

FUNCTIONAL AND MEDICINAL PROPERTIES OF SESAME AND GARLIC MIX: A SHORT REVIEW

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Abstract

Sesame seeds are actually one of the major ancient foods on Earth. Indeed, sesame plants are the aged acknowledged plant species to be developed largely for their seeds and oils rather than for their leaves, fruits or vegetables. Several researches have ascertained an association between functional components of food, health and well-being. Hypertension and atherosclerosis are primarily responsible for cardiovascular diseases globally. Drug treatment alone might not be adequate enough for treatment of either the hypertension or atherosclerosis without the involvement of any dietary management. Therefore sesame and garlic mix become an integral part in course of the cardiovascular disease therapy. Thus, this review distinctively acknowledges the functional components of sesame and garlic mixes which can be effective in the treatment and prevention of diseases. They act concurrently at various or similar target sites with the prospective to impart physiological benefits and promotion of well being including reducing the risk of cardiovascular disease, osteoporosis and other chronic degenerative diseases by lowering of blood cholesterol as well as neutralization of reactive oxygen species and charged radicals.

Keywords: Sesame seeds, Garlic, Cardiovascular diseases, reactive oxygen species.

Introduction

High blood pressure or hypertension is the primitively widespread public health problem and often relegated to as a silent killer. The word hypertension itself entails a disorder instigated by tension or stress. Victor et al., (2001) described hypertension as systolic pressure greater than 120mmHg and diastolic pressure greater than 80mmHg. Hypertension is main imperative risk factor for chronic disease burden in India. Studies from diverse parts of India have described high prevalence of hypertension (Lopez et al.,

2006). High blood pressure (BP) is positioned as the third chief significant risk factor for ascribed burden of disease in south Asia (2010) (Lim& Lancet 2012). Hypertension (HTN) exercises a considerable public health burden on cardiovascular health status and healthcare systems in India (Leeder et al., 2004 and Srinath et al., 2005). HTN is unswervingly accountable for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India (Gupta 2004). The WHO rates HTN as the primarily responsible causes of premature death worldwide (Mackay et al., 2004) .

Hypertension and atherosclerosis are the significant causes behind any cardiovascular diseases (Israili ZH et al., 2007). Recognizably, diet participates a crucial role in their improvement (Wilson et al., 2003). Indirectly pharmacological remediation alone is proven to be unsatisfactory, therefore a dietary intervention is considered very essential for complete treatment (Pessina AC et al., 1996). The chronic features of this disease involve continuation of the treatment which could result in a greater costs as well as providing unwanted side effects. Thus, to lessen the cost and side effects it is often sensible to peek for an alternative path of remediation.

Prevalence of Hypertension:

William et al., (1983) reported that numerously 65 percent of the aged population who had the first stroke had an earlier history of Hypertension. High blood pressure has been recognized as one of the chief menace factor (Miyai N et al., 2002). Kaur M (2012) conducted a study on the predominance of hypertension. (criteria: greater than 160/95 mmHg). In rural Kerala at the period of 1991 in the midst the 20 plus age group prevalence was found to be 18% and studies of Lewington et al., (2002) on aged group the prevalence of hypertension was also high. Kalavathy et al., (2000) performed study in 357 communities where elderly individuals inhabited (191 women, 166 men: mean age 10 years) in Kerala and described that over all predominance of hypertension was 51.8 percent.

A shocking alarm in HTN anticipated by Global Burden of Hypertension 2005 study by Kearney PM et al., (2005) the GBD 2011 study and WHO 2010 NCD India specific data displayed a gloomy image for the 17.8% of the world's population who inhabit in India. Earlier, a systematic review and pilot study on the prevalence of HTN in India were published between 1969 and July 2011 which reported a range between 13.9 to 46.3% and 4.5 to 58.8% in urban as well as the rural areas of India, respectively (Devi P et al., 2013). The regional disparity (between urban and rural) reported in prevalence of HTN are also been noticed in cardiovascular diseases.

Classification of Hypertension:

IZZO et al., (2000) reported about the hypertension and blood pressure. The joint National committee proposes a crucial criteria for diagnosis, staging and therapeutic management of hypertension,

especially in middle aged and elderly American. According to Debra Wood (2007), High blood pressure generally does not produce symptoms and that's why it might go undiagnosed but the organs and tissues can be damaged without any symptoms. The common symptoms are Headache, dizziness, blurry or double vision, abdominal pain, chest pain and shortness of breath.

CATEGORY	SYSTOLIC (mmHg)	DIASTOLIC (mm Hg)
Optimal	<120	<80
Normal	<130	285
High-normal	130-139	35-89
Hypertension stage-I	140-159	90-99
Hypertension stage-II	160-179	100-109
Hypertension stage-III	≥ 180	≥ 110

Source: Joint National Committee (2003) Clinical Foundation

Role of Diet in Hypertension:

Diet can be prevailing approach to combat hypertension. Consuming a diet rich in micronutrients and macronutrients as well as vitamins, proteins and dietary fibres was as close to the diet utilized in the Dietary Approaches to stop hypertension (DASH) clinical trial would be great first line defense (Robert Pasture, 1991).

Table:2 Nutrient content of Sesame seeds

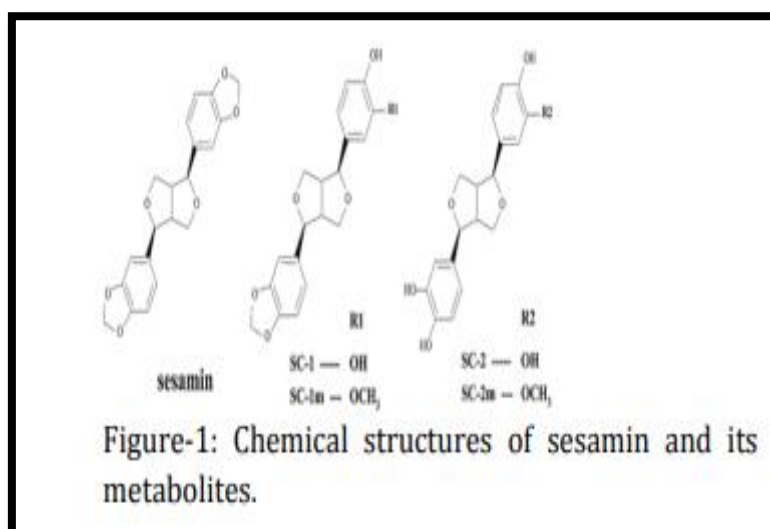
Sesame Seeds, dried 0.25 cup 36.00 grams		Calories: 206 GI: very low		
Nutrient	Amount	DRI/DV (%)	Nutrient Density	World's Healthiest Foods Rating
copper	1.47 mg	163	14.3	excellent
manganese	0.89 mg	39	3.4	very good
calcium	351.00 mg	35	3.1	good
phosphorus	226.44 mg	32	2.8	good
magnesium	126.36 mg	30	2.6	good
iron	5.24 mg	29	2.5	good
zinc	2.79 mg	25	2.2	good
molybdenum	10.62 mcg	24	2.1	good
vitamin B1	0.28 mg	23	2.0	good
selenium	12.38 mcg	23	2.0	good

Phytosterols are compounds recovered from plants which have a chemical structure very analogous to cholesterol, and when existing in the diet in wholesome amounts, are assumed to reduce blood levels of cholesterol and augment the immune response and diminish the risk of certain cancers. Cirag (1997) described in his study that consuming a diet affluent in plant foods will provide abundance of phenolic compounds, terpenoids, pigments and other natural antioxidants which have been associated with protection from / or treatment of chronic diseases such as heart disease, cancer, diabetes and hypertension.

Effect of Sesame seeds and Garlic on Hypertension:

In accordance to Gupta R et al., (2012), a study was carried out to illustrate the antihypertensive effect of garlic which comprises of single or multiple doses of 0.5 ml of aqueous extract of garlic which were given orally to rats. The study of the data revealed that the single dose of garlic is used as a maximum antihypertensive effect after administration. Historically there has been larger interest in comprehending the role of garlic in the reduction of cardiovascular associated risk factors (Rahman, 2000).

Chemical structure of Sesamin and its metabolites:



Sesamin can impede Δ -5 desaturase activity of N-6 fatty acids that ends in the building up of dihomo- γ -linolenic acid (DGLA) in the plasma membrane in the position of arachidonic acid thereby dwindling the production of proinflammatory mediators (Hirose N 1991 and Hirata F 1996). It also augments the gathering of eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) into the cell membrane involving vascular endothelium. Thereby reducing the in-vivo PGE2 production and declining the possibility of further proinflammatory conditions.

Chemical Composition of Garlic and other Spices:

The antioxidant activity of spices is mostly associated to their chemical composition; chiefly due to the existence of polyphenolic and other biologically active compounds. Table-3 lists important antioxidants and the biologically active compounds found in spices and it include flavonoids, phenolic acids, lignans, essential oils, and alkaloids, as recapitulated from various publications (AllwynSundarRaj 2014). These compounds were mostly determined by chromatographic methods.

Table-3: Chemical constituents of different spices and Garlic

Spices and Herbs	Important Chemical Constituents
Cloves	Eugenol, isoeugenol, acetyleugenol, sesquiterpene, pinene, vanillin, gallic acid, flavonoids, phenolic acids
Cinnamon	Eugenol, limonene, terpineol, catechins, proanthocyanidins, tannins, linalool, safrole, pinene, methyleugenol, benzaldehyde
Cardamon	Limonene, 1,8-cineole, terpinolene, myrcene, caffeic acid, quercetin, kaempferol, luteolin, pelargonidin
Coriander	Linalool, borneol, geraniol, terpineol, cumene, pinene, terpinene, quercetin, kaempferol, caffeic, ferulic, <i>n</i> -coumaric and vanillic acids, rutin, tocopherols, pyrogallol
Saffron	Crocins (water soluble carotenoids), safranal, flavonoids, gallic, caffeic, ferulic, <i>n</i> -catechuic, syringic, salicylic, and vanillic acids
Turmeric	Curcumins, essential oils, eugenol, carotene, ascorbic acid, caffeic, <i>p</i> -coumaric, protocatechuic, syringic, vanillic acid
Ginger	Gingerol, turmeric, paradol, geraniol, borneol, linalool, camphene, zingerol, zingiberon

Fenugreek	Sesquiterpenes, aromatic aldehydes, terpenes
Black pepper	Piperine, pinene, camphene, limonene, terpenes, piperidine, isoquercetin, sarmentine
Oregano	Apigenin, quercetin, luteolin, myricetin, diosmetin, eriodictyol, carvacrol, thymol, rosmarinic, caffeic, <i>p</i> -coumaric, protocatechuic acid
Basil	Apigenin, catechins, quercetin, rutin, kaempferol, anthocyanins, eugenol, limonene, terpinene, carvacrol, geraniol, menthol, safrole, tannins, ursolic, <i>p</i> -coumaric, rosmarinic acids
Bay leaf	1,8-cineole, cinnamtannin
Dill	Quercetin, kaempferol, myricetin, catechins, isorhamnetin, carvone, limonene
Garlic	Allicin, diallyl sulfide, diallyl disulfide, diallyl trisulfide, allyl isothiocyanate, <i>S</i> -allyl cysteine

CONCLUSION

Based on the several reviewed literature, we recognized that spices not only augment the flavor, aroma, and color of food and beverages, but they can also safe guard individuals from acute and chronic diseases, due to their greater antioxidant activity. Hence this review represents abundant data on the antioxidant activities of spices as well as information related to their content of flavonoids and total polyphenols. Several of the antioxidants contained in spices have crucially high biological activities and are significantly used in preclinical, clinical, and therapeutic trials investigating new remediation of diseases. It is possible that new spice-based drugs might also be developed. On the whole it can be concluded that the sesame and garlic spicy mix have much medicinal importance and can be used effectively in the reduction of blood pressure and hypertension as well as subsequently blood cholesterol levels and thereby prevent cardiovascular diseases.

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Competing interests

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

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