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Indian spices and herbs as a natural immunity booster for COVID-19

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Abstract
Background: There is currently a lack of standard treatment against COVID-19. People should use certain supplements to boost their immune systems. The best way to strengthen our immunity naturally with the help of medicinal plants and spices.
Objective: The aim of the review is to examine immunity -boosting medicinal plants and spices in support of maintaining health in times of compassion.
Methods: Pubmed and Google Scholar were searched for relevant information regarding medicinal immunity-boosting plants their uses, and properties.
Results: A total of 13 articles were selected for review, which includes information about plants and spices that increase immunity and their effect on health.

Keywords: Garlic turmeric, ginger, clove, black pepper

Introduction

COVID-19 is a virus that has spread all over the world. Thousands of thousands, if not millions, of people have died as a result of this pandemic. People could not survive despite taking all possible measures, drugs, and immunity boosters. In light of the virus's long-term repercussions, we must exercise extreme caution when it comes to our health in the coming days. We've taken all the precautions we can. Traditional medicine is effective in preventing pandemics; all we need to do now is resurrect it. Our traditions, too, have a significant impact on our lives, which are scientific in nature. The world's tragedy has been brought about by a terrible virus known as Corona virus disease-19, which has caused a pandemic. Humans and animals are the ones who are most affected. We must be aware of the following at all times: social distancing, wearing a mask, covering the head as well, avoiding touching in public places, constantly sanitising our hands, and so on. We must wear full-sleeved, neck-tight, and body-covering clothing, as well as shocks, gloves, and hand sanitizer. Only then may we leave the house. We should only go out if it is absolutely necessary; otherwise, we can get everything - milk, veggies, groceries, and other daily needs - delivered to our doorstep via online shopping.

COVID-19 targets those with weakened immune systems, including children and the elderly. The immune system is made up of good bacteria that live in the gut and defend the human body from a variety of diseases. When the immune system's response is low, weak, or impaired, infections like the coronavirus or other disorders like diabetes, heart disease, or cancer might take advantage of it. 1 In this post, we will explore a variety of medicinally essential plants and herbs that can help in the fight against COVID-19, such as Tulsi (Ocimum sanctum), Garlic (Allium sativum), and Giloy (Tinospora Cordifola) Betel vine (Piper betel), Black paper (Piper nigrum), Black cumin (*Black cumin* L.), Ashwagandha (Withania somnifera), turmeric (Curcuma domestica), elderberry (Sambucus nigra), etc Antioxidants, vitamins, proteins, carbohydrates, dietary fibres, amino acids, minerals, steroids, alkaloids, antiviral, antibacterial phytochemicals, amino acids, minerals, steroids, alkaloids, antiviral, antibacterial phytochemicals, amino acids, minerals, steroids, alkaloids, antiviral, antibacterial phytochemicals, amino acids, minerals, amino acids, minerals, steroids, alkaloids, antiviral, antibacterial phytochemicals, antiviral, antibacterial. According to the World Health Organization, herbal medicines are used by over 80% of the world's population for basic health

care, particularly in Europe an According to studies, several of these herbs not only have anti-inflammatory qualities but also aid in the body's natural immune building. Moreover, unlike allopathic treatments such as antibiotics, which can have dangerous side effects, the majority of these herbs and spices are rather safe.

Medicinal Herbs and Plants

Garlic (*Allium sativum*)

Garlic is abundant in antioxidants and helps in the reduction of stress and high blood pressure. It also helps in the absorption of thiamine (vitamin B1) in the body and prevents beriberi. Colds, flu, and COVID-19 infection may be less severe as a result of the ant Garlic, as a function, strengthens the immune system and helps in the fight against viruses and other disorders. It contains Allicin, a broad-spectrum antibiotic. Garlic is used to flavour basically every type of foods in the world.

For years, garlic (Allium sativum Linn.) has played a significant dietary and therapeutic role. It's highly healthy, low in calories, and high in vitamins C, B6, and manganese. It is good for health and cardiovascular system.

Antimicrobial, anticancer, anti-inflammatory, hypoglycaemic, and hormone-like properties are also known. Garlic supplements have been shown to lower total and LDL cholesterol while having no effect on HDL cholesterol levels. For thousands of years, garlic extracts have been used to treat illnesses. Allicin, which is formed by enzymatic (alliin lyase) hydrolysis of alliin after cutting and crushing the garlic, is responsible for its characteristic pungent odour and antibacterial action. Garlic has strong antibacterial properties and is used to treat a variet Hyperlipidaemia, certain types of cancer, viral illnesses, and heavy metal intoxications are all treated with it. Garlic has antibacterial and antifungal qualities, as well as working an antioxidant A curative effect is achieved by combining a number of physiologically active chemicals. Garlic boosts the immune system's response by activating and protecting immune cells that fight viral infection. Garlic's active ingredients, the enzyme alliinase and the sulfur-containing compound allicin, have been shown in vitro to have antiviral activity against a variety of viruses, including Cytomegalovirus, influenza B virus, herpes simplex virus Types 1 and 2, parainfluenza virus Type 3, and human rhinovirus Type 2. (Which causes the common cold and viral pneumonia) It can also be used to treat parasite and fungal infections. Raw garlic (1–2 cloves per day) is cardioprotective and reduces the formation of atherosclerosis when eaten fresh, crushed (crushing activates the component allicin). Its ingestion lowers blood pressure as well as cholesterol levels in the blood (increases high de Garlic's health advantages have been known for centuries, and it has been demonstrated to keep the immune system in check. Garlic extracts offer a variety of medicinal applications, including cardio protection and cell inflammation prevention. Garlic appears to help in the maintenance of A study was conducted on white Leghorn hens who were given garlic extracts, and it was discovered that anti-BA antibody production increased. Garlic chemicals, such as Allicin (diallylthiosulphinate), are essential for T cell expansion and B-cell differentiation. Garlic fractions are useful in immunomodulation and have a variety of other effects, according to study. Garlic components have anti-pathogenic and anti-parasitic properties, which means they kill a variety of diseases. Garlic also stimulates T-lymphocytes and CD8+ cells, as well as delay sensitivity in body cells and tissues and decreases cholesterol levels.

Ginger (Zingiber officinalis)

Zingiber officinale Roscoe is another name called Zanjabeel or Adrak. It is a very important medicinal plant that belongs to the Zingiberaceae family, Ginger's anti-inflammatory, antifungal, and anti-cancer effects are well-known**.** Ginger has long been used to treat colds and coughs, nausea, asthma, travel sickness, morning sickness, arthritis, gastrointestinal issues, and even depression in traditional medicine. Use it to make ginger tea by crushing ginger and boiling it with tea leaves and water. Since ancient times, powdered ginger mixed with pulverised cloves, cardamom, and caraway has been used to treat digestive problems. Immunosuppressive (boost up the immune system of the patients which further prevent load of infection). Ginger can help with respiratory issues (relieve congestion associated with the common cold, and boost immunity) (due to high level of anti-oxidant), Improve blood circulation (because to the presence of vitamin, minerals, and amino acids in ginger) and relieve stress (thanks to the combination of the strong aroma and therapeutic properties). It can help in the restoration and improvement of blood circulation as well as the prevention of fat accumulation in arteries, hence protecting the heart from Cardiac Vascular Disorder.

Gingerol, together with other sulphur-containing chemicals (allicin, alliin, and ajoene) and enzymes, is the pungent active component present in Ginger (allinase, peroxidase, and myrosinase). Ginger contains compounds that boost antioxidant activity. In the body, superoxide dismutase and glutathione peroxidase work together to fight viral infections.

Turmeric (Curcuma domestica)

Turmeric is a perennial herb in the Zingiberaceae family with the scientific name Curcuma domestica. The spice and medicinal herb known as "Indian saffron" is a golden orange spice that has been used for thousands of years. Turmeric includes curcumin, a bioactive molecule that serves as an anti-inflammatory agent. It is commonly used in India for curries and other meals, but it can also be taken once a day as a decoction (kadha) made from grated ginger, tulsi, and turmeric, as recommended by AYUSH, to increase immunity. It is one of the most extensively examined spices, with therapeutic benefits being researched. Curcumin and other diarylheptanoids are the major phytochemicals. Curcumin is quite beneficial in resolving these disorders and boosting the immune system. Previous research has shown that it has antifungal, antiviral, antioxidant, anti-inflammatory, cardiovascular and anti-diabetic effects, gastrointestinal effects, anticancer effect, antimicrobial activity, hepatoprotective and renoprotective effects, photo-protector activity, and therapeutic potential in the treatment of inflammatory and edematic disorders, as well as alzheimer disease. 2 Curcumin toxicity was not observed in human experiments utilising up to 8000 to 2500 mg of curcumin per day for three months. It's a powerful antiviral that can stop viruses from replicating. Curcumin possesses renoprotective and cardioprotective characteristics, according to studies. Because of its limited absorption and metab. Two to three times a day, one teaspoon of turmeric powder combined in hot milk increases immunity against viral infection. It does, however, have several problems. Turmeric is a ground dried root that contains oils, lipids, proteins, carbohydrates, minerals, and curcuminoids, as well as moisture. Curcumin's immunomodulatory activities are due to its interactions with several immunomodulators, such as dendritic cells, macrophages, and B and T lymphocytes. Curcumin is a group

of substances called curcuminoids that are generated from the root of the turmeric plant, Curcuma longa. Curcumin has grown in popularity as a natural therapeutic ingredient. A variety of things can throw the immune system off balance, including lack of sleep, prolonged and chronic stress, vitamin deficiencies, and toxin exposure. Chronic stress overstimulates the innate immune cells, which decreases the immune system's other components that protect against viruses. H1N1 influenza infections, H5N1 (highly pathogenic avian influenza) virus, HIV/AIDS, zika, chikungunya, hepatitis B, hepatitis C, and dengue virus infections are all treated with monoacetylcurcumin and curcumin.

Clove (Syzygium aromaticum)

Syzygium aromaticum is the scientific name of clove. Consuming whole cloves is an excellent way to enhance our immune system. Clove essential oil may have Nutritional Therapeutic Potential because to its many properties, which include antibacterial, antifungal, antiviral, anti-inflammatory, cytotoxic, analgesic, and anaesthetic activity, as well as being extremely and SARS coronavi-rus post-binding into cells is prevented by this compound. Anti-platelet actions, on the other hand, prevent the formation of a thrombus or blood clot. Effective antioxidants. As a result, clove essential oil may be considered one of the most promising candidates for combating the coronavirus and protecting against sudden mortality seen in some patients infected with the coronavirus (COID 19) due to embolism and hypercoagulable formation. Clove is used as an antiviral, antifungal, and antibacterial agent in nature. Clove's mediaeval applications can be observed in ailments like cholera.

Black pepper (*Piper nigrum* L.)

Black pepper is a Piperaceae family flowering vine grown primarily for its dried fruit, which is used as a spice and condiment. It is regarded as the King of Spices and is native to South India. The piperine chemical, which is contained in both the outer fruit and the seed, is primarily responsible for pepper's intense heat. The main chemical component responsible for antibacterial action is piperine. Antibacterial, antimycotic, analgesic, antipyretic, inflammatory, anti-convulsant, CNS depressant, antimutagenic, antioxidant, anti insecticidal, and synergistic pharmacological properties have been documented. Selenium, Vitamin B12, -carotene, and curcumin, among other substances, are all enhanced by piperine. As a result, it serves as a back-up for a number of physiological effects. It aids in the reduction of oxidative stress cells caused by high fat intake. Black pepper can be used for a variety of things, including pain relief, rheumatism, flu, and the common cold. It's also an antimicrobe agent. Spice used to boost the immune system and treat colds and coughs. Sinusitis and nasal congestion are also relieved by black pepper. Its natural expectorant characteristics aid in the removal of mucus and phlegm from the respiratory tract. The antiviral and antibacterial properties of quercetin, which is present in pepper, are thought to help the body's immunity. Piperine's antioxidative, anti-apoptotic, and chemoprotective properties in blastogenesis, cytokine release, and splenic cell population restoration suggest that it could be effective in immunocompromised patients.

Cinnamon (*Cinnamomum zeyeanicum*)

Cinnamon is one of the spices with the most potent antibacterial properties. Cinnamon extract (300 mg/day) increased insulin and activated the NO pathway in skeletal muscle, reducing insulin resistance in fructose-fed diabetic rats. Cinnamon can successfully raise the amount of T cells in the body if there is an imbalance. Cinnamon's capacity to reduce blood glucose levels in patients is one of its most promising properties. Cinnamon oil has antibacterial activity in the range of 10-150 g ml, which means it can inhibit the action of germs o Chinese cinnamon, when paired with 500 mg of double-linked polyphenol type-A polymers, can help lower blood pressure and fasting blood glucose levels.

Cardamom (*Elettaria cardamomum* L.)

Cardamom is a spice that is used to make a variety of dishes (Elettaria cardamomum) Cardamom extracts, like pepper, have pro-inflammatory properties. Cardamom was studied on rats, and it was found to lower blood pressure through cholinergic and calcium antagonistic pathways. Proteins, minerals, lipids, flavonoids, terpenoids, and carotenoids are chemical constituents of cardamom. One of the cardamom extracts is the oil, which has anti-septic properties.

Omum (*Trachyspermum ammi*)

Bishop's weed, also known as ajwain, caraway, or carom, is an annual herb of the Apiaceae family (or Umbelliferae). Iraq, Iran, Afghanistan, Pakistan, and India are among the countries that grow it. The plant's leaves and seeds are both consumed and util It has been shown to have antifungal, antioxidant, antimicrobial, antinociceptive The expectorant characteristics of Ajwain help with decongestion and elimination of mucous, treat the nasal channel, and provide relief from sneezing and coughing, making it a classic Indian home medicine for cold and cough. T. ammi seeds contain ajwain oil, which ranges from 2% to 4.4 percent, cytotoxic, hypolipidemic, antihypertensive, antispasmodic, broncho dilating, ant lithiasis, diuretic, abortifacient, antitussive, nematicidal, anthelmintic, and ant filarial properties in clinical studies used in cooking.

Asafoetida (Heeng)

Agum resin is used as a folk treatment for a range of ailments, including carminative, antispasmodic, expectorant (used to treat chronic bronchitis and whooping cough), sedative diuretic, anthelminthic, emmenagogue, and aphrodisiac. Asafoetida is formed from the Farsi word aza (resin) and the Latin word foetidus. The assumption that the resin's foetid stench functions as a germ repellent has led to medicinal claims. According to Taiwan Medical University, asafoetida roots contain natural antiviral components. Its antiviral effect against the influenza A virus has been demonstrated in vitro (H1N1).

Conclusion

Medicinal plants and herbs are more effective treatments for a variety of ailments. Various traditional medicinal plants and herbs were employed as medications during the COVID-19 pandemic in December 2019, when no proper allopathethic medicine was available to treat COVID-19. This resulted in beneficial health outcomes among COVID-19 patients. The potential use of medicinal plants and herbs to improve immunity against these viruses, as well as to prevent or treat COVID-19 infections, has been reviewed in this study.

The previous discussion examined various regularly used flavouring agents and their effect in immune system enhancement. Increased understanding of spices and their qualities can be used to cure a variety of diseases. Also, there's a good likelihood that using spices can assist solve the

problem of pathogenic germs developing antibiotic resistance. More in-depth research of spices may lead to new insights into mechanism of action, which could aid in the understanding of illness progression. If spice research is advanced, it may lead to the identification of a new potential treatment technique for a variety of illnesses. To summarise, regularly used Indian spices play an essential function in increasing tolerance to pathogenic pathogens. They aid in the prevention of a variety of chronic diseases as well as the improvement of overall health. They assist in the reduction of health-care costs. This can be regarded a viable option for increasing one's quality of life.

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