Agriculture and wood management in Islamic Extremadura (Spain)

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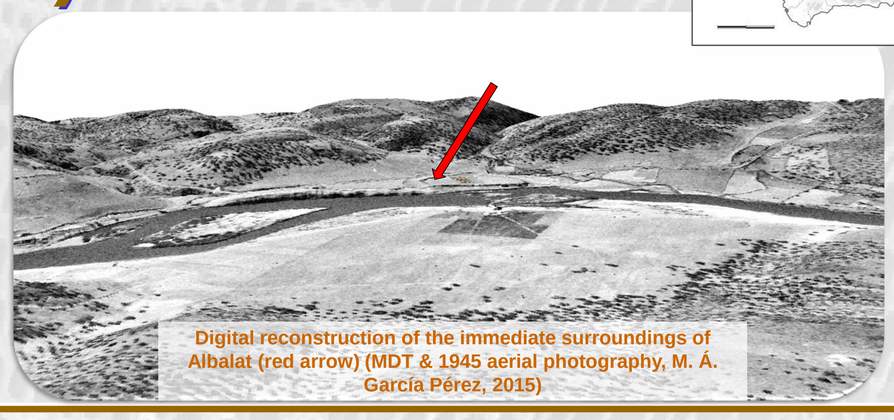
Map of Spain with location of Extremadura region (red spot for Albalat)



Digital reconstruction of the immediate surroundings of Albalat (red arrow) (MDT & 1945 aerial photography, M. Á. García Pérez, 2015)

INTRODUCTION

Started in 2009, the multidisciplinary project in the archaeological settlement of Albalat (Extremadura, Spain) aims to document the small fortified Islamic establishment, mentioned by the textual sources as soon as the second half of the 10th century.

Located on a fluvial terrace dominating one of the fords that cross the Tagus river, Albalat became for the Christian troops a strategic objective, leading to its siege and its systematic destruction in 1142.

Covering a total area of more than 1200 m², the excavation has revealed various types of buildings organized along streets: housings with domestic spaces (kitchens, ovens, storage and patios), craft spaces (metal workshops), as well as a *hammām* installed at the foot of the wall.

Sieving by flotation machine

Manual water sieving

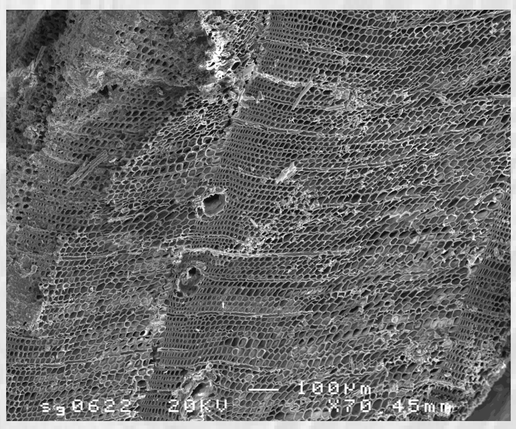
MATERIAL AND METHODS

Since the beginning of the project, a special effort has been made in order to study the widest range of contexts, in domestic spaces as well as in craft spaces. Archaeobotanical material, extracted from about 150 samples, comprises charred and mineralized remains, in varying degrees of abundance.

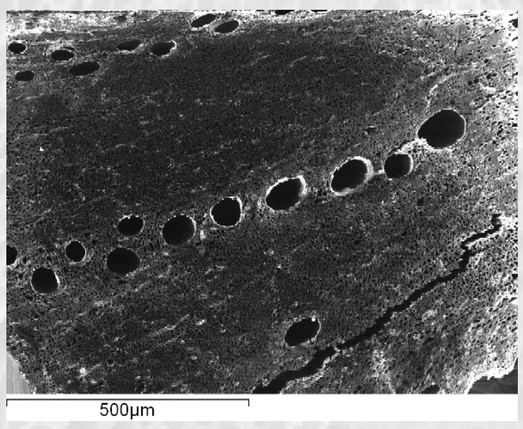
The anthracological material included in this study is preserved by carbonization. It is composed of fragments manually sampled during the excavation, and of charcoals extracted by flotation.

Due to the preservation of seed remains (carbonization and mineralization), we had to adapt the sieving method : part of the samples were sieved with the help of a flotation machine, and the samples coming from the latrine were manually sieved with water. In both cases, fine meshes were used (2 and 0,3 mm).

WOOD MANAGEMENT



Transversal view of *Pinus* sp.



Transversal view of *Quercus ilex/coccifera*

Due to the wide range of contexts sampled at Albalat, the data are highly diverse. Samples coming from construction, frame, etc., provide different results : in the most important house documented at the moment, the results are almost monospecific, with pine wood (*Pinus* sp.) being used as the main taxa, while lesser houses provide a more diversified spectra.

In the contexts in which wood fuel has been studied (fireplaces in kitchens, baths, wastes, etc.), the anthracological spectra shows a larger diversity.

We observe the exploitation of various habitats for timber and firewood, such as the oak forest (*Quercus ilex/coccifera, Quercus* subg. *Quercus*, *Corylus*), the riparian woods (*Alnus* sp., *Fraxinus* sp., *Ulmus* sp.) and other cultivated trees (different types of Rosaceae -*Prunus* and Maloideae-, *Vitis vinifera*, *Olea*, *Quercus/Castanea*), some of them being also identified by fruit remains. Moreover, wood preserved in contact with metal objects (such as arrow heads, key holes) has mainly been identified as Pine tree.

AGRICULTURE AND FOOD

From the analysis of 86 carpological samples, 19 cultivated/gathered taxa have been found: 7 cereals, 2 pulses, 1 technical/oil plant, at least 12 fruits and about 37 weeds/wild plants.

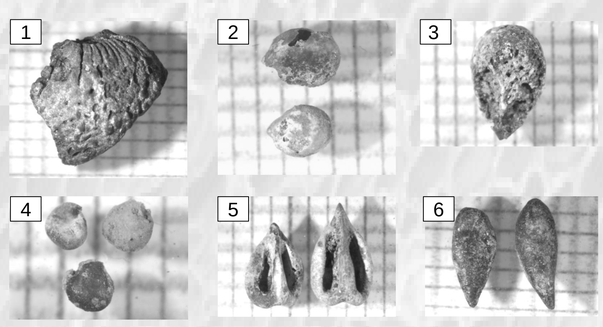
- Hulled barley, rye and naked wheat were the main crops, produced in dry, rich soils as suggested by the discovery of several nitrophilous taxa (*Anthemis arvensis*, *Glebionis coronaria, Polygonum aviculare*).The numerous cereal chaff and straw remains discovered suggest their use as fodder or litter in the biggest houses of the city. Although considered as a "minor cereal" in historical sources (Salas-Salvadó *et al*. 2006), rye is the second most frequent and abundant cereal on the site.
- Pulses are far less common than cereals, and poorly represented.
- Flax is quite common at Albalat, and its oily seeds might have been used as fuel for the lamps, as suggested by the chemical analysis (N. Garnier).
- The most frequent fruits are grapes, figs and acorns, although a large diversity of cultivated/gathered species was used. The numerous grenade and mulberry seeds found in a latrine context suggest their importance for the inhabitants of the biggest house of the city.

CEREALS
Hulled barley (*Hordeum vulgare*)
Rye (*Secale cereale*)
Naked wheat (*Triticum aestivum/durum*)
Cf. Durum wheat (*Triticum* cf. *durum*)
Emmer (*Triticum dicoccum*)
Bromcorn (*Panicum miliaceum*)
Foxtail millet (*Setaria italica*)
Oat (*Avena sp.*)

FRUITS
Grape (*Vitis vinifera*)
Fig (*Ficus carica*)
Grenade (*Punica granatum*)
Almond (*Prunus dulcis*)
Chestnut (*Castanea sativa*)
Oak (*Quercus* sp)
Olive (*Olea europaea*)
Peach (*Prunus persica*)
Mulberry (*Morus alba/nigra*)
Cf. Plum (*Prunus* cf. *domestica*)
Apple/Pear (*Malus/Pyrus*)
Type cherries (*Prunus* spp)
Type Walnut (*Juglans regia* type)

OIL/TEXTIL PLANTS
Flax (*Linum usitatissimum*)

PULSES
cf. Vetch (*Vicia* cf. *sativa*)
Wild pea (*Lathryrus cicera/sativus*)



1. *Prunus dulcis*
2. *Morus alba/nigra*
3. *Malus/Pyrus*
4. *Ficus carica*
5. *Vitis vinifera*
6. *Punica granatum*

SYNTHESIS AND PROSPECTS

The important investment in sampling and sieving during the excavation allows us to confirm the archaeobotanical potential of Albalat's contexts.
It appears that, excepted the durum wheat, none of the plants identified on the site show a strong evidence of Arabo-Berber influences on agriculture. Indeed, none of the novelties supposedly brought by Arabo-Berber populations and cited in historical sources (Albertini 2013) were found in Abalat (such as citrus fruits, rice, spinach, aubergine, cotton).
Albalat's plants spectra seems, so far, quite similar by its composition to the one exploited at previous periods (Roman period, High Middle Ages) in Iberian peninsula. Future investigations will focus on the role of particular species (such as rye), and on the possible spatialization of agricultural/food activities within the site.

REFERENCES

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Salas-Salvadó J., Huetos-Solano M.-D., García-Lorda P. and Bulló M. (2006), « Diet and dietetics in al-Andalus", *British Journal of Nutrition* 96, Suppl. 1 : 100–104.