Turritellid gastropods (family Turritellidae) are common components of many benthic marine assemblages of Late Jurassic to Recent age worldwide. This study focuses on turritellid-dominated assemblages (TDAs) from the La Meseta Formation on Seymour Island from the middle to late Eocene of Antarctica. TDAs are defined as "macrofaunal assemblages in which turritellids 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". By gaining a better understanding of the paleoenvironment and taphonomic processes leading to their formation we can gain insight into the conditions in Antarctic during the Eocene, as well as the conditions which may lead to TDA formation generally.

TDAs occur in six of the seven Telms (horizons) of the La Meseta Formation. Some horizons contain monotypic concentrations of turritellids with no other taxa observed. Two species of turritellids, Colposigma euthenia and C. capitanea, are present, with TDAs primarily composed of C. euthenia. This study examined abundance, shell thickness, and drilling frequency of each turritellid species. Abundance data were also compared with proxies for marine shelf productivity and Eocene cooling trends.

Preliminary results suggest that the abundance of turritellids and vertebrates at higher trophic levels may be correlated. Case (1992) found high shark and penguin diversity and abundance in Telm 5, and high diversity of penguins in Telm 7 and suggested that these Telms should also exhibit high abundances of taxa at lower trophic levels. In this study, Telms 2, 3, 5 and 6/7 have high abundances of turritellids (4.6 shells/cm², 2.9 shells/cm², 127 specimens, and 5.4 shells/cm² respectively). Some of the samples co-occur with bivalves, where turritellids account for almost over 90% of the individuals. Drilling frequency in C. euthenia samples ranges from 0% to 5.9%, and in C. capitanea samples, from 0% to 11.5%. Ivany et al. (2008) reported roughly 10°C cooling from the early Eocene climatic optimum to the end of the Eocene which was controlled by both coastal upwelling and global cooling. Our comparison of shark and penguin data with the TDAs suggests upwelling conditions may have begun by the Middle Eocene.

Authors

Tasnuva Ming Khan
Cornell University

Brendan M. Anderson
Cornell University

Warren Allmon
Paleontological Research Institution

Jeffrey D Stilwell
Monash University

Final Paper Number 190-5
View Related Events
Day: Tuesday, 24 October 2017