Preface of Enhanced Biodegradation of Pesticides in the Environment

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Preface of Enhanced Biodegradation of Pesticides in the Environment

Abstract
ICROBIAL DEGRADATION HAS LONG BEEN RECOGNIZED as a primary means of dissipating many pesticides in soil and water ecosystems, and recognition of this has prompted the development of biodegradable herbicides, insecticides, and fungicides. Because these biodegradable pesticides have predictable patterns of environmental persistence, they have become key components of agricultural and industrial pest management systems. Early research on the degradation of phenoxy herbicides in soil provided evidence that microbial adaptation could result in abnormally accelerated rates of pesticide breakdown.

Disciplines
Entomology | Environmental Health | Environmental Microbiology and Microbial Ecology | Plant Biology

Comments

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Preface

MICROBIAL DEGRADATION HAS LONG BEEN RECOGNIZED as a primary means of dissipating many pesticides in soil and water ecosystems, and recognition of this has prompted the development of biodegradable herbicides, insecticides, and fungicides. Because these biodegradable pesticides have predictable patterns of environmental persistence, they have become key components of agricultural and industrial pest management systems. Early research on the degradation of phenoxy herbicides in soil provided evidence that microbial adaptation could result in abnormally accelerated rates of pesticide breakdown. However, because of the lack of observable economic impact on pest control practices, the phenomenon of enhanced microbial pesticide degradation languished as an academic curiosity for many years. The contemporary occurrence of enhanced degradation and associated pest control failures has spurred reexamination of adapted microbial pesticide degradation as a critical environmental process. The recent flurry of research into microbial adaptation for pesticide degradation has spanned disciplines ranging from applied agronomy to molecular biology.

This book is the first collection of research results to focus exclusively on the adaptation of microorganisms for rapid pesticide degradation. After an introductory chapter, the book is organized into three sections, and it concludes with an appendix of key chemical structures. The first section contains general field and laboratory observations of enhanced herbicide, insecticide, and fungicide degradation. The second section focuses more specifically on the microbiological and biochemical aspects of adapted microbial pesticide metabolism in terrestrial and aquatic systems. Finally, the third section addresses management strategies and implications of enhanced pesticide degradation.

The editors thank the contributors to this volume, including authors, coauthors, and reviewers, for their time and insight. We also express our thanks to the Division of Agrochemicals, the sponsor of the symposium on which this book is based, and to the ACS Books Department staff for their hard work in presenting this volume.
Dedication

This book is dedicated to Dr. E. P. Lichtenstein of the University of Wisconsin and Dr. R. L. Metcalf of the University of Illinois, who conducted pioneering work on the environmental chemistry of pesticides and served as early mentors for the editors.

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January 19, 1990