

1. Record Nr.	UNINA9911019572403321
Autore	Singh Rajeev
Titolo	Airborne Biocontaminants and Their Impact on Human Health
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2024 ©2024
ISBN	9781394178964 1394178964 9781394178940 1394178948
Edizione	[1st ed.]
Descrizione fisica	1 online resource (415 pages)
Altri autori (Persone)	SinghAnamika
Soggetti	Indoor air quality Indoor air pollution
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Dedication Page -- Contents -- About the Editors -- List of Contributors -- Preface -- Chapter 1 Biocontaminants in Indoor Environments: Occurrence, Spread, and Prevention -- 1.1 Introduction -- 1.2 Indoor Microenvironments That Harbor Biocontaminants -- 1.2.1 Bedding/Carpets/Furnishings -- 1.2.2 ACs/Humidifiers -- 1.2.3 AC Ducts/Outdoor Units/Centralized AC Units -- 1.2.4 Fan/Exhaust -- 1.2.5 Furniture Wooden/Metal Items/Decoratives -- 1.2.6 Books/Stationery -- 1.2.7 Electronics - TV, Mobile, and Laptop -- 1.2.8 Refrigerator/Deep Freezer -- 1.2.9 Kitchen Slab and Sink (Wet Surfaces) -- 1.2.10 Kitchen Storage (Dry Surfaces) -- 1.2.11 Bathroom Floor/Walls -- 1.2.12 Toilet and Its Surfaces -- 1.2.13 Basement/Attic -- 1.2.14 Hospitals -- 1.3 Factors Influencing Biocontaminant Accumulation in Microenvironments -- 1.3.1 Entry of Outdoor Microbes -- 1.3.2 Resident Biocontaminants (in Dust) -- 1.3.3 Human Occupancy -- 1.3.4 Pets and Aquariums -- 1.3.5 Construction Materials and VOCs -- 1.4 Conditions Affecting Spread of Biocontaminants -- 1.4.1 Light (Sunlight and Artificial Light, Darkness) -- 1.4.2 Temperature -- 1.4.3 Humidity/Moisture -- 1.4.4 Air Circulation -- 1.4.5 Spores, Pollens, and Allergens -- 1.5

Preventing Biocontaminants in Microenvironments -- 1.5.1 Cleaning Habits - Thorough Cleaning, Disinfecting -- 1.6 Preventing Biocontaminants in Controlled Environments -- 1.6.1 Cleaning Protocols - Comprehensive Cleaning and Disinfection -- 1.6.2 Efficient Ventilation -- 1.6.3 HVAC Systems for Enhanced Air Quality -- 1.6.4 Optimizing Sunlight in Indoor Environments -- 1.7 Conclusion -- References -- Chapter 2 Estimation of Indoor Bioaerosols and Occurrence of Sick Building Syndrome Symptoms Within Office Premises in Urban Delhi -- 2.1 Introduction -- 2.2 Methodology and Study Design -- 2.2.1 Sampling Sites. 2.2.2 Site Description -- 2.2.3 Bioaerosol Sampling -- 2.2.4 Respondent Characteristics and Prevalence of Sick Building Syndrome Symptoms -- 2.2.5 Statistical Analyses -- 2.3 Results and Discussion -- 2.3.1 Seasonal Variation in Bioaerosol Distribution -- 2.3.2 Effect of Meteorological Parameters and Footfall Count on Bioaerosol Distribution -- 2.3.3 Association of Bioaerosol Count and Daily Footfall -- 2.3.4 Respondent Characteristics -- 2.3.5 Occurrence of SBS -- 2.3.6 Occupant Satisfaction -- 2.4 Conclusion -- Acknowledgments -- References -- Chapter 3 Sources and Transmission of Bio-Contaminants in Indoor Areas -- 3.1 Introduction -- 3.2 Sources of Bio-contaminants in Indoor Areas -- 3.2.1 Bacteria in Indoor Air -- 3.2.2 Virus in the Indoor Air -- 3.2.3 Fungi in the Indoor Air -- 3.2.4 Mycotoxins in the Indoor Air -- 3.2.5 (1, 3)--D glucans in the Indoor Air -- 3.2.6 Endotoxins in the Indoor Air -- 3.2.7 Volatile Organic Compounds (VOCs) and Fungi in the Indoor Air -- 3.2.8 Allergens in the Indoor Air -- 3.2.9 Bioaerosols in the Indoor Air -- 3.3 Mode of Transmission of Bio-Contaminants in Indoor Air -- 3.3.1 Humans -- 3.3.2 Building Systems -- 3.3.3 Pets -- 3.3.4 Healthcare Facilities -- 3.3.5 Ventilation Facility and Sunlight -- 3.3.6 Plants -- 3.4 Health Consequences of Bio-Contaminants in Indoor Air -- 3.4.1 Asthma -- 3.4.2 Rhinitis -- 3.4.3 Tuberculosis -- 3.4.4 Leprosy -- 3.4.5 Legionellosis -- 3.4.6 Mycosis -- 3.4.7 Mycotoxicosis -- 3.4.8 Influenza Virus (H1N1) -- 3.4.9 Coronavirus Disease (COVID-19) -- 3.4.10 Chronic Bronchitis -- 3.4.11 Organic Dust Toxic Syndrome -- 3.4.12 Hypersensitivity Pneumonitis or Extrinsic Allergic Alveolitis -- 3.4.13 Sick Building Syndrome -- 3.4.14 Chronic Airflow Obstruction -- 3.5 Method of Detection and Control of Bio-Contaminants -- 3.5.1 Detection of Bio-Contaminants. 3.5.2 Control of Biological Contaminants -- 3.5.3 Control Measures for Reducing Bioaerosols -- 3.6 Summary and Conclusion -- References -- Chapter 4 Climatic/Meteorological Conditions and Their Role in Biological Contamination: A Comprehensive Review -- 4.1 Introduction -- 4.2 Microbial Ecology and Climatic Factors -- 4.2.1 Overview of Microbial Communities -- 4.2.2 Influence of Temperature on Microbial Growth and Survival -- 4.2.3 Effect of Humidity on Microbial Proliferation -- 4.2.4 Precipitation and Its Role in Microbial Dissemination -- 4.2.5 Wind Patterns and Their Impact on the Spread of Contaminants -- 4.3 Climatic Conditions and Waterborne Contamination -- 4.3.1 Rainfall and Surface Water Contamination -- 4.3.2 Floods and Their Role in Waterborne Pathogen Transmission -- 4.3.3 Drought and Its Influence on Water Quality -- 4.4 Climatic Conditions and Airborne Contamination -- 4.4.1 Aerosolized Microorganisms and Atmospheric Conditions -- 4.4.2 Dust Storms and Their Role in Microbial Dissemination -- 4.4.3 Pollen and Allergenic Contaminants Influenced by Weather -- 4.5 Climatic Conditions and Soil Contamination -- 4.5.1 Temperature and Its Impact on Soil Microbial Communities -- 4.5.2 Moisture and Soilborne Pathogen Survival -- 4.5.3 Erosion and Its Connection to Soil

Contamination -- 4.6 Climatic Conditions and Food Contamination -- 4.6.1 Temperature and Food Spoilage -- 4.6.2 Humidity and Microbial Growth in Food Products -- 4.6.3 Impacts of Extreme Weather Events on Food Safety -- 4.7 Impact of Climate Change on Biological Contamination -- 4.7.1 Long-Term Effects of Climate Change on Microbial Ecosystems -- 4.7.2 Altered Climatic Patterns and Their Consequences for Contamination -- 4.7.3 Strategies for Mitigating Climate Change-Related Contamination Risks -- 4.8 Case Studies and Examples. 4.8.1 Documented Instances of Climatic/Meteorological Conditions and Biological Contamination -- 4.8.2 Lessons Learned and Potential Interventions -- 4.9 Detection and Monitoring of Climatic-Related Contamination -- 4.9.1 Methods for Identifying and Quantifying Biological Contaminants -- 4.9.2 Remote Sensing and Technological Advancements -- 4.9.3 Surveillance Systems for Early Detection and Response -- 4.10 Future Research Directions and Recommendations -- 4.10.1 Identifying Research Gaps and Unanswered Questions -- 4.10.2 Integration of Climatic Data Into Contamination Risk Assessments -- 4.10.3 Strategies for Adapting to Changing Climatic Conditions -- 4.11 Conclusion -- References -- Chapter 5 Role of Gases, VOC, PM_{2.5}, and PM₁₀ in Biological Contamination in Indoor Areas -- 5.1 Introduction -- 5.2 Gases and Biological Contamination -- 5.2.1 Carbon Dioxide (CO₂) -- 5.2.2 Carbon Monoxide -- 5.2.3 Nitrogen Dioxide (NO₂) -- 5.2.4 Sulfur Dioxide (SO₂) -- 5.2.5 Volatile Organic Compounds (VOCs) -- 5.2.5.1 Common VOC in Indoor Air -- 5.2.6 Radon (Rn) -- 5.2.7 Ozone (O₃) -- 5.3 Particulate Matter -- 5.3.1 PM_{2.5} -- 5.3.2 PM₁₀ -- 5.4 Human Health Effects and Toxicity Mechanisms -- 5.5 Mitigation Strategies Reducing Indoor Gases and Particulate Matter -- 5.6 Conclusion -- References -- Chapter 6 Indoor Contaminants Based on Fungi -- 6.1 Introduction -- 6.2 Fungal Diseases -- 6.2.1 Mycosis -- 6.2.2 Mycotoxicosis -- 6.2.3 Respiratory Symptoms -- 6.3 Factors Affecting the Colonization of Fungi -- 6.4 Fungal Quantitation -- 6.5 Methods for Quantitation -- 6.5.1 Liquid Impingement -- 6.5.2 Impaction -- 6.5.3 Electrostatic Precipitation -- 6.5.4 Gravitational Settling/Sedimentation -- 6.5.5 Filtration -- 6.6 Determination of Fungal Components in Indoor Conditions -- 6.7 Methodologies for Fungal Analysis. 6.8 Practices that Contribute to the Biotic Indoor Pollution -- 6.9 Removing Fungal Material and Cleaning -- 6.10 Conclusion and Future Perspectives -- References -- Chapter 7 Health Implications Related With the Presence of Waste Sorting Plants and Biological Contaminants -- 7.1 Introduction -- 7.2 Waste Sorting Plants -- 7.3 Biological Contaminants -- 7.4 Major Bio-Contaminants -- 7.4.1 Viruses -- 7.4.2 Bacteria -- 7.4.3 Fungi -- 7.4.4 Mycotoxins and Endotoxins -- 7.4.5 Allergens -- 7.5 Effect of Biological Contaminants and Waste Sorting Plants on Health -- 7.5.1 Bacterial Diseases -- 7.5.2 Diseases Caused by Viruses -- 7.5.3 Disease Spread Through Fungi -- 7.6 Conclusion -- References -- Chapter 8 Neurological Health Hazards Associated with Biological Contaminants -- 8.1 Introduction -- 8.2 Occupational Hazards and Neurological Disorders -- 8.3 Occupational Hazards Associated with Risk Factors Linked to Neurological Disorders -- 8.4 Neurological Diseases Associated with Occupational Hazards -- 8.5 Prevention and Treatment Strategies -- 8.6 Conclusion and Future Directions -- Acknowledgments -- Conflict of Interest -- References -- Chapter 9 Effect of Bioaerosols Exposure on Acute Exacerbation Among Individuals with COPD in Urban India -- 9.1 Introduction -- 9.2 Methodology -- 9.3 Results -- 9.3.1 Effect of Aerosolized Microbes on

COPD Exacerbation -- 9.4 Meteorological Variables -- 9.4.1
Temperature -- 9.4.2 Relative Humidity -- 9.4.3 Particulate Matter --
9.5 Discussion -- 9.6 Conclusion -- Conflict of Interest -- Disclosure
of Interest -- Acknowledgments -- References -- Chapter 10 The
Crucial Role of Pollen Grains, (1 3)--D-Glucan and Endotoxin in
Triggering Respiratory Diseases -- 10.1 Respiratory Diseases -- 10.2
Pollen Grains and Their Role in Triggering Respiratory Diseases --
10.2.1 Pollen Grains.
10.2.2 Pollen and Respiratory Diseases.

Sommario/riassunto

This book examines the impact of airborne particles on human health, focusing on indoor environments. It explores the occurrence, spread, and prevention of bio-contaminants such as bacteria, viruses, fungi, and allergens. The text delves into factors influencing the accumulation and spread of these contaminants, including human occupancy, construction materials, and ventilation systems. It addresses health consequences like asthma, tuberculosis, and sick building syndrome. The book also discusses climatic conditions affecting contamination and offers strategies for detection and control. It aims to provide insights for environmental scientists, public health professionals, and policymakers in understanding and mitigating indoor air quality issues.
