

FOREWORD

Diabetes is a common disorder inflicting most of the people all over the globe. As per WHO report, in 2022, nearly 830 million people are suffering from diabetes. In India, over 100 million adults are termed pre-diabetic and making it a global hotspot of diabetes. Treatment of diabetes is quite expensive especially for low and middle-income groups in India and other underdeveloped & developing countries. Treatment of diabetes is mainly through allopathic drugs leaving side effects, leading to many other complications. In this regard, the authors of this book Dr. N. N. Reddy, Dr. T. N. Shivananda and coworkers have compiled the data base of antidiabetic plants. This work is timely and needful to address the issue which is afflicting the mankind.

According to WHO report, over 80% of people worldwide depend on local herbal remedies for their main healthcare requirements. In the wake of COVID-19, individuals are increasingly turning to traditional practices and alternative therapeutic methods. In this book “Encyclopaedia of Antidiabetic Plants” the authors aimed to record specific plant species along with their descriptions and how they help in managing a significant global health issue-diabetes.

Diabetes is a prevalent metabolic disorder caused by insufficient insulin production or ineffective insulin usage. It currently affects approximately 2.8% of the global population and is projected to increase to 5.4% by 2028. In India, about 2-6% of the population suffers from diabetes or related complications. Treatments include agents that increase the amount of insulin secreted by the pancreas, increase the sensitivity of target organs to insulin, and agents that decrease the rate at which glucose is absorbed from the gastrointestinal tract. People mainly focus on insulin, insulin analogues, oral hypoglycemic agents and various other complementary and alternative medicines to control blood glucose levels in diabetes. Indian systems of medicine extensively use herbal remedies for the treatment of diabetes.

Internationally, there is a renewed interest in herbal medicines due to their perceived safety. In Unani medicine, diabetes is treated with formulations containing various plant materials. Research is going on for establishing alternative effective therapies against diabetes. The medicinal plants are playing an important role in this research as they always are exemplary source of drugs. In India many herbs are found to be useful for the management of diabetes. World Health Organization approves the use of plant drugs for different diseases including diabetes. Plants are good source of drugs and majority of drugs are derived directly or indirectly from them. From the knowledge and detailed survey of the medicinal plants we might be able to discover new drugs which are therapeutically active and cheaper. There are certain advantages of using herbs in the treatment, such as they are easily available, low side effects etc.

In this view the authors have selected a wonderful area of work by writing this book “Encyclopaedia of Antidiabetic Plants”, this book series provides detailed information on 610 plant species belonging to 415 genera comprising 272 families and their products (active and crude extracts) that have potential for treating diabetes. The book series will run into five volumes which serve as an introductory guide for upcoming research on isolating, purifying, and characterizing bioactive antidiabetic compounds found in documented plant species.

The scientific community, researchers, students and healthcare policymakers will gain valuable insights from this work, laying the groundwork for future studies and policy decisions. Although the ideal preparation of this book is to help the people or researcher to understand and overcome diabetes by using the medicinal plants. Most commonly, few numbers of enlisted plants are easily available, and some are endangered. This volume often summarize list of about some medicinal plants and then discuss in depth with a recent publication that extends the information of each plant. Additional readings of original research papers cited in this book series are an important part of the volume for researchers and typically such papers are enlisted for each plant.

The present edited book version is handy, timely and needy to cater to the needs of cross sections of the societies across the globe. I personally congratulate the authors and contributors for their attempt at writing such an informative book. At the same time, I am confident that this book will be widely accepted in the universities, colleges, research institutions, drug manufacturers and allied industries engaged in management of diabetes.



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AUTHORS

Dr. N. N. Reddy, A noted Agricultural Research Service Scientist and Country Head for Climate Change Research of Horticultural crops in India, served in various capacities at different locations in Indian Council of Agricultural Research (ICAR) for 40 years engaged in teaching, Research, Extension, Development and Industry support put together. Presently serving as Professor and Head, Dept. of Fruit Science and Medicinal & Aromatic crops, Associate Dean at Sri Krishnadevaraya College of Horticultural Sciences (SKCHS), affiliated to Dr. YSR Horticultural University at Ananthapuramu-515 002, India. An alumnus of Indian Agricultural Research Institute, (IARI) New Delhi.



Versatile in heading multidisciplinary specialized teams in Agriculture, Horticulture, Forestry, Food Technology, Agrometeorology, Engineering and Indigenous Technical Knowledge Systems (ITKS). The accomplishments include more than 170 Publications in reputed peer reviewed National and International Journals and conferences by virtue of his original work in Horticultural commodities. Recipient of fellow of Horticultural Society of India, New Delhi, International Society of Horticultural Sciences, Netherlands, Life Member of IAHS, Indian Society of Citriculture, Indian Society of Agrometeorology, Member of Bureau of Indian Standards, (BIS), New Delhi and others. Honored to serve as a Member of Drafting Committee to promulgate Good Agricultural Practices (INDIAGAP) for India in order to promote International Quality Standards in Agricultural and Horticultural Commodities for garnering Foreign Exchange to India. Bagged many awards, notable among them are “The Best Researcher” “The Best Teacher” “Innovative Researcher”. Played a pivotal role in getting “Best Institutional Innovation Award” from ICAR for outstanding contribution to research and community leadership in water budgeting and water sharing in eight districts of India. Served as member designate in various committees to bifurcate Andhra Pradesh Horticultural University into Dr Y S R Horticultural University, Tadepalligudem and Sri Konda Laxman Telangana State Horticultural University, Hyderabad. Designed new courses, taught, guided students for their masters and doctoral programmes as a part of Research, Development and Consultancy Projects. Awardee of fellowship from Overseas Development Group, to visit UK and other European Countries for analyzing Land Degradation and Sustainable Livelihood Securities in Rural Settings. Represented third world countries and presented a status paper to the FAO of UN which became instrumental in initiating a dialogue on behalf of India on World Food Security Systems. Accomplished researcher, academician, renowned speaker and a visiting professor to various Universities at home and abroad. Expert advisor and empaneled member to implement CSR projects of TATA’s and others.

Dr. T. N. Shivananda, served ICAR-Indian Institute of Horticulture Research for about 36 years and retired from service in 2021, since then serving as Professor and Head, Dept. of NRM, Sri Krishnadevaraya College of Horticultural Sciences (SKCHS),



affiliated to Dr. YSR Horticultural University at Ananthapuramu-515 002, India. Worked using ^{15}N and ^{32}P isotopes to determine nutrient use efficiency and root activity patterns in fruit crops and vegetable crops. Developed crop specific micro nutrient specials for mango, banana, citrus and vegetable crops. Collaborated with plant protection departments to develop fruit fly trap and formulations for preventing stem borers. Obtained six patents and 6 more are in pipeline. Developed and popularized formulation for white stem borer in coffee (*Coffea arabica*). Contributed significantly to develop in-situ herbal garden of RET species in ICAR-IIHR, Bengaluru. Identified two high yielding L-DOPA lines of *Mucuna pruriens* and registered at NBPGR, New Delhi. The high yielding lines were released as varieties for general cultivation especially favoring industries to isolate L- DOPA from seeds. Developed organic protocols for cultivation of medicinal crops for extraction of active principles such as *Andrographis paniculata*, *Withania somnifera* and many other medicinal crops. Also standardized procedures for cultivation and extraction of essential oils from aromatic crops such as geranium, mint and patchouli. Served as Principal Investigator for externally funded projects from DBT, DST, National Medicinal Plant Board, ICAR-Adhoc projects.

Served as head, agricultural technology information centre to create awareness and popularize the IIHR developed technologies by conducting field demonstrations in farmers fields. Guided three Ph. D students, two M. Sc students in agriculture/horticulture and eight pharmacy students; Published more than 100 research papers in national and international journals; attended more than 120 seminars, conferences, symposia, workshop to learn and update the knowledge and as well to share the information. In recognition of the services rendered in research, DST, New Delhi awarded Biotech product & process development and commercialization award in 2014 with a cash award of rupees two lakhs. Received, FAI silver jubilee award of excellence-2000 in 1992 by fertilizer association of India, New Delhi. Received Amulya 2012 award by Karnataka Science and Technology Promotion Society. Currently engaged in teaching and research.