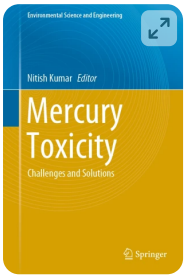


Mercury Toxicity

Challenges and Solutions

Book | © 2023

Overview

Editors: Nitish Kumar

Describes the different sources of mercury toxicity and its distribution in the environment

Presents health risks linked to mercury toxicity

Provides sustainable mitigation strategies of mercury toxicity

Part of the book series: Environmental Science and Engineering (ESE)

About this book

This book presents mercury toxicity with respect to remediation and health issues. It covers sources of mercury contamination, its impact on human

health, and prospective remediation by both bioremediation and phytoremediation with the application of recent advanced techniques such as genetic engineering and nanotechnology.

Both anthropogenic activities and natural processes cause the release of mercury into different spheres of the environment resulting in severe adverse impacts. Increased anthropogenic discharge of mercury leads to disturbance in its natural biogeochemical cycle, which results in unenviable diseases and hazardous health effects. Mercury pollution is responsible for causing neurobehavioral, kidney, heart, gastrointestinal, liver, and other diseases. Many published works about the impact of mercury on health are also available worldwide; however, there is no complete understanding available on toxicological studies of mercury that covers the broader spectrum of findings ranging from sources of exposure to mercury toxicity to its remediation strategies.

This book brings together a diverse group of environmental science, sustainability, and health researchers to address the challenges posed by global mass poisoning caused by mercury contamination. The book also proposes solutions to contamination through multi-disciplinary approaches.

The book contains three sections. The first part describes the different sources and distribution of mercury in soil and plant ecosystems. The second part explains the health risks linked to mercury toxicity. The third part addresses sustainable mercury toxicity mitigation strategies and the potential applications of recent technology in providing solutions. This book is a valuable resource to students, academics, researchers, and environmental professionals working in the field of mercury contamination.

Keywords

Sources and distribution of mercury | Health risks linked to mercury poisoning | Phytoremediation | Bioremediation | Nano adsorbents | Bioadsorbent | Biotechnological approaches for mercury remediation

Search within this book

Search

Table of contents (14 chapters)

Health Risks Linked to Mercury Toxicity

Sustainable Mitigation Strategies and Solutions

Back to top

Editors and Affiliations

Department of Biotechnology, Central University of South Bihar, Gaya, India
Nitish Kumar

About the editor

Dr. Nitish Kumar is a senior assistant professor at the Department of Biotechnology, Central University of South Bihar, India. He completed his doctoral research at the Council of Scientific & Industrial Research (CSIR)–Central Salt & Marine Chemicals Research Institute, India. He has the research and teaching experience of more than 12 years in the field of plant and microbial biotechnology, and heavy metal bioremediation. He has published more than 70 research articles in international and national journals and more than 20 book chapters and 7 books with Springer and Taylor & Francis. Dr. Kumar was a recipient of the Young Scientist Award from the Science and Engineering Research Board (SERB) in 2014. He has received many awards and fellowships and acquired projects from various organizations.

Bibliographic Information

Book Title
Mercury Toxicity

Book Subtitle
Challenges and Solutions

Editors
Nitish Kumar

Series Title
Environmental Science and Engineering

DOI
https://doi.org/10.1007/978-981-99-7719-2

Publisher
Springer Singapore

eBook Packages
Earth and Environmental Science, Earth and Environmental Science (R0)

Hardcover ISBN
978-981-99-7718-5
Published: 24 November 2023

Softcover ISBN
978-981-99-7721-5
Due: 25 December 2023

eBook ISBN
978-981-99-7719-2
Published: 23 November 2023

Series ISSN
1863-5520

Series E-ISSN
1863-5539

Edition Number
1

Number of Pages
XI, 374

Number of Illustrations
27 b/w illustrations, 45 illustrations in colour

Topics
Pollution, general, Environmental Health, Environmental Management, Sustainable Development

Publish with us

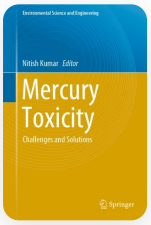
Policies and ethics

Back to top

Application and Development Strategies of Nano-Adsorbents on Mercury Remediation

| Chapter | First Online: 24 November 2023

| pp 271–295 | Cite this chapter



Mercury Toxicity

Visakha Singh, Rabhya Asthana, M. Kiranmai Reddy ✉, Hari Sharan Misra, M. Pradeep & Saladi Sri Kala Venkata Butchi Raju

Part of the book series: Environmental Science and Engineering ((ESE))

Abstract

With the global increase in urbanization and industrialization, the threat to natural ecosystems and biodiversity in the form of pollution is imminent. Universally, one of the major categories of pollutants that we face today is the presence of heavy metals in the environment. Mercury, in particular, is a highly toxic heavy metal capable of showcasing bioaccumulation, persistence, and biomagnification capabilities. It is also responsible for numerous health hazards in human beings and animals. To curb the problem of mercury poisoning in living organisms, several conventional remediation techniques have been

tried and tested for the removal of mercury. Some of these conventional methods are not that accurate in remediating mercury, so using nano adsorbents can show a promising future. Nano-sized adsorbent materials have been widely studied in remediation procedures. Numerous studies in nanotechnology have revealed the effectiveness of nano adsorbents composed of polymers, zeolite, carbon, metals, or even those with magnetic properties in remediation or pollutant removal procedures. The effectiveness of these adsorbents can be applied to remove mercury from different environments based on their functionality. These nano adsorbents are sustainable, reusable, efficient, and cost-effective when it comes to conventional mercury remediation techniques. The major challenges in the use of nano adsorbents may involve issues in large-scale production and application, toxicity, or even pollution if not handled appropriately. This chapter describes the synthesis, applications, challenges, and future scope of various nano adsorbents in the context of mercury remediation or removal techniques from different environments.