

# A study of pollen reconstructs the landscape of Madrid during 400,000 years

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Credit: Manzanares Valley currently/Joaquín Panera

Susana Rubio, Joaquín Panera and Alfredo Pérez González, scientists at the Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), have published a study in the journal *Quaternary International* on the changes to vegetation and climate over the last 400,000 years in the region of Madrid, a Mediterranean area subject to an important continental influence key to understanding global climate change, and especially for the Mediterranean region itself, due to its vulnerability

The study, led by the University of Alcalá de Henares, which was based on analyses of the pollen in eight sedimentary sequences associated with archaeological sites, reconstructs the paleoenvironments of the human groups that occupied the banks of the Manzanares and Jarama rivers from halfway through the Middle Pleistocene, and it brings out how the climate around Madrid has changed, as well as the high palynological variability of the zone.

Pines and other conifers have been the most characteristic elements of a landscape, together with a mesophile and/or Mediterranean forest, which has been varying with the temperature and humidity. During the second half of the Middle Pleistocene, mesophile (humid) forests predominated, while the end of that period was characterized by a cold moment marked by a retreat of the forest during which oaks and holm-oaks disappeared.

In the Upper Pleistocene, an expansion of the Mediterranean species associated to those of the coastal areas of the southern Iberian Peninsula took place. Finally, at the start of the Holocene, 10,000 years ago, the record shows a drop in the diversity of the vegetation, which might be due not so much to climatic as anthropic factors.

Up to now, there were no data from the central region of the Iberian Peninsula, which is typified by being a Mediterranean area subject to an important continental influence. The record it presents is exceptional as

there are hardly any continental records in southern Europe which furnish paleoecological information over such a wide timescale.

**More information:** Ma José Gil-García et al. Landscape evolution during the Middle and Late Pleistocene in the Madrid basin (Spain) vegetation dynamics and human activity in the Jarama-Manzanares rivers (Madrid) during the Pleistocene, *Quaternary International* (2018). [DOI: 10.1016/j.quaint.2018.02.034](https://doi.org/10.1016/j.quaint.2018.02.034)

Provided by CENIEH

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