IS MACROALGAL ACCUMULATION A RELIABLE INDICATOR OF INFAUNAL STRESS IN AN OREGON ESTUARY?

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Abstract

A frequently used indicator of estuarine condition is the accumulation of benthic macroalgae. We compared the biomass of the predominant green macroalgae *Ulva*, the development of toxic sulfides in surficial sediment pore water, and the abundances of infaunal organisms at high and low sulfide sites in Yaquina estuary, Oregon. At the high-sulfide site the median pore water sulfide concentration in the upper intertidal zone between September and November was 80 µM, three orders of magnitude above that at the low-sulfide site (0.1 µM) and four times the median LC_{50} reported for crustaceans and mollusks (~20 µM). This suggests that toxic concentrations of dissolved sulfides occurred only at the high-sulfide site, in late summer and early fall. Infaunal amphipod counts at this site were 17-fold lower than at the low-sulfide site, and substantially lower burrow densities of benthic shrimp at the high-sulfide site also were observed. In contrast, average values for macroalgal accumulation at the high- and low-sulfide sites in the peak season agreed within about a factor of two (225 and 120 gdw m^{-2}, respectively), and were not significantly different. These results suggest that macroalgal biomass alone is not a reliable indicator of benthic condition in Pacific Northwest coastal estuaries.

Keywords: macroalgae, porewater sulfides, infauna