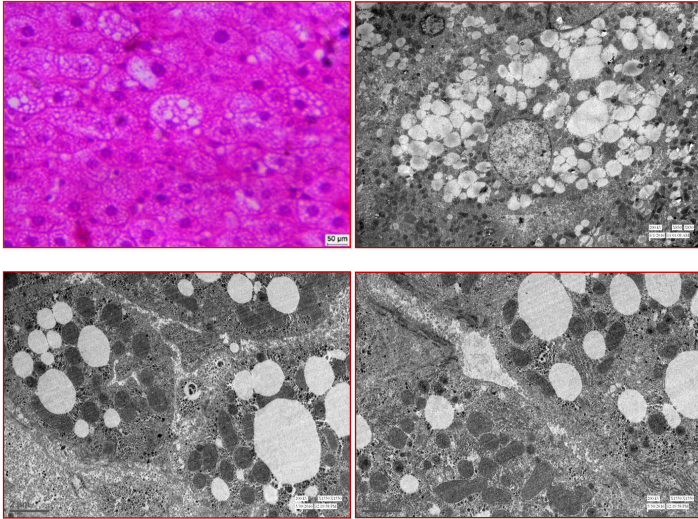


A Handbook on Hepatotoxicity



CHIEF EDITOR
Dr. Monika Bhadauria

EDITORS
Satendra Kumar Nirala • Sadhana Shrivastava
Arvind Kumar Shakya • Neetu Sharma

A Handbook on Hepatotoxicity

Editors: Monika Bhadauria • Satendra Kumar Nirala
Sadhana Shrivastava • Arvind Kumar Shakya • Neetu
Sharma

Published by:

Poddar Publication

Tara Nagar, Chittupur, BHU

Varanasi - 221005

Ph: 0542-2366370, Mob. 09415390515

Email: poddarfoundation@gmail.com

© Editors

Second Edition : **2024**

Price: Rs. 900/-

ISBN: 978-93-84817-00-8

Composing by:

Kumar Graphic

Delhi-110032

Printer:

Kumar Graphic

Shahadra, Delhi-110032

Contents

Chapters

	Page no
1. An Introduction to Toxicology <i>Satendra Kumar Nirala and Monika Bhadauria</i>	25
2. Biochemical and Physiological Pattern of Hepatotoxicity <i>Monika Bhadauria and Satendra Kumar Nirala</i>	36
3. Histological Pattern of Hepatotoxicity <i>Monika Bhadauria and Satendra Kumar Nirala</i>	51
4. Xenobiotic metabolism and Hepatotoxicity <i>Divya Bisht, Arvind Kumar Shakya and Monika Bhadauria</i>	70
5. Antioxidant Defence Mechanism against Hepatotoxicity <i>Divya Bisht, Satendra Kumar Nirala and Arvind Kumar Shakya</i>	86
6. Acetaminophen induced Hepatotoxicity <i>Monika Sharma, Chandra Kant Sharma, Neetu Sharma, Arvind Kumar Shakya, Sadhana Shrivastava and Monika Bhadauria</i>	99
7. Acrylamide induced Hepatotoxicity <i>Piyush Shukla and Satendra Kumar Nirala</i>	111
8. Aflatoxin induced Hepatotoxicity <i>Shamli S Gupte, Sadhana Shrivastava and Monika Bhadauria</i>	125
9. Aspartame induced Hepatotoxicity <i>Lipika Dash and Gita Mishra</i>	148

10. Carbon tetrachloride induced Hepatotoxicity
*Neetu Sharma, Banita Dhatwalia, Monika Sharma,
Monika Bhadauria and Sadhana Shrivastava* 158
11. Cyclophosphamide induced Hepatotoxicity
*Ankita Mukherjee, Asim Amitabh Sahu, Satendra Kumar
Nirala and Monika Bhadauria* 171
12. Diethylnitrosamine induced Hepatotoxicity and
Hepatocarcinogenesis
Shubham Singh and Monika Bhadauria 180
13. D-galactosamine induced Hepatotoxicity
Samrat Rakshit 190
14. Ethambutol induced Hepatotoxicity
*Amita Jaswal, Sadhana Shrivastava and
Monika Bhadauria* 200
15. Ethanol induced Hepatotoxicity
Hemeshwer Kumar Chandra 208
16. Heavy Metal induced Hepatotoxicity: Cadmium
*Shahid Yousuf Ganie, Darakhshan Javaid, Syed Sanober Qadri,
Satendra Kumar Nirala and Mohd Salim Reshi* 226
17. Heavy Metal induced Hepatotoxicity: Lead
*Samta Sharma, Shubham Singh, Satendra Kumar Nirala and
Sadhana Shrivastava* 244
18. Heavy Metal induced Hepatotoxicity: Mercury
*Pratima Dutta, Pavitra Behra, Piyush Shukla, Narottam Das
Agrawal, Mohd Salim Reshi and Satendra Kumar Nirala* 261
19. High Fat Diet induced Hepatotoxicity

	<i>Hemeshwer Kumar Chandra, Gita Mishra, Nisha Sahu, Arvind Kumar Shakya, Piyush Shukla, Satendra Kumar Nirala and Monika Bhadauria</i>	273
20.	Isoniazid induced Hepatotoxicity <i>Nisha Sahu, Gita Mishra, Javid Ahmad Malik, Hemeshwer Kumar Chandra, Amita Jaswal and Monika Bhadauria</i>	295
21.	Lipopolysaccharide induced Hepatotoxicity <i>Samrat Rakshit and Satendra Kumar Nirala</i>	304
22.	Light Metal induced Hepatotoxicity: Aluminum <i>Pavitra Behra, Gita Mishra, Narottam Das Agrawal, Pratime Dutta, Satendra Kumar Nirala and Monika Bhadauria</i>	318
23.	Light Metal induced Hepatotoxicity: Beryllium <i>Narottam Das Agrawal, Anjani Verma, Komal Singh Suman, Pavitra Behra, Pratime Dutta and Satendra Kumar Nirala</i>	329
24.	α -Naphthylisothiocyanate induced Hepatotoxicity <i>Asim Amitabh Sahu, Ankita Mukherjee, Shubham Singh and Monika Bhadauria</i>	348
25.	Polycyclic aromatic hydrocarbon induced Hepatotoxicity <i>Nisha Sahu</i>	365
26.	Pyrazinamide induced Hepatotoxicity <i>Gita Mishra, Nisha Sahu, Javid Ahmad Malik, Hemeshwer Kumar Chandra, Satendra Kumar Nirala and Monika Bhadauria</i>	373
27.	Rifampicin induced Hepatotoxicity <i>Gita Mishra</i>	381

28. Silica induced Hepatotoxicity
*Shruti Saxena, Satendra Kumar Nirala and Sadhana
Srivastava* 388
29. Thioacetamide induced Hepatotoxicity
*Shubham Singh, Asim Amitabh Sahu, Ankita Mukherjee, Pavitra
Behra, Satendra Kumar Nirala and Monika Bhadauria* 402
30. Vanadium induced Hepatotoxicity
Sadhana Shrivastava and Satendra Kumar Nirala 414

Chapter 8

Aflatoxin induced Hepatototoxicity

Shamli S. Gupte^{1*}, Sadhana Shrivastava¹ and

Monika Bhadauria²

¹Reproductive Biology and Toxicology Laboratory, School of Studies in Zoology, Jiwaji University Gwalior 474011 (M.P.) India

²Toxicology and Pharmacology Laboratory, Department of Zoology Guru Ghasidas Vishwavidyalaya, Bilaspur 495009 (C.G.) India

*Corresponding author

Aflatoxin (AF), is a mycotoxin secreted by *Aspergillus flavus* and *Aspergillus parasiticus*. These are naturally occurring mycotoxins and are responsible for contaminating various crops, food, nuts and dairy products. There are about 20 AF out which AFB₁, B₂, G₁ and G₂ are most prevalent and out of these four AFB₁ is most lethal and is widely studied. According to IARC 1993, AFB₁ is classified as class 1 carcinogen. Several studies have shown that people from tropical and sub-tropical countries are at high risk of AFB₁ exposure. Exposure of AFB₁ in humans causes aflatoxicosis, liver cirrhosis, liver cancer, multiple organ failure and stunted growth. Most of the countries have set a limit for AFB₁ exposure to tackle the menace of AFB₁ but due to lack of awareness and poor hygiene condition exposure to AFB₁ is unavoidable.

A brief history of Aflatoxin (AF)

AF was first discovered during the epidemic of “Turkey X Disease”. In year 1960, over 1 lakh of turkey suddenly died. The