

Evidence of extreme Seasonality during Albian and Maastrichtian period at 30°S latitude deduced clumped isotope analyses in mollusc growth band

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The Cretaceous period (Albian and Maastrichtian time) witnessed warm climate scenario. Important of this study is to document variation of sea surface temperatures and salinity at seasonal time scale during Cretaceous. A combined usage of clumped isotope thermometry [1, 2] and $\delta^{18}\text{O}$ of carbonate in the intra-shell growth bands of Oyster shell allowed understanding the temperature and salinity condition during their growth. Here we present seasonal variations of temperature and salinity during Albian to early Maastrichtian time, estimated from analysing growth bands of *gryphaea* sp. from Ariyalur formation of Cauvery basin deposited at the palaeo-latitudinal position of 30°S [3]. In the progressive growth bands, we find maximum temperatures (approximately 46 degrees C) during relatively high salinity condition while the temperatures approaches minimum (15 degrees C) at low salinity values. The minimum temperature observed in the growth bands matches the winter time temperature in the modern day ocean at the same latitude; however the summer time temperature exceeds by 15°C. The salinity condition during the warmer and cooler episodes far exceeds the modern day observation. Such a large seasonal variability in salinity implies intense evaporative process together with hydrothermal fluid escape during warm (summer) period and precipitation driven fresh water discharge during cold (winter) period.

[1] Ghosh *et al* (2006) GCA, **70**, 1439. [2] Henkes *et al* (2013) GCA **106** (2013) 307 [3] Krishnan Ayyasami, (2006) Geosciences Journal, **10** (3) 237