

Introduction

The objective of the 14th ASTM Symposium on Aquatic Toxicology and Risk Assessment was to provide aquatic toxicologists a forum to share new ideas, to demonstrate the application of old ideas, and to challenge current dogma. To this end, we organized ten sessions that ranged from the specific (Organ System Toxicology and Biomarkers) to the more general (Risk Assessment and Complex Mixtures).

The symposium was initiated with a panel discussion on "The Animal Welfare Act: Implications and Predictions in Lower Vertebrate Research." This timely subject was presented from the viewpoint of academia, industry, and governmental regulatory and funding agencies. All agreed that now is the time to become involved in this issue in order to influence future regulations.

Traditional environmental effects testing have endpoints that assess real-time exposure-related effects or responses. The session on Biomarkers presented methods/examples that provide an indication of previous and/or current pollutant or stressor exposure. In the session of Organ System Toxicology the contributors explored the basic physiological processes of specific target organs and argue that an understanding of these processes are basic to understanding the mechanism of toxic action of specific chemicals. The use of fish to assess the potential carcinogenicity of xenobiotics was the focus of the Carcinogenesis session. Topics ranged from the complexities of carcinogenesis in the fish liver to the description and validation of fish carcinogenicity models.

As regulatory agencies begin to include biological assessments in an effort to meet the objectives of several environmental laws, biomonitoring is becoming more prevalent. Several sessions addressed the methods and strategies for biomonitoring point sources as well as monitoring to assess the effectiveness of bioremediation strategies. The sessions on Toxicity Evaluation and Toxicant Reduction Strategies included topics that focused on the utility and limitations of current test methods, the use of a toxicity index for data extrapolation, the utility of specific species for aquatic testing, and factors that may effect interpretation of the results. The concern about the toxicity of contaminated sediments was addressed in a series of presentations in the session on Sediment Toxicity Assessment. Both bioaccumulation and toxicity assessment strategies were presented along with considerations of intrinsic characteristics of the sediment that may influence the interpretation of test results.

The ability to interpret results of toxicity evaluations of matrices that may contain several toxic constituents was addressed in the session covering Complex Mixtures. Topics included the examination of joint toxicity models, intrinsic water quality factors that may confound interpretation of results and methods to identify toxic constituents.

The need for greater sophistication in assessing bioconcentration potential of specific chemicals was the focus of the session on Bioconcentration. Presentations addressed aspects of bioconcentration from experimental design to modeling and data interpretation. The importance of physiological parameters and the need for greater understanding of fish physiology was emphasized. The session on Risk Assessment provided a forum for discussion of methodologies to address the overall risk of contaminants to aquatic and terrestrial populations and communities. Risk Assessment integrates information from each of the areas presented above. Finally, the volume concludes with five papers on General Topics.

This volume marks the end of a series of ASTM symposia dedicated specifically to Aquatic Toxicology. The science has evolved rapidly over the past 14 years, from a descriptive discipline towards an increasingly predictive science. Today, environmental scientists need to address a broader range of environmental issues, many of which raise questions that encompass several environmental disciplines. Consequently, scientists with such diverse backgrounds as geophysics, microbiology, aquatic toxicology, avian toxicology, and environmental chemistry must interact in order to adequately address environmental issues from a holistic perspective. Future ASTM symposia will provide the forum in which methods, ideas, and experiences addressing this holistic approach can be presented.

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