
Soil charcoal analysis of a Mediterranean old-growth forest: historical relict or anomaly?

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Abstract

In the Mediterranean area, old-growth forests are "anomalies" subsisting in the degraded landscapes made of semi-open to open ecological systems. The history of these forests remains poorly documented so far. Indeed, most of these forests are small in size and therefore need to be investigated at local scale. This is a challenge in the Mediterranean context where suitable archives for the recording and the preservation of paleo-indicators are rare. Thus, aiming to document with suitable paleo-signals the origin and the history of old-growth forest in Mediterranean context we have done soil charcoal analysis in the Sainte Baume old-growth forest (southeast France). This forest is a remarkable forest presenting nowadays many temperate species (eg, *Fagus sylvatica*, *Taxus baccata*, etc.). Soil charcoal analyses combined with geomorphological assessment have been carried out. 17 soil profiles have been open and sampled within the forest and 5 nearby the forest. Macroscopic charcoal assemblages have been extracted. Their taxonomical spectrums show a clear distinction between the samples from the forest and from the surrounding? The charcoal assemblages from the forest are clearly dominated by temperate tree species such as *Fagus* and deciduous *Quercus*, while those from the surroundings are dominated by evergreen vegetation, with only few deciduous *Quercus*. Radiocarbon dating from selected charcoal pieces proves the ancient presence of the temperate forest, as an island in a semi-open landscape. Also, the presence of the forest is attested before becoming a holy place and being protected by the establishment of a monastery during the Middle-Age. Thus it is postulate that this forest is the subsistence of a former larger forest, which was degraded in some places, and remains at the Sainte Baume place due to specific physical condition and also thanks to its holy statute.

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