



Mild and arid climate in the eastern Sahara-Arabian Desert during the late Little Ice Age inferred from a northern Red Sea coral record

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The climate of the Sahara and Arabian deserts during the Little Ice Age is not well known, due to a lack of annually resolved natural and documentary archives. The Little Ice Age (~1450-1850) was characterized by generally cold conditions in many regions of the globe with little similarities regarding the hydroclimate. We present an annual reconstruction of temperature and aridity derived from Sr/Ca and oxygen isotopes in a coral of the desert-surrounded northern Red Sea. Our data indicate that the eastern Sahara and Arabian Desert did not experience pronounced cooling during the late Little Ice Age (~1750-1850), but suggest an even more arid climate than today. The mild temperatures are broadly in line with predominantly negative phases of the North Atlantic Oscillation during the Little Ice Age. The extreme aridity is best explained by meridional advection of dry continental air from Eurasia. We find evidence for an abrupt termination of the extreme aridity after 1850, coincident with a reorganization of the atmospheric circulation over Europe. Climate models fail to reproduce this abrupt change in regional aridity. This study highlights the need for temperature and aridity reconstructions from the global deserts to detect the full range of climate change over the Common Era.