# Contents

## SECTION 1

**Medicinal Plant Biodiversity, Standardization of Herbal Bioresources and Phytochemistry**

1. Herbals for Human Health and Disease: Prospects and Challenges in 21st Century ........................................ 1  
   P Chirangini, Amit Kumar, BN Pandey, GJ Sharma, KP Mishra

2. Traditional Medicine: A Novel Approach for Available, Accessible and Affordable Health Care ................................................................. 8  
   Bhushan Patwardhan

3. Production and Standardization of Bioresources for Herbal Drug Development ........................................ 28  
   PS Ahuja, RD Singh, S Raj Kumar, Brij Lal, SK Uniyal

4. Chemical Standardization of Herbal Drugs with Special Emphasis on Chromatography .......................... 36  
   R Govindarajan, M Vijayakumar

   K Kohli, Amin Saima

6. Perspectives of Safety for Natural Health Products ................................................................. 50  
   Pulok K Mukherjee, Atul Wahile

7. Phytochemical Techniques in Herbal Drug Research ........................................................................ 60  
   B Sabulal, V George

8. Bioassay-guided Isolation of Active Principles from Medicinally Important Plants .......................... 70  
   S Narasimhan, G Anitha, K Ilango K, R Mohan Kumar

9. Tracking Bioactivity in Plant Extracts: New Concepts and Approaches ........................................ 77  
   T Satyanarayana, Hema L Emandi

## SECTION 2

**Biotechnological Interventions in Herbal Drug Research**

    AK Mathur, A Mathur, R Seth, P Verma, D Vyas

11. Development of Herbal Drugs: Views on Physiological Inputs ........................................ 95  
    Sudhir Sawhney, Sarita Jaiswal

12. Biotransformation of Lignans and Neolignans ........................................................................ 108  
    SC Puri, Rajesh Arora, RK Sharma, GN Qazi

13. Biotechnology of Medicinally Important Solanaceous Plants ........................................ 117  
    A Sinha, SK Yadav, S Khan, A Kothari, A Sharma, SL Kothari

14. Functional Genomics Approach for Understanding Terpenoid Indole Alkaloid Biosynthesis in *Catharanthus roseus* (L.) G. Don ........................................ 128  
    Ajaykrishna Dutta, Susheel Kumar Raina, Jayanti Sen
SECTION 3
New Drug Discovery

15. Role of Natural Products in New Drug Discovery ......................................................... 139
   Vandita Srivastava, Sudeshan Arora

16. The Role of Natural Product Chemistry in Drug Discovery ........................................ 149
   M Sathe, MP Kaushik

17. Nuclear Magnetic Resonance Spectral Methods for Structure Elucidation of Natural Products ................................................................. 163
   Inder Pal Singh

18. A Scientific Approach for Herbal Drug Research ...................................................... 175
   YB Tripathi

SECTION 4
North-East and Himalayan Region Bioresource and Its Utilization

19. High Altitude Trans-Himalayan Medicinal Plants of Defence Importance ...................... 182
   OP Chaursia, T Parimalazhagan, Z Ahmed

20. Bioactive Compounds from Himalayan Medicinal Plants ........................................... 190
    SMS Chauhan, Ambika, Tanuja Bisht, Pradeep Pratap Singh

21. Rheum emodi: An Important Indian Medicinal Herb ................................................... 200
    AK Sinha, A Swaroop, PS Ahuja

22. Adaptogens in High Altitude Stress Management ....................................................... 209
    Ratan Kumar, Shalini Saggi, Vanita Gupta, HM Divekar

23. Exploration, Conservation and Utilization of Medicinal Plants: A Glimpse from North-East India .............................................................. 217
    H Deka, SN Dube

24. Glimpses of the Research on Medicinal Plants of Tribal Use in the North-East Region of India ............................................................... 221
    JC Sharma, NC Barua, PG Rao

25. Ethnomedicine of North-East India with Special Reference Assam and Arunachal Pradesh..... 228
    A Kar, DR Nath, SN Dube

SECTION 5
Radiomodification, Cancer and Radiation Hygienization

26. Screening Methodologies for Effective Radioprotectors ........................................... 237
    CKK Nair

27. Biological Effects of Ionizing Radiations: Modulation by Phytochemicals .................... 246
    S Chattopadhyay

28. Herbal Drugs in Radioprotection: Modulation by Phytochemicals ................................ 257
    JP Kamat, Kaushala Prasad Mishra

29. Kinetic Spectroscopic and Physico-Chemical Methods for Antioxidant Studies with Reference to Plant Extracts and their Active Ingredients .......................... 268
    S Adhikari, A Sarkar, T Mukherjee
30. Role of Some Dietary Ingredients in Radiation Protection ................................................. 278
   GC Jagetia

31. Development of a Radioprotective Drug from Ocimum sanctum ................................. 291
   P Uma Devi

32. Radioprotection by Himalayan High-Altitude Region Plants ........................................ 301
   Rajesh Arora, R Chawla, Shikha, R Kumar, A Sharma, SC Puri, AK Sinha, RP Tripathi, RK Sharma

33. Herbs and Natural Dietary Supplements for Cancer Chemoprevention .......................... 326
   VR Tandon, B Kapoor, V Khajuria

34. Phytotherapeutics of Cancer ....................................................................................... 337
   Huigol Nagraj G

35. Tumor Cell Apoptosis by Phytochemicals and Herbal Extracts ..................................... 342
   S Chakraborty, M Roy, RK Bhattacharya

36. Radiation Hygienization of Spices and Herbs .............................................................. 352
   PS Varier, A Sharma

SECTION 6

Prospection of Medicinal Plants for Various Bioactivities and Human Health

37. Herbal Drug Food—A Perspective ............................................................................. 359
   AS Bawa, F Khanum

38. Antidiabetic and Related Beneficial Properties of Indian Medicinal Plants ................ 377
   PP Dixit, JS Londe, Saroj S Ghaskadbi, TPA Devasagayam

39. Anti-inflammatory Activity Studies on Some Medicinal Plants of the Western Ghats of South India .......................................................... 387
   S Gopalakrishnan

40. Contraception Through Natural Plant Products .......................................................... 396
   S Thakur, B Rastogi, U Tiwari, SK Jain, DK Saraf, NK Jain

41. Artemisia annua: A Potential Antimalarial Herb ......................................................... 408
   R Jain, VK Dixit

42. Antioxidant Approach to Disease Management with Special Emphasis on Herbal Drugs ....... 421
   R Govindarajan, M Vijayakumar

43. Prevention of Intravascular Thrombosis: Research on Indian Herbs and Spices .......... 432
   WR Surin, Madhu Dikshit

44. Plumbagin—A Phytotherapeutically: Important Compound .................................... 445
   K Jayaram, MNV Prasad

45. Pterocarpus santalinus L.F. and P. marsupium Roxb.—Potential Source of Phytomedicines ..... 450
   K Padmalatha, MNV Prasad

46. Wound Healing and Herbal Drugs ............................................................................ 460
   Shahid H Ansari, Deepika Bhatt, Mohd. Masihuddin, Masih Uzzaman Khan

47. Plants for Aromatherapy and Cosmetics ................................................................... 469
   CM Govil
Herbal Drugs: A Twenty First Century Perspective

48. Herbal Remedies for Management of Parkinson's Disease ................................................................. 476
   Pratibha Luthra

49. Perspectives on Antimicrobial Activity of Natural Plant Products ................................................... 484
   MM Parida, PK Dash, P Saxena, AM Jana, PVL Rao

50. Mechanisms and Pre-clinical Efficacy of Plants in Preventing UV-induced Skin Damage:
    Current Status and Future Prospects .................................................................................................. 497
   MS Baliga

SECTION 7
Linking Traditional Medicine with Modern Medicine

51. Holistic Concepts of Research and Development of Ayurvedic Herbal Drugs
    (An evidence based Integrated Approach) .......................................................................................... 522
    GS Lavekar

52. Ayurvedo-Herbal Medicines—The Need of the Time ..................................................................... 533
    N Singh

53. Antioxidants—Natural Rejuvenators that Heal, Detoxify and Provide Nourishment ....................... 548
    S Narasimhan, R Shobana, TN Sathya

54. Spices in Daily Dietary Regimen: An Ayurvedic Perspective ............................................................ 559
    VS Chauhan

55. Ancient Indian Medicine and Medicinal Plants .................................................................................. 571
    AK Gupta, N Mishra

56. Antistress Agents (Herbs) of Indian Origin ........................................................................................ 578
    SS Abbas, N Singh

SECTION 8
Some Key Issues in Herbal Drug Research

57. Safeguarding Rights on Herbal Formulations .................................................................................... 592
    V Gulwani

58. Issues and Trends in the Management of Biological and Genetic Resources .................................... 605
    Sudhir Kochhar

59. TRIPS Compliant Indian Patents Act: Relevance for Life Sciences ............................................... 617
    Avinash Kumar

60. Herbal Drugs: Regulation Across the Globe ..................................................................................... 624
    K Kohli, GK Jain

61. GLPs and Regulatory Requirements for Pre/Non-clinical and
    Clinical Studies to Produce Standard Herbal Products .................................................................... 636
    DP Attrey

62. Pharmacopoeial Standards of Indian Systems of Medicine .............................................................. 650
    K Kohli, GK Jain

Index ..................................................................................................................................................... 661