

Community-Level Paleocology Study of the Imperial Formation in the Coyote Mountains of Imperial County, California

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Community-level studies of marine ecosystems tend to emphasize or assume that depth of the water column was a primary physical force in the development of paleocommunities. In this study area, communities dominated by oysters and corals are proximal to one other and show only slight lithological differences. Lateral variation observed over a small area (~0.32 km²) of exposed Imperial Formation, suggests that changes in depth, temperature, and salinity may not be the primary driving force. The Imperial Formation is a poorly lithified sandstone and conglomerate, representing a shallow marine environment, of late Miocene/early Pliocene age. Specimens for this study were collected in situ from the basal ~8.5 m of the Imperial Formation at Alverson and Fossil Canyons in the Coyote Mountains. Multiple samples were collected from each bed to evaluate lateral variation. Abundant and diverse fossil material, mainly in the form of molds and casts, permits a community-level study. All taxa, except for echinoids and corals, were identified to the generic level. Bivalves and gastropods were the most common species.

Cluster analyses of presence/absence and abundance data matrices comprising 34 taxa and 17 samples were conducted using correlation, relative Sorensen, and Sorensen grouping methods. These methods calculate relationship distances between taxa and samples based on mutual similarities. Preliminary results suggest that clustering patterns may not be driven by depth or stratigraphic relationship. The lateral variation may be a result of the organism's preferences and interaction with the substrate, but further analysis is required.