

Well lining in ancient hydrological system of Fratte settlement (Salerno, Italy): cypress wood use in the Archaic period (6th-5th century BC)

Giampiero Colaiani¹, Francesco Scelza³, Girolamo Fiorentino², Angela Pontrandolfo³, Alfonso Santoriello³ and Daniela Orrico³

1 ISUFI-University of Salento, Italy; colaiani.gia@libero.it

2 Laboratory of Archaeobotany and Palaeoecology; University of Salento; Via Dalmazio Birago 64, 73100 Lecce, Italy; charcoal@unile.it

3 Laboratory of Archaeology "M. Napoli", University of Salerno, Via Ponte don Melillo, 84084 Fisciano (Salerno), Italy; alab@unisa.it

Summary: Recent archaeological investigations in the archaic settlement (6th-5th century BC) of Fratte (Salerno – Italy) reveal a complex system of the underground water exploitation by use of wells. Thanks to peculiar environmental conditions it was possible to retrieve many cypress wood fragments. Some of these were found on the internal well surfaces. Integration between ethnographical study and wood technology has shown that the xylotomic finds have been used as lining of the sandy/clayish layers, intercepted from the ground perforation in the 6th-5th century BC.

Key words: wood remains, *Cupressus*, well lining, 6th-5th centuries BC, Italy.

INTRODUCTION

The Etruscan-Samnite settlement of Fratte lies on the Scigliato hill (71 m asl) in the Salerno north-eastern zone (Campania, Italy), in a favourable topographical position above the course of the Irno river (Fig. 1). The geomorphological and hydrogeological history of the Irno valley has conditioned the use of the whole territory, favouring human settling since the ancient times (Pontrandolfo and Santoriello, 2009).



FIGURE 1. Fratte settlement localization and picture of the archaeological area.

The archaeological investigations have allowed recognizing the presence of a complex system of underground water exploitation, dated to the 6th-5th century BC. This hydrological system, scattered on the whole hill, is composed of ten wells and at least five shallow-holes connected to underground burrows, used

for the transport of solid and fluid materials (Orrico, 2008; Scelza, 2009) (Fig. 2).

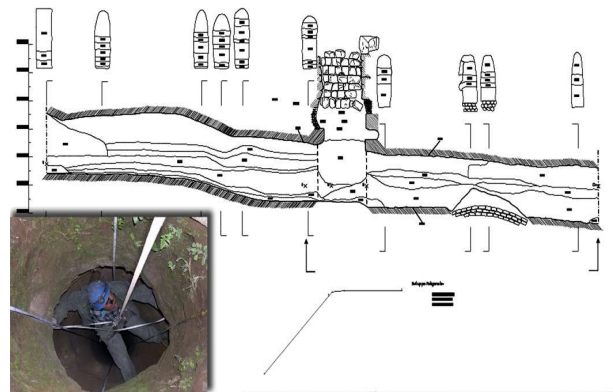


FIGURE 2. The hydrological system relief and picture of one of the wells during the excavation.

DATA AND RESULTS

Hand sampling strategies inside the wells n. 6 and 9 have allowed recovering many wood fragments, characterized by reddish color and yellowish concretions.

Safety reasons and dangerous conditions during the excavation have not allowed a more accurate sampling. 14 wood fragments from well n. 6 and 12 from well n. 9 were retrieved in correlation with the lining of the structure. The xylotomic analysis performed at the Laboratory of Archaeobotany and Palaeoecology of the University of Salento, assign these fragments to cypress wood (*Cupressus*).

The fragments have mainly rectangular shape with an average size of 20 cm length, 10 cm width and 1.5 cm thickness (Fig. 3).

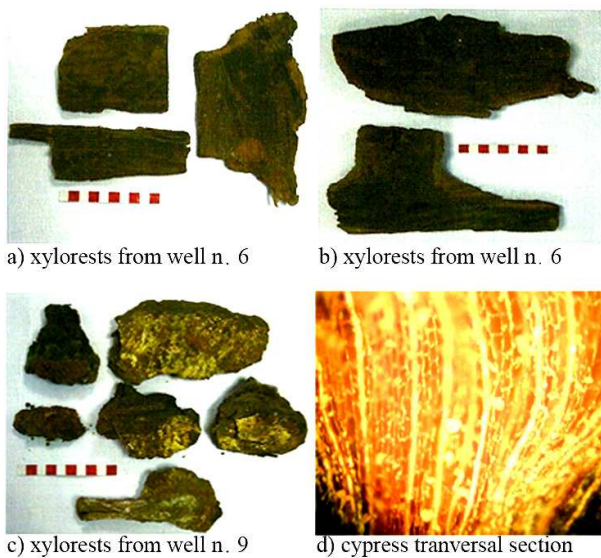


FIGURE 3. Fragments recovered and their xylotomic analysis.

DISCUSSION

According to the shape of the finds, the wells would have contained cypress planks, recovered to the depth of 16 m. This depth corresponds to a sandy/clayish layer, rather friable.

The manufacture of wood and the geological composition of the sediment show that the wells had wood lining walls to sustain the crumbly layer (Hazeltine and Bull, 2003). This interpretation is confirmed by ethnographical comparisons, this well digging technique is still widespread in many villages of Niger and Zambia (Sutton, 2002; Danert, 2006) (Fig. 4).



FIGURE 4. Wood employment in a hand drilled well in Zambia (Sutton, 2002).

The cypress wood choice does not seem to be casual but reflects the ancient knowledge of the elevated resistance of the wood of this plant to damp environments (Giordano, 1980, 1999; Tampone, 1996). The cypress results to be the ideal solution, therefore, to cover the walls of the wells.

A supplementary observation concerns the yellowish coloration of wood fragments from well n. 9. A more careful chemical analysis of this one has revealed that it is sulphur. The sulphur exhalations, connected to the depletion of the groundwater, would be the cause of the abandonment of well n. 9.

CONCLUSIONS

The xylotomical analysis of the fragments retrieved inside the wells has shown the exclusive presence of cypress wood to build the lining. These techniques were used as an alternative to stone cladding.

The choice of cypress wood as lining solution for the wells depends on its chemical/physical characteristics. In fact, the presence of this only *taxon* in the wells does not reflect the taxonomical richness of this area during the 6th-5th centuries BC (Colaiani, in press).

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