

# **Biotic response of Tethyan bathyal ostracodes through the Eocene-Oligocene Transition from the Massignano Composite Stratotype Section (east central Italy)**

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## **ABSTRACT**

The Eocene-Oligocene Transition (EOT) is marked by a double-stepped  $\sim 1.3\text{‰}$  positive excursion in  $d^{18}\text{O}$  over an  $\sim 300$  kyr interval (i.e., Oi-1; Miller et al., 1991; Zachos et al., 1996; Coxall et al., 2005) and a deepening of the calcium compensation depth (CCD) interpreted to represent marked Antarctic glaciation and global ocean-atmosphere cooling. A  $\sim 0.5$  m ( $\sim 55$ -70 kyr) resolution ostracode faunal study of the Massicore, drilled adjacent to and up-section from the Italian Massignano quarry stratotype section that contains the Eocene-Oligocene GSSP (i.e., base of the Priabonian stage), revealed two transient increases in *Krithe* and decreases in faunal evenness, enthalpy,  $e^H$ , and Simpson's Index that lag two surface water cooling pulses based on a dinocyst-based sea surface temperature (DSST) proxy (van Mourik et al., in prep). These transient ostracode faunal changes may reflect changing physico-chemical water properties, increased sedimentation rates, variable food availability in the benthos, and/or intensifying thermohaline circulation from the Indian or Atlantic Ocean through the paleotethyan seaway. Ordination and cluster analyses also show minor faunal differences during times of relatively cold and warm surface waters based on the DSST proxy. Comparisons made between these Massicore ostracode data and re-analyzed Massignano Quarry ostracode data from Dall'Antonia et al. (2003) revealed major similarities (i.e., similar relative abundances among common taxa where both studies overlap) making it practical for us to combine both records in order to provide a more complete Tethyan ostracode record through the broader EOT and spanning Oi-1 at the stratotype locality.