

Decline of evergreen vegetation in the central Mediterranean regions during the 4 ka BP drought event

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Understanding the impact of climate on the development of human societies occupies a prominent place in geoarchaeological research. In this context, pollen records may prove to be a particularly effective tool to disentangle the role of climate versus human activity in landscape changes. One of the most challenging cases is the deforestation event highlighted at around 4200 cal. BP in a number of pollen records from the central Mediterranean region south of 43°N, showing a marked decline in evergreen vegetation without evidence of human activities. In our reconstruction, the onset of the deforestation traces a clear geographic pattern, proceeding with a time-transgressive trend from south-west to north-east and involving sites located in the Mediterranean vegetation belt, both in the Tyrrhenian and in the Adriatic sides of the Italian peninsula, as well as in Corsica and Sicily. This time-transgressive trend suggests that a natural phenomenon was the main factor affecting the evergreen vegetation cover. A reduction of precipitation, producing a progressive aridification from Sicily to the central Adriatic region is a reasonable hypothesis for the observed pattern. Our data suggest a general progression of a north-African high-pressure cell towards the northeast, affecting the Italian territory, but not the Balkan Peninsula, since approximately 4450 cal. BP. This condition lasted until 3800-3600 cal. BP, depending on the sites, and is coeval to a severe drought event around 4000 cal. BP, recorded over a broad longitudinal belt from Africa to China, causing the collapse of important civilizations in the Near and Middle East, as well as in China. Future challenges will be addressed both to define the effects of this climate change to the Mediterranean societies and to include this process in a wider atmospheric circulation pattern (e.g. long-term variability of both the latitudinal shift of the ITCZ and NAO index).

