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CONTENTS

STUDIES

ANCIENT HISTORY

ARCHAEOLOGY

ARCHAEOLOGICAL MATERIAL

ARCHAEOMETRY

DIGITAL AND VIRTUAL ARCHAEOLOGY

NUMISMATICS

IN MEMORIAM

REVIEWS

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FOOD DIET AND RITUAL PRACTICES AT APULUM. A COMPARATIVE ARCHAEOBOTANICAL STUDY

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Abstract: This study analyses the daily diet and ritual practices of the Roman community at *Apulum* (modern-day Alba Iulia) based on archaeobotanical findings from four distinct *research points*: *the canabae of Legio XIII Gemina*, *Municipium Septimium Apulense*, *Colonia Aurelia Apulensis* and *the villa rustica at Oarda-Bulza-Alba Iulia*. The investigation of macro-botanical remains (charred seeds) from both domestic and sacred contexts highlights the staple foods consumed by the population and the role of plants in religious rituals. The diet was dominated by *Triticum aestivum and Triticum spelta*, with legumes revealed in smaller quantities. Research confirms a *diverse agricultural system* in the Apulum hinterland, adapted to the needs of the military garrison and the civilian population. In ritual contexts, *Vitis vinifera* and other identified plant remains indicate specific offerings related to the cults *of Liber Pater* and *Mithras*, reflecting the interaction between food and religion. Comparative analysis with other Roman research points highlights both the local dietary particularities and the integration of Apulum into the economic and agricultural practices of the Roman Empire.

Keywords: *Archaeobotany, Roman diet, Apulum, charred macro-remains, vegetal offerings.*

INTRODUCTION

Apulum (today's municipality of Alba Iulia, in the former province of *Dacia*) was an important military and urban center of the Roman Empire[1], including the castrum of *the XIIIth legion* Gemina[2], civilian settlements (*canabae* and two colonies) and *rustic villae* in the surrounding countryside (see Map 1).[3] The study of plant diet and ritual practices at Apulum is based on the archaeobotanical analysis of plant macroremains (carbonized seeds of cereals, legumes, fruits, etc.) recovered during archaeological excavations from various contexts: urban Roman dwellings, *villa rustica* settlements and religious sanctuaries[4]. By corroborating these local data with the specialized bibliography, we try to reconstruct both the daily diet of the Apulum

[1] OTA 2012, 27, 31.
[2] OTA 2012, 31.
[3] CIUTĂ/EGRI 2021; CIUTA/EGRI 2022.
[4] Since the detailed data from these analyses have already been published in specialized articles (e.g., CIUTĂ 2010; CIUTĂ/TIMOFAN 2013; EL SUSI/CIUTĂ 2020, 7; CIUTĂ/EGRI 2021; CIUTĂ/EGRI 2022), the present study integrates them into a comparative analysis to highlight their implications within the economic, social, and religious practices of the Roman community at Apulum.

community and the role of plants in religious rituals, in comparison with other sites in the Roman Empire.

The first archaeobotanical results for Apulum undertaken have appeared in the last two decades, with the intensification of soil sampling and analysis of plant macroremains during excavations. Thus, research from 1998–2003 at the Sanctuary of Liber Pater (*Colonia Aurelia Apulensis,* see Map 2) provided data on the plants offered in the temple, in particular grape pips deposited as offerings.[5]

The 2009 excavations in the south-eastern area of the civil settlement (*Municipium Septimium Apulense*, St. Francis Ravelin area; see Map 1)[6] allowed the recovery of a large number of carbonized seeds from a Roman dwelling, representing a sample of daily food[7]. Also, a research project carried out in 2013–2016 focused on a temple dedicated to the god Mithras (the so-called *Apulum Mithraeum III*; see Map 2) from where samples were systematically collected to identify the plants used as offerings in this cult[8]. More recently, excavations at a *villa rustica* at Oarda-Bulza (in hinterland of Apulum)[9] have yielded new data on local agricultural practices and crops preferred in the countryside. The Oarda-Bulza site is located at ca. 2 km south-west of the modern village of Oarda de Sus, south of the *Colonia Aurelia Apulensis*[10]. These local studies, together with comparisons with similar findings in other provinces, form the basis of the present study.

DAILY DIET IN APULUM: CULTIVATED AND CONSUMED PLANTS

Archaeobotanical data indicate that the daily diet of the population of Apulum was based on local cereals, legumes and fruits, supplemented by products brought from other regions (such as olive oil and Mediterranean wine, attested by imported amphorae[11]).

The analysis of carbonized seeds from a Roman house excavated in the *canabae* (a civil settlement adjacent to the castrum, *Municipium Septimium Apulense*, see map) revealed a wide spectrum of cereals consumed by residents. Spelt wheat (*Triticum spelta*) predominates in terms of the number of seeds, together with other grains such as emmer wheat (*T. dicoccum*), barley (*Hordeum vulgare*), rye (*Secale cereale*) and oats (*Avena sativa/fatua*).[12]

These species suggest a diversified agriculture in the *hinterland* of Apulum, capable of providing flour and cereal supplies for both the civilian population and the local military garrison. The presence of only a single millet (*Panicum miliaceum*) seed in the mentioned sample indicates that millet was also used in the Roman diet at Apulum, a fact confirmed by samples from the *villa rustica* at Oarda-Bulza, although millet was already known and cultivated extensively in pre-Roman Dacia.[13] Probably millet was used as a secondary food (e.g. in the form of porridge) or only in times of need, a trend also observed in other northern provinces of the Empire – for example, in Roman Britain millet occurs rarely compared to wheat and barley.[14]

Legumes are less abundant in the published archaeobotanical material from Apulum, possibly due to limited sampling to date. However, a few legume seeds have been identified, including fragments attributed to the genus *Vicia*. It is known from comparative archaeological sources that the Romans frequently consumed lentils, bob, chickpeas and peas;[15] such plants may also have been used at Apulum, to be confirmed by future analysis. As for fruit, the evidence from the everyday environment is even harder to capture archaeologically – the pits and peels of fruit must be burned or otherwise preserved to survive in stratigraphy. So far, no pits of fruits such as grapes, plums or others have been reported from the Apulum domestic context. This is also due to the lack of sample collection from Roman contexts.

This does not necessarily mean the absence of their consumption, but rather reflects the different mode of disposal (fruit waste rotting in landfills) or the hazard of storage. However, the presence of imported wine and olive oil amphorae in Roman houses at Apulum confirms the consumption of these Mediterranean products by the local population.[16]

For example, fragments of amphorae for the transportation and storage of wine and oil, including a fragment inscribed (*titulus pictus*) with the name of the *legio XIII Gemina*, have been discovered in a Roman dwelling in *canabae*.[17] This detail indicates that the supply of goods such as wine was probably organized officially, for the needs of the garrison and local elites.[18]

Domestic food processing and preparation

Archaeological discoveries show that the inhabitants of Apulum did not limit themselves to the cultivation of cereals, but also carried out local processing processes to obtain the final food (bread). In the same Roman house mentioned above, components of a hand-operated rotary grinder were found – an almost whole *catillus* (the upper stone of the grinder) and a fragment of a *meta* (the lower stone).[19] These finds demonstrate the use of Roman-type stone grindstones in the household for grinding grain and making flour.[20] Alongside them, numerous fragments of *mortarium-type* vessels have also been recovered.[21] The abundance of grinders and kitchen pottery at Apulum suggests intensive food processing in the domestic environment.[22] It is possible that some local households produced food not only for their own consumption, but also to supply the nearby military camp.

Similar situations of combining domestic and ritual activities have also been documented in Pompeii, where bread

[5] DIACONESCU *et alii* 2002, 32–33; CIUTĂ 2010, 189.
[6] TIMOFAN 2010A, 107–108; TIMOFAN 2010B, 544–545.
[7] DIACONESCU *et alii* 2002, 32–33; 2005, 47–49.
[8] McCARTY *et alii* 2021, 350–352.
[9] RUSTOIU *et alii* 2020, 255–257; MCCARTY *et alii* 2021, 251; CIUTĂ/EGRI 2021; CIUTĂ/EGRI 2022.
[10] CIUTĂ/EGRI 2021, 140.
[11] EGRI 2008, 50; EGRI/TIMOFAN/BOUNEGRU 2021.
[12] CIUTĂ/TIMOFAN 2013, 194.
[13] CIUTĂ 2023, 35.
[14] MILLS 2006, 97, 100.
[15] REED 2024, 28; CARDON 2022, 77.
[16] OTA 2012, 134; CIUTĂ/TIMOFAN 2013, 193/
[17] OTA 2012, 134; TIMOFAN 2012, 102–103/ EGRI/TIMOFAN/BOUNEGRU 2021, 221–232.
[18] EGRI 2008, 224–230.
[19] CIUTĂ/TIMOFAN 2013, 194.
[20] CIUTĂ/TIMOFAN 2013, 19.
[21] CIUTĂ/TIMOFAN 2013, 194; CARDON 2022, 56
[22] OTA 2012, 67.

ovens and grinders have been found in houses, as well as food remains intentionally burnt as offerings in domestic hearths.[23] At Apulum, we do not yet have clear evidence of such *micro-offerings* in households (such as intentional burnings on domestic altars), but these may be discovered in the future, given analogies in other provinces.[24] Grains discovered at Apulum often show evidence of local processing. Numerous fragments of chaff, spikelet's and rachis (spikelet shaft) have been identified in the archaeobotanical samples, indicating *in situ* threshing and cleaning of the grains – for example, the manual hulling of spelt wheat, a hard-shelled species requiring heat or mechanical treatment to extract the grain.[25]

Of particular interest is the identification of partially germinated (sprouted) grains among the charred seeds.[26] At Apulum, in roman house, many wheat grains show traces of germination before being burned. This suggests their possible use in the brewing process through the intentional maltification of the grain[27]. The practice of malting is also attested at other Roman sites: for example, at the fort of Isca (Caerleon) in Britannia, a similar mixture of sprouted grains (spelt, barley, rye and wheat[28]) has been archaeologically associated with brewing beer.[29]

Bread was a staple of the Roman diet and its production involved specific bread-making technologies[30]. Common wheat (*Triticum aestivum*, also known as bread wheat) was particularly valued for baking bread because of its high gluten content, which allows the dough to rise and produce a fluffy loaf.[31]

At the *villa rustica* at Oarda-Bulza-Alba Iulia (Apulum hinterland), common wheat (bread wheat) is the dominant species among the charred seeds,[32] indicating that local farmers were particularly focused on this crop. In contrast, in pre-Roman times local agriculture was more diversified, with a more important role for cereals such as barley and millet.[33]

This change reflects the adoption of Roman dietary preferences: bread wheat becomes the *star* of local agriculture due to the increased demand for quality bread. There are indications that in the 2nd–3rd centuries AD bread wheat was also regarded as a food of higher status in Dacia – an archaeobotanical analysis highlights that bread wheat appears to be associated with people of high social status, whereas traditional grains (barley, spelt) were more widely consumed.[34]

Local technological adaptation facilitated the widespread use of common wheat: Roman rotary mills, whether hand- or animal-powered, could grind more finely and efficiently, providing high quality white flour for bread-making[35]. The discovery of millstones at Apulum, both in the *canabaeum* and in the countryside, confirms that the milling of cereals was carried out locally.[36]

Also, fragments of a bread oven (*furnus*) were identified in the *canabae* house investigated, suggesting the existence of domestic bread baking ovens.[37]

Therefore, the agricultural and culinary technologies practiced in Apulum combined Roman tools (rotary grinders, *dolia* for fermentation, *mortaria*, etc.) with local knowledge of plants, resulting in a syncretic diet[38]. Traditional local foods (barley or millet porridge) coexisted with the newly adopted *Roman* foods (wheat bread, wine, olive oil).[39]

RITUAL PRACTICES AND PLANT OFFERINGS AT APULUM

The analysis of sacred contexts at Apulum provides a complementary perspective on the use of plants, highlighting their symbolic role in rituals[40]. We examine two Roman sanctuaries in Apulum that have provided relevant archaeobotanical data: the temple dedicated to Liber Pater and the Mithraeum (temple of Mithras) conventionally called *Mithraeum III*. These sacred sites make it possible to investigate the differences between everyday and ritual food practices through the plant remains intentionally deposited as offerings[41].

The sanctuary of Liber Pater: Vitis vinifera as a sacred offering

The cult of Liber Pater at Apulum (located in *Colonia Aurelia Apulensis*, see Map 2) is particularly revealing for the way plants were integrated into local religious rituals. Liber Pater, an archaic Italic deity of the fertility of vines and fields (equated with Dionysus/Bacchus in the Roman pantheon), was worshipped as god of wine and vegetation.[42]A sanctuary dedicated to this god was discovered in the northwest of the Roman city of Apulum. Archaeological excavations have brought to light not only the structure of the temple, but also offering pits associated with the cult (called *favissae*).[43]Archaeobotanical analysis of samples taken from this sanctuary directly confirmed the presence of *Vitis vinifera* seeds in the sacred context.[44]

More specifically, grape pips – often accompanied by fragments of dehydrated and burnt bunches or berries – were found in the offering pits of the temple[45]. This supports the hypothesis that grapes and wine were constant offerings to the god Liber Pater, *dominus of* the vine and wine, in local ceremonies at Apulum. The significance of these finds is both practical and symbolic.[46] On the one hand, the finding of grape pips confirms the libation practices mentioned in

[23] CARDON 2022, 6; FOSS 1994, 5.
[24] FOSS 1997, 140, 199.
[25] CIUTĂ/TIMOFAN 2013, 194.
[26] CIUTĂ/TIMOFAN 2013, 194.
[27] LODWICK 2017, 63.
[28] CARDON 2022, 77.
[29] RENFREW 1973, 67; DAVIES 1971, 122–142.
[30] CARDON 2022, 77.
[31] CARDON 2022, 82.
[32] CIUTĂ/EGRI 2022, 256
[33] CIUTĂ 2022, 36.
[34] FOSS 1994, 50–51; CIUTĂ 2022, 33
[35] FOSS 1994, 129–130; CIUTĂ/EGRI 2022, 256
[36] CIUTĂ/TIMOFAN 2013, 193/ CIUTĂ/EGRI 2022, 258.
[37] CIUTĂ/TIMOFAN 2013, 193.
[38] CIUTĂ/TIMOFAN 2013,193/ OTA 2012, 134.
[39] LIVARDA 2017, 190–194/ VAN DER VEEN/HILL 2008, 12–19.
[40] FOSS 1994, 43, 64.
[41] KREUZ 2000, 45–51/ ROTTOLI/CASTIGLIONI 2011, 497–500.
[42] DIACONESCU *et alii* 2002, 32–33; DIACONESCU *et alii* 2005, 49; FIEDLER 2005, 12.
[43] DIACONESCU *et alii* 2002; 2005; FIEDLER/HÖPKEN 2004, 511–513.
[44] CIUTĂ 2010, 189.
[45] CIUTĂ 2010, 189.
[46] FIEDLER/HÖPKEN 2004, 512–514; CIUTĂ 2010, 189.

ancient sources – the pouring of wine on the altar or directly on the ground as a gift to the deity[47].

Wine was considered indispensable in Roman rituals, being „the most common liquid used in rituals as a beverage or for extinguishing sacrificial fire".[48] In fact, the very name of the god Liber derives from the Latin verb *libare* (*to pour in honor of the gods, to taste*), suggesting the act of sacred libation[49]. On the other hand, vines carried a strong symbolic charge: since prehistoric and early antiquity, vines and wine were associated with fertility and vitality of nature, wine often being referred to as the „nectar of the gods" in the Mediterranean world[50]. Offering grapes or wine to the god was, in the Roman conception, a way of celebrating abundance and partaking of the divine essence – wine being the vehicle of sacred ecstasy and communion with the god.[51] We can assume that, during the festivals of Liber Pater (e.g. *Liberalia*, held annually on March 17) or other local *Bacchic-inspired* ceremonies, the devotees brought offerings of wine and grapes to the temple[52]. The sacred liquid was poured on the temple altars, and the grape bunches and ritual pies were deposited and then burned as part of the ritual.[53] The presence of charred seeds in the *favissae* indicates that these offerings were ritually burned – burning offerings was a common practice, transforming the material gift into a 'spiritualized' offering (the smoke and pleasant smell rising to the gods). Thus, grape pips recovered from the temple of Liber Pater are material witnesses of libations and sacred feasts dedicated to the god at Apulum[44]. Archaeobotanical analysis of samples from this sanctuary demonstrates the use of the species *Vitis vinifera* both in liquid form (wine) and as whole fruit in ritual offerings[54]. The results emphasize the central importance of the grapevine in the local cult: grape offerings represented a direct link between the worshippers and their god, himself "under the sign of the vine"[55]. It is not surprising, therefore, that on a site dedicated to the god of wine, botanical evidence even points to the presence of the tutelary plant – a material confirmation of the Latin saying *in vino veritas*.[56]

The cult of Mithras: plant offerings in the Mithraeum

Another major ritual context at Apulum is the sanctuaries of the mysterious cult of *Mithras*[57]. The cult of Mithras, a solar god of oriental origin, popular especially among soldiers, involved initiation ceremonies in subterranean spaces (*mithraea*) and had as its central act the ritual sacrifice of the bull (*tauroctonia*), followed by a sacred banquet of the god Mithras with Sol (personification of the Sun)[58]. Several mithraeums have been archaeologically identified at Apulum; the present discussion focuses on the so-called *Mithraeum III*, systematically excavated in the 2013–2016 campaigns, which provided the opportunity for the archaeobotanical investigation of the plant offerings deposited in this cult.[59]

The analysis of charred seeds recovered from different contexts of the Temple of Mithras (offering pits, storage containers, courtyard treading level, etc.) revealed a specific palette of plants that appear to have been intentionally deposited as offerings. One particular deposition – identified in a box made from tiles, used as an offering box – provided a concentrated lot of charred plant remains.[60] This comprised: grape pips (*Vitis vinifera*), a pumbar kernel (*Prunus cf. spinosa*), seeds of *Raphanus raphanistrum* (wild radish), seeds of *Galium aparine* (sticky) and seeds of *Convolvulus arvensis* (volvulus). All these remains were burned, suggesting that they ended up in sacrificial fires or were burned together as part of the ceremony.

The presence of grapes in this Mithraic ritual context is remarkable and significant. Two grape seeds have been identified, a sign that grapes (or their derivative, wine) were part of the rituals carried out in the sacred "cave" of Mithras.[61] It is known from iconographic representations and literary sources that the initiates of the Mithraic cult, after the slaughter of the bull, participated in a common feast, consuming bread and wine together with pieces of meat – a sacred imitation of the banquet of Mithras and Sol[62]. Wine was used as a sacred beverage in a way analogous to Christian communion, bringing ecstasy and spiritual communion between followers.[63]

Archaeobotanical finds from Apulum support this practice: grapes may have been consumed directly as ritual fruit, but their presence more likely suggests the use of wine (made from grapes) as part of the ceremony. As we have noted, wine was ubiquitous in Roman rituals as a liquid offering[64]; the pouring of wine to quench the sacred fire on the altar or hearth is also archaeologically attested in many contexts[65]. In a mystery cult such as the Mithraic one, extinguishing the flames with wine has a symbolic role of purifying and consecrating the sacred space, marking the completion of the sacrifice in a sacralised way. Along with grape seeds, *Vitis vinifera*, *Prunus spinosa* and wild plant seeds found in the Mithraeum suggest varied and carefully selected plant offerings. The blackthorn (*Prunus spinosa*) produces small plum-like fruits that are very pungent to the taste (usually eaten only after dew or processed)[66]. Finding a blackthorn seed in the offering indicates that the berries could also have served as a ritual offering – possibly as a symbol of *tamed wildness* or as an ingredient in a ritual drink (e.g. blackthorn wine).

Overall, the repertoire of plants found in the Mithraic sanctuary at Apulum illustrates the devotees' concern to offer the god a selection of the 'fruits of the earth': fruits (grapes,

[47] FIEDLER/HÖPKEN 2004, 512–514.
[48] DIACONESCU *et alii* 2005, 47–48.
[49] FOSS 1994, 11; FIEDLER 2005, 18.
[50] VALAMOTI *et alii* 2007, 56–58; FIEDLER 2005, 21.
[51] VERMASEREN 1963, 113; DIACONESCU *et alii* 2005, 49; VALAMOTI *et alii* 2007, 57–60.
[52] FOSS 1994, 64.
[53] FOSS 1994, 89.
[54] FOSS 1994, 65; FIEDLER 2005, 47.
[55] MÉGALOUDI *et alii* 2007, 936.
[56] FIEDLER 2005, 32.
[57] McCARTY *et alii* 2020, 123, 127.
[58] McCARTY *et alii* 2020, 127–129.
[59] McCARTY *et alii* 2020, 123–126.
[60] EL SUSI/CIUTĂ 2020, 7; REED *et alii* 2018, 3–10; ZACH 2002, 231–236.
[61] EL SUSI/CIUTĂ 2020, 7; MCCARTY *et alii* 2020, 127–129.
[62] VERMASEREN 1963, 87–93; McCARTY *et alii* 2020, 123, 129.
[63] VERMASEREN 1963, 98–100; McCARTY *et alii* 2020, 129.
[64] VERMASEREN 1963, 101–102; FIEDLER 2005, 21; VALAMOTI *et alii* 2007, 56–58.
[65] VERMASEREN 1963, 103.
[66] STEVENS 2003, 2; ROTTOLI/CASTIGLIONI 2011, 500.

blackthorn), aromatic or symbolizing seeds (wild radish, bindweed) and, probably, bread and wine (indirectly attested by the presence of cereals and grapes)[67]. The deliberate nature of these deposits is supported by the stratigraphic context and mode of storage – the seeds were found concentrated in offering boxes and other places clearly associated with the ritual, not mixed with household refuse[68]. This is in line with the general observations of scholars: although ancient literary sources mention plant offerings more vaguely (compared to animal sacrifices), archaeology has demonstrated in recent decades that plant remains occur frequently in Roman ritual deposition[69]. In temples throughout the Roman Empire, seeds and fruits have been recovered as offerings, and presence of legumes, fruits and nuts burned with the deceased are often existing in Roman funerary cremations[70]. Vegetable offerings often had symbolic or sensory roles: through smell, colour and texture they contributed to the 'economy of the senses' within the ritual and served as a support of ritual memory for the participants.[71]

The rituals at Apulum – whether of *Liber Pater* or *Mithras* – thus demonstrate a common pattern in Roman religion: the use of plant products (wine, cereals, fruit, herbs) as offerings to accompany or even substitute animal sacrifices[72]. Grapes, in particular, appear as a link between the two cults analysed: in the sanctuary of *Liber Pater* they constitute the supreme offering to the god of wine, while in *Mithraeum* they are part of the ritual of the sacred meal and libation that unites the community of worshippers. [62] The vine thus becomes a polyvalent symbol – at *Liber Pater* it embodies the very sacredness of the cult, while at *Mithras* it crowns the sacred act of mystical brotherhood through the sharing of wine.

Religious practices vs. daily diet: differences in archaeobotanical deposits

Comparative analysis of plant remains from ritual and domestic contexts at Apulum reveals clear differences, both quantitative and qualitative, reflecting the distinct functions of each type of deposition. First, the botanical composition of ritual deposits differs from that of everyday food refuse.[73]

While in a Roman dwelling at Apulum cereal seeds predominate – both whole grains and threshing debris such as chaff, a sign of the preparation of staple food – in a sanctuary fruit kernels and seeds of specific plants (e.g. grapes, blackthorn, bindweed) predominate, as we have seen. In other words, cereals such as wheat and barley feature heavily in kitchen contexts (as traces of milling, baking bread or brewing beer)[74], whereas in temples, it is more likely to find grape pips, nuts, fruit kernels and seeds of aromatic plants – items with symbolic or ritual value[75]. This observation aligns with documentation from other parts of the Empire: for example, offerings such as lentil kernels, grapes, figs or pine nuts were frequently found in Roman funerary cremations in France [76] and Italy[77], signalling a general preference for fruits and seeds in rituals as opposed to the remains from everyday cooking.

Secondly, the deposition context and the process by which the plants become carbonized vary. In the domestic environment, seeds are usually charred accidentally – for example, grains dropped by the hearth or in a bread oven, or a grain store burned in an unintentional fire (or military attack). The harvested material from the Apulum house mentioned probably came either from the remains of a cooking oven or from the destruction by fire of a food store, which explains the presence of the 'complete chain' of processing (grain, chaff, straw) and large supply vessels (*dolia*) in the same stratigraphic level.[78]

In contrast, seeds in temples are intentionally charred as a direct result of the practice of burning offerings on the altar or in ceremonial bowls. This deliberate mode of burning gives plant remains a different status: they are not ordinary household refuse, but relics of a conscious ritual act. For example, the seeds in the offering box of the Mithraeum were preserved only because they were thrown into the fire as part of the ceremony, then gathered and carefully deposited in a sheltered place (*favissa*).[79]

Such ritual plant deposits, although archaeologically they may at first glance resemble a banal burn layer, are in fact the result of repetitive sacred behaviour.[80]

Third, the *quantity* and *diversity of* plants may reflect different intentions. In household rubbish pits or on the floor of ancient kitchens,[81] we expect a relatively random mixture of debris: mainly cereal seeds and crop weeds (accidentally brought in with the harvest), possibly fragments of vegetables or fruit eaten. At Apulum, the domestic samples confirm this pattern, containing in addition to grain also seeds of ruderal plants such as *Chenopodium* album (white goosefoot), *Rumex acetosella* (wild sorrel), *Galium aparine* (cleavers) and so on, which probably arrived among the provisions during the harvest and threshing.[82]

In contrast, in a ritual offering the selection is much more focused and non-accidental: for example, the combination of grapes, white goosefoot, wild sorel and cleavers in the discussed mithraic deposit is not random, but seems specifically chosen, including both the main element (grapes) and common environmental plants with symbolic potential (wild sorrel, cleavers). Species diversity is generally lower numerically in offerings (only a few representative species), but sometimes offerings may contain richer sets of plants. At Roman cremations in Gaul[83], for example, up to 8–10 different species of fruits and seeds have been identified as deposited in the same funerary urn, suggesting a carefully prepared 'funerary menu'. At Apulum, the offerings identified so far at

[67] VERMASEREN 1963, 50.
[68] EL SUSI/CIUTĂ 2020, 52.
[69] MÉGALOUDI *et alii* 2007, 936; REED *et alii* 2018, 3–10; ZACH 2002, 231–236.
[70] ROTTOLI/CASTIGLIONI 2011, 501; ZACH 2002, 231–236; EL SUSI/CIUTA 2020, 53–54.
[71] MÉGALOUDI *et alii* 2007, 936.
[72] LIVARDA 2011; 143–155; REED *et alii* 2018, 3–10; ZACH 2002, 231–236; ROTTOLI/CASTIGLIONI 2011, 496.
[73] ROBINSON 2002, 93–99; FOSS 1994, 64–65.
[74] CARDON 2022.
[75] BOUBY/MARINVAL 2004, 77–78.
[76] BOUBY/MARINVAL 2004, 77–80; PREISS et alii 2005, 362–363.
[77] ROBINSON 2002, 93–99; ROTTOLI/CASTIGLIONI 2011, 293–295.
[78] CIUTĂ/TIMOFAN 2013, 195–196.
[79] McCARTY *et alii* 2020, 127–129.
[80] BOUBY/MARINVAL 2004; ROTTOLI/CASTIGLIONI 2011, 495–496.
[81] FOSS 1994, 130.
[82] STEVENS 2003/1–3.
[83] PREISS et alii 2005, 365–366.

Apulum contain 4–5 species, but future research is likely to extend the list. Important to emphasize is that the absence of a species from the domestic context does not necessarily imply its absence from the ritual context (and *vice versa*). For example, grapes are missing as charred remains from the house under study – a sign that the pips resulting from their consumption have ended up in the garbage and decomposed – but they do appear in the temple of Liber Pater; conversely, the abundant wheat chaff present in the house is completely missing from the temple (where the wheat could have been brought as baked bread as an offering, thus without the processing waste). In other words, the same plants may be part of both daily life and ritual offerings (people brought to the gods what they themselves consumed), but the state in which they appear and the context of their deposition differ fundamentally.[84] For the correct interpretation of the archaeobotanical remains, the researchers therefore propose a contextual approach, placing the finds on a continuous axis between the extremes of "remains from the preparation of everyday food" and "plant remains intentionally burned/deposited as part of ritualized activities".

In the case of Apulum, the ends of this spectrum are exemplified by the situations discussed: at one end, the waste from a Roman kitchen (eminently practical and economic), at the other end, offerings from temples (symbolic and sacrificial). The separation is clear in context, but it should be noted that there may also be intermediate areas – for example, small domestic altars in Roman homes, where minor offerings (cakes, dried fruit) to the household gods (*Lares* and *Penates*) were burned.[85] A famous case comes from Pompeii[86], where "domestic burn offerings" have been documented in some houses, consisting of burnt leftovers of food interpreted as domestic offerings[87]. At Apulum, such micro-offerings in dwellings have not (yet) been reported, but future research may identify them. Concluding on this topic, religious practices and daily diet, although using the same raw material (locally cultivated or harvested plants), are clearly separated by the way these plants are used and deposited. Ritual offerings give food a spiritual value and an intentional pattern of deposition, while daily consumption gives it nutritional value and leaves behind a disorganized pattern of household waste. Archaeobotany allows us to capture these differences, thus providing not only an economic but also a socio-religious perspective on a Roman archaeological site.

Agricultural and food technologies at Apulum

The discoveries at Apulum take on added significance when integrated into the wider context of food and technological practices in the Roman Empire. First, the observed changes in the predominant plant crops reflect a general provincial phenomenon: the introduction of bread wheat (*Triticum aestivum*) and its increasing share in agriculture, documented in many provinces after the Roman conquest[88].

For example, in Britain and Gaul, archaeobotanical studies show a transition from the varied agriculture of the Iron Age (where millet, spelt and barley predominated) to a much greater emphasis on common wheat and spelt in the Roman period, to meet urban demand for white flour.[89] Lodwick (2017) demonstrated the increase in *aestivum* wheat cultivation in Roman England [90], observed similar trends in Gaul (northern France) both studies indicating the decline of barley and millet crops in favour of bread wheat. In Apulum, this trend is clearly evident in the countryside: at the *villa rustica* Oarda-Bulza[91], common wheat was massively cultivated, becoming the dominant species in the harvest, a sign that new technologies (efficient mills, metal plows) and Roman tastes (bread leavened with white flour) were being adopted locally. At the same time, however, traditional crops adapted to the local environment persisted, such as barley and millet[92], The Roman period saw a decline in the diversity of cereals in the north-western provinces, with a shift towards modern (common) wheat and spelt, but barley remained important for brewing beer and as animal feed.[93] Wine consumption at Apulum must also be seen in an imperial context: in the first decades after the conquest, until the eventual development of local wine-growing, wine supplies were most likely imported.[94] The aforementioned amphora inscribed with the name of *the legion XIII Gemina*, mentioned above, suggests official supplies of wine brought from distant provinces (possibly Italy, Gallia Narbonensis or Greek areas). However, the discovery of grape pips in the 2nd–3rd century AD levels at Apulum shows that *Vitis vinifera* were already present – either through small-scale local cultivation or the importation of dried grapes (raisins) consumed locally.[95]

The autochthonous Dacian tradition was also favourable to wine and Roman settlers probably brought noble vine cuttings and planted them in the favourable micro-regions of Dacia (e.g. the Mures and Tarnava valleys, still wine-growing regions today). This context explains why the cult of Liber Pater flourished in Apulum – the veneration of the god of wine thrived especially in the wine-growing regions of the Empire. By comparison, in Britannia – where the cold climate severely limited the cultivation of vines – grapes rarely appeared in the excavations.[96] At Apulum, however, local conditions allowed Dacia to integrate into the 'Roman world of wine', both as a major consumer and, to some extent, as a producer.

Another technological element of interest at Apulum is the processing of oil sources. Dacia was not suitable for olive cultivation, so olive oil likely had to be imported, as evidenced by the amphorae found in the region[97]. However, the locals were able to extract oil from other oil-bearing plants.[98] An exceptional find at villa rustica Oarda-Bulza is a compact

[84] FOSS 1997, 198.
[85] FOSS 1997, 200–202.
[86] ROBINSON 2002, 94–98.
[87] FOSS 1997, 198–203.
[88] LODWICK 2017.19.
[89] LODWICK 2017, 16–19; LEPETZ/ZECH-MATTERNE 2018, 7–12.
[90] LODWICK 2017, 19; LEPETZ/ZECH-MATTERNE 2018, 7–12.
[91] CIUTĂ/EGRI 2022, 255–256.
[92] CIUTĂ/EGRI 2021, 142; CIUTĂ/EGRI 2022, 255–256.
[93] LEPETZ/ZECH-MATTERNE 2018, 9–11; LODWICK 2017, 37, 59. 68.
[94] EGRI/TIMOFAN/BOUNEGRU 2021, 224–230
[95] CIUTĂ 2010, 189; EL SUSI/CIUTĂ, 53.
[96] ALLEN *et alii* 2017, 74.
[97] EGRI/TIMOFAN/BOUNEGRU 2021, 224–225.
[98] EGRI/TIMOFAN/BOUNEGRU 2021, 224–230.

cluster of carbonized hemp seeds (*Cannabis sativa*).[99] This lump of carbonized hemp seeds (about 5.8 grams, in the form of a globular cluster) was found in a main building of the *villae*, in a fire-damaged level.[100] The literature shows that hemp seeds, due to their resistant tegument, can survive the charring process and occasionally occur in archaeological contexts[101]. In the Empire, hemp seeds have been found in wine pressing plants (e.g. at Erden in Germany[102]) and at settlements in the Rhine and Moselle valleys[103], suggesting that they were pressed to extract edible or medicinal oil.

The discovery at Apulum therefore puts Dacia on the map of the versatile use of hemp in the Empire – not only as a textile plant (for fiber and rope), but also as a source of food and oil. The locals, lacking olive trees, turned to hemp, flax, pumpkin or walnut seeds to produce vegetable fats for cooking and lighting[104]. It is an example of local technological adaptation in a global context: Roman knowledge of oil pressing was applied to the resources available in Dacia.[105]

In terms of milling and processing equipment, Apulum is no exception to the standard equipment of a Roman community. Rotary stone grinders (composed of a fixed *meta* and a rotating *catillus*) were massively introduced by the Romans in all provinces, gradually replacing older grinding techniques (such as the hand grinder of the pestle and pestle-log type) At Apulum we have already seen that at least two examples of rotary grinders have been found in *canabae*, one almost intact and one fragmentary[106]. These finds, together with scattered fragments of grindstone in the site buildings, [94] indicate the widespread use of these tools. Moreover, when broken or worn away, grindstones were often reused as building material (e.g. in paving or as infill) – a phenomenon also observed at Apulum[107].

In rural *villages* mills were originally hand-operated[108]; as farms prospered, some households adopted mechanized means: there is evidence in the Empire of animal-powered mills (with larger mills, sometimes mounted on wooden frames) and even of water mills.[109]

In Dacia, no archaeological traces of any Roman water mills have yet been identified, but it is not excluded that large centres such as Apulum may have had hydraulic milling installations in the 2nd–3rd centuries AD. Until their discovery, we can assume that flour production at Apulum was based on smaller, decentralized units – each household or unit (castrum, *rural villa*) had its own manual mills. The practice of bread-making and cooking in Apulum was generally part of the Roman culinary universe.[110] The *mortarium* pots found here[111] are identical to those found in the rest of the Empire, from Pompeii[112] to the edges of Britain[113], and were indispensable for preparing food (pressing garlic and salt, mixing aromatic herbs – coriander, dill – and spices to flavor Roman cuisine)[114]. Fruits such as grapes, plums, cherries or apples were eaten either fresh or preserved (dried, as wines, vinegars, vinegars, jams or cider). A notable example from Silchester in Britain, has revealed in a Roman urban context seeds and pips of Mediterranean fruits: cherries, olives, grapes, figs, mulberries, along with lentils and coriander[115]. Such discoveries show that the Roman urban diet could have been very diverse and 'globalized' even on the periphery of the empire. At Apulum we do not yet have a similar archaeobotanical inventory of imported fruits (no carbonized seeds of figs, dates or olives have been reported), but the presence of olive oil and imported wine attest to the existence of trade links with Mediterranean areas[116]

It is very likely that dried fruits such as figs, raisins or dates nevertheless arrived in Apulum in soldiers' baggage or through trade, and were consumed without leaving visible archaeological traces. Instead, local fruits (plums, apples, pears) might show up in future analyses as accidentally burned pits. Incidentally, we have mentioned a blackthorne stone that appeared in a ritual context – a sign that the local flora of fruit-bearing shrubs (including the wild plum) was known and could be used not only for food but also symbolically in rituals.

APULUM IN THE CONTEXT OF ROMAN FOOD PRACTICES – CONCLUSIONS AND COMPARISONS

The study of the daily diet and rituals at Apulum, based on the archaeobotanical data discussed, confirms the integration of Roman Dacia into the economic and spiritual traditions of the Empire, while also highlighting local particularities. In comparison with other Roman sites, the finds from Apulum present both common aspects and specific elements, which can be summarized as follows:

Cereal cultivation and the agricultural economy: Apulum follows the Roman provincial model, with the adoption of intensive wheat cultivation for bread, but without completely abandoning local cereals.[117] The dominance of spelt wheat[118] in the urban sample may reflect a period or a functional differentiation of crops (spelt and barley for brewing/malting, while *aestivum* wheat for bread – a specialization also suggested by the context of Oarda-Bulza villa rustica).[119] This complementarity has also been observed in other provinces: for example, on farms in the south of, spelt and barley have remained important for beer and porridge, while 'modern' (common) wheat has gained ground for bread-making.[120]

In Dacia, common wheat became prevalent in the 2nd–3rd centuries AD (*villa rustica* from Oarda being an eloquent

[99] CIUTĂ/EGRI 2022, 256.
[100] CIUTĂ/EGRI 2022, 253–254.
[101] STIKKA/HEISS 2013, 78; MÄRKLE/RÖSCH 2008, 261.
[102] KÖNIG 1994; 2017, 115–116 (Fig. 5); WIETHOLD 2012, 318.
[103] MERCURI *et alii* 2002, 264.
[104] CIUTĂ 2023, 36.
[105] CIUTĂ 2023, 35.
[106] CIUTĂ/TIMOFAN 2013, 193.
[107] TIMOFAN 2010 a/b.
[108] CIUTĂ/EGRI 2022, 258.
[109] CARDON 2022, 47.
[110] CARDON 2022.
[111] TIMOFAN 2010a/b; CIUTĂ/TIMOFAN 2013, 193.
[112] FOSS 1994, 17.
[113] CRAMP *et alii* 2011, 1340–1341.
[114] CRAMP *et alii* 2011, 1339–1349.
[115] LODWICK 2014, 543–548.
[116] GLICKSMAN 2007, 44–49.
[117] CARDON 2022, 73.
[118] STEVENS 2003, 1–3.
[119] CIUTĂ/EGRI 2021, 142–143; CIUTĂ/EGRI 2022, 257–258.
[120] CARDON 2022, 73–74.

example), a sign of the orientation of production towards Roman requirements.[121]

Processing technologies: the use of rotary stone grinders, bread ovens and liquid squeezing teapots is a unifying element of Roman civilization.[122] Apulum provides direct examples of grind mills[123] similar to those found at Herculaneum[124] the difference being perhaps one of scale (at Apulum they are in individual households, whereas in a legionary fortress there may have been animal or water-powered mills for the collective rations of the soldiers). The presence of fragments of grinders in the buildings at Apulum[125], similar to the finds in the other *canabae*, indicates the standardization of these tools in Romanized areas.[126] The production of wine in Dacia is indirectly archaeologically attested by installations, and analogies with provinces with comparable climates (Upper Germany, Pannonia) suggest that *villae rustica* [127] such as those near Apulum may have had small grape-pressing installations. Indirect evidence in support of the existence of local viticulture is the very popularity of the cult of Liber Pater: at Sarmizegetusa Ulpia Traiana, the capital of Dacia, an inscription of devotion to Liber Pater – possibly dedicated by a winegrower or merchant – has been found.[128] This epigraphic evidence, along with the presence of grapes (in ritual contexts) at Apulum, indicates that the wine industry was starting to establish itself in Dacia. On the whole, Roman agricultural technologies (the iron plow, efficient drying, teak pits, water mills[129]) were transferred to Dacia, facilitating increased productivity. The large number of *villae rustica* discovered in the hinterland of Apulum, demonstrates the storage capacity and, consequently, the surplus production destined for military or urban consumption.[130]

Roman daily diet in the periphery: The discoveries at Apulum confirm that even in a relatively remote province, the Roman diet could have been very varied, going strictly beyond local resource. So, at Apulum, it is also possible that olive oil and wine were brought from far away[131]. High-ranking consumers (military commanders, officials, wealthy merchants) probably had similar supply networks to those in the West.[132]

Plant offerings in provincial Roman religion: Compared to the Roman centres of Italy, where religious traditions[133] are well known to us from written sources, archaeology at Apulum provides essential information about otherwise poorly documented practices. The offerings of grapes at the Liber Pater directly confirm the sacred role of wine in a cult that spread from Rome to the provinces.[134] In Italy, the vine itself was venerated in rituals[135] (e.g. the *vinae conditae* ritual – the symbolic burial of vine stumps after harvest and their unearthing in spring), but such practices have left no identifiable botanical traces. In provinces such as Dacia, where the Bacchic cult was adopted by local communities, we do find such concrete offerings of grapes, evidence of devotion to the god of wine. Similarly, the cult of Mithras, known through hundreds of inscriptions and reliefs throughout the Empire[136], rarely explicitly mentions plant offerings – the discovery at Apulum thus becomes an important reference point.[137] One might expect that in other *mithraeums*, if systematic flotations were made, grape seeds, cereals and perhaps other offerings would also appear.[138] One study of a *mithraeum* in Rhineland[139], for example, identified pine cones in a possible votive context, suggesting that the pine fruit may have been a ritual offering[140] – ichnographically confirmed by the depiction of the pine cone in the hand of the god Attis[141] (an oriental deity with similar mysteries). At Apulum, pine cones have not yet been found in plant form, but the existence of the species in the local flora would have allowed such offerings, especially as it is a frequent presence in the representations on Roman monuments.

In conclusion, the food diet and ritual practices of the Roman community of Apulum demonstrate both its belonging to the Roman cultural and economic ecumene and specific local adaptations dictated by pre-existing resources and traditions in Dacia. The archaeobotanical bibliography integrated in this analysis – including data from Apulum and analogies from other provinces – has reinforced our interpretations. The cereals cultivated at Apulum (wheat, barley, spelt) are part of the Roman agricultural landscape, and the adoption of bread wheat highlights the Romanization of local agricultural practices. The plant offerings identified align with Roman ritual patterns (with a local emphasis on vines due to the importance of the Bacchic cult at Apulum), demonstrating that the gods were offered the same products consumed by humans, but in a ritually transfigured form. The clear differentiation between the domestic and the sacred context, visible in the profile of the botanical remains, allows us to distinguish in the archaeological materiality two complementary sides of Roman life: food as a daily necessity and food as a sacred instrument. Apulum, as a provincial microcosm, reflects in miniature the Empire itself: on the table of the Romans here were both bread and wine – *pan-Roman* foods, symbols of civilization – and local products integrated under Roman influence; in their temples burned offerings of grapes and other fruits of the earth, just as Romans everywhere brought to the gods the gifts of the harvest. In light of these findings, we can affirm that food and ritual went hand in hand at Apulum, defining the Roman cultural identity of the Dacian community and linking it to the great tradition of the Roman Empire, where *„in vino veritas"*[142] and sacred bread is shared by both men and gods.

[121] CIUTĂ/EGRI 2022, 257–258.
[122] ALLEN *et alii* 2017, 71–72.
[123] OTA 2012, 37.
[124] MONTEIX 2015.
[125] CIUTĂ/TIMOFAN 2013, 193.
[126] OTA 2012, 37–38.
[127] CIUTĂ/EGRI 2021, 140; CIUTĂ/EGRI 2022, 253.
[128] CĂTINAȘ 1975, 343.
[129] CARDON 2022.
[130] CIUTĂ/EGRI 2021, 140–141.
[131] EGRI 2008, 50.
[132] EGRI 2008, 46–49.
[133] ROBINSONS 2002, 94–97.
[134] ROTTOLI/CASTIGLIONI 2011, 502.
[135] ROTTOLI/CASTIGLIONI 2011; ROBINSON 2002, 95–98.
[136] VERMASEREN 1963, 86–89.
[137] EL SUSI/CIUTĂ 2020, 53.
[138] VANDORPE, JACOMET 2011.
[139] VERMASEREN 1963, 90.
[140] LODWICK 2017, 135.
[141] VERMASEREN 1963, 127.
[142] VAN LIMBERGEN 2016.

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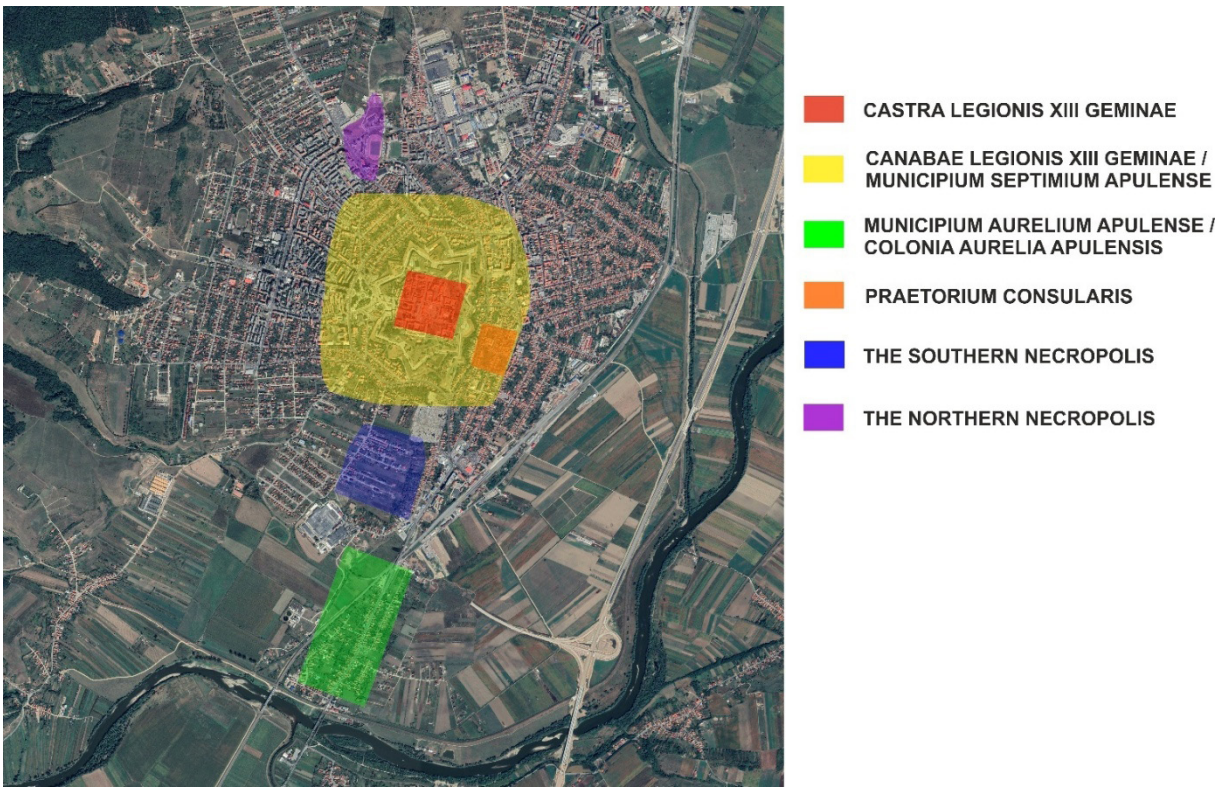
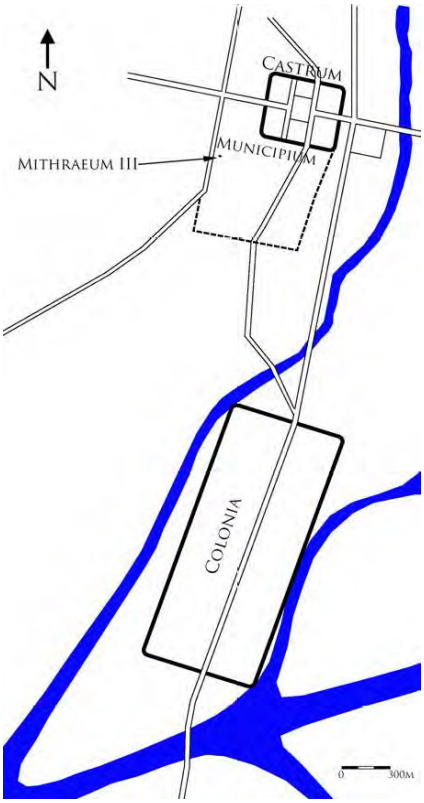


Map 1. Urban layout of Apulum city (prhoto credit @MNUAI /The National Museum of the Union, Alba Iulia).



Map 2. Map of main settlement areas of Apulum (drawing authors: *apud Diaconescu 2004: 107, fig. 413.*).