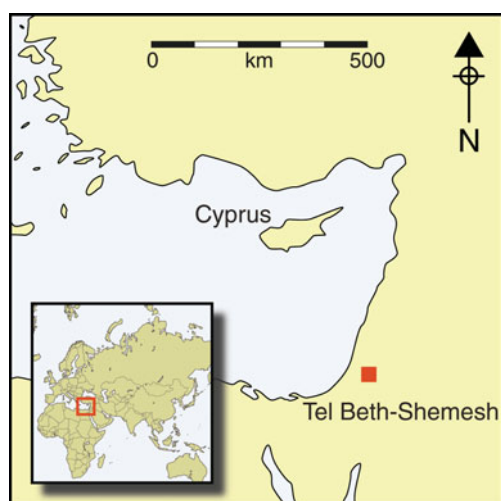


Opium or oil? Late Bronze Age Cypriot Base Ring juglets and international trade revisited

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The Base Ring juglets of Late Bronze Age Cyprus have long been associated with opium due to their hypothetical resemblance to inverted poppy heads. Analysis of organic residues on Base Ring juglets from Cyprus and Israel, however, showed no trace of opium; instead, the vessels had contained a variety of perfumed oils. The analytical results are supported by textual evidence attesting to a lively trade across the eastern Mediterranean in aromatic substances and compounds, rather than in opium. The poppy-head shape of the Base Ring juglets was not a reference to their contents.

Keywords: Cyprus, Tel Beth-Shemesh, Late Bronze Age, opium, oil, Base Ring juglet, organic residue analysis, trade

Introduction

In 1962, Robert S. Merrillees, a research student who would become a prominent figure in Cypriot archaeology, published, in *Antiquity*, an article intriguingly entitled ‘Opium trade in the Bronze Age Levant’. In his brief yet thought-provoking essay, Merrillees raised the hypothesis that Cypriot Base Ring juglets (Figure 1), traded extensively over the eastern Mediterranean during the Late Bronze Age, were deliberately shaped and decorated like the incised head of an opium poppy (*Papaver somniferum* L.) so as to advertise their contents—diluted opium sap (a hypothesis reiterated and amplified in Merrillees 1968: 154–61; 1974: 32–36; 1979: 169–70, 1989: 150–54).

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Figure 1. Base Ring I juglets from the Late Bronze IIA (fourteenth century BC) Canaanite 'palace' at Tel Beth-Shemesh (photograph: Studio M. Fishbain).

This appealing idea spread widely within the archaeological literature of the eastern Mediterranean and Europe (for typical examples, see e.g. Sherratt 1991: 56; Collard 2008), and even percolated into other disciplines (e.g. Kritikos & Papadaki 1967; Merlin 1984: 251–60). Moreover, Kritikos and Papadaki (1967: 33) suggested that Late Cypriot jugs of Bucchero Ware were also modelled on the opium-poppy capsule, a proposal that was readily embraced by Merrillees (1979: 169). Critical scholars were, however, reluctant to see Cyprus as the “center of the drug world of the Late Bronze Age” (Muhly 1996: 50), and either ignored Merrillees’s hypothesis or emphatically rejected it (e.g. Gittlen 1981: 55; Muhly 1982: 253–54; 1986: 46–47; 1996: 50–52, and references therein). Still others raised grave reservations concerning its unconditional adoption (e.g. Knapp 1991: 23–25; Steel 2004a: 170).

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Notably, neither in his original article nor in the essays that followed did Merrillees provide any direct textual or archaeobotanical evidence for Cypriot Late Bronze Age trade in opium. Also missing from his studies are systematic and verifiable chemical analyses of Base Ring juglets from secure contexts (see below). Nevertheless, the fascinating connection he created between the graceful Base Ring juglets and a well-known drug gained such popularity as to become a factoid. A factoid, Merrillees himself reminds us, “is something accepted as factual simply because it has repeatedly appeared in print” (2005: 36–37; see also Maier 1985: 32; 1986: 311).

We were prompted to revisit Merrillees’s well-entrenched hypothesis by the results of organic residue analysis conducted at the University of Albany on Base Ring I juglets, which we recently excavated in a Late Bronze IIA (fourteenth century BC) Canaanite ‘palace’ at Tel Beth-Shemesh, Israel, and on additional samples of Base Ring juglets and jugs from Cyprus (Chovanec 2013; Chovanec *et al.* 2015). As no opium was detected in these samples, it seems timely, after half a century, to reassess the basic tenets of Merrillees’s hypothesis.

Base Ring juglets and organic residue analysis

Originally, Merrillees’s hypothesis lacked analytical support because early claims for opium content in a couple of Base Ring juglets from Late Bronze Age (New Kingdom) Egyptian burial contexts could not be verified (Merrillees 1968: 157, with references therein; 1974: 34). More recent residue analysis initiated by Merrillees (1989) on two further examples from Tell el-Ajjul and from an unknown provenance reported the finding of opium (Evans 1989; the analysis of a third candidate—a Bucchero jug from Kouklia, Cyprus—detected only olive oil); the results were, however, criticised for their vague methodological basis and considered inconclusive (Koschel 1996: 160; Chovanec *et al.* 2012: 14). It seems, therefore, that the only viable evidence for opium in an unprovenanced Base Ring juglet (supposedly from Egypt) was presented by Koschel (1996). Notably, both Koschel (1996: 161) and Bisset *et al.* (1996: 203–204) warn against the use of this single analysis as vindication of Merrillees’s hypothesis because, in their opinion, many more analyses of the contents of Base Ring juglets from secure provenances are required to support it satisfactorily.

In acknowledgement of the fact that organic remains, including residues, degrade over time, an artificial ageing study was undertaken by Sean Rafferty and Zuzana Chovanec at the State University of New York at Albany. The goal of this study was to document the long-term behaviour of opium alkaloids and to identify the chemical constituents that are most likely to be preserved in archaeological contexts (for a detailed discussion, see Chovanec *et al.* 2012). This degradation study identified the molecular ions of six opium alkaloids that could be targeted to detect these compounds in other studies.

These insights were recently applied to organic residue analysis conducted on three Base Ring I juglets from a primary context—a Late Bronze Age IIA (fourteenth century BC) Canaanite ‘palace’ recently discovered at the renewed excavations at Tel Beth-Shemesh, Israel (Figure 1), and 14 samples of Base Ring I–II jugs and juglets from various sites in Cyprus (Chovanec 2013; Chovanec *et al.* 2015).

The results of the residue analysis are illuminating: none of the vessels examined showed any signs of opium content. Rather, they contained aromatic oils. The origin of the oil is

unclear, but in the juglets from Tel Beth-Shemesh it was infused with mint and thujone, and with mint, wood turpentine, wormwood, lavender, sage and rosemary in the vessels from Episkopi. A juglet from Enkomi contained unidentified oil, and another, from Dhali, unidentified plant oil. These mixtures of perfumed oil could have been used for a range of purposes: externally, for cosmetics or ritual anointing, and, due to their taste and health benefits, also internally, for culinary or medicinal purposes.

Cypriot trade in opium? The textual evidence

Merrillees's suggestion that the ubiquitous Late Cypriot Base Ring juglets were shaped like a poppy capsule so as to proclaim their contents at a single glance (i.e. opium) is based on his general assumption that the substance contained in the self-advertising vessels must have been of commercial value (for a negation of the analogy between the juglets and the opium poppy pod, and an alternative view of the origin of their shape, see Gittlen 1981: 55). He therefore tried to demonstrate that opium is frequently mentioned in Egyptian, Assyrian, Greek and Roman writings (Merrillees 1962: 288–89).

It is difficult to see how general references to opium can support the claim for specialised Cypriot trade in this material, especially when some of these citations turned out to be an outcome of misinterpretation (Krikorian 1975), and others are late and irrelevant to the Late Bronze Age. Indeed, Merrillees's (1979: 169) wholehearted acceptance of Krikorian's emphatic disproving of the data allegedly attesting to Mesopotamian acquaintance with the opium poppy and its drug concurs with current scholarly opinion that there is not a single reference to opium in cuneiform texts in the entire Near East. The same conclusion applies to Egyptian texts from the second millennium BC (Muhly 1982: 253; 1996: 50–52). Moreover, Merrillees's references to Egyptian cultivation of the opium poppy come from much later periods (e.g. Ptolemaic, third century BC), and concerned not opium but poppy seed oil. In fact, opium is missing from all Classical literature down to the beginning of the Christian era (Muhly 1996: 51 and references therein).

Merrillees's heavy reliance on circumstantial and late textual evidence to substantiate his hypothesis brings into relief the main shortcoming of his argument: it completely disregards Late Bronze Age texts, from which we can glean information about the character and constituents of Cypriot trade with the Levant. Apparently, this major lacuna reflects Merrillees's long-lasting opposition to the identification of Cyprus with Alashiya of the Near Eastern texts from the second millennium BC (Merrillees 1972, 1987, 2005). Indeed, he continues to maintain this uncompromising stance (Merrillees 2011) even in the face of recent petrographic and chemical analyses conducted on a number of cuneiform tablets sent from Alashiya to Egypt (Amarna) and Ugarit, which indicate that the tablets were made of clays originating from the southern foothills of the Cypriot Troodos Mountains (Goren *et al.* 2003, 2004). These analyses further support the conclusion, reached already by other scholars, that Alashiya is to be identified with Cyprus, based on the integration of archaeological, archaeometallurgical and documentary data (Muhly 1972, 1989; Knapp 1996, 2008: 298–347, 2011; Lebrun 2004; Peltenburg 2012: 1). We therefore subscribe to this identification and agree with Knapp (2011: 250) that it is up to sceptics to present an alternative location for Alashiya that is as convincing as Cyprus.

So, what can be gleaned from the Alashiya documents about the alleged Late Bronze Cypriot trade in opium?

The Amarna letters

Eight Akkadian cuneiform letters found at the Tell el-Amarna archive in Egypt (el-Amarna (EA) tablets 33–40) were sent from the king of Alashiya and his governor/senior prefect to the court of Pharaoh Amenhotep IV (Akhenaten) (Moran 1992; Cochavi-Rainey 2003; for the meaning of ‘king’ and ‘senior prefect’ in the socio-political organisation of Late Bronze Age Cyprus, see Peltenburg 2012; Knapp 2013: 432–47; Singer & Gestoso Singer 2014: 321, no. 16, and earlier literature therein). The letters attest to an extensive exchange of royal gifts between the two political powers, mainly of large shipments (up to 14 tonnes) of copper from Alashiya to Egypt (Knapp 2008: 308–10, 2011). In addition to copper, the Egyptian ruler received from Alashiya diverse items such as a donkey hide (EA 34), timber (EA 35), horses (EA 37), ivory and ship’s beams (EA 40).

It should be emphasised that the Alashiyan letters are devoid of any reference to opium or its derivatives. On the other hand, the king of Alashiya sent to his ‘brother’, the king of Egypt, a jar full of aromatic oil (Ì DÙG = *šamnutābu*; Moran 1992: 35, no. 9; CAD 19, 2006: 22) to anoint his head, and similar jars (also containing scented oil?) that apparently were not available in the pharaoh’s country (EA 34). Special kinds of oil from Alashiya are also referred to in a list of ‘international’ speciality oils used to anoint the army and chariotry of a Nineteenth Dynasty pharaoh, probably Seti II (Papyrus Anastasi IV; Ockinga 1996: 48; for the Egyptians’ insatiable demand for high-quality and scented oils, mainly for anointing, see Leonard 1981: 96; Kelder 2009; for its possible ideological background, see Hulin 2009).

Hittite sources

The political reality behind two centuries (c. 1400–1200 BC) of documented Hittite relations with Alashiya is still enigmatic, especially because the archaeological evidence for these relations is disappointingly meagre. Nevertheless, the Hittite sources do shed some light on Alashiyan products that found their way to Hatti (Lebrun 2004; de Martino 2008; Knapp 2008: 315–16, 327–35). Of particular interest to our discussion is the famous text of Šuppiluliuma II (late thirteenth century BC), in which he recounts the conquest and subjugation of Alashiya by his father Tuthaliya IV (Beckman 1996; de Martino 2008: 248 and references therein).

The tribute imposed both on the king and the governor/senior prefect of Alashiya included, among others, a relatively small quantity (about 34l) of *gayyātum*. Although *gayyātum* is known from second- and first-millennium Mesopotamian texts as some kind of cereal-like plant, its identification is difficult. The quantity of *gayyātum* in the Alashiyan tribute to Hatti hints that it could not have been a banal variety of cereal but rather a rare and valuable commodity, presumably a specialty of Alashiya/Cyprus (Singer & Gestoso Singer 2014: 321–22). Indeed, it was suggested—undoubtedly under the impact of Merrillees’s influential hypothesis—that the *gayyātum* from Alashiya should be identified as opium (Vincentelli 1976: 27).

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This unsubstantiated idea has recently been refuted and replaced by a far more convincing identification. In a scholarly *tour de force*, Singer and Gestoso Singer (2014: 321–28) have demonstrated that both phonetically and semantically Akkadian *gayyātum* equals Egyptian *gjt/gjw*, a plant positively identified with the grass known as cyperus (nutsedge), which the Egyptians used in the preparation of various medical remedies and perfumes. Cyperus is also attested in the Mycenaean Linear B tablets as *kuparo*, used as an ingredient in the Mycenaean perfumed oil industry (according to Karageorghis (1996: 64–65), it might have been imported from Cyprus). This instructive information led Singer and Gestoso Singer (2014: 327–28) to suggest that the *gayyātum* in the tribute list of Alashiya was some kind of perfumed oil, unguent or incense named after one of its ingredients: cyperus.

Discussion

It is quite surprising that despite the hypothetical nature of Merrillees's (1962) suggestion that Late Cypriot Base Ring juglets were opium containers, neither he nor his critics initiated systematic scientific analysis of these vessels. This odd situation, which lasted for about half a century, has been partially amended now by the residue analysis of Base Ring juglets from Tel Beth-Shemesh and Cyprus presented above. Aimed especially at identifying opium alkaloids, the analysis indicated categorically that the vessels examined did not contain opium. Moreover, the scientific evidence demonstrates that Base Ring juglets found in different parts of the eastern Mediterranean (the southern Levant and Cyprus) all held the same kind of substance—aromatic oils.

The analytical findings concerning the contents of the Cypriot Base Ring juglets are supplemented and enhanced by the results of archaeometric investigation of the provenance and contents of another celebrated class of Late Cypriot pottery—Red Lustrous Wheelmade ware (best known for its spindle bottles, lentoid or ‘pilgrim’ flasks, and arm-shaped vessels or ‘libation arms’)—from seven sites in Anatolia, Cyprus and Egypt (Knappet *et al.* 2005). The residue analysis suggests that the Red Lustrous Wheelmade ware might have been used to carry some kind of plant oil, possibly perfumed. The fabric analysis showed the ware to be extremely homogeneous, indicative of a single source—northern Cyprus—although the possibility of other source areas, such as the southern Anatolian coast, was not entirely ruled out. Notably, however, a Cypriot source for the Red Lustrous Wheelmade ware is now emphatically claimed by another provenance study of these ceramics (Grave *et al.* 2014).

In light of the above science-based investigations, it is apparent that in the Late Bronze Age, a variety of Cypriot closed-pottery vessels containing aromatic oils were distributed within the island and abroad. This conclusion is substantiated by the contemporaneous written sources that lack any hint of an opium trade but are replete with references to transactions involving aromatic oils and ingredients for their production (see e.g. Leonard 1981: 96; Knapp 1991; Karageorghis 1996: 64–65); the texts make clear that Alashiya/Cyprus took part in this lively exchange.

An interesting aspect of the aromatic oil exchange in the Late Bronze Age international diplomatic and commercial network of the eastern Mediterranean is its seemingly ‘irrational’ character. Although the king of Alashiya sent jars with aromatic oil to the pharaoh, he asked for a similar consignment to be sent from Egypt back to him (see EA 34 & 35).

Deliberating over the economic ‘irrationality’ characteristic of the Amarna Age trade, Liverani (1979: 21–33) argued that it cannot be understood in purely economic terms, but only as a social phenomenon involving both economic and non-economic factors (political, psychological and so on), and conditioned by customary ideological schemes that transcended the economic aspect.

It seems, however, that the irrational element in the exchange of aromatic oils during the Amarna Age can be easily explained by suggesting that under the generic textual term ‘aromatic oil’, a great variety of aromatic and medicinal compounds were traded—just as revealed by residue analysis. Thus, in the aforementioned Amarna transaction (EA 34), the king of Alashiya sent a jar full of aromatic oil for anointing to his counterpart in Egypt, and 17 similar jars “that are not available [in your country]” (Moran 1992: 106). One may assume that the aromatic oil he received in exchange was of a different kind than had been delivered to the pharaoh.

Greater discussion of the intricate Late Bronze Age trade in scented oils is beyond the scope of the present essay, yet it should be remembered that in the fourteenth and thirteenth centuries BC, the Mycenaeans joined the market and flooded Cyprus and the Levant with their pottery (for the patterns of this trade, see Dabney 2007; Papadimitriou 2013, and references therein). A combined study of the morphology of Mycenaean pottery from the Levant and the Linear B textual evidence led Leonard (1981: 91–96) to suggest that the closed vessels in the repertoire of Mycenaean imports served as containers for two types of scented oils: thick (unguent) and easily poured (for a similar conclusion concerning the Mycenaean pottery in Cyprus, see Steel 2004b: 72–73).

Furthermore, Leonard (1981: 98–100) tried to learn from the Linear B texts about the ingredients of the Mycenaean aromatic oils in order to determine the distinctive qualities that enabled them to compete successfully in a pre-existing market of perfumed oils. The scents he identified—coriander, cyperus (presumably of Cypriot origin (Karageorghis 1996: 64–65)), and especially sage and rose, which he considered unique to the Aegean oils and unguents—are indeed hardly represented or missing completely from the aromatic oils in the Base Ring jugs and juglets examined.

The picture emerging from the above discussion is of a complex network of local and international trade in aromatic oils that spread across the eastern Mediterranean during the Late Bronze Age. Residue analysis and textual evidence hint at regional specialisation in certain brands of scented oils, presumably to secure specific segments of a highly competitive market (cf. Steel 2013: 138). Although additional analysis and study are desired for a better understanding of this market, it is already apparent that the delicate Base Ring juglets with their aromatic contents are faithful representatives of successful Cypriot involvement.

Conclusions

More than 50 years after Robert Merrillees (1962) introduced his intriguing hypothesis that Late Cypriot Base Ring juglets containing opium were traded across the eastern Mediterranean, residue analysis of Base Ring juglets from Tel Beth-Shemesh, Israel and Cyprus casts grave doubts on this popular idea. Rather than opium, the juglets were found to have contained a variety of aromatic oils that could be used for anointing or medicinal

purposes. These finds are supported by Late Bronze Age textual evidence that is completely unaware of opium consumption, and yet attests to Cypriot transactions of scented oils as part of the period's lively trade in aromatic substances and compounds.

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