Grapes, Raisins and Wine? Archaeobotanical Finds from an Egyptian Monastery

Mennat-Allah El Dorry(✉)

Head of the Minister's Scientific Office, Ministry of Antiquities, Cairo, Egypt
m.eldorry@gmail.com

Abstract. The study of grape (*Vitis vinifera* L.) pressing remains recovered archaeologically has been the focus of research in some areas of the Mediterranean. In Egypt, however, such remains are only seldom reported. The first substantial find of grape pressing remains in Egypt has been uncovered in the Yale Monastic Archaeology Project's excavations at the late ninth-century AD monastic settlement of John the Little in Wady al-Natrun in Egypt's Western Desert. The remains consist of pressed fruits and fruit fragments, pips, and stalks. Although grape juice can be made into a variety of products, this paper will argue that wine was a very probable end product of these grape remains. Given the history and importance of wine production in the Coptic Church, these archaeobotanical remains of grapes from John the Little provide a new and unique opportunity to investigate wine production in the Coptic Church from a different perspective. In addition to the archaeological context and the archaeobotanical remains, the textual and ethnographic records related to the manufacture and trade of wine in Egyptian monasteries will be considered.

Keywords: Coptic archaeology · Egypt · Grape-pressing · Monasticism
Vitis vinifera · Wine-making

Introduction

The by-products of pressed grapes (*Vitis vinifera* L.) have been recovered archaeobotanically in several regions of the Mediterranean basin (for example: Mangafa and Kotsakis 1996; Cartwright 2003; Margaritis and Jones 2006; Sarpaki 2012). After grapes are pressed to extract their juice, the grape-pressing by-products include pips, skins and stalks, all of which can be found archaeologically. These types of remains can have their own uses, or can be discarded as rubbish. The remains presented here were recovered and identified during excavations undertaken by the Yale Monastic Archaeology Project in Egypt's Western Desert. This assemblage presents the largest corpus of grape pressing residues recovered from archaeological sites in Egypt.

Prior to this find from John the Little, few grape pressing remains were recorded from Egypt. An example of similar material was found in the Dynasty Zero Tomb of U-j in Abydos inside imported wine jars (McGovern 2003). However, the possibility that these specimens were grape-pressing remains was deemed unlikely (Feindt 2001). Additionally, similar material has been found at Tell al-Borg (C. Malleson, pers. comm.), Middle Kingdom Saqqara Valley of the Kings (A. Fahmy, pers. comm.), and

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Persian/Roman Ayn-Ziyada Hill (C. Newton, pers. comm.). From monastic contexts, a reference is made in Monneret de Villard's publication of his excavations at the monastery of Anba Hadra in Aswan during the 1920s, informing us that squashed grapes were found dried between mats placed at a wine-pressing installation (Monneret de Villard 1927). Recent work at the site of Anba Hadra did in fact reveal a large corpus of some 1000 items of grape pressing remains from probably seventh century contexts in the monastery, identified and studied by the author.

The Monastic Settlement of Saint John the Little

Yale's archaeological investigations began at John the Little in 2007 and continued until 2012. The fieldwork aimed to understand monastic spaces and their use. The excavations have focused on a late ninth-century AD monastic residence that is part of the larger monastic settlement of Saint John the Little in the Wady al-Natrun area (Fig. 1) (Davis 2008; Brooks Hedstrom et al. 2010; Pyke and Brooks Hedstrom 2012). Wady al-Natrun is an approximately 60 × 30 km depression that lies 23 m below sea level at its lowest point (Zahran and Willis 2009). It is one of Egypt's most extensive centers for Coptic monasticism, where the earliest Coptic habitation dates to the early days of Christianity in Egypt. The excavated residential structure measures 20 × 20 m and contains 25 rooms or spaces; and it is one of the few excavated parts of the entire monastic site. The building has been cleared out of most of its mobile contents (though exactly when this happened is still not understood), leaving very little material culture that could help elucidate the lives of its residents. Remains of built platforms that could have been used for seating and/or sleeping, glass architectural elements, fragments of ceramic vessels, a few small finds (such as animal horns or a ceramic stamp), as well as both faunal and floral remains make up the corpus of finds from the residence. Additionally, 17 cooking installations have been uncovered in the residence divided over five rooms (or spaces), including bread ovens and *kanoons*, which are open-topped stove-like structures with an opening for their fuel at the bottom (Pyke and Brooks Hedstrom 2012). While several of these ovens and *kanoons* were probably used simultaneously, they are situated in different phases of use that are currently undated and are still being investigated by the team, in order to better understand their various stages of use.

Charred Grape-Pressing Remains

Archaeobotanical remains studied from the site are almost exclusively related to the use of the ovens and *kanoons*. Large ash deposits were found in and around the ovens and *kanoons*, and were sampled in full; samples ranged from 2 to 16 l. The material, connected with activities in/around the ovens and *kanoons*, is charred. The remains are concentrated in two particular ovens, which are the richest in archaeobotanical material on site. Targeted sampling was employed, where archaeologists sampled ash contexts or contexts with organic material. Samples were first sieved (with a minimum of 0.25 mm mesh) and then processed by bucket flotation. A Stereo Dissecting

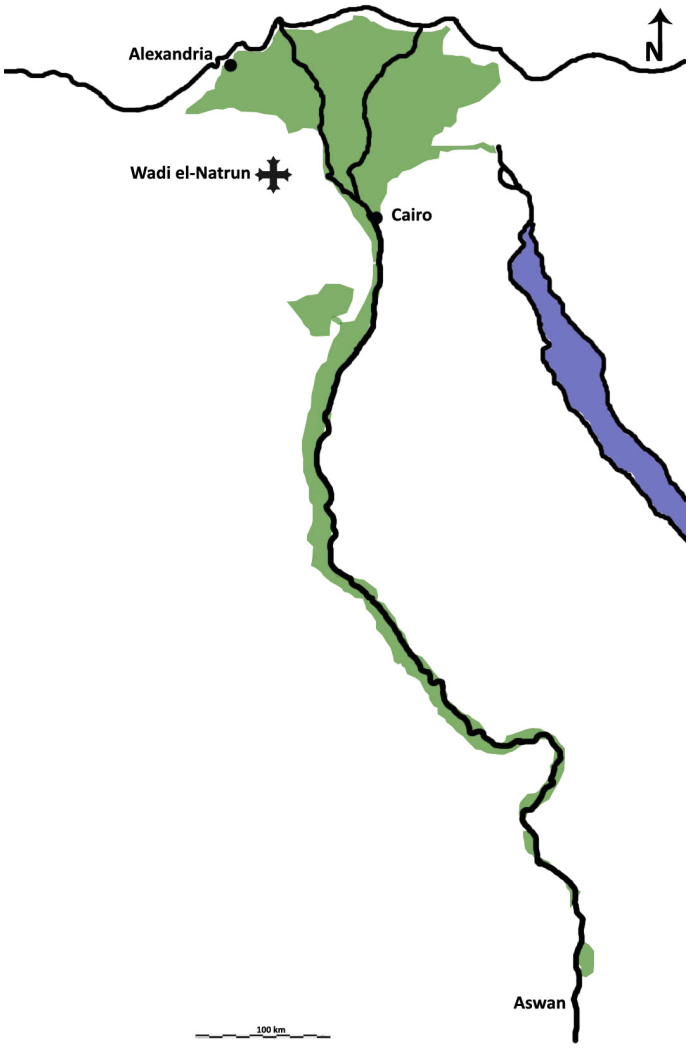

Fig. 1. Map of Egypt with location of Wady al-Natrun.

Microscope with 15–50× magnification range was used for sorting and identifying the macroremains.

Of the total assemblage of archaeobotanical material from the excavated residence (N = 12058/31 samples), a large proportion are *Vitis vinifera* remains (N = 1955), which are present in all 31 samples. The corpus of grapes is made up of mature pips

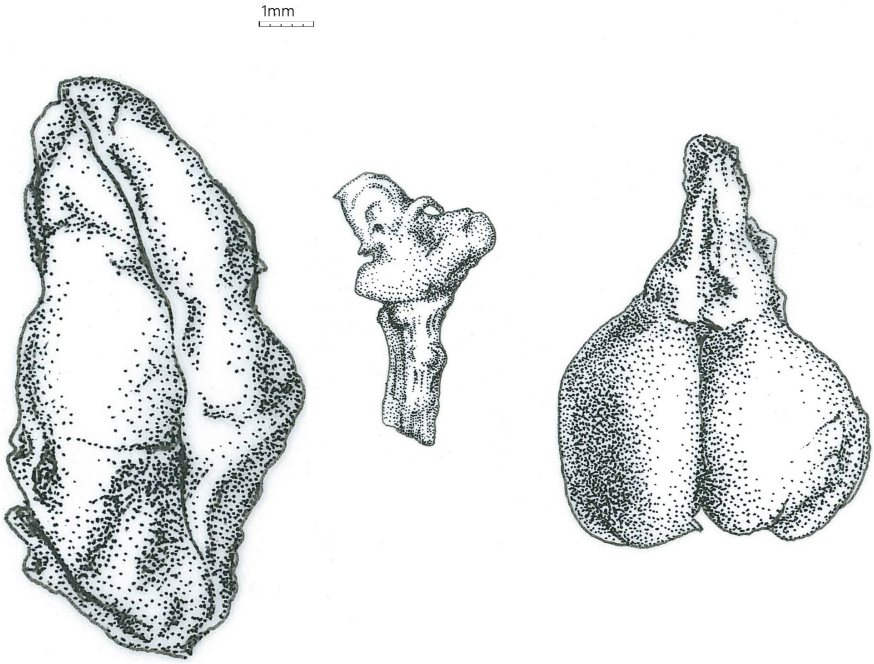

Fig. 2. Grape pressing remains, whole grapes and pips with fused skins (drawing by A. Duma, inked by E. El-Qattan, courtesy of S. Davis/YMAP)

(N = 1546), immature pips (N = 59), fruits (N = 154),[1] and pedicels (N = 150) (Fig. 2). The material is dispersed in different ovens and *kanoons*, but the largest quantity of the remains comes from one single oven. This oven provides the largest amount of items per liter, in addition to being rich in a wider variety of species.

In addition to these remains, exposed and separated grape endosperms (N = 46) were also found (Fig. 3). In some cases the pips were cracked, revealing what seems to be uncharred endosperm, thus allowing for identification. In order to check the occurrence of these remains in the samples, several intact grape pips from the samples were mechanically broken; yet none of these specimens contained such an 'endosperm'. Images of similar grape items were published by Valamoti (2015), which she identified as 'malformed' pips; however, these were desiccated. Margaritis and Jones (2006) have also recovered similar material from Hellenistic Greece, which they identified as endosperms. The Hellenistic specimens were charred. As part of Margaritis and Jones' extensive experimental charring, it was revealed that endosperms did survive in grape pips that were charred in reduced conditions at 250–300 °C. Margaritis and Jones explained that the endosperm is preserved in such a manner when a

[1] In addition to whole fruits, pip clusters are included under the count for 'fruits'. In this case, clusters of fused pips with remnants of skin adhered to them constitute one fruit.

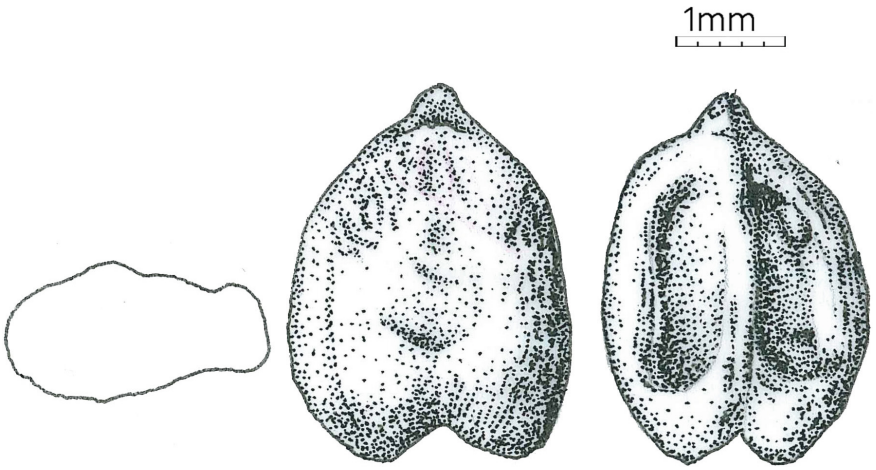

Fig. 3. Endosperms of *Vitis vinifera* from the excavated resident at St John the Little's settlement (drawing by A. Duma, inked by E. El-Qattan, courtesy of S. Davis/YMAP)

pip's outer coat is fractured during charring, but is not completely dislodged, which would later occur during the excavation and handling of the samples.

Comparing the present remains with published images enabled the identification of the Saint John the Little grape remains as most likely remains of grapes that were pressed to extract their juice (Margaritis and Jones 2006; Valamoti et al. 2007).[2] The pressed grapes in both publications have a shriveled appearance, where the skins are closely warped around the pips. This is identical to the remains from the residence at St John the Little. However, cereal processing byproducts (*Triticum durum* Desf. and *Hordeum vulgare* L. chaff) and cereal field weeds (including *Rumex* cf. *dentatus, Lolium* sp. and *Phalaris* sp.) dominated the corpus of macroremains. Identified foodstuffs include *Triticum aestivum/durum* grains, *Lens culinaris* Medick, *Vicia faba* L., *Cicer arietinum* L. and *Phoenix dactylifera* L.

Grape Pressing Remains: Evidence of Wine Production?

The presence of grape pressing remains should not automatically be regarded as evidence for wine production. Grape juice can be processed into a variety of products, including syrup, must, liquor, or vinegar (Halenko 2004; Valamoti et al. 2007). In order to argue for wine production, other data from the excavations of John the Little need to be considered, and complemented by textual, historical, and ethnographic information.

[2] I am indebted to Professor Naomi Miller who first alerted me to this kind of remain surviving archeologically and to Professor Soultana-Maria Valamoti for confirming the identification and for further discussions. Dr. Despina Moissidou generously provided me with an English translation of Greek publications I obtained from Professor Kostas Kotsakis.

First, it is important to consider the archaeological data from John the Little that can be related to wine production. So far, no wine pressing installations were found in the excavated areas of the settlement. It could be that such pressing installations have yet to be revealed, or that grapes were pressed piecemeal by hand or using small mobile presses that were moved out of the residence after abandonment. Pressing grapes by hand to make wine is known in Egypt, with special reference to wine made for the liturgy of the Coptic Church. Observations of Coptic churches in the nineteenth and twentieth centuries tell us that *Abarka (*Greek *aparxh*, meaning first fruits or offering), the thick red wine served in the liturgy of the Coptic Church, must not be tred by foot, but rather pressed by hand or small presses; and it was usually made of rehydrated raisins (Khs-Burmester 1967; Butler 1970a). Today, a Cairo-based family that makes its own *Abarka* and donates it to different churches and monasteries squeezes the grapes by hand (Nassef Family, pers. comm.). Mobile presses that are easily transported are also known (Butler 1970b). The absence of wine pressing installations is therefore not detrimental to the argument against wine production, where hand pressing or small mobile presses could have been used.

As for the ceramic evidence from the excavated residence at John the Little, all the material that has been studied so far could not be linked to wine production. Several liquid-holding type vessels were present, but none are necessarily indicative of having held wine in the past. However, the pottery from the site is still under analysis, so the above comments are preliminary. *Abarka* can be made on an as-needed basis (especially if raisins, rather than fresh grapes, were used), so that no large-scale wine pressing installations, or masses of vessels and storage space were necessary for *Abarka* production.

With the archeological data from John the Little leaving us with little to go on, historical and textual evidence can supplement the botanical and archaeological remains. Wine was a very common product of Coptic monasteries, as is attested by the large corpuses of texts related to the trade and exchange of wine, such as wine receipts and requests for wine written by or to nuns or monks (Crum and Bell 1922; Bacot 1998; Cromwell 2013). A further example of wine as a prime product of monasteries comes from the tenth century "Book of Monasteries" by Muslim writer al-Shabushty, who mentions multiple monasteries in Egypt that were popular wine drinking destinations for visitors (Atiya 1939).

The grapes at Saint John the Little could have been cultivated in Wady al-Natrun itself. There is a single mention from the ninth century AD of vineyards belonging to the neighboring Monastery of Saint Macarius in honor of the patron saint (Evelyn White 1926). The grapes could have also been sourced from the Nile Valley or Delta, which could have been transported in 24 h to Wady al-Natrun (Bagnall 1993). The grapes, whether locally sourced or imported, could have also arrived to the site as raisins, which were also used for wine production (see below).

With the popularity—and importance—of wine in Coptic monasteries, small-scale wine production seems a very likely reason for pressing the grapes. Future excavations in other parts of the monastery may furnish further evidence supporting this interpretation, or perhaps even point to large-scale wine production.

Grape-Pressing Remains: Uses and Disposal

Grape pressing wastes can be used in a variety of manners, most notably as a preservative for table grapes, as fertilizer, as fodder, and as fuel (e.g. Margaritis and Jones 2006). In the case of Saint John the Little monastery, how were grape processing byproducts used and how did they end up in the residence?

Given their recovery in the ovens and *kanoons*, the grape-pressing remains could have very well been part of the fuel. However, grape pressings do not have the same value for fuel as olive pressings or dung cakes (Foxhall 1998). In an arid environment like Wady al-Natrun with limited resources, it is a possibility that the inhabitants of the residence at the monastery of John the Little would have used the wastes of grape pressing as fuel to augment the animal dung fuel used (El Dorry 2015a; El Dorry 2015b). Alternatively, they could have been part of the animal-dung fuel due to their consumption by animals (Foxhall 1998; Miller 2008; Hentges et al. 1982). At John the Little, much of the botanical material most likely originates from fodder stuffs surviving in dung. This is a possibility, given that the remains include many species that are typical components of animal fodder during this time period, including barley, *Phalaris*, *Lolium*, and others. Additionally, many of the specimens have amorphous bits of dung adhered on to them, and several grains and seeds were found embedded in animal dung deposits. Therefore, the use of the grape wastes as fodder is a very likely suggestion. However, the good state of preservation of many of the pressed grape fruits rules out this material having passed through animal digestive systems. No experimental work has been published about the preservation of grape pressing remains in animal dung. A future element of this research would be experimental feeding of animals to study the effects of animal digestion on the remains of grape-pressing.

Although the grape residues may have had specific uses, the possibility that they were simply discarded into the ovens or *kanoons* should be entertained. Grape-pressing remains could have simply been discarded in the ovens as wastes with no further use. The frequency of wine or *Abarka* production should be considered here, but it is difficult to be certain how much wine was produced and how often. Wine for drinking purposes is more conveniently produced as a large-scale endeavor during the grape season, resulting in a large mass of waste. *Abarka* production can either be an annual large-scale event or piecemeal and made throughout the year made from stored raisins. A piecemeal production would have resulted in fewer remains that are more likely to have been discarded than used.

The larger portion of the grape pressing remains come from the ovens, rather than the *kanoons*, especially the ovens in one part of the building. This could be attributed to a preferential use in the forms of fuel employed in the *kanoons* versus the ovens. However, a more likely scenario, based on the frequency and pattern of dispersal of other species, would be that the *kanoons* were simply more frequently cleaned out than the ovens.

Alternative possibilities can be considered, despite their unlikelihood. For example, in Classical Greece, wine press-cake could have been used for preserving table grapes, by covering the grapes with the pressing remains to create a humid and cool environment (Foxhall 1998). The use of these residues as preservative could have resulted

in their disposal in the ovens and *kanoons* as rubbish. However, such a form of preservation is not known from Egyptian literature. Another possibility is the use of grape pressing residues as fertilizer. Vineyards in both Egypt and Lebanon today use grape pressing wastes as fertilizer (Labib Kallas, Winery Manager/EGYBEV, pers. comm.; Winery Representative/Ksara Winery in the Bekaa Valley, Lebanon pers. comm.). This use seems unlikely for the archaeobotanical grape pressing remains from John the Little, as their use as fertilizers would not have resulted in the material being burned in the ovens.

Wine Production in the Coptic Church

Although the trade of wine in Coptic monasteries has been the topic of previous research, some aspects of the production of wine remains little understood (Crum and Bell 1922; Bacot 1998; Cromwell 2013), such as the use of raisins, rather than fresh grapes, for the production of *Abarka* for the liturgy (Drower 1956; Khs-Burmester 1967; Butler 1970a; Gabra 2009). While viticulture has a long history in Egypt, not much is known about the use of raisins in wine production. The use of raisins in wine, rather than fresh grapes, is said to have been a result of the repetitive bans set forth by Muslim rulers against the production of wine, the trade of grapes, and even the mere possession of grapes risked the bearer with legal repercussions during the eleventh to twelfth centuries AD (El Dorry 2016). Scholars have argued for raisins replacing fresh grapes for wine production during these prohibitions (Leeder 1918; Butler 1970a). Could archaeobotanical analysis help detect whether the archaeobotanical remains recovered from the excavated residence at John the Little were raisins or fresh grapes? To address this question, future analysis comparing grape-pressing wastes and raisin-pressing wastes will be necessary.

Conclusions

This find of archaeobotanical macroremains of grape pressings from an excavated residence building at the monastic settlement of John the Little is the first of its kind from a monastic context in Egypt. This is further the most substantial find of grape pressing residues from Egypt. The question of whether these remains were meant for wine (or *Abarka*) or for another grape juice-based product still remains open, but the importance of wine in Coptic liturgy and its importance as an economic commodity from monasteries, makes wine a very probable end product. However, as long as archaeological evidence confirming an economic production is missing, we may have to assume that the production may have been at least for self-supply. In order to be preserved in the ovens, the remains of the grape pressing could have been used in a variety of ways, but they could have very well just been rubbish disposed of in the fire. The grape pressing remains at Little John have brought up many questions about the origins and history of wine production in the Coptic Church; for example, how did the tradition of raisins being used in lieu of fresh grapes for *Abarka* start and why did it disappear? To answer these questions, future work will focus on experimental charring

of more raisin-pressing remains, in addition to the analysis of the modern wastes of *Abarka* production. A detailed ethnographic and historical exploration of *Abarka* production is also necessary.

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