
Handbook of 200 Medicinal Plants

Shahid Akbar

Handbook of 200 Medicinal Plants

A Comprehensive Review of Their
Traditional Medical Uses and Scientific
Justifications

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Stockton, CA, USA

ISBN 978-3-030-16806-3 ISBN 978-3-030-16807-0 (eBook)
<https://doi.org/10.1007/978-3-030-16807-0>

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Dedicated to the Scientists Exploring
Medicinal Plants

Preface

Medicinal plants have served humanity since its beginning. An overwhelming majority of the rural population of the world still relies on plant-based drugs for their healthcare needs. Earlier generations studied these plants utilizing only their keen sense of observation, and undying dedication to humanity, uncorrupted by financial considerations. With the wealth of inherited knowledge about these plants coupled with modern scientific tools, we have been able to harvest the benefits of some of these plants. However, the scientific community has barely scratched the surface of these natural wonders. Pharmacologists in the field of natural products have relied for references of medical uses of plants in Indian systems of medicine on books like *Indigenous Drugs of India* by Sir R. N. Chopra et al., *Indian Medicinal Plants* by K. R. Kirtikar and B. D. Basu, and *Indian Materia Medica* by K. M. Nadkarni. These books have served as excellent references for scientists from around the world for decades. I have also utilized these references for this book.

Interest in natural products has exponentially increased in the past few decades and pharmacological research in natural products is expanding worldwide. With modern daily life heavily influenced with science and technology, the use of medicinal plants has to keep pace, and evolve with it, especially in the mode of their utilization. Furthermore, the spiraling cost of drugs and overall healthcare is untenable, and our sincere efforts should be directed unbiased to unlock the hidden secrets of these natural and inexpensive resources to discover new prototype molecules to meet the growing healthcare challenges of our time. The worth of these plants is only realized by those who have benefitted from them, and I would like to quote here my Prof. (Late) Marvin H. Malone, who said at the VII Symposium on Pharmacognosy, held in Brussels in October 1980, “No person willingly will take an inactive drug when he or she is sick, and no human will patronize an ineffective medicine man when he or she is ill.”

Conceived more than 35 years ago in the absence of personal computers let alone Internet, obtaining credible and comprehensive information about the included plants, possible only by hand searches and limited to available resources, was a painfully slow and difficult task. However, with the advent of Internet and paid publications of the twenty-first century exploded the information available on these plants. At the time of conception of this book, international emphasis was being placed to exploit local customs and resources of the countries around the

world to meet “Health for All by the Year 2000”, the goal WHO had set in 1978. Although the self-imposed deadline passed a long time ago without achieving that noble target, there has been a resurgence of interest in medicinal plants in the twenty-first century but for different reasons, one being the interest in everything “natural”, and second the exploding cost of healthcare. Undeniably, unprecedented progress has been made in medical care over the past half a century, but at an unaffordable high cost. In 1980, after a sudden increase in healthcare cost from the previous year, the U.S. per capita expenditure on healthcare ballooned to \$1,067 that paled in comparison to a new milestone of \$10,345 reached in 2016, and still moving upward.

Selection of plants for this book was discretionary, but largely based on the extent of their use in the traditional systems of medicine of Indian subcontinent. Some of these plants have been extensively studied, while others are still waiting to be explored. The customary practice of describing medicinal properties of plants in abstract terms leaves much to be desired. For example, statement of being anti-cancer, anti-inflammatory or cardiogenic, does not provide enough information with all nuances of the nature of the past work done. In this exercise, I endeavored to provide sufficient information (where available) for each plant covered in this book, for the inquisitive mind to chart a rewarding future course of action, including the controversies in identification, variations in active constituents, and other reasons for variations in observed effects, etc. I hope that it serves the purpose for which it was conceived and worked upon.

Stockton, California, USA
November 2018

Shahid Akbar

Acknowledgments

Availability of *Pharmacographia Indica* by Dymock et al. (1890–1893), which was republished by the Hamdard National Foundation of Pakistan in 1972, was an invaluable gift to me by the (Late) Hakeem Mohammed Said (May his soul rest in Peace) of Pakistan. It provided me the information about many controversies regarding plants' names and their identities that existed in the nineteenth century and still plague this field. It also served as a good reference regarding the uses of plants in ancient Egypt, Greece, and Rome, and the Muslim era of scientific progress.

Special thanks are due to various Chairmen and staff, Department of Ilmul Advia, Faculty of Unani Medicine, A.M.U., Aligarh, India, for providing me facilities over the years, to consult references of old Unani books.

The author would like to express his indebtedness and gratitude to all those scientists, researchers and academics whose works (photographs) posted on Wikimedia have been utilized for this book.

Last but not the least, my family suffered a lot for my obsession to complete this book during the last few years, for which I owe them a great debt of gratitude.

I am also thankful to Springer Nature and its dedicated production team for making the publication of this book possible.

The author regrets the inclusion of one nonherbal drug, i.e., *Bombyx mori*.

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Abbreviations

20-MCA	20-Methylcholanthrene
3'MeDAB	3'-Methyl-4-dimethylaminoazobenzene
5-FU	5-Fluorouracil
5-HIAA	5-Hydroxyindoleacetic acid
5-HT	5-Hydroxytryptamine (Serotonin)
5-LOX	5-Lipoxygenase
6-OHDA	6-Hydroxydopamine
<i>A. actinomycetemcomitans</i>	<i>Actinobacillus actinomycetemcomitans</i> (older name)
<i>A. actinomycetemcomitans</i>	<i>Aggregatibacter actinomycetemcomitans</i> (newer name)
<i>A. aegypti</i>	<i>Aedes aegypti</i>
<i>A. baumannii</i>	<i>Acinetobacter baumannii</i>
<i>A. caviae</i>	<i>Aeromonas caviae</i>
<i>A. flavus</i>	<i>Aspergillus flavus</i>
<i>A. fumigatus</i>	<i>Aspergillus fumigatus</i>
<i>A. galli</i>	<i>Ascaridia galli</i>
<i>A. hydrophila</i>	<i>Aeromonas hydrophila</i>
<i>A. lumbricoides</i>	<i>Ascaris lumbricoides</i>
<i>A. lwoffii</i>	<i>Acinetobacter lwoffii</i>
<i>A. niger</i>	<i>Aspergillus niger</i>
<i>A. ochraceus</i>	<i>Aspergillus ochraceus</i>
<i>A. parasiticus</i>	<i>Aspergillus parasiticus</i>
<i>A. radiobacter</i>	<i>Agrobacterium radiobacter</i>
<i>A. stephensi</i>	<i>Anopheles stephensi</i>
<i>A. terreus</i>	<i>Aspergillus terreus</i>
<i>A. viscosus</i>	<i>Actinomyces viscosus</i>
AA	Arachidonic Acid
AAF	2-Acetylaminofluorine
AC	Adenylate Cyclase
ACE	Angiotensin Converting Enzyme
AChE	Acetylcholinesterase
ADH	Antidiuretic Hormone
ADHD	Attention-Deficit Hyperactivity Disorder

ADV	Adenovirus
Al	Aluminum
ALP	Alkaline Phosphatase
ALT (SGPT)	Alanine Aminotransferase (glutamate-pyruvate transaminase)
AML	Acute Myeloid Leukemia
AMPK	AMP-activated Protein Kinase
<i>An. culicifacies</i>	<i>Anopheles culicifacies</i>
<i>An. stephensi</i>	<i>Anopheles stephensi</i>
ANF	Atrial Natriuretic Factor
AOM	Azoxymethane
APAP	Acetaminophen (Paracetamol)
Apo	Apolipoprotein
ASA	Acetylsalicylic Acid
AST (SGOT)	Aspartate Aminotransferase (glutamic oxaloacetic transaminase)
AUC	Area Under the Curve
B(α)P	Benzo(α)pyrene
<i>B. atrophaeus</i>	<i>Bacillus atrophaeus</i>
<i>B. bronchiseptica</i>	<i>Bacillus bronchiseptica</i>
<i>B. cereus</i>	<i>Bacillus cereus</i>
<i>B. fragilis</i>	<i>Bacteroides fragilis</i>
<i>B. hominis</i>	<i>Blastocystis hominis</i>
<i>B. malayi</i>	<i>Buria malayi</i>
<i>B. megaterium</i>	<i>Bacillus megaterium</i>
<i>B. pahangi</i>	<i>Brugia pahangi</i>
<i>B. pantotrophus</i>	<i>Bacillus pantotrophus</i>
<i>B. pumilus</i>	<i>Bacillus pumilus</i>
<i>B. subtilis</i>	<i>Bacillus subtilis</i>
<i>B. thuringensis</i>	<i>Bacillus thuringensis</i>
BCA	Bilateral Carotid Artery
BChE	Butyrylcholinesterase
BDZ	Benzodiazepine
BMD	Bone Mineral Density
BMI	Body Mass Index
BUN	Blood Urea Nitrogen
<i>C. albicans</i>	<i>Candida albicans</i>
<i>C. butyricum</i>	<i>Clostridium butyricum</i>
<i>C. diphtheriae</i>	<i>Corynebacterium diphtheriae</i>
<i>C. dubliniensis</i>	<i>Candida dubliniensis</i>
<i>C. freundii</i>	<i>Citrobacter freundii</i>
<i>C. glabrata</i>	<i>Candida glabrata</i>
<i>C. guilliermondii</i>	<i>Candida guilliermondii</i>
<i>C. jejuni</i>	<i>Campylobacter jejuni</i>
<i>C. koseri</i>	<i>Citrobacter koseri</i>

<i>C. krusei</i>	<i>Candida krusei</i>
<i>C. lunata</i>	<i>Curvularia lunata</i>
<i>C. miyabeanus</i>	<i>Cochliobolus miyabeanus</i> (formerly <i>Helminthosporium oryzae</i>)
<i>C. neoformans</i>	<i>Cryptococcus neoformans</i>
<i>C. parapsilosis</i>	<i>Candida parapsilosis</i>
<i>C. perfringens</i>	<i>Clostridium perfringens</i>
<i>C. quinquefasciatus</i>	<i>Culex quinquefasciatus</i>
<i>C. ramosum</i>	<i>Clostridium ramosum</i>
<i>C. stellatoidea</i>	<i>Candida stellatoidea</i>
<i>C. tropicalis</i>	<i>Candida tropicalis</i>
<i>C. xerosis</i>	<i>Corynebacterium xerosis</i>
Ca	Calcium
CABG	Coronary Artery Bypass Grafting
CAD	Coronary Artery Disease
CAR	Conditioned Avoidance Response
CAT	Catalase
CCB	Calcium Channel Blocker
CCl ₄	Carbon tetrachloride
Cd	Cadmium
CHD	Coronary Heart Disease
CK	Creatine Kinase
CKD	Chronic Kidney Disease
Cl	Chloride
C _{max}	Peak Plasma Concentration
CMC	Carboxymethyl Cellulose
CMV	Cytomegalovirus
Co	Cobalt
ConA	Concanavalin A
COPD	Chronic Obstructive Pulmonary Disease
COX-1	Cyclooxygenase-1
COX-2	Cyclooxygenase-2
CP	Cyclophosphamide
Cr	Chromium
CREB	Cyclic-AMP Response Element Binding Protein
CRP	C-Reactive Protein
<i>D. pneumoniae</i>	<i>Diplococcus pneumoniae</i>
DA	Dopamine
DEN	Diethylnitrosamine
DES	Diethylstilbesterol
DHEA	Dehydroepiandrosterone
DHT	Dihydrotestosterone
DM	Diabetes Mellitus
DMBA	7,12-Dimethylbenz[α]anthracene
DMH	1,2-Dimethylhydrazine

DOPAC	3,4-Dihydroxyphenylacetic Acid
DSS	Dextran Sulfate Sodium
<i>E. aerogenes</i>	<i>Enterobacter aerogenes</i>
<i>E. carotovora</i>	<i>Erwinia carotovora</i>
<i>E. cloacae</i>	<i>Enterobacter cloacae</i>
<i>E. coli</i>	<i>Escherichia coli</i>
<i>E. faecalis</i>	<i>Enterococcus faecalis</i>
<i>E. faecium</i>	<i>Enterococcus faecium</i>
<i>E. floccosum</i>	<i>Epidermophyton floccosum</i>
<i>E. histolytica</i>	<i>Entamoeba histolytica</i>
EAC	Ehrlich Ascites Carcinoma
EE	Ethinylestradiol
EG	Ethylene glycol
EGFR	Epidermal Growth Factor Receptor
EMF	Electromagnetic Field
EO	Essential Oil
Epi	Epinephrine
EPS	Extra Pyramidal Symptoms
ER	Emergency Room
ESbetaL	Extended Spectrum beta-Lactamases
ESRD	End-Stage Renal Disease
ESWL	Extracorporeal Shock Wave Lithotripsy
ET-1	Endotheline-1
<i>F. moniliforme</i>	<i>Fusarium moniliforme</i>
<i>F. nucleatum</i>	<i>Fusobacterium nucleatum</i>
<i>F. oxysporum</i>	<i>Fusarium oxysporum</i>
<i>F. solani</i>	<i>Fusarium solani</i>
FBG	Fasting Blood Glucose
FDA	Food and Drug Administration
FFA	Free Fatty Acids
FSH	Follicle Stimulating Hormone
<i>G. candidum</i>	<i>Geotrichum candidum</i>
<i>G. duodenalis</i>	<i>Giardia duodenalis</i>
<i>G. intestinalis</i>	<i>Giardia intestinalis</i>
<i>G. lamblia</i>	<i>Giardia lamblia</i>
G-6-Pase	Glucose-6-Phosphatase
G-6-PD	Glucose-6-Phosphate Dehydrogenase
GABA	γ -AminoButyric Acid
GAD	Generalized Anxiety Disorder
GC-MS	Gas Chromatography-Mass Spectrometry
GERD	Gastroesophageal Reflux Disease
GIT	Gastrointestinal
GIAD	Glutamic Acid Decarboxylase
GLP-1	Glucagon-like Peptide 1
GLUT-4	Glucose Transporter 4

GM-CSF	Granulocyte-Macrophage-Colony Stimulating Factor
GPx	Glutathione Peroxidase
GR	Glutathione Reductase
GSH	Reduced Glutathione
GST	Glutathione-S-Transferase
GTT	Glucose Tolerance Test
<i>H. capsulatum</i>	<i>Histoplasma capsulatum</i>
<i>H. contortus</i>	<i>Haemonchus contortus</i>
<i>H. diminuta</i>	<i>Hymenolepis diminuta</i>
<i>H. ducreyi</i>	<i>Haemophilus ducreyi</i>
<i>H. influenzae</i>	<i>Haemophilus influenzae</i> ,
<i>H. nana</i>	<i>Hymenolepis nana</i>
<i>H. oryzae</i>	<i>Helminthosporium oryzae</i> (a plant pathogen)
<i>H. pylori</i>	<i>Helicobacter pylori</i>
H ⁺ K ⁺ -ATPase	Proton Pump
H ₂ O ₂	Hydrogen Peroxide
Hb	Hemoglobin
HBV	Hepatitis B Virus
HCMV	Human Cytomegalovirus
HCV	Hepatitis C Virus
HDL-C	HDL-cholesterol
HepG2	Human Hepatocellular Carcinoma Cells
HFD	High Fat Diet
HIV-1	Human Immunodeficiency Virus-1
HMA	Homeostasis Model Assessment
HMG Co-A Reductase	3-Hydroxy-3-Methylglutaryl Coenzyme A Reductase
HMPC	Committee on Herbal Medicinal Products
HPIV-2	Human Parainfluenza Virus Type 2
HPV	Human Papilloma Virus
HRMS	High Resolution Mass Spectrometry
hs-CRP	high-sensitivity C-Reactive Protein
hsp	Heat Shock Protein
HSV-1	Herpes Simplex Virus-1
HSV-2	Herpes Simplex Virus-2
HUVEC	Human Umbilical Vein Endothelial Cells
HVA	Homovanillic Acid
Hyp	Hydroxyproline
I.P.	Intraperitoneal
I.V.	Intravenous
I/R	Ischemia/Reperfusion
IBD	Inflammatory Bowel Disease
IBS	Irritable Bowel Syndrome
ICV	Intracerebroventricular
IDDM	Insulin-Dependent Diabetes Mellitus
IFN	Interferon

IHD	Ischemic Heart Disease
IL	Interleukin
INH	Isonicotinic acid Hydrazide
iNOS	Inducible Nitric Oxide Synthase
INR	International Normalized Ratio
IOP	Intraocular Pressure
ISI	Insulin Sensitivity Index
K	Potassium
<i>K. aerogenes</i>	<i>Klebsiella aerogenes</i>
<i>K. oxytoca</i>	<i>Klebsiella oxytoca</i>
<i>K. ozaenae</i>	<i>Klebsiella ozaenae</i>
<i>K. pasteurilla</i>	<i>Klebsiella pasteurilla</i>
<i>K. pneumoniae</i>	<i>Klebsiella pneumoniae</i>
<i>L. acidophilus</i>	<i>Lactobacillus acidophilus</i>
<i>L. arabinosus</i>	<i>Lactobacillus arabinosus</i>
<i>L. casei</i>	<i>Lactobacillus casei</i>
<i>L. chagasi</i>	<i>Leishmania chagasi</i>
<i>L. donovani</i>	<i>Leishmania donovani</i>
<i>L. monocytogenes</i>	<i>Listeria monocytogenes</i>
<i>L. tropica</i>	<i>Leishmania tropica</i>
LDH	Lactate Dehydrogenase
LDL-C	LDL-cholesterol
LFT	Liver Function Test
LH	Leutinizing Hormone
LHRH	Leutenizing Hormone Releasing Hormone
L-NAME	N(G)-Nitro-L-Arginine Methyl Ester
LOX	Lipoxygenase
LPO	Lipid Peroxidation
LPS	Lipopolysaccharide
LPx	Lipid Peroxide
LSD	Lysergic acid Diethylamide
LTs	Leukotrienes
<i>M. canis</i>	<i>Microsporum canis</i>
<i>M. catarrhalis</i>	<i>Moraxella catarrhalis</i>
<i>M. chelonae</i>	<i>Mycobacterium chelonae</i>
<i>M. domestica</i>	<i>Musca domestica</i>
<i>M. flavus</i>	<i>Micrococcus flavus</i>
<i>M. furfur</i>	<i>Malassezia furfur</i>
<i>M. grisea</i>	<i>Magnaporthe grisea</i>
<i>M. gypseum</i>	<i>Microsporum gypseum</i>
<i>M. hominis</i>	<i>Mycoplasma hominis</i>
<i>M. indicus</i>	<i>Mucor indicus</i>
<i>M. intracellulare</i>	<i>Mycobacterium intracellulare</i>
<i>M. luteus</i>	<i>Micrococcus luteus</i>
<i>M. morgani</i>	<i>Morganella morgani</i>

<i>M. phlei</i>	<i>Mycobacterium phlei</i>
<i>M. smegmatis</i>	<i>Mycobacterium smegmatis</i>
<i>M. tuberculosis</i>	<i>Mycobacterium tuberculosis</i>
<i>M. xenopei</i>	<i>Mycobacterium xenopei</i>
MABP	Mean Arterial Blood Pressure
MAO	Monoamine Oxidase
MAPK	Mitogen Activated Protein Kinase
MBC	Minimum Bactericidal Concentration
MCA	Middle Cerebral Artery
MCP-1	Monocyte Chemoattractant Protein-1
MCV	Mean Corpuscular Volume
MDA	Malondialdehyde
MDR	Multidrug Resistant
MES	Maximal Electro Shock
MetS	Metabolic Syndrome
Mg	Magnesium
MI	Myocardial Infarction
MIC	Minimum Inhibitory Concentration
Mn	Manganese
MNNG	N-methyl-N'-nitro-N-nitrosoguanidine
MPTP	1-Methyl-4-Phenyl-1,2,3,6-TetrahydroPyridine
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i>
MS	Multiple Sclerosis
MSG	MonoSodium Glutamate
MSSA	Methicillin-Sensitive <i>Staphylococcus. aureus</i>
MTX	Methotrexate
N/V	Nausea/Vomiting
NA	Noradrenaline
NDEA	N-Nitrosodiethylamine
NDMA	N-Nitrosodimethylamine
NE	Norepinephrine
NF- κ B	Nuclear Factor kappa B
NIDDM	Noninsulin Dependent Diabetes Mellitus
NMDA	N-methyl-D-aspartate
NO	Nitric Oxide
NSAIDs	Nonsteroidal Anti-Inflammatory Drugs
NVP	Pregnancy associated Nausea and Vomiting
<i>O. volvulus</i>	<i>Onchocerca volvulus</i>
ODC	Ornithine decarboxylase
OGTT	Oral Glucose Tolerance Tests
OVA	Ovalbumin
P	Phosphorus
<i>P. acnes</i>	<i>Propionibacterium acnes</i>
<i>P. aeruginosa</i>	<i>Pseudomonas aeruginosa</i>
<i>P. berghei</i>	<i>Plasmodium berghei</i>

<i>P. citrinum</i>	<i>Penicillium citrinum</i>
<i>P. cochleariae</i>	<i>Phaemon cochleariae</i>
<i>P. expansum</i>	<i>Penicillium expansum</i>
<i>P. falciparum</i>	<i>Plasmodium falciparum</i>
<i>P. fluorescens</i>	<i>Pseudomonas fluorescens</i>
<i>P. funiculosum</i>	<i>Penicillium funiculosum</i>
<i>P. gingivalis</i>	<i>Porphyromonas gingivalis</i>
<i>P. intermedia</i>	<i>Prevotella intermedia</i>
<i>P. islandicum</i>	<i>Penicillium islandicum</i>
<i>P. italicum</i>	<i>Penicillium italicum</i>
<i>P. melaninogenica</i>	<i>Prevotella melaninogenica</i>
<i>P. mirabilis</i>	<i>Proteus mirabilis</i>
<i>P. morganii</i>	<i>Proteus morganii</i>
<i>P. notatum</i>	<i>Penicillium notatum</i>
<i>P. posthuma</i>	<i>Pheretima posthuma</i>
<i>P. pseudomallei</i>	<i>Pseudomonas pseudomallei</i>
<i>P. purpurogenum</i>	<i>Penicillium purpurogenum</i> (a plant pathogen)
<i>P. putida</i>	<i>Pseudomonas putida</i>
<i>P. shigelloides</i>	<i>Plesiomonas shigelloides</i>
<i>P. testosteroni</i>	<i>Pseudomonas testosteroni</i>
<i>P. verrucosum</i>	<i>Penicillium verrucosum</i>
<i>P. vulgaris</i>	<i>Proteus vulgaris</i>
<i>P. yoelli nigeriensis</i>	<i>Plasmodium yoelli nigeriensis</i>
PAD	Peripheral Artery Disease
PAF	Platelet Activating Factor
PCOS	Polycystic Ovary Syndrome
PCV	Packed Cell Volume
PDA	Photodiode Array
PDE	Phosphodiesterase
PEG	PolyEthylene Glycol
PEPCK	Phosphoenolpyruvate Carboxykinase
PFK	Phosphofructokinase
PG	Prostaglandin
PGI ₂	Prostacyclin
P-gp	P-glycoprotein
PI3 Kinase	Phosphatidylinositol 3' Kinase
PK	Protein Kinase
PLA ₂	Phospholipase A ₂
PMA	Phorbol 12-Myristate 13-Acetate
PMNL	Polymorphonuclear Leucocytes
PMS	Premenstrual Syndrome
PPAR	Peroxisome Proliferator-Activated Receptors
PPAR γ	Peroxisome Proliferator Activator Receptor- γ
PRA	Plasma Renin Activity
PT	Prothrombin Time

PTSD	Post-Traumatic Stress Disorder
PTZ	Pentylentetrazol
<i>R. stolonifer</i>	<i>Rhizopus stolonifer</i>
RA	Rheumatoid Arthritis
RBCs	Red Blood Cells
RCT	Randomized, Placebo Controlled Trial
RDA	Recommended Dietary Allowance
RE System	Reticulo-endothelial System
ROS	Reactive Oxygen Species
RRT	Retroviral Reverse Transcriptase
RSV	Respiratory Syncytial Virus
RVLP	Real Visible Light Phototherapy
<i>S. agalactiae</i>	<i>Streptococcus agalactiae</i>
<i>S. albus</i>	<i>Staphylococcus albus</i>
<i>S. anginosus</i>	<i>Streptococcus anginosus</i>
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
<i>S. bovis</i>	<i>Streptococcus bovis</i>
<i>S. brevicaulis</i>	<i>Scopulariopsis brevicaulis</i>
<i>S. cerevisiae</i>	<i>Saccharomyces cerevisiae</i>
<i>S. cervi</i>	<i>Setaria cervi</i>
<i>S. enteric</i>	<i>Salmonella enteric</i>
<i>S. enteritidis</i>	<i>Salmonella enteritidis</i>
<i>S. epidermidis</i>	<i>Staphylococcus epidermidis</i>
<i>S. epidermis</i>	<i>Streptococcus epidermis</i>
<i>S. faecalis</i>	<i>Streptococcus faecalis</i>
<i>S. haematobium</i>	<i>Schistosoma haematobium</i>
<i>S. haemolyticus</i>	<i>Streptococcus haemolyticus</i>
<i>S. mansoni</i>	<i>Schistosoma mansoni</i>
<i>S. marcescens</i>	<i>Serratia marcescens</i>
<i>S. mutans</i>	<i>Streptococcus mutans</i>
<i>S. paratyphi</i>	<i>Salmonella paratyphi</i>
<i>S. pneumoniae</i>	<i>Streptococcus pneumoniae</i>
<i>S. pyogenes</i>	<i>Streptococcus pyogenes</i>
<i>S. salivarius</i>	<i>Streptococcus salivarius</i>
<i>S. sanguis</i>	<i>Streptococcus sanguis</i>
<i>S. schenckii</i>	<i>Sporothrix schenckii</i>
<i>S. sobrinus</i>	<i>Streptococcus sobrinus</i>
<i>S. stercoralis</i>	<i>Strongyloides stercoralis</i>
<i>S. thermophilus</i>	<i>Streptococcus thermophilus</i>
<i>S. typhi</i>	<i>Salmonella typhi</i>
<i>S. typhimurium</i>	<i>Salmonella typhimurium</i>
<i>S. velterans</i>	<i>Salmonella velterans</i>
<i>Sh. boydii</i>	<i>Shigella boydii</i>
<i>Sh. dysenteriae</i>	<i>Shigella dysenteriae</i>
<i>Sh. flexneri</i>	<i>Shigella flexneri</i>

<i>Sh. paradysenterica</i>	<i>Shigella paradysenterica</i>
<i>Sh. sonnei</i>	<i>Shigella sonnei</i>
SCCD	Supercritical Carbon Dioxide
SHR	Spontaneously Hypertensive Rats
SOD	Superoxide Dismutase
<i>T. asahii</i>	<i>Trichosporon asahii</i>
<i>T. brucei rhodesiense</i>	<i>Trypanosoma brucei rhodesiense</i>
<i>T. cruzi</i>	<i>Trypanosoma cruzi</i>
<i>T. cutaneum</i>	<i>Trichosporon cutaneum</i>
<i>T. erinacei</i>	<i>Trichophyton erinacei</i>
<i>T. gondii</i>	<i>Toxoplasma gondii</i>
<i>T. longifusus</i>	<i>Trichophyton longifusus</i>
<i>T. mentagrophytes</i>	<i>Trichophyton mentagrophytes</i>
<i>T. ovoides</i>	<i>Trichosporon ovoides</i>
<i>T. rubrum</i>	<i>Trichophyton rubrum</i>
<i>T. simii</i>	<i>Trichophyton simii</i>
<i>T. soudanense</i>	<i>Trichophyton soudanense</i>
<i>T. tonsurans</i>	<i>Trichophyton tonsurans</i>
<i>T. tubifex</i>	<i>Tubifex tubifex</i>
<i>T. vaginalis</i>	<i>Trichomonas vaginalis</i>
<i>T. verrucosum</i>	<i>Trichophyton verrucosum</i>
<i>T. violaceum</i>	<i>Trichophyton violaceum</i>
T1DM	Type 1 Diabetes Mellitus
T2DM	Type 2 Diabetes Mellitus
T3	Triiodothyronine
T4	Thyroxine
TAS	Total Antioxidant Status
TBARS	Thiobarbituric Acid Reactive Substances
t-BHP	tert-Butyl Hydroperoxide
TC	Total Cholesterol
TCM	Traditional Chinese Medicine
TGF- β	Transforming Growth Factor- β
TGs	Triglycerides
TLC	Thin Layer Chromatography
TNBSA	Trinitrobenzene Sulfonic Acid
TNF α	Tumor Necrosis Factor α
TPA	12, O-Tetradecanoylphorbol-13-Acetate
t-PA	Tissue Plasminogen Activator
TX	Thromboxane
Tx	Treatment
URTI	Upper Respiratory Tract Infection
UTI	Urinary Tract Infection
<i>V. cholerae</i>	<i>Vibrio cholerae</i>
<i>V. mimicus</i>	<i>Vibrio mimicus</i>
<i>V. parahaemolyticus</i>	<i>Vibrio parahaemolyticus</i>

VEGF	Vascular Endothelial Growth Factor
VLDL	Very Low-Density Lipoprotein
VZV	Varicella-Zoster Virus
WBCs	White Blood Cells
XDH	Xanthine Dehydrogenase
XO	Xanthine Oxidase
<i>Y. enterocolitica</i>	<i>Yersinia enterocolitica</i>
Zn	Zinc

Vernaculars Abbreviations

Indian Languages

Ben.	Bengali
Guj.	Gujarati
Hin.	Hindi
Mal.	Malayalam
Mar.	Marathi
Ori.	Orissa
San.	Sanskrit
Tam.	Tamil
Tel.	Telugu
Urd.	Urdu

Foreign Languages

Alb.	Albanian
Alg.	Algerian
Ara.	Arabic
Ber.	Berber
Bul.	Bulgarian
Bur.	Burmese
Chi.	Chinese
Cro.	Croatian
Cze.	Czech
Dan.	Danish
Dut.	Dutch
E&W Ind.	East and West Indies
Eng.	English
Fin.	Finnish
Fre.	French

Gab.	Gabon
Ger.	German
Gre.	Greek
Haw.	Hawaiian
Hun.	Hungarian
Ind.	Indonesian
Ita.	Italian
Jap.	Japanese
Jav.	Javanese
Kor.	Korean
Lao.	Laotian
Lat.	Latin
Maly.	Malay
Mex.	Mexican
Mor.	Moroccan
Nep.	Nepalese
Nig.	Nigerian
Nor.	Norwegian
Per.	Persian
Pol.	Polish
Por.	Portuguese
Rom.	Roman
Rus.	Russian
Sen.	Senegal
Sin.	Sinhalese (Sri Lanka)
Spa.	Spanish
Sud.	Sudanese
Swa.	Swahili
Swe.	Swedish
Syr.	Syrian
Tag.	Tagalog (The Philippines)
Tha.	Thai
Tur.	Turkish
Vie.	Vietnamese
Zul.	Zulu