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Predatory scars in the shells of a Recent lingulid brachiopod: Paleontological and ecological implications

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The paper presents the detailed quantitative study of predatory scars in the shells of an inarticulate brachiopod: the lingulid Glottidia palmeri Dall, 1870. The scars include four morphological types: u-shaped, pocket, crack, and miscellaneous scars. They concentrate and open up toward the anterior shell edge. They commonly consist of a pair of scars on the opposite valves. The analysis of 820 specimens live-collected from two intertidal localities in the northern Gulf of California indicates that (1) 23.4% specimens bear repair scars; (2) the scars vary in size from 1.5 to 24 mm2 (mean = 2.5 mm2) and all scar types have similar size-frequency distributions; (3) the spatial distribution of scars on the shell is non-random; (4) the anterior-posterior distribution of scars is strongly multimodal and suggests seasonal predation in the late fall and winter months; and (5) the frequency of scarred specimens increases with brachiopod size and differs between the two sampled localities, but does not vary among brachiopod patches from the same locality. The repair scars record unsuccessful attacks by epifaunal intertidal predators with a scissors-type weapon (birds or crabs). The high frequency of attacks, seasonal winter predation, and previous ecological research suggest that scars were made by wintering shorebirds (willets or/and curlews). However, crabs cannot be entirely excluded as a possible predator. Because repair scars represent unsuccessful predation, many of the quantitative interpretations are ambiguous. Nevertheless, the study suggests the existence of strong seasonal interactions between inarticulate brachiopods and their predators. Because shorebirds, crabs, and lingulids may have co-existed in intertidal ecosystems since the late Mesozoic, predatory scars in lingulid shells may have potentially a 100 million year long fossil record.

Key words: predation, lingulids, brachiopods, Glottidia palmeri, shorebirds, Recent, Baja California.

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