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Pollutant Flow Through Marine Food Webs

Alan J. Mearns and David R. Young

[1]*Southern California Coastal Waters Research Project, El Segundo, CA*

ABSTRACT

Documenting pollutant pathways is cited as one of the most important reasons for conducting fish food habits studies. Indeed, in some ecosystems, there are strong relationships between what an organisms eats and the concentrations of some contaminants in an organism's tissues (such as for DDT and for many substances in laboratory experiments). However, during the past decade the results of numerous chemical analysis of biota in both contaminated and uncontaminated coastal ecosystems show that bioaccumulation through marine food changes may be an exception rather than a rule, especially for trace metals. The reasons for this are poorly understood. It is possible that some metals, such as chromium, are discharged in insoluble biologically inactive forms and thus cannot enter the food web (Mearns and Young, 1977). Other organic materials such as chlorinated benzenes are apparently so volatile that they also do not enter the food web (Young and Heesen, 1978). Others, such as polycyclic aromatic hydrocarbons, polychlorinated biphenyls (PCBs) and DDT isomers do enter food webs and may be transferred, concentrated, or metabolized. Finally, it may be that, unlike terrestrial and freshwater systems, ocean food webs are so complex that that averaging of pollutant concentrations across trophic levels becomes a distinct possibility (Isaacs, 1972, 1973, and 1976).

Faced with these uncertainties, how can we determine the importance of food habits studies in documenting or forecasting pollutant flow in marine food webs?