

## Drilling predation on Permian brachiopods and bivalves from the Glass Mountains, west Texas

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Although bored invertebrates have been described from every period of the Paleozoic, little information on the frequency and nature of Late Paleozoic drill holes exists. Our examination of the Permian silicified fossils, which were bulk collected by G.A. Cooper from the Glass Mountains of west Texas, revealed numerous drilled brachiopods and bivalve mollusks. Drill holes are perpendicular to the shell, smooth sided, sometimes beveled, and have other characteristics consistent with a predatory/parasitic origin. The frequency of drilling is significantly lower ( $p < 0.05$ ) for brachiopods (1.07%,  $n = 7597$ ) than for bivalves (7.43%,  $n = 619$ ). This study confirms that drilling predators and/or parasites were present in the Late Paleozoic. However, the drilling frequencies reported here—rarely exceeding 5%—are much lower than those reported for the Late Mesozoic and Cenozoic, which typically exceed 20%. The low Late Paleozoic frequencies are consistent with a majority of estimates reported previously for the older periods of the Paleozoic and suggest that the intensity of drilling predation/parasitism in marine benthic ecosystems remained low throughout the Paleozoic and did not increase until some time in the Mesozoic. Our data suggest that prey/host types with a higher nutritional return (bivalve mollusks) may have been preferentially selected for attack by predator(s)/parasites(s) already in the Permian.

**Key words:** Drilling predation, drilling parasitism, Paleozoic, brachiopods, bivalve mollusks, Texas.

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