

# The Archaeology of Wine in the Southern Caucasus

## New Methods for an Old Tradition

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**Abstract** The Southern Caucasus belongs to the core area where viticulture and wine production first developed in the Neolithic period (sixth millennium BC). Since then wine occupied, and still continues to occupy, a central role in the local cultures, as part of the subsistence economy, a focus of ritualised consumption and a source of visual symbols. Archaeology provides ample material evidence of this tradition and of its continuity/development, in particular from the territory of Georgia: wine production installations, areas for storage, consumption and deposition, specialised tools and vessels, wine-related iconography, etc. The article presents a selection of the different categories of evidence and focuses on the new results obtained on the 'Archaeology of Wine' in the region through a multidisciplinary approach and with the help of bioarchaeology and 'archaeological science'.

**Keywords** Georgia. Southern Caucasus. Viticulture. Bioarchaeology. Wine culture.

**Summary** 1 Introduction. – 2 The Origins of Wine and Viticulture. – 3 Wine Culture in the Southern Caucasus from the Chalcolithic to the Late Second Millennium BC. – 4 From the First Millennium BC to the Late Antiquity: Wine Culture at the Crossroads Between East and West. – 5 Epilogue: A Still Living Tradition.

## 1 Introduction

The Southern Caucasus belongs to the ‘core’ area where viticulture and wine production first developed during the late Neolithic period (sixth millennium BC). It is not surprising, therefore, that the ‘Archaeology of Wine’ has recently become a popular topic of investigation in this region. In Georgia, in particular, in the course of the last 10 years, wide-scale international interdisciplinary research on the subject has been promoted, among others, by the National Wine Agency of Georgia and the Georgian National Museum under the general framework of “Research and Popularization of Georgian Grape and Wine Culture”.<sup>1</sup> This effort resulted not only in a large number of scientific publications, but also in international exhibitions, such as “Georgia. The Cradle of Viticulture” at *La cité du Vin* in Bordeaux in 2017,<sup>2</sup> and “Gold und Wein. Georgiens älteste Schätze” in Frankfurt in 2018.<sup>3</sup>

This essay offers a quick overview of this recent research by presenting a series of different case studies. Its aims are on the one side to sketch a history of wine and viticulture in the region and, on the other one, to highlight the multidisciplinary nature of the ‘Archaeology of wine’. Following the pioneering work of Patrick E. McGovern,<sup>4</sup> this has indeed developed into a complex research field which involves different sources, data and methods, and therefore requires a close collaboration between scholars belonging to very different fields: archaeologists, bioarchaeologists, historians, art historians, cultural anthropologists, experts of ‘archaeological sciences’, but also geologists, climatologists, enologists, DNA experts and specialists of other disciplines.

## 2 The Origins of Wine and Viticulture

A first, important topic of research has been the origin of viticulture and wine. In the first figure, one can appreciate a map of the Ancient Near East showing the distribution of modern wild grapevine (*Vitis vinifera* subsp. *silvestris*) [fig. 1]. Presently, the oldest evidence of winemaking in the region dates back to the pottery Neolithic period and derives from two different areas: the Southern Caucasus

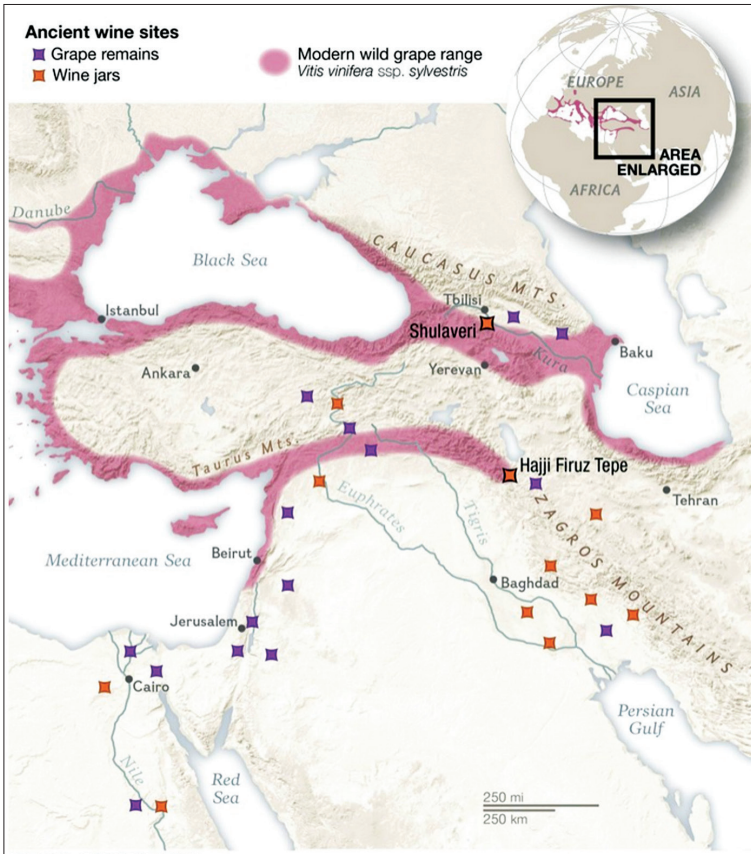
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1 Maghradze et al. 2016; 2019; McGovern et al. 2017. Part of this wider effort is, for instance, the GRAPE project, a Georgian-Canadian cooperative effort by the University of Toronto and the Georgian National Museum focusing on Neolithic sites in the Kvemo Kartli region of Georgia (Batiuk et al. 2017; 2019).

2 Lordkipanidze 2017.

3 Giensch, Hansen 2018.

4 McGovern 2003; 2009; McGovern, Fleming, Katz 1995.



**Figure 1** Map of the Ancient Near East showing the distribution of modern wild grapevine (*Vitis vinifera* subsp. *sylvestris*) with location of sites with evidence for ancient wine and viticulture. From Salopek 2015. NG Maps, Andrew Umentum. Source: University of Pennsylvania Museum of Archaeology and Anthropology

(different sites of the so-called Shulaveri-Shomu culture) and the Zagros Mountains of northwestern Iran (Haji Firuz Tepe).<sup>5</sup> To date, the earliest absolute dates (first half of the sixth millennium, c. 6000-5800 cal. BC) come from Georgia,<sup>6</sup> but the infusion of new data may well change the picture in the future, as it seems probable that by this time wine was already known over a relatively wide area.

Sites like Shulaveris Gora, Gadakhrili Gora and Khramis Didi Gora in Georgia yielded multiple relevant data, which will be presented in decreasing order of certainty. Conclusive evidence is provided by

<sup>5</sup> McGovern et al. 1997.

<sup>6</sup> McGovern et al. 2017.

chemical analyses of ancient organic compounds absorbed into the fabric of pottery vessels (biomolecular archaeological evidence). In fact, several sherds from these sites proved positive for tartaric acid, a clear mark for the original presence of wine by a combination of chemical techniques, including Fourier-transform infrared spectrometry (FTIR), gas chromatography-mass spectrometry (GC-MS), and especially liquid chromatography linear ion trap/orbitrap mass spectrometry (LC-MS-MS).<sup>7</sup>

Secondly, the presence of pollen of *Vitis vinifera L.* and of accompanying weeds was detected on samples taken from both pottery vessels and from contemporary sediments. In the case of samples from pots, a use as wine containers is suggested not only by the mere presence of grape pollen, but also by the fact that pollen grains are perfectly preserved, because alcohol inhibits the multiplication of microbes and fungi, which consequently cannot alter and destroy the pollen grains. Vine starch, microscopic cells of vine cane and hairs of fruit flies (*Drosophila melanogaster*), which is attracted by sugar and alcohol, were also found in the same samples. Pollen grains of *Vitis* were also found on the floors of dwellings, and in all pits and storage areas, suggesting that vineyards were present in the close neighbourhood.<sup>8</sup>

Clear paleobotanical evidence for the domestic variety of wine, on the contrary, is still missing. In fact, for instance, some fossilised pips allegedly collected from domestic contexts at Dangreuli Gora, another Georgian site of the Shulaveri Shomu culture in Georgia, which based on their morphological and ampelographical properties had been attributed to the cultivated variety of grapevine (*Vitis vinifera sativa Linnei*),<sup>9</sup> after being submitted to radiometric dating turned out to be of modern date and therefore intrusive, whereas the morphology of single pips from contemporary settlements in Azerbaijan is still uncertain.<sup>10</sup> This opens up the possibility that in this period wine was made from wild grapes, a practice which was still relatively widespread in recent times.<sup>11</sup>

Another promising line of research, which is still in its beginning and whose results are still very preliminary, is DNA analysis of ancient grape seeds and plant remains from Georgia and the Southern Caucasus, to evaluate them against modern wild and domesticated European

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<sup>7</sup> McGovern et al. 2017, E10311-E10315.

<sup>8</sup> Kvavadze, Jalabadze, Shakulashvili 2010; McGovern et al. 2017, E10315.

<sup>9</sup> Rusishvili 2010, 12-15.

<sup>10</sup> McGovern et al. 2017, E10315; Bouby et al. 2020. Indeed, much caution is needed when analysing isolated seeds from archaeological contexts, as these can easily be transported by rodents and other animals and therefore move from one layer to other.

<sup>11</sup> Chkhartishvili, Maghradze 2012; Maghradze et al. 2019; Maghradze et al. 2021; Bouby et al. 2020.



**Figure 2** Vessel from Khramis Didi Gora with decoration possibly depicting grape clusters.  
From McGovern et al. 2017, fig. 2A

varieties and establish their taxonomic relationships, in order to reconstruct more precisely the process of grape domestication and the subsequent spreading of its cultivation around the Mediterranean basin.<sup>12</sup>

Finally, it was also possible to mobilise additional data which, in spite of providing less certain evidence, can help integrating the general picture of the origins of wine. It may be observed, for instance, that the vessels which residue and palynological analysis proved to have contained wine are closed vessels, usually of hole-mouth shape. It may then be supposed that other vessels of the same shape were also used for the same purpose (morphotypological evidence). It has also been supposed that some decorations, like the one on a famous vessel from Khramis Didi Gora [fig. 2], featuring groups of dots in relief, which are common on Shulaveri Shomu closed vessels, represent

<sup>12</sup> Maghradze et al. 2016, 3-4, 6-7; Maghradze et al. 2019, 3, 6-7; Bouby et al. 2020.

stylised grape bunches<sup>13</sup> and that this and other contemporary iconography may show that grapes and wine were already imbued, like in all following periods, with a deep symbolic meaning.<sup>14</sup>

### **3 Wine Culture in the Southern Caucasus from the Chalcolithic to the Late Second Millennium BC**

Once created, the tradition of wine-making firmly established itself in the region during the following periods, probably helped by the particularly favourable climatic conditions created by the mild climate of the so-called 'Holocene climatic optimum' when, for instance, the total surface, in Georgia, of land where viticulture can be successfully practised reached a maximum, allowing cultivation at higher altitudes than in present days.<sup>15</sup>

During the following Chalcolithic period (c. 5000-3500 BC) direct evidence from Georgia is scanty, but it is compensated by an exceptional discovery from the neighbouring country, Armenia, more precisely from Areni-1, one of a complex of caves in the province of Vayots Dzor.<sup>16</sup> Here, the lower Chalcolithic level, which is <sup>14</sup>C dated between 4223 and 3790 cal BC, yielded an installation consisting of a shallow clay basin with raised edges, the centre of which was occupied by the mouth of a large jar, surrounded by large storage jars [fig. 3]. This has been interpreted as a grape crushing basin, where grapes would have been pressed on the plastered surface of the basin with the juice flowing into the mouth of the jar in the centre of the installation, where it was left to ferment, while secondary fermentation may have taken place in the neighbouring jars. Desiccated grapes, grape seeds (apparently of an intermediary form between wild and domestic) and skins still attached to pedicels, and grape rachises (stems) were also found in close proximity. Chemical evidence by LC-MS-MS proved the presence of tartaric acid/tartrate and of the red pigment malvidin, also typical, although not exclusively, of red wine, as it is for instance found also in pomegranate juice.<sup>17</sup> Wine production at the site may have been associated with ritual activities, as shown by the presence, in the same excavation trench, of three burials of human heads, clearly severed after death from the body, each in spherical receptacles made of unbaked clay.<sup>18</sup>

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**13** McGovern et al. 2017, E10312.

**14** See, for instance, Lordkipanidze 2017, 30.

**15** Maghradze et al. 2016, 7-8, figs 4-7.

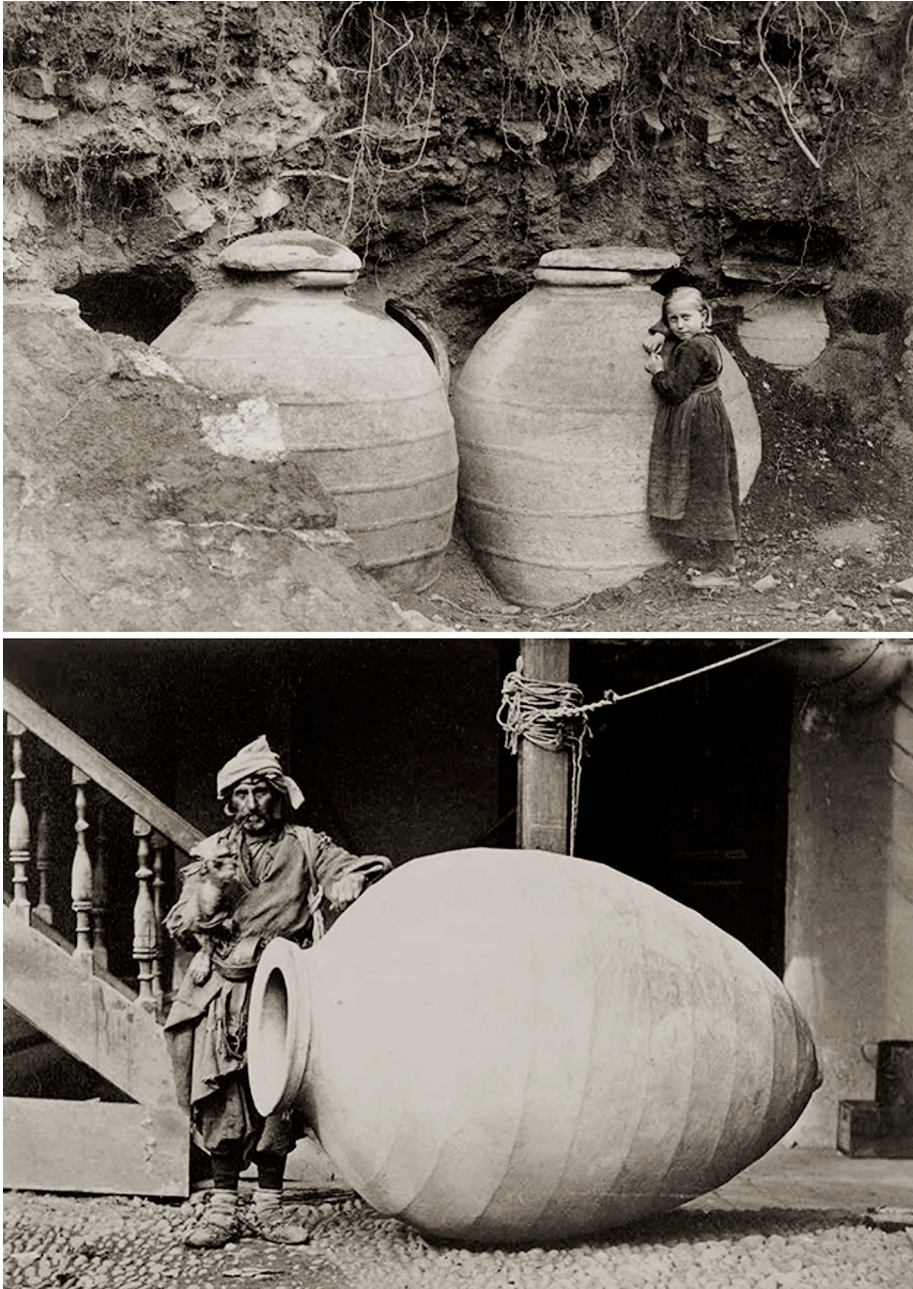
**16** Areshian et al. 2011; Areshian et al. 2012; Wilkinson et al. 2012.

**17** Barnard et al. 2011.

**18** Areshian et al. 2012; Wilkinson et al. 2012.



**Figure 3** View (above) and plan (below) of the Chalcolithic grape-pressing installation and associated burials in Trench A at Areni-1 (Armenia). From Areshian et al. 2012, fig. 7; Wilkinson et al. 2012, fig. 3B



**Figure 4** Nineteenth century AD photos by Dimitri Ermankov (1846 – 1916) of Georgian *qvevris*.  
From Lordkipanidze 2017, 12; 76



Wine fermentation in large underground jars, of which we may have here one of the first examples, was a common practice, by the first millennium BC, all over the Near East and throughout the Mediterranean. Since then, it has continued in Georgia, where this process of wine making in so-called *qvevris* has been preserved in its original form up to the present day and has accordingly been listed in the UNESCO's representative list of Intangible Cultural Heritage of Humanity [fig. 4]. Wine-making in *qvevris* was connected with religious beliefs through cult and ritual practices: until recently, for instance, there was a special *qvevri* (the so-called 'qvevri for communion wine') in the wine cellar of every wine-making villager in Georgia, which was used for keeping the wine to be consumed during the festival of the patron saint of the village (or region). If the family moved from the village, it had to leave this *qvevri* at the local sanctuary. Even today in Kakheti such *qvevris* are found in many old village churches.<sup>19</sup>

Even in the absence of unequivocal evidence of residues of wine on pottery vessels,<sup>20</sup> much data suggests that the practice of viticulture was widespread in the Southern Caucasus by the Early Bronze Age (late fourth/third millennium BC). For instance, pollen of *Vitis vinifera* and plants associated with vineyards are commonly found in palynological samples from archaeological contexts of this period.<sup>21</sup> It has even been suggested by Stephen Batiuk<sup>22</sup> that wine culture was an important element in the identity of the bearers of the Kura-Araxes culture, a cultural complex of south-Caucasian origin which by the beginning of the third millennium BC occupied vast areas at the northern periphery of Syro-Mesopotamia, as would be shown, among others, by the fact that the limits of the distribution of the culture roughly follow those of the habitat of wild grape vine.

Be that as it may, the ritual use of wine by the Kura-Araxes population has been confirmed by a recent discovery of the GISKAP project of Ca' Foscari University of Venice in collaboration with the Georgian National Museum at Aradeti Orgora in the Shida Kartli region of Eastern Georgia.<sup>23</sup> A step trench on the eastern side of the mound brought to the light a densely packed 4m-high sequence of Kura-Araxes layers with 6 different phases, <sup>14</sup>C-dated to the thirty-first-twenty-ninth centuries BC. The fourth of these levels yielded part of a

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<sup>19</sup> Barisashvili 2011.

<sup>20</sup> This absence is clearly a consequence of the fact that residue analysis has been applied, until now, almost exclusively to Neolithic vessels.

<sup>21</sup> Kvavadze, Martkoplshvili, Chichinadze 2020.

<sup>22</sup> Batiuk 2005; 2013.

<sup>23</sup> Kvavadze et al. 2019; see also Gagoshidze, Rova 2018.



**Figure 5** Zoomorphic vessels from Aradeti Orgora (Kura-Araxes period): context of recovery (above); photos (centre left); pollen grains of *Vitis vinifera* (centre right); pollen diagram of the vessels' content (nos 1-3) and of modern wine vessels (below). From Kvavadze et al. 2019, figs 4, 3a, 3c, 7, 6

probable Kura-Araxes shrine, on the burnt floor of which were found the remains of three different vessels: a large jar and two zoomorphic pots in the shape of water-birds, still bearing traces of painted decoration [fig. 5].

The latter were clearly not everyday vessels, but special containers used in ritual ceremonies, such as libations or convivial drinking. Palynological analysis of samples taken from the sediments preserved inside the zoomorphic vessels highlighted the presence, in both of them,<sup>24</sup> not only of numerous pollen grains of common grapevine (*Vitis vinifera*), but also of pollen from vineyard weeds and plants - e.g. walnut and hazelnut - which are usually grown close to the vineyards. Among non-pollen palynomorphs, the samples contained large amounts of vine starch, *Vitis* epidermis and hairs of the tiny *Drosophila* flies, which typically fly around grapes and wine during the first stage of its production, and easily fall into the large vessels where wine is usually placed. The same combination was also found on samples from modern home-made wine, as well as from archaeological vessels of different periods (e.g. of Medieval date) which had contained wine. It can therefore be concluded that both vessels must have originally contained wine.

Finally, pollen of grapevines were found not only in the two zoomorphic vessels, but also in all other sediment samples of the Kura-Araxes period collected within the settlement of Aradetis Orgora and the contemporary cemetery of Doghlauri. This indicates that viticulture was widespread in this period in the Shida Kartli region of Georgia, and that it played a significant cultural role for the Kura-Araxes people.<sup>25</sup>

Following a different line of reasoning, the two vessels from Aradetis Orgora, which are presently unparalleled in the Kura-Araxes culture, may represent the prototypes of a tradition of zoomorphic vessels for alcoholic beverages (mainly but not only wine), which in the course of the third millennium BC spread through Northern Anatolia - along what we called 'the Northern Corridor' - to the Aegean coast, where it probably merged with different indigenous traditions, giving rise there to the first *rhyta*.<sup>26</sup> The local tradition of zoomorphic vessels continued in the Anatolian region in the second millennium BC with the so-called *BIBRU* vessels of the Hittite period.<sup>27</sup>

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**24** The jar, on the contrary, mainly contained pollen of cereals and other non pollen palynomorphs suggesting that it originally contained grains, although pollen grains of *Vitis vinifera* were also present (Kvavadze et al. 2019, 508).

**25** For further contemporary palynological evidence from other Georgian sites, see also Kvavadze, Martkoplshvili, Chichinadze 2020.

**26** Dall'Armellina, Rova 2019. The vessels from Aradetis are not true *rhyta*, as they have in fact only one opening.

**27** Dall'Armellina, Rova 2019, 145-6.



**Figure 6**  
Wine canes wrapped in silver foil from Bedeni Kurgan no. 12  
(second half of the 3rd millennium BC).  
From Lordkipanidze 2017, 61

By the third millennium BC wine was known and appreciated all over the whole Near East and the Eastern Mediterranean. In the Syro-Mesopotamian area, however, it remained for a long time an exotic product reserved for elite consumption, while beer maintained its pre-eminence as traditional local alcoholic beverage. On the opposite, in the northern regions of the Near East, wine production and the ritual importance of wine continued to represent distinctive local features.<sup>28</sup>

For the Southern Caucasus in particular, this is now confirmed by multiple types of archaeological data. Funerary evidence is especially conspicuous: thus, in the burial goods of the monumental barrow graves (kurgans) of the later third and earlier second millennium BC (Bedeni and Trialeti cultures) we find not only sets of elaborate drinking vessels in ceramics and precious metals, but also heavily symbolic items, such as the vine canes wrapped in silver foil found in a Bedeni kurgan [fig. 6], probably meant as a symbol of rebirth and eternal life.<sup>29</sup> The symbolic value of communal drinking is also emphasised by the elaborate decoration of a famous goblet from one of the Trialeti kurgans and by its analogous form from Karashamb in Armenia, both of which re-adapt old Mesopotamian banqueting scenes.<sup>30</sup>

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**28** For Anatolia in particular, see Corti 2017; 2018.

**29** As already remarked above (fn. 20), the absence of results from residue analyses is a consequence of the fact that methods of biomolecular archaeology have up till now rarely been applied to samples of these periods. On the other hand, palynological analyses are now available for several sites attributed to the Early Kurgan cultures (Martqopi and Bedeni, second half of the third millennium BC) (Kvavadze 2016; Kvavadze, Martkoplshvili, Chichinadze 2020, 141-63).

**30** Boehmer, Kossack 2000.



**Figure 7** Statuette of *tamada*, seventh-sixth cent. BC (left) and detail of silver belt showing banqueting scene, second half of fourth century BC (right), from Vani, Georgia. From Lordkipanidze 2017, 42

#### **4 From the First Millennium BC to the Late Antiquity: Wine Culture at the Crossroads Between East and West**

Over time evidence for the production, use and symbolic value of wine in the country becomes more and more abundant, especially from the Late Bronze Age onwards, and it culminates in the first millennium BC, when it really becomes ubiquitous.<sup>31</sup> By this period, morphologically domestic vine pips are attested by paleobotanical analysis.<sup>32</sup> However, the wild type is still frequent, although there is no doubt that vine was cultivated since millennia in the country. DNA analysis of the pips shows a wide diversity of varieties, whose precise meaning is still under investigation, but well corresponds to the diversity of species attested in present-day Georgia.<sup>33</sup>

The production of specialised vessels for wine consumption continues and in fact intensifies in the first millennium BC. In Eastern Georgia, during the first half of the millennium, for instance, one may mention some animal-shaped vessels from Treli Gorebi with clear analogies with items from the Talysh area of Azerbaijan and north-western Iran, which may suggest contacts along the eastern side of the above mentioned 'Northern Corridor'.<sup>34</sup>

<sup>31</sup> Lordkipanidze 2017.

<sup>32</sup> McGovern et al. 2017; Maghradze et al. 2016; 2019; Bouby et al. 2020.

<sup>33</sup> Maghradze et al. 2021.

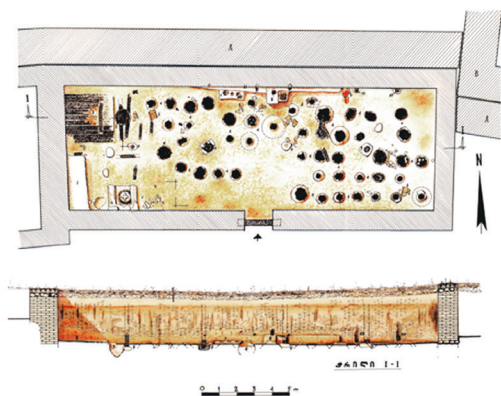
<sup>34</sup> Dall'Armellina, Rova 2019, 146.



**Figure 8** Examples of ceramic and metal vessels for pouring and drinking wine: ceramic vessels in local and Achaemenid style from Takhtidziri, fourth-third century BC, kingdom of Caucasian Iberia (above); metal vessel in Achaemenid style from Akhlagori (kingdom of Caucasian Iberia) and silver *rhyton* from Mtsidsiri (Colchis). From Gagoshidze 2020, 254; 208, 202; Knauss 2006, figs 1, 3

In Western Georgia, on the other hand, the famous site of Vani provides ample evidence for drinking vessels of different materials and sets of them and of their evolution in the course of time. Iconographic evidence is also remarkable: the bronze figurine [fig. 7 left] for instance, depicts a man holding a drinking horn of a type still used in traditional Georgian banquets (so-called *supra*) and therefore known as *tamada* (banquet leader).<sup>35</sup> Over time, in this part of Georgia lo-

**35** On the Georgian tradition of *supra*, cf. Harvey, Jordania 2014; Lordkipanidze 2017. Some intriguing representations of traditional Georgian banquets can be found in the work of the famous painter Niko Pirosmanashvili (1862-1918).



**Figure 9** Tsikhiagora (fourth-third century BC): plan and section of the *marani* (left) and reconstruction of painted *qvevri* (right). From Makharadze, Kalandadze, Sakhvadze 2023, pl. 15; Lordkipanidze 2017, 56 (Artistic installation: Lina Lopez, Production: Vakhtang Khoshtaria)

cal traditions coexist with, are influenced by, or finally substituted by western (Greek) influences [fig. 7 right] as well as, especially during the Achaemenid period, by eastern (Iranian) ones.

The same mixture of local and foreign (in this case prevailing eastern) elements characterises Eastern Georgia in the Achaemenid and post-Achaemenid/Hellenistic period. The kingdom of Caucasian Iberia is characterised by a profusion of ceramic vessels of different shapes for pouring and drinking wine [fig. 8 above], and especially of drinking vessels in precious metal in pure ‘achaemenid style’ [fig. 8 below left]. Especially noticeable is also the presence in Georgia during the Achaemenid and post-Achaemenid periods of zoomorphic *rhyta* and drinking horns in precious metals [fig. 8 below right].

Later in the first millennium there is also remarkable evidence for wine-production and storage facilities. One example is the *marani* (sacred wine cellar) attached to a temple complex of the fourth-third century at Tsikhiagora. It contained a large wooden grape press and 48 *qvevris* with red decorations, each with a capacity of about 600 litres [fig. 9]. More than 6 kg of grape pips were also recovered from it, as well as remains of cut vine canes inside a jar.<sup>36</sup>

By the first centuries of the first millennium AD the territory of Georgia is perfectly integrated in a common ‘wine culture’, which stretches from the eastern Mediterranean to Central Asia and

<sup>36</sup> Makharadze, Kalandadze, Sakhvadze 2023, 58-61.

expresses itself through an Hellenised visual language. Wine, for instance, appears prominently as a source of visual symbols and as an object of ritualised consumption in the well-known Dionysian banquet depicted in the famous mosaic of Dzalisa [fig. 10].

## 5 Epilogue: A Still Living Tradition

The advent of Christianity did not represent a break in the land's 'culture of wine'. Wine consumption not only continued (as it still continues) to play a prominent role in profane occasions, but also in sacred ceremonies. Grapevine, grapes and wine became imbued with novel symbolic values connected with the new religion. Suffice it to mention the cross of St. Nino (the Cappadocian woman who according to the tradition introduced Christianity in Georgia), which is made of vine canes held together with strands of hair from the Saint herself, or the ubiquitous reference to vine, vine branches and grapes in the decoration of local churches [fig. 11 left]. This tradition continued even in the Soviet period on profane monuments [fig. 11 right] and it is still alive, as it now meets the post-Soviet reorganisation of wine production, dissemination and commercialisation and the promotion of wine tourism in the country.<sup>37</sup>

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<sup>37</sup> Harvey, Jordania 2014; Lordkipanidze 2017; Maghradze et al. 2016.





**Figure 10** Detail of the mosaic from Dzalisa (third century AD) with Dionysian banquet. Lordkipanidze 2017, 54-5

**Figure 11** Detail of the decoration of the church of the Ananauri fortress, seventeenth century AD (left); detail of terracotta relief decorating a Soviet public building (the "Green market") in Kutaisi (right). (Photos by the author)

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