

## **Paleopalynology as an Analysis Tool to Measure the Resilience of the Ecosystems of the Western Mediterranean and Their Adaptation to Climate Change**

**Authors :** F. Ismael Roman Moreno, Francisca Alba Sanchez

**Abstract :** Over time, the plant landscape has changed as a result of the numerous events on a global and local scale that have happened. This is the case of the Mediterranean ecosystems, one of the most complex and rich in endemisms on the planet, subjected to anthropic pressures from the beginning of civilizations. The intervention in these systems together with climate changes has led to changes in diversity, tree cover, shrub, and ultimately in the structure and functioning of these ecosystems. Paleopalynology is used as a tool for analysis of pollen and non-pollen microfossils preserved in the flooded grasslands of the Middle Atlas (Morocco). This allows reconstructing the evolution of vegetation and climate, as well as providing data and reasoning to different ecological, cultural and historical processes. Although climatic and anthropic events are well documented in Europe, they are not so well documented in North Africa, which gives added value to the study area. The results obtained serve to predict the behavior and evolution of Mediterranean mountain ecosystems during the Holocene, their response to future changes, resilience, and recovery from climatic and anthropic disturbances. In the stratigraphic series analyzed, nine major events were detected, eight of which appeared to be of climatic and anthropic origin, and one unexpected, related to volcanic activity.

**Keywords :** anthropic, Holocene, Morocco, paleopalynology, resilience

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