Mid-Holocene SST records from coralline Sr/Ca ratios in the northern South China Sea

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Sr/Ca ratios of three *Porites lutea* corals from Sanya in the northern South China Sea (SCS) with ages of 6271±29 aB.P., 6342±19 aB.P. and 6494±24 aB.P., respectively provide three high-resolution SST records standing for 35-45 years, respectively during the Mid-Holocene.

The results indicate warmer climate in the periods from ca 6200 aB.P. to ca 6500 aB.P. than the modern time. The averages of the minimum winter monthly SSTs were about 0.5°C to 1.3°C higher than the instrument measured SSTs during 1970-1994 AD, 0°C to 2.0°C higher for the averages of maximum summer monthly SSTs, and 0.2°C to 1.5°C higher for the averages of annual SSTs. There exists a decreasing trend of summer monthly SSTs from 32.1°C at ~6500 aB.P. to 30.6°C at ~6200 aB.P. with minimum summer SSTs centering at ~6300 aB.P., about 30.5°C. This corresponds to strong summer monsoon and secular decreases of its strength during the Mid-Holocene in the northern SCS, which was closely related to the variations of summer solar insolation in north hemisphere.

The variability of the Middle Holocene coralline SSTs and the modern instrument measured SSTs shows ENSO cycles. However, the ENSO variability in the Middle Holocene SSTs was weaker than the modern records, and the SST records with the highest summer temperatures from ca. 6460 aB.P. to 6494 aB.P. exhibited no significant ENSO cycles. This probably indicates the suppression of ENSO variability by stronger summer monsoon during the Middle Holocene.