3. Case study 2: Muro Tenente

3.1 Introduction: the site and its surroundings

The archaeological site of Muro Tenente (Figs. 3.1 and 3.2) is located between the modern towns of Latiano and Mesagne, some 20 kilometers south-west of Brindisi. The site is located in a slightly elevated position (ca. 5 meters higher than the surrounding landscape) in the Brindisino plain, a relatively flat area in southeast Apulia. The settlement’s ancient name is unknown; the site is probably called Muro Tenente after what is today its most conspicuous feature, the 2.7 kilometers long fortification wall1 (Fig. 3.3), and the nearby masserie Muro and Tenente. In Ester van Joolen’s evaluation of the land systems in the Salento Isthmus, Muro Tenente is placed in the Brindisino-plain land system, a flat or almost flat (‘terraced’) landscape that shows no or relatively minor relief and is intersected by river valleys and depressions.2 Today, olive orchards are the principal form of land use in the Brindisino, together with grapes and cereals (wheat and barley), and occasionally tomatoes, eggplants, melons, citrus fruits and figs.

3.2 History of research

The first systematic excavations at Muro Tenente were carried out by the Soprintendenza per i Beni Archeologici della Puglia in the 1960s and 1970s. Among the first discoveries were a large number of graves and parts of a domestic quarter, dated to the 4th century BC.3 In 1992, a survey team from VU University Amsterdam started to investigate the settlement area.4 The surface scatters revealed that the site was occupied from the Early Iron Age until the Early Imperial period (1st century AD). The survey results showed that the intra-mural settlement area was not completely used for habitation; domestic complexes and burial locations were grouped in nuclei, with large open spaces in between. The settlement appeared to be fairly small in the early periods of its existence, and did not expand significantly until the Early Hellenistic period. In 1993, VU University started excavations at Muro Tenente as part of the already existing long-term research of regional settlement patterns in the Brindisi district in southeast Italy. This so-called Brindisino project also included excavations and surveys in other sites in the area, such as Oria, Masseria Mea (Cellino San Marco), Muro Maurizio, San Pancrazio Salentino and Valesio.

The excavations at Muro Tenente continued on a yearly basis until the summer of 2002. A few years later, the municipality of Mesagne started a project to create an archaeological park in the area, including the building of facilities to make the park better accessible to the public and the re-opening and cleaning of the central part of the site, while excavations were taken up again in the spring of 2007.5 This project was financed by the European Union and carried out by the Royal Netherlands Institute in Rome in collaboration with the Università del Salento in Lecce and VU University. More recently, three one-month summer campaigns were carried out in 2008, 2009 and 2010.

1 Burgers 1994, 146.
2 Van Joolen 2003, 52-54.
5 Burgers 2010, 12-13
3.3 THE ARCHAEOLOGICAL RESEARCH

I will discuss the site of Muro Tenente in much the same way as l’Amastuola in the previous chapter. First, the excavation results will be presented diachronically, starting with the scarce traces of Early Iron Age habitation and ending with the site’s abandonment around the 1st century AD. After that, I will focus on specific contexts that were either intensively sampled and contained interesting archaeobotanical material, or are otherwise of specific interest for the interpretation of the site.

3.3.1 DIACHRONIC OVERVIEW

The survey of the settlement area has shown that the earliest Iron Age habitation was located in the center of the walled area (Fig. 3.2, C).6 The central area is the most elevated point of the site, at about 100 meters above sea level (Figs. 3.2, 3.5).7 Apart from this central nucleus, a few other minor scatters of impasto pottery were detected, covering an area of some 15 hectares in total. This indicates that the settlement had a fairly dispersed character in this period. However, only a few Iron Age features were actually discovered during the excavations, which suggests that most traces of Iron Age origin had already been removed (or built over) in antiquity. Possible remains of an Iron Age hut were found in one of the test trenches that were dug in 1992 (Fig. 3.2, sounding nr. 18). Among the finds from the northeast and east area of the central excavation trench was much Iron Age pottery, but no architectural remains.9

The surveys indicate that habitation continued in the central area in the following centuries.10 At some point in time,11 this center was surrounded by a fortification wall, suggesting that the enclosed area (ca. 8 hectares) had some sort of special status.12 Only a small part of this wall was excavated (Fig. 3.2, trench D), but its course can be followed on aerial photos. The fortification wall around the central area was apparently built and modified during several construction phases. In the latest one, between the end of the 4th and beginning of the 3rd century BC, at least one tower was added.13 At about the same time, another fortification wall was constructed surrounding the whole settlement area. As already mentioned, this outer fortification circuit is still the best visible ancient structure at Muro Tenente. The course of the fortifications can be followed almost in its entire length, enclosing an area of ca. 52 hectares. On the basis of the ceramic evidence, it was concluded that the wall was erected in one single building phase, at some point in the early 3rd century BC.

6 Burgers 1998, 61
7 This higher location also caused a greater degree of erosion in this part of the site, resulting in a considerably thinner ploughzone covering the archaeological strata. In fact, some of the upper archaeological strata in the central excavation trench have already disappeared. Burgers 1999, 121
8 Burgers 1996, 109.
9 A rectangular structure built with upright flat stones located southeast of room 3 (Fig. 3.5, ‘IA hut?’) was initially interpreted as an Iron Age storage room for agricultural products (Burgers, Crielaard and Yntema 2010, 19). However, later on, a closer examination of this structure indicated that an Iron Age date is highly unlikely (J.P. Crielaard, pers. comm.).
10 Burgers 1998, 63.
11 The exact date of the oldest phase (when the structure probably served as a terrace wall) is still unclear, but finds of diagnostic pottery from the 6th century BC is indicative of a terminus post quem around that period. Pers. comm. Raphaëlle-Anne Kok-Merlino, who directed the excavation of the fortification wall in 2008.
12 Burgers 1999, 120
13 Kok 2010, 34–36.
Most of the structures in the central habitation area date to the Early Hellenistic phase, and include stone walls that seemed to define three rooms, a central courtyard, but also two roads and several clusters of graves (Fig. 3.5). The whole complex appeared to have grown ‘organically’ rather than built according to a predefined layout. The most characteristic feature of the building complex was the so-called north wall, a particularly thick (1.5 meter) structure that was apparently built during various phases or instances, resulting in several ‘shells’ with a different width and construction technique. The north side of this wall was flanked by a road, paved with crushed limestone (*tufina pressata*). Against the south side of the wall, three individual rooms were built (Fig. 3.5, 1, 2 and 3), and south of these rooms, a large (140 m²) courtyard was located. The area to the east was interpreted as a somewhat peripheral area, where fires were lit and refuse was dumped. However, the discovery of a pit grave (Fig. 3.5, grave 30), indicated that this area was also used for burials. In the the southeastern part of the central habitation area, another cluster of 13 graves was found.¹⁴

The excavations revealed two habitation quarters that were newly built in the Early Hellenistic Period. The first was located on the inner side of the northern section of the fortifications (trench A on Fig. 3.2, see also Fig. 3.4), the second in the southern section (Fig. 3.6, trench E on Fig. 3.2). In contrast to the buildings in the center, the houses in these parts of the settlement appeared to have been built according to a predefined, regular layout, consisting of series of adjoining houses which make up a kind of *insulae*, separated from each other by paved streets. This predefined pattern might suggest that the new houses were built in a period when the settlement’s population was growing rapidly, creating a need for quickly built, rationally planned new living quarters.

Despite the new building activities in this phase, the settlement’s spatial and functional structure continued to have a rural character. The surveys have detected numerous isolated, fairly small scatters (ca. 500 m² on average) that started to appear in the Early Hellenistic period in the area surrounding the site. It seems that, in this period, part of the population lived in farmsteads in the nearby countryside. Occasionally, fragments of funerary wares were also found at or in close proximity to these sites, indicative of small rural necropoleis. The extra-urban occupation seems to have consisted of isolated farm sites, mostly located at a distance of at least one kilometer from the city walls.

The period of building activities apparently ended less than a century later, when the houses in the northern periphery were abandoned. Some of the structures in the south were destroyed by fire, but this area remained partly in use. Two rectangular structures were built parallel to the fortification wall (Fig. 3.6, ambiente 1 and 2), but they may have been seasonal refuges and not permanently inhabited houses.¹⁵ The presence of nine large tufa blocks close to the fortification wall has been interpreted as a sign that some restoration work on the wall was carried out. The necessity to reinforce the fortification wall might be connected to events during the Second Punic War (218-201 BC), when Hannibal pillaged large parts of Apulia.¹⁶ After the abandonment of the domestic quarters in the periphery, the site was reduced to a much smaller building nucleus in the former town center. Habitation continued here until the early Imperial period. The peripheral zones were no longer used for housing, but for agricultural purposes and, occasionally, burials.

### 3.3.2 Specific contexts

#### Central area (Figs. 3.5 and 3.9)

The walls of the three rooms that were excavated in the central excavation trench all had stone foundations with mudbrick superstructures, and plaster or clay floors. Only the room in the middle (Room 2)

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¹⁴ Tetteroo and Waagen 2010, 111-140.
¹⁵ Di Noi and Burgers 2010, 48.
¹⁶ Di Noi and Burgers 2010, 52.
was completely covered with a tiled roof. Inside, traces of pyrotechnical activity were found: a hearth and, in a later phase, a small oven or furnace. Both features probably had a domestic function. The hearth could be used to heat the room and prepare food at high temperatures, whereas the furnace was probably utilized to cook food at a low fire.\footnote{Units 1675 and unit 1775, not sampled. Crielaard, unpublished preliminary report of the 2001 campaign at Muro Tenente, 7.} The easternmost room (Room 3) housed a small well (unit 450), consisting of a square pit that was lined with stone slabs. Room 1 on the west side was probably a semi-indoor area, that was used for household activities. It was named the ‘entrance room’ after the large, rectangular ‘threshold’ of limestone that is incorporated in the north wall.\footnote{Although the excavation of the wall clearly showed that this limestone block is part of the outer face, and the entrance of Room 1 was probably on the south side.} On its west side, another paved road was located that reached a dead-end against the north wall. Overall, the three rooms give the impression of small, very modest living and working areas.

As the survey and test trenches had already indicated, the settlement area was not completely used for habitation. Large open spaces existed in between the habitation nuclei. It seems that this pattern was repeated on a smaller scale at the level of individual households, as the excavated houses were also separated by open spaces. The function of these open spaces is unclear, but it is possible that they were used for various domestic activities, for example to keep animals, grow fruit and vegetables, and store and process crops. In the courtyard south of the three rooms, a small water channel was located, which consisted of three worked stone blocks that were heavily damaged by recent ploughing activities. In the area south of the courtyard, a layer with much charcoal (units 455, 458, 459 and 1702) was found.\footnote{Unit 458 is described in the find administration as ‘small black charcoal spots forming some sort of construction: postholes?’ But considering their location among the other charcoal depositions, it seems likely that these spots are also related to the nearby kiln.} The latest datable pottery from this stratum could be attributed to the late 4th century BC. The charcoal may have been scooped out of a nearby structure that was interpreted as a kiln (units 841 and 598), possibly for the production of pottery, or indeed charcoal (see paragraph 3.5.1).

In the open area east of the three rooms, two deep pits were excavated that yielded evidence of pyrotechnic activities \textit{in situ} (units 1630, 1635 and unit 1663). Other finds included an ash deposit (unit 503, dating to the 4th century BC), and some bones and a skull of a sheep/goat (unit 1620). The area also contained a tomb (grave 30). About 50 centimeters northeast of this grave a black spot was found, containing a large quantity of carbonized grape remains. There seems to be no stratigraphical connection between grave 30 and this grape deposit.

\textit{Funerary remains (Figs. 3.22 and 3.23)}

Clusters of graves were excavated in the central and northern excavation trenches.\footnote{Tetteroo and Waagen 2010} Unfortunately, the majority had been plundered during recent looting activities. The earliest graves are of the \textit{fossa} (pit) type, dating to the 5th century BC. Four graves in the central trench are more elaborate cist tombs, which are also datable to the 5th century BC. The graves in the center seem to be clustered in small nuclei, with enclosure walls delineating the different burial plots. The wall structures in the southeast corner of the same trench can probably be interpreted as the foundations of similar burial enclosures. Although the tombs at Muro Tenente are clustered and not randomly dispersed over the settlement area, it is not appropriate to refer to them as ‘necropoleis’,\footnote{As, for example, Burgers (1999, 121) calls it.} since they do not form a separate ‘city of the dead’ outside the living quarters.

In 2001, osteological analyses were carried out on 28 skeletons (found in graves excavated between 1995 and 2001) by Erik Akkerman.\footnote{Akkerman 2002.} The average body height of the deceased inhabitants in these
graves was around 155 centimeters for adult women and 163 centimeters for men. Most of the adults suffered from degenerative arthritis, a joint disorder that is caused by daily wear, usually presenting itself in old age. However, since the average age at death of the individuals in this sample was only 26.5 years old for women and 33.5 years old for men, the presence of arthritis might indicate that these individuals continuously carried out heavy physical labor. This seems to be confirmed by the discovery that the muscle attachments on the bones of most individuals were quite large, suggesting a well-developed muscular system. Overall, it can be said that the skeleton remains are indicative of a hard-working peasant population.

The northern Early Hellenistic habitation quarter (Fig. 3.4)
The different layout of the houses in the Early Hellenistic complex located next to the northern fortification wall, compared to the buildings in the center, was perhaps the result of rational planning. Geophysical research indicated that the soil underneath the houses was probably used for agricultural purposes prior to the construction of the habitation quarter. The complex was built in the early 3rd century BC, and abandoned in the final quarter of the same century. Some small and scattered cemeteries were also discovered, mostly datable to the 4th century BC. The houses consisted of stone plinths carrying mudbrick superstructures and tiled roofs of which the scatters were found on the earthen floors. Most houses had several rooms, some of them with clearly defined functions, such as one of the northermmost rooms (IX) that contained a series of large storage vessels (dolia) still in situ, probably for the storage of agricultural produce. One of the other rooms (VIII) had plastered walls, and in one of its corners, a concentration of 36 pyramidal loomweights was found. Another indication of small-scale craft activities came from the supposed courtyard at the eastern side of this room, where a large quantity of misfired sherds suggests that this zone was used for pottery production.

The southern Early Hellenistic habitation quarter (Fig. 3.6)
This part of the settlement probably housed a habitation quarter that is contemporary to the one along the northern fortification wall, but only a very small part of it has been excavated. The investigations so far have unearthed a stone stairway that gave access to the fortifications, a road that ran along the inside of the wall, and another road that probably connected the wall with the center of the settlement. The Early Hellenistic building complex was built next to this north-south orientated road, in a similar style as the houses in the northern trench, with stone walls and tile roofs.

In the eastern corner of the southern trench, a step in the fortification wall was found, and a thick, charcoal-rich layer (‘ash layer’) that extended over a more or less rectangular area of 5 x 2 meters. This layer was sampled thoroughly, resulting in 18 soil samples. It has been interpreted as the remains of a wooden structure, which may have been in use shortly after the abandonment of the peripheral living quarters along the northern and southern part of the fortification wall. The exact period of occupation, however, is not entirely clear, so the structure could also be contemporaneous to the living quarters. The burnt layer was cut by two large brownish circular spots, which were initially thought to have contained large storage vessels. In the middle, a smaller dark circle was visible that looked like a posthole. In 2008, one of the two ‘pithoi’-pits (unit 20056) was excavated (the other one was too shal-

23 This is shorter than the average modern Italian (165 cm for women and 176 cm for men (Garcia and Quintana-Domeque 2007), but similar to southern Italy’s peasant population before World War II (Carter 2006, 42).
26 Burgers and Yntema 1999, 120.
27 Unfortunately, the exact location where the samples were taken was not marked in the excavation report.
28 Di Noi and Burgers 2010, 47. This abandonment probably took place in the final quarter of the 3rd century BC; the ash layer contained the base of a black gloss vase that provided a date in the late 3rd or early 2nd century BC.
low), only to reveal that it hardly contained any archaeological material. The smaller ‘posthole’ in the middle included a few hard-baked pottery sherds, that were placed upright in the hole, presumably to hold a wooden pole. Unfortunately, neither the ‘pithoi’ nor the posthole spots contained any datable pottery, so we can only conclude that these features date from a period posterior to the burnt layer.

This part of the settlement was abandoned in the same period as the habitation quarter in the north, i.e. around the last quarter of the 3rd century BC. The two small rooms that were built parallel to the fortification wall (*ambiente* 1 and 2) belong to the most recent traces of habitation. Only one of these ‘rooms’ (1) has been excavated, revealing several occupational layers and a fireplace. To judge from the reinforcement of the fortification wall in this period, the later 3rd and 2nd centuries BC may have been eventful periods for the inhabitants of Muro Tenente.

### 3.4. THE ARCHAEOBOTANICAL RESEARCH

#### 3.4.1 SAMPLING METHODS AND DATA

During the first years of excavation (1992-2000), archaeobotanical sampling was conducted only occasionally. For this reason, there is only a limited quantity of plant material from the parts of the settlement that were excavated before 2001, particularly the domestic complex in the northern periphery (trench A, excavated 1992-1998). Only seven units were sampled, seemingly at random (their locations are indicated in Fig. 3.7). One single sample was taken in test trench B (Fig. 3.8). In the central excavation area (trench C), samples were taken from 47 units. Seven of them derived from burials; the other samples were collected in a variety of other contexts, all datable to the Early Hellenistic period (Fig. 3.9). During the excavations in 2007 along the interior of the southern fortification wall (trench E), a total of 41 soil samples were taken from eleven stratigraphical units (Fig. 3.10). The archaeobotanical analyses yielded a total of 5,158 charcoal fragments and 5,628 carbonized seeds and fruits. The complete results can be found in Appendix 3, Figs. 3.12 and 3.13 (charcoal), Figs. 3.14 and 3.15 (seeds and fruits). In the figures, no chronological or contextual differences have been distinguished.

#### 3.4.2 CHARCOAL

*Figures 3.12 and 3.13 make it clear that the great majority of charcoal fragments from Muro Tenente, at least in absolute numbers (792 fragments), belongs to the genus *Erica*, including tree heath and Mediterranean heath fragments. However, in terms of frequency (i.e. how often a taxon occurs in different units), *Olea europaea* heads the list (19 units). Another wood taxon that occurs quite frequently is oak, including both evergreen and deciduous types. *Juniperus* sp. was found in large numbers, but all these fragments came from a single context, in contrast to *Pistacia* sp., which appeared in modest amounts, but in quite a few different units. In addition to the carbonized wood of *Pistacia lentiscus*, several fruits were found. Other taxa that were identified include pine wood, myrtle and *Rhamnus/Phillyrea*. Finally, a few fragments of charcoal from an apple or pear genus (*Pyrus/Malus*) were found. A short description of the main characteristics of all these species was given in Chapter 2, where the results of the*

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29 Pers. comm. from Lucia di Noi, who directed the excavations in the southern excavation trench in 2007.

30 The archaeobotanical finds from Muro Tenente have already partly been published in Burgers and Lentjes 2008 (charcoal) and Lentjes 2010 (all macroremains).

31 A detailed description of the sample processing method and the complete analysis results can be found in Appendix 1 and 2.
archaeobotanical analyses at l’Amastuola are discussed. However, a few plant species were found at
Muro Tenente that did not occur in the samples from l’Amastuola. These include pomegranate (Punica
granatum), which was found in one context only and appeared too damaged to provide a secure iden-
tification. A few small fragments of sage (Salvia) were found in one context. Salvia is the largest genus
in the mint family, Lamiaceae, with a few dozen species of shrubs, herbaceous perennials, and annuals.
Ephedra (Mormon-tea) is a small (20-150 cm) plant that occurs in dry climates over a wide area across
southern Europe, mostly on beaches and on dry calcareous soils. The fragments of Populus/Salix are a
bit of a surprise in this context, as neither poplar (Populus) nor willow (Salix) are
macchia species. They are both found primarily on moist soils along water courses, none of which can be found around the
site of Muro Tenente today. Wild apples and pears (Pyrus pyraster, Pyrus amygdaliformis, Malus sylvestris)
can still be found throughout the Mediterranean region in forests, macchie and garighe. The cultivated
species are Pyrus communis and Malus domestica, but on the basis of the anatomy of these charcoal frag-
ments, it is not possible to determine whether the wood belonged to a cultivated variant.

3.4.3 SEEDS AND FRUITS

The sample from Muro Tenente mostly consisted of cereals, the majority of them free-threshing wheat
and barley, both naked and hulled (see Figs. 3.14 and 3.15). Other cereals that were found at Muro
Tenente include rye, oat and emmer wheat. The only rachis internodes that were found at Muro
Tenente belong to the latter cereal type. Pulses were found mostly in burial contexts. Broad bean and
bitter vetch are the most common types. Fruit remains are quite rare, with the exception of the large
deposition of carbonized grapes that was located next to grave 30. Olive stones were also found, as
well as two mastic berries and two unknown fruits from the Rosaceae family.

3.5 THE ARCHAEOBOTANICAL RESEARCH: INTERPRETATIONS

To facilitate the comparison with l’Amastuola, the following pages are organized in the same way as
paragraph 2.5, starting the discussion of the archaeobotanical data from Muro Tenente with a review
of the use of wood, followed by discussions of food preparation and diet, the cultivation of grapes and
olives, and the use of plants in ritual activities.

3.5.1 THE USE OF WOOD

In Table 3.1 and Fig. 3.16, charcoal from six contexts that can be associated with hearths or furnaces
are compared in order to form a general picture of which firewood was used. The same restrictions
that were expressed in Chapter 2 obviously hold true for the charcoal assemblage of Muro Tenente. In
other words, it only provides a partial impression of which species were preferred as fuel and/or pro-
duce ash, with no distinction between different types of pyrotechnic structures. Just like the charcoal
assemblage from l’Amastuola, the fuel species at Muro Tenente included olive and oak wood. Other
wood types that were used as fuel include Pistacia and members of the Pomoideae family. Interestingly,
oak does not abound in the fuel assemblage; a large quantity of fragments was found in unit 458, but
none of the other units contained oak charcoal. A possible explanation is that oak wood would have been
difficult to obtain, if there were no oak forests within easy reach of the settlement.
As we have seen above, Erica wood abounds in the archaeobotanical assemblage from Muro Tenente. Apparently, it was also regularly collected to use as firewood. Erica wood is, indeed, a good choice to light a fire, but it is not very suitable to maintain it and to reach a high temperature. While doing some ad hoc experiments with Erica twigs and fire, I found that small, sun-dried twigs in particular took no time at all to burn and turn to ashes. It is possible that the Erica branches that were used as fuel for fires at Muro Tenente were thicker and contained more water, or even that most of the Erica wood was entirely consumed by the fire.

Interestingly, the excavations at Muro Tenente revealed two deposits of ash that were not associated with pyrotechnic structures (units 253 and 503). Since ash can be used for a variety of purposes, it is possible that it was collected and stored here. In fact, ash production could very well have been part of the settlement’s routine craft activities. The same can be argued for the production of charcoal. There are no archaeological indications of the use of charcoal burners at Muro Tenente, but, as I explained in Chapter 2, such structures can be archaeologically invisible. Most of the charcoal that was collected in the areas around the ‘kiln’ structure in the area south of the rooms and in the courtyard in trench C (Fig. 3.9) showed severe heat damage and vitrification, as can be seen on Fig. 3.17. This damage could indicate that the fuel was already carbonized before use (i.e. that it was charcoal instead of wood), especially since the ‘kiln’ may have been used for pottery production or metal smelting, which requires high temperatures. Indeed, it could even be hypothesized that this kiln was especially used for the production of charcoal, which would explain the abundant presence of (heavily damaged) charcoal fragments in this part of the courtyard.

To complete the discussion of the use of wood, a few observations can be made about wood as construction material (see Table 3.2). The recent excavations along the southern fortification wall (E) supplied two possible examples of charcoal remains from buildings. Unfortunately, no comparable contexts were found in the other excavation trenches. The remains from the southern trench can both be associated with the charcoal-rich layer in the eastern corner (‘ash layer’ on Fig. 3.6) and were retrieved from the ash layer itself (unit 20011) and from one of the post holes (unit 20056) that was found in it. As I described above in paragraph 3.3.2, this posthole spot dates to a period posterior to the burnt layer.

The charcoal from unit 20056 is the only context in Muro Tenente where Juniperus-wood was found. The wood of Mediterranean juniper (Juniperus communis) is known for its excellent qualities, since it is robust, easy to work, fragrant and takes a good polish. Indeed, juniper wood was highly praised as construction wood by the Romans. It is unclear, however, whether it was used as a wooden post here or for some other part of the structure, such as the roof or the floor.

The charcoal from the ashy layer included oak, olive, mastic and Erica wood (Fig. 3.19). I would argue that the relatively large amount of oak (153 fragments out of 270, i.e., 57%) derived from the timber used for this structure, including one of the central posts that supported the roof. Oak trees generally produce excellent timber. The roof was possibly covered with heather twigs (Erica), and could even have been supported by beams made of olive wood, although olive is not particularly suitable for construction. However, it is also possible that the olive wood, together with mastic, Erica and various cereals, fruits and pulses that were found in the same context, were the remains of either a refuse dump or storage facility in this area (see paragraph 4.3.2). Summarizing, very little can be

32 The alkaline properties of ash make it especially effective as a whitening agent to wash clothes, but also to use as a fertilizer for agricultural fields. Hakbijl (2002) also reports its effectiveness as an insecticide.
33 Units 253, 455, 458, 503 and 1702.
34 Units 841 and unit 598.
35 Although recent studies (McParland et al. 2010) shown that vitrified charcoal does not always result from high temperature charring.
36 Meiggs 1982.
37 Gale and Cutler 2000, 204.
said about wood as construction material at Muro Tenente, because there is too little charcoal from associated contexts. It appears that Erica, juniper, olive, mastic and oak wood were all used in house building, but it is unclear for which parts of the structures.

3.5.2 Food Preparation and Diet

The cereal spectrum at Muro Tenente differs somewhat from the one at l’Amastuola. Free-threshing wheat abounds, as well as naked barley. Considering that free-threshing cereals are usually underrepresented because there is less chance that they get carbonized in the cleaning process, it may be assumed that free-threshing wheat and naked barley were an important part of everyday meals at Muro Tenente. This means that, in contrast to l’Amastuola, a considerable part of the cereal crops did not need parching. Still, mortars and pestles were occasionally found at the site, as well as millstones, although generally out of context. Until recent times, stones were often removed from the fields and piled up elsewhere by local farmers to prevent them causing damage to the plough.38

The absence of weeds and scarcity of chaff in the samples from Muro Tenente is remarkable. The few grains of oat and rye can probably be regarded as weedy admixtures39 in the wheat and barley yields, and a total of ten spikelet forks from emmer wheat from six different units represent the only chaff remains. The units in which the spikelet forks were found are indicated in Fig. 3.20. Four of these find contexts were probably refuse dumps, but unit 1636 and unit 1638 are the upper and lower layer of the fill of grave 30. The scarcity of chaff and weed remains at Muro Tenente may be due to the sampling method,40 but it is also possible that cereal cleaning usually took place outside the settlement.

Cereals may have been the most important component of the crop collection in Muro Tenente, but pulses were clearly also part of the everyday diet, even though broad beans and bitter vetches were the only two types of beans among the archaeobotanical macroremains. Other pulses are conspicuously lacking; especially the absence of chickpeas and lentils is remarkable. As we have seen in the previous chapter, the former was also absent in the samples from l’Amastuola. Why they were not found at Muro Tenente is unclear, but it probably has to do with the relatively small number of samples.

The cereals could have been eaten whole, in porridges and gruels, or milled to flour to bake bread, although no clear evidence for bread baking was found at Muro Tenente. Pulses can be eaten fresh or dried, or ground into bean flour to bake bread. Pliny describes how bakers used broad bean flour (lomentum) mixed with wheat flour to increase the bread weight.41 Pulses, on the other hand, can also be grown to enrich the soil as a green crop, or as a complement in fodder. As far as fruit and vegetables are concerned, only the consumption of grapes and olives is clearly demonstrated at Muro Tenente. In addition, there is some charcoal from pomegranate, apple (Malus) and pear (Pyrus) trees. It remains uncertain whether these fruits were cultivated or gathered in the wild.

40 As I pointed out in Chapter 2, light chaff remains are usually rare in carbonized archaeobotanical assemblages, because they are unlikely to survive in charred form.
41 Ciaraldi 1999, 83: Pliny NH 18.30.117.
As far as the food products originating from animals are concerned, the stable isotope analysis on five human skeletons from Muro Tenente showed that meat did not play a large role in the inhabitants’ diet.\(^{42}\) Sheep and goats’ milk would have been a much-needed source of protein and animal fat.\(^{43}\) Indeed, observations in the excavation reports indicate that a large part of the archaeozoological material consisted of sheep (\textit{Ovis aries}) and/or goat (\textit{Capra hircus}) bones. We have to rely on these notes to get an impression of what kind of animal bones were found at Muro Tenente, since the bone material is now lost due to a flood that a few years ago partially destroyed the archaeological storage depot of the Museo Nazionale Archeologico di Egnazia, where the finds from Muro Tenente are stored.

3.5.3 Grape and Olive Cultivation

The excavations at Muro Tenente have supplied little direct archaeological evidence for the production of wine and olive oil, but, as I already pointed out in the previous chapter, this shortage is hardly surprising, since it is quite exceptional to find archaeological remains of olive oil and wine production in Mediterranean contexts.\(^{44}\) Significantly, dense concentrations of transport vessels for wine and/or olive oil were recovered during the urban survey of Muro Tenente. The finds also included fragments of olive/wine presses, but, as is the case with most millstones and other heavy agricultural process-

\(^{42}\) Akkerman (2002, 46) subjected bone material from five Muro Tenente skeletons (two male, three female) to stable isotope analysis. Nitrogen is a stable isotope that is often used in osteological research, because its values can reflect the ratio between diet components of marine and terrestrial origin. Nitrogen enters the food chain from soil or seawater, taken up first by plants, then passed up the food chain to animals. In groups of humans subsisting on land plants and animals, the collagen in their bones contains relatively low levels of $\delta^{15}$N, while those groups relying on freshwater or marine animals will have higher $\delta^{15}$N values. These differences can be explained by the fact that water, and therefore also fish and water mammals, are naturally high in nitrogen. The quantities of the different isotopes can be measured by mass spectrometry and compared to a standard; the result (e.g. $\delta^{13}$C, $\delta^{15}$N, $\delta = \text{delta}$) is expressed as parts per thousand (‰ or ppm). The $\delta^{13}$C values from the skeletons at Muro Tenente were normal, but low $\delta^{15}$N values suggested that these individuals lived on a modest, primarily vegetarian diet. Another common feature was the relatively bad condition of the teeth; a high percentage showed caries and teeth rot. Nevertheless, apart from a single case of rickets (a childhood disease caused by vitamin D deficiency, leading to softening of bones and potentially fractures and deformity), there were hardly any traces found of severe illnesses. Signs of growth arrest due to starvation, which can be witnessed by Harris’ lines (dense lines parallel to the growth plates of long bones, representing temporary slowing or cessation of longitudinal growth) were equally rare.

\(^{43}\) Milk and dairy products were probably obtained from goats and sheep and not from cows, as, until recently, drinking cow milk was very unusual in Mediterranean countries. Sheep and goats are much better adapted to heat and drought than cattle, which is one of the reasons why they play such an important role in the economy of Mediterranean countries. Goats eat practically anything: they can thrive on dry macchia vegetation and still produce plenty of milk. This is why modern Mediterranean farmers often keep a few goats with a flock of sheep for the milk, and also because the goats can lead the way for flocks of sheep on the move. Barker 1985, 30-31; 43, De Grossi Mazzorin 2001.

\(^{44}\) Cf. Foxhall 1993 (see paragraph 2.5.3). Especially the reuse of the pressing equipment may be a factor here. Some pressing stones were picked up during the surveys, but they were rarely found in context during the excavations. Furthermore, it must also be pointed out that only a small part of the settlement has been excavated. It is quite possible that there are still wine and olive presses waiting to be uncovered.
ing equipment, they were generally found out of context. As a result, they cannot be held to refer to wine and olive oil production in a specific period of time.\(^{45}\) The archaeobotanical evidence for olive and grape cultivation at Muro Tenente is fragmented, but does provide some valuable information. Olive wood is ubiquitous at Muro Tenente. Olive stones were found in modest quantities, but they appeared all over the settlement in various types of contexts, including graves, ritual contexts and refuse dumps.\(^{46}\)

Grape remains, on the other hand, occur in abundance at Muro Tenente. The most interesting find was made in one particular context located a little to the northeast of grave 30 in the central excavation trench (C). The soil sample from the black spot that was uncovered here contained 9 olive stones and 5,175 grape pips, together with grape stems, skins and flesh (Fig. 3.21). The presence of the latter indicates that the grapes were not fresh when they were carbonized, as fresh grapes contain much water and tend to explode when they are exposed to fire, leaving hardly any trace of their skins and pips. It takes no more than a few minutes for a grape to burn away in smothering ashes. Therefore, if the grapes from Muro Tenente had been fresh, they could not have been exposed to the fire for more than a few minutes. Otherwise, there would not have been so many pips left. A more plausible explanation is that they were dried, or in some other way drained of their liquid contents. It is possible that the fruits were raisins,\(^{47}\) but it rather looks like they were pressed. Some of the finds consist of grape-skins attached to the pips, and the abundant presence of loose, ‘empty’ skins also strongly suggests juice extraction. Furthermore, the fruit remains show a clear resemblance to pressed grapes from other archaeological sites, such as the Neolithic site of Dikili Tash in northern Greece\(^{48}\) and Early Hellenistic Komboloi in Southern Macedonia.\(^{49}\) In short, I would argue that the archaeological remains of the grapes from Muro Tenente morphologically resemble ‘wine-pressings’. The deposition could represent the remains of grape juice residue after fermentation, possibly –but not necessarily– with wine as the desired end product. The grape pressings may have been dumped and carbonized after sieving. It is possible that their carbonization is due to use as fuel (see paragraph 5.3.1). However, even if the hypothesis is accepted that this grape deposit represents the remains of wine production, it still supplies no conclusive evidence of grape cultivation at Muro Tenente. The idea that wild grapes can be used to produce wine is now widely accepted.\(^{50}\) I will return to this issue in the next chapter, when I discuss the possibilities of grape and olive cultivation at Muro Tenente in more detail.

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\(^{46}\) Units 89, 253, 805, 1624, 1636, 1638, 2551, 20011 and 20067.


\(^{48}\) Valamoti et al. 2007.

\(^{49}\) Margaritis and Jones 2006.

\(^{50}\) The process of wine making was apparently invented before the cultivation of the grape: finds of tartaric acid in vessels from astonishingly early contexts in the Near East has led to the discovery that the presence of cultivated grapes is not necessarily a conditio sine qua non for wine making. Tartaric acid is one of the main acids found in wine, but it also occurs naturally in grapes and many other plants, so the substance in these vessels could, theoretically, also have been grape juice. Such ancient grape juice, or wine, has been found in vessels from Haji Firuz Tepe and Godin Tepe in Iran that date to the 6\(^{th}\) millennium BC, and the Macedonian tell-site Dikili Tash/Philippoi (Valamoti et al. 2007). Some of the burnt houses from the latter site, dating to the end of the 5\(^{th}\) millennium BC, contained the remains of charred grape pips with skins, clearly used for the extraction of juice. Measurements carried out on the grape pips suggest that they were morphologically wild. Since the region of the Drama plain, where the site is located, is within the geographical distribution zone of the wild vine, it is possible that these grapes were harvested from wild plants. Another possibility would be that the grapes represent a ‘transitional phase’ in cultivation, originating from plants at a very early stage of tending or cultivation (before the development of pips bearing the morphological characteristics of domestication).
Some of the most significant finds of archaeobotanical material at Muro Tenente derive from graves (Figs. 3.22 and 3.23). Unfortunately, in only five out of the 29 tombs that were excavated soil samples were taken. Four of these graves (22, 25, 27 and 30) are located in the central excavation trench, and one in the northern trench (45). The information on the graves, including the results of the archaeobotanical analyses, is collected in Table 3.3.

The differences between the archaeobotanical data from graves—some contained considerably more plant remains than others—can probably be attributed to problems of sampling and post-depositional processes. For example, grave 30 was excavated in 2001, when archaeobotanical sampling was carried out much more meticulously than during the earlier excavation campaigns. Nevertheless, there are also some interesting finds from the graves of earlier excavations. For instance, grave 45, which was excavated in the northern excavation trench (A) in 1997, did not contain any macroremains, but it is the only context at Muro Tenente where carbonized pomegranate wood was found, although the charcoal fragments were heavily damaged, making it difficult to positively identify them.

Grave 22 was not excavated because it appeared to be disturbed, but a soil sample was taken from the area around it. It is possible that there is no relation between the grave and the area of the sample, which contained some wheat (T. aestivum/compactum and Triticum sp.), a vetch (Vicia sp.) and some unidentified cereals. Among the charcoal fragments were olive wood and unidentifiable hardwood.

Only two soil samples were taken from grave 25, a pit (fossa terragna) grave that was excavated in 2000. One sample was taken from the grave fill (unit 560), and one smaller sample of a charcoal spot within the fill (unit 441). The sample from the grave fill did not contain any botanical material, probably due to the ploughing (?) damage that was caused to the grave, resulting in the removal of the cover stones and parts of the skeleton. The charcoal sample from the fill yielded only a tiny quantity of fragments of Erica sp.

Grave 27 is another pit grave that was excavated in the same year, from which five samples were taken: two from the grave fill and three from the contents of a black gloss kantharos, a Gnatia kantharos and one of several small black gloss cups that belonged to the grave gifts from inside the tomb. The samples yielded a modest amount of macroremains, consisting of two olive stones, which were possibly part of a food offering. An interesting aspect of the plant remains from this grave was the discovery of pine wood. Pinus pinea and Pinus halepensis are not distinguishable from one another on the basis of their wood anatomy, but these are the most common pine species in the Mediterranean region. Unfortunately, no pine cones or nuts were encountered. These might have had a symbolic value (see paragraph 5.3.4 for the association of the pine cone with Dionysos).

Grave 30 contained the remains of a female between 20 and 23 years of age. The deceased woman’s right hand seemed to have held three small, rounded stones and next to the left hand a bigger stone (a pestle?), and a smaller, round stone were found. According to the preliminary osteological analysis, the woman was ca. 1.48 meters tall (measured in situ). Her teeth show clear signs of extreme decay, while the bones bear evidence to the first stages of degenerative arthritis. The ceramic grave gifts date between 280 and 230 BC, so the burial took place in a period when the nearby rooms were still in
use. The soil samples were taken from the soil surrounding the grave (unit 1628), from the upper and lower layers of the grave fill (unit 1636 and 1638, respectively, both dry-sieved with 100% coverage, and from some of the grave gifts. These included a miniature trozzella, a miniature krater, two black gloss plates, a black gloss oil lamp, a loomweight and three knucklebones of a sheep/goat. The samples from the trozzella, krater and one of the plates are included in sample 1638.

The samples from the grave fill (unit 1636, 1638) included emmer wheat, some chaff remains and unidentified cereals, grape pips, olive stones, broad beans and bitter vetches. The lower layer also contained some heavily damaged charcoal, of which only one fragment could be identified, which appeared to be olive wood. The samples from the uppermost layer of the grave fill (unit 1624) contained 30 grape pips, free-threshing wheat, olive stones, barley, emmer wheat and broad beans. All of these may be interpreted as (carbonized) food offerings deposited during the burial. The grave goods offered only a very limited amount of plant remains. The black gloss plate contained some charcoal, which was, unfortunately, unidentifiable. The charcoal in the krater was also partly unidentifiable, but one fragment appeared to be olive wood. The trozzella contained unidentifiable charcoal as well, along with a spikelet fork that probably belonged to emmer wheat.

Two other finds of possible ritual depositions of carbonized food were made in units 1689 and 2551. Unit 1689 consists of the dark soil around a 4th-century BC drinking cup. This cup was found underneath one of the walls (unit 18) in room 2, and was interpreted as a possible sacrifice. The dark soil around it contained a lot of ash and one wheat grain, which might indicate that the cup was filled with burned food remains. Unit 2551 was also interpreted as a sacrifice, but here the plainware pot was positioned in the middle of two division walls between the different burial clusters. Since it was probably already broken in antiquity, and a stone was put right in and through it, it is also possible that this vase actually contains the remains of a ritual meal that was associated with one of the burials rather than with the walls. The soil within the pot was sampled, and contained some heavily damaged charcoal (cf. Erica sp.) and an olive stone.

Summarizing, it can be concluded that the burning of food was often part of burial rituals at Muro Tenente, and possibly also in other contexts of ritual origin. As far as the graves are concerned, this usage is remarkable, since the deceased were buried and not cremated. This means that the burning of food did not take place inside the grave. Indeed, the pottery containers in which the food remains were found were not burned, so it appears that the macroremains were carbonized before they were included in the burial. This also explains the presence of small charcoal fragments in the burials. The taxa spectrum found in these ritual contexts is remarkably similar to the finds from other parts of the site, including domestic contexts and waste dumps. It appears that no special or exotic foods or products with a certain special meaning were used for ritual sacrifices, at least not in the ones that were preserved and sampled. In short, it seems that the food of the dead was the same as the food of the living, consisting mainly of cereals, pulses and fruits.

3.6 SUMMARY AND CONCLUSION

Since almost all of the archaeobotanical samples from Muro Tenente derive from a single phase, this second case study is mostly informative about the Early Hellenistic period. A distinction can be made between units of domestic and of ritual origin, but the samples were predominantly taken from layers that were formed between the middle of the 4th and the late 3rd century BC.

Unfortunately, sieves with rather wide meshes (2.5 and 5 mm) were used.
The charcoal assemblage from Muro Tenente shows considerable diversity. This indicates that the most important argument to select a certain wood species as fuel was its availability. In other words, there is no clear evidence of a deliberate choice of wood as fire fuel. Erica and olive wood dominate the charcoal assemblages in hearths and kilns, followed by olive and oak wood. There are some indications that oak was used as construction material, but the evidence is inconclusive.

The inhabitants’ diet consisted mostly of plant foods and contained very little meat. There is evidence for the consumption of wheat and barley, such fruits as olives, grapes, pomegranates, apples and pears, and pulses, among which bitter vetch and broad bean. Free-threshing wheat and naked barley were apparently more common than hulled types. The absence of weeds and the scarcity of chaff in the samples indicates that cereal cleaning usually took place outside the settlement.

The abundant finds of transport vessels and fragments of pressing stones are indicative of wine and olive oil consumption at Muro Tenente. Olive charcoal is ubiquitous, and olive stones were found in various types of contexts. The same holds true for grape remains, of which a particularly large amount was found in the central excavation trench (C). This deposit, which contained 9 olive stones and 5,175 grape pips, together with grape stems, skins and flesh, possibly represents the carbonized remains of pressed fresh grapes. In short, there is some archaeobotanical evidence to support the hypothesis that the inhabitants of Muro Tenente practiced olei- and viticulture. I will return to this issue in the next chapter.

As also observed at l’Amastuola, the ritual offering of food was apparently common practice at Muro Tenente, and it appears that instead of rare crops or products, mostly everyday food was used for this purpose.

In the next chapter, I will discuss some of the remaining questions that the archaeobotanical research at Muro Tenente has raised. In contrast to l’Amastuola, I believe that there are several reasons to argue that agricultural production took place at relatively large scale at Muro Tenente, and was probably partly sold on a market. I will discuss these reasons in detail in Chapter 4, where I will also address some other important aspects of Muro Tenente’s surrounding landscape and rural economy.
Table 3.1: Muro Tenente, charcoal from contexts that can be associated with hearths or furnaces

<table>
<thead>
<tr>
<th>Trench</th>
<th>Unit</th>
<th>Context</th>
<th>Structure</th>
<th>Date</th>
<th>Taxa Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>253</td>
<td>refuse dump</td>
<td>IV-III BC</td>
<td>2nd half IV BC</td>
<td>Erica sp. (incl. Erica cf. multi-flora and Erica cf. arborea) 23 65 100 Mediterranean/tree heath</td>
</tr>
<tr>
<td>C</td>
<td>455</td>
<td>charcoal deposit</td>
<td>kiln</td>
<td>2nd half IV BC</td>
<td>Olea europaea 49 olive</td>
</tr>
<tr>
<td>C</td>
<td>458</td>
<td>charcoal deposit</td>
<td>kiln</td>
<td>2nd half IV BC</td>
<td>Pistacia sp. 19 mastic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pomoideae (Pyrus/Malus)</td>
</tr>
<tr>
<td>C</td>
<td>459</td>
<td>charcoal deposit</td>
<td>kiln</td>
<td>2nd half IV BC</td>
<td>Erica sp. (incl. Erica cf. multi-flora and Erica cf. arborea) 10 10 467 Mediterranean/tree heath</td>
</tr>
<tr>
<td>C</td>
<td>503</td>
<td>ash deposit</td>
<td>IV BC</td>
<td></td>
<td>Olea europaea 10 olive</td>
</tr>
<tr>
<td>C</td>
<td>1702</td>
<td>charcoal deposit</td>
<td>kiln</td>
<td>2nd half IV BC</td>
<td>Pistacia sp. 7 mastic</td>
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<tr>
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<td></td>
<td></td>
<td>Quercus sp. 28 oak</td>
</tr>
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<td></td>
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<td></td>
<td>unidentifiable hardwood 28 1650 unidentifiable hardwood</td>
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Trench | Unit | Context       | Structure | Date      | Taxa Common Name                                      |
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<td>charcoal deposit</td>
<td>kiln</td>
<td>2nd half IV BC</td>
<td>Erica sp. (incl. Erica cf. multi-flora and Erica cf. arborea) 10 10 467 Mediterranean/tree heath</td>
</tr>
<tr>
<td>C</td>
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<td>ash deposit</td>
<td>IV BC</td>
<td></td>
<td>Olea europaea 10 olive</td>
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<tr>
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Table 3.2: Muro Tenente, charcoal from contexts that can be associated with construction material

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<th>taxa</th>
<th>common name</th>
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<tr>
<td>E</td>
<td>20011</td>
<td>ashy layer</td>
<td>burned structure?</td>
<td>Late Hellenistic</td>
<td>Erica sp.</td>
<td>heath</td>
</tr>
<tr>
<td>E</td>
<td>20056</td>
<td>post hole</td>
<td>?</td>
<td>Late Hellenistic</td>
<td>Juniperus sp.</td>
<td>juniper</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Olea europaea</td>
<td>olive</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pinus sp.</td>
<td>pine</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td>Pistacia cfr. lentiscus</td>
<td>mastic</td>
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Table 3.3: Muro Tenente, grave contexts and possible ritual depositions

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<th>Unit</th>
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<th>Structure</th>
<th>Date</th>
<th>charcoal</th>
<th>common name</th>
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<td>A</td>
<td>34</td>
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<td>grave 45</td>
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<td>Erica sp.</td>
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<td>447</td>
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<td>grave 22</td>
<td>Early Hellenistic</td>
<td>Pinus pinea/ halepensis</td>
<td>umbrella/ Aleppo pine</td>
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<tr>
<td>C</td>
<td>805</td>
<td>fill + grave gifts</td>
<td>grave 27</td>
<td>Early Hellenistic</td>
<td>Punica granatum</td>
<td>pomegranate</td>
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<tr>
<td>C</td>
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<td>grave fill</td>
<td>grave 30</td>
<td>Early Hellenistic</td>
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<td></td>
<td></td>
<td>around grave</td>
<td>grave 22</td>
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<td>unidentifiable softwood</td>
<td>unidentifiable softwood</td>
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<td></td>
<td>fill + grave gifts</td>
<td>grave 27</td>
<td>Early Hellenistic</td>
<td>107</td>
<td></td>
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</table>

seeds and fruits

<p>| | | | | | |</p>
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<td>free-threshing wheat</td>
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<tr>
<td>Triticum dicoccum</td>
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<tr>
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<td>cereals</td>
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<tr>
<td>Vicia faba var. minor</td>
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<td>broad bean</td>
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<tr>
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<td>Context</td>
<td>Date</td>
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<td>olive</td>
<td>Punica granatum</td>
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<tr>
<td>seeds and fruits</td>
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<td>Olea europaea</td>
<td>olive</td>
<td>Triticum aestivum/compactum</td>
</tr>
<tr>
<td></td>
<td>Triticum dicoccum</td>
<td>emmer wheat</td>
<td>Triticum dicoccum spikelet fork</td>
<td>emmer wheat</td>
<td>Triticum sp.</td>
</tr>
<tr>
<td></td>
<td>Triticum sp.</td>
<td>1</td>
<td></td>
<td>wheat</td>
<td>Cerealia</td>
</tr>
<tr>
<td></td>
<td>Vicia sp.</td>
<td>2</td>
<td></td>
<td>vetch</td>
<td>Vitis vinifera</td>
</tr>
</tbody>
</table>
3.1 Aerial view of Muro Tenente, showing the outlines of the Early Hellenistic fortification wall (cf. Fig. 3.2).

3.2 Muro Tenente, location of the excavation trenches and soundings.
3.3 Muro Tenente, inner face of the southern section of the fortification wall.
3.4 Muro Tenente, northern excavation trench (A).
3.5 Muro Tenente, central excavation trench (C).
3.6 Muro Tenente, southern excavation trench (E).
3.7 Muro Tenente, archaeobotanical samples from the northern excavation trench (A).
3.8 Muro Tenente, archaeobotanical sample from test trench B.
3.9 Muro Tenente, archaeobotanical samples from the central excavation trench (C).
3.10 Muro Tenente, archaeobotanical samples from the southern excavation trench (E).

3.11 Muro Tenente, ashy layer in the southern excavation trench (E), units 20009 and 20011.
3.12 Muro Tenente, results of the charcoal analysis: frequency of wood taxa (i.e. the number of stratigraphical units in which it was found).

3.13 Muro Tenente, results of the charcoal analysis: total number of fragments of wood taxa.
3.14 Muro Tenente, results of the analysis of seeds and fruits: frequencies.

3.15 Muro Tenente, results of the analysis of seeds and fruits: total number of fragments.
3.16 Muro Tenente, results of the charcoal analysis: wood taxa from hearths and fireplaces (fuel?).

![Charcoal Analysis Pie Chart]

- **Erica**: 71%
- **Quercus**: 21%
- **Pomoideae**: 1%
- **Pistacia**: 2%
- **Olea europaea**: 5%

3.17a Muro Tenente, charcoal fragment from unit 455.

3.17b Muro Tenente, charcoal fragment from unit 455, 100x magnification.
3.18 Muro Tenente, results of the analysis of seeds and fruits from unit 20011.

3.19 Muro Tenente, results of the charcoal analysis from unit 20011.
3.20 Muro Tenente, location of archaeobotanical samples that contained chaff remains.
3.21 Muro Tenente, carbonized grape remains from unit 89.
3.22 Muro Tenente, central excavation trench (C) with the location of graves 22, 25, 27 and 30.
3.23 Muro Tenente, northern excavation trench (A) with the location of grave 45.