Out-of-phase temperature and aridity reconstruction for the last millennium in a Mediterranean wetland.

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Principal Component Analysis for pollen data from the sediments of Las Tablas de Daimiel wetland (central Spain) shows a great resemblance with regional and local temperature reconstructions for the north hemisphere and the Mediterranean region during the last millennium.

On the other hand, aridity record derived from geochemical proxies for salinity, for the same period matches the documentary record of droughts and harvests for the last centuries.

When both records are put together, there is a time lag between these curves that evidences that, in this semiarid region, there is no clear relationship between temperature and moisture for the centennial scale.

Classic climate periods are defined then by the frequency of changes and the phase relationship between temperature and moisture. Thus, the Medieval Warm Period is characterized by warmer and drier conditions with a maxima around the 11th century AD with a time lag of less than 100 years between both signals. Then climate becomes wetter and colder but, from the 15th century AD onwards, temperature and aridity difference in phase reaches almost 200 years and changes are faster. As a result, the Little Ice Age is characterized by a sequence of cooling-wetting, cooling-drying, warming-drying and warming-wetting periods.

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