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Intensities of drilling predation of molluscan assemblages in intertidal and subtidal soft substrates in the Persian (Arabian) Gulf

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Intensities of drilling predation of molluscan assemblages in intertidal and subtidal soft substrates in the Persian (Arabian) Gulf

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Trace fossils left by predators in the skeleton of their prey are arguably one of the most powerful sources of direct data on predator-prey interactions available in the fossil record. Drill holes, especially those attributed to naticid and muricid gastropods, are unambiguous marks of predation and allow discriminating between successful and unsuccessful predation attempts (complete and incomplete holes, respectively).
Latitude and water depth influence drilling frequency. We inspected death assemblages of an intertidal flat and of two subtidal (water depth between 6 and 20 m) sandy sites in the Persian (Arabian) Gulf, off the coast of the United Arab Emirates, to determine the patterns of predation on shelled molluscs along the depth gradient. The study is based on ∼7,000 and ∼60,000 shells from the intertidal and subtidal, respectively. Drilling Frequency (DF, the number of drilled individuals), Incomplete Drilling Frequency (IDF, number of incomplete drill holes), and Prey Effectiveness (ratio between the number of incomplete drill holes and the total number of drilling attempts) were used as metrics of drilling intensity.
We observed major differences between the intertidal and subtidal study areas. Drilling frequencies were generally remarkably low and intertidal flats showed a much lower drilling frequency than the subtidal (1.4% and 6.7%, respectively). In the subtidal, we observed significant differences of drilling intensity among bivalve species and between the two sites. However, predation metrics did not correlate with environmental factors such as substrate type and depth, nor with species life habits such as infaunal vs. epifaunal and death assemblage indices such as diversity, abundance and evenness. The abundance of naticid and muricid predators in the living and death assemblage also did not correlate with predation intensities, with the single exception of muricid abundance in the LA at one of the two subtidal sites.
The study shows that bivalve predation intensity in the studied area is highly variable among prey species and depth zones (intertidal vs subtidal), but poorly dependant upon other environmental and community structure factors. Results for gastropods are currently being analysed.