



A REVIEW ON DIETARY SUPPLEMENT TO ENHANCE IMMUNITY USING HERBS

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ABSTRACT:

Extracts of herbs and spices are increasing interest in the food industry because they retard oxidative degradation of lipids. There is also increasing interest in the antiviral activity of plant products. This review paper highlights the antiviral properties of herbal materials. The aim of this article is to review the antiviral potential of selected medicinal plants and herbs. Which include fennel, garlic, eucalyptus, lemon balm, peppermint, clove, turmeric, astragalus, ginger, cinnamon.

KEY WORDS: Herbs,, Clove, Ginger, Fennel, Garlic, Astragalus.

INTRODUCTION

Increasing public concern about hygiene has been driving many studies to investigate antimicrobial and antiviral agents. However, the use of any antimicrobial and antiviral agents must be limited due to their possible toxic or harmful effects. In recent years, due to previous antibiotics' lesser side effects, the use of herbal materials instead of synthetic or chemical drugs is increasing. Herbal materials are found in medicines. Herbs can be used in the form of plant extracts or as their active components. Furthermore, most of the world's populations used herbal materials due to their strong antimicrobial and antiviral properties and primary healthcare benefits. This review paper highlights the antiviral properties of herbal materials. The presented herbal antiviral agents in this review include, Lemon Balm, Peppermint, Clove, Turmeric, Astragalus, Ginger, Eucalyptus ,Fennel, Garlic, Cinnamon which are all summarized.

REVIEW OF LITERATURE

Ginger

A Comparative study on the antioxidant and anti-inflammatory (HRSV of gingerol-[6], gingerol-[8], gingerol-[10] and shogaol-[6]. These properties help maintain a healthy immune system. (Dugasani S *et al.* 2010).

Fresh ginger had antiviral effects against human respiratory syncytial virus, immune response against HRSV which causes respiratory infections, and helps to boost anti-inflammatory.(Jung San Chang *et al.*2013)

A brief study about the composition and the antioxidant properties. The antioxidant activity of ginger is related to the chemical compounds present in ginger such as zingiberene, zingerone, shogaols, and gingerols, (Höferl,M. *et al.* 2015).

Researchers have analyzed the antioxidant activities of ginger and its components in numerous in vivo and in vitro lab experiments. Some researchers have demonstrated the potential antioxidant properties of ginger extract. [Nile, S.H *et al.* (2015) did a chromatographic

analysis on the properties and activities of ginger extract]

Garlic

The major components of garlic (phenolic, polysaccharides, and organosulfur contents). It also contains saponins, amino acids, flavonoids, vitamins A and C, B-complex vitamins, and minerals. (Fratianni,F. *et al.* 2016). Garlic has been known as a natural antioxidant and can inhibit the harmful effects of free radicals in cells. (Onyeoziri, U.P. *et al.*2016). Antioxidant materials are naturally found in different plants and can neutralize free radicals through electron donation and by converting these harmful molecules to harmless products (Ghasemi, K *et al.* (2015).

The extract of garlic proved that it shows antiviral activity against influenza virus (H1N1).(Mehrbod, P *et al.* (2009). The antioxidant property of garlic which is due to the presence of some chemical components including organosulfur, and phenolic compounds. Garlic has a high content of phenolic compounds which are the reason for the high antioxidant activities of garlic.(Chung, L.Y. 2006)

Lemon balm

A solvent extraction study revealed that high in antioxidants, Lemon Balm is protective to cells in the body, boosting immunity and helping prevent both acute and chronic disease.(Herodež ŠS *et al.* 2003)

The aqueous extracts from lemon balm leaves display potent anti-HIV-1 activity by increasing the virion density.(Geuenich S *et al.* 2008)

Mint

The antioxidant activity of mint exclusively relies on its chemical composition and can prevent oxidative stress at the cellular level or in a living organism. Other studies have reported the use of mint extract as an antioxidant and antimicrobial bioactive natural extract. Other studies have reported the antimicrobial effect of this plant with different oil concentrations.(Džami'c, A.M *et al.*2010).

This herbal medicine shows inhibitory activity against HSV-1 and HIV viruses.(Anwar, F *et al.*2019).

Fennel

Studies have revealed that the antioxidant ability of this

plant is due to the presence of high phenolic content in its extracts. Fennel was shown to have high antioxidant ability. The antioxidant ability of the extract of this plant is due to numerous antioxidant processes such as free radical scavenging, superoxide anion radical scavenging, total antioxidant, and hydrogen peroxide scavenging.(Shahat AA *et al.* 2011).

The antiviral activity of the essential oil of fruit sample of *F. vulgare* along with 12 other Turkish medicinal plants against the DNA virus Herpes simplex type-1 (HSV-1) and the RNA virus parainfluenza type-3 (PI-3). Most of the oils and compounds displayed strong antiviral effects against HSV-1, ranging between 0.8 and 0.025µg/mL. (Orhan *et al.* 2012)

Cinnamon

The anti-inflammatory and antioxidant properties of cinnamon and herbal tea in an in-vitro model.(Willis, S. *et al.*2019)

The polyphenol contents of the cinnamon bark extracts and reported that the evaporated ethanolic extract of cinnamon has high antioxidant potential. (Gulcin, I. *et al.*2019)

Astragalus

Astragalus membranaceus has obvious HSV-1-inhibiting efficacy and low cytotoxicity.(Yan Sung *et al.*2004)

The APS(Astragalus polysaccharide) can protect the astrocytes against HSV-1 induced proliferation inhibition and enhance the immunological function of astrocytes by up regulating the TLR3/NF- B signaling pathway along with increasing expression of TNF- and IL-6.(Shi *et al.*,2014).

Turmeric

Research study on therapeutic effects of turmeric in several diseases shows antiviral activity of this plant against HIV virus.(Riaz, T *et al.*2004)

The different extracts of turmeric, such as chloroform, *n*-butanol, ethyl acetate, and *n*-hexane, show strong antioxidant characteristics. (Hay e *et al.*2011)

The aqueous and ethanol extracts of turmeric show significant antioxidant characteristics through the increase in antioxidant enzymes, scavenging different free radicals, and inhibiting lipid peroxidation.(Karimi, N. *et al.*2018)

The anti-inflammatory potential of herbal teas in an in vitro cell model, it is the phenolic compound of curcumin that is responsible for its antioxidant activities. The phytochemical structures in turmeric include vitamin C, cineole, tumerone, borneol, zingiberene, d-sabinene, and d-phellandrene. Many types of chemical compounds are found in turmeric including sesquiterpene Ketones, monoterpenes, and sesquiterpene alcohols (e.g., zingiberene). Fresh turmeric contains zingiberene, while the most significant curcuminoid presented in turmeric is curcumin.(Willis, S. *et al.*2019).

Clove

The bioactive components of clove such as eugenol, eugenyl acetate, -humulene, 2-heptanone, and -caryophyllene, allow clove to demonstrate one of the highest potent antioxidant activities among other herbal medicines. Clove has strong antioxidant effects that can naturalize ROS and other free radicals in lipid chains.(Cortés-Rojas *et al.* 2014)

The antiviral activity of this plant against different viruses

such as herpes adenovirus, poliovirus, and coxsackievirus.(Akhtar, M.S *et al.* 2014) strong antioxidant activity of this herb against DPPH when compared to vitamin C.(Adefegha, S.A *et al.* 2016)

Eucalyptus

It has been used as traditional medication for the treatment of numerous diseases including diabetes, pulmonary tuberculosis, bacterial and fungal infections, and influenza.(Singh, H.P. *et al.* 2012).

High concentrations of several polyphenolic compounds including flavonols, hydroxybenzoic acids, and hydrolyzable tannins in the extract of eucalyptus through bioassay guided fractionation and in vitro evaluation. These compounds are the reason for the high antimicrobial and antioxidant activity of eucalyptus.(Luís, Â *et al.*2016) De Mendonça Braga *et al.* (2018) studied the chemical characterization and biological potential of the essential oil of Eucalyptus. The medical applications of eucalyptus which are based on the high antioxidant and antimicrobial abilities of its essential oil.(Mallard, I. *et al.*2018)

The compounds isolated from this plant show antiviral activity against herpes simplex virus (HSV) and influenza virus. They also have strong anti-inflammatory and antioxidant properties (due to the presence of polyphenol, oenothien B, gallic acid, ellagic acid, flavonoids, and hydrolyzable tannin dimer) that help the immune system. (Brezáni, V *et al.*2018)

DISCUSSION

Ginger



Ginger is one of the most commonly consumed dietary condiments in the world. Ginger has never changed in its medicinal properties since time immemorial. Ginger (underground rhizome of *Zingiber officinale roscoe* and herbaceous perennial plants) is one of the essential herbal medicinal plants from the *Zingiberaceae* family. This plant family also includes cardamom and turmeric. Ginger (the rhizome of *Zingiber officinale*) is native to Asia and has been used as a medicine for more than two thousand years around the world. These principal components are responsible for its biological properties such as antioxidant, antidiabetic, antimicrobial, renoprotective, antihypertensive, antiulcer, anti-inflammatory, cardiovascular, analgesic, and gastrointestinal activities. Generally, ginger is known as safe medicine with pharmacological activity.

Garlic



Garlic (*Allium sativum*) is an herbal medicine belonging to the *Amaryllidaceae* family. Garlic is native to Central Asia, especially Iran. Garlic has been demonstrated to possess biological activities including antioxidant, antiviral, antidiabetic, anticancer, antibacterial, cardioprotective, and anti-inflammatory effects. Garlic contains antioxidants that may help prevent Alzheimer's disease and dementia.

Lemon Balm



Lemon balm (*Melissa officinalis*) is one of the traditional herbal medicines belonging to the *Lamiaceae* family. This herbal medicinal plant grows in North America, Europe, and Asia. Its use as a medicinal plant originated from Mediterranean countries. The extracts and essential oil have some pharmacology effects including antimicrobial, anticancer, antibacterial, anti-cardiovascular diseases, antioxidant, anti-inflammatory, antispasmodic, and antiviral properties.

Astragalus



Astragalus (*Astragalus propinquus*, flowering plant in the family *Fabaceae*) is a herb popular in traditional Chinese medicine which has significant immune-enhancing and antiviral qualities. Astragalus is a natural dietary supplement that's used for various health conditions. It's used to treat the common cold, upper respiratory infections, fibromyalgia, and diabetes. It is a prominent herb in Chinese medicine, and has anti-inflammatory and antibacterial properties. Research suggests that the root can boost resistance to infection. Studies performed on animals indicate that it can regulate the body's immune responses.

Mint



Mint (*Mentha*) is one of the aromatic perennial herbs belonging to the *Lamiaceae* family. It has been used for various applications, such as pharmaceuticals and cosmetics applications. The essential oil and aqueous extracts of mint potentially have antioxidant properties due to the existence of phenolic compounds. Mint essential oil has been shown to be an effective alternative short-term treatment of irritable bowel syndrome in humans, due to its anti-inflammatory abilities.

Fennel



Fennel (*Foeniculum vulgare*) is one of the herbal medicinal plants belonging to the *Apiaceae* family. Its native habitats include shores of Mediterranean Sea. The inhibitory ability of fennel depends on its dosage. Consequently, fennel extract and oils could be a bio source of medicinal materials needed for the manufacturing of novel immunity boosting agents.

Cinnamon



Cinnamon (*Cinnamomum verum* and *Cinnamomum zeylanicum*) is one of the plants that belong to the *Lauraceae* family. This traditional herbal medicine is from Australia and Asia. Based on the antioxidant, antimicrobial, and anti-carcinogenic activities of this plant, it is widely used in medical industries. Cinnamon has been traditionally used for its antiseptic, antioxidant, and antimicrobial properties. Cinnamon has potential antioxidant, anti-mutagenic, anti-diabetic, anticancer, and anti-inflammatory activities.

Turmeric



Turmeric (*Curcuma longa*) is one of the herbal medicines used traditionally. It belongs to the *Zingiberaceae* family. Due to the existence of curcumin (a polyphenolic compound), the extracts of turmeric have shown antimicrobial and antioxidant activity. Turmeric's extracts have been shown to have strong antioxidant properties.

Clove



Clove (*Syzygium aromaticum*), from the *Myrtaceae* family, is one of the most effective antimicrobial and antioxidant herbs. This herb is one of the traditional herbs primarily local to Asia and Africa. It possess many pharmacological activities such as antimicrobial, antioxidant, anti-inflammatory, antimutagenic, anticancer, and anti-allergic properties. The high antioxidant activity of clove's extract and essential oil is related to the chemical content of this herb, like a phenolic compound.

Eucalyptus



Eucalyptus (*Eucalyptus*) is a member of the *Myrtaceae* family. It is called the fever tree based on its strong antimicrobial ability. This herbal medicine is native to the Mediterranean, Australia, and Tasmania area. The antioxidant ability of this herbal medicine is in its extract.

CONCLUSION

Since time immemorial people have tried to find medications to alleviate pain and cure different illnesses. In every period, every successive century from the development of humankind and advanced civilizations, the healing properties of certain medicinal plants were identified, noted, and conveyed to the successive generations. The benefits of one society were passed on to another, which upgraded the old properties, discovered new ones, till present days. The continuous and perpetual people's interest in medicinal plants has brought about today's modern and sophisticated fashion of their processing and usage. In the current pandemic scenario, precautions and boosting immunity are one of the best choices to get away from COVID-19 infection. As per our study, we conclude that the uses of spices and herbs may play a significant role against viral infections and help boost immunity. In India, people have been using spices as well as herbs from ancient times due to their taste, antiviral, antimicrobial, antioxidant, and

immunity-boosting properties. Since ages Indians are habitual of taking these natural products that have conferred immunity in the Indian population, which probably is the major cause for low mortality in India. However, the excessive use of spices and herbs may cause various side effects.

RECOMMENDATION

various Indian herbs were used back in the day to boost the immune system for people with poor resilience. People who are most prone or sensitive to infection consume these herbs to get rid of cold and flu. These herbs are purely healthy and can be easily added to our diet. antioxidants help to reduce internal infection by destroying free radicals. It protects against the risk of various infections. At times like these prevention is better than cure.

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