

## REVIEW ON PREVENTION OF COVID-19: MIRACULOUS NATURAL HERBS

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### ABSTRACT

Currently, the novel and major life-threatening cause all over the world is COVID-19 (Coronavirus disease 2019) which is started at the end of 2019 in Wuhan, China, and spread all over the world today. The infection of COVID-19 severity is variable which affects all ages' people and especially elderly persons whose immune system is very weak. Fatigue, fever, respiratory illness, dry cough, loss of appetite, olfactory dysfunction are the most common symptoms of this disease along with the decrease of certain cells of the immune system like helper T cells, monocytes/macrophages, etc. and an increase in pro-inflammatory cytokines are some of the major characteristics of this disease. Some natural herbal products are a successive option to combat SARS-Cov-2 disease. Herbs have various potential compound which is used as a dietary product that strongly influences immunity and maintenance of the homeostasis of inflammatory/anti-inflammatory. In the present review, we describe the potential of three herbal products as Turmeric (Haldi), Heart-leaved moonseed (Giloy), and Black cumin (Kalonji) that can be used for preventative or nutritional therapy of COVID-19.

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### INTRODUCTION

COVID-19 is currently an unexpected pandemic which is an emergence outbreak that originated from Wuhan, China in 2019 and spread across the worldwide. Coronavirus disease 2019 which continues to be a matter of health concern all over the world is caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). SARS-CoV-2 is the seventh member in the Coronaviridae family and is capable of affecting humans (1). SARS-CoV-2 is the RNA virus that severity is variable mainly influences pro-inflammatory cytokines and inflammation of the lungs. According to the WHO, about 19 lakh people all over the world are suffering from the disease and more than 7 lakh people have died (2). The most prevalent symptoms of this disease are dry cough (76%), fever (98%), myalgia (44%), and respiratory illness as well as release high amounts of proinflammatory cytokines such as IL-10, IL-2, IL-7, G-CSF in blood (3). The risk of this disease is in all age groups, but in older people, immunocompromised persons and individuals who are suffering from some serious disease like diabetes, cardiovascular diseases, are more susceptible to this

disease. The disease spread mainly occurs when normal person who comes in contact with droplets of coughing or sneezing of the infected person. At present time there is no specific treatment for COVID-19, patients use many antiviral medicines such as Remdesivir, Lopinavir, Ribavirin with certain precaution (4). Based on previous studies we can hypothesize that COVID-19 can be cured by herbal products because the natural product contains different compounds such as flavonoids, terpenoids, polysaccharides which show immunomodulatory, antibacterial, and antiviral activities. Herbal plants also target viral spike proteins, enzymes, etc. which exhibit its potential and safety profile useful for therapeutic approach. Natural products are not only inexpensive but also easily available and they have no side effects. This review explains some herbal products that prevent or cure the COVID-19 diseases.

### NATURAL MEDICINAL CANDIDATE

#### CURCUMALONGA (TURMERIC/ HALDI)

Turmeric is a famous rhizomatous herbal plant grown in India. This plant has received special interest in medical and scientific fields. Its genus is Curcuma and

the family is Zingiberaceae (5). Turmeric is a natural product generally used in Asian traditional food supplement as a spice and coloring agent of food which enhance the taste of food. In recent years *C. longa* is used as a medicinal plant that exerts as antioxidant, anticancer, anti-inflammatory, antiviral, and antibacterial so used in the treatment of various diseases like neurodegenerative diseases, respiratory diseases, allergy, diabetes. Various dietary supplements are found in turmeric such as 96.4% carbohydrate content, 5.1% fat, 6.3% protein and some amount of minerals and moisture (6). Turmeric also contains demethoxycurcumin, curcumin, and bisdemethoxycurcumin which are curcuminoids compounds and perform medicinal activity. Among all the compounds curcumin is the most important bioactive component of turmeric which makes it an important candidate for therapy to be used in the treatment of COVID-19 (6). Curcumin is a potential agent that shows activity against SARS-CoV-2. It can bind with 30 viral proteins and interfere with the penetrating pathways of the virus (7). Curcumin has the proper ability to bind to ACE2 receptors which makes it more difficult for the COVID-19 virus to enter (7). Angiotensin-converting enzyme -2 acts as a receptor for COVID-19, in-vivo research has shown that if curcumin doses are low Ang II levels decrease in the body thereby increasing ACE-2 protein (8,9). Curcumin also modulates various signaling molecules such as adhesion molecules, NF- $\kappa$ B, cyclooxygenase, pro-inflammatory cytokines. The most important characteristic of curcumin is the inhibition of thrombin and Factor Xa (FXa), thereby reducing the viscosity of blood (also known as COVID-19 coagulopathy) in COVID-19 patients and prolonging the survival rate of patients (10). So, curcumin emerges as one of the best candidates for the treatment of COVID-19. According to the FDA (US Food and Drug Administration), it is a tolerable and safe herbal product (11). On the basis of studies turns out that it can be used regularly in food not to increase the taste of food only but also to enhance the immune system as well as fight against the pathogenic microorganism.

#### **TINOSPORA CARDIFLIA (HEART-LEAVED MOONSEED/GILOY)**

*T. cordifolia* is a miraculous Indian herb also known as Giloy, Amrita, Guduchi, Madhuparni, and Heart-leaved moonseed (12-14). The family of *T. cordifolia* is Menispermaceae (15). This is a medicinal plant that contains numerous secondary metabolites like diterpenoid lactone, alkaloids, steroids which have many including properties antioxidant, antiallergic, anti-inflammatory, immunomodulatory (15). It is actively involved in the fight against various

pathogenic organisms (Bacteria, Viruses, etc.) and is also helpful in preventing many diseases. Boosting the immune system is the major and popular character of *T. cordifolia*. It is a magical immunity booster called life nectar. It is mentioned in Rigveda that this herb is like an elixir (12-14). Studies exhibited that the extract of *T. Cordifolia* shows an immunomodulatory effect in HIV patients. Choline, magnoflorine, tinosporin are the active phytoconstituents of *T. Cordifolia* which shows the immunomodulatory, antioxidant effects, and also the ability to scrounge free radicals (16). *T. cordifolia* by the method of non-enzymatic also exhibits the activity of antioxidants in the in-vitro model (17). The alcohol extract of *T. cordifolia* reveals an anti-inflammatory effect. Another study has been also exhibited that this herb in albino rats shows the activity of antipyretic (18). COVID-19 Virus binds its spike protein RBD (Receptor-Binding Domain) to the ACE2 receptor present on host cells for entry into the host; research has shown that *Tinospora cordifolia* can disrupt the electrostatic intercommunication between the receptor-binding domain and the ACE2 receptor which cause weakened the entry of SARS-CoV-2 (19).

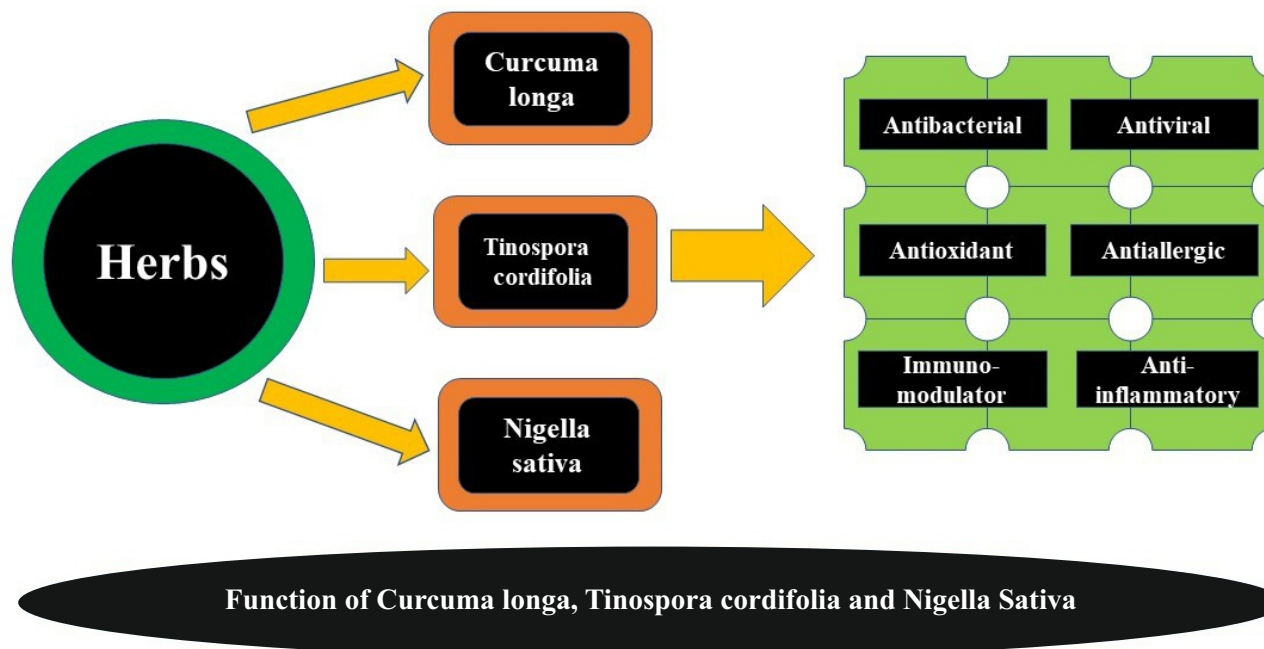
#### **NIGELLA SATIVA (BLACK CUMIN/ BLACK SEED/ KALONJI)**

*N. Sativa* is a natural flowering plant belonging to Ranunculaceae family. This herb is an Indian household medicine from the name of kalonji and is also used all over the world for cooking. It is also known as Black caraway. According to the Prophet Mohammad description, kalonji is a marvelous plant that can cure every disease that is a globally, healer. *N. Sativa* is used for the treatment of various diseases include Diabetes, Asthma, Arthritis because it contains various alkaloids (Nigellicine, Nigellimine), proteins, fatty acids, and other constituents like methionine, palmitic, glutamic. It also has many active medical constituents such as Thymoquinone, thymol (20-28). This medicative herb also has antiviral, antibacterial, Hepatoprotective, Neuroprotective, Antioxidant, antihypertensive activity (29-33). In human beings, Zn is present in the intracellular compartment and involved in cell growth. In the case of any bacterial and viral infections, Zn activates the pathways of the immune system that initiate the expression of IL-6, IL-8, TNF- $\alpha$ , Neutrophils, NK cell, T and B cell and boosts innate and adaptive immunity (34-35). Research revealed that *N. sativa* has an active supplement of Zn which not only suppresses rhinovirus processing in the human cell but also blocks the viral entry pathway. It inhibits the replication cycle of picornaviruses, influenza virus, HIV, vaccinia virus as well as SARS COV-2 by blocking of virus RdRp (RNA dependent

RNA polymerase) activity (36-43). The infection of virus and other pathogens, Zn is directly or indirectly triggering the host immune response. The active constituent of *N. sativa* is thymoquinone that indirectly activates the inhibitory molecule  $\kappa$ -opioid receptor. One of the other compound known as hemorphins found in *N. sativa*. Hemorphins is an opioid active peptide which inhibits ACE or in other words, it interferes with the path of SARS-COV-2 and useful to treat the patients (44-45).

## CONCLUSION

Various types of life-threatening diseases are arising in the world, which not only people are getting infected but people are also dying in abundance, in such a situation, due to the limited modern medicine, natural herbs are a light of hope for the people. While the whole world is waiting for effective medicine to treat COVID-19, here in this review we are drawing your attention to the effect of herbal products. The



**Fig. 1: Function of Curcuma longa, Tinospora Cardifolia, Nigella sativa.**

## DISCUSSION

The recently discovered SARS-CoV-2 is causing major problems across the world. Till date, there is no specific treatment for COVID-19 disease necessitates an urgent to develop medications that block SARS-CoV-2 targets. The use of nutraceuticals for illness prevention and treatment has grown as a result of their benefits. So according to the above study, we found that Herbal treatments may be able to control the creation and release of Proinflammatory Cytokines, as well as inhibit the virus's development in the cells of the host. Curcuma longa, Tinospora cardifolia, and Nigella sativa have several medicinal functions including antibacterial, antifungal and antiviral. These 3 herbs not only block the entry of SARS-CoV-2 into the host body but also modulate certain molecular pathways and act as an elixir against COVID-19. Therefore, Given the beneficial effects of these herbs, it can be used as a supplement.

herb contains a variety of natural ingredients that make it suitable as a base for medicines. According to WHO, around 4 billion people in the world depend on these herbal medicines as the primary treatment for many diseases because it is easily available to all classes of persons and also have no side effect. The bioactive components present in the herb enhance our immunity, due to which natural product has attained a great achievement in the treatment of many diseases as well as in the treatment of COVID-19. These components are easily available in every kitchen for cooking purposes and can be used as first aid in the treatment of COVID-19. Therefore, this review provides a clinical perspective and application of these herbs in the prevention and treatment of viral infections in the respiratory system. The evidence suggests it is safe to use by public members with appropriate caution. In addition, it is also helpful for scientific and experimental documentation on traditional herbs.



# REFERENCES

1. Cheepsattayakorn A, Cheepsattayakorn R. Proximal origin and phylogenetic analysis of COVID-19 (2019-nCoV or SARS-CoV-2). *EC Microbiology*.2020;19:9–12.
2. World Health Organization, Coronavirus Disease 2019, World Health Organization, Geneva, Switzerland.2020.
3. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020;395(10223):497-506.
4. Maideen N. Prophetic Medicine-Nigella Sativa (Black Cumin Seeds) – Potential Herb for COVID-19?.*Journal of Pharmacopuncture*. 2020;23(2):62-70.
5. S1. Hewlings S, Kalman D. Curcumin: A Review of Its Effects on Human Health. *Foods*. 2017;6(92):1–11.
6. Kocaadam B, Şanlıer N. Curcumin, an active component of turmeric (*Curcuma longa*), and its effects on health. *Critical Reviews in Food Science and Nutrition*. 2015;57(13):2889-2895.
7. Zahedipour F, Hosseini S, Sathyapalan T, et al. Potential effects of curcumin in the treatment of COVID -19 infection. *Phytotherapy Research*. 2020;34(11):2911-2920.
8. Pang XF, Zhang LH, Bai F, et al. Attenuation of myocardial fibrosis with curcumin is mediated by modulating expression of angiotensin II AT1/AT2 receptors and ACE2 in rats. *Drug design, development and therapy*. 2015; 9:6043.
9. Xu X, Cai Y, Yu Y. Effects of a novel curcumin derivative on the functions of kidney in streptozotocin-induced type 2 diabetic rats. *Inflammopharmacology*. 2018;26(5):1257-64.
10. Keihanian F, Saeidinia A, Bagheri R. K, et al. Curcumin, Hemostasis, Thrombosis, and Coagulation. *J. Cel Physiol*. 2018;233 (6):4497–4511.
11. Hewlings S, Kalman D. Curcumin: A Review of Its Effects on Human Health. *Foods*. 2017;6(10):92.
12. Khare C.P. Indian medicinal plants-an illustrated dictionary.663-664.
13. Mishra R, Kaur G. Aqueous Ethanolic Extract of *Tinospora cordifolia* as a Potential Candidate for Differentiation Based Therapy of Glioblastomas. *PLoS ONE*. 2013;8(10):e78764.
14. Leonti M, Casu L. Soma, food of the immortals according to the Bower Manuscript (Kashmir, 6th century A.D.). *Journal of Ethnopharmacology*. 2014;155(1):373-386.
15. Choudhary N, Siddiqui M. B, Azmat S, et al. *Tinospora cordifolia*: ethnobotany, phytopharmacology and phytochemistry aspects. *International Journal of Pharmaceutical Sciences and Research*. 2013;4(3):891–899.
16. Sharma V, Gupta R. Ameliorative effects of *Tinospora Cordifolia* root extract on histopathological and biochemical changes induced by Aflatoxin-B1in mice kidney. *Toxicology International*. 2011;18(2):94.
17. N P. Antioxidant activity of *Tinospora cordifolia* leaf extracts through non-enzymatic method. *Journal of Medicinal Plants Research*. 2012;6(33):4790–479.
18. Ashok B, Ravishankar B, Prajapati P, et al. Antipyretic activity of Guduchi Ghrita formulations in albino rats. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2010;31(3):367-370.
19. Balkrishna A, POKHREL S, Varshney A. *Tinospora cordifolia* (Giloy) may curb COVID-19 contagion: Tinocordiside disrupts the electrostatic interactions between ACE2 and RBD. *Authorea*.
20. Ahmad A, Husain A, Mujeeb M, et al. A review on therapeutic potential of *Nigella sativa*: a miracle herb. *Asian Pac. J. Trop. Biomed*. 2013;3(5):337–352.
21. Butt M, Sultan M. *Nigella sativa*: Reduces the Risk of Various Maladies. *Critical Reviews in Food Science and Nutrition*. 2010;50(7):654-665.
22. Ijaz H, Tulain U.R, Qureshi J, et al. Review: *Nigella Sativa* (Prophetic medicine): A Review. *Pak. J. Pharm. Sci*.2017;30(1):229–234.
23. Kooti W, Hasanzadeh-Noohi Z, Sharafi-Ahvazi N, et al. Phytochemistry, pharmacology, and therapeutic uses of black seed (*Nigella sativa*). *Chin. J. Nat. Med*. 2016;14(10):732–745.
24. Padhye S, Banerjee S, Ahmad A, et al. From here to eternity - the secret of Pharaohs: therapeutic potential of black cumin seeds and beyond. *Cancer Ther*. 2008;6(b):495–510.
25. Goreja, W. G. *Black seed: Nature's miracle remedy*. 7 Amazing Herbs Press. 2003.
26. Nickavar B, Mojab F, Javidnia K, et al. Chemical composition of the fixed and volatile oils of *Nigella sativa* L. from Iran. *Z. Naturforsch. C*. 2003;58(9-10):629–631.
27. Avula B, Wang Y.-H, Ali Z, et al. Quantitative determination of chemical constituents from seeds of *Nigella sativa* L. using HPLC-UV and identification by LC-ESI-TOF. *J. AOAC Int*.

- 2010;93(6):1778–1787.
28. Kiralan M. Volatile compounds of black cumin seeds (*Nigella sativa* L.) from microwave-heating and conventional roasting. *J. Food Sci.* 2012;77(4):C481–4.
29. Abdel-Sater, K. A. Gastroprotective effects of *Nigella sativa* oil on the formation of stress gastritis in hypothyroidal rats. *International Journal of Physiology, Pathophysiology and Pharmacology*. 2009;1(2):143–149.
30. Abdel-Zaher A. O, Abdel-Rahman M. S, Elwasei F. M. Protective effect of *Nigella sativa* oil against tramadol-induced tolerance and dependence in mice: Role of nitric oxide and oxidative stress. *Neurotoxicology*. 2011;32(6):725–733.
31. Abel-Salam B. K. A. Immunomodulatory effects of black seeds and garlic on alloxan-induced Diabetes in albino rat. *Allergologia Immunopathologia*. (2012);40(6):336–340.
32. Assayed, M. E. Radioprotective effects of black seed (*Nigella sativa*) oil against hemopoietic damage and immunosuppression in gamma-irradiated rats. *Immunopharmacology and Immunotoxicology*. 2010;32(2):284–296.
33. Boskabady M. H, Mohsenpoor N, Takalo L. Antiasthmatic effect of *Nigella sativa* in airways of asthmatic patients. *Phytomedicine*. 2010;17(10):707–713.
34. Vallee B.L, Falchuk K.H. The biochemical basis of zinc physiology. *Physiol. Rev.* 1993;73(1):79–118.
35. Hayden M.S, Ghosh S. Regulation of NF-kappaB by TNF family cytokines. *Semin. Immunol.* 2014;26(3):253–266.
36. Uchide N, Ohyama K, Bessho T, et al. Effect of antioxidants on apoptosis induced by influenza virus infection: inhibition of viral gene replication and transcription with pyrrolidine dithiocarbamate. *Antiviral Res.* 2002;56(3):207–217.
37. Korant B.D, Kauer J.C, Butterworth B.E. Zinc ions inhibit replication of rhinoviruses. *Nature*. 1974;248(449):588–590.
38. Krenn B.M, Gaudernak E, Holzer B, et al. Antiviral activity of the zinc ionophores pyrithione and hinokitiol against picornavirus infections. *J. Virol.* 2009;83(1):58–64.
39. Lanke K, Krenn B.M, Melchers W.J.G, et al. PDTC inhibits picornavirus polyprotein processing and RNA replication by transporting zinc ions into cells. *J. Gen. Virol.* 2007;88(Pt4):1206–1217.
40. Haraguchi Y, Sakurai H, Hussain S, et al. Inhibition of HIV-1 infection by zinc group metal compounds. *Antiviral Res.* 1999;43(2):123–133.
41. Katz E, Margalith E. Inhibition of vaccinia virus maturation by zinc chloride. *Antimicrob. Agents Chemother.* 1981;19(2):213–217.
42. Kaushik N, Subramani C, Anang S, et al. Zinc salts block hepatitis e virus replication by inhibiting the activity of viral RNA-dependent RNA polymerase. *J. Virol.* 2017;91(21):e00754-17.
43. Velthuis A.J.W, van den Worm S.H.E, Sims A.C, et al. Zn(2+) inhibits coronavirus and arterivirus RNA polymerase activity in vitro and zinc ionophores block the replication of these viruses in cell culture. *PLoS Pathog.* 2010;6(11):e1001176.
44. Abdel-Fattah A.M, Matsumoto K, Watanabe H. Antinociceptive effects of *Nigella sativa* oil and its major component, thymoquinone, in mice. *Eur. J. Pharmacol.* 2000;400(1):89–97.
45. Lantz I, Glamsta E.L, Talback L, et al. Hemorphins derived from hemoglobin have an inhibitory action on angiotensin converting enzyme activity. *FEBS Lett.* 1991;287(1-2):39–41.

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