

# Bioremediation of Soils Contaminated with Aromatic Compounds

Edited by

Hermann J. Heipieper

NATO Science Series

IV. Earth and Environmental Sciences - Vol. 76

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## Hermann J. Heipieper

UFZ-Centre for Environmental Research Leipzig Halle, Leipzig, Germany



Published in cooperation with NATO Public Diplomacy Division

Proceedings of the NATO Advanced Research Workshop on Bioremediation of Soils Contaminated with Aromatic Compounds Tartu, Estonia 1–3 July 2004

A C.I.P. Catalogue record for this book is available from the Library of Congress.

ISBN-10 1-4020-5692-3 (PB) ISBN-13 978-1-4020-5692-5 (PB) ISBN-10 1-4020-5691-5 (HB) ISBN-13 978-1-4020-5691-8 (HB) ISBN-10 1-4020-5693-1 (e-book) ISBN-13 978-1-4020-5693-2 (e-book)

Published by Springer, P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

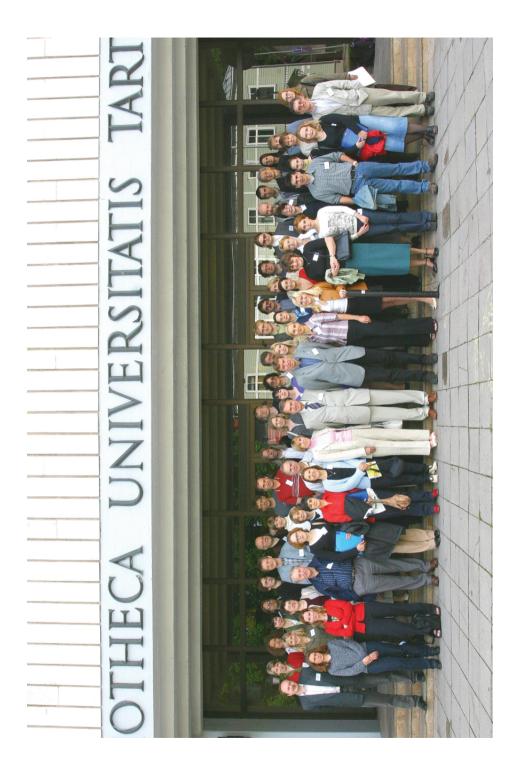
www.springer.com

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#### 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 sustainabijity.

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 scientists 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 coworkers 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 Maia Kivisaar Ain Heinaru Organizing Committee of the NATO-ARW

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