Paleoclimate and palynological proxies during the Holocene sea level rising and human settlements (South Sardinia, West Mediterranean Sea)

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Several sites, from the Cagliari and Oristano Gulfs and some spots distributed in central and southern Sardinia, spanning the last 10000 years, have been the subject of this updated synthesis. The time scale is in calibrated years BP. When age-models were not provided, the age is based on the pottery fragments and by comparison with other known settlements. Sedimentological and palaeontological analyses have been carried out in the filling cores of paleo-valleys that occurred during the Holocene sea level rise. This data have also been isotopically recalibrated (C14) considering different freshwater ingressions in different periods. The $\delta^{18}O$ and $\delta^{13}C$ records of a 30 m Holocene succession have returned resolution at a multi-decadal scale and have been compared in the geo-chronologic frame to the benthic foraminifer ecological associations and the rising sea level curve. The long-term isotopic variability indicate an increasing salinity of the waters between ca. 10000 to 7500 years BP followed by high precipitation with high organic influx of terrestrial origin (7500 to 3850 years BP) and by an increase of water salinity up to 200 years BP. The oldest vegetation (9654 cal. year BP) was mainly represented by a *Pinus sylvestris*/*pinaster*, Betulaceae and Ericales woodland. The climate amelioration up to about 7700 cal. years BP leads to the spread of Ericaceae and the mixed termophilous forest. Up to about 7400 cal. years BP the record displays a pollen abundance of drier, likely cold, open vegetation with chenopods and herbs; trees vegetation was restricted to the *Pinus* forest in the south and *Alnus*, *Corylus*, *Juglans Juniperus* and *Quercus* woodland in central Sardinia. Up to about 4800 cal. years BP a persistent peak in deciduous mixed *Quercus* forest spread. Then, *Pistacia* and Ericaceae schrublands, beyond phases with chenopods, herbs and graminae pollen abundance characterized the Eneolithic and Bronze ages during which the shrinking of the mixed forest, the expansion of cereal culture is attested in the archaeological contexts. A last chenopods and herbs open vegetation phase onsets at presumably the Little Ice Age in south Sardinia.