# Unveiling Vegetation Patterns, Modern Pollen Profiles, and Environmental Influences in Sougna Mountain, Northern Morocco

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## Abstract:

This study explores the distribution of vegetation within the Sougna mountain, analyzes its contemporary pollen composition, and examines its correlations with environmental factors and land use variables. In a range spanning from 138 to 1364 m asl, a collection of 31 moss polsters was gathered across diverse landscapes, including cork oak forest, pine reforestation, and matorrals, covering wooded and open areas. At each site, data on land use and environmental variables were gathered. The vegetation within the Sougna mountain is dispersed in a mosaic pattern across three distinct vegetation belts, each exhibiting unique pollen assemblages primarily composed of the corresponding vegetation types (such as *Quercus suber* forest, matorrals of *Erica* spp. and *Cistus* spp., and *Pinus pinaster* reforestation). CCA analysis was employed to examine the variance between the variables and pollen data. Anthropogenic factors like grazing and cultivation played a significant role in distinguishing degraded and grazed areas. Moreover, elevated precipitation levels and altitude showed a positive correlation with wooded communities, thereby establishing a strong relationship with tree cover. Our findings indicate that pollen types such as *Poaceae*, *Cannabis*, *Plantago*, *Nicotiana*, *Urtica* and *Asteraceae*, are primarily associated with human activities and serve as key indicators for distinguishing degraded communities. It is crucial to exercise caution when interpreting the presence of these taxa in the pollen diagram. Employing a high taxonomic resolution is advised to avoid overestimating the presence of certain taxa. These outcomes hold the potential to significantly enhance palynological efforts aimed at reconstructing historical vegetation and land use patterns in the Sougna mountain and more broadly, in the Rif landscape.

Keywords: Pollen analysis, Moss polster, Vegetation belts, Indicator taxa.