



Role of Herbals as Immunity Boosters in the Management of COVID-19

Shivani ^a and Ritika Puri ^{a*}

^a *University Institute of Pharma Sciences, Chandigarh University, Gharuan, India.*

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i63A35222

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here:

<https://www.sdiarticle5.com/review-history/77502>

Received 23 November 2021

Accepted 27 December 2021

Published 29 December 2021

Review Article

ABSTRACT

The review mainly focuses on various herbs that can be used for the enhancement of immunity amidst COVID-19 pandemic. Coronavirus comes under the viruses that are capable of causing common cold, raising the temperatures and also can result in severe acute respiratory syndrome. The major threat to public health is caused due to the emerging infections such as SARS. Novel Coronavirus or COVID-19 has spread across various countries and been declared as a 'pandemic' by the World Health Organization. Basically, coronavirus affects the individuals which have low immunity. However, one can adopt various herbs that can increase the amount of intestinal beneficial bacteria and can make up 85% of the immune system of the body. So, making use of such herbs one can very effectively promote health and boost immunity to fight against the virus attack. Also, the plants based play a major role in boosting the immunity and preventing the individuals from catching COVID-19 infections.

Keywords: COVID-19 infections; *Streptococcus pneumonia*; SARS-CoV2; respiratory syndrome.

1. INTRODUCTION

In Wuhan, Hubei Province, People's Republic of China (PRC), an unidentified case of pneumonia was detected in late December 2019. The clinical

characteristics of the disease were having resemblance to the virus *Streptococcus pneumonia* that causes a viral disease. With the thorough investigation of all the samples collected by the PRC experts of various disease

*Corresponding author: E-mail: ritika.pharma@cumail.in;

control centers, it was confirmed that the occurrence of novel pneumonia was due to the new coronavirus. Officially the disease was named as COVID-19 by the World Health Organization [1]. It was named as severe acute respiratory syndrome coronavirus 2 or SARS-CoV2 by the International Committee on Taxonomy of Viruses. The assigning of the official name of the novel coronavirus and the disease caused by the same is the effect of the statement in clinical research and scientific evidences.

The novel coronavirus belongs or to fit in the family of β -coronavirus that is a vast class of virus present in nature. Like all the other viruses SARS-CoV2 also has multiple hosts that include intermediary as well as the final hosts which makes the prevention and the treatment of Coronavirus disease even more challenging. And when compared to respiratory syndrome transmitted in middle east and severe acute respiratory syndrome, it has been found that COVID-19 is highly transmissible and infectious with low mortality rate [2].

It has been observed that etymology of SARS-CoV2 is the result of an inconsistent immune response. However, the only possible treatment for treating SARS patients remains the immunity boosters so as to strengthen the immune

response. Viral infections can be inhibited by interferons by both the adaptive as well as the innate immune response. In the clinical trials, alpha-interferon produced by synthetic recombinant technology is proven to be effective for the patients with SARS-CoV2. It was reported in one of the studies that alfacon-1 plus interferon corticosteroids treatment resulted in lowering of oxygen saturation level caused due to respiratory disease and offered 50% promising solution of lung radiographic anomalies when compared to alone treatment of corticosteroids without using any combinations [3]. Moreover, interferon was also an active inhibitor of replication due to MERS-CoV [4]. Such inferences suggest the use of interferon in the treatment of infections linked with COVID-19. Also, when it comes to long-term use and keeping in mind all the age groups, intravenous immunoglobulin comes out to be the safest immunomodulator. Moreover, it could also help in the conservative production of pro-inflammatory signals of cytokines thereby increasing the number of anti-inflammatory cytokines mediators [5]. Also, thymosin alpha-1 ($T\alpha$ -1) effectively controls the spread of the disease by boosting the immunity for the patients with SARS [6]. These thymosin alpha-1 ($T\alpha$ -1) and Intravenous immunoglobulin may also consider as an effective treatment for COVID-19.

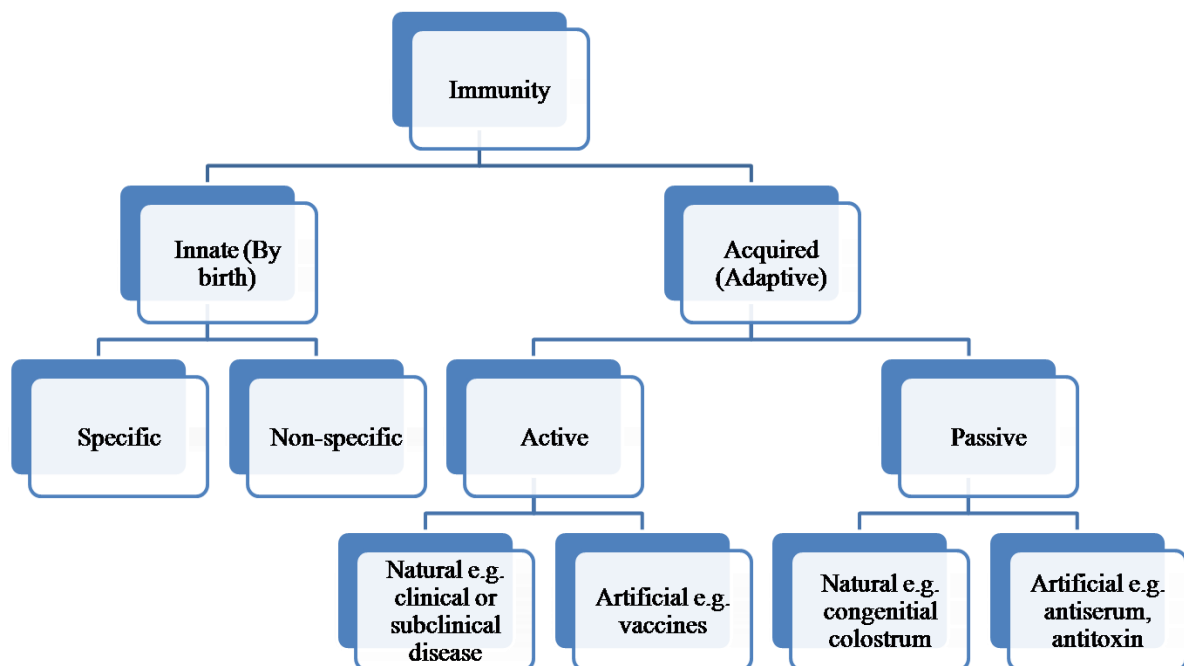












Fig. 1. Different types of immunity



Table 1. Herbal plants used to boost immunity

Scientific Name	Common name	Family	Part Used	Chemical Constituents	Uses	Picture	Reference
<i>Azadirachta indica</i>	Neem	Meliaceae	Leaves, stem bark	Azadirachtin, nimbin, nimbidin	Strong antioxidant		[9]
<i>Allium sativum</i>	Garlic	Liliaceae	Bulb	Allicin, Alliin, vitamin C, alpha glutamyl peptides	Carminative, expectorant, respiratory diseases such as bronchial asthma, chronic bronchitis		[10]
<i>Zingiber officinale</i>	Ginger	Zingiberaceae	Rhizomes	Sesquiterpene hydrocarbon like α -zingiberol; α -sesquiterpene alcohol α -bisabolene, α -farnesene, α -sesquiphellandrene	Antiemetic, stimulant, conditions like sore throat, asthma, cold, cough		[11]

Scientific Name	Common name	Family	Part Used	Chemical Constituents	Uses	Picture	Reference
<i>Ocimum Sanctum</i> <i>Linn</i>	Tulsi	Labiatae	Leaves	Volatile oils such as Eugenol, carvacrol, eugenol-methyl-ether and other components like vitamin C	Immunomodulator, stimulant, anti-spasmodic, anti-asthmatic, Stomachic		[12]
<i>Asparagus racemosus</i>	Shatavari	Liliaceae	Roots	Steroidal saponins such as Shatavarin I-IV, sarsapogenin, β -sitosterol, stigmasterol	Anti-spasmodic, demulcent, diuretic, in bronchial infections, in case of infertility		[13] [14]
<i>Andrographis peniculata</i>	Kaalmegh	Acanthaceae	Leaves or entire aerial plant	Kalmeghin, andrographolide, β -sitosterol, eugenol, caffeic	Tonic, influenza disease, bronchitis, cholera, dyspepsia, diabetes		[15]
<i>Terminalia arjuna</i>	Arjuna	Combretaceae	Bark, Leaves	Arjunic cid, tannins, arjunetin, arjunones, arjunolic acid	Cardiotonic, hepatoprotective, respiratory diseases, diuretic		[16]

Scientific Name	Common name	Family	Part Used	Chemical Constituents	Uses	Picture	Reference
<i>Bauhinia variegata</i> Linn.	Kanchanar	Caesalpiniaceae	Roots, bark	Eugenol, lupinol, β -sitosterol	Astringent,		[17]
<i>Thea Sinensis</i>	Tea	Theaceae	Leaves and leaf buds	Caffeine, theobromine, theophylline and tannins	Stimulant, astringent, diuretic, antioxidant, hepatoprotective		[18]
<i>Centella asiatica</i>	Brahmi	Umbelliferae	Fresh or dried herb	Triterpenoid saponin glycosides, brahmoside, brahminoside	Immunomodulator, stimulates reticulo-endothelial system, anti-inflammatory		[19]

Scientific Name	Common name	Family	Part Used	Chemical Constituents	Uses	Picture	Reference
<i>Acanthopanax sessiliflorus</i>	Prickly spine	Araliaceae	Shoots and roots	Bio-polymers	Lympho-proliferative activity		[20]
<i>Cannabis Sativa Linn.</i>	Common hemp	Cannabinaceae	leaves	cannabinoids	Immunomodulator		[21]
<i>Thuja occidentalis</i>	White cedar	Cupressaceae	Leaves and immature cones	polysaccharides	Insecticide, liniment, immunomodulator		[22]

Scientific Name	Common name	Family	Part Used	Chemical Constituents	Uses	Picture	Reference
<i>Panax ginseng</i>	Ginseng	Araliaceae	Dried roots	triterpenoids ginsenoside, chikusetsusaponin, panxoside	Demulcent, stimulant, carminative, expectorant, increase humoral and cellular immunity		[23]
<i>Dracocephalum parviflorum</i>	Dragon head	Lamiaceae	leaves	polysaccharides	Immunity booster		[24]

2. SIGNS AND SYMPTOMS

Symptoms that involve primarily are tiredness, sputum during coughing, chest blockage and mild fever. Person may feel loss of taste and smell. Other symptoms of COVID-19 are muscle ache, headache, runny nose, chest pain, chills and shortness of breath.

Individuals with chronic medical conditions such as diabetes, hepatopathy, high blood pressure, obese and poor immunity are more prone to develop serious illness.

3. PREVENTION

No one has been able to issue the complete guidelines for the prevention of coronavirus by far. However, WHO and ECDC have issued certain guidelines in the same regards. These guidelines are meant for the health care providers during the caring of such infected patients. This is mainly because many studies have stated the human to human transmission of coronavirus infection that originated from Wuhan, China. Another study related to the spread of the disease was through airborne transmission, however, no strict evidence has been put forward for the same. Because of limited amounts of evidence regarding the spread of the virus, health care professionals were unable to come up with prevention guidelines.

Some of the general guidelines were published according to WHO, these include [7,8]:

- Separating the patient from the other members of the family into an isolated room.
- Taking strict contact and droplet precautions
- Certain airborne precautions, etc.

According to the information leaflet published by European Centre for Disease Prevention and Control, members of the family or those in contact with the patient shall avoid any direct physical contact with the sick, especially those who have symptoms related to cough. The leaflets also include that one must avoid the visit to the market where dead or live animals are handled. It is also advised to wash hands with soap or use alcohol based disinfectant before and after eating, after using the toilet and also after coming in contact with animals. Also, you can altogether avoid contacting animals and the droppings linked with them.

4. FINDINGS

According to a report issued by the World Health Organization about three-quarters of the world's entire population trusts traditional remedies and mainly herbs for health care. Also, these herbs can be considered as the best remedy for the treatment of many of the known diseases.

However, till the time no proper and reliable cure for coronavirus is available with us, we can stick to the suggested preventive measures and keep ourselves safe. Some of the commonly available herbs that can be added to our daily diet for boosting our immunity include black-cumin, garlic, and liquorice. Not only will these herbs enhance the immunity of an individual but will also improve the gut for healthy digestion. You can include these as a part of your food or even adding them in the tea. These easily available herbs will reduce the danger to a large extent and help you to recover from the illness really quick.

5. CONCLUSION

Coronavirus is serious disease caused by virus SARS-CoV2. It may get transmitted to human by close contact or droplets present in the air. Individuals with poor immune system are more prone to it. Few plants with significant medicinal value and immuno-modulator activity may stimulate the immune response. Therefore, use of those herbals in your daily life to boost the immunity response can play the vital role in the prevention and management of coronavirus.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020;395:497–506.

2. Liu Y, Gayle AA, Wilder-Smith A, Rocklöv J. The reproductive number of COVID-19 is higher compared to SARS coronavirus. *J Travel Med.* 2020;27(2):taaa021. DOI:10.1093/jtm/taaa021
3. Loutfy MR, Blatt LM, Siminovitch KA, Ward S, Wolff B, Lho H, et al. Interferon alfacon-1 plus corticosteroids in severe acute respiratory syndrome: A preliminary study. *JAMA.* 2003;290:3222–8.
4. Mustafa S, Balkhy H, Gabere MN. Current treatment options and the role of peptides as potential therapeutic components for Middle East respiratory syndrome (MERS): a review. *J Infect Public Health.* 2018;11:9–17.
5. Gilardin L, Bayry J, Kaveri SV. Intravenous immunoglobulin as clinical immunomodulating therapy. *CMAJ* 2015;187:257–64.
6. Kumar V, Jung YS, Liang PH. Anti-SARS coronavirus agents: a patent review (2008– present). *Expert Opin Ther Pat.* 2013;23:1337–48
7. European Centre for Disease Prevention and Control (ECDC). Case definition and European surveillance for human infection with novel coronavirus (2019-nCoV); 2020. Available: <https://www.ecdc.europa.eu/en/case-definition-and-european-surveillance-human-infection-novel-coronavirus-2019-ncov>
8. European Centre for Disease Prevention and Control (ECDC). Health emergency preparedness for imported cases of highconsequence infectious diseases; 2019. Retrieved on 14 feb 2020. Available: <https://www.ecdc.europa.eu/en/publications-data/health-emergency-preparedness-imported-cases-highconsequence-infectious-disease>
9. Mohammad A. Alzohairy, Therapeutics Role of *Azadirachta indica* (Neem) and Their Active Constituents in Diseases Prevention and Treatment. *Evid Based Complement Alternat Med*; 2016.
10. Bayan L, Koulivand PH, Gorji A. Garlic: A review of potential therapeutic effects. *Avicenna J Phytomed.* 2014;4(1):1-14.
11. Mashhadi NS, Ghiasvand R, Askari G, Hariri M, Darvishi L, Mofid MR. Anti-oxidative and anti-inflammatory effects of ginger in health and physical activity: review of current evidence. *Int J Prev Med.* 2013;4(Suppl 1):S36-S42.
12. Vaghasiya J, Datani M, Nandkumar K, Malaviya S, Jivani N. Comparative evaluation of alcoholic and aqueous extracts of *Ocimum sanctum* for immunomodulatory activity. *Int J Phar Biol Res.* 2010;1(1):25e9
13. Nadkarni KM, Nadkarni AK. *Indian Materia medica.* 3rd ed. Mumbai: Popular Prakashan; 2005
14. Bopana N, Saxena S. *Asparagus racemose* and ethnopharmacological evaluation and conservation needs. *J Ethnopharmacol.* 2007;110:1e15
15. Varma A, Padh H, Shrivastava N. Andrographolide: A new plant-derived antineoplastic entity on horizon. *Evid Based Complement Alternat Med.* 2011; 2011:815390
16. Halder S, Bharal N, Mediratta PK, Kaur I, Sharma KK. Antiinflammatory, Immunomodulatory and anti-nociceptive activity of *Terminalia arjuna* Roxb. Bark powder in mice and rats. *Indian J Exp Biol.* 2009;47:577e83
17. Ghaisas MM, Saikh SA, Deshpande AD. Evaluation of immunomodulatory activity of ethanolic extract of stem bark of *Bauhinia variegata* Linn. *IJGP.* 2009;3(1): 70e4
18. Bhatt RP, Pandya BK, Sheth RN. *Camellia sinensis* L: The medicinal beverage: A review. *IJPSRR.* 2010;3(2):6e9
19. Mali RJ, Hatapakki BC. An in vitro study of effect of *Centella asiatica* on phagocytosis by human neutrophils. *IJPSN.* 2008;1(3):297e302.
20. Jeong SC, Jeong YT, Yang BK, Song CH. Chemical characteristics and immunostimulating properties of biopolymers extracted from *Acanthopanax sessiliflorus*. *J Biochem Mol Biol.* 2005; 39(1):84e90
21. Killestein J, Hoogervorst ELJ, Reif M, Blauw B, Smits M, Uitdehaag BMJ, Nagelkerken L, Polman CH. Immunomodulatory effects of orally administered cannabinoids in multiple sclerosis. *J Neuroimmunol.* 2003;137(1-2):140e3
22. Gohla SH, Zeman RA, Bogel M, Jurkiewicz E, Schrum S, Haubeck HD, Schmitz H, Hunsmann G, Neth RD. Modification of the in vitro replication of the human immunodeficiency virus HIV-1 by TPSg, a polysaccharide fraction isolated from the Cupressaceae *Thuja occidentalis* L. *Arborvitae.* *Haematol Blood Transfus.* 1992;35:140e9

23. Kim JH. Pharmacological and medical applications of *Panax ginseng* and ginsenosides: A review for use in cardiovascular diseases. J Ginseng Res. 2018;42(3):264-269. DOI: 10.1016/j.jgr.2017.10.004
24. Amirghofran Z, Azadbakht M, Karimi MH. Evaluation of the immunomodulatory effects of five herbal plants. J Ethnopharmacol. 2000;72(1-2):167e72.

© 2021 Shivani and Puri; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/77502>