Plant remains from the burials of St. Sisto basilica (Montalto di Castro, central Italy)

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Abstract
La fondazione della basilica di San Sisto a Montalto di Castro (Viterbo, Lazio) si data anteriormente al XIII secolo. Una serie di tombe e ossari risalenti ai secoli XV e XVI sono venuti alla luce durante gli scavi archeologici effettuati nel 2001. Sono stati studiati i resti botanici trovati tra i corredi funerari e facenti parte di alcune bare. Attorno ai chiodi di ferro che tenevano insieme le assi delle bare si sono conservate tracce di legno che è risultato appartenente a due taxa, pioppo (Populus sp.) ed ontano (Alnus sp.). Il pioppo è il legno usato nelle sepolture più antiche, mentre l’ontano è stato usato per le sepolture più recenti databili posteriormente alla seconda metà del XVI secolo. Il ritrovamento più eccezionale è una coroncina di gelsomino (Jasminum sp.) trovata nella tomba ipogea, vicino i corpi di due bambini. Secondo le fonti storiche il gelsomino venne importato in Europa nella seconda metà del XV secolo e successivamente venne coltivato in chiostri e monasteri in quanto simbolo dell’immortalità per i cristiani. Fra i corredi funerari delle sepolture più recenti sono stati inoltre ritrovati i resti di un rosario e di una collana, che sono risultati realizzati rispettivamente con osso e con legno di betulla (Betula sp.).

1. Introduction
The town of Montalto di Castro stands on a height near Tarquinia, in the Viterbo province, on the border between Lazio and Tuscany. This territory is also known as “Southern Etruria”, which is an ancient Etruscan possession. The St. Sisto basilica is located just outside the ancient town walls along the route connecting Montalto with its sea-coast hamlet (Lanzi 1938; Giontella 2007). The basilica is inserted in the ex-monastery buildings and seems as a whole of stiles amalgamation occurred over time. The original structures, dated around the 13th century, are partly still legible within the buildings. Its present-day east-west oriented nave and two aisles are parted from each other by columns of various shapes and sizes (Lupidi 2007).

The historical sources are scarce: St. Sisto appears in 1234 as belonging to the “Tre Fontane” monastery in Rome. The next mention is in the year 1356, when there was a synod, a council of a church convened to decide an issue of doctrine, administration or application (Giontella 2007; Falsetti and Mattei 2007). The copies of the proceedings, edited in 15th century (Signorelli 1907) have survived. The ancient monastery structures were rebuilt in 1579, when the monastery had given to Saint Agostino’s friars. It was converted into a lazaretto over the years and, in 1708, into a hospital, when Pope Clement 11th entrusted it on friar’s order “San Giovanni di Dio”, also known as “Fatebenefratelli”, for treatment of the sick (Lupidi 2007). In that period the structure received the most evident and invasive renovations to meet the building on new purpose. In the year 1798 the hospital was sacked by French troops and again, more seriously, during the Roman Republic period (1848-1849), when it was burnt (Lupidi 2007).

2. The excavation
At St. Sisto (fig. 1) before the recent restoration works (2001-2004), careful archaeological excavation was needed, with the basilica’s documentation and interpretive graphics supporting, which was followed by the discovery of funeral coverage on the original walking level during the cleaning and removal works (by mechanical means). When they demolished the 18th century floor to bring back the original structure, a crypt, two ossuaries and some small pit type graves were brought to light. These signs suggest that from the erection of the building, at least until 17th century, the structure has changed its cult place function (Giannini 2001). Currently the building is used as a place for various cultural events.

The archaeological excavation was carried out between November and December 2000, in a relatively short period of time to avoid disturbance with the renovation work in progress. The research was made on behalf of Mastarna s.p.a. by the archaeologist Dr. Silvia Giannini. The images and data of the excavation were kindly provided by Dr. Maria Gabriella Scapaticci (Soprintendenza Archeologica per l’Etruria Meridionale), who supervised the excavation work and authorized the present publication.

Figure 2 shows the plan of the basilica and the tombs
location. Nearby the gateway there are two hypogeum environments dug in the natural rock base, one on the right aisle (fig. 1b, fig. 2, tomb 1) and the other one on the left side (fig. 2, tomb 2) in a way mirror symmetric as regards to the median building axis. The crypt in the right aisle (tomb 1), fully preserved and accessible via narrow stair, consists of a hypogeum irregular rectangle room with an ossuary in the middle.
The symmetrical tomb of this (tomb 2), excavated in the west area on the left aisle, is preserved only in part. It was destroyed and cut half in its original height when the cellar was dug in the floor in 18th century. During the same building-phase, the first two ossuaries were placed in the middle of the building (ossuaries 8 and 9).

The first use of the pit type graves 3, 4, 5, 6 and 7, dug inside the cocciopesto floor, seems subsequent to the burials above-mentioned. The reiterated use of these graves is clear by the dismantled human bones in the layers of soil plugging the in situ burials.

During the same phase radical works were probably carried out, which changed the basilica’s look. In the western aisle basilica bricks were used to plug some lacunas in the cocciopesto floor. The use of bricks, which damaged the uniformity of the plan, is suggesting that these lacunas were repaired during a period when practical and economic purposes were more important than building harmony. During this last poor period the graves 3, 4, 6 and 7 were probably used for the last time, since a thin cocciopesto layer plug them.

The last burial found in situ was grave 5, considered subsequent as the others. It is clue, how the pit was closed, namely by bricks and mortar, which damaged the uniformity of the floor. It remains only a part of burial, because the upper portion was removed during the cellars excavation works.

A significant find for the dating of the graves consists of a celebration coin for the year 1600 Jubilee found near the feet of the body in grave 7.

3. Material and methods

The materials delivered for analysis to the archaeobotanical laboratory of Sapienza University of Rome, consist mostly of wooden finds, which were preserved thanks to the presence of metals, precisely iron. This particular kind of conservation is called metallization and consists of a preservation of the organic matter through the metal oxides, in this case iron ones.

The organic findings coming from the pit type graves are mostly fragments of the wooden coffins preserved around the iron nails (fig. 3). The funeral depositions are often multiple as in grave 3, where three individuals were entombed: a 20-30 years old female and two infants. This burial was intact and some tissue fragments, some rosary parts, a bronze earring and a gold enameled ring were found near the bodies.

Most findings are from the crypt (tomb 1, fig. 1b, fig. 2). Inside the funeral chamber there are two symmetrical deposition platforms. The tombs were profaned in historical times, the depositions were scattered and the grave-goods are certainly without the most valuable objects. On the left platform two bodies were entombed: a 6-10 years old child and a 12-18 years old juvenile (Giannini 2001). Some objects belonged to the latter, among them one rosary, and a bronze crucifix as well as a necklace composed of small globes alternating to four small bronze medals with saint images. Some textile fragments, several
PLANT REMAINS FROM THE BURIALS OF ST. SISTO BASILICA (MONTALTO DI CASTRO, CENTRAL ITALY)

small bronze nails and a headdress of flowers have been found as well. Even on the right platform two young-age bodies were buried. Their remains are a few fabric pieces and some rosary globes similar to the previous.

For wood identification is generally needed to make some sections of the samples according to the three diagnostic plans: cross, radial and tangential (Sadori and Follieri 2005). As a rule, it would require at least 10 mm³ of sample (Follieri and Sadori 2005). This was not the case of the remains of the present article, as the preserved wood material was few, consisting in wooden splinters and small pieces metalized on the nails (fig. 3, table 1) or on the wire (fig. 4, table 1).

For first general observations, optical microscope with reflected light (stereomicroscope) was used. For detail identification, the use of a microscope to a greater magnification as the Differential Interference Contrast microscopy (DIC), also known as Nomarski Interference Contrast (NIC) (we used the model Leica DMRB) was preferred. When optical techniques are not sufficient it needs to use a SEM: Scanning Electron Microscope (Follieri and Sadori 2005), but this was not the case. Identification was carried out using wood atlas with specific key to taxa (Greguss 1959; Greguss 1972; Schweingruber 1978, 1990).

Photographs were taken with a high resolution digital camera (Nikon Coolpix) connected to the Nomarski microscope.

4. Results

4.1. The finds from the pit type burials

The wooden samples of the coffins from the graves 3, 5, and 6, constitute the majority of the salvage, at 153 total amount elements (fig. 3). The wooden splinters were extremely fragile and hardly handled as the analysis purposes did not permit the use consolidating substances. The wood preserved on metallic surfaces of the nails, however, showed more compact texture and they almost entirely kept their morphological characteristics. Owing to the fibres orientation on the surface of the nails was practicable to observe only a few fragments containing cross section. Many fragments were identified as belonging to Alnus. It was inferred by the wood remains on the nails that all the alder boards had the same thickness measure, between 25 and 28 mm.

4.2. The findings from the crypt

Many pieces of wooden coffins come from tomb 1 as well. Wood fragments of Populus (fig. 4) were identified, carrying out analyses on 5 nails and 2 splinters. Because of the scarce wood preservation, it was difficult to carry out this identification, as Populus wood is very similar to Salix one. The assignment was however done using the number of pits in the crossing fields, which in poplar usually does not exceed the 5 units (Greguss 1959) to distinguish between Populus and Salix woods, also for the scarcity of the material.

Despite the archaeological excavation report named it a bracelet, the reassembled circumference of about 30 cm suggests that the “jewel” was a necklace (fig. 5). The wooden necklace decay was particularly noticeable. The material was not coherent and it was crumbling at minimum stress. The band was formed by several wooden beads connected by a wire. They were alternated with four small bronze medals with pictures of saints. The wire had “cemented” the spherules in a hard structure enabling their preservation. Only one bead retains still its original form (the one in physical contact with a metal medal) and only 2-3 mm of wood around the wire remains from the others. Unfortunately, it was not possible to identify a clear cross-section. The holes were made along the wood longitudinal direction. In any case, it was possible to ascertain the presence of a diffused porosity. This feature, combined with the presence of multi-seriated rays (between 2 to 4 cells) and scalariform perforations (between 8 and 20 bars) are typical of Betula wood (Greguss 1972; Schweingruber 1990).

<table>
<thead>
<tr>
<th>Kind of wood remain</th>
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<tbody>
<tr>
<td>Nails from the coffins</td>
<td>153</td>
</tr>
<tr>
<td>Beads from the necklace</td>
<td>42</td>
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<tr>
<td>Stems from the bunch (estimate)</td>
<td>50</td>
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</tbody>
</table>

Table 1. St. Sisto basilica (Montalto di Castro, central Italy). Wood samples distribution from the burials.
The remains of two small plants bunches, probably flowers, are the most typical ones from this grave (fig. 6, table 1). Actually, it is very rare to find these perishable materials. The remains of the two little bunches, mineralized by the wire which kept they, are only the thin wooden stems. Originally they were likely to form a little funeral head crown, as it can be argued from their curvature and position. The twigs were generally too thin to provide sufficient evidence for the diagnosis. One of them, showing a dichotomous branching, resulted sufficiently thick and isolated. Secondary wood structures were scarcely preserved, surprisingly only the marrow was retained. The scientific literature never reports the marrow as a diagnostic element. The marrow of the samples showed a rare honeycomb structure, with hexagonal cells. A comparison with specific anatomical wood atlases (Greguss 1972; Schweingruber 1990) restricted the investigations to the Oleaceae family. In only one section it was possible to observe a small part of wood with the typical hardwood structure and a probable porous ring. The radial section indicated the presence of heterogenous rays, with procumbent (oblong) and rarely quadrangular cells and of vessels with simple perforations and large scalariform pits; the rays resulted uniseriate on tangential surface. These characters refer to the genus Jasminum. The assignment to the genus Syringa was ruled out because this genus

6. - St. Sisto basilica, tomb 1. a. jasmine (Jasminum sp.) head-crown, b. jasmine wood radial section, photograph carried out at the Nomarski microscope.
Jasminum has only quadrangular ray cells and not erected too as Jasminum (Greguss 1959).

The analysis of the bead from the rosary noticed that it was not made of wood but bone.

5. Discussion and conclusions

Both poplar (Populus) and alder (Alnus) are very soft and easily workable woods as well as relatively inexpensive. They are often used as building material (Giordano 1980). Since both are very common in this area, this two genus do not give clues about their origin. Both are not longevial species and they have a relatively fast growth. They require lots of water and it is not uncommon to see mixed grove made up with alders, poplars, willows and other riparian species along the course of rivers (Pignatti 1982).

Near the small town of Montalto the Fiora river is flowing, springing from the southern side of Mount Amiata and flows into the Tyrrhenian Sea, just north of Montalto di Castro, proceeding a course of about 80 km north-south direction. It is plausible that the timber was taken from these river shores.

Alnus glutinosa, A. cordata and A. incana are currently very common in Italy, especially in the central Apennines (Pignatti 1982). Its use traces to very ancient times, its best feature is to become very hard and tough in water. It was used even since the Bronze Age for making piles of perialacustrine settlements (Corona et al. 1974).

An interesting point is that all the coffins from the graves 3, 5 and 6 were made from the same wood, alder, while the coffin of the tomb 1 (the older one) from poplar. This fact could confirm not only that the funeral areas had been used at different times, but also that the first burials were used in a short time, if not even contemporaneous. To get a more complete reconstruction it would have been interesting to examine the timber used in the graves 4 and 7, but unfortunately we were not in possession of those ones.

The necklace found in the tomb 1 was made of birch wood. The genus Betula includes approximately 40 species of shrubs and trees. It is a typical angiosperm in the northern Euro-Siberian landscape, namely cold-temperate climates. In Italy it reaches its most southern limit. For this reason it is not a typical Italian tree, though Betula pendula is very common in some areas of the peninsula. B. pubescens and B. nana are also occasionally noticeable (Pignatti 1982). The presence of birch is reported in Liguria, Emilia Romagna and Tuscany, but in the southern Apennines it is more common, especially in Campania (Plini and Tondi 1989). In Latium it is reported in two locations, at Manziana (Tassi 1979) and Monti della Laga (Plini and Tondi 1989), in the latter seems to be native. Birch woods are also reported in the national parks of Aspromonte and Abruzzo. Though it is quite common in Italy today, it is not known if it was at the time of the burials as well. The use of birch wood for making beads is probably not a random choice, but an intentional technical solution. This soft wood is well suitable for turned and sculpture works. Northern European people have used it since ancient times for the manufacture of small artifacts. The particular feature justifies the use of this material in the burial. Thanks to the letters carved on the medal (S. FRA. D. PA.) and to the confirmation coming from the iconography, it was possible to attribute the image of the saint to San Francesco di Paola (Paola, 1416 - Tours, 1507).

The cult of this saint began immediately after his death and spread first in Calabria (Italy) and later as far as France (Aretino 1978). This little medal provides a terminus post quem, which allows dating the burials after 1519.

A very particular find was the headcrown made with jasmine flowers. Jasmine is a deciduous shrub, which includes more than 200 species.

It blooms in spring and, depending on the species, the color of the flowers can vary among white, yellow and pink (Pignatti 1982). The most common jasmine, Jasminum umilis, is native in Malabar in the Eastern Indies and was imported into Europe by Spanish sailors in a not well defined period between the middle and the end of 15th cent. However in Italy a species seems to have been present before that time, a figure of this flower is in fact represented in the well-known Renaissance manuscript “Rinio code”, the Liber de Simplicibus (Roccabonella 1419). The legend said that Cosimo De Medici the 1st had the first specimen of this plant; he was so jealous of it that he forbade his gardeners to spread it out of his garden.

Tiny fragments of this plant were found on the mummy of a pharaoh in the necropolis of Deir el-Bahri (Kantor 1999). It seems it was already imported by Romans in the form of scent. A short reference is made by Dioscorides (Anazabe 40 AD. ca 90 AD) in his famous code De Materia Medica. Dioscorides refers to the Iasmelaios oil used mainly after the ablutions in the baths. “(...) it is good for the whole body after bathing, for those who want warmth and relaxation. It has a heavy sweet smell, so that many do not use it willingly” (Dioscorides 2000).

However there is not conclusive scientific evidence that the Romans imported the jasmine in the form of plant. Pollen dubitatively attributed to jasmine (because of the poor preservation), was found in the soil contained in one small pot of the 2nd century AD in the Horti Luculliani, in Rome (Giardini et al. 2006).

Jasmine lives in a temperate climate. In many places it is naturalized along the coasts and in southern-central Italy. In addition to J. umilis the most common species...
in Italy are *J. fruticans* and *J. officinalis* (Pignatti 1982). In monasteries it was common to plant jasmine because it was a symbol of the immortality for the Christians, therefore it is not so unexpected to find it in the tombs.

References


