LATE PENNSYLVANIAN (VIRGILIAN) MARINE INVERTEBRATE ASSEMBLAGES IN THE HOLDER FORMATION, DRY CANYON, SACRAMENTO MOUNTAINS, NEW MEXICO

Barry S. Kues

Dept. of Earth & Planetary Sciences, MSCO3 2040, University of New Mexico, Albuquerque, NM, 87131-0001

The Holder Formation along Dry Canyon consists mainly of a 75 m-thick cyclic sequence of Virgilian marine siliciclastics, marine carbonates, and alluvial siliciclastics above a large basal algal bioherm complex (Yucca mound), deposited on a narrow shelf just west of the shoreline of the Pedernal land mass. Holder marine invertebrates have been little studied; here two quite different marine assemblages from road cuts in the upper part of the Holder, around Milepost 5 of US-82, are summarized. The first assemblage is from a 1-m-thick interval of dark gray calcareous mudstone within a regressive sequence about 45 m above the top of the bioherm. This assemblage is dominated by gastropods (18 species, of which Retispira espinasa, 42%, Taosia crenulata, 17%, Colpites monilifera, 13%, Hypselentoma perhumerosa, 9%, and Goniasma lasallensis, 7%, are most abundant), and bivalves (9 species; Polidevicia arata, 56%, cf. Sedgwickia topekaensis, 25%, and Myalinella sp., 11%, most abundant), with rare brachiopods (Linoproductus) and nautiloid cephalopods (Metacoceras, Pseudorthoceras). Three of the five most common gastropods are also present in the overlying Laborcita Formation, but H. perhumerosa and the bivalve cf. Sedgwickia topekaensis have not previously been reported from New Mexico. The absence of most stenohaline marine groups (crinoids, bryozoans, corals, fusulinids) and low taxonomic diversity of this assemblage suggest abnormal marine conditions.

The second assemblage, from 15-20 m above the first, at the top of the road cut, is from interbedded dark gray shale and thin-bedded limestone. It includes gastropods (42 species), bivalves (19 species), brachiopods (22 species), as well as cephalopods, scaphopods, solitary rugose corals, bryozoans, crinoids, echinoids, trilobites, ostracods, fish teeth, and fusulinids. The most common gastropods are Euphemites sp. (18%), Donaldina stevensana (14%), Amphiscapha subrugosa (9%), Glabrocingulum (Ananias) spp. (8%), Retispira tenuilineata (6%), Strobeus spp. (6%), and Hypergonia n. sp. (5%). Bivalves are dominated by fragments of Myalina (Orthomyalina) subquadrata (41%), followed by Nuculopsis spp. (19%), Edmondia (10%), and Permophorus (8%). The most abundant brachiopods are Crurithyris planoconvexa (54%), Neochonetes granulifer (16%), Kutorginella aff. lasallensis (12%), Composita subtilita (5%), and Neospirifer cf. dunbari (4%). The productoid Kutorginella has not previously been reported from New Mexico. High taxonomic diversity, abundant stenohaline groups, large numbers of molluscs, and dominantly dark gray shale substrate indicates that the fauna of the second assemblage lived in a nearshore, quiet, normal marine environment characterized by moderate influx of fine-grained siliciclastics. Many of the species in these Holder assemblages are known from Virgilian strata elsewhere in New Mexico, but the taxonomic composition and relative abundances of taxa in the two assemblages are distinctive.


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