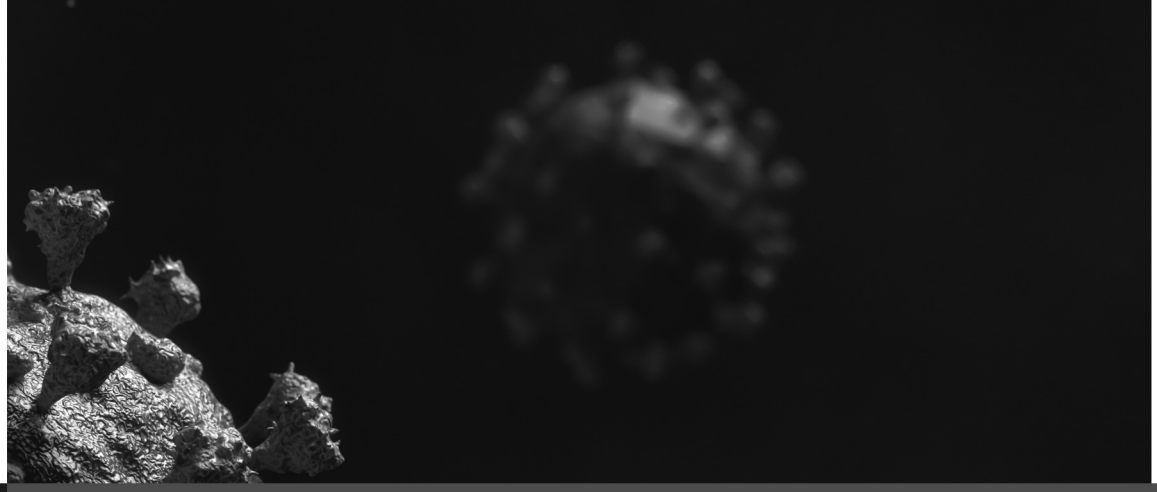
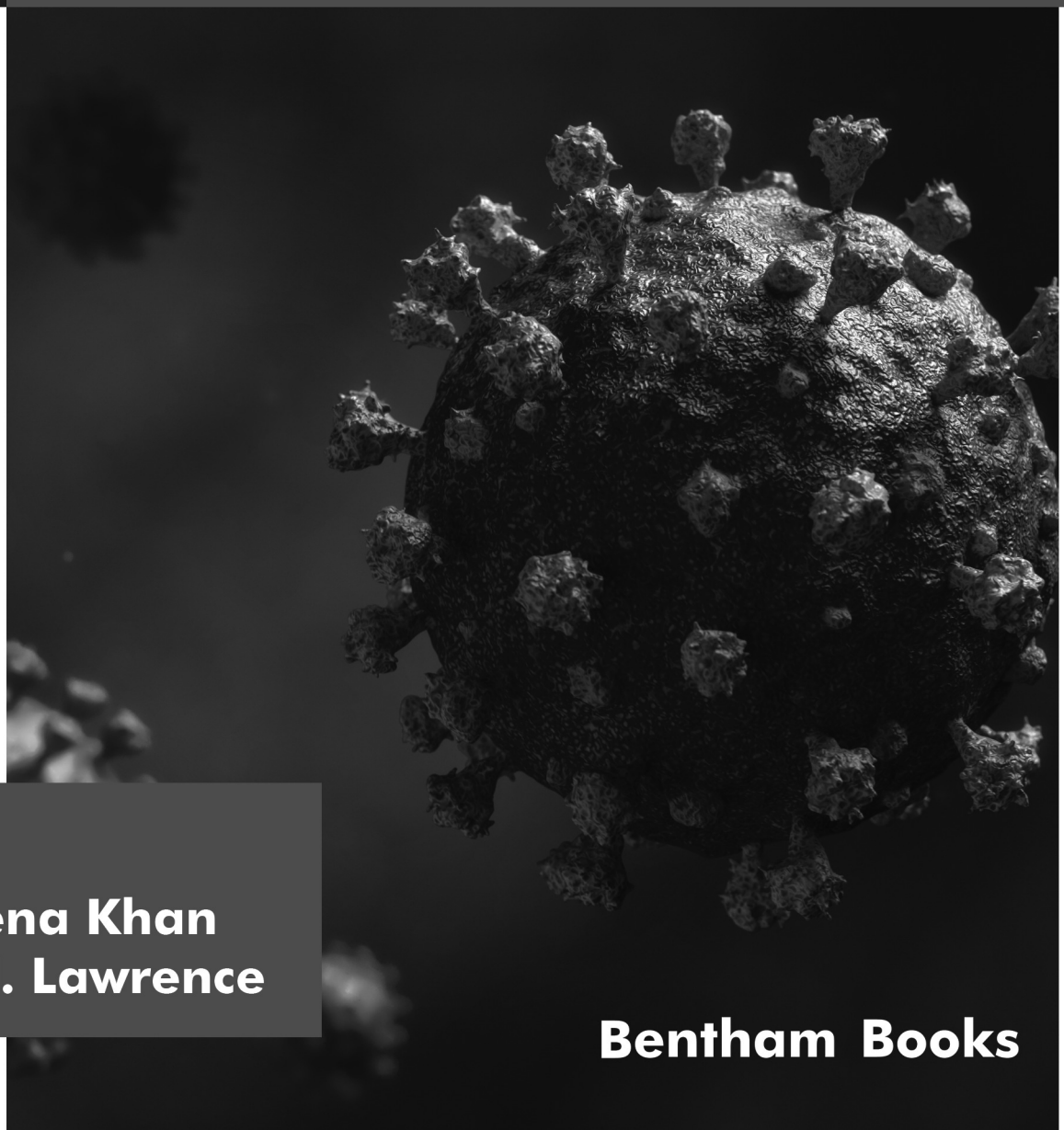


COVID-19:
ORIGIN, IMPACT AND MANAGEMENT
PART 2



Editors:
Tahmeena Khan
Alfred J. Lawrence

Bentham Books

COVID-19: Origin, Impact and Management (Part 2)

Edited by

Tahmeena Khan
Department of Chemistry
Integral University, Lucknow
India

&

Alfred J. Lawrence
Department of Chemistry
Isabella Thoburn College, Lucknow
India

COVID-19: Origin, Impact and Management (Part 2)

Editors: Tahmeena Khan & Alfred J. Lawrence

ISBN (Online): 978-981-5165-94-4

ISBN (Print): 978-981-5165-95-1

ISBN (Paperback): 978-981-5165-96-8

First published in 2023.

CONTENTS

CHAPTER 2

The Impact of Air Pollution and Environmental Factors on COVID-19 Transmission

Alfred J. Lawrence[1], Vinay P. Aneja[2] and **Tahmeena Khan[3,*]**

[1] *Department of Chemistry, Isabella Thoburn College, Lucknow, India*

[2] *North Carolina State University, USA*

[3] *Department of Chemistry, Integral University, Lucknow, India*

Abstract: SARS-CoV-2 (COVID-19) has caused serious mortal damage to the human race. The virus causes respiratory infections, and many studies are trying to comprehend the mode of spread and infection. This chapter has explained the origin of the virus, its structure and activity domain, symptoms, medicinal interventions, and particularly various modes of spread with emphasis on air pollution as contributing and facilitating factors assisted with favourable meteorological conditions, including temperature and relative humidity. Pieces of evidence from different countries suggest that the spread of the virus may be facilitated by air pollution and people who are exposed to high pollution levels are more susceptible to falling victim to the virus. Transmission of the SARS-CoV-2 may be facilitated by the airborne particulate matter, and both particulate matter and coronavirus cause oxidative stress in the body that helps in enhancing the susceptibility and severity towards respiratory infection. Not only ambient air pollution, but indoor air pollution (IAP) is also a factor worth considering. People in developing and under-developed nations are at high risk as they are exposed to high IAP levels. Awareness must be created to educate them about the associated harmful consequences, including the risk of catching the lethal COVID-19 infection. In the absence of any concrete medicinal solution, it is necessary to build immunity which may be uplifted by the usage of natural food sources, including herbs and spices. An overview of some commonly available herbs and spices of medicinal importance has also been given in the chapter.

Keywords: Air Pollution, Airborne , Environment, Humidity, Indoor Pollution, Oxidative Stress, Particulate matter, Respiratory Infection, SARS-CoV-2, Temperature.

[*] **Corresponding author Tahmeena Khan**: Department of Chemistry, Integral University, Lucknow, India; E-mail: tahminakhan30@yahoo.com

Tahmeena Khan

Dr. Tahmeena Khan is currently working as an assistant professor, in the Department of Chemistry, Integral University. She did M.Sc., and holds a specialization in inorganic chemistry. She did her M.Phil. in magnetic resonance spectroscopy and magnetic resonance imaging and worked on automated 3D structure determination of proteins for her dissertation. For her doctoral degree, she worked on mixed ligand-metal and mixed metal-ligand complexes of thiosemicarbazones and their therapeutic properties. She holds fifteen years of teaching experience and has published more than forty research papers and twenty book chapters. She also has two international books and two national books as editor and two books as author to her credit. Dr. Khan is also a life member of several academic bodies. She has keen interest in medicinal and environmental chemistry.

Alfred J. Lawrence

Dr. Alfred J. Lawrence is working as Assistant Professor in the Department of Chemistry, Isabella Thoburn College, Lucknow. He is also serving as the coordinator of the Research & Networking Cell and the chairperson of the Internal Quality Assurance Cell (IQAC) of the college. He holds twelve years of teaching experience and twenty years of research experience in Air Pollution monitoring and Health Risk Assessment. He has done his Ph.D. from St. John's College, Agra and holds four years of Post-Doctoral research experience from Purdue University, USA. He has been a visiting scholar to the University of Manchester and Oxford University, UK. He has published more than thirty five research papers in reputed international journals and five book chapters. He has also edited two international books and two conference proceedings. He has completed two research projects and is currently working on a project funded by the Department of Higher Education, Govt. of Uttar Pradesh. He has received many fellowships and was awarded International Society of Indoor Air Quality (ISIAQ) Fellowship, ETH Fellowship and International Society for Environmental Epidemiology Fellowship, Department of Science & Technology Travel Grant, University Grant Commission Travel Grant to present Research work in Ghent University, Belgium; ETH University, Switzerland; ISEE - Italy, University of Scotland, England and AWMA, USA respectively to present his research work.