

Air, Water and Soil Pollution Science and Technology

# Contaminated

# Soils

Sources, Properties  
and Impacts

Michaela Dunn  
Editor

NOVA

# CONTENTS

|                  |   |            |
|------------------|---|------------|
| <b>Preface</b>   |   | <b>vii</b> |
| <b>Chapter 1</b> | Research Progress in Nanotoxicology<br><i>Caixia Wang and Xiaoke Hu</i>   | <b>1</b>   |
| <b>Chapter 2</b> | Compost in Soil Remediation: Immobilization and Mobilization of Heavy Metals<br><i>Zygmunt M. Gusiatin and Dorota Kulikowska</i>  | <b>19</b>  |
| <b>Chapter 3</b> | Investigation of the Genetic Potential of the Winter Wheat Resistance to Heavy Metals in Contaminated Soils for the Development of Clean Growing Technology<br><i>R. A. Alybayeva, S. D. Atabayeva and S. Sh. Asrandina</i>   | <b>53</b>  |
| <b>Chapter 4</b> | Impact of Heavy Metals and Metalloids on Soil Microorganisms of Mining Areas<br><i>H. Moreira, S. I. A. Pereira and P. M. L. Castro</i>   | <b>95</b>  |
| <b>Chapter 5</b> | Heavy Metals Contamination of Soils in the Ural Region, Russia<br><i>Yu. N. Vodyanitskii and A. T. Savichev</i>   | <b>121</b> |
| <b>Chapter 6</b> | Evaluation of Specific Reactivity of Cement - Brown Coal Components as Sorbents for Remediating Pb Contaminated Sites<br><i>Jean Diatta and Witold Grzebisz</i>   | <b>141</b> |
| <b>Chapter 7</b> | Inoculation of <i>Lens Culinaris</i> , <i>Vicia Faba</i> and <i>Sulla Coronaria</i> with Heavy Metal-Resistant PGPB Shows Potential for Phytostabilization<br><i>Imen Challougui Fatnassi, Manel Chiboub, Omar Saadani, Abdelkerim Souhir, Khedhiri Mannai, Jebara Moez and Salwa Harzalli Jebara</i> | <b>163</b> |
| <b>Chapter 8</b> | Assessment of Cu, Pb, Cd Bonds with Soil Colloids as an Index of Retention-Release Dynamics<br><i>Jean Diatta</i>   | <b>189</b> |

*Chapter 3*

**INVESTIGATION OF THE GENETIC POTENTIAL OF  
THE WINTER WHEAT RESISTANCE TO HEAVY  
METALS IN CONTAMINATED SOILS FOR  
THE DEVELOPMENT OF  
CLEAN GROWING TECHNOLOGY**

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**ABSTRACT**

In Kazakhstan, the development of a powerful industry was based on its rich natural resources. However, the industrial centers are the areas of highest contamination by heavy metals. Sound environmental technologies are crucial to address heavy metal pollution problem. Development and use of plant varieties, characterized by minimal accumulation of heavy metals, can provide such environmental solution. The aim of this study was to identify wheat germplasm resistant to heavy metals (lead, copper, zinc and cadmium), which are priority pollutants in eastern Kazakhstan region, and identification of donors for breeding and promising forms of wheat that are resistance to heavy metals and destined for agricultural production. Different genotypes of winter wheat (Kazakh, Russian, a collection of CIMMYT cultivars and lines of winter wheat, wild species of wheat) were studied. Plants were grown on scientific test site, under natural environmental pollution, in the suburban area of Ust-Kamenogorsk city, East Kazakhstan region. The content of heavy metals in plants was determined by atomic absorption on the device AAnalyst 300 of "Perkin Elmer". Experiments and determination of physiological parameters were conducted by the method of field experiment. The study

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