



# Bioremediation of Soils Contaminated with Aromatic Compounds

Edited by

Hermann J. Heipieper

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IV. Earth and Environmental Sciences – Vol. 76

# Bioremediation of Soils Contaminated with Aromatic Compounds

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# Bioremediation of Soils Contaminated with Aromatic Compounds

edited by

**Hermann J. Heipieper**

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# TABLE OF CONTENTS

Group Picture.....	v
Preface .....	ix
List of Participants.....	xi
Bioremediation of Soils Contaminated with Aromatic Compounds: Effects of Rhizosphere, Bioavailability, Gene regulation and Stress Adaptation <i>H.J. Heipieper</i> .....	1
Influence of the Rhizosphere on the Biodegradation of Organic Xenobiotics – A Case Study with 2,4-dichlorophenoxyacetic Acid <i>L.J. Shaw, R.G. Burns</i> .....	5
Regulation of the Atrazine Degradative Pathway in <i>Pseudomonas</i> <i>V. García-González, F. Govantes, A. Hervás, I. Canosa,</i> <i>O. Porrúa, E. Santero</i> .....	31
The Role of Plants and Bacteria in Phytoremediation - Kinetic Aspects <i>S. Trapp, A.S. Ücisik, P. DelChicca Romano, M. Larsen</i> .....	41
Regularities in the Oxidizing Metabolism of Bacteria <i>G.M. Dmytrenko</i> .....	51
Formation of Microbial Communities in Oil Shale Chemical Industry Solid Wastes During Phytoremediation and Bioaugmentation <i>J. Truu, E. Heinaru, E. Vedler, J. Juhanson, M. Viirmäe,</i> <i>A. Heinaru</i> .....	57



Studies on Biodegradation of Aromatic Pollutants by <i>Trichosporon Cutaneum</i> Yeast Strain <i>M. Gerginova, N. Dimova, D. Ivanova, Z. Alexieva</i> .....	67
The Potential of Keratinolytic and Keratinophilic Fungi for Degradation of Petroleum Hydrocarbons in Soil <i>W. Przysaś, K. Ulfig, K. Miksch</i> .....	75
Study of Contamination and Migration Polychlorinated Biphenyls in the Environment. Bioremediation of Contaminated Soils and Assessment of Their Impact on the Serpukhov Population Health <i>G.A. Zharikov, R.V. Borovick, V.V. Kapranov, N.I. Kiseleva, O.A. Krainova, V.P. Dyadishcheva, A.V. Shalanda, M.G. Zharikov</i> .....	93
Shedding Light on the Bioavailability of Organic Pollutants <i>A. Keane, S. Ghoshal, P. Phoenix, P.C.K. Lau</i> .....	105
Reduction of Chromium (VI) by Bacteria Collection Strains of Different Physiological Groups <i>G.M. Dmytrenko, T.V. Ereshko, V.V. Konovalova</i> .....	125

## PREFACE

Environmental biotechnology, which was in its infancy in the early 80's, has evolved thanks to the revolution brought about by molecular biology. Multiple successes in the biological cleanup of civil and industrial wastewater and of hydrocarbon soil pollution, demonstrate the vast power of clean technologies. In addition, the buildup of information on the activities of microorganisms as catalysts in all sorts of natural, industrial and animal environments has flourished. There is a continuing realization of the critical role of microbial processes in biological, industrial and geological systems.

Since environmental biotechnology has matured, it is ready to tackle bigger challenges: the scaling up of many bioremediation systems still in progress, the search for novel biocatalysts for industrial applications, the continuing effort against common human life-threatening processes such as antibiotic resistance, the accumulation of hormone-mimicking substances (endocrine disrupters), the deposition of air-borne pesticides in the environment and, the degradation of recalcitrant contaminants. These endeavors will help prevent the contamination of food chains, protect human life and allow for human activity and economic development that do not compromise environmental sustainability.

This volume includes the key lectures and participants' contributions delivered at the NATO-funded Advanced Research Workshop (NATO-ARW No. 980838) *Bioremediation of Soils Contaminated with Aromatic Compounds: Effects of Rhizosphere, Bioavailability, Gene Regulation and Stress Adaptation*, held in Tartu, Estonia, from the 1<sup>st</sup> to the 3<sup>rd</sup> of July 2004, and attended by participants from 15 countries.

The purpose of the workshop was to bring together scientists from NATO and Partner countries to establish collaborative research on bioremediation. Bioremediation has become a generally accepted means of cleaning up polluted sites, particularly ones contaminated with various xenobiotic compounds. The main topic of the workshop was bioremediation of soils contaminated with aromatic compounds such as herbicides, BTEX, and phenols.

The programme included 18 oral presentations and a poster session. Each of the 4 major sessions: Rhizosphere; Bioavailability and Transport; Molecular Biology, Gene Regulation and Genomics; Biodiversity and Environmental Genomics, Stress Adaptation was represented by a key scientist who presented their field.

This book is addressed to a wide readership. Specialized workers in the field of environmental biotechnology should find the updated materials on several areas of this topic very useful. University teachers could use the material in this book for introductory or graduate courses, and those who have a general interest in the subject should find the offered overviews particularly interesting. There are extensive literature references for further detailed studies.

Many people have contributed to the success of the ARW on which this volume is based. We wish to thank especially Ene Talpsepp and all her co-workers from the University of Tartu for their outstanding work, availability and kindness in the organization of the meeting. We thank all the participants, mainly the invited key speakers: Alexander Boronin, Ildefonso Cases, Victor de Lorenzo, Hauke Harms, Ain Heinaru, Hermann J. Heipieper, Janet K. Jansson, Ulrich Karlson, Maia Kivisaar, Peter C.K. Lau, Dietmar Pieper, Martin Romantchuk, Eduardo Santero, Ana Segura Carnicero, Elizabeth J. Shaw, Victoria Shingler, Stefan Trapp, Peter A. Williams for their contributions to a stimulating dialogue atmosphere throughout the duration of the Workshop.

Last but not least, we would also like to thank NATO Science Committee for selecting our meeting, NATO-ARW No. 980838, for the financial support by NATO.

Hermann J. Heipieper  
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