Conservation of a Terracotta *Acroterion* from an Unknown Temple in Aegean Thrace

Sevdalina Neykova [a]

[a] *Laboratory for Analyses, Conservation and Restoration, National Institute of Archaeology with Museum, Bulgarian Academy of Sciences, 2 Saborna Str, 1000 Sofia, Bulgaria, sevdalinaneikova@abv.bg*

ABSTRACT

The terracotta *acroterion* from the permanent exhibition of the National Archaeological Museum in Sofia most probably represents the goddess Artemis. Discovered during the World War I, the *acroterion* is connected with the past of the ancient city of *Dicaea*, situated on Lake Bistonis, present-day Lake Vistonida in Greece.

Although being a part of the permanent exhibition of the museum, the *acroterion* needed a new conservation treatment because of the inappropriate intervention applied to it in the past. The aesthetics of the statue were poor and the iron armature inserted into a cavern inside the statue no longer functioned as a system that should hold the statue's separate parts together. Executed at the Laboratory of Analysis, Conservation and Restoration of the National Institute of Archaeology with Museum, the new conservation treatment aimed not only to return statue's aesthetics and stability but also to answer to the question whether the *acroterion* had a polychrome finish as was often the case with statues and terracotta figurines in the Antiquity.

The executed chemical analyses by meanings of X-Ray Fluorescence Spectrometry (XRF) revealed that the surface of the statue was entirely covered by white paint, obtained by the use of the mineral kaolin. Covering statues with white paint in ancient Greece aimed to make sculptures appear more valuable by eliciting associations with marble. This particular technique refers to Marbleizing or Graining.

KEYWORDS

Acroterion, Artemis, X-Ray Fluorescence Spectrometry, polychromy, Aegean Thrace

The National Archaeological Museum in Sofia houses a terracotta statue dated to the 5th century B.C. from an unknown temple in Aegean Trace (fig. 1–2). The statue depicts an idealized figure of a woman in Doric *peplos* and probably represents the goddess Artemis. (Venedikov, Gerassimov 1975). The statue was found during World War I, while digging artillery trenches on the Aegean coast, east of the village of Tuzla. According to B. Filov, the ancient city of *Dicaea* was located in the region of this discovery (Филов 1928/29).

Two settlements named *Dicaea* are known to have existed in Ancient Greece. The first one – *Dicaea* (Δίκαια) existed during about 500–450 B.C. and was situated on the Termaian bay (Termaic Gulf), on the north of Potideia, at the westernmost of the three peninsulas at the southern end of the Chalcidice. *Dicaea* was situated east of Aineia in the interior, probably near present-day Trifolo. As late as the early years of the Peloponnesian War it was a member of the Delian League. It was able to keep its autonomy into the first half of the 4th century, becoming Macedonian no later than 348 or 349. Its later history is unknown (Zahrnt 2013).

Fig. 1. The acroterion after conservation – front view. Photo Ch. Tzochev
Обр. 1. Акротерият след консервация – фронтален изглед.
Снимка Ч. Цочев

Fig. 2. The acroterion after conservation – back view. Photo Ch. Tzochev
Обр. 2. Акротерият след консервация – изглед от тилната страна.
Снимка Ч. Цочев

However, Venedikov and Gerassimov point that *Dicaea* was a Greek colony at the Aegean Sea facing Abdera and Maroneia (Venedikov, Gerassimov 1975, 51). This is not the case with *Dicaea* located in the Chalcidice since Abdera and Maroneia are located far eastwards from Chalcidice. A second settlement named *Dicaea* (Δικαία) was situated on lake Bistonis, present-day lake Vistonida (Greek: Λίμνη Βιστωνίδα), in the country of the Bistones. The place appears to have decayed at an early period. Some identify it with the modern Curnu, and others with Bauron (Smith 1854). This second *Dicaea* is more probably the place mentioned by Filov, Venedikov and Gerassimov as the place from which the *acroterion* is.

The statue is 80 cm high, including the pedestal. The goddess is represented in a dynamic pose. The arms of the figure are broken off, the left one – from the elbow and the right one – from the shoulder. The left arm is slightly outstretched and probably held a bow. The right arm hung down the side of the goddess' body, as can be seen from traces on the dress. Judging from its dimensions and material, the statue of Artemis from *Dicaea* could have been designed as a sculpture *acroterion* for the decoration of a temple pediment or a pediment of another type of building (Venedikov, Gerassimov 1975, figs. 62–63). The *acroteria* are architectural ornaments placed on a flat base called *acroter* or *plinth*, and mounted at the apex of the pediment of Classical buildings. The *acroterion* may take a wide variety of forms, such as a statue, ornament or a palmette. This particular representation of a goddess has no parallels among the extant images of Artemis. The closest comparable examples to the *Dicaea* statue is the so-called "Artemis Colonna" at the Bode Museum in Berlin and three marble *acroteria* representing the goddess Nike from the temple of Artemis, Sanctuary of Asclepius, Epidaurus, Greece, housed in the National Museum in Athens.

The *acroterion* was restored soon after its discovery. However, the need for new conservation treatment was necessary because of the inappropriate intervention applied to it in the past. The aesthetics of the statue were poor. Even though it was part of the permanent exhibition of the museum, the object was covered with dust and soil, which had not been removed after the statue's discovery. Salt efflorescence occurred on the lower part of the goddess' dress. Glue stains were visible on her neck and torso. Missing portions of the figure's back, neck and dress were restored in three different materials – gesso, a mixture of gesso and a pigment with reddish-pink color, and a mixture of gesso, sand and a pigment with pink color. The restored areas were covered with pink tempera paint. The paint covered the entire surface of the left arm of the figure as well. *Acroterion's* base, torso and legs were joined together with an iron armature, fit into the cavern inside the statue and ending with a square iron plaque. The armature and the plaque were corroded. The upper part of the statue was loose and moved around the armature. Due to the faulty repair of the statue's torso and legs, a deep crack between the two parts was visible. A thick layer of gesso was applied at the bottom of statue's base in order to flatten it. Gesso coated with pink tempera paint covered some of the original parts of the statue's feet.

The new conservation treatment was executed at the Laboratory for Analyses, Conservation and Restoration at the National Archaeological Museum. It began with removing the glue stains from the terracotta using acetone, applied with cotton buds. Surface dirt and deposited soil were cleaned, using a synthetic fiber pencil and local ultrasound ablation. A mixture of ethanol and water at a 1:1 ratio was used to remove pink paint from the surface of the left arm. The gesso fillings which covered parts of statue's feet and unstable reconstructions were removed mechanically. The gesso layer from the bottom of the base was entirely removed. The statue's upper part was then lifted in order to cut off part of the iron

armature. The torso of the statue was then mounted again on the spit and glued to the lower part of the goddess' body. The iron elements were subsequently treated with an inhibitor and with 5% tannin dissolved in ethanol and finally coated with 3, 5 and 25% solutions of Acryloid B 72 dissolved in toluene. For the terracotta's surface consolidation 3% Acryloid B 72 dissolved in toluene was used. Most of the old restorations in gesso were preserved. Their surface was treated in such as way as to approximate the texture of the terracotta. The restorations were subsequently coated with acrylic resin Acryl 33 dissolved in water.

For color reintegration of the fillings mineral pigments mixed with acrylic resin Acryl 33 dissolved in water were used. The retouching technique of *tratteggio* was used.

After removing the surface dirt, traces of white paint became visible upon the entire surface of the statue. The paint was best preserved on the statue's hair. Terracotta figurines and statues commonly featured a polychrome finish with various colours in ancient Greece – red, ochre, yellow, white, blue and purple. In addition, the practice of painting sculpture was the norm rather than the exception in Greek art. The painting technique which was used for terracotta figures in Antiquity was widespread in the areas of present Greece, Crete, Italy and North Africa (Papadopoulou et al. 2004, 1877–1884). All that remained on the surface of the *acroterion*, however, are traces of white paint solely.

Two samples of the paint were analyzed by X-Ray Fluorescence Spectrometry (XRF) in order to identify its chemical composition. The analysis showed that the white pigment was not the most commonly used for such purposes – calcium carbonate ($CaCO_3$). Most probably, the used pigment is kaolin – $Al_2O_3.2\ SiO_2.\ 2H_2O$ because of the high concentrations of silicon (48.155%) and aluminum (44.623%) in the samples. Kaolin is produced by the chemical weathering of aluminum silicate minerals like feldspar (Ненов 1984, 96-97). It is used as white pigment also in Etruscan polychromes on terracotta from the Cerveteri area (Bordignon 2008, 23–29; Bordignon et al. 2007, 87–100).

Results of the analysis of the white paint. The results present element concentrations in Sample 1.

Instrument	EDX – 720 Rayny Shimadzu										
Analyte	Na – U TG kV : Rh 50										
Atmosphere	Air										
Colimator	1 mm										
Spin	Off										
Filter	No										
Group	Powder - Air										
Time (sec)	Live - 99										
Acq. (keV)	0 - 40										
Dt. (%)	6										
Identified elements	Si	Al	Ca	S	Fe	K	Ba	Ti	Ac	Sr	Cu
Concentration (in %)	48.1	44.6	2.0	4.1	0.4	0.3	0.1	0.08	0.005	0.004	0.004

No other paints appear to have been used for colouring the statue which leads to the conclusion that the use of white paint intended solely to imitate marble surface instead of terracotta. Covering statues with white paint in ancient Greece aimed to make sculptures

appear more valuable by eliciting associations with marble. This particular technique refers to Marbleizing or Graining.

Statue's recent restoration and investigation of the remnants of its original polychromy helped for reconstruction of its original appearance and for retrieving of its aesthetics.

References

Ненов, Н. 1984. *Практикум по химични проблеми в консервацията.* София: Наука и изкуство

Филов, Б. 1928/1929. Глинена статуйка на Артемида отъ южна Тракия. Известия на Българския археологически институт V, 1–12

Andrić, V., Stojanović, M., Perisić, N., Mioć, U. B., Damjanović, Lj. 2006. *Investigation of Neolithic Coloured Pottery by X-Ray Fluorescence, IR Spectroscopy and X-Ray Powder Diffraction.* Paper, presented at ICOSECS05. Okhrid, Macedonia.

Bordignon, F. 2008. The White Color in Etruscan Polychromes on Terracotta: Spectroscopic Identification of Kaolin. *Journal of Cultural Heritage* 9.1, 23–9

Bordignon, F., Postorino, P., Dore, P., Guidi, G. F., Trojsi, G., Bellelli, V. 2007. In Search of Etruscan Colours: A Spectroscopic Study of a Painted Terracotta Slab from Ceri. *Archaeometry* 49, 87–100

Papadopoulou, D.N., Zachariadis, G.A., Anthemidis, A.N., Tsirliganis, N.C., Stratis, J.A. 2004. Comparison of a Portable Micro-X-Ray Fluorescence Spectrometry with Inductively Coupled Plasma Atomic Emission Spectrometry for the Ancient Ceramics Analysis. *Spectrochimica Acta Part B: Atomic Spectroscopy* 59, 1877–1884

Smith, W. 1854. *Dictionary of Greek and Roman Geography, Illustrated by Numerous Engravings on Wood.* London: Walton and Maberly

Venedikov, I., Gerassimov, T. 1975. *Thracian Art Treasures.* Sofia

Zahrnt, M., 2013. "Dicaea." Brill's New Pauly. Brill Online, 2013. Reference. 27 May 2013 <http://www.encquran.brill.nl/entries/brill-s-new-pauly/dicaea-e317700>

Консервация на акротерий от ***terracotta*** от неизвестен храм в Егейска Тракия

Севдалина Нейкова

(резюме)

В постоянната експозиция на Националния археологически музей в София е изложена статуя от *terracotta*, с датировка V в.пр.Хр., произхождаща от неизвестен храм в Егейска Тракия (обр. 1 и 2). Статуята вероятно изобразява богинята Артемида

и представлява акротерий – скулптурна декорация, поставяна в ъглите или на върха на фронтона на сгради, построени в антични ордери. Произведението е открито по време на Първата Световна Война, при изкопи за военни окопи в близост до брега на Егейско море, източно от селището Тузла. Възможно е статуята да произхожда от античния град *Dicaea*, идентифициран в близост до района, в който е открита статуята.

Некомпетентните реставрационни намеси извършени върху акротерия в миналото и последствията от тях наложиха провеждането на консервация, извършена в лабораторията за анализи, консервация и реставрация (ЛАКР) на Националния археологически музей. Фигурата бе покрита с повърхностни замърсявания, почвени отложения и солни налепи, останали неотстранени по време на предшестващите реставрационни намеси. Реконструираните липсващи части от фигурата бяха изпълнени от различни материали. Върху тях бе нанесена ярко розова боя, която покриваше и обширни участъци от оригиналната повърхност на статуята. Отделните части от тялото на богинята бяха свързани посредством силно корозирала желязна арматура. Върху стъпалата и постамента на фигурата се наблюдаваха гипсови напластявания, целящи стабилизиране на долната част на произведението.

След отстраняване на повърхностните замърсявания, депозираната в гънките на косата и дрехата пръст и наслоеният върху оригинални участъци гипс, по повърхността на произведението се разкриха остатъци от бяла боя. Практиката за оцветяване в бяло на фигури от *terracotta* е била прилагана често в Античността с цел имитация на мраморна повърхност. Химичният състав на бялата боя беше изследван от С. Нейкова посредством Рентгено-флуоресцентна спектрометрия (XRF). Анализите идентифицираха използвания пигмент като каолин.

Консервационната намеса включваше укрепване на повърхността на статуята и стабилизиране на връзката между отделните части на фигурата. След обработка на старите възстановки с цел приближаване на фактурата им до тази на оригиналната повърхност, се извърши цветова реинтеграция на възстановените участъци в техника *tratteggio.*