

Community Toxicity Testing

JOHN CAIRNS, Jr.
editor

 STP 920

COMMUNITY TOXICITY TESTING

A symposium
sponsored by ASTM
Committee D-19
on Water
Colorado Springs, Colo., 6–7 May 1985

ASTM SPECIAL TECHNICAL PUBLICATION 920
John Cairns, Jr., Virginia Polytechnic Institute
& State University, editor

ASTM Publication Code Number (PCN)
04-920000-16



1916 Race Street, Philadelphia, Pa. 19103

Library of Congress Cataloging-in-Publication Data

Community toxicity testing.

(ASTM special technical publication; 920)

Includes bibliographies and indexes.

“ASTM publication code number (PCN) 04-920000-16.”

1. Toxicity testing—Congresses. 2. Biotic communities—Toxicology—Congresses. 3. Pollution—Environmental aspects—Congresses. I. Cairns, John, 1923— . II. American Society for Testing and Materials. Committee D-19 on Water. III. Series. RA1199.C645 1986 574.5'222 86-20568
ISBN 0-8031-0488-X

Copyright © by AMERICAN SOCIETY FOR TESTING AND MATERIALS 1986
Library of Congress Catalog Card Number: 86-20568

NOTE

The Society is not responsible, as a body,
for the statements and opinions
advanced in this publication.

Foreword

The ASTM Symposium on Community Toxicity Testing, sponsored by Committee D-19 on Water, was held in Colorado Springs, Colorado, on 6–7 May 1985. John Cairns, Jr., Virginia Polytechnic Institute & State University, served as symposium chairman and has edited this publication.

Related ASTM Publications

Validation and Predictability of Laboratory Methods for Assessing the Fate and Effects of Contaminants in Aquatic Ecosystems, STP 865 (1985), 04-865000-16

Aquatic Toxicology and Hazard Assessment (Seventh Symposium), STP 854 (1985), 04-854000-16

Ecological Assessment of Macrophyton: Collection, Use and Meaning of Data, STP 843 (1984), 04-843000-16

Aquatic Toxicology and Hazard Assessment (Sixth Symposium), STP 802 (1983), 04-802000-16

Estimating the Hazard of Chemical Substances to Aquatic Life, STP 657 (1978), 04-657000-16

A Note of Appreciation to Reviewers

The quality of the papers that appear in this publication reflects not only the obvious efforts of the authors but also the unheralded, though essential, work of the reviewers. On behalf of ASTM we acknowledge with appreciation their dedication to high professional standards and their sacrifice of time and effort.

ASTM Committee on Publications

ASTM Editorial Staff

Allan S. Kleinberg
Janet R. Schroeder
Kathleen A. Greene
Bill Benzing

Contents

Overview	1
Evaluation of the Use of Community Similarity Techniques As Applied to Phytoplankton Communities—D. C. REINKE	6
Discussion	16
Some Methods for Measuring Effects of Toxicants on Laboratory- and Field-Colonized Estuarine Benthic Communities—	
M. E. TAGATZ	18
Discussion	29
Comparison of Estimates of Hazard Derived at Three Levels of Complexity—B. R. NIEDERLEHNER, J. R. PRATT,	
A. L. BUIKEMA, JR., AND J. CAIRNS, JR.	30
Discussion	46
Community-Level Effects of Coyote Population Reduction—	
R. H. SCHMIDT	49
The Sea Urchin: Bioassay for the Assessment of Damage from Environmental Contaminants—G. PAGANO, M. CIPOLLARO,	
G. CORSALE, A. ESPOSITO, E. RAGUCCI, G. G. GIORDANO, AND N. M. TRIEFF	66
Preliminary Results of Interlaboratory Testing of a Standardized Aquatic Microcosm—F. B. TAUB, A. C. KINDIG, AND	
L. L. CONQUEST	93
Discussion	116
A Microcosm Procedure for Determining Safe Levels of Chemical Exposure in Shallow-Water Communities—J. M. GIDDINGS	121
Discussion	132

A Comparison of Mixed Flask Culture and Standardized Laboratory Model Ecosystems for Toxicity Testing—	
L. J. SHANNON, M. C. HARRASS, J. D. YOUNT, AND	
C. T. WALBRIDGE	135
Discussion	156
Evaluation of Simple Generic Aquatic Ecosystem Tests to Screen the Ecological Impacts of Pesticides—	
P. J. SHEEHAN, R. P. AXLER,	
AND R. C. NEWHOOK	158
Discussion	178
Population and Guild Analysis for Interpretation of Heavy Metal Pollution in Streams—	
R. C. PETERSEN, JR.	180
Impact of Drilling Fluids on Seagrasses: An Experimental Community Approach—	
R. D. MORTON, T. W. DUKE,	
J. M. MACAULEY, J. R. CLARK, W. A. PRICE, S. J. HENDRICKS,	
S. L. OWSLEY-MONTGOMERY, AND G. R. PLAIA	199
A Simple In-Stream Test of Laboratory Findings that NTA Protects Fish and Invertebrates Against Copper and Zinc—	
J. B. SPRAGUE	213
Discussion	223
Effect of 3-Trifluoromethyl-4-Nitrophenol on the Structure and Function of Protozoan Communities Established on Artificial Substrates—	
P. V. MCCORMICK, J. R. PRATT, AND J. CAIRNS, JR.	224
Discussion	238
Structural and Functional Response of Natural Phytoplankton and Periphyton Communities to a Cationic Surfactant with Considerations on Environmental Fate—	
M. A. LEWIS,	
M. J. TAYLOR, AND R. J. LARSON	241
Use of Limnocostracans in Evaluating the Effects of Pesticides on Zooplankton Communities—	
N. K. KAUSHIK, K. R. SOLOMON,	
G. L. STEPHENSON, AND K. E. DAY	269
Discussion	288
Zooplankton Community Responses to Synthetic Oil Exposure—	
L. A. HOOK, P. J. FRANCO, AND J. M. GIDDINGS	291

Production of Coexisting Juvenile Coho Salmon and Steelhead Trout in Heated Model Stream Communities—R. M. HUGHES AND G. E. DAVIS	322
Author Index	339
Subject Index	341

ISBN 0-8031-0488-X