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Archaeobotanical Evidence of Funerary Plant Offerings at the Southern Etrurian Necropolis of "Valle Santa nell'Agro Veientano" (Rome, Italy)

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ABSTRACT

The present study concerns the archaeobotanical analysis of soil samples and vase fillings from Etruscan tombs from the Necropolis of "Valle Santa nell'Agro Veientano", found along *via di Boccea*, north of Rome (Italy). While the site was in use between the Archaic and Late Roman Age, the studied vestibule tombs belong to the Etruscan necropolis (second half of the 6th – beginning of the 4th centuries BC). Archaeological data, based on the incineration rite and funerary equipment, suggest that these were used by one high-status family (or two) originally from Veio.
Carpological analyses reveal the presence of food plants comprised of cereals, pulses and fruits. Furthermore, anthracological data give indications concerning the past environment, with a prevalence of deciduous and semi-deciduous oaks, accompanied by other taxa such as evergreen oaks, hornbeam, ash and Rosaceae Prunoideae. This is in accordance with the present-day vegetation of northern Latium. Finally, remains of synanthropic weeds (*e.g.*, Asteraceae, Caryophyllaceae and Polygonaceae) suggest a heavily anthropized environment.
This study represents a step forward in the understanding of the still under-explored human-plant interactions of Etruscans.

1. Introduction

Etruscans are a non-Indo-European population of preclassical Italy, whose culture developed between the 7th and the 3rd centuries BC in central Italy (Vernesi *et al.*, 2004). While Etruria *sensu strictu* is framed by the rivers Arno and Tiber, the commercial and political expansion of Etruscans reached the Po Valley (north) and Campania (south; Bianchi Bandinelli and Torelli, 2008; Stoddart *et al.*, 2019). Their cities were independent city-states that shared a religion and a language. While the Etruscan culture is believed to have developed locally, archaeological evidence suggests an eastern influence (Vernesi *et al.*, 2004).

Etruscan human-plant relations are still under-explored, with archaeobotanical studies often being restricted to single contexts and published as short sections in archaeological reports. The Brain network and database (Mercuri *et al.*, 2015; Mariotti Lippi *et al.*, 2018) has proved to be a useful tool to perform bibliographic research, allowing the quick identification of relevant publications. To our knowledge, only ten Etrurian archaeological sites have been studied in terms of plant remains (Mercuri *et al.*, 2015; Figure 1). Of these, Pyrgi (Coccolini and Follieri, 1980), Tarquinia (Rottoli, 2005), Veio (Celant, 2009), Vulci (Marchesini *et al.*, 2014) are found in Latium. This selection is expanded by also considering the sites in the Po Valley, such as the settlement of Arginone in Mirandola (Accorsi *et al.*, 1992), and Campania (*e.g.*, Fratte – Colaianni *et al.*, 2009). Another distinction can be made based on the type of context, with plant remains from funerary contexts being studied only in Petriolo (Milanesi, 2018), Tarquinia (Rottoli, 2005), Vulci (Marchesini *et al.*, 2014) and Verucchio (Marchesini and Marvelli, 2002; Sala and Rottoli, 2018).

1.1 The necropolis of "Valle Santa nell'Agro Veientano"

The present study concerns the archaeobotanical analysis of soil sediments and vase fillings from Etruscan tombs from the Necropolis of "Valle Santa nell'Agro Veientano", found

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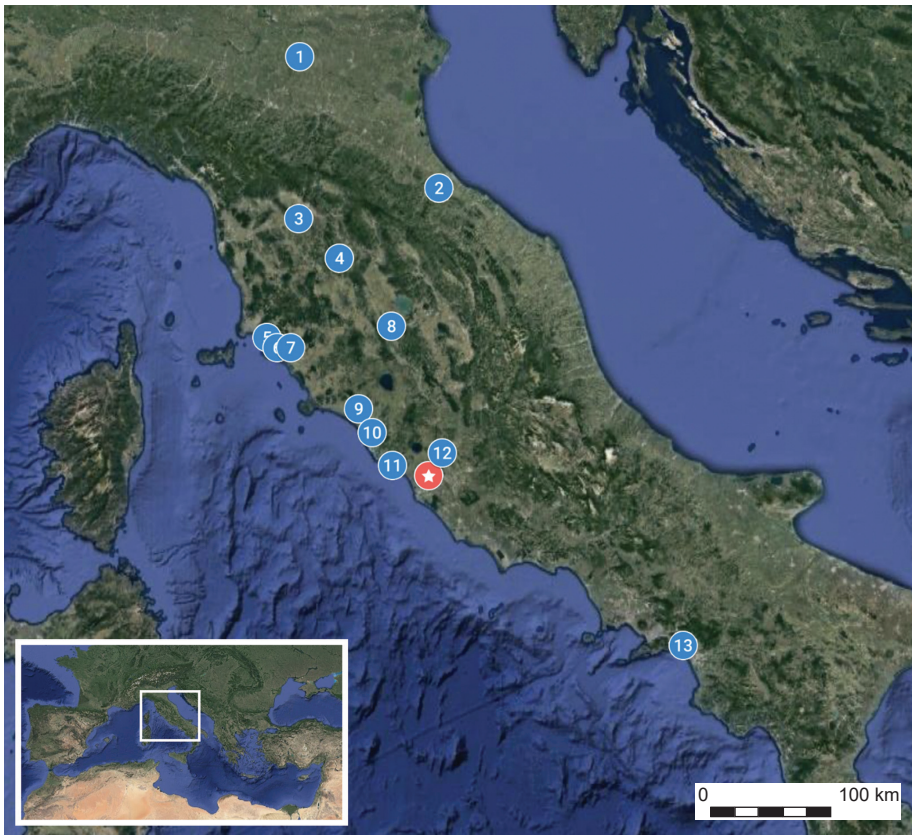

Figure 1. The geographical setting of the archaeological sites mentioned in the text: 1. Mirandola – Arginone; 2. Verucchio; 3. Prato Rosello; 4. Cetamura del Chianti; 5. Follonica; 6. Pian D'Alma; 7. Vetulonia; 8. Chiusi; 9. Vulci; 10. Tarquinia; 11. Pyrgi; 12. Veio; 13. Fratte. Starred: Necropolis of Valle Santa nell'Agro Veientano.

in the proximity of km 11,500 of *via di Boccea*, north of Rome (Italy). The site was identified during archaeological excavations carried out between 2011 and 2014 with the aim of performing preliminary verifications of building projects (De Cristofaro *et al.*, 2015). The use of the small but meaningful site is framed between the Archaic Age and the Late Roman Age (7th–1st centuries BC). Of specific interest for this study is an area south of the natural canal, intended for funerary use for a sepulchral district. Such a nucleus includes six "vestibule" tombs, dated between the end of the 6th and the beginning of the 4th century BC. All the investigated burials observe the incineration rite. The remains were found collected in clay vessels, in a cloth or in a perishable container, placed directly on the bottom of the relative niche. The spatial disposition of the tombs – four of which are very close and almost tangential, with the same orientation and side by side to form a single row, having rich funerary equipment (including a bronze bowl, glass paste balsam, a bronze mirror, a bronze strigil), and the use of the incineration rite suggest that they belonged to one (or possibly two) high-status families originally from Veio (De Cristofaro *et al.*, 2015).

2. Materials and Methods

Sediment, including vase and *bucchero* chalice fillings, was collected from eight different tombs (V, VI a, VI b, VI d, VI d5, XIX a, XX a, and XX b) during the excavation work giving a total of 15 soil samples. Sediment from the stratigraphic units (SU) 62/160 belongs to Tomb XX, part a and part b. Nonetheless, a sample strictly from SU 160 was also collected. The soil samples were then stored at the deposit of the Drugstore Museum in *via Portuense 317* (Rome, Italy) until 2020 when they were brought to the Laboratory of Archaeobotany and Palynology at "Sapienza" University of Rome. Here, a known volume (11.7 l in total) of these soil sediments was processed through bucket flotation. Charred macro-remains floating on the water surface were collected on a 250 µm sieve. The remaining sediment was then water-sieved, using a 1 mm mesh, to retrieve any additional plant (for example, preserved through mineralisation) or animal remains. Once dry, samples were sieved on a series of nested sieves of mesh size 5, 2, 1 mm (and 0.5 mm in the case of the light fraction) to make hand-picking more efficient.

2.1 Carpological remains

Carpological remains were observed using a Leica M205C stereomicroscope (magnification range 7.8× – 160×). High-resolution images were acquired through a Leica IC80 HD camera and the Leica Application Suite version 4.5.0 software and subsequently merged using Helicon Focus (version 6.6.1 Pro) to obtain well-focused images over the entire surface.

Identification of carpological remains was performed through a series of atlases (Jacomet, 2006; Neef *et al.*, 2012; Cappers and Bekker, 2013; Nesbitt, 2016; Sabato and Peña-Chocarro, 2021). The Euro+Med PlantBase

(2006+continuously updated) database was used as a reference for the nomenclature. It was not always possible to carry out identification to a species level due to either the state of conservation of the remains or, in the case of weeds, due to the multitude of species with similar characteristics within the same family, and the small amount of remains (which do not allow evaluation of the interspecific variety).

2.2 Anthracological remains

Charcoal fragments >2 mm were analysed following the diagnostic sections of wood (transversal, tangential, and radial) under a Nomarski microscope (phase contrast microscope with differential interference contrast). Their morphological characteristics were interpreted using atlases (Schweingruber, 1990; for *Quercus* taxa: Cambini, 1967). The nomenclature of *Quercus* species follows Cambini (1967).

3. Results

All extracted plant remains were preserved by charring, the most common modality of fossilisation in the Mediterranean basin (Renfrew, 1973). Anthracological remains were found in eleven processed sediment samples, while seeds/fruits were present in only five. Four samples turned out to be devoid of plant macro-remains.

A total of 469 charcoal fragments were studied, belonging to 10 different taxa (Table 1). The most numerous ones are represented by *Quercus* sect. *cerris* (semi-deciduous oaks – 234 fragments) and *Quercus* sect. *robur* (deciduous oaks – 135 fragments). *Quercus* sect. *cerris* is also the taxon with the highest ubiquity (81.8%). Other taxa include, in order of abundance, *Quercus* sp. (oaks – 51 fragments), *Ostrya*/*Carpinus* sp. (11 fragments), and *Ostrya carpinifolia* Scop.

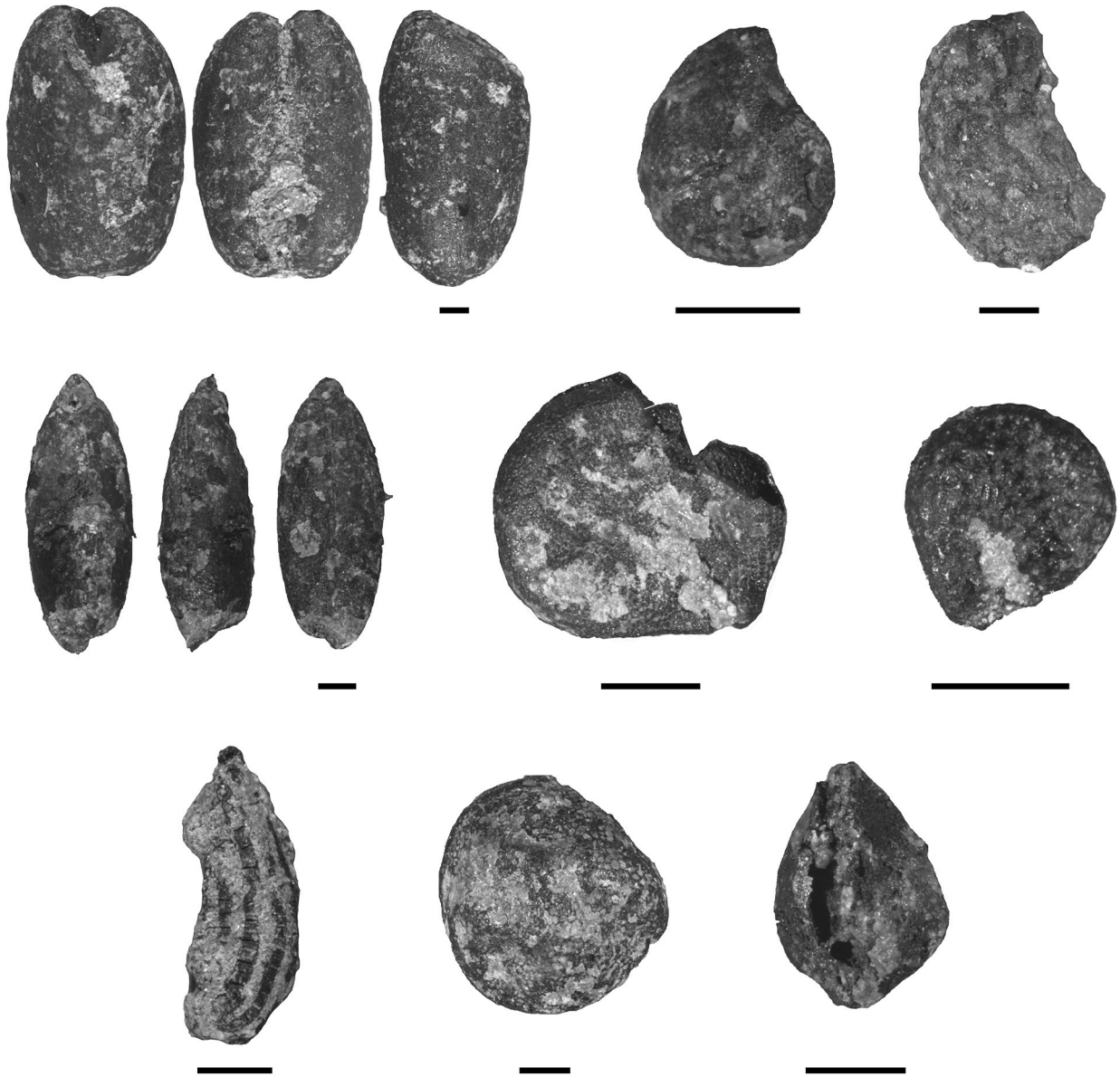

Figure 2. Carpological remains from the necropolis of Valle Santa nell'Agro Veientano. From right to left – top row: *Triticum aestivum/durum*, *Ficus carica*, *Rubus* sp.; middle row: *Avena* sp., Caryophyllaceae, *Portulaca oleracea*; bottom row: *Anthemis* sp., Brassicaceae, Polygonaceae. Scale bar: 0.5 mm.

Table 1. Anthracological assemblage of the studied samples. The * indicates that the sediment belongs to two stratigraphic units.

			Tomb V			Tomb VI a		Tomb VI d	Tomb VI d5	Tomb XX a	Tomb XX b		Tomb XX a/b		
Stratigraphic unit (SU)/locus	**27**		**N.D.**		**Vase #1**	**Bucchero chalice**		**45**	**51**	**160**	**62**	**154**	**62/160 A***	**62/160 B***	
Volume (l)	**0.6**		**0.1**		**1.5**	**0.5**		**0.6**	**0.2**	**1**	**0.2**	**1**	**1.5**	**0.9**	
Concentration (charcoal fr./l)	**21.(6)**		**710**		**6**	**94**		**121.(6)**	**220**	**177**	**10**	**23**	**1.(3)**	**8.(8)**	
	5 mm	**2 mm**	**5 mm**	**2 mm**	**2 mm**	**5 mm**	**2 mm**	**5 mm**	**5 mm**	**5 mm**	**2 mm**	**5 mm**	**2 mm**	**2 mm**	**TOTAL**
Fraxinus sp.														1	1
Monocotyledons						2	2			2					6
Ostrya carpinifolia								1		6				2	9
Ostrya/*Carpinus*					2					3			2	4	11
Quercus deciduous	2	6	32	25	1	6	2			48		13			135
Quercus semi-deciduous	2	1	2	1	1	16	7	62	38	102	1	1			234
Quercus evergreen							1	2	1	1					5
Quercus sp.	1	1	7	1	4	1	10	4	5	14		3			51
Rosaceae Prunoideae								1							1
Indet.			1	2	1			3		1	1	6		1	16
TOTAL	5	8	42	29	9	25	22	73	44	177	2	23	2	8	469

Table 2. Carpological assemblage of the studied samples. The * indicates that the sediment belongs to two stratigraphic units.

		Tomb V		Tomb VI d	Tomb XX a	Tomb XX a/b A	
Stratigraphic unit (SU)/locus		**Vase #1**	**N.D.**	**45**	**160**	**60/162***	
Volume (l)		**1.5**	**0.1**	**0.6**	**1**	**1.5**	
Concentration (remains/l)		**34**	**10**	**41.(6)**	**2**	**0.(6)**	**TOTAL**
CEREALS							
Triticum *aestivum/durum*	caryopsis	5					5
Cereals indet.	caryopsis fragment	16		25			41
PULSES							
Pulses indet.	cotyledon	1					1
FRUITS							
Ficus carica	achene	1					1
Rubus sp.	endocarp					1	1
WEEDS/SPONTANEOUS PLANTS							
Anthemis sp.	fruit	1					1
Asteraceae indet.	fruit	1			1		2
Avena sp.	caryopsis	1					1
Brassicaceae indet.	seed	2					2
Caryophyllaceae indet.	seed	8					8
Fabaceae indet.	seed	1					1
Poaceae indet.	caryopsis fragment	3					3
Polygonaceae indet.	seed	5					5
Portulaca oleracea	seed		1				1
Indet.		6			1		7
TOTAL		51	1	25	2	1	80

(European hop-hornbeam – 9 fragments). The sample from SU 160 (Tomb XX a) is the richest in charcoal pieces (177 fragments).

Carpological remains amount to a total of 80 findings, belonging to 14 different taxa (Table 2). These are represented by cereals (Cereals indet. – 41 caryopses fragments), including naked wheats (*Triticum aestivum/durum* – 5 caryopses; Figure 2), pulses (1 cotyledon), figs (*Ficus carica* L. – 1 achene; Figure 2), berries (*Rubus* sp. – 1 endocarp; Figure 2), and numerous spontaneous plants (*e.g.*, Asteraceae, Caryophyllaceae and Polygonaceae).

4. Discussion

The preservation of plant remains exclusively by charring in the investigated contexts is coherent with the incineration rite practiced in the necropolis of "Valle Santa nell'Agro Veientano" (De Cristofaro *et al.*, 2015). The same rite could also be responsible for the lack of plant remains in five of the processed samples, as combustion could have proceeded further, turning all plant material into ash. The type of container used to store the remains in the tombs does not appear to influence the concentration of plant remains in the sample. For example, the sample richest in carpological remains is represented by the filling of a ceramic vase in Tomb V. However, the sediment from Tomb VI d (where a perishable container is believed to have been used) presents a higher concentration of carpological remains per litre of sediment (41.7 vs. 34 remains/l). The use of perishable containers could nonetheless influence the anthracological assemblage. Archaeological and archaeobotanical data suggest that these could have been made from wood or be represented by woven baskets (De Cristofaro *et al.*, 2015). For instance, incinerated remains in Tomb VI d could have been stored in a box made of *Quercus* sect. *cerris*, as this taxon was very abundant in the studied sample. Similarly, the numerous charcoal fragments in *Quercus* sect. *robur* in Tomb XX b, could represent pieces of the box used to store the incinerated remains.

4.1 Funerary offerings

More detailed information about funerary rituals can be obtained by analysing the carpological assemblages. The sample richest in seeds/fruits is represented by the filling of vase 1 in Tomb V. Here, numerous findings of edible species were recovered. These are represented by five caryopses of naked wheats (*Triticum aestivum/durum*), 16 caryopsis

fragments of cereals (that could not be better identified due to the poor state of preservation), a cotyledon of a legume and a fig achene. Twenty-five burnt cereal caryopsis fragments were also recovered in the filling of Tomb VI d (SU 45). Finally, a *Rubus* sp. endocarp was found in the filling of Tomb XX. Considering the concentration of these findings in small volumes of sediment, the remains of cereals, pulses, and edible fruits could be associated with food offerings. While only cereals can be interpreted as voluntary food offerings, the other records could have accidentally fallen into the containers. Nonetheless, palynological and anthracological evidence seems to suggest a similar funerary ritual at the *necropolis* of Vulci, where funerary offerings appear to be comprised of cereals, fava beans and grapevine (Marchesini *et al.*, 2014). An even richer assemblage was recorded in tomb 12/2005 at Verucchio, where a wider set of cereals, pulses and fruits was found (Sala and Rottoli, 2018). The deposition of food plants is also attested at Tarquinia in the sacred "Area Alpha", where the retrieval of cereals, legumes, and fruits, along with animal bones in two pots, seems to be related to the monumental nature of the area (Rottoli, 2005).

The retrieval of a common purslane seed (*Portulaca oleracea* L.; Figure 2) from a soil sample from Tomb V is more problematic. Although it represents an edible species consumed in different parts of the world (Danin *et al.*, 2013), common purslane is also known as a synanthropic species, growing on rich and fertilised soils (Nakhutsrishvili, 2012). In this case, more than a single seed is needed to interpret it as a food offering.

Pictorial evidence from Etruscan tombs can help to interpret archaeobotanical data in terms of plant availability and funerary rituals. For example, on the right wall of the Tomb of the Triclinium (470 BC) in the *Monterozzi* necropolis, it is possible to admire the depiction of a fig tree (Colletti, 2016). This allows one to hypothesise that this plant had a ritual meaning. Mural paintings, such as those of Golini Tomb I near Orvieto (ca. 350 BC), can also help to obtain information concerning banquets; in this case, it is possible to recognise flat breads, pomegranates, and grapes (Cocomazzi, 2008; Della Fina, 2019). A depiction of bread is also present on the Belly Amphora by the Andokides Painter (520–510 BC), discovered at Vulci and stored in the Staatliche Antikensammlungen in Munich (inventory number 2301). The hypothesis can be advanced that cereals were donated as a primary product to produce bread. Other plants often depicted in Etruscan funerary contexts are olive trees, myrtle, laurel, and ivy (Cerchiai, 1995; Colletti, 2016).

Some final considerations can be made based on the ceramic assemblage that accompanied the plant remains in the necropolis of "Valle Santa nell'Agro Veientano". Here, one or more ceramic containers were retrieved in each tomb, such as a *bucchero* chalice (tomb VI a), a miniature *bucchero* chalice and a brown clay plate (tomb VI c), a fragmentary plate (tomb VI d), and a clay plate (tomb XIX b). These could be related to the practice of food offering.

Other observations related to rituals concern the choice of timber for the funeral pyres, represented mostly by deciduous and semi-deciduous oaks. This contrasts with the data from the tombs in Vulci (Marchesini *et al.*, 2014), where evergreen oaks prevail.

4.2 Past environment

Anthracological remains are useful for obtaining information about the procurement of raw materials and past vegetation. Currently, the flora of Northern Latium is characterised by the presence of *Quercus cerris* L. and *Quercus frainetto* Ten. Forests on sandy substrates, related to the significant water availability in these soils. In the areas where the substrate is clayey, other types of deciduous oaks are also present, such as *Q. virgiliana* Mill. And, locally, *Q. robur* L. (Blasi and Biondi, 2017). In terms of wood anatomy, *Q. frainetto*, *Q. virgiliana* and *Q. robur* can be grouped as *Quercus* section *robur* (deciduous oaks), while *Quercus cerris* belongs to *Quercus* section *cerris* (semi-deciduous oaks; Cambini, 1967). Considering the frequency of deciduous and semi-deciduous oak charcoal fragments in the analysed samples, it is possible to hypothesise that the environment surrounding the archaeological site was similar to the present-day one, and that the timber was of local provenance. An abundance of deciduous oaks has also been documented in other Etruscan sites, such as Cetamura del Chianti (Mariotti Lippi *et al.*, 2020), Chiusi (Costantini *et al.*, 2009), Pian D'Alma (Mariotti Lippi *et al.*, 2002) and Vetulonia (Coradeschi *et al.*, 2021), supporting the hypothesis that, in the first millennium BC, the woody flora composition was similar to the modern one in Etruria.

Past and present environments can also be compared by looking at other arboreal taxa. These include evergreen oaks (*Quercus* sect. *suber*), such as *Quercus ilex* L. (holm oak), currently present near the coastal strip of Upper Latium and Southern Tuscany (Blasi and Biondi, 2017). Similar consideration can be made for the charcoal fragments of *Fraxinus* sp. (ash tree), *Ostrya carpinifolia* Scop. (European hop-hornbeam), *Ostrya*/*Carpinus* (hornbeam) and Rosaceae Prunoideae, which nowadays form part of the flora of Upper Latium, particularly in level and semi-level areas, where they are conditioned by the dynamics of the agricultural system (Blasi and Biondi, 2017). Finally, it is possible to distinguish an herbaceous component (Monocotyledons), reduced to a few species, that are difficult to distinguish based only on the anatomy of the stem. A similar anthracological assemblage was identified in two wells near Temple A at the nearby site of Pyrgi, where numerous fragments of deciduous and evergreen oaks are accompanied by riparian taxa such as *Fraxinus cf. ornus*, *Salix* sp. and *Ulmus* sp. (Coccolini and Follieri, 1980).

Further information regarding the environment of the past can be provided by the presence of wild plants. Among these we find oats (*Avena* sp.; Figure 2), whose wild or cultivated state is difficult to determine with certainty on solely archaeobotanical remains. Some species of the genus *Avena* are typically interpreted as weeds of cultivated fields (Fuller and Stevens, 2019).

Synanthropic taxa also include *Anthemis* sp. (Figure 2) and several species of the Asteraceae, Brassicaceae

(Figure 2), Caryophyllaceae (Figure 2), Fabaceae, Poaceae and Polygonaceae (Figure 2) families (Drozdova *et al.*, 2019; Piqué *et al.*, 2021; Sadori *et al.*, 2010) identified in the studied contexts. These suggest a heavily anthropized environment. Unfortunately, the amount of information that can be obtained from these taxa is limited, as a more precise identification of the remains was not possible. Nonetheless, human presence and exploitation of the environment at "Valle Santa nell'Agro Veientano" is also attested by traces of viticultural cultivation detected during the archaeological excavations of the site (De Cristofaro *et al.*, 2015).

5. Conclusions

The present study represents the first attempt at reconstructing human-plant relations at the *necropolis* of "Valle Santa nell'Agro Veientano". Here, archaeobotanical data provide insights into the human-plant relations of the Etruscans, including aspects related to funerary rituals. These appear to have included offerings of naked wheats and other cereals, pulses, and fruits. A preference for deciduous and semi-deciduous oaks in their funeral pyres suggests the use of local timber.

Important information can be gathered concerning the past vegetation surrounding the studied site. The anthracological data allow a description of an environment surrounding the archaeological site that is similar to the modern one, dominated by semi-deciduous and deciduous oaks. Other taxa include evergreen oaks (presumably *Q. ilex*), ash trees, hornbeams and Rosaceae Prunoideae. This is also consistent with other archaeobotanical data available in the area in the same timeframe. The environmental image of the 6th–4th century BC Valle Santa is completed by the retrieval of spontaneous plants attributable to synanthropic taxa, whose presence provides records of anthropic activity.

Overall, the present study provides new information regarding the Etruscans and their plants, enriching our knowledge of their ritual sphere and past environment.

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