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Terrestrial climate variability and seasonality changes in the Mediterranean region between 15 000 and 4000 years BP deduced from marine pollen records

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Abstract. Pollen-based climate reconstructions were performed on two high-resolution pollen marines cores from the Alboran and Aegean Seas in order to unravel the climatic variability in the coastal settings of the Mediterranean region between 15 000 and 4000 years BP (the Lateglacial, and early to mid-Holocene). The quantitative climate reconstructions for the Alboran and Aegean Sea records focus mainly on the reconstruction of the seasonality changes (temperatures and precipitation), a crucial parameter in the Mediterranean region. This study is based on a multi-method approach comprising 3 methods: the Modern Analogues Technique (MAT), the recent Non-Metric Multidimensional Scaling/Generalized Additive Model method (NMDS/GAM) and Partial Least Squares regression (PLS). The climate signal inferred from this comparative approach confirms that cold and dry conditions prevailed in the Mediterranean region during the Oldest and Younger Dryas periods, while temperate conditions prevailed during the Bølling/Allerød and the Holocene. Our records suggest a West/East gradient of decreasing precipitation across the Mediterranean region during the cooler Late-glacial and early Holocene periods, similar to present-day conditions. Winter precipitation was highest during warm intervals and lowest during cooling phases. Several short-lived cool intervals (i.e. Older Dryas, another oscillation after this one (GI-1c2), Gerzensee/Preboreal Oscillations, 8.2 ka event, Bond events) connected to the North Atlantic climate system are documented in the Alboran and Aegean Sea records indicating that the climate oscillations associated with the successive steps of the deglaciation in the North Atlantic area occurred in both the western and eastern Mediterranean regions. This observation confirms the presence of strong climatic linkages between the North Atlantic and Mediterranean regions.

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