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Reconstructing past arboreal cover based on modern and fossil pollen data: A statistical approach for the Gredos Range (Central Spain)

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Abstract

Quantifying and reconstructing past vegetation changes is an important step to fully understand human-environment interactions in the past. In this study we present a reconstruction of arboreal cover of six study sites in the Gredos Range (central Spain) over the last 3000 years based on multivariate statistical analysis (cluster analysis and non-metric multidimensional scaling, NMDS) of 186 modern pollen samples, modern vegetation data and six detailed fossil pollen records. The integrated approach allows distinguishing eight modern vegetation communities and linking the fossil pollen records with these vegetation communities as modern analogues. The information of the arboreal cover of the modern pollen sites was used to estimate the past arboreal cover of the fossil pollen sites in the Gredos Range. This estimated arboreal cover shows a higher level of landscape openness than suggested by the original pollen percentages data. Our results show that the evolution of the arboreal cover through time differs along an altitudinal gradient, with a decrease in arboreal cover during the Roman and Visigoth periods (2000 – 1240 cal BP) at low altitudes and

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