DOMOIC ACID IN THE BENTHIC FOOD WEB

OF

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ABSTRACT

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Phytoplankton that have flocculated and settled to the sea floor are an important potential food source for benthic communities. If the flocculate is composed of harmful algal bloom (HAB) species like *Pseudo-nitzschia australis*, a producer of domoic acid (DA), the flocculate could represent an important source of phycotoxins to benthic food webs. Here we test the hypothesis that DA contaminates benthic organisms during local blooms of *P. australis* ($\geq 10^4$ cells L^{-1}). To test for trophic transfer and uptake of DA into the benthic food web we sampled eight benthic species comprising four feeding types: filter feeders (*Emerita analoga* and *Urechis caupo*); a predator (*Citharicthys sordidus*); scavengers (*Nassarius fossatus* and *Pagurus samuelis*); and deposit feeders (*Callianassa californiensis*, *Dendraster excentricus*, and *Olivella biplicata*). Sampling occurred before, during, and after blooms of *P. australis*, in Monterey Bay, CA during 2000 and 2001. Domoic acid was detected in all eight benthic species, with DA contamination persisting over variable time scales. Maximum DA levels in *N. fossatus* (673 ppm), *E. analoga* (278 ppm), *C. sordidus* (514 ppm), *C. californiensis* (144 ppm), *P. samuelis* (55 ppm), *D. excentricus* (13 ppm), and *O. biplicata* (2 ppm) coincided with *P. australis* blooms. For five of the species, these concentrations exceeded levels thought to be safe for consumers (i.e. safe for humans: < 20 ppm). These high concentrations of DA are thus likely to have deleterious effects on higher-level consumers (marine birds, sea lions, and the endangered California Sea Otter) known to prey upon these benthic species.