Woodland transformation under palaeogeographic constraints and fuelwood use on a coastal lagoon during the Antiquity, according to charcoal analysis (The Prés-Bas villa and Le Bourbou, Loupian, Hérault)

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Summary: Charcoal remains from the villa of Prés-Bas and the pottery workshop of Le Bourbou reveal that, during Antiquity, the mixed oak woodland and the alluvial plain vegetation were both exploited for fuelwood. Based on local ecology, these results illustrate the long term opposition between the northern and the southern shores of the Thau lagoon.

Key words: Roman villa, Antiquity, palaeobotany, coastal environment, effects of human activities.

INTRODUCTION

The margins of the Thau lagoon, occupied since the early Neolithic, provide abundant archaeological, palaeobotanical and palaeogeographic information. Our palaeoenvironmental study is based on charcoal analysis carried out at the roman villa of Prés-Bas. Long term coastal morphological evolution and vegetation history are used as reference to distinguish the role of physical conditions and human incentive.

A PROSPEROUS GALLO-ROMAN VILLA

The villa of Prés-Bas (Loupian, Hérault) located in the Narbonnaise, 1.2 km away from the lagoon of Thau, was occupied from 50 BC to 600 AD. Built first as a modest farm it was later transformed into a magnificent residence with mosaic floors during the 5th century the villa was transformed into a magnificent residence with mosaic floors (Bermond and Pellecuer, 1997).

CHARCOAL SAMPLING AND RESULTS

Charcoal was sampled from the domestic deposits of the villa, the praefurnium and the pottery kilns by dry sieving (4 mm mesh), to ensure the reliability of data, their palaeoenvironmental representativity and the correct identification and interpretation of the area targeted for wood collecting (Chabal, 1997). Charcoal analysis provided a large plant spectrum with 33 species, at least. The study of 4600 charcoal fragments from domestic residues sampled in the villa (Fig. 1), shows that Quercus ilex dominated woodland during all the occupation. The abundance of Olea europaea and the presence of Vitis vinifera and Juglans regia are particularly noted. Cupressus, probably introduced in France and rarely identified during the Antiquity, is present. Data from the praefurnium (300/375 AD) also reveal the use of diverse species (9 taxa/540 charcoal fragments). Quercus (deciduous), Quercus coccifera-ilex and Ulmus predominate; their frequencies vary slightly according to the 8 sampling areas. The potters from the Bourbou (3500 charcoal fragments) used 23 species, at least; fragments of Quercus coccifera-ilex and associated species predominate. Wood calibre and humidity seem important factors to take into account for this activity, while the species used seems to be of no consequence (Chabal, 2001).

DISCUSSION AND CONCLUSIONS

Quercus coccifera-ilex (certainly the holm oak) and associated species are the main components of fuelwood used both in the villa and in the pottery kilns. The wood supply must have been a well organised activity. Based on the species identified (cultivated species and plants from the alluvial plain) it appears reasonable to think that the supply area must have included the very near proximity. Inside the villa, differences between the domestic spaces and the praefurnium are observed and must be explained. Intentional choice appears as an unlikely explanation, as the three main species identified in the praefurnium are hardwoods, with similar behavior during combustion. Moreover, deciduous Quercus and Ulmus could have been the dominant species of the ancient woodlands situated close to the northern shore of the lagoon. At present, Ulmus and Fraxinus still survive further west, as residual groves on alluvial soils. Therefore, our hypothesis is that the differences observed may reflect different supply areas. Coppices of holm oak, providing
most of the fuelwood, could have been exploited on the hills behind the villa, beyond the cultivated areas, and even further away. A more reduced area of ancient woodland could have provided a separate provision of fuelwood for the praefurnium. Can we guess why? This mixed or alluvial woodland, older than the oak coppices, could have provided wood of larger calibre, more appropriate for the slow and continuous heating of the hypocaust.

The ecological connotation of this interpretation is supported by our knowledge of the long term transformations of the coastline. Some studies highlight the complex palaeogeographic evolution of the littoral area during the Holocene (Court-Picon et al., 2010). Abundant organic remains (wood, charcoal, seeds and fruits) have been recovered from the Late Bronze Age dwellings built on the shores of the lagoon, when the sea level was ~2m asl. On the southern shore, the majority of the agrarian activities and wood cutting took place in the xero-thermophilous areas of the 'lido' and Mont St-Clair. On the northern shore, two contrasting habitats are noticed: the alluvial/mesophilous areas, with deciduous Quercus, Ulmus, Fraxinus, Juglans and the drier areas colonised by Quercus ilex (Bouby et al., 1999; Chabal et al., 2010).

During the Antiquity, sea level was ca. 1.5 m higher. In the northern shore, the alluvial plain may have been partially submerged. The mesophilous forest may also have been cleared for agriculture during the Iron Age. Then, oak dominated areas may have become the main available woodlands. In mixed woodland, the exploitation of wood would quickly favour Quercus ilex over Quercus pubescens (Chabal, 1997). People living in the villa exploited the drier areas of the low hills, as well as the more humid areas/older stands. This was complemented by a more opportunistic supply (pruning of cultivated trees). Our perception of local woodlands based on fuel used during the Antiquity is in conformity with the ecology characterising the northern shore of the lagoon; it also reflects the differences noted since the Bronze Age, taking into account the rise of sea level.

REFERENCES


FIGURE 1. Charcoal analysis diagram of the villa of Prés-Bas (Loupian, Hérault).