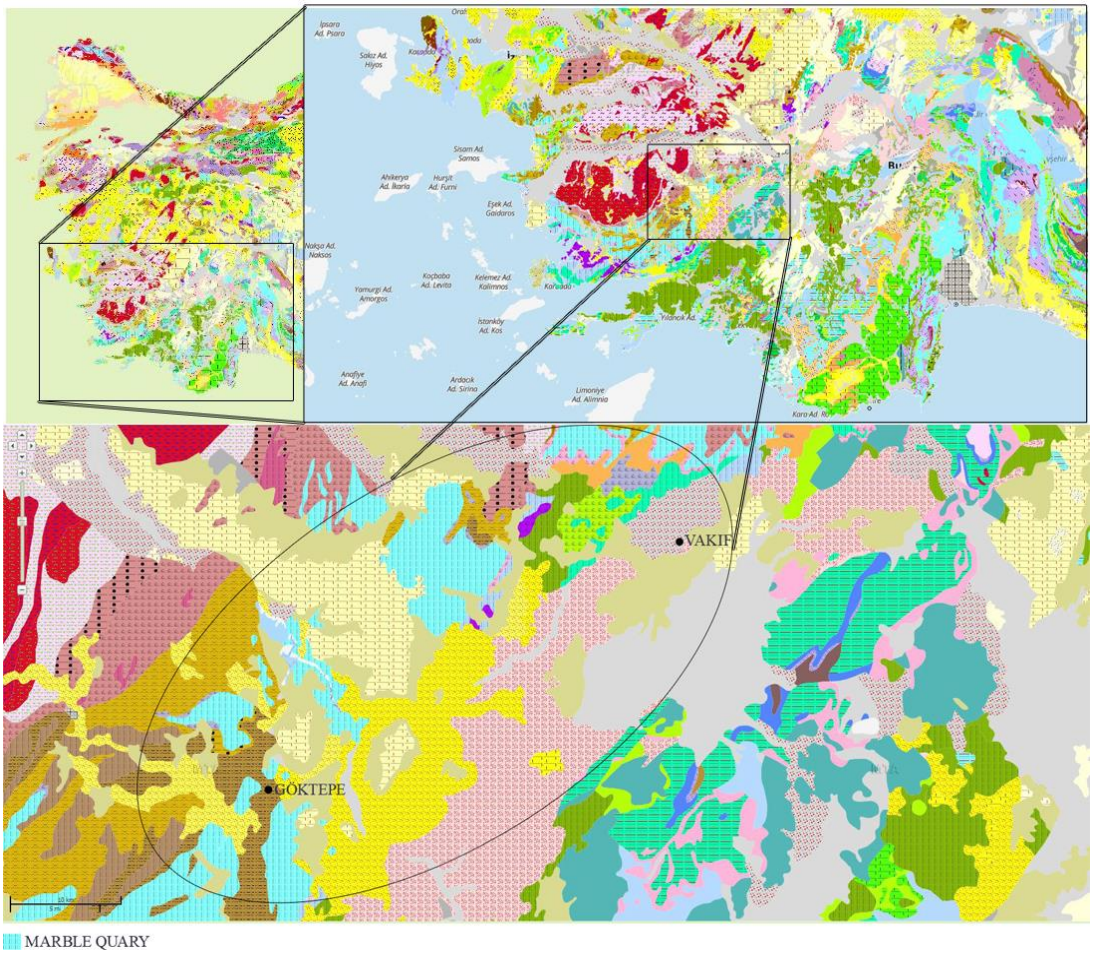


*Figure 5. Map Showing Marble Quarries at Göktepe and Vakif (MTA Archives, 2021)*

Within the scope of the study, centers that contributed to marble production in ancient times were discussed. This data is taken from 3 different centers and consists of 11 different samples in total (Magrini et al., 2018). Sr, Mn, Fe values in the samples and areas where samples are provided are included in Table 2. When the geological structures of the areas where samples are provided are examined, it is seen that there is a marble bed in the southwest of Anatolia, extending from the northeast to the Aegean sea (Figure 5). It is known that the Göktepe marble quarry, one of these marble quarries, was used in the Roman Imperial Period and Late Antiquity (Bruno et al., 2012). Another marble quarry evaluated in the research is the Vakıfköy marble quarry. This quarry is located at the foot of the Babadag mountain line. The locations of these quarries in question are shown in detail with the geological map in Figure 5. The blue legend shows the marble deposits (Figure 5). It is among the quarries that provide raw materials to the Aphrodisias sculpture school. It is among the Anatolian marble quarries that were active in the period when Apollon's torso, which is the subject of the research, was produced (Bruno et al., 2012).

***Table 2. Data table for Sr, Mn, Fe values found from the XRF analysis (Magrini et al., 2018).***

| No | Sample Location | pXRF elemental concentrations (ppm) | | |
|---|---|---|---|---|
| | | **Sr** | **Mn** | **Fe** |
| 1 | Aphrodisias Vakif | 95 | 156 | 19 |
| 2 | Docimium | 62 | 137 | 175 |
| 3 | Docimium | 77 | 7 | 139 |
| 4 | Docimium | 69 | 64 | 397 |
| 5 | Göktepe quarry | 93 | 10 | 124 |
| 6 | Göktepe | 246 | 1 | 102 |
| 7 | Göktepe | 352 | <0 | 91 |
| 8 | Göktepe | 511 | 20 | 112 |
| 9 | Göktepe | 598 | 8 | 146 |
| 10 | Göktepe | 853 | 7 | 128 |
| 11 | Göktepe | 1006 | 10 | 56 |
| 12 | Torso of Apollon (Our Sample) | 166 | 1354 | 261 |

The values given in Table 2 were evaluated graphically, each in itself, as handling Sr, Mn, and Fe values separately (Figure 6- 7- 8). The reason for using concentration data is to eliminate the oxidized values encountered in p-XRF measurements and to distribute them proportionally among other elements. Thanks to the concentration data, it is possible to correctly examine the element that is the subject of the study instead of the misleading oxidized values. This is happened thanks to a correlation that includes all oxide-free elements.

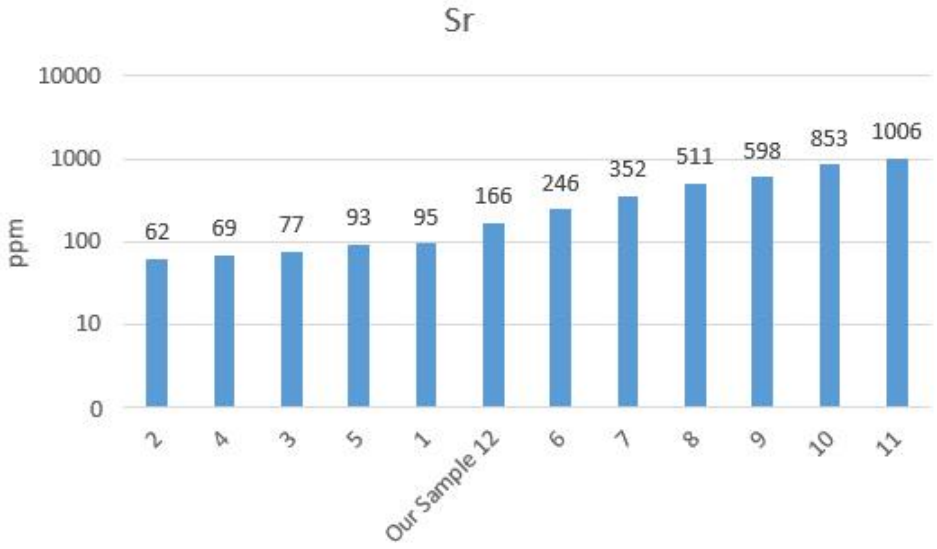


***Figure 6. Chart Showing Logarithmic Strontium Values***

As can be seen from the figure 6 generated based on the literature sources, there is a link between the strontium value of Apollon's Torso, which is the subject of the study, and that of other samples. In this context, Apollon's Torso has a strontium value of much more than 2, 4, 3 numbered samples, respectively, in terms of Sr value. Therefore, these values are excluded from the comparison. Samples 5 and 1 offer a lower value too but are within limits that can be considered as lower limits. When the Sr value of sample 6 is examined, it is seen that it has a greater value than that of Torso but is also in a close relationship. Finally, since the values provided by samples 7, 8, 9, 10, 11 are much higher than that of Torso, they do not provide any data for provenance analysis. In other words, it looks like they are from a remote area. As shown in the logarithmic chart, the artifact provides a value between those of samples 5, 1, and 6.

The fact that Sr values are close to those of samples 5, 1, and 6 here means that the Sr element accompanying Ca has a similar oxygen-binding probability. In other words, Sr is actually one of the rare elements that mineralize in the form of sulfate in nature together with Ca. Sr is seen as the main trace element in almost all of the limestones and marbles based on Ca as the principal element in the region. Since the Sr value of this statue is between the Sr values of Aphrodisias Vakıf and Göktepe, it increases the likelihood that this statue belongs to these places.

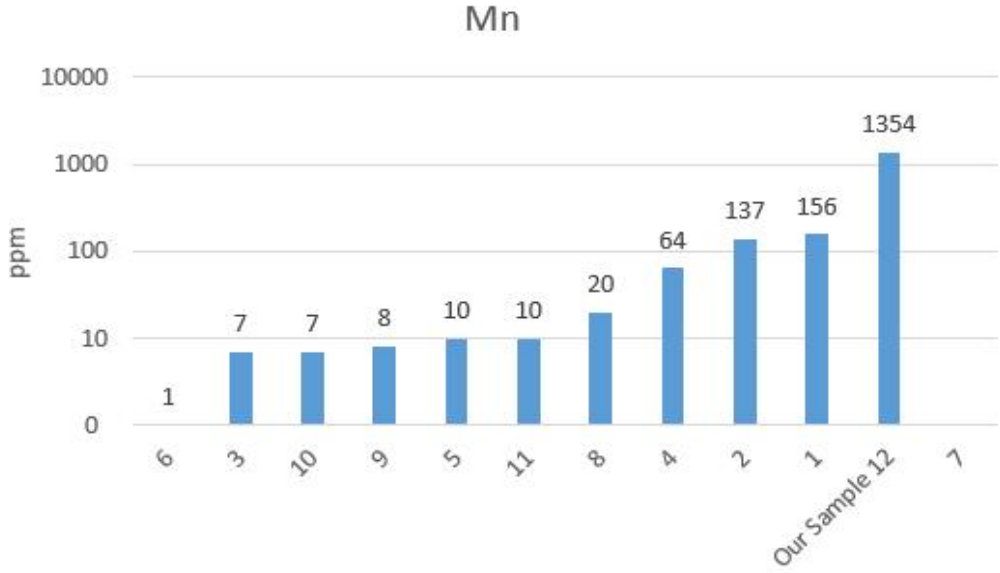


*Figure 7. Chart Showing Logarithmic Manganese Values*

Another logarithmic chart generated by scanning literature sources is the figure 7 showing manganese values of samples. In this graph, except for the sample used in the experiment, the samples of the others are taken directly from the quarries were studied. In this way, no contamination occurred on the samples. However, it turns out that Apollon's Torso, which is the subject of the article, has been subjected to metal contamination for years due to its presence in open-air and warehouse conditions, along with other metal materials. Although Mn metal is a transition element, it is more active than Fe against acids and bases and is less affected by any basic and acidic environment than Fe, and it can be mentioned along with structures similar to CaO because its stable oxide is MnO. As a result, while it is easier for Fe to be removed by any washing process, the probability of Mn to be removed seems less likely, which may have caused the Mn to be strangely high in pXRF analyzes performed on the structure. Since the amounts of interest here are at ppm level, it can be said that although the range for Mn is seen as a very high amount from the averages taken in the analysis, the main reason is that either Mn remains monoxide in the structure (MnO) due to its similarity to Ca or Mn accumulates unaffected by acid-base as a result of Fe leaving the surface after washing. Similarly, Mn is more likely to carbonate in terms of limestone and marble formation than Fe (Ca(Mn)CO3).

Here, two approaches can be considered as a comparison. First, such a high Mn value is considered to come from outside, and all of it can be ignored. Secondly, the centers closest to it can be evaluated, considering that the majority of them come from outside. These two assumptions lead us to quarries no. 1 and 6. If the entire Mn is ignored, quarry number 6 indicates that the origin of the statue is Göktepe quarry. According to the second assumption, if the nearest rates are taken, the Aphrodisias Vakıf quarry appears as the one. Even with the assumptions made with this Mn ratio, the number 1 Aphrodisias quarry and number 6 Göktepe quarry stand out in the evaluation.

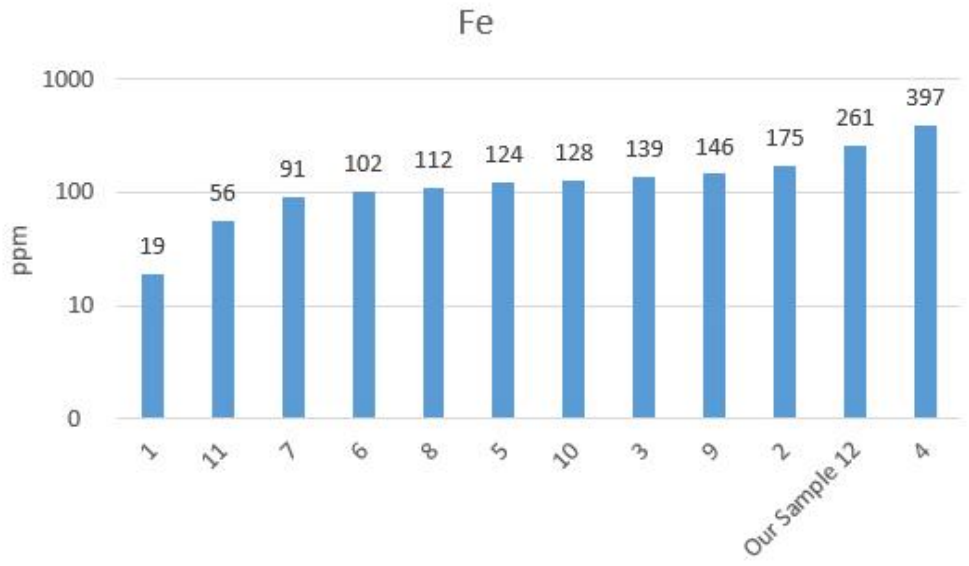


*Figure 8. Chart Showing Logarithmic Iron Values*

According to the figure 8, the Fe value of the Torso is lower than that of sample 4 and higher than that of sample 2. It can be assumed that the amount of Fe element, like Mn, increases as a result of some contamination due to the environmental conditions in which it is present. Mn is an element that has been used for years to remove sulfur and reduce brittleness, and it is known to be the most important secondary element of Fe. However, since sample 1 offers the lowest data as regards Fe, it reduces the likelihood of associating it with the origin of our artifact.

Conversely, considering the regions in the 100-200 ppm band and it is also known that this work is processed with a chisel containing Fe, it is more probable that it could have been produced in an area of 100 ppm. As in the previous Sr analysis, it is even more likely that it was produced in Göktepe, which is the quarries numbered 5, 8, 9, 10, especially 6.

Although areas 2 and 3 also appear to be above and close to the 100 ppm limit for Fe, the remote Sr value has reduced the likelihood that these quarries are the origin of our artifact. Because Fe, like Sr, has not been a trace element that forms the mineral form by sulfating, however, it should be noted that, like the Ca-O binary bond, Fe has a Fe-O binary valence bond. Since Fe is a transition element and its valence electrons are constantly moving in the presence of hydroxide in the form of +2 and +3, it cannot be stabilized and causes the colors of limestone and marble structures such as Ca to change discontinuously from yellow to pink-brown.

## 4. CONCLUSIONS

When the sculptures and vase paintings of Apollon are examined holistically, it is noticeable that the statues of God, in which he is depicted with a bow, are numerous due to his silver bow, which is one of the attributes mentioned in Homer's epics. The first inscribed sculpture in which he is referred to as the God with an arrow is the work called Mantiklos Apollon. For this reason, it is possible to date the earliest depiction of Apollon with a quiver strap on his body to the 7th century BC. In addition, the presence of the expression "God with the Silver Arrow" on the artifact prevents it from mixing with other statues of God with a strap on his chest. Thus, when the type of Kitharoidos is examined, the kithara strap on the chest attracts attention. In this context, Apollon's Torso in Sivas Museum can be considered in close relationship with these two groups. However, it is seen that there is no chlamys in the Apollon sculptures carrying kithara on his left. The statue of Apollon, which is the subject of the article, differs from the kitharoidos type due to the chlamys detail on its left side. Therefore, it is possible to argue that it is a local copy of the Belvedere type.

Dating; The flat structure of the back of the Apollon's Torso at Sivas Archeology Museum makes it possible to say that the artifact belongs to a relief. For this reason, it is possible to think that it could be a part of the artifact from the columnar sarcophagus group from the Antakya sarcophagus, thanks to the close iconographic features it bears with them. In this context, due to its small size, the assumption that it is associated with a Sidamara-type sarcophagus becomes an acceptable assumption. It is known that workshops producing Sidamara type sarcophagus were active between 160 and 270 AD. Based on this information, it is possible to say that our artifact which is the subject of the article may have been carved between 160 and 270 AD.

As mentioned above, since the artifact is of the Sidamara type, it can be said that it is of "Dokimeion workshop-style" in terms of style characteristics. However, Dokimeion, which is also frequently encountered in ancient sources, maybe the workshop with the highest potential among sarcophagus production areas in Anatolia (Strabon 12.8.14). In this context, it can be argued that it was in a quarry and workshop position that determined the trends together with Rome and Athens during its active period. However, this is the subject of another article. Itinerant craftsmen/artists from Dokimeion can also be in the position of applying the Dokimeion trend to different marble quarries in workshops outside Dokimeion in different regions.

As a result of archaeometric pXRF analyses, the work should be evaluated primarily in terms of strontium value. Fe and Mn values may have increased due to contamination. Therefore, it is possible to associate the work with samples that fall below its Fe value. In this context, the Strontium value constitutes the primary evaluation criterion, while Mn and Fe should be considered as supporting data.

It is seen that the work may be related to the areas where samples 6 and 1 were taken according to their strontium value. The Mn value can be handled with two different approaches as described above. Whether the Mn value comes entirely or a large amount of it from outside, these two assumptions point the mines no. 1 and 6. However, the fact that the Fe ratio is at the lowest level in the sample taken from quarry no. 1 also reduces the possibility of this quarry being the torso's quarry. If evaluated within this framework, it is possible to say that quarry no. 6 is the marble quarry of our torso artifact.

Example 6 is taken from the marble quarry located in the Goktepe Neighborhood of Menteşe District of Mugla Province. Example 1 was taken from the Vakıf neighborhood in the Tavas District of Denizli province, near the ancient city of Aphrodisias. The distance of the quarries where these two samples were taken is 45 km in the northeast-southwest direction. At the same time, when the existing geological inventories are examined, it is seen that there is a marble bed that extends in this direction. This situation also explains the numerical proximity of marble samples taken from different neighborhoods located on the same bed/vein. It is possible to associate Apollon's Torso with these marble quarries, taking into account the error rates given in Table 1 in terms of strontium value. When the analysis data on the Mn value are compared, it is seen that there is 1198 ppm more manganese than even sample 1, which is one of the closest samples to the artifact subject to examination. If we associate this situation with a 100-year-old process of contamination, it is recommended that Mn data should not be used for provenance analysis for artifacts extracted from the soil many years ago. When the work is examined in terms of iron values, it can be associated with Dokimeion marble quarries. However, the Sr values of Dokimeion marble quarries are far from the Sr values of Torso. The quarry where sample 1 is taken, which constitutes a probability in terms of Sr value, is excluded from the evaluation when Fe values come into the equation. When the evaluation is made on the basis of the rising iron values due to contamination, the Fe value, like the Sr value, supports the views on the possibility that the source of the artifact is the Göktepe marble quarry. This situation supports the idea that opposes the hypothesis that there is only Dokimeion among the Anatolian columned sarcophagus production centers, which has been going on for years, and that creates opinions that there are different centers.

As a conclusion, thanks to this study, which is a combination of archaeological methodology and archaeometric methodology, answers were found to the typological questions about the period and provenance of the artifact. An artifact that entered the museum inventory in the 1920s was both associated with the place it belongs to in the archaeological literature and an answer was produced to the question of which region it was a product of.

In addition, thanks to this artifact, in light of the information that there is no such sarcophagus workshop in Sivas and its immediate vicinity, information can be obtained about Turkey's unregistered antiquities traffic inside the country in the 1920s.

## ACKNOWLEDGEMENTS

The work in question was studied with the written permission of the Turkish Ministry of Culture and Tourism, Sivas Museum Directorate. In this context, I would like to thank Museum Director Ali Alkan for his devoted contributions to the study of the artifact.
I would like to thank Associate Professor Ali Özer, Metallurgical and Materials Engineer, for his help in the elemental analysis of the study and the evaluation of these analyses.

## REFERENCES

Pausanias, *Description of Greece*, (Vol 1-6), (Translated with a commentary: J. G. Frazer), The Macmillan Company, New York 1898.
Pliny, *The Natural History*, (Translated: John Bostock – H. T. Riley), (Vol. I-VI), London 1855.

Strabon, (1987), Geographika, (Antik Anadolu Coğrafyası, Book XII, XIII, XIV), (Trns. A. Pekman), İstanbul: Arkeoloji ve Sanat Yayınları.
Amelung, W. (1908) *Die Sculpturen des Vaticanischen Museum. Band II, 2 Text,* Berlin: In Kommission Rei Georg Reimer.
Andreae, B. (1998) *Museo Pio Clementino. Cortile Ottagono. Bildkatalog der Skulpturen des Vatikanischen Museums II*, Berlin: De Gruyter.
Bartoccini, R. (1929) *Le Terme di Lepcis (Leptis Magna), Bergamo:* Istituto italiano d'arti grafiche.
Bashar, M., Esquivel, F. J., Esquivel, J. A., (2017), A Statistical Approach of the Marble Phoenician Anthropomorphic Sarcophagi: Amrīt Site, *Scientific Culture,* Vol 3, No 2, pp. 1-6.
Bieber, M. (1955) *The Sculpture of the Hellenistic Age*, New York: Columbia University Press.
Boardman, J. (2001) *Yunan Heykeli Arkaik Dönem*, İstanbul: Homer Kitabevi.
Boardman, J. (2014) *Yunan Heykeli Geç Klasik Dönem*, İstanbul: Homer Kitabevi.
Bonet, P. C. (2003) *La Colección Várez Fisa en el Museo Arqueológico Nacional*, Madrid: Ministerio De Educación, Cultura y Deporte.
Boysal, Y. (1967) *Grek Klasik Devir Heykeltraşlığı*, Ankara: Güzel İstanbul Matbaası.
Brunn, H., Bruckmann, F. (1902) *Denkmäler griechischer und römischer Skulptur I*, München: Columbia University Press.
Bruno, M., Elçi, H., Yavuz, A. B., Attanasio, D. (2012*) Unknown Ancient Marble Quarries of Western Asia Minor, in:* Anna Guttierrez Garcia, Pilar Lapuente Mercadal, Isabel Roda de Llanza (Eds.), Interdisciplinary Studies on Ancient Stone, Proceedings of the IX Association for the Study of Marbles and Other Stones in Antiquity (ASMOSIA) Conference, Tarragona: pp. 562 - 572
Bulut, M. (2019) *Sivas'taki Geç Dönem Osmanlı Kamu Yapıları*, Sivas: Sivas Valiliği, İl Kültür ve Turizm Müdürlüğü Yayını.
Cagiano de Azevedo, M. (1951) *Le Antichità de Villa Medici*, Roma: La Libreria dello Stato.
Camporini, E. (1979) *Sculture a tutto tondo del Civico Museo archeologico di Milano provenienti dal territorio municipal e da altri municipia*, Milano: Comune di Milano.
Carpenter T. H. (2002) *Antik Yunan'da Sanat ve Mitoloji*, İstanbul: Homer Kitabevi.
Charbonneaux, J. (1943) *La Sculpture Grecque Classique*, Paris: Editions de Cluny.
Conze, A. V. (1891) *Beschreibung der antiken Skulpturen mit Ausschluss der pergamenischen Fundstücke*, Berlin: Spemann.
Çelgin, G. (2018) *Eski Yunanca Türkçe Sözlük*, İstanbul: Alfa.
Denizli, H. (1998*) Sivas Tarihi ve Anıtları*. Sivas: Özbelsan A.Ş.
Di Bella M., Sabatino G., Giuliano A., Italiano, F., Quartieri S., Triscari M., Magazu S., Tripodo, A., (2020) New Spectroscopic Data On "Marmi Mischi" Baroque Glass Decorations From "Pallium Altaris" Of Messina (Sicily, Italy), *Mediterranean Archaeology and Archaeometry*, Vol. 20, No 2, (2020), pp. 97-111.
Dinç, M. (2015) *Manisa Müzesi'ndeki Hellenistik – Roma Dönemi Heykelleri, Manisa Müzesi Heykeltıraşlık Eserleri* (Eds. Serra Durugönül), İstanbul, Ege Yayınları.
Durukan, A, (2020) *Grek Heykeltraşlığında Heykel Tipleri*, Atatürk University, Institute of Social Science, PhD. Thesis, Erzurum: Turkey.
Elderkin, G. W. (1939) The Sarcophagus of Sidamara. Hesperia. *The Journal of the American School of Classical Studies at Athens*, Vol. 8, No. 2, pp. 101-105.
EPA (2021) Erdener Pehlivan Archive
Flashar, M. (1992) *Apollon Kitharodos: Statuarische Typen des Müsischen Apollon*, Köln: Böhlau.
Fuchs, W. (1969) *Die Skulptur der Griechen*, München: Hirmer Verlag.
Gauckler, P. (1895) *Musée de Cherchel: Musées de l'Algérie et de la Tunisie,* Paris: E. Leroux.
Grimal, P. (1997) *Mitoloji Sözlüğü Yunan ve Roma*, İstanbul: Sosyal Yayınları.
Hamilton, E. (1942) *Mythology*, Boston: Brown and Company.
Helbig, W. (1963) *Führer durch die öffentlichen Sammlungen klassischer Altertümer in Rom. Die päpstlichen Sammlungen im Vatikan und Lateran I,* Tubingen: Wasmuth.
Heres, H., Kunze, G., Röhl, S. (1997) *Geschichte und Restaurierung der Statue des Meleager in der Antikensammlung der Staatlichen Museen zu Berlin, Beiträge zur Erhaltung von Kunstwerken 7,* Berlin: V von der Hochschule für Bildende Künste Dresden, pp. 101-113.
Heres, H. (1996) Von Fall zu Fall entscheiden! Zu den Restaurierungen von Marmorskulpturen in der Antikensammlung 1996, *Jarbuch der Berliner Museen*, Vol. 38, pp. 185-194.
Herrmann, P. (1925) *Verzeichnis der antiken Original-Bildwerke*, Dresden: J. Bard.

Himmelmann, N. (1998) *Apollo vom Belvedere, in: Matthias Winner (Eds.), II Cortile delle Statue, Der Statuenhof des Belvedere im Vatikan,* Mainz: Max Planck Instute, pp. 211-225.

Howatson M. C. (2013) *Oxford Antikçağ Sözlüğü*, (Trns.: Faruk Ersöz), İstanbul: Kitap Yayınevi.

Kansteiner, S. (2007*) Heinses Umgang mit antiker Skulptur, in:* M. Bernauer, N. Miller (Eds.), Wilhelm Heinse – Der andere Klassizismus, Mainz: Wallstein.

Karaosmanoğlu, M. (2005) *Mitoloji ve Ege'nin Tanrıları*, Erzurum: Eser Ofset Matbaacılık.

Kılınç, F. (2000) New Find: *The Antakya Sarcophagus* (Ed. Christine Kondoleon), *Antioch The Lost Ancient City,* Princeton: Princeton University.

Kocaman Sakin, B. (2018) *Hatay Müzesi Roma İmparatorluk Dönemi Lahitleri*, Mustafa Kemal University, Institute of Social Science, Master Thesis, Hatay, Turkey.

Koch, G. (2001) *Roma İmparatorluk Dönemi Lahitleri*. İstanbul: Arkeoloji ve Sanat Yayınları.

Koch, G. (2010) *Türkiye'deki Roma İmparatorluk Dönemi Lahitleri*. Antalya: Vehbi Koç Vakfı.

Korkanç, M., İnce, İ., Hatır, M. E., Tosunlar, M. B., (2018) Historical Granaries at Taşkale (Turkey) Under Risk: A Geotechnical Analysis, *Mediterranean Archaeology and Archaeometry*, Vol. 18, No 1, (2019), pp. 149-162.

Landwehr, C. (2000) *Die römischen Skulpturen von Caesarea Mauretaniae II*, *Idealplastik – Männliche Figuren 22-24,* Bonn: Philipp von Zabern, Cat. no. 74 Pl. 12. 13.

Liritzis, I., Laskaris, N., Vafiadou, A., Karapanagiotis, I., Volonakis, P., Papageorgopoulou, C., Bratitsi, M., (2020) Archaeometry: An Overvıew, *Scientific Culture,* Vol 6, No 1, pp. 49-98.

LIMC II, Lambrinoudakis, W. (1984) *LIMC II*, Munchen: Artemis, Apollon, pp. 183-327.

Lullies, R. (1956) *Griechische Plastik von den Anfangen bis zum Ausgang des Hellenismus*, München: Hırmer Verlag München.

Magrini, D., Attanasio, D., Bracci, S., Cantisani, E., Prochaska, W., (2018) Innovative application of portable X-ray fluorescence (XRF) to identify Göktepe white marble artifacts, *Archaeol. Anthropol. Sci*. Vol. 10. No. 5. pp. 1141 – 1152.

Manderscheid, H. (1981) Die Skulpturenausstattung der kaiserzeitlichen Thermenanlagen, *MAR,* vol. 15. No: 106, Berlin: Cat. no. 311, Pl. 39.

Mc Cann, A. M. (1978) *Roman Sarcophagi in the Metropolitan Museum of Art*, New York: The Metropolitan Museum of Art.

MTA Archive (2021) Mineral Research and Exploration General Directorate, (http://yerbilimleri.mta.gov.tr/anasayfa.aspx), (AD. 15.12.2021).

Neudeckler, R. (1988*) Die Skulpturenausstattung römischer Villen in Italien, BeitrESkAr 9,* Mainz: Philipp von Zabern.

Ögüs, E. (2003) *The Antakya sarcophagus: Design elements and the chronology of Docimeum columnar sarcophagi,* Bilkent University, Institute of Social Science, PhD. Thesis, Ankara: Turkey.

Pasinli, A. (1989*) Istanbul Archaeological Museums,* (Eds., Fatih Cimok - Anita Gillertt), İstanbul: A Turizm Yayınları.

Pehlivan, G. F. (2021) Kültürel Mirasın Belgeleme Çalışmalarında Fotoğraf Tabanlı Programların Kullanılması, XII. International Sinan Symposium 8-9 April 2021, Edirne: pp. 395-404.

Pürlü, K., Altın, Y., Aygün, A., Cebecioğlu, M., Özkanat, E., Çetindağ, E., Bedir, A., Kaya, A., Cavus, İ., Babacan, S., (2011) *Sivas 1000 Temel Eser, Sivas Kültür Envanteri* [The Cultural Inventory of Sivas], (Eds. Kadir Pürlü), Sivas: Sivas Valiliği İl Kültür ve Turizm Müdürlüğü.

Shqiarat, M., Alnawafleh, H., Abudanah, F., (2019) Characterization and Provenance Study of Marble from Udhruh, Southern Jordan, *Mediterranean Archaeology and Archaeometry*, Vol. 19, No 1, pp. 1-8.

Smith, A. H. (1904) *A Catalogue of Sculpture in the Department of Greek and Roman Antiquities, British Museum III,* London: Printed by Order of the Trustees.

Smith, R. R. R. (2013) *Helenistik Heykel*, İstanbul: Homer Kitabevi.

Stemmer, K. (1995) *Standorte Kontext und Funktion antiker Skulptur,* Berlin: Ausstellungs.

Şahin, M. (2000) *Miletopolis Kökenli Figürlü Mezar Stelleri ve Adak Levhaları,* Ankara: Türk Tarih Kurumu.

Vermeule, C. (2000) *The Sculpture of Roman Syria.* (Eds. Christine Kondoleon). *Antioch The Lost Ancient City*, Princeton: Princeton University.

Zanker, P. (1974) *Klassizistische Statuen, Studien zur Veränderung des Kunstgeschmacks in der römischen Kaiserzeit* Vol. 114, Mainz: Cat. no. 16 Pl. 83,2.