

# A Review on Immunity Boosting by Herbal Medicines to Cure and Treatment of Covid-19 Affects

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## ABSTRACT

The whole world is standing on the verge of COVID-19 (SARS-CoV-2) pandemic scenario, which revealed the endurance of our current health care system. Moreover, to overcome the global menace and dwindle the infection; there is an exigency for social distancing and quarantines. Health is the greatest wealth for human mankind. So, there has been a great requirement in ways to boost our immune system and to build a strong defence mechanism against the deadly virus and diseases. Since ancient times, the use of medicinal plants, herbs and spices has been well known for their medicinal and healing properties. Therefore, the use of medicinal plants and herbs will play a critical role in boosting our immunity during the COVID-19 pandemic, despite any side effects. It is also very important to consume supplements in the form of immune nutrients such as vitamin A, C, D, E, B-complex, Zinc and Copper that will support your body to fight against pathogens. We have been using different types of herbs which are traditionally being used by tribal and rural people of India as well as China and other developing countries in the form of ayurvedic formulations. This paper presents an analysis of popular immune-boosting medicinal plants and herbs and their effectiveness in the treatment of various ailments

**Key-words:** COVID-19 (SARS-CoV-2), Immunity boosting, Medicinal plants, Nutrients, Virus and pathogens

## INTRODUCTION

Nowadays, there is an increasing trend and demand towards organic and green living worldwide. Herbal products derived from plants or trees are found rich in nutritional supplements aromatic products. Aroma therapies and folk medicines are holistic healing treatment that uses natural plant extracts to promote health and well-being [1,2]. There have been scientific trials of different types of medicine worldwide; chloroquine is recently used in the field of nanomedicine [3]. It is being investigated with nanoparticle uptake in cells.

The nanomedicine study can provide clues on chloroquine-induced alteration of SARS COVID-19 cellular uptake. It is the approved drug for malaria and also, one of the famous nanomedicines and its derivative hydroxychloroquine is being used for COVID-19 patients. Hydroxychloroquine shows effective results when it is given with azithromycin. However, this approved drug is not approved for COVID-19 treatment regardless of some severe medication and complications. So, it cannot be given to all COVID-19 patients because it can have side effects on the patients, who have past health problems such as diabetes, high blood pressure, kidney injuries and liver problems [4,5].

Traditional herbal medicines are naturally occurring; plant-derived substances with minimal or no industrial processing, that have been used to treat illness within local or regional healing practices, which are getting significant attention in global health debates. In China, traditional herbal medicine played a prominent role in

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the strategy to contain and treat severe acute respiratory syndrome (SARS) [6-8]. The market for medicinal plants in India stood at ₹ 4.2 billion (US\$ 56.6 million) in 2019 and is expected to increase at a CAGR 38.5% to ₹ 14 billion (US\$ 188.6 million) by 2026. The total world herbal trade is currently assessed at US\$ 120 billion [9-12]. As efforts are underway to find treatment for the ailments; caution must be taken against misinformation, especially on social media, about the effectiveness of certain remedies. Many plants and substances are being proposed without the basic information and evidence of quality, safety and efficacy. The use of certain products to treat such ailments, which have not been robustly investigated can put people's lives in danger, giving a false sense of security and distracting them such as, from hand washing and physical distancing which are cardinal in COVID-19 prevention, and may also increase self-medication and the risk to patient safety [13-15].

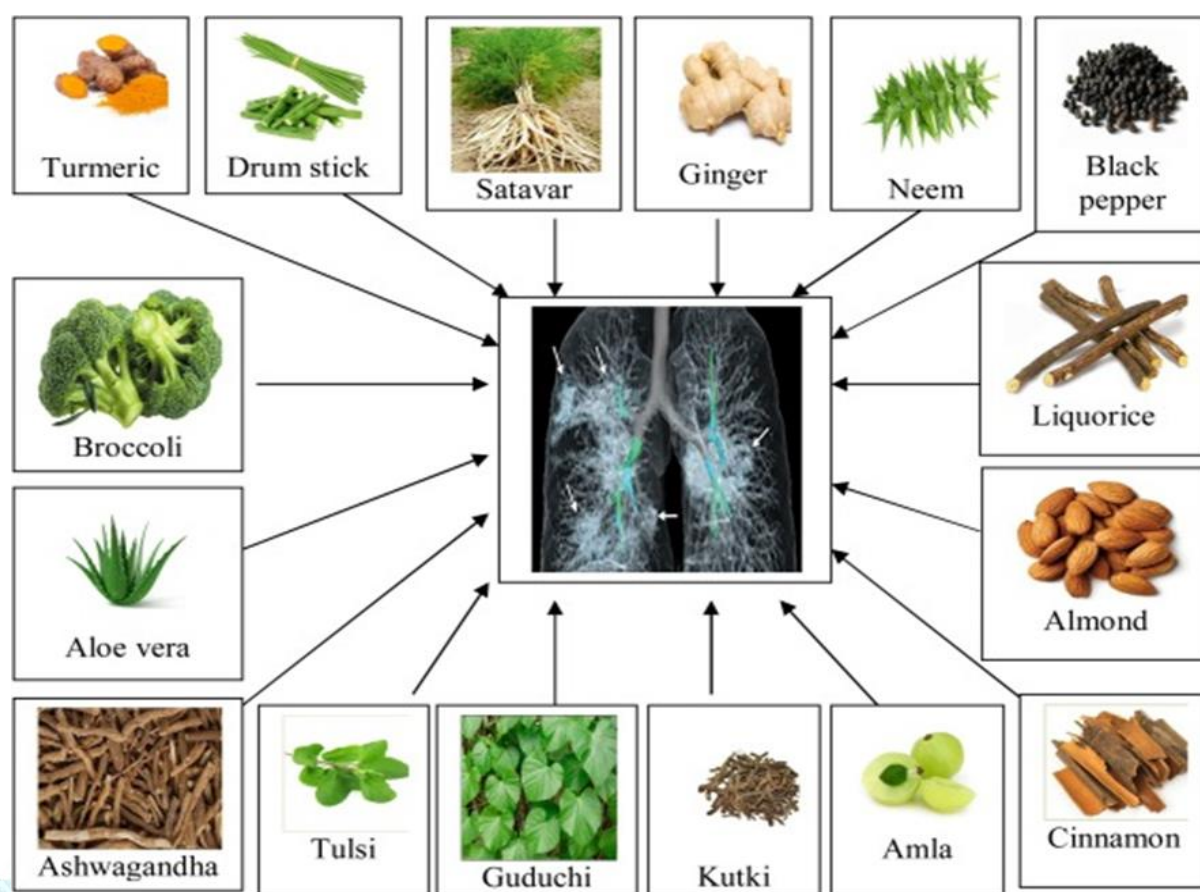
Natural products and herbal medicine have a long track record in treating respiratory infections and many have been approved as drugs or over-the-counter food additives [16]. Furthermore, people in the community and researchers are trying to find the best way to cure or prevent the disease, including using herbal medicine. Since the immune system of patients plays an essential role during infection, herbal medicine which has an immunomodulatory effect could have the potential as a preventive measure and even therapeutic agent for patients with COVID-19 infection [17]. A recent trend in the community is the consumption of herbal medicines containing certain active compounds, which have antimicrobial or antiviral, anti-inflammatory and immune-stimulatory activities such as Echinacea, Quinine and Curcumin [18-20]. Ashwagandha (*Withania somnifera*) [21], Black pepper (*Piper nigrum*), Dalchini (*Cinnamomum zeylanicum*), Javitri (*Myristica fragrans*), Clove (*Syzygium aromaticum*), the smoke of Ajwain (*Trachyspermum ammi*) is proved to be the best bronchodilator during Covid infection, Amalaki (*Phyllanthus emblica*), Guduchi (*Tinospora cordifolia*), Tulsi (*Ocimum tenuiflorum*), Ginger (*Zingiber officinale*), Turmeric (*Curcuma longa*), Aloe (*Aloe barbadensis*) are reported effective treatment to check the viral loads. Ginger is also good for throat infection, as compounds are assumed to have the capacity to modulate the immune response and therefore, they are believed to

have beneficial effects on preventing or treating. Turmeric (*Curcuma longa*), for example, has been used traditionally by many countries in Asia as a drug or supplement because of its antioxidant, anti-inflammatory, anti-mutagenic, anti-cancer, and anti-microbial effects [22-25]. Many herbal products contain an active compound, which acts as an antiviral and immuno-stimulator.

Indian spices and herbal extracts have been used to ameliorate many diseases as conventional medicines. Several plant extracts were found to inhibit the replication of viruses effectively, while the antibacterial and antifungal properties of aromatic herbs, medicinal plants, and volatile oils are established, there is currently insufficient scientific evidence to determine the non-toxic and efficient methods of using them as antiviral treatments. They suppress different developments in the viral replication cycle, and thus little to no viral progeny is produced. Small doses of these medications that do not harm the host cell can function. Unfortunately, resistance to these specific drugs can evolve by replicating viruses. Herbal antiviral drugs have been understudied to pesticides. Some experimental studies, however, have started to more precisely test their efficacy. Antiviral activities against such viruses have been demonstrated by medicinal plants and their isolated components. Suppression of viral replication is mainly the mechanism of action [26-28].

**Research concept-** Ayurvedic herbs are used locally and help enhance the immunity of the body and also safeguard by preventing infection since the immune system plays an essential and primary role in the defence against this novel viral infection (Fig. 1). [6,11] Several medicinal plants are used as potential therapeutic agents against various ailments. Indian Ayurveda practitioners suggest a few important plants which supply strong immunity in the human body. Some important herbal medicinal plants are: Ashwagandha (*W. somnifera* Dunal) [21], Turmeric (*C. longa* L.) [22], Neem (*A. indica* A. Juss) [23], Drumstick (*M. oleifera* Lam.) [29], Amalaki (*E. officinalis* Gaertn.) [30], Kutki (*P. kurroa* Royle ex Benth) [31], Tulsi (*O. sanctum* L.) [32], Ginger (*Z. officinale* Roscoe) [33], Black pepper (*P. nigrum* L.) [34], Guduchi (*T. cordifolia*) [35], Liquorice (*G. glabra* L.) [36], Harsingar (*Nyctanthes arbor-tristis* L.) [37], Satavar (*A. racemosus* Willd) [38], Cinnamon (*C. zeylanicum* Blume) [39], Aloe (*A. barbadensis* Mill), Almond (*P. amygdalus*) [40,41] and Broccoli (*B. oleracea* L).





**Fig. 1:** Herbs Used for Boost Immunity and Check Viral Infection

**Review of literature-** Tulsi is considered a holy plant in Ayurveda and is available everywhere in India. The plant is also known as holy basil and belongs to the family Lamiaceae. The leaves contain mainly Ursolic acid ( $C_{30}H_{48}O_3$ ) and Apigenin ( $C_{15}H_{10}O_5$ ) and in addition, it has oil that contains monoterpene 1,8-cineole, and eugenol. The leaves show an immune-modulatory effect by an increase in IFN- $\gamma$ , IL-4, T-helper cells, NK cells and enhance phagocytic activity and the phagocytic index. The oil also boosts immunity by mediated GABAergic pathways and by cell-mediated and humoral immunity. Immunomodulatory activity of an aqueous leaf extract of *Ocimum sanctum* was evaluated by in-vitro and in-vivo methods using delayed-type hypersensitivity, humoral antibody titer, total leucocyte count and differential leucocyte count models. Recently, the plant is the prime focus in COVID-19 treatment as an antiviral agent. The study revealed the antiviral activity of leaves (crude extract, terpenoid and polyphenol) against the H9N2 virus using an in ovo model and showed potent antiviral efficacy. In another study, the antiviral activity of different extracts of Tulsi (*O. sanctum*) was confirmed against orthomyxovirus and paramyxovirus using *in vitro* cytotoxicity assay.

A study last year revealed that phytochemicals from Tulsi (*Ocimum sanctum*) potentially inhibit Mpro (main protease) of SARS-CoV-2 using molecular docking<sup>[911]</sup>. The drumstick plant is found in the family- Moringaceae and is distributed throughout India. Its leaves, flowers and fruits have significant immunomodulatory activity. The leaves contain mainly Niaziminin A and Niaziminin B, and the flower contains mainly bioactive agents such as Vitamin-A, a nutrient that can help to boost the immune system and protect overall vision health. The flowers also contain calcium to strengthen bones, vitamin C to reduce inflammation, and some potassium, iron and amino acids. The root contains alkaloids like Isopelletierine, Anaferine, Cuseohygrine, Anahygrine, Steroidal lactones, Withanolides, Withaferins and Saponins. Ashwagandha (*Withania somnifera*) is an evergreen shrub found in India. It is in the Solanaceae family and is a master herb in ayurvedic medicine<sup>[21]</sup>.

## CONCLUSIONS

Medicinal and aromatic plants (MAPs) are widely regarded as a constant source of safe and effective medicines with the potential to develop constituents found in the plants into newer drugs and their active role

in combating COVID-19 infections and strengthening immunities. The most important guidelines recommended by AYUSH, India during home quarantine is outlined. The study resulted in documenting; Euphorbiaceae as the leading family with the highest proportion of medicinal plants. Roots were found to be the most frequently used plant parts for the preparation of traditional remedies. Most medicinal plants in the study area were harvested from the wild. The phytochemical and pharmacological investigation is recommended with due consideration to frequently used medicinal plants.

The present review discussed seventeen essential "Indian plants" and their main Phyto-constituents. Thus, it will play a crucial role in fostering the immune response to a wide range of diseases in future irrespective of any side effects.

#### CONTRIBUTION OF AUTHORS

**Research Concept-** Dr. Sonalika Singh Jadoun, Dr. Pratap Chand Mali and Nishant Kumar Choudhary

**Research Design-** Dr. Sonalika Singh Jadoun

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**Data Analysis and Interpretation-** Dr. Sonalika Singh Jadoun

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**Writing Article-** Nishant Kumar Choudhary

**Critical Review-** Dr. Sonalika Singh Jadoun, Dr. Pratap Chand Mali and Nishant Kumar Choudhary

**Article Editing-** Nishant Kumar Choudhary

**Final Approval-** Dr. Sonalika Singh Jadoun

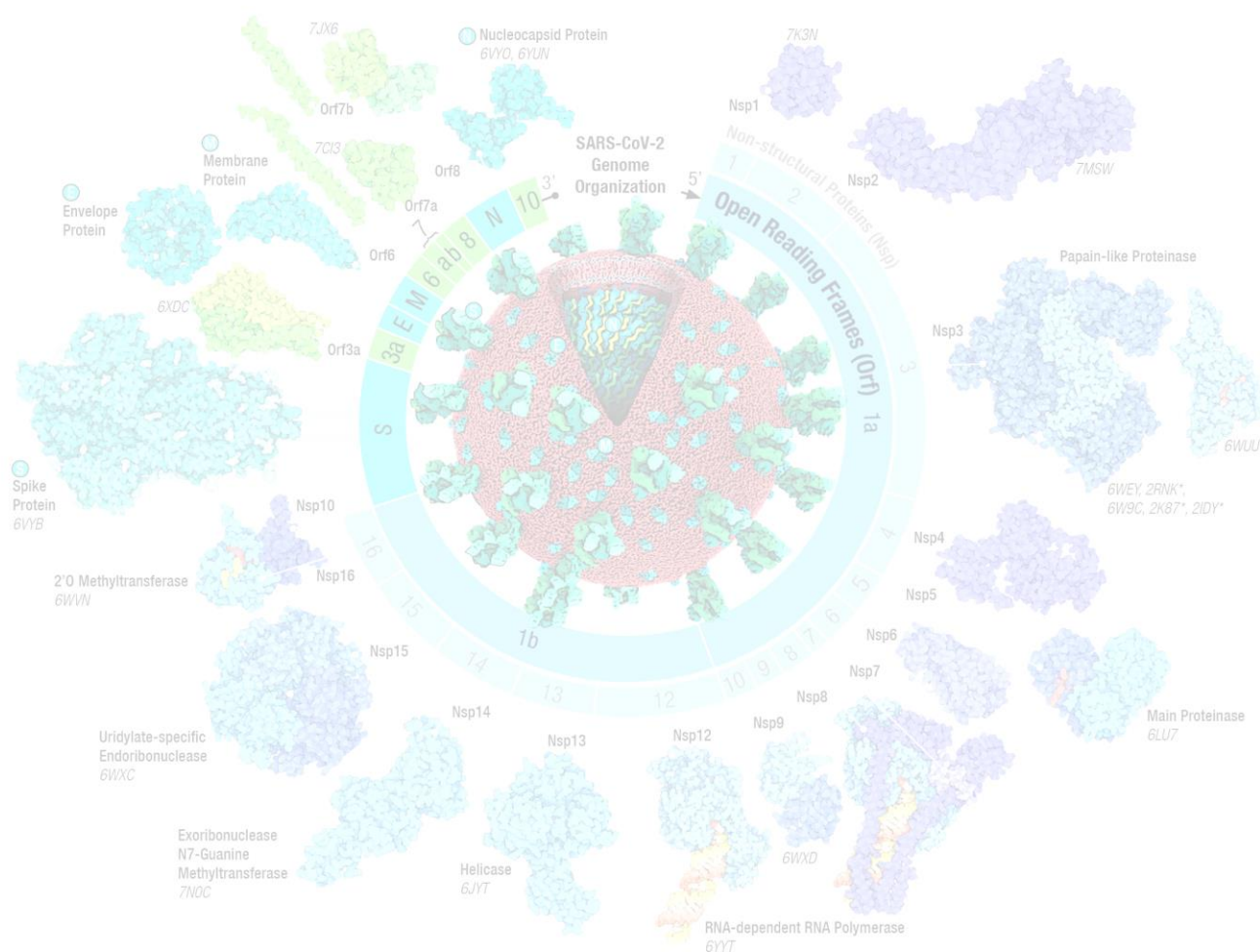
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