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RESEARCH ARTICLE

ANTIOXIDANTS EFFECT ON HERBS

***Pidaran Murugan**

Principal, Department of Biochemistry, Faculty of Science, Bharathidhasn University Model College, Vedharanyam-614810, Tamil Nadu, India. E mail: manomuruganphd@gmail.com

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ABSTRACT

The body's trillion or so cells face formidable threats, from lack of food to infection with a virus. Another constant threat comes from chemicals called free radicals. In very high levels, they are capable of damaging cells and genetic material. The body generates free radicals as the inevitable byproducts of turning food into energy. Free radicals are also formed after exercising or exposure to cigarette smoke, air pollution, and sunlight. Antioxidant-the word itself is magic. Using the antioxidant concept as a spearhead in proposed mechanisms for staving off so-called "free-radical" reactions, the rush is on to mine claims for the latest and most effective combination of free-radical scavenging compounds. The antioxidants in spices and herbs are very effective because they possess excellent antioxidant activity. The spices and herbs have been used as antioxidants as whole or ground spice/herb, extracts, encapsulated or as emulsions. Aside from their efficacy as antioxidants, spices and herbs are classified as all natural, an attractive quality for consumers. However, more recently, herbs and spices have been identified as sources of various phytochemicals, many of which possess powerful antioxidant activity. Thus, herbs and spices may have a role in antioxidant defense and redox signaling.

Key words: Antioxidants, Vitamins, Phytochemicals.

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INTRODUCTION

Antioxidants are substances that prevent oxidation of other compounds. One of the classic definitions of oxidation is combination of an element or compound with oxygen, hence the term oxidation. In recent years, we've been hearing a whole lot about antioxidants, chemicals that neutralize harmful free radicals in our bodies. Free radicals are highly charged oxygen molecules (having either one too many or too few electrons) that are formed mainly as a natural byproduct of breathing, but also from exposure to food additives and pesticides, UV light, cigarette smoke, exhaust fumes, and chemical pollutants. Not satisfied in their unstable state, free radicals roam the body, stealing mates for their unpaired electrons from unsuspecting cells (Abdalla, 2009). These biomolecular bandits have so far been linked to dozens of illnesses, including cancer, arteriosclerosis, and arthritis, as well as to premature aging. Widely touted as "fountains of youth," antioxidants provide the best defense against these scavengers — either by blocking their production or by serving as biochemical kamikazes, allowing themselves to be ransacked by free radicals in place of healthy cells (Bashir et al., 2004). Vitamins A, C, and E, along with beta carotene (a precursor to vitamin A), are the best-known antioxidants.

***Corresponding author: Pidaran Murugan,**
Principal, Department of Biochemistry, Faculty of Science, Bharathidhasn University Model College, Vedharanyam-614810, Tamil Nadu, India. E mail : manomuruganphd@gmail.com

But none of these make their way often enough (and in sufficient quantities) into the Western diet, which tends to be heavy on fats and carbs and low on antioxidant-rich fruits, veggies, nuts, and seeds. Indeed, it is estimated that less than 10% of Americans regularly consume five fruits or vegetables daily, the National Cancer Institute's recommended minimum (Cody, 1986). Of course, supplements are always an option, and in recent years both C and E have become bestsellers for vitamin retailers nationwide. (Vitamin A can be harmful in very high doses, and so folks tend to steer clear of this one in supplement form).

DISCUSSION

Herbs, like basil, are the leaves of a plant, while spices, like cinnamon, are usually made from the seeds, berries, bark, or roots of a plant. Both are used to flavor food, but research shows they're chock-full of healthy compounds and may have health benefits. Cinnamon is an ancient spice tracing back 4000+ years to the Egyptian pharos. It has been mentioned in the Bible and well documented for its healing abilities. Cinnamon's unique smell and taste comes from essential oils containing a wide range of active ingredients. If most superfoods have one or two main "go-to" antioxidants, cinnamon has a small army, each one ready for a ferocious oxidative stress battle that tops ORAC value to 131,420 (Brieger et al., 2012).

Cinnamon contains numerous flavonoids like eugenol, quercetin, gnapthol, oroxindin, hypolaetin, hesperidin, gossypin, hibifolin, cinnamtannin B1 and cinnamaldehyde to name a few. Together these compounds fight bacteria, balance hormones, improve liver function along with blood pressure and all types of metabolic conditions. Cinnamon shown to reduce inflammation in every tested tissue, inhibit cancers while improving circulation, brain health and immunity (Dhanushka Gunawardena et al., 2015). Cinnamon shows great promise against neurodegenerative diseases such as Alzheimers and Parkinson's by increasing neuro-protective proteins inside CNS and nerve cells (Saurabh Khasnavis and Kalipada Pahan). "Herbs and spices fight inflammation and reduce damage to your body's cells," Moreno says. "That's because each one is rich in phytochemicals, which are healthful plant chemicals." Turmeric, the spice that gives curry its characteristic yellow color, is another popular Ayurvedic remedy. Curcumin, its main active compound, has powerful antioxidant and anti-inflammatory properties. A plant-based diet protects against chronic oxidative stress-related diseases. Dietary plants contain variable chemical families and amounts of antioxidants. It has been hypothesized that plant antioxidants may contribute to the beneficial health effects of dietary plants.

Basil is an excellent source of vitamin K, manganese, iron, vitamin A, and vitamin C. It's also a good source of calcium, magnesium, and omega-3 fatty acids. Basil isn't simply for internal use. When basil's oils are extracted to make an essential oil, it is used for treating cuts, wounds, and skin infections (Gang, 2002). The herb can also be used to make freshly brewed tea by placing 2–3 teaspoons of holy basil in a cup of boiling water and letting it steep for 5–6 minutes. The leaves are also commonly used in cooking, though some people eat the leaves raw. Holy basil tastes spicy and bitter. One of the best health benefits of Basil is that it is another excellent source of antioxidants as well. Basil contains water soluble flavonoids called riantin and viceninare which can help to protect white blood cells. Basil has also been known to help fight free radical damage (Ortiz, 1996). One of the best health benefits of Basil is that it is another excellent source of antioxidants as well.

Basil contains water soluble flavonoids called riantin and viceninare which can help to protect white blood cells. Basil has also been known to help fight free radical damage. The eugenol in basil can block calcium channels, which may help to lower blood pressure. The essential oils in the herb can help to lower your cholesterol and triglycerides. Basil also contains magnesium, which can help to improve blood flow by allowing muscles and blood vessels to relax. Basil contains compounds, such as eugenol, that may help reduce blood pressure, according to animal studies. Basil's powerful oil helps cleanse the skin from within. The excellent skin cleanser is perfect for those with oily skin. It also helps remove dirt and impurities that clog pores. The strong anti-inflammatory and antimicrobial properties of basil would help prevent formation of acne. It may be also used to keep the scalp conditioned and healthy which can support healthy hair growth (Van Wyk and Ben-Erik, 2005). Holy basil (*Ocimum sanctum*): Holy basil is a fragrant, adaptogenic herb known for its healing properties. It may help prevent hair loss caused by dandruff and itching or changes in hormonal levels.

Cloves are the flower buds of the clove tree, an evergreen also known as *Syzygium aromaticum*. Found in both whole and

ground forms, this versatile spice can be used to season pot roasts, add flavor to hot beverages, and bring spicy warmth to cookies and cakes. It is advised that you can consume not more than 2 to 3 cloves a day. Excessive consumption of cloves can cause fluid imbalances and liver damage. However, you need to moderately consume this as this will lead to further medical complications. Nowadays, many reports confirm the antibacterial, antifungal, antiviral and anticarcinogenic properties of spice plants. Clove in particular has attracted the attention due to the potent antioxidant and antimicrobial activities standing out among the other spices (Diego Francisco et al., 2014). Cloves: Cloves is a treasure trove of anti-inflammatory compounds, which can come handy during times of sore throat, cough, cold and sinusitis. You can chew on to some cloves raw, or mix it with hot water and drink it early morning and even mix it in your cup of chai. This fragrant flower contains abundance of flavonoids, vitamins (A and C), minerals and many others. Its main active ingredient a phenolic type called *eugenol* which shown to be 5 times more effective in destroying free radicals than vitamin E (another powerful antioxidant) (Bamdad et al., 2006). Cloves possess multitude of highly reactive polyphenols (like eugenol) which boosts immunity, combat bacteria, viruses and tooth decay, enhance organ performance, and internal antioxidant production. Eugenol in cloves protects bone mass, improves circulation while inhibiting cancers and mutations (Abdel-Wahhab et al., 2005).

Oregano is a herb from the mint, or Lamiaceae family. People have used it for thousands of years to add flavor to dishes and to treat health conditions. It features in the Mediterranean diet. This plant has been used for over 2500 years in traditional practices as a flavouring herb and a healing agent (Hazzit et al., 2006). A popular choice among ancient Greeks as Hippocrates himself used it as an antiseptic. Oregano's main active compound is called carvacrol and has been the focus of many scientific studies. Carvacrol produces oregano's pungent odour and is a powerful antioxidant and anti-bacterial compound against common food-borne bacterial strains. Oregano and other herbs provide antioxidants. Dietary antioxidants help the body eliminate free radicals, which are toxic substances that result from natural processes and environmental stresses. A buildup of free radicals can trigger oxidative stress (Antuono et al., 2000). Oxidative stress can lead to cell damage that may result in various diseases, including cancer and diabetes.

Rosemary is a fragrant evergreen herb native to the Mediterranean. It is used as a culinary condiment, to make bodily perfumes, and for its potential health benefits. Rosemary is a member of the mint family Lamiaceae, along with many other herbs, such as oregano, thyme, basil, and lavender. Rosemary is loaded with numerous phytonutrients which pair as highly reactive antioxidants like caffeic acid, carnosic acid, chlorogenic acid, oleanolic acid, rosmarinic acid, ursolic acid, pinene, camphor, carnosol, eugenol, luteolin and their derivatives. These compounds fight oxidative stress, protect liver, cardiac, muscle and other body tissues, decrease blood sugar levels and diabetic symptoms (Nieto et al., 2011), reduce physical pain and anxiety while improving mood, cognition and concentration (Nieto et al., 2010). In the brain, rosemary protects the integrity of blood-brain barrier (BBB) along with other brain cells reducing the risk of damage (as seen in a stroke) or degeneration (as in Alzheimers) (Aguilar et al., 2008). The herb contains

substances that are useful for improving digestion and increasing circulation. In cooking, rosemary is used as a seasoning in a variety of dishes, such as soups, casseroles, salads, and stews. Use rosemary with chicken and other poultry, game, lamb, pork, steaks, and fish, especially oily fish.

Dried Peppermint used in chutney and pesto, too. Try adding dried mint leaves to curries, casseroles and stews or using them as a rub for racks of lamb. If you aren't an active or experienced cook, you can enjoy dried mint leaves sprinkled over soups, salads, cooked vegetables, fresh fruit or yogurt. Mint is a particularly good source of vitamin A, a fat-soluble vitamin that is critical for eye health and night vision. It is also a potent source of antioxidants, especially when compared to other herbs and spices (Díaz-Maroto et al., 2003).

Curcumin is a mighty free radical scavenger showing great ability in decreasing inflammation causing pathways all over the body. Image result for turmeric Turmeric is the spice that gives curry its yellow color. It has been used in India for thousands of years as a spice and medicinal herb. Recently, science has started to back up what Indians have known for a long time — it really does contain compounds with medicinal properties. Turmeric and its powerful ingredient, curcumin, have a range of health benefits. Antioxidants have the potential to prevent heart disease, eye conditions and Alzheimer's. Anti-inflammatory properties can help people with arthritis. Turmeric may even reduce the risk or spread of cancer (Murugan and Pari, 2005).

Conclusion

Medicinal plants play a vital role in antioxidant properties. Antioxidants, which help eliminate these free radicals, come in many forms. Some are naturally produced within the body, while others come from your diet. The vitamin C, vitamin E, beta-carotene and polyphenols found in fruits, tea and coffee are all compounds that act as antioxidants lets us hope that in future natural products will be competing modern medicines with added advantages of more safety and lower costs.

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