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Persistent domoic acid in marine sediments and benthic infauna along the coast of Southern California

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Abstract

Blooms of the diatom genus *Pseudo-nitzschia* occur annually in the Southern California Bight (SCB), and domoic acid (DA) associated with these events can contaminate fisheries, presenting both human and wildlife health risks. Recent studies have suggested that marine sediments may act as a reservoir for DA, extending the risk of food web contamination long after water column blooms have ended. In this study, we conducted a regional assessment of the extent and magnitude of DA in the benthic environment, and monthly observations of sediments and benthic infauna at multiple stations over a 16-month period. DA was widespread in continental shelf sediments of the SCB. The toxin was detected in 54% of all shelf habitats sampled. Detectable concentrations ranged from 0.11 ng/g to 1.36 ng/g. DA was consistently detected in benthic infauna tissues over the monthly timeseries, while the DA concentrations in sediments during the same period were commonly below detection or at low concentrations. The presence of DA in the benthic environment did not always have an apparent water column source, raising the possibility of lateral transport, retention/preservation in sediments or undetected blooms in subsurface waters. In most cases, DA was detected in tissues but not in the co-located surface sediments. Coarse taxonomic sorting of the infauna revealed that the accumulation of DA varied among taxa. We observed that DA was widespread among lower trophic level organisms in this study, potentially acting as a persistent source of DA to higher trophic levels in the benthos.

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