

### Medicinal Plants for Holistic Health and Well-Being.

Namrita Lall (ed.). Academic Press, an Imprint of Elsevier, 125 London Wall, London EC2Y5AS, UK. 2018. xvi + 312 pages. Price: US\$ 99.95.

This book addresses in a competent manner, issues and solutions pertaining to medicinal plants and traditional medicine across the world. Many species, health problems and traditional practices discussed here are typical of the global scenario. One can identify similar species and practices in India, China, Sri Lanka and the temperate regions of the world. The book provides universally applicable perspectives for students, researchers and the pharmaceutical industry. The editor Namrita Lall (University of Pretoria, South Africa) has focused on plants and diseases perhaps interpreting holistic health and well-being as treatment by natural products instead of chemicals.

The book highlights the use of medicinal plants and their therapeutic contribution to selected health issues. The disease entities covered are skin cancer, skin ageing, acne vulgaris, macular hypomelanoma, oral care and tuberculosis. Bio-prospecting and chemical profiling have taken up majority of the pages and hence are useful for researchers working in this field.

The book provides in-depth details of the aetio pathology of the diseases covered and sufficient information regarding the reported medicinal plants for the given health conditions. The foreword by Abraham E. van Wyk (University of Pretoria, South Africa) points out the importance of this book for the global scientific community involved with natural products.

The first chapter titled 'The ancient roots of modern medicine' explains the role and relationship of traditional knowledge with modern science. It is estimated that around 3000 medicinal plants are used in South Africa. This knowledge is beginning to get acknowledged through modern scientific studies. There are no documented historical evidences on this traditional knowledge. The community of herbalists or INYANGAs are the custodians of the oral traditional knowledge.

The second chapter on the prevalence of cancer in South Africa, gives an estimate of 100,000 cases every year. The occurrence of skin cancer is very high with around 20,000 cases per year. After explaining about various types of skin cancers, the authors have given a detailed list of plants that are being used for treating them. Each piece of information given in the list is accompanied by a reference; hence further reading is possible for researchers. The authors have given sufficient importance to the role of food and nutraceuticals in the health and well-being of skin cancer patients. The reference section of this chapter is exhaustive and highlights the important role of medicinal plants as a source of anticancer drugs and as potential chemopreventive agents.

The third chapter deals with skin aging and plants. Chronological aging and photo-aging and their relationship with UV exposure are discussed. Complex biological processes such as extrinsic aging mostly due to UV exposure and intrinsic aging due to hormonal changes are well explained. The role of medicinal plants in anti-aging is explained in detail, including inhibition of elastase enzyme as a prospective anti-wrinkle treatment. A detailed reference section shows that the potential of medicinal plants is promising and one has to account for synergistic cause of aging.

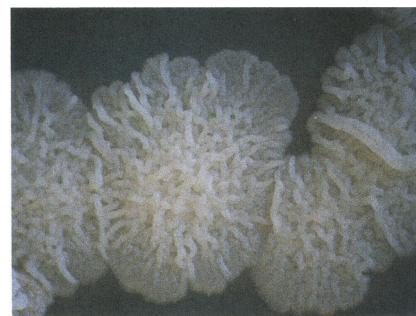
Acne vulgaris is a common chronic skin ailment affecting 85% of the population at some point in their lives. The fourth chapter provides details of disease pathogenesis, including hormonal involvement. It is interesting to note the rate of prevalence of this ailment in South Africa compared to other countries. A list of medicinal plants has been provided with their traditional use and biological activity against acne vulgaris. The role of essential oils from medicinal plants is also discussed in detail with ref-

erences. The authors suggest the need for clinical research and safety studies to make use of the full potential of South Africa's rich heritage and traditional knowledge.

Medicinal plants as an alternative treatment for progressive macular hypomelanosis (PMH) is discussed in the fifth chapter. The role of melanin and other causative factors and lesions is discussed with illustrations. The melanin transfer and related studies give a better understanding of PMH. Plant image marked as (A) is *Achyranthes aspera*, (B) is *Raphanus sativus*. In figure 5(B) is labeled as *Achyranthes aspera*, (A) is labeled as *Raphanus sativus*. This is wrong. A section on plant compounds stimulating melanin production is discussed in detail. This has explained the role of *Terpenoids*, *Phenolics* and plant hormones. This chapter has valuable bibliography listing and will be highly appreciated by researchers.

The sixth chapter deals with the role of medicinal plants in oral care. The authors have done a commendable job by including this subject as part of health and well-being. A section on periodontal diseases such as periodontitis, dental caries, and oral candidiasis provides highly informative illustrations and explanations. The report on prevalence of dental diseases is an eye-opener for health policy makers, as it shows that 80% of oral diseases remains untreated in South Africa. A section is devoted to plant products, their properties and studies carried out on important medicinal plants. There is great potential for plant-based oral products and the modern dental care industry is looking for alternatives from medicinal plant-based products.

Tuberculosis (TB) is a global problem especially in the developing countries. The seventh chapter discusses the possibilities of using medicinal plants as an



*Mycobacterium smegmatis* biofilm (Oosthuizen, 2015).

adjuvant at some level of intervention in the management of TB. A section on the pathogenesis and treatment guidelines with detailed illustrations is useful even for a common reader. It is known that the reduced immune response, co-infection, latent infection, resistance, etc. increase the mortality rate. An exhaustive list of medicinal plants tested for their antimycobacterial activity is given along with references and bibliography details for further reading. The chapter concludes by highlighting the importance of immune-stimulating and hepatoprotective activity of possible plant products. The authors have also mentioned about the need for BABS (bioprospecting, access and benefit sharing) regulations in South Africa and possible suggestions as a way forward.

The editor and her team are specialists in medicinal plants used in the treatment of superficial skin infections. The eighth chapter deals with issues of superficial skin ailments and methodologies for exploring herbal soap formulations for such ailments. After explaining various types of skin infections, the authors have mentioned the recent statistical data of disease prevalence in South Africa. In case of skin infections, data show that they range from 3.4% to 55% among Nigerians. In recent years resistance to antibiotics is a difficult challenge in treating skin infections. The widespread use of herbals is more advantageous due to their low cost, availability and convenience with less chance of resistance over a period of time when compared to antibiotics. The popular medicinal species used for skin infections are discussed in this chapter with a detailed list of references. Herbal soaps as a medium have many advantages as they are used as emulsifiers, surfactants and germicides with increased permeability. A study on 20 such herbal soaps revealed their activity against many organisms causing skin infections.

The ninth chapter on garlic as medicine is interesting as it starts with its historical importance, origin and its widespread use in many countries. The nutritional values, biological properties and research findings of the biological activities of garlic extract are given in detail with an exhaustive list of references. Emphasis is given to its antibacterial, cardiovascular, immune stimulatory properties and its role in cancer treatment. Even though the clinical signifi-

cance of garlic is well known, it is still debatable because of contradictory reports from different studies. As mentioned by the authors, the role of garlic in health care is promising and it serves as a pioneer medicinal plant in health care.

The final chapter of the book discusses how to maximize the knowledge and resource domain of medicinal plants. The authors are confident that one can improve the underestimated, underappreciated ethnomedicinal practices in South Africa and other countries. To achieve this, the following steps are suggested by them: (i) educate the global population regarding the use of plants in medicine; (ii) the use of medicinal plants stemming from ethnomedicinal origin needs to be fully understood and scientifically validated; (iii) bridge the gap between modern Western medicine and traditional medicine and (iv) develop sustainable strategies for commercialization. Researchers and students of traditional medicine and medicinal plants all over the world will surely benefit from this well-written book.

S. N. VENUGOPALAN NAIR

*The University of Trans-Disciplinary  
Health Sciences and Technology (TDU),  
No. 74/2, Jarakbande Kaval,  
Attur P.O., via Yalahanka,  
Bengaluru 560 064, India  
e-mail: venu.gopal@tdu.edu.in*

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**Annual Review of Biomedical Engineering, 2017.** Martin L. Yarmush, James S. Duncan and Martha L. Gray (eds). Annual Reviews, 4139 El Camino Way, P.O. Box 10139, Palo Alto, California 94303-0139, USA. Vol. 19. viii + 532 pages. Price: US\$ 101.

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Biomedical engineering (BME) is a collaborative field that allows integration of science, technology and engineering to solve major clinical challenges. Due to its diverse nature, it is challenging to summarize and provide an overview of the field in a single book. Hence, the editors of this volume deserve appreciation for having taken up this challenging task and coming out with a collection of reviews that provide the necessary overview of emerging biomedical engineering areas.

This volume consists of 19 articles, each providing an in-depth review of the respective field. These reviews cover several areas such as tissue regeneration, imaging/modelling techniques, cancer, biomechanics, etc. Apart from these, few reviews also focus on individual topics such as glycoaminoglycans, thrombosis, body-powered energy harvesting for medical devices, immunoengineering, etc.

Tissue regeneration is an emerging field that is now starting to make its impact in clinics. Several products in the market are being used to improve the quality of life of patients. This volume contains three articles that review this area. 'Microsphere-based scaffolds in regenerative engineering' describes how microspheres can be used to deliver drugs at a controlled rate and act as a building block for larger scaffolds. Microparticle fabrication methods and their potential applications are discussed. Another article focuses on myocardial and vascular tissue engineering. It reviews approaches with their pros and cons to induce vascularization and focuses on biologically derived scaffolds. Levin *et al.* discuss the role of bioelectricity in developmental pattern formation. This could be the key to understanding mechanisms that control large-scale shape of tissues and organs and has wide implications in clinics for regenerative medicine and for correcting birth defects.

Biomedical imaging and modelling is an area that has been most successful in translating to clinics, with several concepts and products being regularly used to diagnose and treat diseases. So, it is not surprising that four reviews are dedicated to this topic. Shen *et al.* provide an introduction of approaches to deep learning, followed by several applications like detection of anatomical and cellular structures in medical imaging. Hyder *et al.* discuss imaging brain metabolism with major focus on magnetic resonance imaging and magnetic resonance spectroscopy. These techniques allow the user to understand how the brain utilizes nutrients for growth and function and hence can be instrumental in diagnosing and treating brain disorders. Bassett *et al.* discuss the use of network science to predict complex behaviours and links of neural systems that cannot be predicted by treating them as individual elements due to interactions over large spatio-temporal space. Another chapter reviews