


Nigella sativa: miraculous plant

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Received: 9 November 2020 Accepted: 27 December 2020
 Published 2021 Volume 2, Issue 1,

 **How to Cite:** Abdollahi N, Nadjarzadeh A. *Nigella sativa*: miraculous plant. *Critical Comments in Biomedicine*. 2021; 2(1): e1004.

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Plants can be considered as factories producing various chemical compounds. Many of them are used to prevent diseases, and some of them are used as medicine or food [1]. Herbal medicines have long been used for different diseases [2]. Recently, the production of new products from natural plant sources has been considered. It is estimated that there are 300000 plant species in the world, of which only 15% have been studied in terms of medicinal potential [3]. One of the most valuable medicinal plants is *Nigella Sativa*, which are small seeds rich in many nutrients [4]. *Nigella sativa* from the Ranunculaceae family is an annual plant that grows in the Mediterranean region and widely in India, Turkey, Pakistan, and southern Europe [Figure 1] [5].



Figure 1: *Nigella sativa*

For more than thousands of years, this herb has been applied in various parts of the world as a preservative of food, spices, medicine, and treatment of many diseases in traditional medicine [6]. This seed has various names in different areas in the world. In Iran, it is called Shonaiz. In Europe, it is known as Ajenu, black cummin in America, Al-Sawda, Al-habbah, Kamounaswad, and Habbet el-Baraka in Arabic countries, Kalongi in India and Pakistan, and Schwarz kummel in Germany [7]. In describing the antiquity of using this plant, it can be said that Prophet Mohammad mentioned that "this plant is the cure for every disease except death." Besides, Avicenna, in his book "The Canon of Medicine" has mentioned the effects of *Nigella Sativa* on the improvement of fatigue and depression and increasing energy levels [8, 9].

The seeds of this plant are rich in various chemical compounds, including proteins, fixed and volatile oils, carbohydrates, and amino acids. Many studies have reported different bioactive compounds of *Nigella sativa* seeds [Table 1] [10]. One of the most important of them is thymoquinone [11]. Thymoquinone has different medicinal properties such as anti-viral, anti-inflammatory, anti-tumor, and anti-oxidation [12-14]. Also, Khalil et al., in their review, discussed the effect of thymoquinone in reducing the risk of some chronic issues such as neuropathy, nephropathy, retinopathy, cardiovascular diseases, diabetes, cancer, and obesity [15].

Table 1. Bioactive compounds from *Nigella sativa* seeds

Group	Percentage %
Volatile oil	0.4-0.45
Fixed oil	32-40
Carbohydrates	33.9
Fiber	5.5
Proteins	16-19.9
Minerals	1.79-3.74
Water	6

Therapeutic and Pharmacological Activities of *Nigella sativa*

Extensive studies on *Nigella sativa* have been conducted over the past few decades. The results show that it has some medicinal properties and therapeutic activities. Hadi et al.'s study showed that consumption of *Nigella sativa* oil in patients with type 2 diabetes can improve oxidative stress [16]. Kanter et al., in an animal study, have found that *Nigella sativa* has antioxidant properties and increases the levels of antioxidant enzymes such as catalase and superoxide dismutase [17]. Another animal study illustrated that this herb has anti-inflammatory effects and can improve asthma [18]. According to Heshmati et al.'s meta-analysis, *Nigella sativa* could improve lipid profile and glycemic status in diabetic models [19]. Moreover, Khurshid et al. demonstrated the antiproliferative and apoptosis effects of *Nigella sativa* seed proteins [20]. Razmpoosh et al. showed that *Nigella sativa* supplementation improves kidney and liver parameters in obese women and reduces their risk factors for cardiovascular disease [21, 22]. Besides, Gilani et al., in a review, reported *Nigella sativa* biological activities such as antispasmodics, antihypertensive, antimicrobial, spasmolytic, analgesic, and bronchodilator [23].

Currently, *Nigella sativa* is one of the most sought after topics in the world. According to the results of studies, its seeds have many nutritional and medicinal values, and its rational consumption can improve and cure some diseases. However, further studies are needed to find its new biological

activities, and more clinical trials are suggested to prove its medicinal properties.

Acknowledgments

Nothing to declare

Authors' contributions

All authors contributed to this project and article equally. All authors read and approved the final version of the manuscript.

Funding source

None

Conflict of Interest

The authors declare that there is no potential conflict of interests in this review.

References

- [1] Dubick MA. **Historical perspectives on the use of herbal preparations to promote health.** *The Journal of Nutrition.* 1986;116:1348-54
- [2] Ghazanfar SA. **Handbook of Arabian medicinal plants: CRC press;** 1994
- [3] De Luca V, Salim V, Atsumi SM, Yu F. **Mining the biodiversity of plants: a revolution in the making.** *Science.* 2012;336:1658-61
- [4] Takruri HR, Dameh MA. **Study of the nutritional value of black cumin seeds (*Nigella sativa*L).** *Journal of the Science of Food and Agriculture.* 1998;76:404-10
- [5] Assi MA, Noor MM, Bachek NF, Ahmad H, Haron AW, Yusoff MSM, et al. **The various effects of *Nigella Sativa* on multiple body systems in human and animals.** *Pertanika journal of scholarly research reviews.* 2016;2:1-9
- [6] Gali-Muhtasib H, El-Najjar N, Schneider-Stock R. **The medicinal potential of black seed (*Nigella sativa*) and its components.** *Advances in Phytomedicine.* 2006;2:133-53
- [7] Ahmad Z, Ghafoor A, Aslam M. ***Nigella sativa*—A potential commodity in crop diversification traditionally used in healthcare.** *Project on Introduction of Medicinal herb and species as crop Ministry of food, agriculture and livestock, Pakistan.* 2004;2:6-10
- [8] Ilaiyaraja N, Khanum F. ***Nigella sativa* L: a review of therapeutic applications.** *Journal of Herbal Medicine and Toxicology.* 2010;4:1-8
- [9] Nadkarni K. ***Crocus sativus, Nigella sativa.*** *Indian materia medica.* 1976:386-411

- [10] Rajsekhar S, Kuldeep B. **Pharmacognosy and pharmacology of Nigella sativa-A review.** *International Research Journal of Pharmacy.* 2011;2:36-9
- [11] Botnick I, Xue W, Bar E, Ibdah M, Schwartz A, Joel DM, et al. **Distribution of primary and specialized metabolites in Nigella sativa seeds, a spice with vast traditional and historical uses.** *Molecules.* 2012;17:10159-77
- [12] Ali MY, Akter Z, Mei Z, Zheng M, Tania M, Khan MA. **Thymoquinone in autoimmune diseases: Therapeutic potential and molecular mechanisms.** *Biomedicine & Pharmacotherapy.* 134:111157
- [13] Janfaza S, Janfaza E. **The study of pharmacologic and medicinal valuation of thymoquinone of oil of Nigella sativa in the treatment of diseases.** *Annals of Biological Research.* 2012;3:1953-7
- [14] Jehan S, Zhong C, Li G, Zulqarnain Bakhtiar S, Li D, Sui G. **Thymoquinone Selectively Induces Hepatocellular Carcinoma Cell Apoptosis in Synergism With Clinical Therapeutics and Dependence of p53 Status.** *Frontiers in pharmacology.* 2020;11:1453
- [15] Khalil P, Masood S, Rehman AU, Khalil F, Nawaf J. **Preventive Role of Thymoquinone against Certain Chronic Health Issues: A Review.** *International Journal of Nutrition Sciences.* 2020
- [16] Hadi S, Mirmiran P, Daryabeygi-Khotbesara R, Hadi V. **Effect of Nigella sativa oil extract on inflammatory cytokine response and oxidative stress among people with type 2 diabetes mellitus: a randomized, double-blind, placebo controlled trial.** *Progress in Nutrition.* 2018;20:127-33
- [17] Kanter M, Coskun O, Korkmaz A, Oter S. **Effects of Nigella sativa on oxidative stress and β -cell damage in streptozotocin-induced diabetic rats.** *The Anatomical Record Part A: Discoveries in Molecular, Cellular, and Evolutionary Biology: An Official Publication of the American Association of Anatomists.* 2004;279:685-91
- [18] Ikhsan M, Hiedayati N, Maeyama K, Nurwidya F. **Nigella sativa as an anti-inflammatory agent in asthma.** *BMC Research Notes.* 2018;11:1-5
- [19] Heshmati J, Namazi N. **Effects of black seed (Nigella sativa) on metabolic parameters in diabetes mellitus: A systematic review.** *Complementary therapies in medicine.* 2015;23:275-82
- [20] Khurshid Y, Syed B, Simjee SU, Beg O, Ahmed A. **Antiproliferative and apoptotic effects of proteins from black seeds (Nigella sativa) on human breast MCF-7 cancer cell line.** *BMC Complementary Medicine and Therapies.* 2020;20:1-11
- [21] Razmpoosh E, Safi S, Abdollahi N, Nadjarzadeh A, Nazari M, Fallahzadeh H, et al. **The effect of Nigella Sativa on the measures of liver and kidney parameters: a systematic review and meta-analysis of randomized-controlled trials.** *Pharmacological Research.* 2020:104767
- [22] Razmpoosh E, Safi S, Nadjarzadeh A, Fallahzadeh H, Abdollahi N, Mazaheri M, et al. **The effect of Nigella sativa supplementation on cardiovascular risk factors in obese and overweight women: a crossover, double-blind, placebo-controlled randomized clinical trial.** *European Journal of Nutrition.* 2020:1-12
- [23] Gilani A-uH, Jabeen Q, Khan MAU. **A review of medicinal uses and pharmacological activities of Nigella sativa.** *Pak J Biol Sci.* 2004;7:441-51