

Chapter 32

Role of Spices Beyond a Flavouring Agent: The Antioxidant and Medicinal Properties

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ABSTRACT

Plants, principally spices and herbs, have been given much more attention because they are considered important for flavoring and coloring foods and their use as condiments. Herbs and spices have been used for generations by humans as food and also to treat ailments since they are full of medicinal and antioxidant properties and contain bioactive compounds like tannins, alkaloids, phenolics, flavonoids, polyphenols, and vitamins, which help in healing diseases. Spices and herbs contain biomolecules that play a crucial role in healthcare and fitness levels. Spices and herbs have been considered as esoteric food adjuncts as they play numerous roles like being coloring agents, flavoring agents, preservatives, food additives, and having uses in the medicinal and pharmaceutical industries.

DOI: 10.4018/978-1-6684-3546-5.ch032

INTRODUCTION

Since ancient eras, spices and herbs have been known to play a vital role in the lifestyle of human beings. Herbs, as well as spices, are seasonings derived from plants and used for different purposes. The terms 'herbs' and 'spices' are two sides of the same coin, or often used interchangeably, but they are defined sparsely. Herbs store flavor components in their leaves, whereas spices store in their seeds, bark, and root. A spice may be any part of the plant such as bud (clove), bark (cinnamon), root (ginger), aromatic seed (cumin), and flower stigma (saffron) of a plant. Among the whole world, India is rich in herbs and spices and has been recognized as a country for spices and traditional medicine; that is having a wide range of physiological and pharmacological properties. Being a biodiversity-rich country, in India, there is extensive use of spices and herbs. It was observed that the consumption of these food additives is found to be doubled between 1970 and 2005, and among them, the use of garlic has increased more than six-fold (USDA ERS, 2011).

Spices are esoteric food adjuncts that have been known for thousands of years which enhance the sensory quality of food. The quantity and variety consumed in tropical countries is particularly extensive. These spices impart uniquely characteristic flavors, aromas, or piquancy and colors to foods. Apart from their role in flavoring, spices often are used for preservation, medicinally, pharmaceutically, and for health maintenance purposes (Opara and Chohan, 2014).

Besides being ornamental in food quality and aiding as a source of basic nutritional requirements, spices are beneficial for therapeutic diseases (Lobo et al., 2010). They have several bioactive compounds that behave as antioxidants and have antimicrobial, pharmaceutical, and nutritional properties. The bioactive molecules, including secondary metabolites secreted by plants, possess a distinct pharmacological property and are also involved in defense against stress (Newman and Cragg, 2012). This plant constituent is known to function against repellents and pathogens called allelochemicals, and several active compounds like flavanols, tocopherols, geraniolthymol, carvacrol, and benzoic acid which are major antibacterial and antifungal compounds. (Adeyemi, 2011). Currently, studies focused enormously on the medicinal and nutritional properties of spices. They are a potential source of bioactive compounds such as polyphenols, antioxidants, and essential oils, and antimicrobial chemicals that can deal with the current situation of stress, depression, hormonal imbalance, and metabolic disorders that are common issues in today's lifestyle. A bioactive molecule like polyphenols from ginger (*Zingiber officinale*) and turmeric (*Curcuma longa* L.) both display anti-inflammatory, anti-cancerous, and radical scavenging properties (Scalbert and Williamson, 2000). Antioxidants from turmeric, curcumin, clove, eugenol, and red pepper capsaicin control oxidative stress in cells due to their antioxidant properties and they scavenge the oxygen radicals in aerobic metabolism that interferes with signal transduction pathways (Rubió et al., 2013; Srinivasan, 2014). These metabolites play a constructive role in treating chronic disorders such as cancer, diabetes, and diseases associated with respiratory and cardiovascular problems (Kaefer and Milner, 2011). Here this chapter deals with the role of spices in flavoring, nutritional, medicinal, and pharmacological aspects. Their potential role in traditional systems of medicine for combating chronic diseases is also discussed.

Traditional Uses of Spices

Traditionally, spices are a part of our diet and have been almost requisite in the culinary art of flavoring foods since ancient times. Spices, whether in fragmented or pounded form, are aromatic vegetable sub-

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