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Identifying the (Royal) Winepresses in the "Valley of the King"

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This paper presents four Iron Age winepresses discovered at 'Emeq Lavan, Rogem Gannim and Mordot Arnona in Jerusalem. The winepresses located along 'Emeq Refa'im share a uniform industrial plan featuring three treading surfaces, settling vats and a central collection chamber. The installations date to the late eighth–seventh centuries BCE, when the subjugation of Judah to Assyria created a need for a centralized royal economy. The newly identified winepresses attest to the high degree of standardization of wine production in the region. We suggest that the location and implementation of a standardized plan indicate that these installations were part of a newfound royal estate established in areas that were previously sparsely populated and uncultivated. It is further suggested that the winepresses may be identified with the royal estate of *mmšt* (Mamsh[i]t), biblical "Valley of the King."

Keywords: Iron Age, winepress, Judah, viticulture, Valley of the King, wine production, royal estate, mmšt

Introduction

The significance of viticulture in the economy of the ancient Southern Levant during the Iron Age is well-attested in the archaeological record. While evidence of grape cultivation may include an array of agricultural constructions, wine production is best represented archaeologically by winepresses.[2] The simplest winepress form is composed of a treading

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[2] Some researchers prefer not to use the term "winepress," as extraction installations may have been used for olive oil production as well. In this paper we use "winepress" confidently, as the collection chambers discussed are too large to have been used for olive oil. Olive oil extraction produces 15% of the weight of the raw product (Frankel and Ayalon 1988:27).

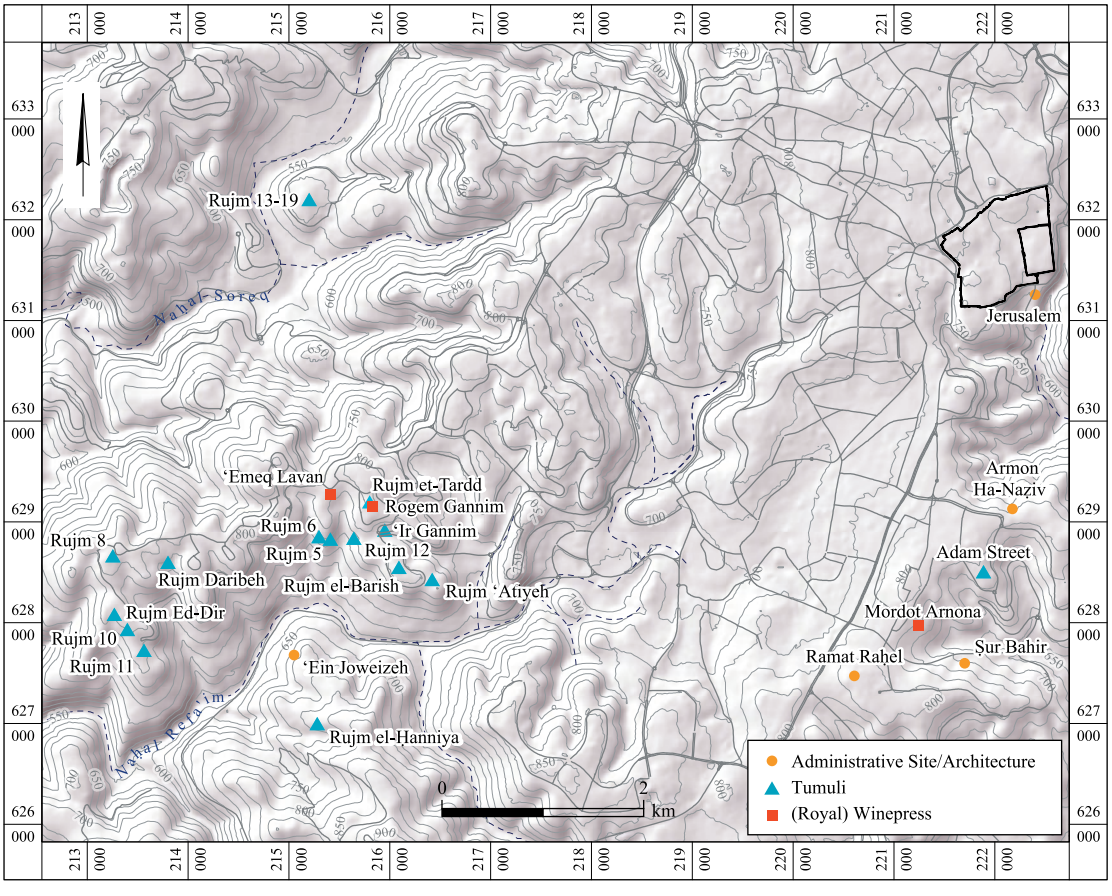

Fig. 1. Map of sites and winepresses (illustration: O. Zakaim).

surface and a collection vat (Frankel and Ayalon 1988:27; Walsh 2000:148), and in the hill country, these were hewn into the bedrock near the vineyard (Frankel and Ayalon 1988:29). In the Shephelah piedmont and along the Mediterranean coastal plain, Iron Age winepresses were built of stone walls, with surfaces of plaster with seashell inclusions (Wolff 2023:974). Differences in local topography and geology may have led to the great variation in the size and layout of the winepresses. Some presses feature shallow rounded settling pits carved into the base of the collecting vats. The Iron Age winepresses in the vicinity of Jerusalem are most often composed of a single treading floor with one or two niches in the back wall for anchoring a wooden beam, such as at Ras et-Tawil (Gibson 2009) Tell el-Ful (Landes-Nagar 2014), Ramat Shelomo (Storchan 2017), Shu'faṭ (Zilberbod 2013) and en-Nabi Danyal (Amit and Yezerski 2001). Other, more complex presses comprise multiple treading surfaces and vats that could be operated simultaneously (Feig 2003). Many of the winepresses are found along the banks of the Naḥal Soreq or the 'Emeq Refa'im catchment basins (Gadot 2015).

In this paper we present and discuss the implications of four near-identical Iron Age winepresses discovered at 'Emeq Lavan, Rogem Gannim and Mordot Arnona (Fig. 1).

Their date, proximity to the administrative centers at Ramat Raḥel and Mordot Arnona, and to the massive stone tumuli,[3] as well as their association with sizable assemblages of stamped storage jar handles, suggest that the winepresses were part of newfound agricultural estates—presumably royal estates established in areas that were previously sparsely populated and uncultivated, which appear on *lmlk* stamp impressions (Lipschits 2021:123–127). We suggest that the winepresses along 'Emeq Refa'im may be identified with the royal estate of *mmšt* (Mamsh[i]t), biblical "Valley of the King" (Lipschits and Na'aman 2020).

Identifying "Royal" Winepresses

Archaeological excavations in the Jerusalem area have uncovered a rather large number of Iron Age agricultural settlement and winepresses (Gadot 2015: Tables 1, 2), indicating the significance of viticulture in the region. The winepresses show little standardization and are usually small, simple installations with a rectangular treading surface and a collecting vat. In great contrast, excavations south and southeast of 'Emeq Refa'im uncovered four winepresses at 'Emeq Lavan, Rogem Gannim and Mordot Arnona, built as industrial installations with a complex tripartite layout composed of three side-by-side treading surfaces and settling vats feeding into a large collection chamber. The treading surfaces, each measuring 2.5 × 2.5 m, accommodated a wooden lever, one end of which was anchored to the back wall. Each of the three surfaces are connected to an independent square-shaped settling vat (1 × 1 m). The extracted juice flowed from the vats into a shared collection chamber via feeder channels carved into the top of the latter. The appearance of a standardized winepress layout in late eighth-century BCE Judah seems to indicate a measure of increased control and standardization employed in many of the agricultural production installations (Faust and Weiss 2005; Katz 2008:55–59). Moreover, these winepresses are extremely large, with production capacities well beyond those of other industrial presses, such as that found nearby at Beit Ṣafafa (Feig 2003), which seems to have been unplanned and formed of a random agglomeration of scattered treading surfaces.

In the late eighth century BCE, the subjugation of Judah to Assyria created a need for a centralized royal economy and improved agricultural production, which served as a catalyst for the standardization of the economic and commercial systems (Lipschits 2018a; 2018b; 2021). These changes were brought about by significant governmental initiative and implementation, when Judah had lost its independence, becoming a subordinate province. For example, during this period, the ceramic repertoire of the region changed considerably, as

[3] These features are sometimes termed "stone heaps" or "clearance heaps" and are often associated with traditional agricultural activity. Other researchers prefer to use the Arabic word *rujum* to describe these features. Here we use "tumulus," meaning mound, in hopes to prevent misinterpretation of the function of this phenomenon.

small-scale unstandardized manufacture in local workshops evolved into mass production of standardized vessels in centralized workshops; these vessels were then distributed throughout the kingdom (Zimhoni 2004:1705; Katz 2008:52–53, with further references therein). Furthermore, the emergence and widespread distribution of the *sheqel* weight in Judah during this period unified the measurement system and established commercial standards and control tools (Kletter 1998; Katz 2008:75–79, with further references therein). The high degree of standardization and industrial size of the newly identified winepresses make them extremely unique, and they can therefore be seen as evidence of intentional administrative control over the viticulture and agricultural production to the south of Jerusalem.

The Winepress at Rogem Gannim

Rogem Gannim is located in the southwestern area of modern Jerusalem, and the most notable feature at the site is the Rujm et-Tarud tumulus (Fig. 1; Amiran 1958: Tumulus No. 4; Cinamon 2004:38–48, Site 44). This tumulus is one of the largest in the area, measuring 42 m in diameter at its base and 9 m high (Amiran 1958: Table 1). The first excavations of the tumulus were conducted on its western slope (Amiran 1958:220–221) and later, the north and east of its perimeter were explored (Barkay 2003). The site was revisited between 2000 and 2006 as part of the Rogem Gannim Project in Community Archaeology, which exposed an agglomeration of hewn installations spread over four terraces below and southeast of the tumulus and dated to the Iron Age and to the Persian, Early Roman and Islamic periods (Sion 2001; 2002; Greenberg and Cinamon 2006; 2011). According to the excavators, the tumulus was one of the earliest features at the site dating to Iron Age II (eighth–sixth century BCE). Additionally, during this period, the site played an active role in wine production as indicated by a collection of stamped jar handles: four with *lmlk* stamps, four with incised circles and another two with rosette impressions (Greenberg and Cinamon 2006: Table 1).[4] Wine production at the site continued into the Persian period (sixth–fourth century BCE), to which the excavators ascribe most of the hewn features, including winepresses WP1–8. The excavations uncovered nine stamped handles from this period as well: two with roaring-lion impressions and seven of the *yhwd/yhd/yh* type (Greenberg and Cinamon 2006: Table 1). The Early Roman and Islamic phases of activity at the site included modification, alteration and functional conversion of many of the preexisting hewn winepresses and associated installations.

The most interesting of the installations uncovered at the site are winepresses WP5–7 due to their multipart plan (Fig. 2). Greenberg and Cinamon considered that they initially functioned independently and that Cistern 3 served as a storage facility. In a later phase, the presses operated as "a carefully planned ensemble" (Greenberg and Cinamon 2011:84)

[4] Recent excavations at Rogem Gannim, directed by Shlomit Weksler-Bdolah on behalf of the IAA, uncovered additional stamped handles. We wish to thank her for allowing us to mention these finds.

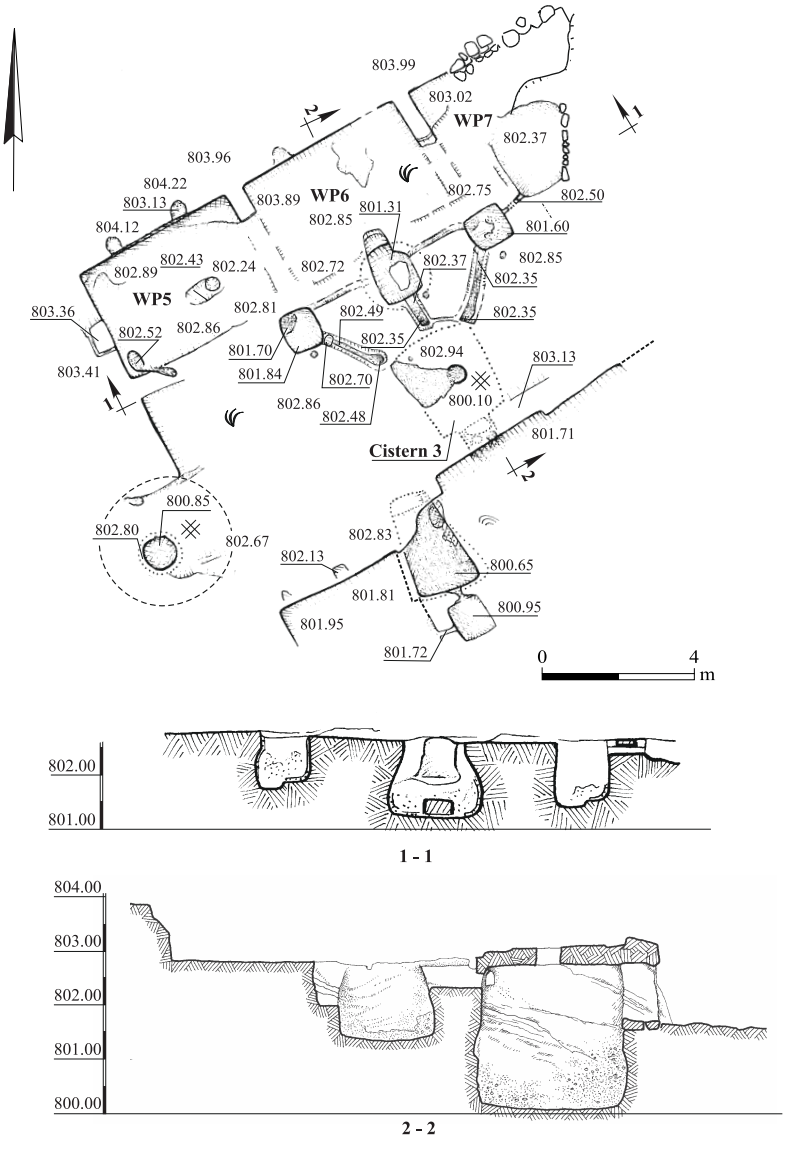

Fig. 2. The Rogem Gannim winepress, plan and sections
(after Greenberg and Cinamon 2011: Plan 1, Sections 8–8 and 9–9).

composed of three treading floors, with carved niches for anchoring a beam to the back wall, three closely placed settling vats (later modified) and convergence channels carved with recesses for roof slabs leading to centralized collection in Cistern 3 (2.0 × 2.5 m, 2.5 m deep). The almost perfect alignment and symmetry of the winepress's elements indicate, however, that each feature was preplanned and constructed during Iron II, and that from the outset, the "cistern" functioned as a collection chamber for the must extracted in the three treading floors above it. The other constructions in the area may have been added, perhaps during the Persian period; their irregular plans seem to indicate that they were installed ad hoc at available locations.

The Winepress at ‘Emeq Lavan

‘Emeq Lavan is a small tributary of ‘Emeq Refa’im and to the north of it, near the modern Qiryat Menaḥem neighborhood in southern Jerusalem. Several salvage excavations were undertaken along the northern slope of the valley in preparation for construction of the Ora Junction (Storchan 2015; 2016). During the excavations, a concentration of hewn installations was uncovered on a bedrock outcrop, including the remains of a complex industrial winepress (Figs. 3, 4). The winepress, located 125 m northwest of Rujm 5 (Fig. 1; Amiran 1958:211–218, Tumulus 5) and 420 m to the northeast of the Rogem Gannim winepress, was hewn into the *nari* bedrock on a southeastern slope. Its plan is similar to that of the one at Rogem Gannim, composed of three side-by-side square settling vats (L202–204; Fig. 3) and channels that fed the must into a large collection chamber (L209; Storchan 2015: Area B).[5] Over time, some of the components were physically altered as the installation was redesigned and reused. Based on similarities to the winepress at Rogem Gannim, the earliest phase of the winepress at ‘Emeq Lavan should be dated to the late Iron Age.[6]

The northern part of the winepress once included three side-by-side treading surfaces, which were completely removed by a later stone quarry (L201). The reconstruction of these surfaces is based on the comparison with the winepresses at Rogem Gannim (see above) and Mordot Arnona (see below). Each of the surfaces was individually attached to one of the abovementioned independent settling vats. The western and middle vats (L202, L203) measure around 1 × 1 m and are 1 m deep, while the easternmost vat (L204) is a bit larger (1.0 × 1.5 m, 1.0 m deep), as it was expanded during a later phase. The western vat was found coated almost entirely by a layer of plaster. The middle vat was found completely stripped of its plaster, down to bedrock. Excavation inside the eastern vat revealed multiple layers of plaster coating the vat walls, indicating that it was routinely maintained longer than the others. The last layer of plaster covered and canceled out the connection to the convergence channel. Within the vat, a small stone pillar was set into the floor plaster (Fig. 5),[7] and a few fragments of a Hellenistic-period storage jar were uncovered in the soil fill. It seems that during this later period, the vat and probably its associated treading surface remained active as a simple winepress, detached from the large collection chamber.

Just as in the winepress at Rogem Gannim, the settling vats at ‘Emeq Lavan were connected to a shared collection chamber via three narrow convergence channels. The channels (0.1 m wide, 0.25 m deep) were hewn with a recess on both sides to accommodate

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[5] The collection chamber of the winepress was excavated by Ron Lavi (Permit No. A-5915/2010). We wish to thank him for allowing us to publish the results from his excavation.

[6] The excavation did not uncover any significant Iron Age pottery, and the dating of the winepress is based on typological similarities with the winepresses discussed here (see below).

[7] The occurrence of pillars within settling or collection vats has been mentioned by Billig and others (Billig 2019; Billig, Freud and Bocher 2022:12, n. 3).

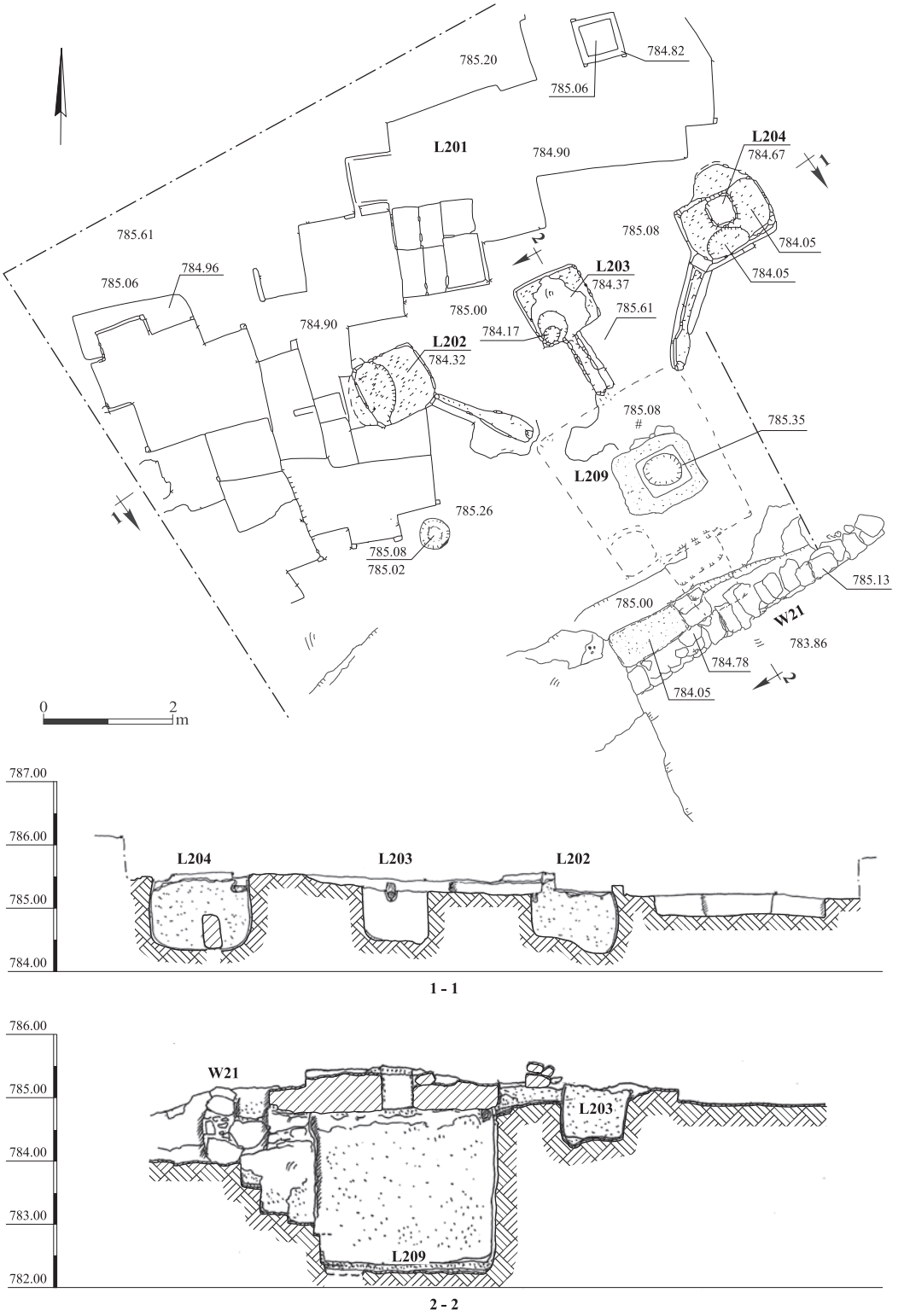


Fig. 3. The 'Emeq Lavan winepress, plan and sections (drafting: N. Zak and O. Zakaim).

Fig. 4. The collection vats and hewn channels at ‘Emeq Lavan, aerial view to the northeast (photography: SkyView Ltd.).

Fig. 5. The collection vats and convergence channels at ‘Emeq Lavan, looking southwest; note stone pillar within Vat 204 (photography: A. Peretz).

Fig. 6. Interior view of the collection chamber at 'Emeq Lavan, showing drains of the convergence channels, looking northwest (photography: A. Peretz).

a row of capstones. Just before reaching the shared square-shaped collection chamber (2.5 × 2.5 m, 2.5 m deep), the unroofed channels continue as circular holes drilled into the top of the chamber's northwestern wall—a thin bedrock layer covering their tops (Fig. 6). The winepress's plan has a northwest–southeast symmetry axis, with two channels reaching two of the chamber's opposite corners at similar angles, and a central channel, equidistant from the other two, meeting the middle of the chamber's northwestern wall. The entrance to the chamber is in the south via a carved rectangular doorway with a hewn staircase of three steps. Excavation in the chamber uncovered a round settling pit (diam. 0.5 m, 0.3 m deep) hewn into the floor of the southwestern corner. Similar pits were found in the two winepresses at Mordot Arnona (see below). The settling pit indicates that the juice extracted on the surfaces above was collected in this chamber, which did not function as a jarring facility.

In the Late Ottoman–modern period, the entrance to the collection chamber was blocked with the construction of a wall (W21). Its builders left a small gap between it and the bedrock face and placed a small plastered basin in the northwestern corner of the chamber, which probably served as a trough. During this period, a hole was carved into the roof of the collection chamber converting it into a water cistern. Moreover, in this phase the internal surface of the chamber was coated with a gray-colored cement, replacing the original plaster.

Two Winepresses at Mordot Arnona

The site of Mordot Arnona is located 3.5 km south of the Old City of Jerusalem, about 750 m northeast of Ramat Raḥel and east of the Armon Ha-Naẓiv–Ramat Raḥel watershed ridge (Fig. 1). The site holds a commanding view to the east from the top of the Naḥal Darga basin. Excavations at the site's upper part uncovered remains of a monumental structure, dated by the excavators to Iron IIB. Also uncovered were a massive stone heap and a monumental structure on top of it, dated to Iron IIC (Ben-Ari et. al 2021; Sapir et. al. 2022). West of these monumental structures, an excavation uncovered the remains of two complex winepresses, each composed of three adjacent treading surfaces with independent settling vats and convergence channels leading to a shared collection chamber.

The western winepress was composed of a large treading floor (L2370; c. 11.0 × 3.5 m; Figs. 7, 8) circumscribed on three sides by three ashlar walls (W2863, W2864, W2865), three square-shaped plastered settling vats arranged on an east–west axis (c. 1 × 1 m; L2406, L2497 and an eastern vat that was poorly preserved) and three carved convergence channels capped with a line of stone slabs (L2262, L2498, L2405), which connected the vats with a large deep collection chamber (L2339; 2.3 × 2.0 m, 2 m deep). To the north of the settling vats and to the east of the western treading floor (L2370) are the remains of two similar treading surfaces (L2311, L2209), separated from each other by a hewn partition. Some plaster layers associated with these surfaces were disturbed by modern agricultural tilling.

The walls surrounding the western treading floor were built of two rows on a hewn foundation (Fig. 9): W2865 in the south, W2864 in the west and W2863 in the north. Of the eastern wall, only the hewn foundation remains. The treading floor comprises a thick hard plaster layer that was laid directly on the bedrock and abuts the walls.

The middle settling vat (L2497) has a gray plaster floor, which was laid directly upon the bedrock and over which was a thin accumulation of soil (c. 7 cm thick). Channel 2262, exposed thanks to the lack of preservation of the eastern vat (Fig. 10), was carved with a U-shaped profile (c. 10 cm wide) and roofed with medium-sized stone slabs. Its inner surfaces were plastered, including under the capstones. A rectangular gap (0.2 m wide) was left uncovered on the top of each of the eastern, western and central convergence channels, which functioned as a cleanout or access point for maintenance. The western channel connects to the northwestern corner of the chamber; the eastern channel, to its northeastern corner; and the central channel, to the center of its northern wall.

The western winepress's collection chamber could be accessed from the south via a hewn staircase. Unlike the chambers at Rogem Gannim and 'Emeq Lavan, this chamber was found with no roof, though one may have once existed and since been destroyed. The walls and floor of the chamber were coated with a layer of plaster. Similar to 'Emeq Lavan, a settling pit was carved into the floor in the chamber's southeastern corner. The chamber, vats and treading surfaces yielded ceramic assemblages containing worn-out pottery sherds dated to the Iron Age and the Roman and Byzantine periods.

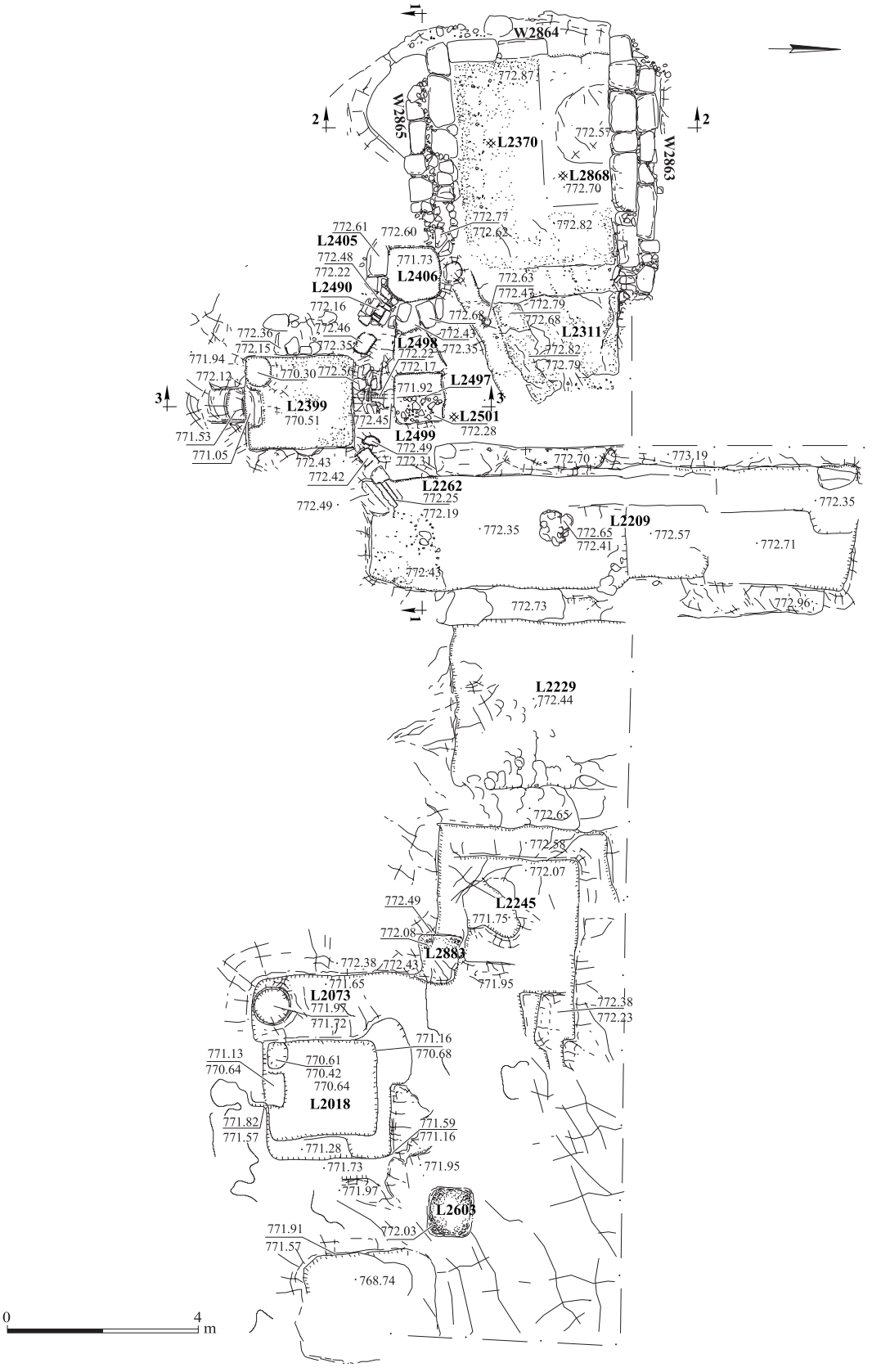
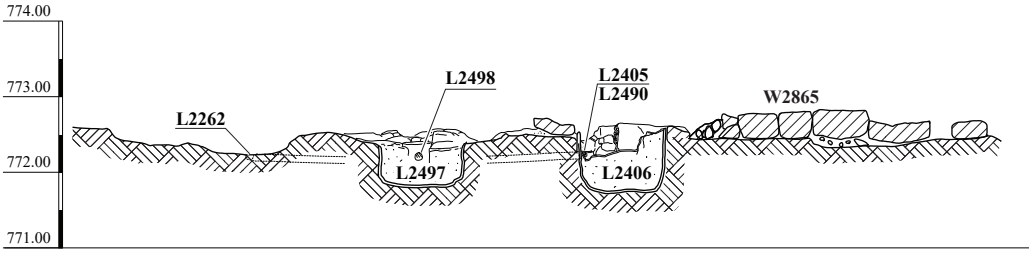


Fig. 7. The eastern and western Mordot Arnona winepresses, plan and sections (drafting: O. Zakaim).



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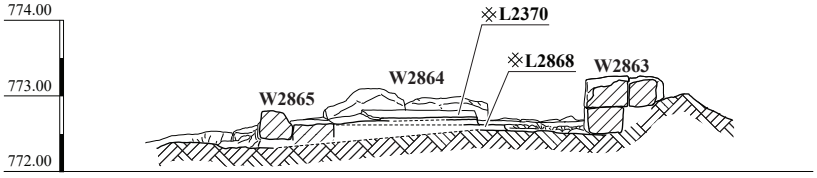

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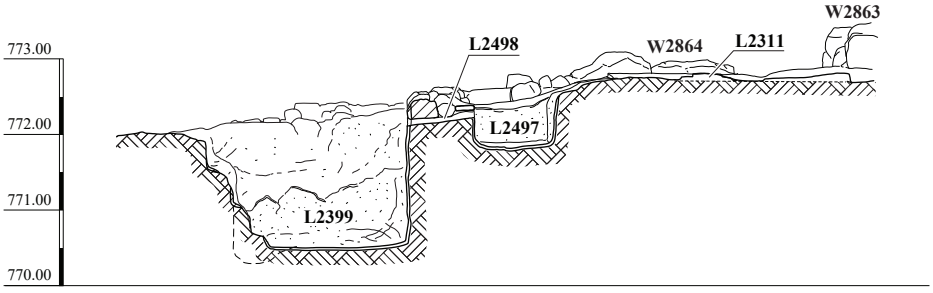

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Fig. 7. (cont.).

Fig. 8. The western and eastern Mordot Arnona winepresses, aerial view to the south (photography: A. Peretz).

Fig. 9. Ashlar construction around the treading surface at Mordaot Arnona, looking west (photography: N. Sapir).

Fig. 10. View of the convergence channel at Mordot Arnona, looking south (photography: E. Aladjem).

The western winepress was used over a substantial period of time, with modifications made to the original winepress elements in the later phases of usage. For example, the western settling vat (L2406) was covered by plaster that sealed the convergence channel opening and thus altered its function. Similarly, in the middle vat (L2497), a thick and dense makeup of soil and small stones was laid upon the earlier remains, sealing the convergence channel and canceling it. A new layer of plaster was laid upon the makeup, altering the function of the installation. We may assume that these alterations put the eastern settling vat out of use as well. The collection chamber (L2399) seems to have remained in use during this phase, as the excavation uncovered large sherds of early Hellenistic-period jars within it.

The eastern winepress at Mordot Arnona was built along the same east–west axis as the western one, and less preserved due to damage by modern-day deep agricultural tilling (Fig. 8). The area of the complex was covered by marl soil and scattered worked stones upon bedrock. The stones suggest an ashlar construction surrounding the treading surfaces, as in the western winepress. The excavation identified two phases of use of this installation. The remains of the early phase include two plaster-lined settling vats carved in the bedrock (L2603, L2883), but rather than a treading floor to their north, a hard and compact layer of white marly sediment was exposed. This could be part of the marl layer covering the deep collection chamber (see below). Alternatively, some of this layer may be the result of a post-depositional crystallization of disintegrated natural marl and of the mortar makeup of the treading surface that no longer exists. Similar mortar was exposed in the western complex, below the lowest level of the plastered treading floor.

To the south of the settling vats is a large, rectangular, plastered collection chamber (L2018; 2.45 × 2.00 m, 1.65 m deep). Two hewn stairs were identified in its south, and a round settling pit was carved into the floor in its southwestern corner, which was intentionally filled with earth and small fieldstones. This collection chamber was similar in size to that of the western winepress and was carved along the same axis. Moreover, the bottom levels of both chambers and related features inside them are very similar. The fill layers in the eastern chamber yielded a reverse ceramic stratification, with a clean Iron Age assemblage above soil layers containing sherds dated to the Persian and Hellenistic periods. Based on this sequence, it seems that the chamber was used into the Persian and Hellenistic periods, and later served as a dump for discarding refuse from disturbed nearby Iron Age layers. To the latest phase we attribute a *ṭabun* (L2073) uncovered above the chamber's western side. While the ceramic assemblage associated with this feature contained no diagnostic sherds, similar *ṭabun*s exposed in the eastern extent of the excavation were clearly dated and associated with the Persian compound.

Three square-shaped and rectangular spaces (L2209, L2229, L2245) were carved in the bedrock between the eastern and western winepresses at Mordot Arnona. In L2229 were broken jars dated to the early Hellenistic period,[8] found *in situ* upon a beaten earth floor that

[8] The preliminary dating of the ceramic assemblage is based on D. Sandhaus's on-site observations.

was laid directly on bedrock. While the function of these demarked spaces is unclear, we assume that they served the winepress either for storage or as loading docks. They may have been part of the original plan of the winepress or added as a later feature.

Reconstructing the Standardized Complex Winepress

The excavations at Rogem Gannim, 'Emeq Lavan and Mordot Arnona revealed the remains of four nearly identical winepresses, all preplanned and built following similar, standardized blueprints. It is possible that the desire to retain the schematic plan dictated not only the form of the installations, but also their locations, which were chosen based on topographic and geological features required by the plan. As each of the winepresses presented here was used over extended periods of time, while undergoing modifications and alterations, their degrees of preservation vary. By comparing the plans of the four winepresses we can offer a solid reconstruction of an ideal blueprint that would have been used by the ancient builders (Fig. 11:A).

Each of the winepresses had three side-by-side rectangular treading surfaces, which are best preserved at Rogem Gannim. At Mordot Arnona, a thick, hard plaster was used to coat the entirety of the treading surfaces. Based on two carved niches found in the back wall marking the surfaces at Rogem Gannim, the presses probably used wood beam levers. At Mordot Arnona, these niches would have been incorporated into the ashlar walls surrounding the surfaces. Each of the treading surfaces was connected to a cubical settling vat measuring approximately 1 × 1 m and 1 m deep. In turn, the vats were connected to a collection chamber via hewn convergence channels with a recessed frame to accommodate a flagstone capping, such as that found at 'Emeq Lavan. The channels at Mordot Arnona were carved and roofed with well-drafted stones, probably an ad hoc local adaptation.

The convergence channels fed into a large, nearly square, shared collection chamber. The chambers of all four winepresses have similar dimensions (2.3–2.5 m long, 2.0–2.5 m wide, 1.5–2.0 m deep). The chambers at Rogem Gannim and 'Emeq Lavan were well-preserved, including the bedrock roof, and the convergence channels align almost perfectly with the upper corners and central axis of the chambers. The bedrock roofs of the collection chambers at Mordot Arnona were not preserved; they had probably collapsed or were intentionally removed in later use phases. In each winepress, access to the chamber was via a hewn staircase opposite the channels. Additionally, except for Rogem Gannim, there was a round settling pit in each chamber, clearly indicating that the chamber was indeed used for the collection of extracted liquids. While some degree of variation can be seen between the winepresses' plans (Fig. 11:B–E), their construction indicates a high degree of standardization, which could have only been achieved under the authority of a single administration.

After reconstructing the winepress blueprint, we can estimate the production yield of such a complex. Based on the average collection chamber size, each winepress could hold approximately 9100–9400 liters after each pressing; multiple pressings could have been

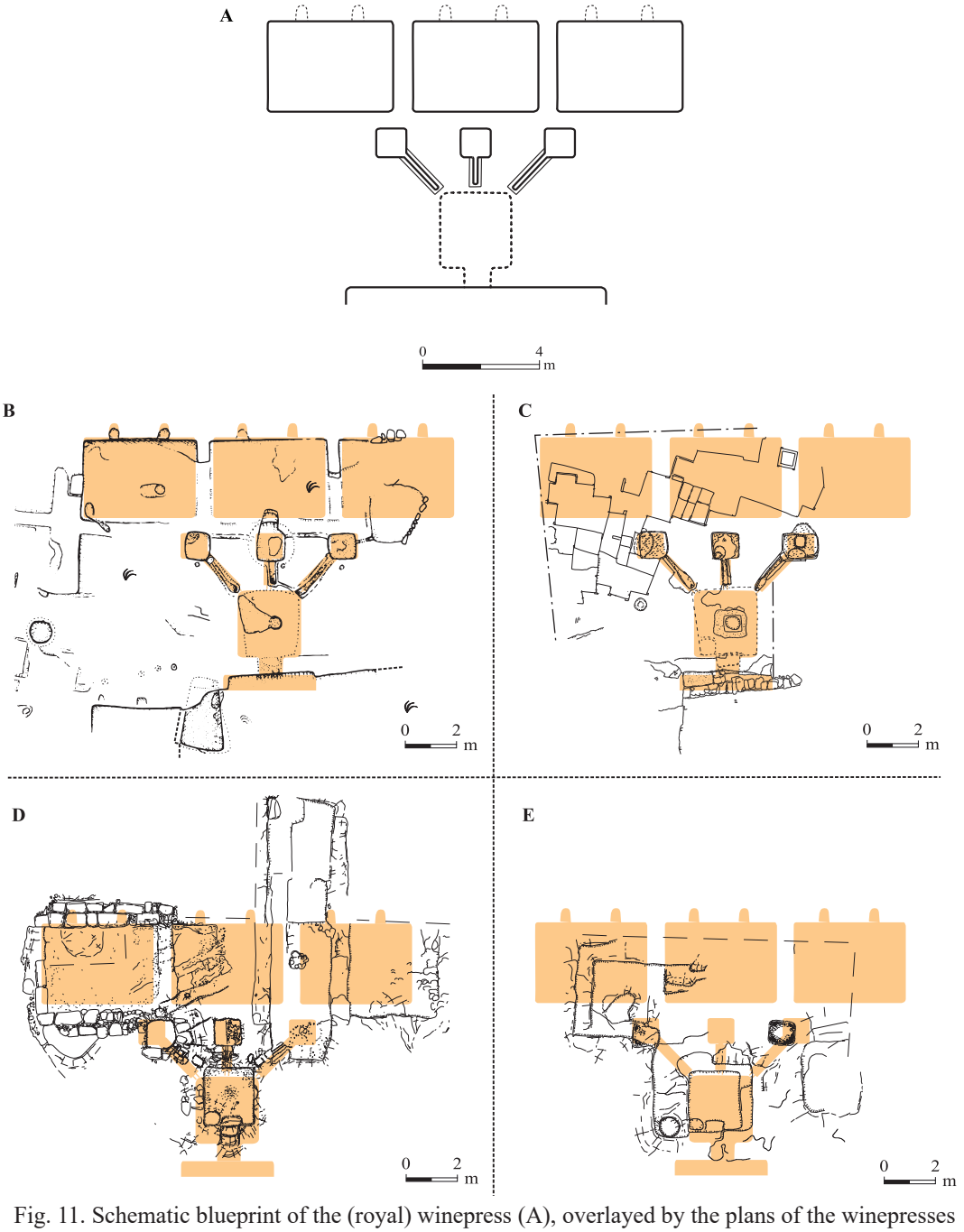

Fig. 11. Schematic blueprint of the (royal) winepress (A), overlayed by the plans of the winepresses at Rogem Gannim (B), ‘Emeq Lavan (C) and Mordot Arnona (D, E) (drafting: O. Zakaim).

undertaken in each harvest season. The collection chamber of the eastern complex at Mordot Arnona was a bit smaller, with a carrying capacity of c. 8000 liters. As the average volume of a single *lmlk*-type storage jar is around 45 liters (Lipschits 2021:1; similar measurements are reported by Karasik, Harush and Smilansky 2020), about 200 jars would be needed to store the contents of a full collection chamber.

In ancient periods, one dunam of land could yield 500–1000 kg of grapes, from which 300–600 liters of wine could be produced (Frankel and Ayalon 1988). Based on these figures, produce from c. 16–32 dunams of vineyards would be needed to fill the largest collection chamber of these ancient estate winepresses (9400 liters). According to Frankel and Ayalon (1988:20), one person can press about 100 kg per hour (60 liters per hour). With a total of six workers, two treading on each surface, c. 26 hours of pressing would be needed to fill the largest chamber.

Dating the Winepresses

The nearly identical winepress layout replicated at Rogem Gannim, 'Emeq Lavan and Mordot Arnona suggests that the installations were contemporaneous and date to the late Iron Age, based on ceramic assemblages, proximity to significant and dateable features and typological considerations. However, as with most ancient hewn features, the ceramic assemblages retrieved from soil fill layers above the treading floors and within the vats are dated to later periods, and should be attributed to reuse or disturbances by intrusion or quarrying activity, when the winepresses had already been out of use.

Greenberg and Cinamon (2011:84) point out that the winepress complex uncovered at Rogem Gannim (originally classified as three presses) could not be dated with certainty. They suggest that it was damaged in quarrying activity, probably in the Early Roman period, possibly as part of building activity in Cave 1. South of the winepresses, on the same terrace, a bell-shaped pit was exposed alongside several natural and carved depressions. Only one of the pits yielded an undisturbed accumulation of soil fill, containing Iron Age and Persian-period pottery sherds (Greenberg and Cinamon 2011:84–85, Figs. 21:5, 8; 22:13–14; 23:9). These finds date the initial usage of the terrace and the site as early as the late Iron Age and Persian period, including the winepresses.

At Mordot Arnona, two phases were discerned in both the eastern and the western complexes. In the eastern complex, the pottery deposit was reversed stratigraphically, with Iron Age pottery in the upper part of the soil fill in the collection chamber and early Hellenistic pottery on the bottom. In the western complex, several large sherds of early Hellenistic-period jars were exposed at the bottom of the collection chamber. Additional broken jar fragments were found *in situ* in a carved space between the two complexes (L2229). All of these indicate the date of the later usage of the complexes but supply no direct evidence of the earlier one. The small amount of early Hellenistic jar sherds in Area A stands in stark contrast with the large number of Iron Age jar sherds (dozens of Iron Age jar rims and hundreds of body sherds, most of them of the *lmlk* type).[9] These, together with 155 *lmlk* stamped jar handles and 17 "private" stamped jar handles (Sapir et al. 2022: Table 2; 2023), suggest that the winepress complexes

[9] The pottery from Mordot Arnona is currently being studied by Liora Freud. We wish to thank her for allowing us to quote her preliminary analysis.

were founded in the late eighth century BCE and were components of the flourishing wine industry and royal administration that continued to exist in the seventh century BCE.

Excavation of the winepress at ‘Emeq Lavan uncovered no sizeable ceramic assemblage dated to the Iron Age, and the dating of this winepress is based on the similarities to those at Mordot Arnona and Rogem Gannim.

The Big Picture of the Winepresses

In our opinion, there is enough contextual evidence to suggest that the winepresses discussed in this paper were constructed in the late Iron Age, probably in the late eighth–seventh centuries BCE. In addition to the details presented above, significant evidence for dating the winepresses and determining their economic roles stems from understanding these three sites—‘Emeq Lavan, Rogem Gannim and Mordot Arnona—as part of a larger phenomenon in the economy and administration of Judah during the late eighth century BCE. The changes during this period were not driven solely by endogenous factors but were rather a reaction to the subjugation of Judah to Assyria, which urged the establishment of a highly administered economy (Lipschits, forthcoming). As part of these changes, during the late eighth century BCE, the production of Iron Age storage jars evolved from small-scale, unstandardized manufacture in local workshops to mass production of standardized vessels in central workshops (Lipschits 2021:15). Similarly, the distribution of weights during this period indicates that the ruling administration was increasingly involved in implementing the use of standard units of measurements. In our opinion, the administrative control resulted in improved agricultural production and transportation, and served as a catalyst for the standardization of the economic and commercial systems (see also Lipschits 2021:15). Moreover, ‘Emeq Refa’im served as a focal point in this developing system and was economically reliant on wine production from the late eighth to the fifth century BCE (Greenberg and Cinnamon 2006:236–238).

It seems that the results of the excavations at Mordot Arnona are an archaeological and chronological anchor evincing the beginning of the development of the settlement along the Armon Ha-Naẓiv–Ramat Raḥel ridge already in the last third of the eighth century BCE (Ben-Ari et al. 2021; Sapir et al. 2022). The plan and characteristics of the site during this period indicate that a monumental public building was erected at the end of the eighth century BCE. The structure seems to have been rather short-lived, and it was removed, apparently by deliberate action, at the beginning of the seventh century BCE (Ben-Ari et al. 2021; Sapir et al. 2022). Possible support for this conjecture can be found in an unusual assemblage of jar handles bearing “private” and *lmlk* stamp impressions from the end of the eighth century BCE (Ben-Ari et al. 2021; Sapir et al. 2022; 2023).

A comparison between the finds from the excavations at Ramat Raḥel and those from Mordot Arnona shows similarities in the pottery assemblages and in the numbers of jar handles stamped with either “private” or early and late *lmlk* stamp impressions. Similar to Mordot Arnona, the date of the first construction phase at Ramat Raḥel can also be deduced

mainly from the copious finds dating to the end of the eighth or the beginning of the seventh centuries BCE, found in the fill below the floor of the second construction phase, which dates to the last third of the seventh century BCE (Lipschits 2021:146).

It seems that Ramat Raḥel was built on the southern part of the long ridge that ends to the east of 'Emeq Refa'im, biblical "Valley of the King," in order to manage and control the development of a new royal estate that was established in the valley. This was one component of several in Judah's developing economy and administration as it became a vassal kingdom under Assyrian rule, designed to ensure the regular tax payment to the Assyrian Empire. We may assume that the construction of the contemporary administrative center at Mordot Arnona at the end of the eighth century and the beginning of the seventh century BCE strengthened the control at the edge of the ridge, extending it to the agricultural areas to the south and east of 'Emeq Refa'im, which were geographically beyond the area that Ramat Raḥel could observe and control. As in 'Emeq Refa'im, here also several tumuli were found: one at the site of Mordot Arnona itself, one east of this site (*HA* 1981; Kloner 2001:132–133) and one south of the site (not excavated and erased by constructional works). These tumuli may have been used for control over the eastern slopes of the ridge and the agricultural estates that were established in the upper reaches of Naḥal Darga. The location of the site of Mordot Arnona, with a clear view toward Ramat Raḥel and the fortified tower at Ṣur Bahir (Fig. 1; Eisenberg and De Groot 2006),[10] completed a military, economic and administrative "triangle of control," with these three structures commanding the areas to the west, south and east of the Armon Ha-Naẓiv–Ramat Raḥel ridge, as well as the ridge itself.

'Emeq Refa'im was an important feature in the royal landscape and should be identified as the location of biblical "Valley of the King" (Lipschits and Na'aman 2020) and as suggested above, also as the royal estate of Mamshit, mentioned in *lmlk* stamp impressions. The discovery of decorated Proto-Aeolic architectural elements at 'Ein Joweizeh (Fig. 1; Ein-Mor and Ron 2016), 'Ein Ḥanniya (Yuval Baruch, pers. comm.[11]) and Armon Ha-Naẓiv (Billig 2021; Billig, Freud and Bocher 2021; 2022) suggests that the valley functioned as a royal estate, perhaps managed from Ramat Raḥel. In light of the excavations at Mordot Arnona, it seems that these estates were more widespread than previously assumed. The system of tumuli encircling 'Emeq Refa'im and constructed on the hills above it, together with the tumuli above the Naḥal Darga basin, is another prominent feature in this unique landscape. They are dated to the later part of the eighth century BCE but continued to exist in the seventh century BCE (Cinamon 2004; Lipschits and Gadot 2008; Ben-Ari et al. 2021). Though the exact function of these features is unclear, it seems that they are best understood as political and/or religious landmarks associated with the viewshed of the palace at Ramat Raḥel on the eastern side of the valley and that of Mordot Arnona above the Naḥal Darga basin and to the east and southeast.

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[10] Further excavations at the site uncovered the remains of a winepress (May 2001). Based on its published plans and photographs, it may fit the criteria of the winepresses discussed here.

[11] A Proto-Aeolic capital from the site has not yet been published (for preliminary information regarding the excavation, see Baurch and Zilberbod 2015).

Conclusions

Ancient viticulture in the Levant, and more specifically in the Jerusalem region, during the Iron Age has become a prominent area of research. It is commonly accepted that wine in the ancient world was not important only for its caloric and dietary significance, but also for its vital economic role as a taxable good. While the system of stamped *lmlk* jars represents administrative involvement in processing and taxation of agricultural produce, the current study on the winepresses at Rogem Gannim, ‘Emeq Lavan and Mordot Arnona has been able to identify, for the first time, administrative standardization in multiple agricultural production installations. The standardization of the winepresses and their geographic distribution are evidence of the development of agricultural royal estates established in the hill country in areas that were controlled by the royal house. The swift development of the economy and administration of Judah at the end of the eighth century BCE was directly related to the Assyrian pressure and taxation, which imposed a sudden need for standardization and centralization upon the economic system (Lipschits 2018a; 2018b; 2021:131). The process was not limited to the area around Jerusalem and incorporated also more distant regions, including the Hebron area in the south of the Judean hill country and ‘Emeq Ha-Ella in the Shephelah, to the west.

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