# AN EXAMINATION OF SOME CHLORINATED PESTICIDE RESIDUES IN THE WATER, SEDIMENT AND SELECTED BIOTA IN THE ALA WAI CANAL, OAHU, HAWAII

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## SUMMARY

This study has been concerned with several aspects of pesticide contamination in the Ala Wai Canal. Two species of fish, *Elops hawaiensis* and *Chanos chanos*, were examined as indicators of pesticide pollution in the canal. It was found that the average concentration of DDT residues for both species was below the arbitrary limit set by the Food and Drug Administration. On an individual basis, however, several fish surpassed these limits for DDT, including metabolites.

The average dieldrin values for the muscle tissue in *Elops* were observed to be approximately a third of the FDA limit, while a number of individual fish exceeded this amount. The average dieldrin concentration in the *Chanos* has been observed to border on tolerance limits in edible fish.

Intraspecies examination of the *Elops* and *Chanos* indicates that each specie accumulated the contaminants to differing degrees in each tissue. To account for this differential accumulation, lipid analyses were conducted. These results contributed no substantive evidence, however, that affinity for the lipid fraction was the cause for the accumulation. Interspecies comparisons have revealed that the brain and muscle tissues of the *Chanos* contained the higher amount of pesticides. The opposite was observed for the liver tissue. It has also been apparent from interspecies comparisons that the metabolite/DDT ratio is twice as high in the *Elops* as in the *Chanos*. This may be related to the higher position of the *Elops* on the food chain.

A second aspect of this study has dealt with the relative amounts of pesticides in the canal and in the two streams which ultimately enter into the canal. It has appeared that a major source of residue contamination was from the Manoa-Palolo Drainage Canal. Of the two streams, a slight trend towards Manoa Valley as the larger contributant was observed. Termite and other insect control in this area is known to be widely used, thus accounting for this difference.

The final section of this thesis has dealt with the organisms, water and sediment values in total. The degree of concentration of residues from the water to the fish has been quite apparent. The degree to which the ratio of derivatives of DDT to the parent compound has increased implies that they were formed via internal metabolism of the organism and passed on to the next higher level in the food web.

A survey of chlorinated pesticide residues present in the Ala Wai Canal has been conducted. DDE, DDD, DDT and dieldrin were the predominant pesticides observed in all samples examined.