

Black seed (*Nigella sativa*), a COVID-19 Medicinal Intervention

Ponn P. Mahayosnand¹, Samiha Ahmed², ZM Sabra³

¹MPH, Research Scholar, Ronin Institute, Montclair, NJ, USA

²MPH, Graduate, University of Maryland, College Park, Maryland.

³Medical Student, Islamic University of Gaza, Faculty of Medicine, Gaza, Palestine.

Correspondence: ponn.mahayosnand@ronininstitute.org

Keywords: *Black seed, Nigella sativa, COVID-19, COVID-19 prophylaxis, COVID-19 treatment*

Abstract

This review article presents the medicinal use of black seed (*Nigella sativa*) for coronavirus 2019 (COVID-19). The authors analyze current COVID-19-specific black seed studies in the Middle East, South Asia, and the Far East. While black seed has benefits far beyond its antiviral and immunity-enhancing effects, the authors focus on these properties as they relate specifically to COVID-19. Since some of the countries discussed have fewer financial and human resources, the successful ingestion or inhalation of black seed or black seed oil deserves worthy attention. This report is split into two sections: [1] the Islamic, historical, botanical, and scientific significance of black seed; and [2] the chemical composition, nutritional values, and current use of black seed as a prophylactic and COVID-19 treatment.

Introduction

The authors intend to introduce black seed, a common ancient natural medicine that can be used to improve overall health and well-being, to key stakeholders: health researchers, policymakers, public health and preventive medicine clinicians and practitioners, and other persons concerned about a more equitable, economical, and accessible alternative, all-natural option for preventing and treating COVID-19. Black seed also serves as an introduction to Prophetic Medicine, a complementary practice used throughout the Muslim world alongside allopathic medicine. Implemented into one's daily life, black seed has proven health implications surpassing the current COVID-19 pandemic.

The history and religious significance of black seed

Black seed is known as a natural medicine in the Christian faith, as noted in the Old Testament. (1, 2) In

Islam, it is reported that the Prophet Muhammad (peace be upon him) said black seed is a cure for everything, when used regularly, except death. (1-4) Following the medicinal advice of the Prophet (peace be upon him) or verses from the Qur'an is called *at-Tib an-Nabawi* or Prophetic Medicine. (5,6) It is hard to gauge how widespread black seed usage is among Muslims worldwide. However, Muslim-majority countries had fewer COVID-19 cases and deaths during the 3 global peak dates in 2020-2021 in a cross-country analysis of 165 countries. (7) Therefore, stakeholders should take notice of any COVID-19 interventions used in Muslim-majority countries.

It is documented that black seed was historically used by the Egyptian pharaohs, Greek physicians, and Ibn Sina, who is often referred to as the father of modern medicine. (1,2) Black seed was used by Egyptians for mummification, and it was found in Tutankhamun's tomb. They also recorded black seed as a prescription for various health conditions, such as bronchial asthma,

hypertension, and back pain. Hippocrates and Galen used to treat hepatitis, fevers, nasal congestion, headaches, influenza, and even intestinal parasites with black seed. (2,3) In Ibn Sina's famous "Canon of Medicine," black seed is noted for its ability to energize and stimulate a fatigued body and mind. Black seed is one of the most widely and continuously researched medicinal plants in peer review journals, (6) with proven efficacy in non-communicable diseases and other ailments.

The botany of black seed

Black seed is also known as black cumin seed, black cumin, black caraway, and black coriander in English, "little black seed" in Greek, black grains in Italian, "seeds of blessings" in Arabic, and kalonji seeds in India. (1) Additionally, it is referred to as "the miracle cure" and "blessed herb." (4)

The botanical names are:

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Ranunculales
Family: Ranunculaceae
Genus: *Nigella*
Species: *sativa*

Originally from the Mediterranean peninsula, black seed spread throughout Northern Africa, Eastern Asia, and Southern Europe, then to Eastern Europe and North America. Although it is currently cultivated throughout the world, it thrives in the climate and soil of the Middle East, the Mediterranean region, and Southern Asia. The plant is a thin white-petaled flower with five seed pods that distinctively stay closed until the seeds are ripe. Once the pods open, exposure to the air turns the seeds' color to black.

The science of black seed

Black seed is "antioxidant, antibacterial, antifungal, antiparasitic, antiviral, anti-inflammatory, anticancer, antidiabetic, hepatoprotective, [and] immunomodulatory," with many other beneficial medicinal effects. Black seed's therapeutic potential "is mostly related to the presence of a number of pharmacologically active constituents such as thymoquinone, thymohydroquinone, dithymoquinone, thymol, nigellone and many other phytochemicals." (1,6,8) Elnour and Abdelsalam reported black seed's "extremely low toxicity" on humans and animals. Black

seed has a strong ability to improve immunity when taken regularly and continuously.

Nutritional benefits

Black seed is rich in nutritional value as it contains vitamin A, calcium, iron, sodium, potassium, and more. (3) Notably, it has 8 of the 9 essential amino acids, which cannot be synthesized in the body and thus must be ingested from food. In relation to immunity, when a black seed powder capsule was ingested for 4 weeks in healthy volunteers, the ratio of helper to suppressor T-cells increased 73%, whereas the ratio decreased by 7% in the control group receiving a placebo. (2) When studied on immunocompromised AIDS patients, they increased the ratio by 55%. Ingested black seed oil relieves allergy and bronchial asthma symptoms as it serves as a bronchodilator. (4)

With over 100 chemicals making black seed unique and incomparable, its antiviral properties are also impressive. For example, black seed can significantly inhibit Hepatitis C Virus (HCV) replication. (3) A black seed concoction was found to dramatically decrease the viral load, symptoms, and signs and CD4 T-cell counts of HIV patients. Numerous studies have also proven its antimalarial properties.

In conjunction with its benefits on immunity and respiratory health, black seed's ability to relieve fevers and influenza, along with its antiviral abilities, the possibilities of black seed having a positive effect on COVID-19 is extremely positive. Black seed and its oil are readily available, highly affordable, and can be self-administered at home. Known as a "miracle cure" by the two largest religions in the world (Christianity and Islam), black seed should be considered seriously.

Black Seed and COVID-19

Black seed COVID-19 related studies have taken place in Pakistan, China, India, Korea, Malaysia, and treatment protocols are used in Saudi Arabia, Egypt, and Pakistan.

Chemical structure and Biological Properties of Black Seed

An important aspect of black seed is that the chemical structure of its biological compounds supports antiviral activity. The primary bioactive compounds of interest identified in black seed include thymoquinone and nigellimine. (8) Thymoquinone studied in isolation has shown "anti-inflammatory, anti-oxidant, anti-tumor, and

antimicrobial activities.” (6,9) A molecular docking study in India analyzed the binding between the SARS-CoV-2 receptor-binding sites and active compounds in black seed, primarily dithymoquinone, thymohydroquinone, thymol, and thymoquinone. This study showed the potential for blocking viral activity by binding to the COVID spike protein receptor. In some cases, these compounds bound SARS-CoV-2 even more strongly than chloroquine, which was considered a potential immunoregulatory treatment at the time. (5) Thymoquinone was also found to be safe for children in a study done on epileptic adolescents. (9)

Respiratory Benefits of Black Seed

Across several respiratory disease studies, both in humans and in guinea pigs, respiratory symptom relief, such as in asthma patients, was observed after treatment with black seed. (10) In one study, some cases showed less reliance on their original inhaler dosage after treatment. Additionally, cytokines that lead to increased numbers of mucus-producing cells in the lungs have been inhibited by black seed. This activity would potentially decrease the overproduction of mucus, alleviating a patient's shortness of breath. Given the severe respiratory nature of COVID-19, black seed has great potential as a viable treatment.

Symptom Reliever

Black seed may also serve as an effective COVID-19 symptom treatment of fever, chills, shortness of breath, low oxygen levels, muscle fatigue, and loss of taste or smell. (11) For patients experiencing Cytokine Storm Syndrome due to an exacerbated inflammatory response to COVID-19, the anti-inflammatory properties of black seed can provide relief. (12) Since black seed has shown to increase the production of reactive oxygen species denaturing enzymes, it can also aid in the oxidative stress observed in COVID-19 patients. (11) While COVID-19 inhibits autophagic activity, an important immune response that removes virus-infected cells from the human body, thymoquinone shows promise in enhancing this immune response. (12)

TaibUVID - a Black seed mixture as a COVID-19 treatment

The Taibah University anti-COVID-19 treatment (TaibUVID) has been studied in Saudi Arabia as a novel COVID-19 treatment. The TaibUVID mixture consists of “1 small spoonful (tea spoonful) of nigella sativa oil (or 2

gram nigella sativa seeds) mixed with 1 gram of grinded anthemis hyalina mixed with 1 large spoonful of natural honey.”(13) The mixture is recommended orally or can be inhaled as a vapor. A retrospective study of 20 COVID-19 patients and their healthy contacts in Egypt used this supplement. The study cohort consisted of volunteers who were already familiar with TaibUVID as a supplement through social media. (14) El-Sayed found that regular consumption among infected patients led to reduced COVID-19 symptoms, and, in 70% of patients, there was a faster recovery time of 1-4 days.

A group of healthy contacts of the infected patients of this study, including family members, medical personnel, and others, volunteered to use TaibUVID as a prophylaxis regularly. Of these individuals, 70% of those who had contact with COVID-19 infected patients did not result in any positive PCR tests during the 4 months of testing. This indicates TaibUVID's significant potential for prophylaxis, which is important to consider as COVID variants emerge. Not unpleasant to consume, participants generally had no complaints taking TaibUVID regularly. Composed of readily available, inexpensive ingredients, TaibUVID is a highly accessible prophylaxis. TaibUVID Forte supplements were recommended alongside COVID-19 treatment on positive cases for expedited symptom relief, and TaibUVID inhalation therapy was a recommended hospital treatment for COVID-19 inpatient cases.

Honey and black seed COVID-19 treatment

A clinical trial conducted in Pakistan showed promising results of honey and black seed mitigating severity of symptoms in COVID-19 patients. (15) Both moderate and severe COVID-19 cases were included in the study. The experimental group was given a mix of 1 g honey and 80 mg/kg of body weight of black seed daily. This mixture was divided into 2-3 doses per day. After roughly 3 months of symptom observation and regular PCR testing, it was found that symptoms were resolved in patients given the honey and black seed earlier than those receiving the placebo. The patients receiving the mixture also tested negative for COVID-19, on average, 4 days earlier than the group receiving the placebo.

Conclusion

The promising results presented in this paper represent only a fraction of the black seed COVID-19 research conducted. For example, in India, a list of all COVID-19 immunity-boosting foods studied was compiled. Black seed topped the list with the highest nutrient value, above

the commonly-known cumin, turmeric, cinnamon, and cardamom. (16) Saudi Arabia studied natural combinations of black seed, garlic, wasabi, honey, and vitamin C-rich foods. (17) A study in Malaysia found that black seed's effectiveness increased when supplemented with Zinc. (8) Bangladesh also took steps to conduct research with black seed. (18) An important fact stressed throughout this paper is that black seed must be taken regularly and continuously for the greatest prophylaxis or treatment effect.

The authors hope that this introductory piece intrigues the reader and encourages them to support, further explore, and possibly use black seed and/or Prophetic Medicine as a complement to Western medicine practices. Specific to the pandemic, the authors strongly recommend further and ongoing research trials of black seed and its therapeutic and prophylactic effects on COVID-19 be conducted.

Acknowledgements: The authors would like to thank Maryam Edris for her research support.

Funding: None.

Competing interests: None declared.

References

1. Singh AK, Singh P, Kisku U, Kumar A, Kumar S. Effects of dietary supplementation of Black Cumin (*Nigella sativa*) in small ruminants: A review. *Indian J Anim Health*. 2022 Nov 14. Available from: <https://doi.org/10.36062/ijah.2022.09622>
2. Dubey PN, Singh B, Mishra BK, Kant K, Solanki RK. *Nigella* (*Nigella sativa*): a high value seed spice with immense medicinal potential. *Indian J Agric Sci*. 2016;86(8). Available from: <https://doi.org/10.56093/ijas.v86i8.60500>
3. Sadeghi E, Imenshahidi M, Hosseinzadeh H. Molecular mechanisms and signaling pathways of black cumin (*Nigella sativa*) and its active constituent, thymoquinone: a review. *Mol Biol Rep*. 2023 May 8. Available from: <https://doi.org/10.1007/s11033-023-08363-y>
4. Home - Ibn Sina Institute of Tibb [Internet]. [cited 2023 Aug 23]. Available from: <http://www.tibb.co.za/wp-content/uploads/2018/12/black-seed.pdf>
5. Shaikh YI, Shaikh VS, Ahmed K, Nazeruddin GM, Pathan HM. The Revelation of Various Compounds Found in *Nigella sativa* L. (Black Cumin) and Their Possibility to Inhibit COVID-19 Infection Based on the Molecular Docking and Physical Properties. *Eng Sci*. 2020. Available from: <https://doi.org/10.30919/es8d1127>
6. Azamat Kizi KS. Therapeutic Potential of *Nigella sativa*: A Miracle Herb. *Eur Int J Multidiscip Res Manag Stud*. 2022;02(04):259-62. Available from: <https://doi.org/10.55640/eijmrms-02-04-49>
7. P Mahayosnand P, Gheno G, Sabra Z, Sabra D. Muslim-majority Countries Have Fewer COVID-19 Cases and Deaths: A Cross-country Analysis of 165 Countries During the 3 Global Peak Dates in 2020-2021. *HPHR J*. 2021. Available from: <https://doi.org/10.54111/0001/vv2>
8. Rahman MT. Potential benefits of combination of *Nigella sativa* and Zn supplements to treat COVID-19. *J Herb Med*. 2020 Oct. Available from: <https://doi.org/10.1016/j.hermed.2020.100382>
9. Ahmad A, Rehman MU, Ahmad P, Alkharfy KM. Covid-19 and thymoquinone: Connecting the dots. *Phytotherapy Res*. 2020 Jul 10;34(11):2786-9. Available from: <https://doi.org/10.1002/ptr.6793>
10. Kulyar MF, Li R, Mehmood K, Waqas M, Li K, Li J. Potential influence of *Nigella sativa* (Black cumin) in reinforcing immune system: A hope to decelerate the COVID-19 pandemic. *Phytomedicine*. 2020 Jul;153277. Available from: <https://doi.org/10.1016/j.phymed.2020.153277>
11. Maideen NM. Prophetic Medicine-*Nigella Sativa* (Black cumin seeds) – Potential herb for COVID-19? *J Pharmacopunct*. 2020 Jun 30;23(2):62-70. Available from: <https://doi.org/10.3831/kpi.2020.23.010>
12. Islam MN, Hossain KS, Sarker PP, Ferdous J, Hannan MA, Rahman MM, Chu D, Uddin MJ. Revisiting pharmacological potentials of *Nigella sativa* seed: A promising option for COVID-19 prevention and cure. *Phytotherapy Res*. 2020 Oct 12. Available from: <https://doi.org/10.1002/ptr.6895>
13. Open Access Peer Reviewed Journals | Science and Education Publishing: Home [Internet]. The Evidence-Based TaibUVID Nutritional Treatment for Minimizing COVID-19 Fatalities and Morbidity and eradicating COVID-19 pandemic: A novel Approach

- for Better Outcomes (A Treatment Protocol); [cited 2023 Aug 23]. Available from: <http://pubs.sciepub.com/ajphr/8/2/3/>
14. Sayed S, Bahashwan S, Aboonq M, Baghdadi H, Elshzley M, Okashah A, Rashedy A, Ahmed R, Aljehani Y, El-Tahlawi R, Nabo M, Hamouda O, El-Murr AR, Abdul-Latif T, Mahmoud H. Adjuvant TaibUVID nutritional supplements proved promising for novel safe COVID-19 public prophylaxis and treatment: enhancing immunity and decreasing morbidity period for better outcomes (A retrospective study). *Int J Med Dev Ctries*. 2020. Available from: <https://doi.org/10.24911/ijmdc.51-1594011487>
 15. Ashraf S, Ashraf S, Ashraf M, Imran MA, Kalsoom L, Siddiqui UN, Farooq I, Akmal R, Akram MK, Ashraf S, Ghufran M, Majeed N, Habib Z, Rafique S, -Abdin Z, Arshad S, Shahab MS, Ahmad S, Zheng H, Mirza AR, Zulfiqar S, Anwar MI, Humayun A, Mahmud T, Saboor QA, Ahmad A, Ashraf M, Izhar M. Honey and Nigella sativa against COVID-19 in Pakistan (HNS-COVID-PK): A multicenter placebo-controlled randomized clinical trial. *Phytotherapy Res*. 2022 Nov 24. Available from: <https://doi.org/10.1002/ptr.7640>
 16. Richardson DP, Lovegrove JA. Nutritional status of micronutrients as a possible and modifiable risk factor for COVID-19: a UK perspective. *Br J Nutr*. 2020 Aug 20;124(1):1-7. Available from: <https://doi.org/10.1017/s000711452000330x>
 17. Enani SM. Possible Prophylactic and Therapeutic Foods for Prevention and Management of COVID-19- An Updated Review. *Curr Res Nutr Food Sci J*. 2020 Dec 28;8(3):682-9. Available from: <https://doi.org/10.12944/crnfsj.8.3.02>
 18. Anam E, Swachho RB, Jannat K, Rahmatullah M. Home remedies for COVID-19 treatment in Gazipur district, Bangladesh. *J Med*