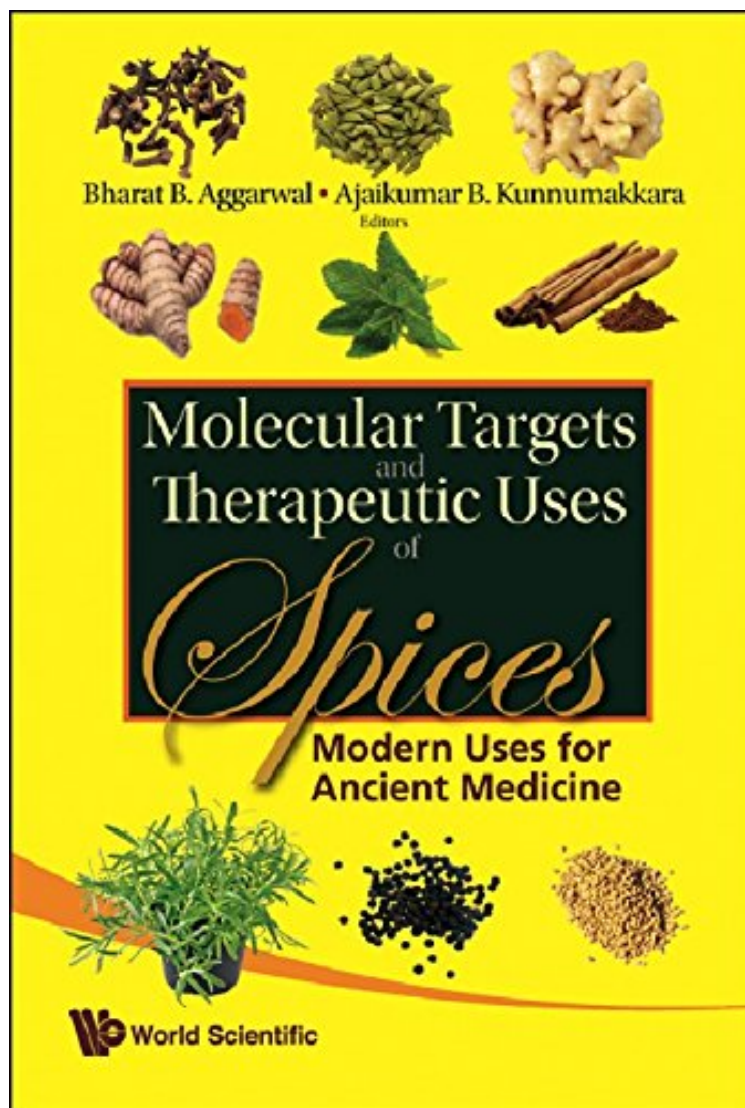


Molecular Targets and Therapeutic Uses of Spices: Modern Uses for Ancient Medicine

Bharat B. Aggarwal, Ajaikumar B. Kunnumakkara
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students to scientists

By Jessie Woodring
Published in 2009, *Molecular Targets and Therapeutic Uses for Spices: Modern Uses for Ancient Medicine* contains an effective synopsis of hundreds of years of traditional medicine as well as more recent research on spices. Although the book itself was compiled and edited by Dr. Bhata B. Aggarwal and Dr. Ajaikumar B Kunnumakkara, it represents work from numerous sources originating in labs all over the world, pulling them together into a comprehensive resource for any who are studying the molecular value of spices. The editors are both accomplished in their fields. Dr. Aggarwal is a Professor of Medicine, Immunology, Biochemistry, Experimental Therapeutics, and Chief of Cytokine Research laboratory at the University of Texas M. D. Anderson Cancer Center in Houston. He has been listed as one of the worlds most highly cited scientists. The primary focus of his work is research into the role of inflammatory pathways in tumorigenesis and their transformation by natural products including dietary agents, spices, traditional Chinese medicine, and Ayurvedic medicine. Dr. Kunnumakkara is also involved in the cancer research field, working at the Signal Transduction Section of the Medical Oncology Branch at the National Cancer Institute in Bethesda, USA. He holds a PhD in biochemistry from the University of Calicut in Kerala. Dr. Kunnumakkaras focus is to identify safe, efficacious, and affordable anti-inflammatory, antitumor, and antimetastatic compounds from natural sources and develop different in vivo models for biomedical research. Despite the highly scientific nature of this book, it remains readable for a range of levels, and has the potential to be valuable to a large continuum of readers. Part of the text at the beginning is written for general comprehension, including diagrams and charts that are effective in pulling the whole thing together. The later chapters of the book flesh out the overview and consequently are dense with specific chemical and biological terms and abbreviations. For that reason the book is not only useful to scientists, clinicians, herbalogists, naturopaths, but also those that may not come from a science background but who use the products themselves. Chapter 1 is an overview of the traditional uses of spices. It includes the history, country of origin, alternate and scientific names, physical description, and all past and present traditions for how the spice has been used in medicine and homeopathy. It provides an introduction to black pepper, cardamom, cinnamon, cloves, coriander, fenugreek, garlic, ginger, kalonji, kokum, capsaicin, rosemary, mint, and turmeric. Chapters 2-15 typically supply more background information on the history of each spice of interest, provides pictures for reference, and then explores the chemical constituents based on the research that has been done, ending with a conclusion and discussion of the molecular targets of the active molecule in the spice. Chapter 2 focuses on black pepper (*Piper nigrum*) and its bioactive compound, piperine. Chapter 3 is about cardamom and its active constituent, 1,8-cineole. Chapter 4 talks about molecular targets and health benefits of cinnamon. It outlines that compounds in cinnamon have been proven to improve the function of insulin in the body as well as work as antioxidants. Chapter 5 is about cloves and their active compounds: eugenol 1 and isoeugenol 2. This chapter is organic chemistry-heavy, with explanations and drawing of phenol radical attacks, chemical hardness, and phenolic O-H bond dissociation enthalpy. Chapter 6 focuses on coriander, specifically the bioactive constituents of it, how it is used in cooking, and its therapeutic uses as a number of helpful supplements such as an anti-oxidant, anti-inflammatory, antimutagenic, and diuretic. Chapter 7 is about a plant called fenugreek whose active component is a steroid called diosgenin. The chapter is very biological in nature and in topic, with sections that talk about metabolic diseases and fenugreek combats, as well as cancer, in vivo and in vitro studies, and cell growth. Chapter 8 is about the diallyl sulfide in garlic and a large part of the history and background section of the chapter is about the chemistry of garlic and the way that it can be modified and used in anticancer drugs. Chapter 9 focuses on ginger, specifically its widespread use against a wide range of cancers among many other positive medical uses. Chapter 10 is about kalonji, which is the origin of the *Nigella sativa* oil, and its many anticancer effects. Chapter 11 is about kokum (garcinol). Chapter 12 is about capsaicin, a hot spice found in peppers used in the chemoprevention of cancer. Chapter 13 is about rosemary (rosmarinic acid). I would recommend this book first and foremost to researchers, whether professional or undergraduate, as a good place to start when approaching research on the medicinal properties of spices. It is a good resource for those who are interested in natural medicine, as well as being of interest to those who are studying the active constituents and molecular targets of natural products.

Most therapeutics available today are highly toxic, very expensive and exhibit minimum efficacy. The issue of toxicity is even more critical for prevention than for therapy because the former involves normal subjects. Thus, therapeutics that are safe and affordable are needed for both prevention and therapy. Spices of Southeast Asian origin, once employed for taste, appearance and preservation of food, now appear to have therapeutic value for humans. What the active principles in these spices are and how they mediate their effect against various diseases are beginning to emerge from extensive research carried out within the last half-century. The current monograph is an attempt to address the active constituents, their molecular targets and the therapeutic uses of these spices.