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ABSTRACT VOLUME

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BIOTURBATION, HABITAT PARTITIONING, AND TIERING IN TROPICAL INTERTIDAL CALLIANASSID MOUNDS: AN EXAMPLE FROM THE BAHAMAS

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Bioturbation and mounded topography generated by callianassid shrimp is pervasive in modern tropical, shallow subtidal to intertidal, sandy carbonate substrates of the wider Caribbean region and beyond. Callianassids are active substrate-surface engineers, powerful bioturbators, and the dominant animals of the deep-tier endobenthos. In the Bahamas, extensive tidal flats with distinctive mound and funnel topography created by the callianassid *Glypturus aceanthoehirus* are common along the margins of lagoons or "creeks." With time, these callianassid mounds commonly coalesce to form composite mound surfaces that become stabilized with the development of thin microbial mats. This sets the stage for shallow-tier burrowers to colonize and partition these surfaces.

In Pigeon Creek on San Salvador Island, at least three species of burrowers commonly inhabit these stabilized mound surfaces: the upogebiid shrimp *Upogebia vasquezi* and the fiddler crabs *Uca major* and *Uca* spp. (Fig. 1). *U. vasquezi* burrows are distinctive, unusual, and complex. A remarkably thick and cohesive, externally pelleted lining encapsulates two U-shaped, interlocking but unconnected burrows that penetrate 10-15 cm into the substrate. Each burrow system contains a male and female pair. The burrows of *U. major* are unlined, have diameters of 2-5 cm, and extend obliquely into the mound substrate, following a gently meandering, somewhat irregular course for distances of up to 50 cm. These burrows end with a bulbous turnaround. *Uca* spp. burrows are similar in form to those of *U. major* but are much shorter in extent and smaller in diameter, typically about 1 cm. Partitioning of callianassid mound surfaces by *U. vasquezi*, *U. major*, and *Uca* spp. burrows is in a ratio of about 5:1:4.5/m² (Curran and Martín 2003).

Callianassid-mounded substrates with trace fossils formed by *Glypturus aceanthoehirus* and *Upogebia vasquezi* have been recognized on San Salvador Island in a lagoonal facies of the late Pleistocene Grotto Beach Formation, with the top of this facies representing sea-level stillstand and initial regression at the end of the Last Interglacial. These trace fossils may prove
useful as both paleoenvironmental and sea-level position indicators in the Bahamas and other geologically similar areas.

References

Fig. 1. Generalized profile across the Pigeon Creek sand flat showing the intertidal zones and occurrence of the dominant shallow-tier burrows in coalesced mounds generated by the deep-burrowing callianassid Glypturus acanthochirus. The sand flat is exposed at low tide for a distance of about 180 m from the edge of the red mangroves.