
New Age Herbals

Brahma Singh • K. V. Peter
Editors

New Age Herbals

Resource, Quality and Pharmacognosy

 Springer

Editors

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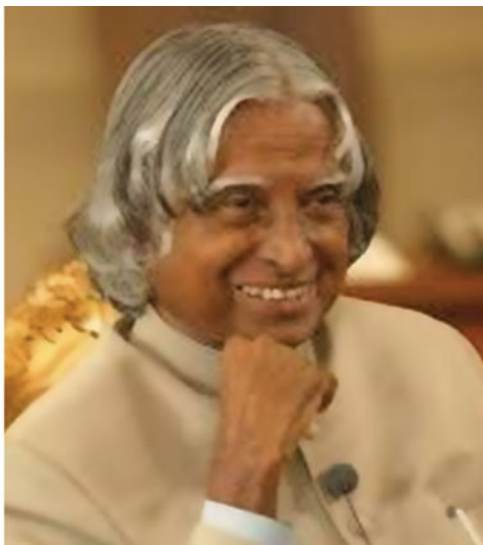
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This publication is dedicated to the 11th President of India (2002–2007) – popularly known as People’s President; former Secretary, Department of Defence Research and Development, Government of India; and Director General of Defence Research and Development Organization, New Delhi – late Dr. A.P.J. Abdul Kalam, Bharat Ratna, who had enormous interest in new age herbals.



Dr. A. P. J. Abdul Kalam

Foreword

I pleaded for “Evergreen Revolution” not only for food and nutrition security but also for a zero-hunger society free from food-related diseases and disorders like diabetes, obesity, cardiovascular diseases, the currently rampant and spreading “depression” and others. Vedic health and wellness promoting practices of ancient India given in *Sushruta Samhita* and *Charaka Samhita* have more relevance today than ever before. The World Health Organization estimates plant-based medicines cater to nearly 80% of the world population to meet the primary health requirements. Every plant in the universe – terrestrial, aquatic, marine and micro-cellular – has one or more wellness properties and uses but about 800 flowering plants, 650 lichens, 650 algae, 200 pteridophytes and 150 bryophytes are attributing medicinal properties and being used in Indian systems of medicine – Ayurveda, Unani, Siddha, Homeopathy (AYUSH), Tribal and Amchi/Tibetan. Incredible knowledge on phytomedicines is acquired in non-coded form by tribals and rural community, and the resultant “folk medicine” acquired national and international attention. “Holistic medicine” involving management of mind-body interaction, meditation, yoga, use of wellness foods – herbal tablets, capsules, syrups, nutritional formulations – and formulation of Food Safety Standards and its implementation are making visible changes in the life expectancy of people in India. Clean drinking water and hygienic standards for food and plant medicines/herbals processing are vital steps to be followed.

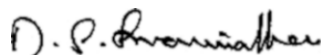
India stands 10th among the plant genetic resources rich countries encompassing 15 agro-climatic zones with a medicinal plant wealth of 15,000–20,000 and harbors two of the 25 hotspots of the world – Eastern Himalayas and Western Ghats. I am happy to note that this book covers not only the plant genetic resources on herbs but their quality aspects of raw material and processed formulations as well. Knowledge base on the use of medicinal plants and their varied formulations is deep-rooted in AYUSH systems of Indian medicine.

Modern lifestyles, kitchen-less homes, ready-to-eat foods, human migration and alien food styles are exposing people to new-age health problems. These newer problems need newer solutions. The book “New Age Herbals: Resources, Quality and Pharmacognosy” with its 21 chapters authored by the well-known, experienced and established scientists and science managers answer a few of the above queries. Noni (*Morinda citrifolia* L.) is one of such new age shrubs carrying more than

200 nutraceuticals. Its fruits, leaves and bark are used in medicine and dye industry. Sea buckthorn (Brahmphal) is another high-altitude, arid desert bush rich in pharmaceuticals and nutraceuticals. It is naturally growing in Ladakh (J&K) and Himachal Pradesh. The seabuckthorn getting global importance and attention besides being storehouse of phytomedicines is useful in checking soil and water erosion and fixing atmospheric nitrogen to enrich the soil. Similarly, other chapters on plants like *Rhodiola*, *Artemisia*, ashwagandha, Indian hawthorn (ghingharu) and medicinal mushrooms particularly *Cordyceps* along with veterinary phytomedicines covered in this book are quite informative providing potential lead for research and production of pharmaceuticals, cosmeceuticals, radioprotectors, adaptogens and nutraceuticals. The new age herbal research and development in progress in Indian scientific organizations like CSIR, ICAR and DRDO besides certain universities have been adequately covered in this book, which I consider a wise and useful compilation for the benefit of stakeholders.

I congratulate Dr Brahma Singh, Padma Shri Awardee and Former Director, Life Sciences, DRDO, New Delhi, for conceiving the idea of a book on new age herbals, for convincing experienced authors to write elaborate 21 chapters and for devoting time in editing them. I appreciate the technical and academic support given by Prof KV Peter to the Editor for a useful publication. I compliment all the authors who have put considerable time and effort to compile these informative chapters.

I also compliment Springer, Singapore, for publishing the book.



M.S. Swaminathan Research Foundation
Chennai, India

M. S. Swaminathan

Preface

It is a fact that majority of the global population depend upon herbs and herbal-based treatments for their primary health care and wellness. India has inherited one of the world's richest treasure troves of medicinal plants. The diversity of India in medicinal flora is unmatched with the presence of 16 different agro-climatic zones, 10 vegetation zones and 426 biomes. Conspicuous adverse side effects of modern drugs used in treatments of new lifestyle ailments – diabetes, cancer, cardiovascular diseases and obesity – and use of modern nano- and micro-analytical tools monitoring the chemistry and mode of action of plant molecule(s) have resulted in renewed interest and importance of herbs and medicinal plants. These advances facilitated the validation and revalidation of claims of phytomedicines mentioned in several ancient literatures or traditional systems of medicines practiced particularly in India and China like “Charaka Samhita”, “Sushruta Samhita” and later “Ayurveda”, “Siddha”, “Unani”, “SOWA-RIGPA-Amchi” (Tibetan, Bhutan), “Naturopathy”, “Yog”, “Homoeopathy” and “tribal medicine”. The interest is not only to validate claims but to find out newer medicines and molecules for treatment of several emerging diseases. The research on bio-medicine triggered further research and development on medicinal plants on a fairly large scale in India and other countries. It is an established fact that management of health problems be affordable, less cumbersome and with no side effects, wherever herbs play a major role. Human food and nutrition are major contributors to human health and wellness. The Greek philosopher Hippocrates stated, “Food is thy medicine”. Herbs and medicinal plants are now being authentically documented with empirical proof for their immunity modulation, pharmaceutical, nutraceutical, cosmeceutical, adaptation, radioprotection traits and other health-associated properties. Research and development reported and under progress on above aspects in India are compiled through contribution of chapters by scientists of repute. Some of them devoted their lifetime to research on particular aspects of certain medicinal plants.

Many questions and queries are raised on quality and availability of raw herbs and phytomedicines. This book covers the availability of quality herbs both from wild and from farmer's fields raised by adopting modern production technologies and good agriculture practices (GAP) and use of known plant variety or particular genotypes (to avoid variation in different lots of medicine). Maintenance of quality of raw materials and phytomedicines are covered in two chapters elaborately. The

21 chapters are categorized under plant resources, quality, pharmacognosy and new age herbals keeping in view the interests of practitioners, students and readers.

With the advent of intensive and inquisitive herbal research and development, extraordinary pharmaceutical, nutraceutical and other traits of underutilized and underexploited plants like sea buckthorn/brahmaphal, noni, rosewood, Indian hawthorn and sweet wormwood are being revealed. Chapters on these new medicinal plants are quite informative having several leads for further research to deal with newer health problems. Research and development on certain novel herbs in Indian science and industry's laboratories are covered in this compilation. All the stakeholders in herbal and medicinal plants would find the book informative with updated scientific knowledge. The book will be a pathfinder for disease and disorder-free world.

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Brahma Singh

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We, the editors, express our gratitude to all the authors of 21 chapters who have spent a lot of time in writing the interestingly useful chapters. We appreciate their time, patience, efforts and stringless co-operation. We are grateful to Prof. MS Swaminathan “Father of Green Revolution in India” for the Foreword.

We enjoyed working with the publisher Springer particularly Dr Madhurima Kahali, New Delhi, and Ms Reshmi Rema, Project Coordinator (books), Chennai, and impressed with their pleasant managerial dealings. We sincerely acknowledge assistance and contribution of all concerned with this publication particularly Mr Biswal Atma. Our families, especially spouses Saroj Singh and Vimala Peter, supported us in this academic venture which we thankfully acknowledge with love and affection.

Chennai, India
New Delhi, India

K. V. Peter
Brahma Singh

Contents

Introduction	1
Brahma Singh	
Part I New Age Medicinal Plants	
Research and Development on <i>Artemisia annua</i> in India	15
Ashutosh K. Shukla, Ajit K. Shasany, and Suman P. S. Khanuja	
Indian Sea Buckthorn	29
Brahma Singh	
Noni (<i>Morinda citrifolia</i> L.): Research and Development	55
P. I. Peter and K. V. Peter	
<i>Rhodiola</i>: An Overview of Phytochemistry and Pharmacological Applications	71
Pushpender Bhardwaj, Garima Bhardwaj, Rinky Raghuvanshi, Mohan Singh Thakur, Raj Kumar, and O. P. Chaurasia	
<i>Ophiocordyceps sinensis</i>: The Medicinal Caterpillar Mushroom	115
Ranjit Singh, P. S. Negi, and Sanjai K. Dwivedi	
Indian Hawthorn (<i>Pyracantha crenulata</i>)	135
Ranjit Singh, P. S. Negi, and Sanjai K. Dwivedi	
Advancement in Medicinal Mushroom Research	151
V. P. Sharma and Sudheer Kumar Annepu	
Biotechnological Strategies for Improvement of <i>Withania somnifera</i> (L.) Dunal	163
Kulwinder Kaur, Ashok Kumar Panigrahi, and Pratap Kumar Pati	
Part II Phytomedicine and Raw Herb Quality	
Quality Control of Herbal Drugs: Advancements and Challenges	189
Sharad Srivastava and Ankita Misra	

Part III Pharmacognosy

- Cultivation and Bioprospecting of Medicinal Plants** 213
Kewalanand and Brajkishor Prajapati
- High-Yielding Improved Varieties of Medicinal and Aromatic Crops for Enhanced Income** 247
J. R. Bahl, A. K. Singh, R. K. Lal, and A. K. Gupta
- Indian Plant Genetic Resources of Medicinal Value** 267
Veena Gupta
- Common Pests and Diseases of Medicinal Plants and Strategies to Manage Them** 289
T. Marimuthu, M. Suganthy, and S. Nakkeeran
- Biodiversity Conservation in Medicinal Plants and Protection of Plant Varieties and Farmers' Rights Act** 313
Rayappa R. Hanchinal, Jyoti Jaiswal, and Dinesh Kumar

Part IV New Age Uses of Herbs

- Exploring the Medicinal Value of Green Wealth with Special Reference to Neuronutrient Medhya Rasayana Plant Drugs** 331
Ram H. Singh
- Medical Radiation Countermeasures for Neuroprotection: Herbal Solutions, Evidences, and Challenges Therein** 347
Madhu Bala and Vanita Gupta
- DRDO Herbal Technologies: Military and Civil Applications** 359
Rajesh Arora
- Herbals for Animal Health and Better Production** 409
Anup Kalra, K. Ravikanth, and M. J. Saxena
- Medicinal Plants as Novel Promising Therapeutics for Neuroprotection and Neuroregeneration** 437
Gurcharan Kaur, Hardeep Kataria, and Rachana Mishra
- Phytosomes: The Novel Drug Delivery System for Phytomedicine** 455
Jubilee Purkayastha and Jayita Ghosh