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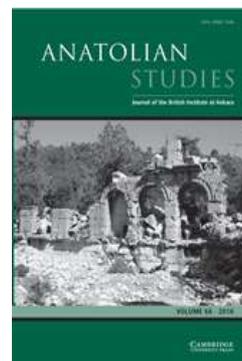
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The Early Bronze Age figurine from Hasanoğlan, central Turkey: new archaeometrical insights

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Abstract

The following article discusses the archaeometrical dimension of a well-known Early Bronze Age metal figurine from Hasanoğlan, Turkey, on permanent display in the Anatolian Civilisations Museum in Ankara. The transfer of the object to a new display case allowed for an examination with a portable x-ray fluorescence (P-XRF) device in order to reveal the chemical composition of the statuette and its attached ornaments. The figurine was confirmed to be made of silver. However, it is alloyed with a small but still substantial amount of copper. The applications are basically made of gold, but with a suspected substantial (up to 23%) amount of silver involved. The final section of the article is dedicated to a critical comparison with recently published figurines from Alaca Höyük, together with an archaeological and chronological reappraisal of this unique piece of art.

Özet

Bu makale, Ankara Anadolu Medeniyetleri Müzesinde sergilenen Erken Bronz Çağına ait ünik eserler arasında kabul edilen Hasanoğlan Metal Figürininin bir arkeometrik çalışmasını içermektedir. Hasanoğlan heykelciğinin, müzede yeni vitrinine taşınması vesilesi ile yapılan Portatif X-Ray Flüoresans (P-XRF) Spektrometresi ölçümleri, figürin ve üzerindeki dekoratif eklentilerin kimyasal bileşimlerini açığa çıkarmıştır. Figürin, az ama safsızlık kabul edilmeyecek oranda bakır metali katılmış gümüş alaşımından yapılmıştır. Eklentiler temel olarak altın metalinden yapılmış olmakla birlikte ölçümlerde hemen altındaki gümüş metalinden de kaynaklanması olası yüksek oranda gümüş içermektedir. Makalenin son bölümü, bu eşsiz sanat eserinin son zamanlarda yayınlanmış Alacahöyük metal figürinleriyle arkeolojik ve kronolojik olarak yeniden değerlendirilmesine ayrılmıştır.

Within the broad range of figural metal objects produced in third-millennium BC Early Bronze Age Anatolia, the figurine from Hasanoğlan is in many ways a truly outstanding artefact. Representing one of the few exceptions to the usual abstract, schematic figural renderings of humans typical of this period in Anatolia, its naturalistic appearance, combined with the meticulous application of miniature jewellery items makes this figurine an iconic object with which to illustrate the supreme standards of Early Bronze Age Anatolian metalwork. However, an in-depth appraisal of this fine piece of early Anatolian art using modern analytical methods has not previously been undertaken, and is attempted with this contribution.

The figurine, first published in 1960, was purportedly found in 1956 in the village of Hasanoğlan, about 34km east of Ankara, during stone-quarrying activities (fig. 1).

However, a later inspection of the alleged findspot could not verify any of the testimonies given by locals (Dolunay 1960: 81). A possible relation between the figurine and two pins with elaborately-shaped heads, also allegedly from Hasanoğlan and likewise lacking any archaeological context (Anatolian Civilisations 1983: 11, A.247, A.248), remains undemonstrated. Since its acquisition in the 1950s, the figure has been on display in the Anatolian Civilisations Museum in Ankara.

The figurine

The figurine itself measures 24cm in height, a maximum of 4.9cm in diameter and a maximum of 1.9cm in depth (fig. 2). The slender body, although slightly disproportional, clearly displays a naked female. The extremities, such as the fingers and toes, are carefully exercised, and the bones of the knees and wrists are modelled naturalis-



Fig. 1. Map of Anatolia showing the findspots mentioned in the text.

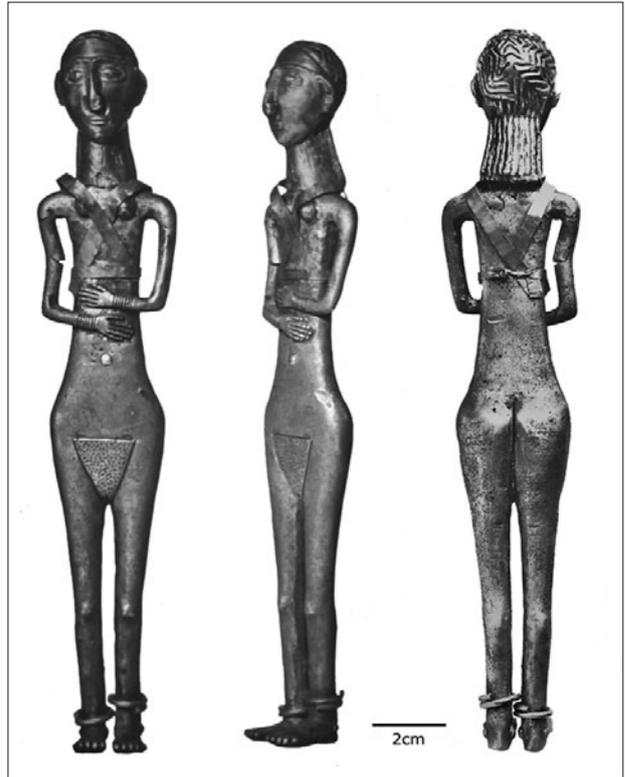


Fig. 2. The figurine from Hasanoğlan.



Fig. 3. The Hasanoğlan figurine: frontal view, detail.

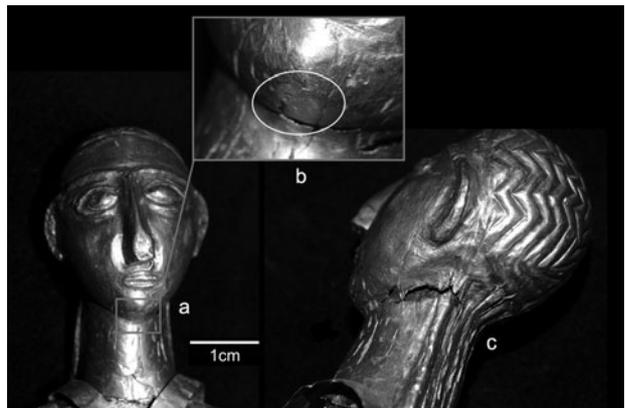


Fig. 4. The Hasanoğlan figurine: facial detail.



Fig. 5. The Hasanoğlan figurine: detail of ankles.

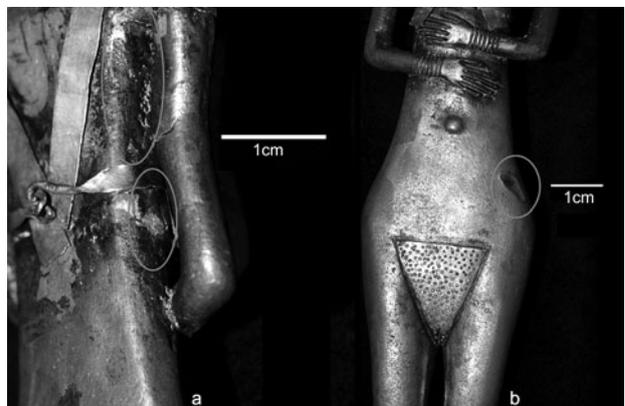


Fig. 6. The Hasanoğlan figurine: damage caused by electrochemical and, possibly, mechanical cleaning procedures.

tically. Both wrists are marked with seven parallel lines, probably imitating bracelets (fig. 3). The head and neck are plated with what appears to be a gold sheet, with the facial expression and hair rendered in minute detail (fig. 4a, 4c). Across the gold-plated breasts spreads a double diagonal golden sash combined with a horizontally running belt, interwoven at the back. The navel is pronounced and modelled in a bulging fashion; the feet are adorned with two gold miniature anklets (fig. 5). The head and parts of the right arm were broken off immediately after discovery, presumably in a coarse attempt to remove sticky soil from the figure’s surface (Dolunay 1960: 81). Of ancient date, however, is a crack in the gold appliqué right underneath the chin, which was repaired with a thin piece of gold foil (fig. 4b; Dolunay 1960: 81). Smaller scars and shallow indentations from minor casting imperfections are scattered over the figurine’s body. Although there are no specific records of such a procedure preserved in the museum archives (as for any minor or major conservation efforts), the whole body shows distinct traces of electro-chemical cleaning efforts, indicated by the light coloured blots caused by ammoniac treatment that are plainly visible on the figure’s feet, back and head (fig. 6a). A peculiar area of damage above the left hip, visible on the image of the figurine in the museum’s catalogue (Anatolian Civilisations 1983) but not mentioned in N. Dolunay’s 1960 report, likewise might be related to a modern electrolytic cleaning attempt. This cavity does not seem to have been caused by a sharp blow, since no displacement of material can be observed; the indentation

rather gives the impression of the surface having become molten, as if a soldering iron or an electrically-charged rod had been applied (fig. 6b).

The material of the figurine was declared to be silver with gold appliqué in the original publication (Dolunay 1960: 81); however, this assumption was based solely on naked-eye inspection.

Archaeometric analysis

Analyses were performed at the conservation laboratory of the Anatolian Civilisations Museum using an Innov-X hand-held x-ray fluorescence (P-XRF) spectrometer including instrumentation components such as a Peltier cooled PIN silicon x-ray detector (with energy resolution of 180 eV at Mn K α) and an Ag anode, side window and low-power, air-cooled x-ray tube.

In order to validate the accuracy of the P-XRF measurements, some reference materials were also analysed. The measured concentrations are listed in tables 1, 2 and 3, and show a high level of agreement with the certified values for most of the elements.

Seven measurements were taken from different parts of the body in order to establish a statistically sound idea of the elemental composition of the figurine itself and the applied ornamentations. The measurement recorded internally as P-XRF no. 72 aimed to target the right ankle of the figurine. However, the measuring instrument could not be placed evenly on the surface and the resulting gap of about 4mm caused an erroneous reading; this measurement has therefore been discarded from the results presented here.

Sample	Cu (%)		Au (%)		Ag (%)	
	C	M	C	M	C	M
ABSBL	5.37 ± 0.02	4.72 ± 0.08	89.98 ± 0.03	90.6 ± 0.6	4.65 ± 0.04	4.65 ± 0.1
ABKMF	12.46 ± 0.02	12.1 ± 0.12	58.57 ± 0.04	60.1 ± 0.3	28.97 ± 0.04	27.7 ± 0.2

Table 1. Compositional analysis of certified reference gold alloys. C: certified; M: measured.

Sample	Cu (%)		Pb (%)		Ag (%)	
	R	M	R	M	R	M
CNR141	7.66	8.9 ± 0.1	–	–	92.34	91.2 ± 0.3
CNR91	1.51	1.57 ± 0.04	1.24	2.2 ± 0.04	97.25	96.2 ± 0.3

Table 2. Compositional analysis of reference silver alloys. R: reference; M: measured.

	Pb (%)		Sn (%)		Zn (%)	
	C	M	C	M	C	M
CNR691						
A	7.9 ± 0.7	8.6 ± 0.2	7.16 ± 0.21	6.0 ± 0.1	6.02 ± 0.22	6.7 ± 0.1
D	9.2 ± 1.7	9.8 ± 0.2	10.1 ± 0.8	8.1 ± 0.1	0.148 ± 0.024	0.16 ± 0.02

Table 3. Compositional analysis of certified reference copper alloys. C: certified; M: measured.

The results given in table 4 show that the actual body of the figurine is made of silver; however, it is alloyed with a small but significant amount of copper. This result coincides with some of the values retrieved from a number of the statuettes from Alaca Höyük discussed below. The presence of copper might testify to recycled ore or a contaminated crucible. However, metalsmiths in Bronze Age Anatolia might have realised the hardening effect of copper when added to silver; a small amount suffices to improve the durability of the item being produced. Bismuth (Bi), however, coincides with silver as a natural phenomenon, and thus its presence has no significance whatsoever.

The tiny gold applications were rather difficult to target. On the one hand, the P-XRF detector was a little too large to pinpoint the miniature bracelets efficiently. On the other hand, the XRF beam penetrated the thin gold foil used for the sash and head, and merged the analysis data of the gold itself with the silver surface of the statuette underneath. One measurement taken from a gold appliqué does indeed show a high content of silver (about 23% by weight). This might not necessarily be the result of a ‘measurement mash’ of gold decoration and silver body, but actually testify to a silver-rich gold used for the ornamentation, as attested so far for *all* the gold-based objects retrieved from the Alaca Höyük burials (Yalçın 2011: 59).

Discussion

Archaeometrically and stylistically, the next of kin to the Hasanoğlan figurine are the six anthropomorphic figurines from the Alaca Höyük ‘royal’ burials, which were recently subject to new metallographic analysis (fig. 7; Yalçın, Yalçın 2013a; published identically in German as Yalçın, Yalçın 2013b; and with the same illustrations in Turkish as Yalçın 2012).

The ascription, due to stylistic considerations, to Alaca Höyük of another silver figurine with gold applications in the Boston Museum collection (Yalçın, Yalçın 2013b: 244) is by no means certain. Another comparable naturalistic, finely-executed figurine, with an apparently secure archaeological context, comes from the richly-equipped Early Bronze Age burial at Horoztepe (Özgüç, Akok 1958). That said, the ‘nursing mother’ theme displayed in this example

is unique amongst the figurines discussed here (Özgüç 1958) and some doubts about its original context remain since the burial had been partly looted and disturbed prior to archaeological excavation (Özgüç, Akok 1958). Ceremonial items in the shape of abstract and theriomorphic standards resembling those found in the tombs of Alaca Höyük are likewise known from Horoztepe (Özgüç, Akok 1958) and also Ballıbağ (Süel 1989) and Kalınkaya (Zimmermann 2007). The reliably documented burials from Alaca Höyük contain both types of standards together with a variety of figurines, strengthening the authenticity claim of the Horoztepe ‘nursing mother’.

In terms of their shape and manufacture, the six figurines from Alaca Höyük fall into a number of different categories. Two of the figurines (11702 and 8801) are made of silver with some traces of copper. One of them (11702), possibly the only male representation within the group (see below), was originally gilded. Two other figurines (8802 and 7025) are bronze items with applied gold fittings and traces of silver detected in the pubic region. The remaining two examples (7026 and 7027) are bronzes with considerably high amounts of alloyed tin and, in the case of 7026, lead.

Stylistically, none of the Alaca Höyük figurines exactly match our statuette from Hasanoğlan. Numbers 11702, 8801 and 8802 can be grouped together as partly schematised female figurines with characteristic crescent-shaped heads. The bow-like item originally attached to the back of 11702 (cf. Koşay 1938: 116, pl LXXXIX) led Ü. Yalçın to the assumption that a male – the only male within this group of six figurines – could be depicted here (Yalçın, Yalçın 2013a: 42). The body shape, however, with its pronounced hips, rather suggests another female representation and is perfectly comparable with figures 8801 and 8802. That aside, representations of females or female deities with weaponry are not an uncommon phenomenon in the Near East (cf. Lewis 2005: 74, fig. 4.5). The other statuettes are more deliberately modelled, with 7025 and 7026 being very different in terms of gesture, both holding a vessel in front of their breasts. Finally, figure 7027 sits somewhat awkwardly amongst its contemporaries, depicting a baby or young child with a pot belly and slit eyes.

<i>Analysis no.</i>	<i>Cu</i>	<i>Ag</i>	<i>Pb</i>	<i>Fe</i>	<i>As</i>	<i>Sn</i>	<i>Ni</i>	<i>Au</i>	<i>Zn</i>	<i>Bi</i>
1	2/6	94.5	0.46	–	–	–	–	0.52	–	1/8
2	2/3	94.5	0.26	–	–	–	–	0.51	–	2/2
3	1/6	96.2	0.27	–	–	–	–	–	–	1/1
4	2/8	93.9	0.38	0.64	–	–	–	0.5	0.43	1/2
5	–	22.9	–	–	–	–	–	77.0	–	–
6	–	23.2	–	–	–	–	–	76.7	–	–

Table 4. The Hasanoğlan figurine P-XRF analysis results.

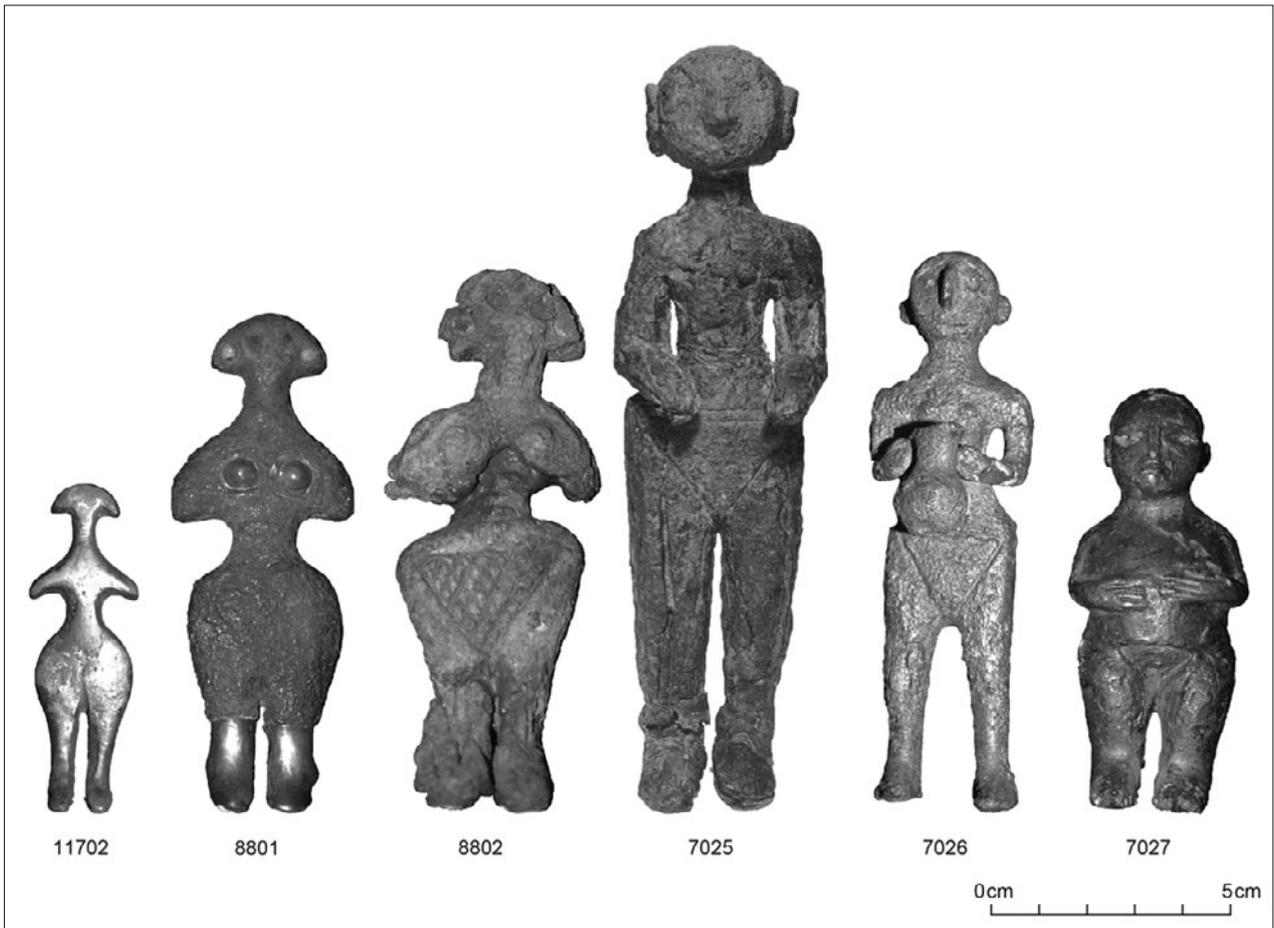


Fig. 7. Early Bronze Age figurines from the ‘royal’ burials of Alaca Höyük (after Yalçın 2013a).

However, a common feature that unites figures 8802, 7025, 7026 and 7027 with our Hasanoğlan statuette is the pronounced, oversized triangular pubic region with an indication of the vagina. Another conspicuous detail helps to establish a rough chronological framework around our Hasanoğlan figure; the double sash made of interwoven gold strips, not present on any of the other metal figures discussed here, is a very common design feature on abstracted Early Bronze Age clay or stone figurines (Aydingün 2006: 41, 42, 44, 48, figs 38, 40, 41–42, 46, with further literature). The miniature gold anklets adorning both feet have parallels amongst the broad range of jewellery items of the third millennium BC. Massive copper-based anklets with open ends are known as burial gifts, and have been retrieved, partly in situ, from several central Anatolian sites including the Early Bronze Age cemeteries of Kalınkaya-Toptaştepe (Zimmermann 2007: 19, fig. 10d–e) and Resuloğlu (Yıldırım 2006: 11, 12, fig. 17a).

A unique treatment, however, is the gold coating of the figurine’s head, with a thickness ranging from 0.5–0.8mm. Life-size counterparts of gold masks, which rose to prominence presumably as death masks in the Mycenaean world of the second millennium BC (cf. Müller-Karpe 1974: pls

222.1, 224.1–3; Burns 2010: 52–53, 92), are not known from Anatolian Early Bronze Age contexts. There are, however, gold appliqué reported from early second-millennium burials at Kültepe-Karum Kanesh, which covered the eyes and mouth of the deceased (Özgüç 2005: 224–27, fig. 280). To what extent the concept of a gilded face in mortuary contexts applies also to our Hasanoğlan figurine remains subject to debate. There is, however, a certain danger in labelling all the naturalistic metal figurines discussed here unequivocally as ‘goddesses’ or ‘female deities’ (cf. Yalçın, Yalçın 2013b: 258–59). Their presence in burials (valid for all the metal figurines from Alaca Höyük and also a reasonable possibility for the poorly documented Hasanoğlan figurine) might equally testify to high-ranking (female) individuals or worshipped ancestors. That said, the possibility of a ‘deifying’ facet should not necessarily be excluded (Yakar 2011).

In its archaeometrical dimension, our Hasanoğlan statuette fits well with the alloying traditions of third-millennium BC central Anatolia (Zimmermann, Yıldırım 2008; Zimmermann et al. 2009; Zimmermann 2012), underlining its authenticity. Conspicuous is the attested amount of copper, which is also present in the silver-based figurines

11702 and 8801 from Alaca Höyük (Yalçın, Yalçın 2013b: 249, table 1) and also in small-scale jewellery items from central Turkey (Zimmermann 2012: 305). Possible explanations for this phenomenon might be an attempt to ‘stretch’ the available silver or the use of partly recycled materials to cast these statuettes.

In any case, as a fine piece of art, the Hasanoğlan figurine remains one of the pinnacles of third-millennium workmanship, and provides another much-needed glimpse of Early Bronze Age metalworking traditions, which are still not fully understood.

References

- Anatolian Civilisations 1983: *Anatolian Civilisations I. Prehistoric/Hittite/Early Iron Age*. Istanbul, Turkish Ministry of Culture and Tourism
- Aydingün, Ş. 2006: ‘Urbanization, the invention of bronze and the sacred bodies of the Early Bronze Age’ in *Mysterious Women of the Bronze Age*. Istanbul, Turkish Ministry of Culture and Tourism: 29–80
- Burns, B.E. 2010: *Mycenaean Greece, Mediterranean Commerce, and the Formation of Identity*. Cambridge, Cambridge University Press
- Dolunay, N. 1960: ‘Hasanoğlan idolü’ *5. Türk Tarih Kongresi 1956*. Ankara, Türk Tarih Kurumu: 80–86
- Koşay, H.Z. 1938: *Alaca Höyük Hafriyatı. 1936 Daki Çalışmalara ve Keşiflere Ait İlk Rapor*. Ankara, Türk Tarih Kurumu
- Lewis, T.J. 2005: ‘Syro-Palestinian iconography and divine images’ in N.H. Walls (ed.), *Cult Image and Divine Representation in the Ancient Near East*. Boston, American Schools of Oriental Research: 69–107
- Müller-Karpe, H. 1974: *Handbuch der Vorgeschichte. Dritter Band Kupferzeit. Dritter Teilband Tafeln*. Munich, Beck
- Özgüç, T. 1958: ‘The statuette from Horoztepe’ *Anatolia/Anadolu* 3: 53–56
- 2005: *Kültepe Kaniş/Neşa*. Istanbul, Yapı Kredi Yayınları
- Özgüç, T., Akok, M. 1958: *Horoztepe. Eski Tunç Devri Mezarlığı ve İskân Yeri/An Early Bronze Age Settlement and Cemetery*. Ankara, Türk Tarih Kurumu
- Süel, M. 1989: ‘Balıbağ/1988 kurtarma kazısı’ *Türk Arkeoloji Dergisi* 28: 145–63
- Yakar, J. 2011: ‘Presumed social identity of the occupants of late third millennium BC Alacahöyük and Horoztepe “Royal Tombs”’ *Journal of Archaeomythology* 7: 1–8
- Yalçın, Ü. 2011: ‘Alacahöyük İlk Tunç Çağı kral mezarları üzerine’ in 1. *Çorum Kazı ve Araştırmalar Sempozyumu*. Çorum, T.C. Çorum Valiliği: 55–64
- 2012: ‘Alacahöyük iç kral mezarları üzerine II. İdoller’ in 2. *Çorum Kazı ve Araştırmalar Sempozyumu*. Çorum, T.C. Çorum Valiliği: 111–22
- Yalçın, Ü., Yalçın, H.G. 2013a: ‘Reassessing anthropomorphic metal figurines of Alaca Höyük, Anatolia’ *Near Eastern Archaeology* 76: 38–49. <http://dx.doi.org/10.5615/neareastarch.76.1.0038>
- 2013b: ‘Anthropomorphe Metallfigurinen aus Alaca Höyük, Anatolien’ *Das Altertum* 58: 241–62
- Yıldırım, T. 2006: ‘An Early Bronze Age cemetery at Resuloğlu, near Uğurludağ, Çorum. A preliminary report of the archaeological work carried out between years 2003–2005’ *Anatolia Antiqua* 14: 1–14. <http://dx.doi.org/10.3406/anata.2006.1061>
- Zimmermann, T. 2007: ‘Kalinkaya-Toptaştepe, eine chalkolithisch-frühbronzezeitliche Siedlung mit Nekropole im nördlichen Zentralanatolien: Die Grabfunde der Kampagnen von 1971 und 1973’ *Istanbul Mitteilungen* 57: 7–26
- 2012: ‘Lapanu-let (it) glow! Recent archaeometric analyses of Hittite and Hittite metalwork’ in R. Matthews, J. Curtis (eds), *Proceedings of the Seventh International Congress on the Archaeology of the Ancient Near East, 12 April – 16 April 2010, the British Museum and UCL, London*. Wiesbaden, Harrassowitz: 303–12
- Zimmermann, T., Yıldırım, T. 2008: ‘Three best to have in plenty – Rethinking central Anatolian Early Bronze Age alloying traditions’ in Ü. Yalçın, H. Özbal, A.G. Paşamehmetoğlu (eds), *Ancient Mining in Turkey and the Eastern Mediterranean*. Ankara, Atılım University: 87–97
- Zimmermann, T., Yıldırım, T., Özen, L., Zararsız, A. 2009: ‘“All that glitters is not gold, nor all that sparkles silver” – fresh archaeometrical data for central Anatolian Early Bronze Age metalwork’ *Antiquity Project Gallery* 83.321: <http://antiquity.ac.uk/projgall/zimmerman321/>

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