



HUMAN-RELATED FOREST FIRES IN THE SUBALPINE BELT OF THE SPANISH PYRENEES

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The subalpine belt of the Central Pyrenees ranges approximately between 1700 and 2200 m a.s.l. This area should be covered with dense forests of *Pinus sylvestris* and *P. uncinata*, with increasingly open formations towards the upper forest limit. At present, most of the subalpine belt is occupied with grasslands due to human-induced deforestation for enlarging the area occupied by summer pastures. Two are the most important scientific problems related to deforestation of the subalpine belt: (i) the timing of deforestation, and (ii) the geomorphic consequences of a sudden substitution of forests by grasslands. Up to now, intense deforestation is clearly recorded in regional palaeoenvironmental sequences since the Middle Ages and, traditionally, this practice was usually attributed to large fires with the purpose of balance the winter and summer pasture resources. Nevertheless, the presence of abundant remnants of prehistoric monuments (dolmens, cromlechs, tumulus) in the subalpine belt induced to think in a previous seasonal presence of human populations, most probably practicing some primitive type of transhumance. This would only be possible if part of the subalpine forests would be burnt to allow a limited expansion of grasslands, despite the consequences in the landscape of this kind of practices were not permanent in time. We present here new dates of fire occurrence from charcoal obtained from soils in the hillslopes and from lacustrine sediments. Two periods of human-induced fires have been identified: (i) between 2500 and 2000 cal. yr BP, and (ii) between 1100 and 900 cal yr BP. The consequences of deforestation can be easily observed in the landscape, particularly shallow landslide activity, gelifluction, solifluction and the rapid development of parallel incisions in the steepest slopes.