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PALEOENVIRONMENTAL INTERPRETATION OF TURRITELLINE GASTROPOD-DOMINATED ASSEMBLAGES (TDAS) FROM THE LA MESETA FORMATION (MIDDLE TO UPPER EOCENE), SEYMOUR ISLAND, ANTARCTICA

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Turritelline gastropods (*sensu* Marwick, 1957) are common components of many benthic marine assemblages of the Late Jurassic to Recent age worldwide. This study focuses on turritelline-dominated assemblages (TDAs), (defined as “macrofaunal assemblages in which turritelline gastropods 1) comprise either at least 20% of the total actual or estimated biomass or at least 20% of the macroscopic individuals in the assemblage, and 2) are at least twice as abundant as any other macroscopic species in the assemblage”) from the middle to late Eocene La Meseta Formation on Seymour Island, Antarctica. Understanding of the paleoenvironmental and taphonomic processes that lead to their formation can provide insights into the conditions of the Antarctic Peninsula in the Eocene.

Two turritelline species, *Colposigma euthenia* and *Colposigma capitanea*, are present in the La Meseta, and *C. euthenia* forms TDAs. Paleoenvironmental and taphonomic interpretations were based on abundance, orientation and sediment characteristics. Environmental conditions favored by each species were based on stable isotope sclerochronology.

Stable isotope sclerochronology indicates that *C. euthenia* lived for less than one year, while *C. capitanea* had a lifespan of around three years. *C. capitanea* is always lighter in oxygen isotopic fractionation, with the heaviest observed *C. capitanea* value (0.56 ‰) being lighter than the lightest observed *C. euthenia* value (0.94 ‰). Short-term eustatic sea level varied between 140 m to 210 m over the La Meseta, and TDAs occur in horizons where eustatic sea level was close to 200 m.

Our analysis suggests that *C. euthenia* may have been a relatively deep-water species with an r-selected life habit. In the context of the La Meseta Formation, TDAs are indicative of an increasingly unimodal current upsection, and minor, short term increases in eustatic sea level. Early in the La Meseta, warm sea surface temperatures contributed to high invertebrate and vertebrate species diversity, but then gave way to regionally cooler temperatures following the opening of the Drake Passage. The accompanying increase in productivity, potentially reflected in the latest TDAs examined here, may have contributed to CO2 drawdown and led to the global cooling and subsequent glaciation of Antarctica at the Eocene-Oligocene Boundary.

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T118. Paleoenvironmental Reconstructions from Biogenic Carbonates I
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